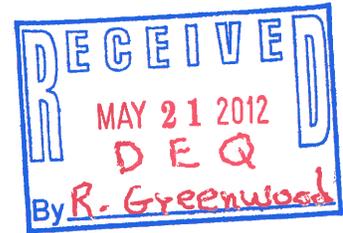


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DEPARTMENT OF ENVIRONMENTAL QUALITY  
STATE A/C PROGRAM

**Northwest Chrome, Inc.**  
**Permit- to-Construct Application**  
**New Plymouth, ID Facility**



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## TABLE OF CONTENTS

<b>1.0</b>	<b>INTRODUCTION AND OVERVIEW .....</b>	<b>1</b>
<b>2.0</b>	<b>FACILITY CLASSIFICATION.....</b>	<b>2</b>
2.1	FACILITY DESCRIPTION.....	2
2.2	FACILITY LOCATION .....	2
2.3	AMBIENT BOUNDARY .....	3
<b>3.0</b>	<b>PROCESS DESCRIPTION .....</b>	<b>4</b>
3.1	GENERAL DISCUSSION .....	4
3.1.1	Stripping Operation.....	4
3.1.2	Polishing Operation .....	4
3.1.3	Electroplating Operations .....	5
3.1.4	Natural Gas Space Heaters.....	5
3.2	PROCESS FLOW DIAGRAM.....	5
<b>4.0</b>	<b>REGULATORY APPLICABILITY .....</b>	<b>6</b>
4.1	STATE REGULATORY APPLICABILITY .....	6
4.1.1	Certification of Documents.....	10
4.1.2	Demonstration of Preconstruction Compliance with Toxic Standards.....	10
4.1.3	Ambient Air Quality Standards for Specific Air Pollutants .....	10
4.1.4	Toxic Air Pollutants.....	10
4.1.5	New Source Performance Standards.....	11
4.1.6	National Emission Standards for Hazardous Air Pollutants.....	11
4.1.7	Visible Emissions.....	11
4.1.8	Rules for Control of Fugitive Dust .....	11
4.1.9	Fuel Burning Equipment – Particulate Matter .....	12
4.1.10	Particulate Matter – Process Weight Limitations .....	12
4.1.11	Odors.....	12
4.2	FEDERAL REGULATORY APPLICABILITY .....	12
4.2.1	National Ambient Air Quality Standards.....	13
4.2.2	New Source Review.....	13
4.2.3	New Source Performance Standards.....	14
4.2.4	National Emissions Standards for Hazardous Air Pollutants .....	14
4.2.5	Risk Management Programs for Chemical Accidental Release Prevention .....	14
4.2.6	Title V Operating Permit .....	15
4.2.7	Acid Rain Requirements .....	15
<b>5.0</b>	<b>EMISSIONS SUMMARY .....</b>	<b>16</b>
5.1	CRITERIA POLLUTANTS.....	16
	Particulate Matter Calculations.....	17
5.2	TOXIC AND HAZARDOUS AIR POLLUTANTS .....	18
<b>6.0</b>	<b>LIMITATIONS ON POTENTIAL TO EMIT .....</b>	<b>24</b>
6.1	MATERIAL THROUGHPUT.....	24
6.2	EQUIPMENT LIMITS.....	24
6.3	OPERATION AND MAINTENANCE REQUIREMENTS.....	24
6.4	MONITORING REQUIREMENTS.....	24
6.5	RECORDKEEPING REQUIREMENTS.....	24

**LIST OF TABLES**

Table 1 State Regulatory Applicability Summary ..... 7  
 Table 2 Grain Loading Emissions for Natural Gas Combustion ..... 12  
 Table 3 Federal Regulatory Applicability Summary ..... 12  
 Table 4 Northwest Chrome Facility-Wide Potential to Emit Criteria Pollutants ..... 17  
 Table 5 Facility Criteria Pollutant Change in Emissions..... 17  
 Table 6 PTE TAPs from All Sources..... 19  
 Table 7 PTE HAPs from All Sources ..... 20

**LIST OF APPENDICES**

Appendix A Site Location Map and Plot Plan  
 Appendix B DEQ PTC Forms and Checklists  
 Appendix C Process Flow Diagram  
 Appendix D Manufacturer Information  
 Appendix E Emissions Inventory  
 Appendix F Modeling Analysis

**LIST OF ACRONYMS & ABBREVIATIONS**

**AAC** Acceptable Ambient Concentration  
**AACC** Acceptable Ambient Concentration for a Carcinogen  
**DEQ** Department of Environmental Quality  
**EPA** Environmental Protection Agency  
**fps** Feet Per Second  
**HAP** Hazardous Air Pollutant  
**IDAPA** Idaho Administrative Procedures Act  
**NAAQS** National Ambient Air Quality Standards  
**NESHAP** National Emissions Standards for Hazardous Air Pollutants  
**PSD** Prevention of Significant Deterioration  
**PTC** Permit-to-Construct  
**PTE** Potential to Emit  
**TAP** Toxic Air Pollutant  
**VOC** Volatile Organic Compounds

**NORTHWEST CHROME, INC.  
PERMIT-TO-CONSTRUCT-APPLICATION  
NEW PLYMOUTH, IDAHO FACILITY**

**1.0 INTRODUCTION AND OVERVIEW**

Northwest Chrome, Inc. (Northwest Chrome) is submitting this Permit-to-Construct (PTC) Application for their decorative chrome, nickel, and copper electroplating facility in New Plymouth, Idaho. The Northwest Chrome process consists of chromium, nickel, and copper submerge tanks that emit PM-10, volatile organic compounds (VOCs), toxic air pollutants (TAPs), and hazardous air pollutants (HAPs). The Northwest Chrome facility is an area source for HAP emissions and is regulated as a Title V source under 40 CFR 63 – Subpart N, National Emission Standards for Chromium Emissions from Hard and Decorative Chromium Electroplating and Chromium Anodizing Tanks. The facility is being relocated from its current operating location and is requesting a new PTC for the revised location.

The purpose of this document is to present all necessary and applicable information regarding the facility in support of a PTC Application for the facility. Northwest Chrome will be a minor source for all Criteria and Hazardous Air Pollutants. A site location map and plot plan has been included in Appendix A for reference.

This application is meant to ensure that the facility is in full permit compliance with all applicable Idaho Administrative Procedures Act (IDAPA) regulations. All required Department of Environmental Quality (DEQ) PTC forms and checklists are included in Appendix B.

With the submittal of this PTC application, Northwest Chrome requests that the Idaho Department of Environmental Quality issue a new PTC for the facility.

## **2.0 FACILITY CLASSIFICATION**

The Northwest Chrome facility should be considered a true minor source because its potential to emit (PTE) is less than all major source thresholds. The Standard Industrial Classification defining the facility is 3471.

### **2.1 FACILITY DESCRIPTION**

Northwest Chrome is an electroplating facility which performs both plating and polishing activities. Their process primarily involves electroplating chromium, nickel and copper onto various metals, including automobile bumpers and wheels, motorcycle gas tanks and tailpipes. Both the electroplating and polishing operations occur in a single 125-foot by 67-foot size building.

The polishing operations consist of buffing the metal and aluminum alloys, etc. prior to electroplating, to create a shiny mirror-like finish. There are no emissions from the polishing process. Any material used in the polishing process either is applied to the accessories or falls to the ground where it is swept up during daily cleaning. Appendix D provides supporting documentation on the polishing process.

The primary source of emissions is from the electroplating operations. Electroplating emissions discharge through a single 35-foot-tall stack, which has a volumetric flow rate of 19.25 feet per second (fps). Northwest Chrome applies a fume suppressant, Fumetrol 140, to the chromium electroplating bath in order to control chromium emissions. The Fumetrol 140 suppressant has a control efficiency of 99.815% (Appendix D). Nickel and copper are uncontrolled.

Material Safety Data Sheets and other supporting information are included in Appendix D for the miscellaneous solutions utilized in Northwest Chrome's process. The main pollutants of concern are chromium VI and nickel (586 TAPs), which are emitted from the electroplating process when the tanks are electrified, and sulfuric acid (a 585 TAP), which is emitted when the substance is added to tanks.

### **2.2 FACILITY LOCATION**

The Northwest Chrome facility is located at 420 Industrial Way in New Plymouth, Idaho. It is within Air Quality Control Region 63 and Universal Transverse Mercator zone 11. The exact location in relation to the surrounding area is shown on the Location Map in Appendix A. The facility is located within Payette County, which is designated as unclassifiable for all criteria pollutants. The closest distance to the property boundary from the building is 5.5 meters (18 feet). The electroplating stack is 8 meters (26.2 feet) from the property boundary.

### **2.3 AMBIENT BOUNDARY**

The facility property boundary is in close proximity to the building. Facility staff is trained to notice and stop unauthorized access. Therefore, the property boundary is used as the ambient air boundary. The property boundary is shown in the plot plan in Appendix A. The closest distance between the electroplating stack and the ambient boundary is approximately 8 meters (26.2 feet).

### **3.0 PROCESS DESCRIPTION**

#### **3.1 GENERAL DISCUSSION**

Northwest Chrome electroplates and polishes various automobile and motorcycle accessories. The process involves stripping incoming articles of material (i.e. paint, oil and dirt residue), polishing (where parts are polished by machine and prepared for plating), and finally electroplating (where all parts are plated with copper, nickel and/or chrome). The facility will also have a wheel polishing area, where wheels are delivered, polished, and picked up in the same area. The wheel polishing process does not involve electroplating. The facility will utilize two small natural gas fired space heaters for temperature control in the polishing and electroplating areas, respectively.

The primary source of emissions comes from the electroplating operations. Other contributing sources include small emissions from the stripping process (when process chemicals are added to the tanks) and from the combustion of natural gas for building/space heating. The polishing process has no emissions, as described below. All operations occur within a single 125-foot by 67-foot building.

##### **3.1.1 Stripping Operation**

Incoming articles (metallic vehicle bumpers, wheels, nuts and bolts, etc.) are sent through a series of caustic and acid-based submerge tanks that effectively strip a majority of oils, dirt or residue adhered to the incoming articles. Any residues remaining on the articles will have a negative effect on the smooth finish desired of the end product. Once articles have been stripped, they are sent to the polishing area in order to smooth out any rough surfaces. Sodium hydroxide and various acids are added to the tanks, on an annual or semi-annual basis, in order to control the concentration needed for proper stripping. Emissions from this process occur when chemicals are being added to the tanks. Calculations are available in the emissions inventory provided in Appendix E.

##### **3.1.2 Polishing Operation**

A description of Northwest Chrome's polishing operation, which includes materials used for polishing and the operating procedures, is included in Appendix D. The polishing operation takes place in a separate closed area from the electroplating process. The polishing procedure occurs in four stages that include rough (80-180 grit) surface sanding, fine (180-220 grit) sanding, and two buffing stages. The process is intended to smooth out the article and bring it to a mirror-like finish before it is electroplated. The particulates from the sanding process are large and settle on the floor near the sanding machines. The particles remain in the building and are not released to the atmosphere. Northwest Chrome has visually inspected the polishing area and has concluded that

no emissions leave the room. Due to this, the sanding machines are not considered emission sources. The next step of the process utilizes buffing wheels which use cloth to buff and polish the product. The buffing wheels are lubricated periodically as a maintenance procedure for preservation of the equipment. No emissions result from this process.

### **3.1.3 Electroplating Operations**

Once articles have been stripped and polished, they are sent through the plating line where they are plated copper, nickel, and/or chrome. The chromium, nickel, and copper electroplating baths each utilize a separate rectifier to electrically charge the solution within the respective tank. Emissions from these sources are exhausted through a 35-foot vertical roof stack that has a diameter of 16 inches, an exhaust velocity of 19.25 fps, and an exit gas temperature of 70 degrees Fahrenheit (°F). Detailed emissions calculations are provided in the emissions inventory within Appendix E and within “Section 5 Emissions Summary”.

### **3.1.4 Natural Gas Space Heaters**

Northwest Chrome utilizes two identical 0.175 MMBtu/hr natural gas-fired space heaters within the electroplating and polishing areas. Table 2 provides the estimated emissions from these minor sources comply with the IDAPA 58.01.01.677 allowable particulate concentrations. Each heater has a stack height of 20 feet, a stack exit diameter of 10 inches, and an exit gas temperature of 350 (°F). The exit gas velocity is 2.14 fps.

## **3.2 PROCESS FLOW DIAGRAM**

Appendix C contains a diagram of Northwest Chrome’s process flow.

#### **4.0 REGULATORY APPLICABILITY**

In preparing and submitting this application, Northwest Chrome has evaluated the applicability of state and federal regulations to the permit to construct. The following subsections contain the applicability analysis for a specific subset of air quality regulations.

##### **4.1 STATE REGULATORY APPLICABILITY**

Table 1 cites the applicable and inapplicable requirements of the Rules for the Control of Air Pollution in Idaho (IDAPA 58.01.01) for air emitting activities at Northwest Chrome. Each regulation requiring additional description is detailed below.

**Table 1 State Regulatory Applicability Summary**

Citation under IDAPA 58.01.01	Title	Compliance Determination Method (Recordkeeping, Monitoring, Reporting, Test Method)	Applicable Yes or No	In Compliance Yes or No	Explanation Code and/or Additional Information
123	Certification of Documents	Recordkeeping/Reporting	Yes	Yes	Section 4.1.1
200 - 203	Procedures and Requirements for Permits to Construct General Applicability	N/A	Yes	Yes	A Permit to Construct is required.
204	Permit Requirements for New Major Facilities or Major Modifications in Nonattainment Areas	N/A	No	N/A	(Note D)
205	Permit Requirements for New Major Facilities or Major Modifications in Attainment or Unclassifiable Areas	N/A	No	N/A	(Note D)
206 - 208	Optional Offsets for Permits to Construct; Emission Reduction Credit; Net Air Quality Benefit	N/A	Yes	N/A	
209	Procedures for Issuing Permits	N/A	Yes	N/A	
210	Demonstration of Preconstruction Compliance with Toxic Standards	Recordkeeping/Reporting	Yes	Yes	Section 4.1.2
211	Conditions for Permits to Construct	N/A	Yes	N/A	
212	Obligation to Comply	Specific for each requirement	Yes	N/A	
213	Pre-Permit Construction	N/A	Yes	N/A	
214	Demonstration of Preconstruction Compliance for New and Reconstructed Sources of Hazardous Air Pollutants	Recordkeeping/Reporting	Yes	Yes	
220 - 223	Exemptions from Permit to Construct Requirements	N/A	No	N/A	A Permit to Construct is Required
224 - 227	Fees	N/A	Yes	N/A	Application fee is submitted; Northwest Chrome will pay assessed fee.
228	Appeals	N/A	Yes	N/A	
510	Stack Heights and Dispersion Techniques	Air Dispersion Modeling; Recordkeeping, Reporting	Yes	Yes	See 511-516
511	Applicability	Recordkeeping	Yes	Yes	
512	Definitions	Recordkeeping	Yes	Yes	
513	Requirements	Recordkeeping	Yes	Yes	
514	Opportunity for Public Hearing	N/A	No	No	(Note B)

Citation under IDAPA 58.01.01	Title	Compliance Determination Method (Recordkeeping, Monitoring, Reporting, Test Method)	Applicable Yes or No	In Compliance Yes or No	Explanation Code and/or Additional Information
515	Approval of Field Studies and Fluid Models	N/A	No	No	Administrative and/or procedural
516	No Restriction on Actual Stack Height	N/A	Yes	N/A	No substantive requirements
550-561	Air Pollution Emergency Rule	N/A	No	N/A	Applicability is case-by-case
562	Specific Emergency Episode Abatement Plans for Point Sources	N/A	No	N/A	Northwest Chrome has not been required by the Department to prepare an Emergency Episode Abatement Plan.
563 - 574	Transportation Conformity	N/A	No	N/A	(Note B)
577	Ambient Air Quality Standards for Specific Air Pollutants	Air Dispersion Modeling and Monitoring	Yes	Yes	(Notes D) Section 4.1.3
582	Interim Conformity Provisions for Northern ADA County Former Non-Attainment Area for PM-10	No	NA	N/A	(Note D)
585-586	Toxic Air Pollutants Non-Carcinogenic Increments, Toxic Air Pollutants Carcinogenic Increments	Recordkeeping/Reporting	Yes	Yes	(Note A) Section 4.1.4
587	Listing or Delisting Toxic Air Pollutant Increments	N/A	No	N/A	(Note A, C)
590	New Source Performance Standards	N/A	No	N/A	See Form FRA within Appendix B
591	National Emission Standards for Hazardous Air Pollutants	Monitoring, Reporting, Recordkeeping	Yes	Yes	Section 4.1.5 Northwest Chrome is applicable to 40 CFR 63 Subpart N
600-609	Rules for Control of Open Burning	N/A	No	N/A	(Note F)
610	Industrial Flares	N/A	No	N/A	No substantive requirements
611-616	Rules for Control of Open Burning	N/A	No	N/A	(Note F)
625	Visible Emissions	Monitoring, Reporting, Recordkeeping	Yes	Yes	Section 4.1.6
650-651	Rules for Control of Fugitive Dust	Reasonable steps taken to control or mitigate fugitive dust	Yes	Yes	Reasonable precautions are utilized to control fugitive emissions at this facility. This is not applicable to any point source.

Citation under IDAPA 58.01.01	Title	Compliance Determination Method (Recordkeeping, Monitoring, Reporting, Test Method)	Applicable Yes or No	In Compliance Yes or No	Explanation Code and/or Additional Information
675	Fuel Burning Equipment – Particulate Matter Facility operates fuel burning equipment.		No	N/A	See rules 676-680
676	Standards for New Sources	Recordkeeping	No	N/A	Less than 10 MMBtu/hr
677	Standards for Minor and Existing Sources	N/A	Yes	Yes	Source complies with the emissions standard as stated in the rule.
678-680	Combinations of Fuels	N/A	No	N/A	(Note F)
681	Test Methods and Procedures	Use of required test procedure(s)	No	N/A	
700	Particulate Matter – Process Weight Limitations		Yes	Yes	See rules 701-703
701	Particulate Matter – New Equipment Process Weight Limitations	Monitoring and Testing	No	N/A	(Note A)
702	Particulate Matter – Existing Process Weight Limitations	Monitoring and Testing	No	N/A	(Note A)
703	Particulate Matter – Other Processes	N/A	No	N/A	(Note D)
725	Rules for Sulfur Content of Fuels General Applicability	N/A	No	N/A	(Note E)
726	Definitions as Used in Sections 727 through 729	N/A	No	N/A	
727	Residual Fuel Oils	N/A	No	N/A	(Note E)
728	Distillate Fuel	N/A	No	N/A	(Note E)
729	Coal	N/A	No	N/A	(Note E)
750-751	Rules for Control of Fluoride Emissions	N/A	N/A	N/A	(Note D)
775-776	Rules for Control of Odors General Applicability	Northwest Chrome will investigate any odor complaint or identified issue.	Yes	N/A	(Note A); No substantive requirements for regulated units or activities.

APPLICABILITY EXPLANATION CODES

N/A Not Applicable

A - State only

B - Regulation applies to regulatory authority.

C - Currently there are no projects or circumstances existing at the facility that would subject Northwest Chrome to these provisions; however, Northwest Chrome may use these provisions in the future if the circumstances arise.

D - Facility is not in this source category.

E - Facility does not use this fuel type.

F - Facility does not conduct this activity.

#### **4.1.1 Certification of Documents**

IDAPA 58.01.01.123 requires all documents including application forms for permits to construct, records, and monitoring reports submitted to the Department shall contain a certification by a responsible official. Northwest Chrome will comply with this requirement and the appropriate certifications by a responsible official are being submitted with this application.

#### **4.1.2 Demonstration of Preconstruction Compliance with Toxic Standards**

IDAPA 58.01.01.210 establishes requirements for compliance with toxic standards. Northwest Chrome will comply with this rule by identifying and calculating the toxic pollutant emission rates from all applicable emissions units at the facility.

Northwest Chrome calculated the change in TAP emission rates from all on-site emissions locations. The emissions of nickel, chromium VI, and sulfuric acid exceeded their respective screening emissions levels. Emissions of sulfuric acid and nickel were modeled and the modeled ambient concentrations were less than the acceptable ambient concentration (AAC) and acceptable ambient concentration for a carcinogen (AACC) levels, respectively.

Because the facility's electroplating tank is subject to 40 CFR Part 63, Subpart N (MACT), in accordance with IDAPA 58.01.01.210.20, no further procedures for demonstrating preconstruction compliance will be required for chromium VI. As long as the facility complies with MACT standards, the facility complies with Section 210 of the Rules.

Overall, the facility has demonstrated compliance with the toxic standards in accordance with IDAPA 58.01.01.210.

#### **4.1.3 Ambient Air Quality Standards for Specific Air Pollutants**

IDAPA 58.01.01.577 establishes ambient air quality standards for specific air pollutants including PM-10, sulfur dioxide, ozone, nitrogen oxide, carbon monoxide, fluorides, and lead. Northwest Chrome demonstrated compliance with the criteria standards by being below the screening emissions levels for these pollutants. Criteria emissions are summarized in Table 4 and detailed calculations are provided in the Emissions Inventory within Appendix E.

#### **4.1.4 Toxic Air Pollutants**

IDAPA 58.01.01.585 and 586 establishes requirements for compliance with TAPs. The emissions of nickel, sulfuric acid, and chromium VI exceeded their respective screening emissions levels. Emissions of nickel and sulfuric acid were modeled, and the modeled ambient concentrations were less than their respective acceptable ambient concentrations (AAC/AACC). No further procedures for demonstrating preconstruction compliance will be required for chromium VI, because the facility is subject to 40 CFR Part 63, Subpart N (MACT). As long as the facility complies with MACT standards, the facility complies with Section 210 of the Rules.

The TAP Preconstruction Compliance Application Completeness Checklist is included in Attachment B and TAP emissions are shown in Section 5.0.

#### **4.1.5 New Source Performance Standards**

The facility is not subject to New Source Performance Standards. See Form FRA within Appendix B for further analysis.

#### **4.1.6 National Emission Standards for Hazardous Air Pollutants**

Two sets of National Emissions Standards for Hazardous Air Pollutants (NESHAPs) may potentially apply to the Northwest Chrome facility. The first NESHAP regulations were developed under the auspices of the original Clean Air Act. These standards are codified in 40 CFR Part 61, and address a limited number of pollutants and industries. 40 CFR Part 61 regulations do not apply to this facility.

Newer regulations are codified in 40 CFR Part 63 under the authority of the 1990 Clean Air Act Amendments. These standards regulate HAP emissions from specific source categories and typically affect only major sources of HAPs. Part 63, Subpart N, specifies regulations for National Emissions Standards for Chromium Emissions from Hard and Decorative Chromium Electroplating and Chromium Anodizing Tanks. Northwest Chrome utilizes chromium electroplating tank to perform decorative chromium electroplating. Therefore, the facility's chromium electroplating tank is subject to 40 CFR 63.340(a).

In accordance with 40 CFR 63.340(c), process tanks associated with a chromium electroplating or chromium anodizing process, but in which neither chromium electroplating nor chromium anodizing is taking place, are not subject to the provisions of this subpart. Examples of such tanks include, but are not limited to, rinse tanks, etching tanks and cleaning tanks. Likewise, tanks that contain a chromium solution, but in which no electrolytic process occurs, are not subject to this subpart. An example of such a tank is a chrome conversion coating tank where no electrical current is applied.

A complete regulatory review is outlined in full detail on Form FRA, within Appendix B.

#### **4.1.7 Visible Emissions**

The regulation states that any point of emission shall not have a discharge of any air pollutant for a period aggregating more than three minutes in any 60-minute period of greater than 20 percent opacity. The emissions points at this facility are subject to this regulation. Northwest Chrome will comply with this rule by completing all routine onsite equipment maintenance and ensuring that the facility is operated within the standards of good engineering practices.

#### **4.1.8 Rules for Control of Fugitive Dust**

IDAPA 58.01.01.650 requires that all reasonable precautions be taken to prevent the generation of fugitive dust. Northwest Chrome will comply with fugitive particulate matter regulations by maintaining all equipment according to the manufacturer's specifications and best practices.

**4.1.9 Fuel Burning Equipment – Particulate Matter**

This regulation establishes particulate matter emission standards (grain loading standards) for fuel burning equipment. Fuel burning equipment is defined in IDAPA 58.01.01.006.45 as, “Any furnace, boiler, apparatus, stack and all appurtenances thereto, used in the process of burning fuel for the primary purpose of producing heat or power by indirect heat transfer.”

This regulation, as stated above, is applicable to the natural gas-fired heaters. Table 2 shows the estimated grain loading concentrations for natural gas, in accordance with IDAPA 58.01.01.677. All calculations have been corrected to Northwest Chrome’s facility altitude of 2,056 feet and three percent oxygen. All natural gas combustion equipment is in compliance with the grain loading standard.

**Table 2 Grain Loading Emissions for Natural Gas Combustion**

Source	PM Emission Factor (lb/scf) <sup>a</sup>	Gas Volume @ 3% O <sub>2</sub> (dscf/MMBTU)	Combustion Volume of 1 cubic feet of gas (dscf/scf)	Grain Loading (grain/dscf)	Allowable Particulates (grain/dscf)	Meet Grain Loading Standard?
Polishing Space Heater	7.6 X 10 <sup>-6</sup>	1.099 X 10 <sup>4</sup>	11.54	4.61 X 10 <sup>-3</sup>	0.015	Yes
Electroplating Space Heater	7.6 X 10 <sup>-6</sup>	1.099 X 10 <sup>4</sup>	11.54	4.61 X 10 <sup>-3</sup>	0.015	Yes

**4.1.10 Particulate Matter – Process Weight Limitations**

IDAPA 58.01.01.701 promulgates restrictions on PM for the entire facility based on process weight. Fuel burning equipment at the facility is not subject to this requirement. Additionally, PM calculations for the electroplating process are based upon rectifier amperage and AP-42 (or source test) emissions factors. Process weight is not a factor; therefore, the process weight limitation requirement does not apply to Northwest Chrome.

**4.1.11 Odors**

IDAPA 58.01.01.775-776 requires no emissions of odorous gases, liquids, or solids to the atmosphere in such quantities as to cause air pollution. Northwest Chrome will comply with this requirement by keeping records of all odor complaints received and will take appropriate action for each complaint which has merit.

**4.2 FEDERAL REGULATORY APPLICABILITY**

A review of applicable Federal Rules, Title 40 of the CFR, is provided in Table 3. The completed federal regulatory applicability form (Form FRA) is included in Appendix B.

**Table 3 Federal Regulatory Applicability Summary**

Section	Description	Regulatory Citation	Applicable
4.2.1	National Ambient Air Quality Standards (NAAQS) (dispersion modeling)	40 CFR Part 50	Yes; below screening levels for all pollutants
4.2.2	New Source Review	40 CFR Part 51	No
4.2.3	New Source Performance Standards	40 CFR Part 60	No
4.2.4	National Emissions Standards for Hazardous Air Pollutants (NESHAPs)	40 CFR Parts 61, 63	Yes; Part 63, Subpart N
4.2.5	Risk Management Programs For Chemical Accidental Release Prevention	40 CFR Part 68	No
4.2.6	Title V Operating Permit	40 CFR Part 70	No
4.2.7	Acid Rain Requirements	40 CFR Parts 72–78	No

#### 4.2.1 National Ambient Air Quality Standards

Primary National Ambient Air Quality Standards (NAAQS) are identified in 40 CFR Part 50 and define levels of air quality, which the United States Environmental Protection Agency (EPA) deems necessary to protect the public health. Secondary NAAQS define levels of air quality, which the EPA judges necessary to protect public welfare from any known, or anticipated adverse effects of a pollutant. Examples of public welfare include protecting wildlife, buildings, national monuments, vegetation, visibility, and property values from degradation due to excessive emissions of criteria pollutants.

Emissions from this facility will not cause or significantly contribute to a violation of any ambient air quality standard. The facility will be a minor source for all pollutants. Northwest Chrome demonstrated compliance with the criteria standards by being below the screening emissions levels for these pollutants. Criteria emissions are summarized in Table 4 and detailed calculations are provided in the Emissions Inventory within Appendix E.

#### 4.2.2 New Source Review

Payette County is designated as an attainment area for all criteria pollutants. Therefore, the prevention of significant deterioration (PSD) regulations codified in 40 CFR Part 52 apply to the region. The PSD rule applies to: (1) a new major source that has the PTE of 100 tons per year (tpy) or more for any criteria pollutant for a facility that is one of the 28 industrial source categories listed in 40 CFR § 52.21(b)(1)(i)(a); or (2) a new major source that has the PTE of 250 tpy or more of a regulated pollutant if the facility is not on the list of industrial source categories; or (3) a modification to an existing major source that results in a net emission increase greater than a PSD significant emission rate as specified in 40 CFR § 52.21 (b)(23)(i); or (4) a modification to an existing minor source that is major in itself.

The Northwest Chrome facility does not fall under one of the 28 industrial source categories, nor will the PTE exceed 250 tpy for any regulated pollutant. Therefore, Northwest Chrome is not subject to PSD regulations. Additionally, Northwest Chrome will not exceed the 100,000 tpy threshold for CO<sub>2</sub>e as defined in 40 CFR Part 98.

#### **4.2.3 New Source Performance Standards**

The facility is not subject to New Source Performance Standards.

#### **4.2.4 National Emissions Standards for Hazardous Air Pollutants**

NESHAPs are discussed in Section 4.1.6 above. Subpart N of the NESHAPs, Area Source Standards, applies to the Northwest Chrome facility. Because they utilize a chromium electroplating tank to perform decorative chromium electroplating, the facility's chromium electroplating tank is subject to 40 CFR 63.340(a).

In accordance with 40 CFR 63.340(c), process tanks associated with a chromium electroplating or chromium anodizing process, but in which neither chromium electroplating nor chromium anodizing is taking place, *are not subject* to the provisions of this subpart. Examples of such tanks include rinse tanks and cleaning tanks. Likewise, tanks that contain a chromium solution, but in which no electrolytic process occurs, are not subject to this subpart. An example of such a tank is a chrome conversion coating tank where no electrical current is applied.

Therefore, the only affected source at Northwest Chrome subject to the following 40 CFR Part 63 Subpart N requirements is the chromium electroplating tank.

Northwest Chrome is choosing to use the surface tension limit under 40 CFR 63.342 (d)(2) to demonstrate compliance with MACT standards for their chromium electroplating tank.

Northwest Chrome is choosing to add a chemical fume suppressant, which will not allow the surface tension of the chromium electroplating tank to exceed 45 dynes/cm as measured by a stalagmometer. The chemical fume suppressant is Fumetrol 140, manufactured by Atotech. Fumetrol 140 has been proven to control 99.815% of chromium emissions. Refer to Appendix D for more information on both Fumetrol 140 and the operation of the stalagmometer. Fumetrol 140 was utilized in the emissions calculations and ambient air quality analysis.

All operating, monitoring, recordkeeping, and reporting requirements in 40CFR Part 63 applying to Northwest Chrome's chromium electroplating tank are included in the regulatory review on Form FRA within Appendix B.

A complete regulatory review is outlined in full detail on Form FRA, within Appendix B.

#### **4.2.5 Risk Management Programs for Chemical Accidental Release Prevention**

The facility is not subject to the Chemical Accidental Release Prevention Program and will not be required to develop a Risk Management Plan (RMP). Facilities that produce, process, store, or use any regulated toxic or flammable substance in excess of the thresholds listed in 40 CFR Part 68 must develop a RMP. The facility does not store any regulated toxic or flammable substances in excess of the applicable thresholds. A RMP is not necessary for this facility.

#### **4.2.6 Title V Operating Permit**

Title V of the Clean Air Act created the federal operating permit program. These permitting requirements are codified in 40 CFR Part 70. These permits are required for major sources with a PTE (considering federally enforceable limitations) greater than 100 tpy for any criteria pollutant, 25 tpy for all hazardous air pollutants (HAPs) in aggregate, or 10 tpy of any single HAP. Northwest Chrome will qualify as a minor source and will be exempt from a Title V operating permit. Subsection 63.340(e) of 40 CFR Part 63, Subpart N was amended December 19, 2005, effectively exempting area sources from the obligation to obtain a Title V permit under 40 CFR Part 70 or 71. A detailed analysis is provided on Form FRA within Appendix B.

#### **4.2.7 Acid Rain Requirements**

The acid rain requirements codified in 40 CFR Parts 72-78 apply only to utilities and other facilities that combust fossil fuel and generate electricity for wholesale or retail sale. The proposed facility will not produce electrical power for sale. Therefore, the facility is not subject to the acid rain provisions and will not require an acid rain permit.

## 5.0 EMISSIONS SUMMARY

As discussed in Section 3, the primary source of emissions comes from the electroplating operations. Other contributing sources include small emissions from the stripping process (when process chemicals are added to the tanks) and from the combustion of natural gas for building/space heating. The polishing process has no emissions. This section includes all criteria air pollutant and TAPs calculations. A complete emissions inventory is included in Appendix E.

### 5.1 Criteria Pollutants

Criteria pollutant emissions at the Northwest Chrome facility occur from natural gas combustion, strip tank re-filling, and from the electroplating processes.

Particulate emissions occur during the chromium, copper and nickel electroplating operations in the form of a mist. Gas bubbles, generated during the process, rise to the surface of the liquid and burst. Upon bursting, tiny droplets of material (chromic acid for the chromium tank) become entrained in ambient air, as particulate matter.

Northwest Chrome will add Fumetrol 140, a wetting agent, to the chromium tank bath in order to comply with the MACT standard outlined in 40 CFR 63, Subpart N. Fumetrol 140 reduces the surface tension of the liquid within the tank and diminishes the formation of the chromic acid mist droplets. Particulate emissions from the copper and nickel tanks are summarized in the table below.

VOC emissions are accounted for with the use of EGME, a chemical component of *Aluminum Brightener* which is stored in drums to pre-treat products that will be plated.

All other criteria emissions are the result of natural gas combustion from the two area/space heaters. The potential to emit criteria pollutants is shown in Table 4 below. Calculations may be found in the emissions inventory under the "Criteria Facility Wide PTE" worksheet provided in Appendix E.

**Table 4 Northwest Chrome Facility-Wide Potential to Emit Criteria Pollutants**

Description	NOx Emissions (lbs/hr)	CO Emissions (lb/hr)	CO <sub>2</sub> e Emissions (lb/hr)	PM-10 Emissions (lb/hr)	PM-2.5 Emissions (lb/hr)	SOx Emissions (lb/hr)	VOC Emissions (lb/hr)	Lead Emissions (lb/hr)
Combustion Sources	0.0343	0.0288	41.1765	0.0026	0.0026	0.0002	0.0015	0.0000002
Electroplating Process	n/a	n/a	n/a	0.0004	n/a	n/a	0.0150	n/a
<b>TOTAL</b>	<b>3.43E-02</b>	<b>2.88E-02</b>	<b>4.12E+01</b>	<b>2.96E-03</b>	<b>2.61E-03</b>	<b>2.06E-04</b>	<b>1.66E-02</b>	<b>1.72E-07</b>
Description	NOx Emissions (tons/yr)	CO Emissions (tons/yr)	CO <sub>2</sub> e Emissions (tons/yr)	PM-10 Emissions (tons/yr)	PM-2.5 Emissions (tons/yr)	SOx Emissions (tons/yr)	VOC Emissions (tons/yr)	Lead Emissions (tons/yr)
Combustion Sources	0.1503	0.1262	180.3529	0.0114	0.0114	0.0009	0.0067	0.0000008
Electroplating Process	n/a	n/a	n/a	0.0014	n/a	n/a	0.0442	n/a
<b>TOTAL</b>	<b>1.50E-01</b>	<b>1.26E-01</b>	<b>1.80E+02</b>	<b>1.29E-02</b>	<b>1.14E-02</b>	<b>9.02E-04</b>	<b>5.09E-02</b>	<b>7.51E-07</b>

**Particulate Matter Calculations**

PM emissions were calculated by utilizing the following:

- AP-42 emission factors for the
- SCAQMD emissions factor for copper and nickel electroplating baths
- Amperage of the rectifiers
- Chemical fume suppressant source test report

Electronic copies of the Excel spreadsheets used to calculate facility emissions are included in Appendix E of this permit application.

Table 5 shows the total facility change in emissions from a pre-facility emissions level of zero.

**Table 5 Facility Criteria Pollutant Change in Emissions**

Description	NOx (lb/hr)	CO (lb/hr)	CO <sub>2</sub> e (lb/hr)	PM (lb/hr)	PM-10 (lb/hr)	PM-2.5 (lb/hr)	Sox (lb/hr)	VOC (lb/hr)	Lead (lb/hr)
Combustion Sources	0.0343	0.0288	41.1765	0.0026	0.0026	0.0026	0.0002	0.0015	0.0000002
Electroplating Process	n/a	n/a	n/a	0.0004	0.0004	n/a	n/a	0.0150	n/a
<b>TOTAL</b>	<b>3.43E-02</b>	<b>2.88E-02</b>	<b>4.12E+01</b>	<b>2.96E-03</b>	<b>2.96E-03</b>	<b>2.61E-03</b>	<b>2.06E-04</b>	<b>1.66E-02</b>	<b>1.72E-07</b>
Description	NOx (tons/yr)	CO (tons/yr)	CO <sub>2</sub> e (tons/yr)	PM (tons/yr)	PM-10 (tons/yr)	PM-2.5 (tons/yr)	SOx (tons/yr)	VOC (tons/yr)	Lead (tons/yr)
Combustion Sources	0.1503	0.1262	180.3529	0.0114	0.0114	0.0114	0.0009	0.0067	0.0000008
Electroplating Process	n/a	n/a	n/a	0.0015	0.0015	0.0015	n/a	0.0442	n/a
<b>TOTAL</b>	<b>1.50E-01</b>	<b>1.26E-01</b>	<b>1.80E+02</b>	<b>1.29E-02</b>	<b>1.29E-02</b>	<b>1.29E-02</b>	<b>9.02E-04</b>	<b>5.09E-02</b>	<b>7.51E-07</b>

## 5.2 TOXIC AND HAZARDOUS AIR POLLUTANTS

The detailed criteria emission estimates are shown here for the electroplating operations. TAPs and HAPs were calculated by using the following:

- AP-42 emission factors
- SCAQMD emissions factor for copper and nickel electroplating baths
- Amperage of the rectifiers
- Chemical fume suppressant source test report
- Chemical information from Material Safety Data Sheets for all chemical substances used in the operation.

The chromium electroplating process has a maximum rated capacity of 5,000 Ampere (A). Fumetrol 140, a chemical mist suppressant added to the chromium bath, is used to control the chromium emissions. The control efficiency of Fumetrol 140 is 99.81%. Manufacturing information is provided within Appendix D. The copper and nickel electroplating baths have a maximum rated capacity of 2,200 Ampere (A). These units do not employ emissions controls.

IDAPA 58.01.01.585 and 586 establishes requirements for compliance with TAPs. The emissions of nickel, sulfuric acid, and chromium VI exceeded their respective screen emissions levels. Emissions of nickel and sulfuric acid were modeled, and the modeled ambient concentrations were less than their respective AAC. No further procedures for demonstrating preconstruction compliance will be required for chromium VI, because the facility is subject to 40 CFR Part 63, Subpart N (MACT). As long as the facility complies with MACT standards, the facility complies with Section 210 of the Rules.

The TAP Preconstruction Compliance Application Completeness Checklist is included in Appendix B.

**Table 6 PTE TAPs from All Sources**

<b>Part 1. PRE- AND POST-PROJECT CARCINOGENIC TAP EMISSIONS SUMMARY POTENTIAL TO EMIT</b>					
<b>Non-Carcinogenic Toxic Air Pollutants</b>	<b>Pre-Project</b>	<b>Post-Project</b>	<b>Change In</b>	<b>Non-Carcinogenic Screening Emission Level</b>	<b>Exceeds Screening Level?</b>
<b>(sum of all emissions)</b>	<b>24-hour Average Emissions Rates for Units at the Facility (lb/hr)</b>	<b>24-hour Average Emissions Rates for Units at the Facility (lb/hr)</b>	<b>24-hour Average Emissions Rates for Units at the Facility (lb/hr)</b>	<b>(lb/hr)</b>	<b>(Yes / No)</b>
Antimony	0.00E+00	0.00E+00	0.00E+00	3.3E-02	No
Barium	0.00E+00	1.51E-06	1.51E-06	3.3E-02	No
Chromium	0.00E+00	4.80E-07	4.80E-07	3.3E-02	No
Cobalt	0.00E+00	2.88E-08	2.88E-08	3.3E-03	No
Copper	0.00E+00	5.43E-05	5.43E-05	6.7E-02	No
Cristobalite	0.00E+00	2.28E-03	2.28E-03	3.3E-03	No
Ethylbenzene	0.00E+00	0.00E+00	0.00E+00	2.9E+01	No
Fluoride	0.00E+00	0.00E+00	0.00E+00	1.67E-01	No
Hexane	0.00E+00	6.18E-04	6.18E-04	1.2E+01	No
Hydrogen Chloride	0.00E+00	8.43E-01	8.43E-01	5.0E-02	No
Hydrogen Peroxide	0.00E+00	1.03E+00	1.03E+00	1.0E-01	No
Manganese	0.00E+00	1.30E-07	1.30E-07	3.33E-01	No
Mercury	0.00E+00	8.92E-08	8.92E-08	3.E-03	No
2-Methoxyethanol (EGME)	0.00E+00	1.50E-02	1.50E-02	1.E+00	No
Molybdenum	0.00E+00	3.77E-07	3.77E-07	6.67E-01	No
Naphthalene*	0.00E+00	2.09E-07	2.09E-07	2.0E-06	No
Pentane	0.00E+00	8.92E-04	8.92E-04	1.18E+02	No
Phosphoric Acid	0.00E+00	1.11E+00	1.11E+00	6.70E-02	No
Phosphorous	0.00E+00	0.00E+00	0.00E+00	7.0.E-03	No
Potassium Hydroxide	0.00E+00	7.08E-03	7.08E-03	1.3.E-01	No
Quartz	0.00E+00	2.28E-04	2.28E-04	6.7.E-03	No
Selenium	0.00E+00	8.24E-09	8.24E-09	1.3E-02	No
Sodium Hydroxide	0.00E+00	2.80E-02	2.80E-02	1.3E-01	No
Sulfuric Acid	0.00E+00	6.68E+00	6.68E+00	6.7E-02	Yes
1,1,1 - Trichlorethane (Methyl Chloroform)	0.00E+00	0.00E+00	0.00E+00	1.3E+02	No
Toluene	0.00E+00	1.17E-06	1.17E-06	2.5E+01	No
o-Xylene	0.00E+00	0.00E+00	0.00E+00	2.9E+01	No
Vanadium	0.00E+00	7.89E-07	7.89E-07	3.0E-03	No
Zinc	0.00E+00	9.95E-06	9.95E-06	6.67E-01	No

**Part 2. PRE- AND POST-PROJECT CARCINOGENIC TAP EMISSIONS SUMMARY POTENTIAL TO EMIT**

Carcinogenic Toxic Air Pollutants	Pre-Project	Post-Project	Change In	Carcinogenic Screening Emission Level	Exceeds Screening Level?
(sum of all emissions)	Annual Average Emissions Rates for Units at the Facility (lb/hr)	Annual Average Emissions Rates for Units at the Facility (lb/hr)	Annual Average Emissions Rates for Units at the Facility (lb/hr)	(lb/hr)	(Yes / No)
Arsenic	0.00E+00	6.86E-08	6.86E-08	1.5E-06	No
Benzene	0.00E+00	7.21E-07	7.21E-07	8.0E-04	No
Beryllium	0.00E+00	4.12E-09	4.12E-09	2.8E-05	No
Cadmium	0.00E+00	3.77E-07	3.77E-07	3.7E-06	No
Chromium VI	0.00E+00	4.36E-05	4.36E-05	5.6E-07	Yes
Formaldehyde	0.00E+00	2.57E-05	2.57E-05	5.1E-04	No
Nickel	0.00E+00	1.59E-04	1.59E-04	2.7E-05	Yes
Benzo(a)pyrene	0.00E+00	4.12E-10	4.12E-10	2.0E-06	No
Benz(a)anthracene	0.00E+00	6.18E-10	6.18E-10	NA	NA
Benzo(b)fluoranthene	0.00E+00	6.18E-10	6.18E-10	NA	NA
Benzo(k)fluoranthene	0.00E+00	6.18E-10	6.18E-10	NA	NA
Chrysene	0.00E+00	6.18E-10	6.18E-10	NA	NA
Dibenzo(a,h)anthracene	0.00E+00	4.12E-10	4.12E-10	NA	NA
Indeno(1,2,3-cd)pyrene	0.00E+00	6.18E-10	6.18E-10	NA	NA
Total PAHs	0.00E+00	3.91E-09	3.91E-09	2.00E-06	No

\*Although listed as non-carcinogen in the Rules, DEQ has determined that naphthalene is a possible/probable carcinogen. Compliance for naphthalene emissions should be based on the EL or AACC listed in Section 586 for PAH.

\*\*See spreadsheet prepared by JBR (included in Appendix E of the permit applications) for further information regarding emission factors and calculation assumptions.

Note:

PAH is considered as one TAP comprised of: benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, chrysene, indeno(1,2,3-cd)pyrene, benzo(a)pyrene. The total is compared to benzo(a)pyrene.

**Table 7 PTE HAPs from All Sources**

Hazardous Air Pollutant	PTE (tons/yr)
Arsenic	3.01E-07
Benzene	3.16E-06
Beryllium	1.80E-08
Cadmium	1.65E-06
Ethylbenzene	0.0E+00
Formaldehyde	1.13E-04
Chromium	1.91E-04
Mercury	3.9E-07
1,1,1 – Trichlorethane (Methyl Chloroform)	0.0E+00
Naphthalene	9.2E-07
Nickel	6.97E-04

<b>Hazardous Air Pollutant</b>	<b>PTE (tons/yr)</b>
Xylene	0.0E+00
Selenium	3.6E-08
Toluene	5.1E-06
Hexane	2.71E-03
Phosphorous	0.00E+00
<b>Total</b>	<b>3.72E-03</b>

\* Maximum Individual HAP

\*\* See spreadsheets prepared by JBR (included in Appendix E of the permit application) for further information regarding emission factors and calculation assumptions.)

## **6.0 LIMITATIONS ON POTENTIAL TO EMIT**

To demonstrate compliance with NAAQS and the screening level values for TAPs, Northwest Chrome proposes the following permit conditions:

### **6.1 MATERIAL THROUGHPUT**

- No throughput limits are requested.

### **6.2 EQUIPMENT LIMITS**

- The chromium electroplating rectifier will not exceed 5,000 amperes;
- The nickel and copper rectifiers will not exceed 2,200 amperes;
- The surface tension of the chromium electroplating tank will not exceed 45 dynes/cm;
- Fumatrol 140 will be used in the chromium tanks during operation;
- The facility will not discharge particulate matter to the atmosphere from any fuel-burning; and
- Equipment in excess of 0.015 gr/dscf of effluent gas corrected to 3% oxygen by volume for gas.

### **6.3 OPERATION AND MAINTENANCE REQUIREMENTS**

- All operation and maintenance requirements of 40 CFR 63.342(f), applicable to the facility, will be met.

### **6.4 MONITORING REQUIREMENTS**

- The facility will accept 45 dynes/cm, as measured by a stalagmometer, as the maximum surface tension value that corresponds to compliance with the applicable emission limitation. The facility will comply with requirements in accordance with 40 CFR 63.343(c)(5)(A-C).

### **6.5 RECORDKEEPING REQUIREMENTS**

- The facility will comply with the requirements in accordance with 40 CFR 63.346(b)(2-5, 8-11, 13, 15-16).

### **6.6 REPORTING REQUIREMENTS**

- The facility will comply with the *Notification* requirements of 40 CFR 63.345(b)(1-2, 4 and 5i)
- The facility will comply with the *Reporting* requirements of 40 CFR 63.347(a); (c)(2)(i-ii); (e)(1-3); (g)(3); and (h).

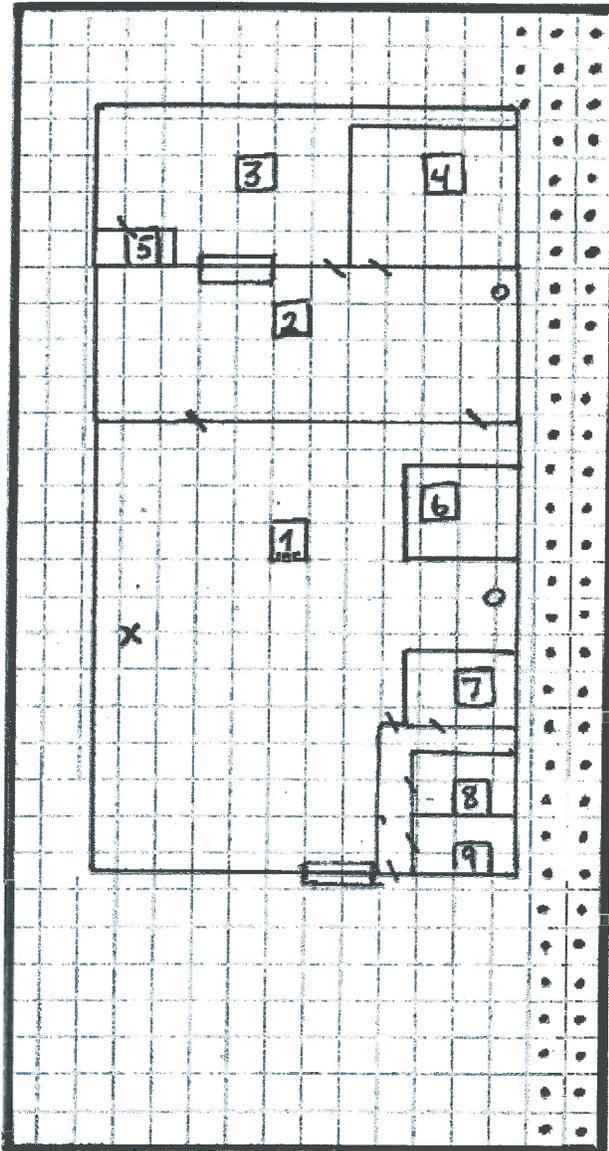
Refer to Form FRA for a complete analysis of the regulatory review.

## **APPENDIX A**

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### **Site Location Map and Plot Plan**

NORTHWEST CHROME INC.  
 420 INDUSTRIAL WAY  
 NEW PLYMOUTH, ID 83655



Legend

- |                    |                |                         |                 |
|--------------------|----------------|-------------------------|-----------------|
| 1- Plating Dept.   | 6- Strip Dept. | o- Heater Stack         | — Property line |
| 2- Polishing Dept. | 7- Break room  | x- Electroplating Stack | — Building edge |
| 3- Open Area       | 8- Office      | /- Door                 |                 |
| 4- Wheel Room      | 9- Restroom    | □ - Overhead Door       |                 |
| 5- Compressor Room |                | ⊙ - Unpaved Road        |                 |

Scale Bar  
 Each Square represents 6'



Northwest Chrome, Inc.

NW 1st Ave

Pine St

Walnut St

Peach Ln

Cherry St

Idaho St

W Canal St

Idaho St

Canal St

W Ash St

Ash St

Maple St

Holly Ave

E Park Ave

od Ln

Elm St

New Plymouth

S Plymouth Ave

SW Park Ave

SW Locust St

SE Park

East Blvd

SW Ave

Southwest Blvd

SE 1st Ave

Blaine Rd

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**APPENDIX B**

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**DEQ PTC Forms and Checklists**





## Department of Environmental Quality - Air Quality Division Minor Source Permit to Construct Application Completeness Checklist

This checklist is designed to aid the applicant in submitting a complete permit to construct application.

### I. Actions Recommended Before Submitting Application

- Refer to the Rule. Read the Permit to Construct requirements contained in IDAPA 58.01.01.200-228, Rules for the Control of Air Pollution in Idaho. The Rules are available on DEQ's website (go to <http://adm.idaho.gov/adminrules/rules/idapa58/0101.pdf>).
- Refer to DEQ's Permit to Construct Guidance Document. DEQ has developed a guidance document to aid applicants in submitting a complete permit to construction application. The guidance document is located on DEQ's website (go to [http://www.deq.idaho.gov/air/permits\\_forms/permitting/ptc\\_prepermit\\_guidance.pdf](http://www.deq.idaho.gov/air/permits_forms/permitting/ptc_prepermit_guidance.pdf)).
- Consult with DEQ Representatives. It is recommended that the applicant schedule a pre-application meeting with DEQ to discuss application requirements before submitting the permit to construct application. The meeting can be in person or on the phone. Contact DEQ's Air Quality Hotline at **877-5PERMIT** to schedule the pre-application meeting.
- Submit Ambient Air Quality Modeling Protocol. It is strongly recommended that an ambient air quality modeling protocol be submitted to DEQ at least two (2) weeks before the permit to construct application is submitted. Contact DEQ's Air Quality Hotline at **877-5PERMIT** for information about the protocol.

### II. Application Content

**Application content should be prepared using the checklist below. The checklist is based on the requirements contained in IDAPA 58.01.01.202.**

- Apply for a Permit to Construct. Submit a Permit to Construct application using forms available on DEQ's website at [http://www.deq.idaho.gov/air/permits\\_forms/forms/ptc\\_general\\_application.pdf](http://www.deq.idaho.gov/air/permits_forms/forms/ptc_general_application.pdf).
- Permit to Construct Application Fee. The permit to construct application fee of \$1000 must be submitted at the time the original permit to construct application is submitted. Refer to IDAPA 58.01.01.224. If the permit to construct application is withdrawn or denied and a new application is submitted, a new \$1,000 application fee is required to be submitted. The application fee is not transferable or refundable. The application fee can be paid by check, credit card or Electronic Funds Transfer (EFT). If you choose to pay by credit card or EFT, please refer to the following Access Idaho link:  
<https://www.accessidaho.org/secure/deq/payport/item.html?id=511>  
If you choose to pay by check, enclose the check with your permit to construct application.
- Process Description(s). The process or processes for which construction is requested must be described in sufficient detail and clarity such that a member of the general public not familiar with air quality can clearly understand the proposed project. A process flow diagram is required for each process.
- Equipment List. All equipment that will be used for which construction is requested must be described in detail. Such description includes, but is not limited to, manufacturer, model number or other descriptor, serial number, maximum process rate, proposed process rate, maximum heat input capacity, stack height, stack diameter, stack gas flowrate, stack gas temperature, etc. All equipment that will be used for which construction is requested must be clearly labeled on the process flow diagram.
- Potential to Emit. Submit the uncontrolled potential to emit (pre-control equipment emissions estimates) and the controlled potential to emit (post-control equipment emissions estimates) for all equipment for which construction is requested. Any limit on the equipment for which is construction is requested may become a





**Department of Environmental Quality**

1410 N. Hilton, Boise, ID 83706

For assistance, call the

Air Permit Hotline - 1-877-5PERMIT

AQ-CH-P008

limit on that equipment in the permit to construct.

- Potential to Emit and Modeled Ambient Concentration for All Regulated Air Pollutants.** All proposed emission limits and modeled ambient concentrations for all regulated air pollutants must demonstrate compliance with all applicable air quality rules and regulations. Regulated air pollutants include criteria air pollutants, toxic air pollutants listed pursuant to IDAPA 58.01.01.585 and 586, and hazardous air pollutants listed pursuant to Section 112 of the 1990 Clean Air Act Amendments (go to <http://www.epa.gov/ttn/atw/188polls.html>). Describe in detail how the proposed emissions limits and modeled ambient concentrations demonstrate compliance with each applicable air quality rule and regulation. It is requested that emissions calculations, assumptions, and documentation be submitted with sufficient detail so DEQ can verify the validity of the emissions estimates.
- Scaled Plot Plan.** It is required a scaled plot plan be included in the permit to construct application and it must clearly label the location of each proposed process and the equipment that will be used in the process.
- List all Applicable Requirements.** All applicable requirements must be cited by the rule or regulation section/subpart that applies for each emissions unit.
- Certification of Permit to Construct Application.** The permit to construct application must be signed by the Responsible Official and must contain a certification signed by the Responsible Official. The certification must state that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete. Refer to IDAPA 58.01.01.123.
- Submit the Permit to Construct Application.** Submit the permit to construct application and application fee to the following address:

Air Quality Program Office – Application Processing  
Department of Environmental Quality  
1410 N. Hilton  
Boise, ID 83706-1255





Please see instructions on page 2 before filling out the form.

**All information is required. If information is missing, the application will not be processed.**

IDENTIFICATION	
1. Company Name	2. Facility Name:
Northwest CHrome, Inc.	New Plymouth, ID
3. Brief Project Description:	PTC Application for a new Chrome, Nickel and Copper Electroplating and Polishing business

FACILITY INFORMATION	
4. Primary Facility Permit Contact Person/Title	Art Garcia <span style="float: right;">Owner</span>
5. Telephone Number and Email Address	208.278.5044 <span style="float: right;">jgarcia811@yahoo.com</span>
6. Alternate Facility Contact Person/Title	
7. Telephone Number and Email Address	
8. Address to Which the Permit Should be Sent	420 Industrial Way
9. City/County/State/Zip Code	New Plymouth <span style="margin-left: 50px;">Payette</span> <span style="margin-left: 50px;">ID</span> <span style="float: right;">83655</span>
10. Equipment Location Address (if different than the mailing address above)	
11. City/County/State/Zip Code	
12. Is the Equipment Portable?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
13. SIC Code(s) and NAICS Code	Primary SIC: 3471 <span style="margin-left: 50px;">Secondary SIC:</span> <span style="float: right;">NAICS: 332813</span>
14. Brief Business Description and Principal Product	Northwest Chrome electroplates and polishes various automobile and motorcycle accessories. The Process includes chromium, nickel and copper buffing before polishing.
15. Identify any adjacent or contiguous facility that this company owns and/or operates	NA
16. Specify the reason for the application	<input checked="" type="checkbox"/> Permit to Construct (PTC) <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p><b>For Tier I permitted facilities only:</b> If you are applying for a PTC then you must also specify how the PTC will be incorporated into the Tier I permit.</p> <input type="checkbox"/> Incorporate the PTC at the time of the Tier I renewal  <input type="checkbox"/> Co-process the Tier I modification and PTC  <input type="checkbox"/> Administratively amend the Tier I permit to incorporate the PTC upon your request (IDAPA 58.01.01.209.05.a, b, or c)           </div> <input type="checkbox"/> Tier I Permit <input type="checkbox"/> Tier II Permit <input type="checkbox"/> Tier II/Permit to Construct

CERTIFICATION	
In accordance with IDAPA 58.01.01.123 (Rules for the Control of Air Pollution in Idaho), I certify based on information and belief formed after reasonable inquiry, the statements and information in the document(s) are true, accurate, and complete.	
17. Responsible Official's Name/Title	Art Garcia <span style="float: right;">Owner</span>
18. Responsible Official Address	420 Industrial Way New Plymouth, ID 83655
19. Responsible Official Telephone Number	208.278.5044
20. Responsible Official Email Address	jgarcia811@yahoo.com
21. Responsible Official's Signature	<span style="float: right; border: 1px solid black; padding: 2px;">Date: 5-17-12</span>
22. <input checked="" type="checkbox"/> Check here to indicate that you would like to review the draft permit prior to final issuance.	









Please see instructions on page 2 before filling out the form.

IDENTIFICATION							
1. Company Name: Northwest Chrome, Inc.		2. Facility Name: New Plymouth			3. Facility ID No:		
4. Brief Project Description: PTC Application for a new Chrome, Nickel and Copper Electroplating and Polishing business							
EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION							
5. Emissions Unit (EU) Name: CHROMIUM ELECTROPLATING PROCESS							
6. EU ID Number: VENTSTK							
7. EU Type: <input checked="" type="checkbox"/> New Source <input type="checkbox"/> Unpermitted Existing Source <input type="checkbox"/> Modification to a Permitted Source -- Previous Permit #:      Date Issued:							
8. Manufacturer: NA							
9. Model: NA							
10. Maximum Capacity: 5000 AMPERES							
11. Date of Construction: UNKNOWN							
12. Date of Modification (if any):							
13. Is this a Controlled Emission Unit? <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes    If Yes, complete the following section. If No, go to line 22.							
EMISSIONS CONTROL EQUIPMENT							
14. Control Equipment Name and ID: Atotech Fume Suppressant; Fumetrol 140							
15. Date of Installation: NA      16. Date of Modification (if any): NA							
17. Manufacturer and Model Number: Atotech; Model Number NA							
18. ID(s) of Emission Unit Controlled: Chemical suppressant added to the chromium solution to prevent emissions							
19. Is operating schedule different than emission units(s) involved? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No							
20. Does the manufacturer guarantee the control efficiency of the control equipment? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No    (If Yes, attach and label manufacturer guarantee)							
Control Efficiency		Pollutant Controlled					
		PM	PM10	SO <sub>2</sub>	NO <sub>x</sub>	VOC	CO
21. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency. Fumetrol 140 is used to suppress chromium emissions. See the source test information, provided in Appendix D (Manufacturing Information), for further specifications.							
EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)							
22. Actual Operation:							
23. Maximum Operation:							
REQUESTED LIMITS							
24. Are you requesting any permit limits? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No    (If Yes, indicate all that apply below)							
<input type="checkbox"/> Operation Hour Limit(s):							
<input type="checkbox"/> Production Limit(s):							
<input type="checkbox"/> Material Usage Limit(s):							
<input type="checkbox"/> Limits Based on Stack Testing: Please attach all relevant stack testing summary reports							
<input type="checkbox"/> Other:							
25. Rationale for Requesting the Limit(s):							





Please see instructions on page 2 before filling out the form.

IDENTIFICATION		
1. Company Name: Northwest Chrome, Inc.	2. Facility Name: New Plymouth	3. Facility ID No:
4. Brief Project Description: PTC Application for a new Chrome, Nickel and Copper Electroplating and Polishing Facility		

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION	
5. Emissions Unit (EU) Name:	POLISHING AREA NATURAL GAS HEATER
6. EU ID Number:	POLHTR
7. EU Type:	<input checked="" type="checkbox"/> New Source <input type="checkbox"/> Unpermitted Existing Source <input type="checkbox"/> Modification to a Permitted Source – Previous Permit #:      Date Issued:
8. Manufacturer:	LUXAIRE
9. Model:	M# UH175LC
10. Maximum Capacity:	0.175 MMBTU/HR
11. Date of Construction:	UNKNOWN
12. Date of Modification (if any):	
13. Is this a Controlled Emission Unit?	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes    If Yes, complete the following section. If No, go to line 22.

EMISSIONS CONTROL EQUIPMENT						
14. Control Equipment Name and ID:						
15. Date of Installation:	16. Date of Modification (if any):					
17. Manufacturer and Model Number:						
18. ID(s) of Emission Unit Controlled:						
19. Is operating schedule different than emission units(s) involved?	<input type="checkbox"/> Yes <input type="checkbox"/> No					
20. Does the manufacturer guarantee the control efficiency of the control equipment?	<input type="checkbox"/> Yes <input type="checkbox"/> No (If Yes, attach and label manufacturer guarantee)					
Control Efficiency	Pollutant Controlled					
	PM	PM10	SO <sub>2</sub>	NO <sub>x</sub>	VOC	CO

21. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)	
22. Actual Operation:	
23. Maximum Operation:	8,760 HOURS/YEAR

REQUESTED LIMITS	
24. Are you requesting any permit limits?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (If Yes, indicate all that apply below)
<input type="checkbox"/> Operation Hour Limit(s):	
<input type="checkbox"/> Production Limit(s):	
<input type="checkbox"/> Material Usage Limit(s):	
<input type="checkbox"/> Limits Based on Stack Testing:	Please attach all relevant stack testing summary reports
<input type="checkbox"/> Other:	
25. Rationale for Requesting the Limit(s):	





Please see instructions on page 2 before filling out the form.

IDENTIFICATION						
1. Company Name: Northwest Chrome, Inc.		2. Facility Name: New Plymouth		3. Facility ID No:		
4. Brief Project Description:				PTC Application for a new Chrome, Nickel and Copper Electroplating and Polishing Facility		
EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION						
5. Emissions Unit (EU) Name:		ELECTROPLATING AREA NATURAL GAS HEATER				
6. EU ID Number:		ELECTROHTR				
7. EU Type:		<input checked="" type="checkbox"/> New Source <input type="checkbox"/> Unpermitted Existing Source <input type="checkbox"/> Modification to a Permitted Source -- Previous Permit #:			Date Issued:	
8. Manufacturer:		LUXAIRE				
9. Model:		M# UH175LC				
10. Maximum Capacity:		0.175 MMBTU/HR				
11. Date of Construction:		UNKNOWN				
12. Date of Modification (if any):						
13. Is this a Controlled Emission Unit?		<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes    If Yes, complete the following section. If No, go to line 22.				
EMISSIONS CONTROL EQUIPMENT						
14. Control Equipment Name and ID:						
15. Date of Installation:			16. Date of Modification (if any):			
17. Manufacturer and Model Number:						
18. ID(s) of Emission Unit Controlled:						
19. Is operating schedule different than emission units(s) involved?			<input type="checkbox"/> Yes <input type="checkbox"/> No			
20. Does the manufacturer guarantee the control efficiency of the control equipment?			<input type="checkbox"/> Yes <input type="checkbox"/> No    (If Yes, attach and label manufacturer guarantee)			
Control Efficiency		Pollutant Controlled				
		PM	PM10	SO <sub>2</sub>	NO <sub>x</sub>	VOC
21. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.						
EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)						
22. Actual Operation:						
23. Maximum Operation:		8,760 HOURS/YEAR				
REQUESTED LIMITS						
24. Are you requesting any permit limits?		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No    (If Yes, indicate all that apply below)				
<input type="checkbox"/> Operation Hour Limit(s):						
<input type="checkbox"/> Production Limit(s):						
<input type="checkbox"/> Material Usage Limit(s):						
<input type="checkbox"/> Limits Based on Stack Testing:		Please attach all relevant stack testing summary reports				
<input type="checkbox"/> Other:						
25. Rationale for Requesting the Limit(s):						





## Facility Wide Potential to Emit Emission Inventory Application Template and Instructions

For new stationary sources provide the facility's potential to emit for all NSR Regulated Air Pollutants. The potential to emit provided here must match the emissions rates which are requested to be permitted.

For modifications to existing facilities (including the addition of new emissions units), if the existing facility classification is in question an existing facility wide potential to emit emission inventory will be required to be submitted<sup>1</sup>. Contact DEQ to determine if a facility wide emission inventory for the existing facility is required.

**All emissions inventories must be submitted with thorough documentation.** The emission inventories will be subjected to technical review. Therefore, prepare your application with sufficient documentation so that the public and DEQ can verify the validity of the emission estimates. **Applications submitted without sufficient documentation are incomplete. Follow the instructions provided on page 2; do not proceed until you have read the instructions.**

**Applicants must use the Potential to Emit Summary table provided below.**

**Table 1. POTENTIAL TO EMIT FOR NSR REGULATED POLLUTANTS**

Emissions Unit	EU ID #	NSR Pollutant <sup>*</sup>								
		NOx	CO	CO <sub>2</sub> e	PM	PM-10	PM-2.5	SOx	VOC	Lead
		T/yr	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr
<b>Point Sources</b>										
Combustion Sources		0.1503	0.1262	180.352 9	0.0114	0.0114	0.0114	0.000 9	0.006 7	0.000000 8
Electroplating Sources		n/a	n/a	n/a	0.0014	0.0014	n/a	n/a	0.044 2	n/a
<b>Totals*</b>		<b>1.50E-01</b>	<b>1.26E-01</b>	<b>1.80E+02</b>	<b>1.29E-02</b>	<b>1.29E-02</b>	<b>1.14E-02</b>	<b>9.02E-04</b>	<b>5.09E-02</b>	<b>7.51E-07</b>

\* Does not include fugitive emissions sources as the facility does not fall within a listed source category.

\*\* See spreadsheets prepared by JBR (included in Appendix E of the permit application) for further information.

- a) NSR Regulated air Pollutants are defined<sup>2</sup> as: Particulate Matter (PM, PM-10, PM-2.5), Carbon Monoxide, Lead, Nitrogen Dioxide, Ozone (VOC), Sulfur Dioxide, CO<sub>2</sub>e<sup>3</sup>, Green House Gases (GHG) mass, all

<sup>1</sup> The applicant must determine if the existing facility is a major facility. If the facility is an existing PSD major facility and changes are being made to the facility the major modification test must be conducted.

<sup>2</sup> 40 CFR 52.21(b)(50), as incorporated by reference at IDAPA 58.01.01.107.03.d

<sup>3</sup> Multiply each green house gas (GHG) by the global warming potential (GWP) listed at 40 CFR 98, Table A- 1 of Subpart A then sum all values to determine CO<sub>2</sub>e (GHGs are carbon dioxide, nitrous oxide,





## Ambient Impact Assessment Emission Inventory for New Minor Facilities and Minor Modifications Application Template and Instructions

### New Minor Facilities or Minor Modifications to Existing Facilities

Applicants must demonstrate that the source will not cause or significantly contribute to a violation of an ambient air quality standard for criteria pollutants<sup>1</sup>. As described in the [State of Idaho Air Quality Modeling Guideline](#), there are three methods that an applicant can use to demonstrate compliance:

- Method 1.** Demonstrate that emissions from the new and/or modified existing facility are below air quality modeling thresholds that are listed in the [State of Idaho Air Quality Modeling Guideline](#).
- Method 2.** Demonstrate that emissions from the new and/or modified source will not cause ambient impacts at or above significant ambient impact levels (Significant Impact Analysis or Preliminary Analysis).
- Method 3.** Demonstrate that facility wide emissions, when combined with co-contributing sources and background levels, do not cause an exceedance of ambient standards (Cumulative Analysis).

The type of emission inventory required depends upon which method is used to demonstrate compliance. In the following pages the type of emission inventory that is required to be submitted is discussed for each method. DEQ strongly recommends that the applicant develop and submit for DEQ approval a written modeling protocol prior to submitting the application (refer to the [State of Idaho Air Quality Modeling Guideline](#)). The modeling protocol must address what types of emission inventories are required for modeling, and address which fugitive emissions must be included.

**All modeling emission inventories must be summarized using the emission inventory summary table provided below (Table 1).**

The applicant must document all emission calculations and follow the emission inventory instructions provided. **Applications without sufficient documentation are incomplete; do not proceed until you have read the instructions on page 6.**

---

<sup>1</sup> Rules for the Control of Air Pollution in Idaho (IDAPA 58.01.01.203 & 403)



**Table 1 Facility Criteria Pollutant Change in Emissions**

Description	Pounds per Hour								
	NOx Emissions (lb/hr)	CO Emissions (lb/hr)	CO <sub>2</sub> e Emissions (lb/hr)	PM Emissions (lb/hr)	PM-10 Emissions (lb/hr)	PM-2.5 Emissions (lb/hr)	SOx Emissions (lb/hr)	VOC Emissions (lb/hr)	Lead Emissions (lb/hr)
Combustion Sources	0.0343	0.0288	41.1765	0.0026	0.0026	0.0026	0.0002	0.0015	0.000002
Electroplating Process	n/a	n/a	n/a	0.0004	0.0004	n/a	n/a	0.0150	n/a
<b>TOTAL</b>	<b>3.43E-02</b>	<b>2.88E-02</b>	<b>4.12E+01</b>	<b>2.96E-03</b>	<b>2.96E-03</b>	<b>2.61E-03</b>	<b>2.06E-04</b>	<b>1.66E-02</b>	<b>1.72E-07</b>

Description	Tons per Year								
	NOx Emissions (T/yr)	CO Emissions (T/yr)	CO <sub>2</sub> e Emissions (T/yr)	PM Emissions (T/yr)	PM-10 Emissions (T/yr)	PM-2.5 Emissions (T/yr)	SOx Emissions (T/yr)	VOC Emissions (T/yr)	Lead Emissions (T/yr)
Combustion Sources	0.1503	0.1262	180.3529	0.0114	0.0114	0.0114	0.0009	0.0067	0.000008
Electroplating Process	n/a	n/a	n/a	0.0014	0.0014	n/a	n/a	0.0442	n/a
<b>TOTAL</b>	<b>1.50E-01</b>	<b>1.26E-01</b>	<b>1.80E+02</b>	<b>1.29E-02</b>	<b>1.29E-02</b>	<b>1.14E-02</b>	<b>9.02E-04</b>	<b>5.09E-02</b>	<b>7.51E-07</b>

\*Note that pre-facility emissions are assumed to be zero.

Sources requiring modeling to demonstrate compliance with AAQS, based upon DEQ guidance, are summarized below.

Pollutant	Averaging Period	Background Conc. (µg/m <sup>3</sup> )	Modeled Worst Case Impact (µg/m <sup>3</sup> )	AAC / AACC (µg/m <sup>3</sup> )	Max Ambient Conc as % of NAAQS	Location Of Highest Model Impact
Sulfuric Acid	24 hour	N/A	25.5	50	51.0%	E property boundary
Nickel	Annual	N/A	4.04-03	4.2E-03	95.5%	W property boundary

SEE **APPENDIX F** WITHIN PTC APPLICATION FOR A COMPLETE MODELING ANALYSIS AND FURTHER DISCRPTIONS OF THE ABOVE TABLES





**STATE OF IDAHO  
DEPARTMENT OF  
ENVIRONMENTAL QUALITY**

Version 1, August 2010

## **Toxic Air Pollutant Emissions Inventory Application Template and Instructions**

Applicants must demonstrate preconstruction compliance with toxic air pollutant (TAP) standards contained in IDAPA 58.01.01.210 (*Rules for the Control of Air Pollution in Idaho*). DEQ has developed a TAP completeness checklist in order to assist applicants. DEQ strongly recommends that applicants complete and submit this checklist as part of the application. **Applications which do not follow one of the available methods for demonstrating compliance described in the checklist will be determined incomplete or denied.** Follow this link to the checklist: [Toxic Air Pollutant Application Completeness Checklist](#). Be sure to calculate emissions correctly for the averaging periods as described in the checklist and in the instructions on page 3.

The type of TAP emissions inventory required depends upon which method is used to demonstrate compliance (see the [Toxic Air Pollutant Application Completeness Checklist](#)). **All TAP emissions inventories must be summarized using the emissions inventory summary tables provided below (Table 1 and Table 2).**

The applicant must **document all emission calculations as described in the instructions provided on the following page. Applications without sufficient documentation are incomplete; do not proceed until you have read the instructions.**

Applicants are encouraged to call DEQ's Air Quality Permit Hotline (1-877-573-7648) to ask questions as they prepare the application.



**Part 1. PRE- AND POST PROJECT NON-CARCINOGENIC TAP EMISSIONS SUMMARY  
POTENTIAL TO EMIT**

Non-Carcinogenic Toxic Air Pollutants  (sum of all emissions)	Pre-Project	Post Project	Change in	Non-Carcinogenic Screening Emission Level	Exceeds Screening Level?
	24-hour Average Emissions Rates for Units at the Facility  (lb/hr)	24-hour Average Emissions Rates for Units at the Facility  (lb/hr)	24-hour Average Emissions Rates for Units at the Facility  (lb/hr)	(lb/hr)	(Y/N)
Antimony	0.00E+00	0.00E+00	0.00E+00	3.3E-02	No
Barium	0.00E+00	1.51E-06	1.51E-06	3.3E-02	No
Chromium	0.00E+00	4.80E-07	4.80E-07	3.3E-02	No
Cobalt	0.00E+00	2.88E-08	2.88E-08	3.3E-03	No
Copper	0.00E+00	1.59E-04	1.59E-04	6.7E-02	No
Cristobalite	0.00E+00	2.28E-03	2.28E-03	3.3E-03	No
Ethylbenzene	0.00E+00	0.00E+00	0.00E+00	2.9E+01	No
Fluoride	0.00E+00	0.00E+00	0.00E+00	1.67E-01	No
Hexane	0.00E+00	6.18E-04	6.18E-04	1.2E+01	No
Hydrogen Chloride	0.00E+00	8.43E-01	8.43E-01	5.0E-02	No
Hydrogen Peroxide	0.00E+00	1.03E+00	1.03E+00	1.0E-01	No
Manganese	0.00E+00	1.30E-07	1.30E-07	3.33E-01	No
Mercury	0.00E+00	8.92E-08	8.92E-08	3.E-03	No
2-Methoxyethanol (EGME)	0.00E+00	1.50E-02	1.50E-02	1.E+00	No
Molybdenum	0.00E+00	3.77E-07	3.77E-07	6.67E-01	No
Naphthalene*	0.00E+00	2.09E-07	2.09E-07	2.0E-06	No
Pentane	0.00E+00	8.92E-04	8.92E-04	1.18E+02	No
Phosphoric Acid	0.00E+00	1.11E+00	1.11E+00	6.70E-02	No
Phosphorous	0.00E+00	0.00E+00	0.00E+00	7.0.E-03	No
Potassium Hydroxide	0.00E+00	7.08E-03	7.08E-03	1.3.E-01	No
Quartz	0.00E+00	2.28E-04	2.28E-04	6.7.E-03	No
Selenium	0.00E+00	8.24E-09	8.24E-09	1.3E-02	No
Sodium Hydroxide	0.00E+00	2.80E-02	2.80E-02	1.3E-01	No

Sulfuric Acid	0.00E+00	6.68E+00	6.68E+00	6.7E-02	Yes
1,1,1 - Trichlorethane (Methyl Chloroform)	0.00E+00	0.00E+00	0.00E+00	1.3E+02	No
Toluene	0.00E+00	1.17E-06	1.17E-06	2.5E+01	No
o-Xylene	0.00E+00	0.00E+00	0.00E+00	2.9E+01	No
Vanadium	0.00E+00	7.89E-07	7.89E-07	3.0E-03	No
Zinc	0.00E+00	9.95E-06	9.95E-06	6.67E-01	No

\* Although listed as a noncarcinogen in the Rules, DEQ has determined that naphthalene is a possible/probable carcinogen. Compliance for naphthalene emissions should be based on the EL or AACC listed in Section 586 for PAH.

\*\* See spreadsheets prepared by JBR (included in Appendix F of the permit application) for further information regarding emission factors and calculation assumptions.

**Part 2. PRE- AND POST PROJECT CARCINOGENIC TAP EMISSIONS  
SUMMARY POTENTIAL TO EMIT**

<b>Carcinogenic Toxic Air Pollutants</b>	<b>Pre-Project</b>	<b>Post Project</b>	<b>Change in</b>	<b>Carcinogenic Screening Emission Level</b>	<b>Exceeds Screening Level?</b>
<b>(sum of all emissions)</b>	<b>Annual Average Emissions Rates for Units at the Facility (lb/hr)</b>	<b>Annual Average Emissions Rates for Units at the Facility (lb/hr)</b>	<b>Annual Average Emissions Rates for Units at the Facility (lb/hr)</b>	<b>(lb/hr)</b>	<b>(Y/N)</b>
Arsenic	0.00E+00	6.86E-08	6.86E-08	1.5E-06	No
Benzene	0.00E+00	7.21E-07	7.21E-07	8.0E-04	No
Beryllium	0.00E+00	4.12E-09	4.12E-09	2.8E-05	No
Cadmium	0.00E+00	3.77E-07	3.77E-07	3.7E-06	No
Chromium VI	0.00E+00	4.36E-05	4.36E-05	5.6E-07	Yes
Formaldehyde	0.00E+00	2.57E-05	2.57E-05	5.1E-04	No
Nickel	0.00E+00	1.59E-04	1.59E-04	2.7E-05	Yes
Benzo(a)pyrene	0.00E+00	4.12E-10	4.12E-10	2.0E-06	No
Benz(a)anthracene	0.00E+00	6.18E-10	6.18E-10	NA	NA
Benzo(b)fluoranthene	0.00E+00	6.18E-10	6.18E-10	NA	NA
Benzo(k)fluoranthene	0.00E+00	6.18E-10	6.18E-10	NA	NA
Chrysene	0.00E+00	6.18E-10	6.18E-10	NA	NA
Dibenzo(a,h)anthracene	0.00E+00	4.12E-10	4.12E-10	NA	NA
Indeno(1,2,3-cd)pyrene	0.00E+00	6.18E-10	6.18E-10	NA	NA
Total PAHs	0.00E+00	3.91E-09	3.91E-09	2.00E-06	No

a) PAH is considered as one TAP comprised of: benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, chrysene, indeno(1,2,3-cd)pyrene, benzo(a)pyrene. The total is compared to benzo(a)pyrene.

\*\* See spreadsheets prepared by JBR (included in Appendix E of the permit application) for further information regarding emission factors and calculation assumptions.



## Department of Environmental Quality - Air Quality Division Toxic Air Pollutant (TAP) Preconstruction Compliance Application Completeness Checklist

This checklist is designed to aid the applicant in submitting a complete preconstruction compliance demonstration for toxic air pollutants (TAPs) in permit to construct applications. The applicant must place a check mark in the box for each section below that applies.

I. Actions Needed Before Submitting Application

- Refer to the Rule. Read the Demonstration of Preconstruction Compliance with Toxic Standards contained in IDAPA 58.01.01.210 (Rules Section 210) Rules for the Control of Air Pollution in Idaho (Rules). Toxic air pollutants (TAPs) are regulated in accordance with Rules Section 210 only from emission units constructed or modified on or after July 1, 1995.

Determine if a new (constructed after June 30, 1995) emission unit has the potential to emit a TAP listed in IDAPA 58.01.01.585 (Rules Section 585) or IDAPA 58.0101.586 ( Rules Section 586). Potential toxic air pollutants can be determined by reviewing commonly available emission factors, such as EPA's AP-42, or calculating emissions using a mass balance. For TAPs that are emitted but not listed in Rules Section 585 and 586, contact the Air Permit Hotline at 877-5PERMIT.

Determine if the proposed construction or modification is exempt from the need to obtain a permit to construct in accordance with IDAPA 58.01.01.220-223. Use the Exemption Criteria and Reporting Requirements for TAPs IDAPA 58.01.01.223 checklist to assist you in the exemption determination. If the source does not qualify for an exemption in accordance with IDAPA 58.01.01.220-223 complete the following checklist and submit it with the permit application. Please note that fugitive TAP emissions are not included in the IDAPA 58.01.01.223 exemption determination, but fugitive TAP emissions are included in the analysis if a permit is required. Stated another way: if a source is required to obtain a Permit to Construct because it does not meet the exemption criteria for any reason all TAP emissions, including fugitive TAPs, are included in the compliance demonstration in the application for the permit to construct. Should you have any questions regarding the fact that all TAPs, including fugitive TAPs, are included in the TAP preconstruction compliance demonstration submitted with a permit to construct application you may call the Air Permit Hotline at 877-5PERMIT.

**Will the new or modified source result in new or increased potential emissions of TAPs?**

- Yes. If yes, continue to section II.
- No. If no, no further action is required.

II. Application Content

If a new source has the potential to emit a TAP, or if a modification to an existing source increases the potential to emit of a TAP, then one of the following methods (A-J) of demonstrating TAP preconstruction compliance must be documented for each TAP. Standard methods are one of A-C. The applicant may also use one of the specialized methods in D-J. Fugitive TAP emissions shall be included in the analysis. The compliance methods are based on the requirements of Rules Section 210. Applicants are often able to demonstrate preconstruction TAP compliance using a combination of methods A and B.

Emission Calculations

Emissions calculation methodologies used are dependent on whether a specific TAP is a non-carcinogen or a carcinogen and whether the compliance method chosen from the list below calls



for controlled or uncontrolled emissions. Non-carcinogens are regulated based on a 24-hour averaging period and emission rates used for comparison to the non-carcinogen screening emissions level (EL) should be the maximum controlled or uncontrolled emissions quantity during any 24-hour period divided by 24. Carcinogens are regulated as a long term increment and emission rates used for comparison to the carcinogen EL should be the maximum controlled or uncontrolled emissions quantity during any 1 year period divided by 8760.

### Modeling Analyses

Atmospheric dispersion modeling is required when controlled TAP emissions rates exceed ELs. Modeling analyses should be conducted in accordance with IDAPA 58.01.01.210.03. Quantification of Ambient Concentrations and the State of Idaho Air Quality Modeling Guideline ([http://www.deq.idaho.gov/air/data\\_reports/publications.cfm#model](http://www.deq.idaho.gov/air/data_reports/publications.cfm#model)). For non-carcinogen 24-hour increments, compliance is demonstrated using the maximum modeled 24-hour-averaged concentration from available meteorological data (typically a five-year data set). For carcinogen long-term increments, compliance is demonstrated using the maximum modeled average concentration for the duration of the data set (one-year to five-year data set).

A submitted modeling report should clearly specify modeled emissions rates and results. All electronic model input files should be submitted, including BPIP input files.

### Poly aromatic Hydrocarbons

Questions often arise regarding polyaromatic hydrocarbons as they are listed in Rules Section 586 of the Rules. The following two points are provided for clarification.

- 1) The following group of 7 PAH's (i.e. named POM), shall be combined and considered as one TAP equivalent in potency to benzo(a)pyrene:
  - Benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a, h)anthracene, chrysene, indeno(1,2,3,-cd) pyrene, benzo (a) pyrene
- 2) All other PAH's are considered as a single pollutant and the emission of each is compared the PAH increment listed in Rules Section 586.

### Compliance Methods

Fill in letter(s) (A-J) from the list below for TAP compliance demonstration method(s) used: **E.**

#### **A. TAPs Compliance Using Uncontrolled Emissions (Rules Section 210.05)**

- Calculate the uncontrolled emissions (Rules Section 210.05) of each TAP from new emissions units. Uncontrolled emission rates are emissions at maximum capacity without the effect of physical or operational limitations. See Quantification of Emission Rates (Rules Section 210.02). Show calculations and state all assumptions.
- Calculate the increase of TAP emissions from modified emissions units. Show calculations and state all assumptions. The increase in emissions for a modified emission unit is determined by subtracting the potential to emit the TAP before the modification from the uncontrolled potential to emit after the modification. In conducting this analysis please note the following for TAP emission rate increase determinations:

Uncontrolled emission rates after the modification are emissions at maximum capacity without the effect of physical or operational limitations.

When determining the emissions increase from existing permitted emissions units the emission rate before the modification is equivalent to the emission limits contained in the permit for the



TAPs or, if there no emission limits in the permit, by determining what the emission rate is under the physical or operational limitations contained in the permit.

- Aggregate the uncontrolled emissions for each TAP from all new emissions units with the increase in emissions from all modified emissions units.
- If the aggregated emissions increase for each TAP from the new and modified units, as determined above, are less than or equal to the respective TAP screening emissions level (EL) then preconstruction compliance with toxic standards has been demonstrated and no further analysis is required. Submit a table comparing the uncontrolled emissions rate to the applicable EL.

If aggregated emissions are greater than the respective screening emissions level (EL) for any pollutants, use another compliance demonstration method for those pollutants, such as methods B, C, or D.

**B. TAP Compliance Using Uncontrolled Ambient Concentration (Rules Section 210.06)**

- Determine the uncontrolled emissions of each TAP from new emission units and the increase in emissions from all modified emissions units as described above in compliance Method A. Show calculations and state all assumptions.
- Model the uncontrolled emissions of each TAP from new emissions units and the increase in emissions from all modified emissions units.
- If the uncontrolled ambient concentration is less than or equal to the acceptable ambient concentration increment listed in Rules Section 585 and 586 no further procedures for demonstrating preconstruction compliance will be required for that TAP as part of the application process. Submit a table comparing uncontrolled ambient concentrations to the applicable acceptable ambient concentration.

**C. TAP Compliance Using Controlled Ambient Concentrations (Rules Section 210.08)**

- Determine the controlled emissions from new emissions units and the controlled emission increase from modified emissions units. Show all calculations and state all assumptions, including the control methods.
- Model the controlled emissions of each TAP from new emissions units and the increase in controlled emissions from all modified emissions units.

TAP emissions levels (EL) included in Rules Section 585 and 586 are derived based on generic modeling. If the sum the of emissions from new and modified sources is below the EL compliance is demonstrated without the need to conduct site-specific dispersion modeling.

- If the controlled ambient concentration from emission increases from new emissions units and modified emissions units is less than the applicable acceptable ambient concentration no further procedures for demonstrating preconstruction compliance are required.
- The Department shall include an emission limit for the TAP in the permit to construct that is equal to or, if requested by the applicant, less than the emission rate that was used in the modeling (Rules Section 210.08.c).

In some instances the Department may consider a throughput limit or other inherently-limiting operational restriction in a permit as an effective emission limit for the TAP, rather than including a specific emission rate limit. Note that the applicant may model uncontrolled emissions as described in compliance Method B in an attempt to avoid TAPs emissions limitations.



**D. TAPs Compliance for NSPS and NESHAP Sources (Rules Section 210.20)**

- If the owner or operator demonstrates that the TAP emissions from the source or modification is regulated by 40 CFR Part 60, 40 CFR Part 61 or 40 CFR Part 63, no further procedures for demonstrating preconstruction compliance will be required for that TAP.
- Provide a demonstration that the TAP is regulated under 40 CFR Part 60, 40 CFR Part 61 or 40 CFR Part 63. This demonstration must be specific for each TAP emitted.

**E. TAP Compliance Using Net Emissions (Rules Section 210.09)**

An applicant may use TAP net emissions to show preconstruction compliance; however this analysis may require more work than some of the others procedures available to demonstrate preconstruction compliance. When netting, all emissions increases and decreases of the TAP that have occurred within five years must be included in the analysis as described below.

- Determine the net emission increase for a TAP. A net emissions increase shall be an emission increase from a particular modification plus any other increase and decreases in actual emissions at the facility that are creditable and contemporaneous with particular modification (Rules Section 210.09). Show all calculations and state all assumptions.
- A creditable increase or decrease in actual emissions is contemporaneous with a particular modification if it occurs within five (5) years of the commencement of the construction or modification (Rules Section 210.09.a).

Actual emissions are (Rules Section 006.03):

- In general, actual emissions as of a particular date shall equal the average rate, in tons per year, at which the unit actually emitted the pollutant during a two year period which precedes the particular date and which is representative of normal source operation. The Department shall allow the use of a different time period upon a determination that it is more representative of normal source operation. Actual emissions shall be calculated using the unit's actual operating hours, productions rates, and types of materials processed, stored, or combusted during the selected time period.
- The Department may presume that the source-specific allowable emissions for the unit are equivalent to actual emissions of the unit.
- For any emission unit (except electric utility steam generating units) that has not begun normal operations on the particular date, actual emissions shall equal the potential to emit of the unit on that date.
- Do not include emissions increases from emission units that have an uncontrolled emission rate that is 10% or less than the applicable screening emission level (EL) in Rules Section 585 and 586 (Rules Section 007.09.c.ii) and do not include emission increases from environmental remediation sources (Rules Section 007.09.c.iii). Show all calculations and state all assumptions.
- If the net emission increase is less than or equal to the applicable screening emissions level (EL) listed in Rules Section 585 and 586, no further procedures for demonstrating preconstruction compliance will be required (Rules Section 210.09.c).
- The Department shall include emission limits and other permit terms for the TAP in the permit to construct that will assure that the facility will be operated in the manner described in the preconstruction compliance demonstration (Rules Section 210.09.d).



In some instances the Department may consider a throughput limit or other inherently-limiting operational restriction in a permit as an effective emission limit for the TAP, rather than including a specific emission rate limit..

**F. TAP Compliance Using Net Ambient Concentration (Rules Section 210.10)**

- Determine the emission increase from the new source or modification, and all other creditable emission increases and decrease using the methods described above in compliance Method E.
- Model the emissions increases and decreases for each TAP. Modeling TAP decreases is accomplished by using negative valued emissions rates in the model input.
- If the net ambient concentration is less than or equal to the applicable ambient concentration increment listed in Rules Section 585 and 586, no further procedures for demonstrating preconstruction compliance are required.
- The Department shall include emission limits and other permit terms for the TAP in the permit to construct that will assure that the facility will be operated in the manner described in the preconstruction compliance demonstration (Rules Section 210.10.d).

In some instances the Department may consider a throughput limit or other inherently-limiting operational restriction in a permit as an effective emission limit for the TAP, rather than including a specific emission rate limit..

**G. TAP Compliance Using T-RACT Ambient Concentration for Carcinogens (Rules Section 210.12)**

The applicant may use T-RACT to demonstrate preconstruction compliance for TAPs listed in Rules Section 586 only.

T-RACT is an emissions standard based on the lowest emission of TAPs that a particular source is capable of meeting by application of control technology that is reasonably available, as determined by the Department, considering technological and economic feasibility. If control technology is not feasible, the emission standard may be based on the application of a design, equipment, work practice or operational requirement, or combination thereof (Rules Section 007.16).

**T-RACT Submittal Requirements**

- The applicant shall submit the following information to the Department identifying and documenting which control technologies or other requirements the applicant believes to be T-RACT (Rules Section 210.14).

The technical feasibility of a control technology or other requirements for a particular source shall be determined considering several factors including but not limited to:

- Process and operating procedures, raw materials and physical plant layout.
- The environmental impacts caused by the control technology that can not be mitigated, including but not limited to, water pollution and the production of solid wastes.
- The energy requirements of the control technology.



The economic feasibility of a control technology or other requirement, including the costs of necessary mitigation measures, for a particular source shall be determined considering several factors including, but not limited to:

- Capital costs.
- Cost effectiveness, which is the annualized cost of the control technology divided by the amount of emission reduction.
- The difference in costs between the particular source and other similar sources, if any, that have implemented emissions reductions.
- Compare the source's or modification's approved T-RACT ambient concentration to the applicable acceptable ambient concentration increment listed in Rules Section 586 multiplied by a factor of 10. If the sources approved T-RACT concentration is less than or equal to 10 times the applicable acceptable ambient concentration increment listed in Rules Section 586, no further procedures for demonstrating preconstruction compliance will be required.
- If an application is submitted to the Department without T-RACT and determined complete, and T-RACT is later determined to be applicable the completeness determination of the application will be revoked until a supplemental application is submitted and determined complete. When the supplemental application is determined complete, the timeline for agency action shall be reinitiated (Rules Section 210.13.b).
- If the Department determines that the source has proposed T-RACT, the Department shall develop emission standards to be incorporated into a permit to construct.

In some instances, the Department may consider a throughput limit or other inherently limiting operational restriction in a permit as an effective emission limit for the TAP, rather than including a specific emission rate limit.

**H. TAP Compliance Using the Short Term Source Factor (Rules Section 210.15)**

- For short term sources, the applicant may utilize a short term adjustment factor of ten (10) only for a carcinogenic pollutant listed in Rules Section 586. For a carcinogen listed in Rules Section 586 multiply either the applicable acceptable ambient concentration increment or the screening emission rate (EL), but not both, by ten (10) to demonstrate preconstruction compliance (Rules Section 210.15).
- A short term source is any new stationary source or modification to an existing source, with an operational life no greater than five (5) years from the inception of any operations to cessation of actual operations (Rules Section 210.15).

**I. TAP Compliance for Environmental Remediation Sources (Rules Section 210.16)**

- For remediation sources subject to or regulated by the Resource Conservation and Recovery Act and the Idaho Rules and Standard for Hazardous Waste, or the comprehensive Environmental Response, Compensation and Liability Act or a consent order, if the estimated ambient concentration is greater than the acceptable ambient impact increment listed in Rules Section 585 and 586, Best Available Control Technology shall be applied and operated until the estimated uncontrolled emission from the remediation source are below the applicable acceptable ambient concentration increment (Rules Section 210.16).

**J. TAP Compliance Using Offset Ambient Concentration (Rules Section 210.11)**



- Contact the Department prior to proposing to utilize Offset Ambient Concentrations to demonstrate preconstruction compliance.
- Emission offsets must satisfy the requirements for emission reduction credits (Rules Section 460).
  - The proposed level of allowable emissions must be less than the actual emissions of the emissions units providing the offsets (Rules Section 460.01).
  - An air quality permit must be issued that restricts the potential to emit of the emission unit providing the offset.
  - Emission reduction imposed by local, state or federal regulations or permits shall not be allowed.
- Compare the source's or modifications approved emission offset ambient concentration to the applicable acceptable ambient concentration listed in Rules Section 585 and 586. If the source's or modifications approved offset concentration is less than the acceptable ambient concentration listed in Rules Section 585 and 586, no further procedures for demonstrating preconstruction compliance will be required.
- The Department shall include emission limits and other permit terms for the TAP in the permit to construct that will assure that the facility will be operated in the manner described in the preconstruction compliance demonstration (Rules Section 210.10.d).





STATE OF IDAHO  
DEPARTMENT OF  
ENVIRONMENTAL QUALITY

Version 1, August 2010

## Facility Wide Hazardous Air Pollutant Potential to Emit Application Template and Instructions

Provide the facility wide potential to emit for all Hazardous Air Pollutants (HAPs). **The potential to emit provided here must match the emissions rates which are requested to be permitted.**

HAPs are pollutants that are required to be regulated under the Clean Air Act. A list of the HAPs may be found by following this link: [HAP list](#); review the list carefully to be sure you have included all listed HAPs.

**All emissions inventories must be submitted with thorough documentation.** The emission inventories will be subjected to technical review; prepare your application with sufficient documentation so that either the public or DEQ can verify the validity of the emission estimates. **Applications submitted without sufficient documentation are incomplete. Follow the instructions provided on the following page; do not proceed until you have read the instructions.**

**Applicants must use the Potential to Emit Summary table provided below.** Identify the individual HAP with the highest emissions and total HAP emissions. The potential to emit provided here must match the emissions rates which are requested to be permitted. **All fugitive emissions of HAPs must be included.**



Table 5-4 PTE HAPs from All Sources

HAP Pollutants	PTE (T/yr)
Arsenic	3.01E-07
Benzene	3.16E-06
Beryllium	1.80E-08
Cadmium	1.65E-06
Ethylbenzene	0.0E+00
Formaldehyde	1.13E-04
Chromium	1.91E-04
Mercury	3.9E-07
1,1,1 - Trichlorethane (Methyl Chloroform)	0.0E+00
Naphthalene	9.2E-07
Nickel	6.97E-04
Xylene	0.0E+00
Selenium	3.6E-08
Toluene	5.1E-06
Hexane	2.71E-03
Phosphorous	0.00E+00
<b>Total</b>	<b>3.72E-03</b>

\* Maximum Individual HAP

\*\* See spreadsheets prepared by JBR (included in Appendix E of the permit application) for further information regarding emission factors and calculation assumptions.)



## Department of Environmental Quality - Air Quality Division Exemption Criteria and Reporting Requirements for Toxic Air Pollutant (TAP) Emissions Checklist

This checklist is designed to assist in documenting that a facility qualifies and complies with the *Exemption Criteria and Reporting Requirements for Toxic Air Pollutants*, IDAPA 58.01.01.223.

- Refer to the Rule. Read the *Exemption Criteria and Reporting Requirements for Toxic Air Pollutant Emissions*, IDAPA 58.01.01.223 (Section 223), Rules for the Control of Air Pollution in Idaho (Rules).

### General Information

- Fugitive toxic air pollutant emissions shall not be considered in determining whether a source meets the applicable exemption criteria. A list of toxic air pollutants is given in Rules Section 585 and 586.
- Toxic air pollutants are regulated in accordance with Rules Section 210 only from emission units constructed or modified on or after July 1, 1995.
- Record Retention. In accordance with Rules Section 220 the source shall maintain documentation on site which shall identify the exemption determined to apply to the source and verify that the source qualifies for the identified exemption. Documentation shall be kept for the life of the source (but not less than five years) or until a permit to construct or operating permit is issued which covers operation of the source.
- Annual Report. Facilities that have exempted toxic air pollutant emissions in accordance with a Level I, Level II, or Level III exemption shall submit a report labeled "Toxic Air Pollutant Exemption Report" by May 1 each year for exemptions claimed during the previous 12 month period. The report shall state the date construction has or will commence and shall include copies of all exemption determinations by the owner or operator for Level I, Level II, or Level III exemptions (Rules Section 223.05).

### Below Regulatory Concern (BRC) Exemption (Rules Section 223.01)

- Calculate the uncontrolled emissions (Rules Section 210.05) of each toxic air pollutant from new emissions units. Uncontrolled emission rates are emissions at maximum capacity without the effect of physical or operational limitations. See Quantification of Emission Rates (Rules Section 210.02). Show calculations and state all assumptions.
- Calculate the increase of TAP emissions from modified emissions units. Show calculations and state all assumptions. The increase in TAP emissions from modified emission units which are aggregated and compared to the exemption criteria is determined by subtracting the potential to emit the TAP before the modification from the uncontrolled potential to emit after the modification. In conducting this analysis please note the following for TAP emission increase determinations:
- Uncontrolled emission rates after the modification are emissions at maximum capacity without the effect of physical or operational limitations.
  - When determining the emissions increase from existing permitted emissions units the emission rate before the modification is equivalent to the TAP emission limits contained in the permit or, if there are no emission limits in the permit, by determining what the emission rate is under the physical or operational limitations contained in the permit.
  - The emission increase determination for TAPs described above only applies to determine what emissions increases are for comparing to the TAP exemption thresholds. This method shall not be used to determine if a modification will occur. Emissions increases for modifications are determined in accordance with IDAPA 58.01.01.006.63 and IDAPA 58.01.01007.04 (projected actual emissions are subtracted from baseline actual emissions to determine if an emissions increase will occur for modification determinations).



- Questions often arise regarding polyaromatic hydrocarbons as they are listed in Rules Section 586 of the Rules. The following two points are provided for clarification.
  - 1) The following group of 7 PAH's shall be combined and considered as one TAP equivalent in potency to benzo(a)pyrene:

Benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a, h)anthracene, chrysene, indeno(1,2,3,-cd) pyrene, benzo (a) pyrene
  - 2) All other PAH's are considered as a single pollutant and the emission of each is compared to the PAH increment listed in Rules Section 586.

Aggregate the uncontrolled emissions increase of each TAP from new and modified emissions units.

NA The source qualifies for a BRC exemption if the uncontrolled emission increase for all toxic air pollutants is less than or equal to 10% of the screening emission levels (EL) listed in Rules Section 585 & 586.

#### **Level I Exemption (Rules Section 223.02)**

The uncontrolled emission rate from all new and modified emissions units shall be less than the applicable screening emission levels (EL) listed in Rules Section 585 & 586; or the uncontrolled ambient concentration for all toxic air pollutants shall be less than the applicable ambient concentration increment listed in Rules Sections 585 & 586. Calculate and document the uncontrolled emission rate from new and modified sources as described above.

Aggregate the uncontrolled emissions increase of each TAP from new and modified emissions units.

NA The source qualifies for a Level I exemption if the aggregated uncontrolled emissions from the new and modified emission units is less than or equal to all applicable screening emission levels (EL) listed in Rules Section 585 and 586.

Model the uncontrolled emissions for each TAP from new emissions units and the increase in emissions from all modified emissions units. Refer to Quantification of Ambient Concentrations (Rules Section 210.03) and the State of Idaho Air Quality Modeling Guideline ([http://www.deq.idaho.gov/air/data\\_reports/publications.cfm#model](http://www.deq.idaho.gov/air/data_reports/publications.cfm#model)). Maintain electronic input, output, and BIPinput modeling files.

NA The source qualifies for a Level I exemption if the uncontrolled ambient concentration from each new and modified emission unit is less than or equal to all applicable acceptable ambient concentration increments listed in Rules Section 585 and 586.

#### **Level II and Level III Exemptions (Rules Sections 223.03 & 223.04)**

A stationary source may choose to document a Level II or Level III exemption. However Level II and Level III exemption criteria are more stringent than Level I exemption criteria. Consequently there is little practical use for these levels of exemptions. Therefore, this checklist does not detail Level II or Level III exemption criteria.



# AIR PERMIT APPLICATION

Revision 6  
10/7/09



**DEQ AIR QUALITY PROGRAM**  
1410 N. Hilton, Boise, ID 83706  
For assistance, call the  
**Air Permit Hotline – 1-877-5PERMIT**

For each box in the table below, CTRL+click on the blue underlined text for instructions and information.

IDENTIFICATION	
<p>1. Company Name: Northwest Chrome, Inc.</p>	<p>2. Facility Name: New Plymouth, ID</p>
<p>3. Brief Project Description: PTC Application for a new Chrome, Nickel and Copper Electroplating and Polishing business</p>	
APPLICABILITY DETERMINATION	
<p>4. List applicable subparts of the New Source Performance Standards (NSPS) (<a href="#">40 CFR part 60</a>).</p> <p>Examples of NSPS affected emissions units include internal combustion engines, boilers, turbines, etc. The applicant must thoroughly review the list of affected emissions units.</p>	<p>List of applicable subpart(s):</p> <p><i>Not Applicable</i></p> <p><input type="checkbox"/> Not Applicable</p>
<p>5. List applicable subpart(s) of the National Emission Standards for Hazardous Air Pollutants (NESHAP) found in <a href="#">40 CFR part 61</a> and <a href="#">40 CFR part 63</a>.</p> <p>Examples of affected emission units include solvent cleaning operations, industrial cooling towers, paint stripping and miscellaneous surface coating. <a href="#">EPA has a web page dedicated to NESHAP</a> that should be useful to applicants.</p>	<p>List of applicable subpart(s):</p> <p><i>40 CFR Part 61 is Not Applicable.</i></p> <p><i>40 CFR Part 63, Subpart N Applies to the facility.</i></p> <p><input type="checkbox"/> Not Applicable</p>
<p>6. For each subpart identified above, conduct a complete a regulatory analysis using the instructions and referencing the example provided on the following pages.</p> <p><b>Note</b> - Regulatory reviews must be submitted with sufficient detail so that DEQ can verify applicability and document in legal terms why the regulation applies. Regulatory reviews that are submitted with insufficient detail will be determined incomplete.</p>	<p><input type="checkbox"/> A detailed regulatory review is provided (Follow instructions and example).</p> <p><input type="checkbox"/> DEQ has already been provided a detailed regulatory review. Give a reference to the document including the date.</p>
<p><b>IF YOU ARE UNSURE HOW TO ANSWER ANY OF THESE QUESTIONS, CALL THE AIR PERMIT HOTLINE AT 1-877-5PERMIT</b></p>	
<p><i>It is emphasized that it is the applicant's responsibility to satisfy all technical and regulatory requirements, and that DEQ will help the applicant understand what those requirements are prior to the application being submitted but that DEQ will not perform the required technical or regulatory analysis on the applicant's behalf.</i></p>	

Green highlights indicate non-applicability

Yellow highlights indicate some form of applicability

*Times New-Roman, bold and italic font indicates response to rule.*

**e-CFR Data is current as of May 10, 2012**

## **Title 40: Protection of Environment**

### **PART 63—NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR SOURCE CATEGORIES**

#### **Subpart N—National Emission Standards for Chromium Emissions From Hard and Decorative Chromium Electroplating and Chromium Anodizing Tanks**

**Source:** 60 FR 4963, Jan. 25, 1995, unless otherwise noted.

#### **§ 63.340 Applicability and designation of sources.**

(a) The affected source to which the provisions of this subpart apply is **each chromium electroplating or chromium anodizing tank at facilities performing hard chromium electroplating, decorative chromium electroplating, or chromium anodizing.**

*The facility's chromium electroplating tank is subject to 40 CFR 63.340(a).*

(b) Owners or operators of affected sources subject to the provisions of this subpart **must also comply with the requirements of subpart A of this part**, according to the applicability of subpart A of this part to such sources, as identified in Table 1 of this subpart.

(c) **Process tanks associated with a chromium electroplating or chromium anodizing process, but in which neither chromium electroplating nor chromium anodizing is taking place, are not subject to the provisions of this subpart.** Examples of such tanks include, but are not limited to, rinse tanks, etching tanks, and cleaning tanks. Likewise, tanks that contain a chromium solution, but in which no electrolytic process occurs, are not subject to this subpart. An example of such a tank is a chrome conversion coating tank where no electrical current is applied.

*The facility's process tanks are not subject to the rule.*

(d) Affected sources in which research and laboratory operations are performed are exempt from the provisions of this subpart when such operations are taking place.

(e) **If you are an owner or operator of an area source subject to this subpart, you are exempt from the obligation to obtain a permit under 40 CFR part 70 or 71, provided you are not required to obtain a permit under 40 CFR 70.3(a) or 71.3(a) for a reason other than your status as an area source under this subpart. Notwithstanding the previous sentence, you must continue to comply with the provisions of this subpart applicable to area sources.**

*The facility is an area source subject to this subpart and, given the above rule, is exempt from the obligation to obtain a Title V permit. Northwest Chrome will*

*continue to comply with the provisions of this subpart applicable to area sources, as noted in the following sections.*

[60 FR 4963, Jan. 25, 1995, as amended at 61 FR 27787, June 3, 1996; 64 FR 69643, Dec. 14, 1999; **70 FR 75345, Dec. 19, 2005**]

*Based upon the above definition, the facility is not required to submit a Title V Application. This was a requirement in the previous permit for TVCP, as is stated in the Statement of Basis and Permit for TVCP facility. The amendment to section 63.340 (e) makes it clear that area sources, which Northwest Chrome is, "are exempt from the obligation to obtain a permit under 40 CFR part 70 or 71." Northwest Chrome will comply with the other provisions of the subpart that are applicable to the area source. For more information on the amendment, please see the **70 FR 75345, Dec. 19, 2005 amendment (attached).***

### **§ 63.341** Definitions and nomenclature.

*The definitions are generally applicable to the facility.*

### **§ 63.342** Standards.

(a) Each owner or operator of an affected source subject to the provisions of this subpart shall comply with these requirements on and after the compliance dates specified in §63.343(a). **All affected sources are regulated by applying maximum achievable control technology.**

(b) *Applicability of emission limitations.* (1) The emission limitations in this section **apply during tank operation** as defined in §63.341, and **during periods of startup and shutdown** as these are routine occurrences for affected sources subject to this subpart. The emission limitations do not apply during periods of malfunction, but the **work practice standards that address operation and maintenance and that are required by paragraph (f) of this section must be followed during malfunctions.**

(2) If an owner or operator is **controlling a group of tanks with a common add-on air pollution control device**, the emission limitations of paragraphs (c), (d), and (e) of this section apply whenever any one affected source is operated. The emission limitation that applies to the group of affected sources is:

*No add-on air pollution control devices will be used in the operation. Fumetrol 140 suppressant will be used instead.*

(c)(1) *Standards for open surface* **hard chromium electroplating tanks**. During tank operation, each owner or operator of an existing, new, or reconstructed affected source shall control chromium emissions discharged to the atmosphere from that affected source by either:

*The facility is not a hard chromium electroplating operation, rather a decorative one.*

(2) *Standards for* **enclosed hard chromium electroplating tanks**. During tank operation, each owner or operator of an existing, new, or reconstructed affected source shall control chromium emissions discharged to the atmosphere from that affected source by either:

*The facility is not a hard chromium electroplating operation, rather a decorative one.*

(3)(i) An owner or operator may demonstrate the size of a **hard chromium electroplating** facility through the definitions in §63.341(a). Alternatively, an owner or operator of a facility with a maximum cumulative potential rectifier capacity of 60 million amp-hr/yr or more may be considered small if the actual cumulative rectifier capacity is less than 60 million amp-hr/yr as demonstrated using the following procedures:

*The facility is not a hard chromium electroplating operation, rather a decorative one.*

**Green highlights indicate non-applicability**

**Yellow highlights indicate some form of applicability**

*Times New-Roman, bold and italic font indicates response to rule.*

(d) **Standards for decorative chromium electroplating tanks using a chromic acid bath and chromium anodizing tanks.** During tank operation, each owner or operator of an existing, new, or reconstructed affected source shall control chromium emissions discharged to the atmosphere from that affected source by either:

(1) Not allowing the concentration of total chromium in the exhaust gas stream discharged to the atmosphere to exceed 0.01 mg/dscm ( $4.4 \times 10^{-6}$  gr/dscf); or

(2) If a chemical fume suppressant containing a wetting agent is used, by not allowing the surface tension of the electroplating or anodizing bath contained within the affected source to exceed **45 dynes/cm ( $3.1 \times 10^{-3}$  lb<sub>f</sub>/ft)** as measured by a **stalagmometer** or 35 dynes/cm ( $2.4 \times 10^{-3}$  lb<sub>f</sub>/ft) as measured by a tensiometer at any time during operation of the tank.

*Northwest Chrome is choosing to use the surface tension limit under 40 CFR 63.342 (d)(2) to demonstrate compliance with MACT standards for their chromium electroplating tank.*

*Northwest Chrome is choosing to add a chemical fume suppressant, which will not allow the surface tension of the chromium electroplating tank to exceed 45 dynes/cm as measured by a stalagmometer. The chemical fume suppressant is Fumetrol 140, manufactured by Atotech. Fumetrol 140 has been proven to control 99.815% of chromium emissions. Refer to Appendix D for more information on both Fumetrol 140 and the operation of the stalagmometer. Fumetrol 140 was utilized in the emissions calculations and ambient air quality analysis.*

(e) **Standards for decorative chromium electroplating tanks using a trivalent chromium bath.** (1) Each owner or operator of an existing, new, or reconstructed decorative chromium electroplating tank that uses a trivalent chromium bath that incorporates a wetting agent as a bath ingredient is subject to the recordkeeping and reporting requirements of §§63.346(b)(14) and 63.347(i), but are not subject to the work practice requirements of paragraph (f) of this section, or the continuous compliance monitoring requirements in §63.343(c). The wetting agent must be an ingredient in the trivalent chromium bath components purchased from vendors.

(f) **Operation and maintenance practices.** All owners or operators subject to the standards in paragraphs (c) and (d) of this section are subject to these operation and maintenance practices.

(1)(i) At all times, including periods of startup, shutdown, and malfunction, owners or operators shall operate and maintain any affected source, including associated air pollution control devices and monitoring equipment, in a manner consistent with good air pollution control practices.

(ii) Malfunctions shall be corrected as soon as practicable after their occurrence.

(iii) Operation and maintenance requirements established pursuant to section 112 of the Act are enforceable independent of emissions limitations or other requirements in relevant standards.

(2)(i) Determination of whether acceptable operation and maintenance procedures are being used will be based on information available to the Administrator, which may include, but is not limited to, monitoring results; review of the operation and maintenance plan, procedures, and records; and inspection of the source.

(j) Based on the results of a determination made under paragraph (f)(2)(i) of this section, the Administrator may require that an owner or operator of an affected source make changes to the operation and maintenance plan required by paragraph (f)(3) of this section for that source. Revisions may be required if the Administrator finds that the plan:

(A) Does not address a malfunction that has occurred;

(B) Fails to provide for the proper operation of the affected source, the air pollution control techniques, or the control system and process monitoring equipment during a malfunction in a manner consistent with good air pollution control practices; or

(C) Does not provide adequate procedures for correcting malfunctioning process equipment, air pollution control techniques, or monitoring equipment as quickly as practicable.

(3) **Operation and maintenance plan.** (i) The owner or operator of an affected source subject to paragraph (f) of this section shall prepare an operation and maintenance plan no later than the compliance date, except for hard chromium electroplaters and the chromium anodizing operations in California which have until January 25, 1998. The plan shall be incorporated by reference into the source's title V permit, if and when a title V permit is required. The plan shall include the following elements:

*A Title V Permit is not required. Refer to 63.340 (e) above.*

(A) The plan shall specify the operation and maintenance criteria for the affected source, the add-on air pollution control device (if such a device is used to comply with the emission limits), and the process and control system monitoring equipment, and shall include a standardized checklist to document the operation and maintenance of this equipment;

(B) For sources using an add-on control device or monitoring equipment to comply with this subpart, the plan shall incorporate the operation and maintenance practices for that device or monitoring equipment, as identified in Table 1 of this section, if the specific equipment used is identified in Table 1 of this section;

(C) If the specific equipment used is not identified in Table 1 of this section, the plan shall incorporate proposed operation and maintenance practices. These proposed operation and maintenance practices shall be submitted for approval as part of the submittal required under §63.343(d);

(D) The plan shall specify procedures to be followed to ensure that equipment or process malfunctions due to poor maintenance or other preventable conditions do not occur; and

(E) The plan shall include a systematic procedure for identifying malfunctions of process equipment, add-on air pollution control devices, and process and control system monitoring equipment and for implementing corrective actions to address such malfunctions.

Green highlights indicate non-applicability

Yellow highlights indicate some form of applicability

*Times New-Roman, bold and italic font indicates response to rule.*

### § 63.343 Compliance provisions.

(a) *Compliance dates.* (1) The owner or operator of an existing affected source shall comply with the emission limitations in §63.342 as follows:

(2) The owner or operator of a new or reconstructed affected source that has an initial startup after January 25, 1995, shall comply immediately upon startup of the source. The owner or operator of a new or reconstructed affected source that has an initial startup after December 16, 1993 but before January 25, 1995, shall follow the compliance schedule of §63.6(b)(1).

*Northwest Chrome will immediately comply with the provisions upon startup.*

(3) The owner or operator of an existing area source that increases actual or potential emissions of hazardous air pollutants such that the area source becomes a major source must comply with the provisions for existing major sources, including the reporting provisions of §63.347(g), immediately upon becoming a major source.

(4) The owner or operator of a new area source (i.e., an area source for which construction or reconstruction was commenced after December 16, 1993) that increases actual or potential emissions of hazardous air pollutants such that the area source becomes a major source must comply with the provisions for new major sources, immediately upon becoming a major source.

(5) An owner or operator of an existing hard chromium electroplating tank or tanks located at a small, hard chromium electroplating facility that increases its maximum cumulative potential rectifier capacity, or its actual cumulative rectifier capacity, such that the facility becomes a large, hard chromium electroplating facility must comply with the requirements of §63.342(c)(1)(i) for all hard chromium electroplating tanks at the facility no later than 1 year after the month in which monthly records required by §§63.342(c)(2) and 63.346(b)(12) show that the large designation is met, or by the compliance date specified in paragraph (a)(1)(ii) of this section, whichever is later.

(6) *Request for an extension of compliance.* An owner or operator of an affected source or sources that requests an extension of compliance shall do so in accordance with this paragraph and the applicable paragraphs of §63.6(i). When the owner or operator is requesting the extension for more than one affected source located at the facility, then only one request may be submitted for all affected sources at the facility.

(7) An owner or operator of a decorative chromium electroplating tank that uses a trivalent chromium bath that incorporates a wetting agent, and that ceases using the trivalent chromium process, must comply with the emission limitation now applicable to the tank within 1 year of switching bath operation.

**(b) Methods to demonstrate initial compliance.** (1) Except as provided in paragraphs (b)(2) and (b)(3) of this section, an owner or operator of an affected source subject to the requirements of this subpart is required to conduct an initial performance test as required under §63.7, except for hard chromium electroplaters and chromium anodizing operations in California which have until January 25, 1998, using the procedures and test methods listed in §§63.7 and 63.344.

(2) If the owner or operator of an affected source meets all of the following criteria, an initial performance test is not required to be conducted under this subpart:

(i) The affected source is a hard chromium electroplating tank, a decorative chromium electroplating tank or a chromium anodizing tank; and

(ii) A wetting agent is used in the plating or anodizing bath to inhibit chromium emissions from the affected source; and

(iii) The owner or operator complies with the applicable surface tension limit of §63.342(c)(1)(iii), (c)(2)(iii), or (d)(2) as demonstrated through the continuous compliance monitoring required by paragraph (c)(5)(ii) of this section.

*Northwest Chrome will comply with the above mentioned method (63.343(a)(7)(b)) in order to demonstrate initial compliance.*

(3) If the affected source is a decorative chromium electroplating tank using a trivalent chromium bath, and the owner or operator is subject to the provisions of §63.342(e), an initial performance test is not required to be conducted under this subpart.

(c) *Monitoring to demonstrate continuous compliance.* The owner or operator of an affected source subject to the emission limitations of this subpart shall conduct monitoring according to the type of air pollution control technique that is used to comply with the emission limitation. The monitoring required to demonstrate continuous compliance with the emission limitations is identified in this section for the air pollution control techniques expected to be used by the owners or operators of affected sources.

(1) *Composite mesh-pad systems.*

(2) *Packed-bed scrubber systems.*

(3) *Packed-bed scrubber/composite mesh-pad system.*

(4) *Fiber-bed mist eliminator.*

(5) *Wetting agent-type or combination wetting agent-type/foam blanket fume suppressants.* (i) During the initial performance test, the owner or operator of an affected source complying with the emission limitations in §63.342 through the use of a wetting agent in the electroplating or anodizing bath shall determine the outlet chromium concentration using the procedures in §63.344(c). The owner or operator shall establish as the site-specific operating parameter the surface tension of the bath using Method 306B, appendix A of this part, setting the maximum value that corresponds to compliance with the applicable emission limitation. In lieu of establishing the maximum surface tension during the performance test, the owner or operator may accept 45 dynes/cm as measured by a stalagmometer or 35 dynes/cm as measured by a tensiometer as the maximum surface tension value that corresponds to compliance with the applicable emission limitation. However, the owner or operator is exempt from conducting a performance test only if the criteria of paragraph (b)(2) of this section are met.

(ii) On and after the date on which the initial performance test is required to be completed under §63.7, except for hard chromium electroplaters and chromium anodizing operations in California,

which have until January 25, 1998, the owner or operator of an affected source shall monitor the surface tension of the electroplating or anodizing bath. Operation of the affected source at a surface tension greater than the value established during the performance test, or greater than 45 dynes/cm as measured by a stalagmometer or 35 dynes/cm as measured by a tensiometer if the owner or operator is using this value in accordance with paragraph (c)(5)(i) of this section, shall constitute noncompliance with the standards. The surface tension shall be monitored according to the following schedule:

(A) The surface tension shall be measured once every 4 hours during operation of the tank with a stalagmometer or a tensiometer as specified in Method 306B, appendix A of this part.

(B) The time between monitoring can be increased if there have been no exceedances. The surface tension shall be measured once every 4 hours of tank operation for the first 40 hours of tank operation after the compliance date. Once there are no exceedances during 40 hours of tank operation, surface tension measurement may be conducted once every 8 hours of tank operation. Once there are no exceedances during 40 hours of tank operation, surface tension measurement may be conducted once every 40 hours of tank operation on an ongoing basis, until an exceedance occurs. The minimum frequency of monitoring allowed by this subpart is once every 40 hours of tank operation.

(C) Once an exceedance occurs as indicated through surface tension monitoring, the original monitoring schedule of once every 4 hours must be resumed. A subsequent decrease in frequency shall follow the schedule laid out in paragraph (c)(5)(ii)(B) of this section. For example, if an owner or operator had been monitoring an affected source once every 40 hours and an exceedance occurs, subsequent monitoring would take place once every 4 hours of tank operation. Once an exceedance does not occur for 40 hours of tank operation, monitoring can occur once every 8 hours of tank operation. Once an exceedance does not occur for 40 hours of tank operation on this schedule, monitoring can occur once every 40 hours of tank operation.

(iii) Once a bath solution is drained from the affected tank and a new solution added, the original monitoring schedule of once every 4 hours must be resumed, with a decrease in monitoring frequency allowed following the procedures of paragraphs (c)(5)(ii) (B) and (C) of this section.

(6) *Foam blanket-type fume suppressants.* (i) During the initial performance test, the owner or operator of an affected source complying with the emission limitations in §63.342 through the use of a foam blanket in the electroplating or anodizing bath shall determine the outlet chromium concentration using the procedures in §63.344(c), and shall establish as the site-specific operating parameter the thickness of the foam blanket, setting the minimum thickness that corresponds to compliance with the applicable emission limitation. In lieu of establishing the minimum foam blanket thickness during the performance test, the owner or operator may accept 2.54 centimeters (1 inch) as the minimum foam blanket thickness that corresponds to compliance with the applicable emission limitation. All foam blanket measurements must be taken in close proximity to the workpiece or cathode area in the plating tank(s).

(j) On and after the date on which the initial performance test is required to be completed under §63.7, except for hard chromium electroplaters and chromium anodizing operations in California which have until January 25, 1998, the owner or operator of an affected source shall monitor the foam blanket thickness of the electroplating or anodizing bath. Operation of the affected source at a foam blanket thickness less than the value established during the performance test, or less than 2.54 cm (1 inch) if the owner or operator is using this value in accordance with paragraph (c)(6)(i) of this section, shall constitute noncompliance with the standards. The foam blanket thickness shall be measured according to the following schedule:

(A) The foam blanket thickness shall be measured once every 1 hour of tank operation.

(B) The time between monitoring can be increased if there have been no exceedances. The foam blanket thickness shall be measured once every hour of tank operation for the first 40 hours of tank operation after the compliance date. Once there are no exceedances for 40 hours of tank operation, foam blanket thickness measurement may be conducted once every 4 hours of tank operation. Once there are no exceedances during 40 hours of tank operation, foam blanket thickness measurement may be conducted once every 8 hours of tank operation on an ongoing basis, until an exceedance occurs. The minimum frequency of monitoring allowed by this subpart is once per 8 hours of tank operation.

(C) Once an exceedance occurs as indicated through foam blanket thickness monitoring, the original monitoring schedule of once every hour must be resumed. A subsequent decrease in frequency shall follow the schedule laid out in paragraph (c)(6)(ii)(B) of this section. For example, if an owner or operator had been monitoring an affected source once every 8 hours and an exceedance occurs, subsequent monitoring would take place once every hour of tank operation. Once an exceedance does not occur for 40 hours of tank operation, monitoring can occur once every 4 hours of tank operation. Once an exceedance does not occur for 40 hours of tank operation on this schedule, monitoring can occur once every 8 hours of tank operation.

(iii) Once a bath solution is drained from the affected tank and a new solution added, the original monitoring schedule of once every hour must be resumed, with a decrease in monitoring frequency allowed following the procedures of paragraphs (c)(6)(ii) (B) and (C) of this section.

(7) *Fume suppressant/add-on control device.* (i) If the owner or operator of an affected source uses both a fume suppressant and add-on control device and both are needed to comply with the applicable emission limit, monitoring requirements as identified in paragraphs (c) (1) through (6) of this section, and the work practice standards of Table 1 of §63.342, apply for each of the control techniques used.

(ii) If the owner or operator of an affected source uses both a fume suppressant and add-on control device, but only one of these techniques is needed to comply with the applicable emission limit, monitoring requirements as identified in paragraphs (c) (1) through (6) of this section, and work practice standards of Table 1 of §63.342, apply only for the control technique used to achieve compliance.

(8) *Use of an alternative monitoring method.* (i) Requests and approvals of alternative monitoring methods shall be considered in accordance with §63.8(f)(1), (f)(3), (f)(4), and (f)(5).

(ii) After receipt and consideration of an application for an alternative monitoring method, the Administrator may approve alternatives to any monitoring methods or procedures of this subpart including, but not limited to, the following:

(A) Alternative monitoring requirements when installation or use of monitoring devices specified in this subpart would not provide accurate measurements due to interferences caused by substances within the effluent gases; or

(B) Alternative locations for installing monitoring devices when the owner or operator can demonstrate that installation at alternate locations will enable accurate and representative measurements.

(d) An owner or operator who uses an air pollution control device not listed in this section shall submit a description of the device, test results collected in accordance with §63.344(c) verifying the performance of the device for reducing chromium emissions to the atmosphere to the level required by this subpart, a copy of the operation and maintenance plan referenced in §63.342(f) including operation and maintenance practices, and appropriate operating parameters that will be monitored to establish continuous compliance with the standards. The monitoring plan submitted identifying the continuous compliance monitoring is subject to the Administrator's approval.

[60 FR 4963, Jan. 25, 1995; 60 FR 33122, June 27, 1995, as amended at 62 FR 42920, Aug. 11, 1997; 68 FR 37347, June 23, 2003; 69 FR 42895, July 19, 2004]

**Green highlights indicate non-applicability**

**Yellow highlights indicate some form of applicability**

*Times New-Roman, bold and italic font indicates response to rule.*

### **§ 63.344 Performance test requirements and test methods.**

**(a)** *Performance test requirements.* Performance tests shall be conducted using the test methods and procedures in this section and §63.7. Performance test results shall be documented in complete test reports that contain the information required by paragraphs (a)(1) through (a)(9) of this section. The test plan to be followed shall be made available to the Administrator prior to the testing, if requested.

**(1)** A brief process description;

**(2)** Sampling location description(s);

**(3)** A description of sampling and analytical procedures and any modifications to standard procedures;

**(4)** Test results;

**(5)** Quality assurance procedures and results;

**(6)** Records of operating conditions during the test, preparation of standards, and calibration procedures;

**(7)** Raw data sheets for field sampling and field and laboratory analyses;

**(8)** Documentation of calculations; and

**(9)** Any other information required by the test method.

**(b)**(1) If the owner or operator of an affected source conducts performance testing at startup to obtain an operating permit in the State in which the affected source is located, the results of such testing may be used to demonstrate compliance with this subpart if:

**(i)** The test methods and procedures identified in paragraph (c) of this section were used during the performance test;

**(ii)** The performance test was conducted under representative operating conditions for the source;

**(iii)** The performance test report contains the elements required by paragraph (a) of this section; and

**(iv)** The owner or operator of the affected source for which the performance test was conducted has sufficient data to establish the operating parameter value(s) that correspond to compliance with the standards, as required for continuous compliance monitoring under §63.343(c).

(2) The results of tests conducted prior to December 1991 in which Method 306A, appendix A of this part, was used to demonstrate the performance of a control technique are not acceptable.

(c) *Test methods.* Each owner or operator subject to the provisions of this subpart and required by §63.343(b) to conduct an initial performance test shall use the test methods identified in this section to demonstrate compliance with the standards in §63.342.

(1) Method 306 or Method 306A, "Determination of Chromium Emissions From Decorative and Hard Chromium Electroplating and Anodizing Operations," appendix A of this part shall be used to determine the chromium concentration from hard or decorative chromium electroplating tanks or chromium anodizing tanks. The sampling time and sample volume for each run of Methods 306 and 306A, appendix A of this part shall be at least 120 minutes and 1.70 dscm (60 dscf), respectively. Methods 306 and 306A, appendix A of this part allow the measurement of either total chromium or hexavalent chromium emissions. For the purposes of this standard, sources using chromic acid baths can demonstrate compliance with the emission limits of §63.342 by measuring either total chromium or hexavalent chromium. Hence, the hexavalent chromium concentration measured by these methods is equal to the total chromium concentration for the affected operations.

(2) The California Air Resources Board (CARB) Method 425 (which is available by contacting the California Air Resources Board, 1102 Q Street, Sacramento, California 95814) may be used to determine the chromium concentration from hard and decorative chromium electroplating tanks and chromium anodizing tanks if the following conditions are met:

(i) If a colorimetric analysis method is used, the sampling time and volume shall be sufficient to result in 33 to 66 micrograms of catch in the sampling train.

(ii) If Atomic Absorption Graphite Furnace (AAGF) or Ion Chromatography with a Post-column Reactor (ICPCR) analyses were used, the sampling time and volume should be sufficient to result in a sample catch that is 5 to 10 times the minimum detection limit of the analytical method (i.e., 1.0 microgram per liter of sample for AAGF and 0.5 microgram per liter of sample for ICPCR).

(iii) In the case of either paragraph (c)(2) (i) or (ii) of this section, a minimum of 3 separate runs must be conducted. The other requirements of §63.7 that apply to affected sources, as indicated in Table 1 of this subpart, must also be met.

(3) Method 306B, "Surface Tension Measurement and Recordkeeping for Tanks Used at Decorative Chromium Electroplating and Anodizing Facilities," appendix A of this part shall be used to measure the surface tension of electroplating and anodizing baths.

***Method 306B information will be attached to this Form.***

(4) Alternate test methods may also be used if the method has been validated using Method 301, appendix A of this part and if approved by the Administrator. Procedures for requesting and obtaining approval are contained in §63.7(f).

(d) *Establishing site-specific operating parameter values.* (1) Each owner or operator required to establish site-specific operating parameters shall follow the procedures in this section.

(2) All monitoring equipment shall be installed such that representative measurements of emissions or process parameters from the affected source are obtained. For monitoring equipment purchased from a vendor, verification of the operational status of the monitoring equipment shall include execution of the manufacturer's written specifications or recommendations for installation, operation, and calibration of the system.

(i) Specifications for differential pressure measurement devices used to measure velocity pressure shall be in accordance with section 2.2 of Method 2 (40 CFR part 60, appendix A).

(j) Specification for differential pressure measurement devices used to measure pressure drop across a control system shall be in accordance with manufacturer's accuracy specifications.

(3) The surface tension of electroplating and anodizing baths shall be measured using Method 306B, "Surface Tension Measurement and Recordkeeping for Tanks used at Decorative Chromium Electroplating and Anodizing Facilities," appendix A of this part. This method should also be followed when wetting agent type or combination wetting agent/foam blanket type fume suppressants are used to control chromium emissions from a hard chromium electroplating tank and surface tension measurement is conducted to demonstrate continuous compliance.

(4) The owner or operator of a source required to measure the velocity pressure at the inlet to an add-on air pollution control device in accordance with §63.343(c)(2), shall establish the site-specific velocity pressure as follows:

(5) The owner or operator of a source required to measure the pressure drop across the add-on air pollution control device in accordance with §63.343(c) (1) through (4) may establish the pressure drop in accordance with the following guidelines:

(e) *Special compliance provisions for multiple sources controlled by a common add-on air pollution control device.* (1) This section identifies procedures for measuring the outlet chromium concentration from an add-on air pollution control device that is used to control multiple sources that may or may not include sources not affected by this subpart.

(6) Each owner or operator that uses the special compliance provisions of this section to demonstrate compliance with the emission limitations of §63.342 shall repeat these procedures if a tank is added or removed from the control system regardless of whether that tank is a nonaffected source. If the new nonaffected tank replaces an existing nonaffected tank of the same size and is connected to the control system through the same size inlet duct then this procedure does not have to be repeated.

(f) *Compliance provisions for the mass rate emission standard for enclosed hard chromium electroplating tanks.* (1) This section identifies procedures for calculating the maximum allowable mass emission rate for owners or operators of affected sources who choose to meet the mass emission rate standard in §63.342(c)(2)(iv) or (v).

(i)(A) The owner or operator of an enclosed hard chromium electroplating tank that is an affected source other than an existing affected source located at a small hard chromium electroplating facility who chooses to meet the mass emission rate standard in §63.342(c)(2)(iv) shall determine compliance by not allowing the mass rate of total chromium in the exhaust gas stream discharged to the atmosphere to exceed the maximum allowable mass emission rate calculated using equation 9:

## **§ 63.345 Provisions for new and reconstructed sources.**

### *Generally applicable to Northwest Chrome.*

(a) This section identifies the preconstruction review requirements for new and reconstructed affected sources that are subject to, or become subject to, this subpart.

(b) *New or reconstructed affected sources.* The owner or operator of a new or reconstructed affected source is subject to §63.5(a), (b)(1), (b)(5), (b)(6), and (f)(1), as well as the provisions of this paragraph.

(1) After January 25, 1995, whether or not an approved permit program is effective in the State in which an affected source is (or would be) located, no person may construct a new affected source or reconstruct an affected source subject to this subpart, or reconstruct a source such that it

becomes an affected source subject to this subpart, without submitting a notification of construction or reconstruction to the Administrator. The notification shall contain the information identified in paragraphs (b) (2) and (3) of this section, as appropriate.

(2) The notification of construction or reconstruction required under paragraph (b)(1) of this section shall include:

*Not Applicable to Northwest Chrome.*

(3) If a reconstruction is to occur, the notification required under paragraph (b)(1) of this section shall include the following in addition to the information required in paragraph (b)(2) of this section:

*Not Applicable to Northwest Chrome.*

(4) The owner or operator of a new or reconstructed affected source that submits a notification in accordance with paragraphs (b) (1) through (3) of this section is not subject to approval by the Administrator. Construction or reconstruction is subject only to notification and can begin upon submission of a complete notification.

*Not Applicable to Northwest Chrome.*

(5) **Submittal timeframes.** After January 25, 1995, whether or not an approved permit program is effective in the State in which an affected source is (or would be) located, an owner or operator of a new or reconstructed affected source shall submit the notification of construction or reconstruction required by paragraph (b)(1) of this section according to the following schedule:

(i) If construction or reconstruction commences after January 25, 1995, the notification shall be submitted as soon as practicable before the construction or reconstruction is planned to commence.

(ii) If the construction or reconstruction had commenced and initial startup had not occurred before January 25, 1995, the notification shall be submitted as soon as practicable before startup but no later than 60 days after January 25, 1995.

Green highlights indicate non-applicability

Yellow highlights indicate some form of applicability

*Times New-Roman, bold and italic font indicates response to rule.*

## § 63.346 Recordkeeping requirements.

*Generally applicable to Northwest Chrome.*

(a) The owner or operator of each affected source subject to these standards shall fulfill all recordkeeping requirements outlined in this section and in the General Provisions to 40 CFR part 63, according to the applicability of subpart A of this part as identified in Table 1 of this subpart.

(b) The owner or operator of an affected source subject to the provisions of this subpart shall maintain the following records for such source:

(1) Inspection records for the add-on air pollution control device, if such a device is used, and monitoring equipment, to document that the inspection and maintenance required by the work

practice standards of §63.342(f) and Table 1 of §63.342 have taken place. The record can take the form of a checklist and should identify the device inspected, the date of inspection, a brief description of the working condition of the device during the inspection, and any actions taken to correct deficiencies found during the inspection.

- (2) Records of all maintenance performed on the affected source, the add-on air pollution control device, and monitoring equipment;
- (3) Records of the occurrence, duration, and cause (if known) of each malfunction of process, add-on air pollution control, and monitoring equipment;
- (4) Records of actions taken during periods of malfunction when such actions are inconsistent with the operation and maintenance plan;
- (5) Other records, which may take the form of checklists, necessary to demonstrate consistency with the provisions of the operation and maintenance plan required by §63.342(f)(3);
- (6) Test reports documenting results of all performance tests;
- (7) All measurements as may be necessary to determine the conditions of performance tests, including measurements necessary to determine compliance with the special compliance procedures of §63.344(e);
- (8) Records of monitoring data required by §63.343(c) that are used to demonstrate compliance with the standard including the date and time the data are collected;
- (9) The specific identification (i.e., the date and time of commencement and completion) of each period of excess emissions, as indicated by monitoring data, that occurs during malfunction of the process, add-on air pollution control, or monitoring equipment;
- (10) The specific identification (i.e., the date and time of commencement and completion) of each period of excess emissions, as indicated by monitoring data, that occurs during periods other than malfunction of the process, add-on air pollution control, or monitoring equipment;
- (11) The total process operating time of the affected source during the reporting period;
- (12) Records of the actual cumulative rectifier capacity of hard chromium electroplating tanks at a facility expended during each month of the reporting period, and the total capacity expended to date for a reporting period, if the owner or operator is using the actual cumulative rectifier capacity to determine facility size in accordance with §63.342(c)(2);
- (13) For sources using fume suppressants to comply with the standards, records of the date and time that fume suppressants are added to the electroplating or anodizing bath;
- (14) For sources complying with §63.342(e), records of the bath components purchased, with the wetting agent clearly identified as a bath constituent contained in one of the components;
- (15) Any information demonstrating whether a source is meeting the requirements for a waiver of recordkeeping or reporting requirements, if the source has been granted a waiver under §63.10(f); and
- (16) All documentation supporting the notifications and reports required by §63.9, §63.10, and §63.347.

(c) All records shall be maintained for a period of 5 years in accordance with §63.10(b)(1).

**§ 63.347 Reporting requirements.***Generally applicable to Northwest Chrome.*

(a) The owner or operator of each affected source subject to these standards shall fulfill all reporting requirements outlined in this section and in the **General Provisions** to 40 CFR part 63, according to the applicability of **subpart A as identified in Table 1** of this subpart. These reports shall be made to the Administrator at the appropriate address as identified in §63.13 or to the delegated State authority.

**Green highlights indicate non-applicability**

**Yellow highlights indicate some form of applicability**

*Times New-Roman, bold and italic font indicates response to rule.*

(1) Reports required by subpart A of this part and this section may be sent by U.S. mail, fax, or by another courier.

(i) Submittals sent by U.S. mail shall be postmarked on or before the specified date.

(ii) Submittals sent by other methods shall be received by the Administrator on or before the specified date.

(2) If acceptable to both the Administrator and the owner or operator of an affected source, reports may be submitted on electronic media.

(b) The reporting requirements of this section apply to the owner or operator of an affected source when such source becomes subject to the provisions of this subpart.

(c) *Initial notifications.* (1) The owner or operator of an affected source that has an **initial startup before January 25, 1995**, shall notify the Administrator in writing that the source is subject to this subpart. The notification shall be submitted no later than 180 calendar days after January 25, 1995, and shall contain the following information:

(2) The owner or operator of a **new or reconstructed affected source that has an initial startup after January 25, 1995** shall submit an initial notification (in addition to the notification of construction or reconstruction required by §63.345(b)) as follows:

(i) A notification of the date when construction or reconstruction was commenced, shall be submitted simultaneously with the notification of construction or reconstruction, if construction or reconstruction was commenced before January 25, 1995;

(ii) A notification of the **date when construction** or reconstruction was **commenced**, shall be submitted **no later than 30 calendar days** after such date, if construction or reconstruction was commenced after January 25, 1995; and

(iii) A notification of the **actual date of startup of the source shall be submitted within 30 calendar days after such date.**

(d) *Notification of performance test.* (1) The owner or operator of an affected source shall notify the Administrator in writing of his or her intention to conduct a performance test at least 60 calendar days before the test is scheduled to begin to allow the Administrator to have an observer present during the test. Observation of the performance test by the Administrator is optional.

(2) In the event the owner or operator is unable to conduct the performance test as scheduled, the provisions of §63.7(b)(2) apply.

(e) *Notification of compliance status.* (1) A notification of compliance status is required each time that an affected source becomes subject to the requirements of this subpart.

(2) If the State in which the source is located has not been delegated the authority to implement the rule, each time a notification of compliance status is required under this part, the owner or operator of an affected source shall submit to the Administrator a notification of compliance status, signed by the responsible official (as defined in §63.2) who shall certify its accuracy, attesting to whether the affected source has complied with this subpart. If the State has been delegated the authority, the notification of compliance status shall be submitted to the appropriate authority. The notification shall list for each affected source:

(i) The applicable emission limitation and the methods that were used to determine compliance with this limitation;

(ii) If a performance test is required by this subpart, the test report documenting the results of the performance test, which contains the elements required by §63.344(a), including measurements and calculations to support the special compliance provisions of §63.344(e) if these are being followed;

(iii) The type and quantity of hazardous air pollutants emitted by the source reported in mg/dscm or mg/hr if the source is using the special provisions of §63.344(e) to comply with the standards. (If the owner or operator is subject to the construction and reconstruction provisions of §63.345 and had previously submitted emission estimates, the owner or operator shall state that this report corrects or verifies the previous estimate.) For sources not required to conduct a performance test in accordance with §63.343(b), the surface tension measurement may fulfill this requirement;

(iv) For each monitored parameter for which a compliant value is to be established under §63.343(c), the specific operating parameter value, or range of values, that corresponds to compliance with the applicable emission limit;

(v) The methods that will be used to determine continuous compliance, including a description of monitoring and reporting requirements, if methods differ from those identified in this subpart;

(vi) A description of the air pollution control technique for each emission point;

(vii) A statement that the owner or operator has completed and has on file the operation and maintenance plan as required by the work practice standards in §63.342(f);

(viii) If the owner or operator is determining facility size based on actual cumulative rectifier capacity in accordance with §63.342(c)(2), records to support that the facility is small. For existing sources, records from any 12-month period preceding the compliance date shall be used or a description of how operations will change to meet a small designation shall be provided. For new sources, records of projected rectifier capacity for the first 12-month period of tank operation shall be used;

(ix) A statement by the owner or operator of the affected source as to whether the source has complied with the provisions of this subpart.

(3) For sources required to conduct a performance test by §63.343(b), the notification of compliance status shall be submitted to the Administrator no later than 90 calendar days following completion of the compliance demonstration required by §63.7 and §63.343(b).

*Northwest Chrome's source should not be required to complete a performance test in accordance with 63.343(b).*

**Green highlights indicate non-applicability**

**Yellow highlights indicate some form of applicability**

*Times New-Roman, bold and italic font indicates response to rule.*

**(4)** For sources that are not required to complete a performance test in accordance with §63.343(b), the notification of compliance status shall be submitted to the Administrator no later than 30 days after the compliance date specified in §63.343(a), except the date on which sources in California shall monitor the surface tension of the anodizing bath is extended to January 25, 1998.

**(f)** *Reports of performance test results.* (1) If the State in which the source is located has not been delegated the authority to implement the rule, the owner or operator of an affected source shall report to the Administrator the results of any performance test conducted as required by §63.7 or §63.343(b). If the State has been delegated the authority, the owner or operator of an affected source should report performance test results to the appropriate authority.

**(2)** Reports of performance test results shall be submitted no later than 90 days following the completion of the performance test, and shall be submitted as part of the notification of compliance status required by paragraph (e) of this section.

**(g)** *Ongoing compliance status reports for major sources.* (1) The owner or operator of an affected source that is located at a major source site shall submit a summary report to the Administrator to document the ongoing compliance status of the affected source. The report shall contain the information identified in paragraph (g)(3) of this section, and shall be submitted semiannually except when:

**(i)** The Administrator determines on a case-by-case basis that more frequent reporting is necessary to accurately assess the compliance status of the source; or

**(ii)** The monitoring data collected by the owner or operator of the affected source in accordance with §63.343(c) show that the emission limit has been exceeded, in which case quarterly reports shall be submitted. Once an owner or operator of an affected source reports an exceedance, ongoing compliance status reports shall be submitted quarterly until a request to reduce reporting frequency under paragraph (g)(2) of this section is approved.

**(2)** *Request to reduce frequency of ongoing compliance status reports.* (i) An owner or operator who is required to submit ongoing compliance status reports on a quarterly (or more frequent basis) may reduce the frequency of reporting to semiannual if all of the following conditions are met:

**(A)** For 1 full year (e.g., 4 quarterly or 12 monthly reporting periods), the ongoing compliance status reports demonstrate that the affected source is in compliance with the relevant emission limit;

**(B)** The owner or operator continues to comply with all applicable recordkeeping and monitoring requirements of subpart A of this part and this subpart; and

**(C)** The Administrator does not object to a reduced reporting frequency for the affected source, as provided in paragraphs (g)(2) (ii) and (iii) of this section.

**(ii)** The frequency of submitting ongoing compliance status reports may be reduced only after the owner or operator notifies the Administrator in writing of his or her intention to make such a change, and the Administrator does not object to the intended change. In deciding whether to approve a reduced reporting frequency, the Administrator may review information concerning the source's entire previous performance history during the 5-year recordkeeping period prior to the intended

change, or the recordkeeping period since the source's compliance date, whichever is shorter. Records subject to review may include performance test results, monitoring data, and evaluations of an owner or operator's conformance with emission limitations and work practice standards. Such information may be used by the Administrator to make a judgment about the source's potential for noncompliance in the future. If the Administrator disapproves the owner or operator's request to reduce reporting frequency, the Administrator will notify the owner or operator in writing within 45 days after receiving notice of the owner or operator's intention. The notification from the Administrator to the owner or operator will specify the grounds on which the disapproval is based. In the absence of a notice of disapproval within 45 days, approval is automatically granted.

(iii) As soon as the monitoring data required by §63.343(c) show that the source is not in compliance with the relevant emission limit, the frequency of reporting shall revert to quarterly, and the owner shall state this exceedance in the ongoing compliance status report for the next reporting period. After demonstrating ongoing compliance with the relevant emission limit for another full year, the owner or operator may again request approval from the Administrator to reduce the reporting frequency as allowed by paragraph (g)(2) of this section.

(3) **Contents of ongoing compliance status reports.** The owner or operator of an affected source for which compliance monitoring is required in accordance with §63.343(c) shall **prepare a summary report to document the ongoing compliance status of the source.** The report must contain the following information:

(i) The company name and address of the affected source;

(ii) An identification of the operating parameter that is monitored for compliance determination, as required by §63.343(c);

(iii) The relevant emission limitation for the affected source, and the operating parameter value, or range of values, that correspond to compliance with this emission limitation as specified in the notification of compliance status required by paragraph (e) of this section;

(iv) The beginning and ending dates of the reporting period;

(v) A description of the type of process performed in the affected source;

(vi) The total operating time of the affected source during the reporting period;

(vii) If the affected source is a **hard chromium electroplating tank** and the owner or operator is limiting the maximum cumulative rectifier capacity in accordance with §63.342(c)(2), the actual cumulative rectifier capacity expended during the reporting period, on a month-by-month basis;

(viii) **A summary of operating parameter values**, including the total duration of excess emissions during the reporting period as indicated by those values, the total duration of excess emissions expressed as a percent of the total source operating time during that reporting period, and a breakdown of the total duration of excess emissions during the reporting period into those that are due to process upsets, control equipment malfunctions, other known causes, and unknown causes;

(ix) **A certification by a responsible official**, as defined in §63.2, that the work practice standards in §63.342(f) were followed in accordance with the operation and maintenance plan for the source;

(x) **If the operation and maintenance plan required by §63.342(f)(3) was not followed, an explanation of the reasons for not following the provisions, an assessment of whether any excess emission and/or parameter monitoring exceedances are believed to have occurred, and a copy of the report(s) required by §63.342(f)(3)(iv) documenting that the operation and maintenance plan was not followed;**

**Green highlights indicate non-applicability**

**Yellow highlights indicate some form of applicability**

*Times New-Roman, bold and italic font indicates response to rule.*

(xi) A description of any changes in monitoring, processes, or controls since the last reporting period;

(xii) The name, title, and signature of the responsible official who is certifying the accuracy of the report; and

(xiii) The date of the report.

(4) When more than one monitoring device is used to comply with the continuous compliance monitoring required by §63.343(c), the owner or operator shall report the results as required for each monitoring device. However, when one monitoring device is used as a backup for the primary monitoring device, the owner or operator shall only report the results from the monitoring device used to meet the monitoring requirements of this subpart. If both devices are used to meet these requirements, then the owner or operator shall report the results from each monitoring device for the relevant compliance period.

(h) *Ongoing compliance status reports for area sources.* The requirements of this paragraph do not alleviate affected area sources from complying with the requirements of State or Federal operating permit programs under 40 CFR part 71.

(1) The owner or operator of an affected source that is located at an area source site shall prepare a summary report to document the ongoing compliance status of the affected source. The report shall contain the information identified in paragraph (g)(3) of this section, shall be completed annually and retained on site, and made available to the Administrator upon request. The report shall be completed annually except as provided in paragraph (h)(2) of this section.

(2) *Reports of exceedances.* (i) If both of the following conditions are met, semiannual reports shall be prepared and submitted to the Administrator:

(A) The total duration of excess emissions (as indicated by the monitoring data collected by the owner or operator of the affected source in accordance with §63.343(c)) is 1 percent or greater of the total operating time for the reporting period; and

(B) The total duration of malfunctions of the add-on air pollution control device and monitoring equipment is 5 percent or greater of the total operating time.

(ii) Once an owner or operator of an affected source reports an exceedance as defined in paragraph (h)(2)(i) of this section, ongoing compliance status reports shall be submitted semiannually until a request to reduce reporting frequency under paragraph (h)(3) of this section is approved.

(iii) The Administrator may determine on a case-by-case basis that the summary report shall be completed more frequently and submitted, or that the annual report shall be submitted instead of being retained on site, if these measures are necessary to accurately assess the compliance status of the source.

(3) *Request to reduce frequency of ongoing compliance status reports.* (i) An owner or operator who is required to submit ongoing compliance status reports on a semiannual (or more frequent) basis, or is required to submit its annual report instead of retaining it on site, may reduce the

frequency of reporting to annual and/or be allowed to maintain the annual report onsite if all of the following conditions are met:

**(A)** For 1 full year (e.g., 2 semiannual or 4 quarterly reporting periods), the ongoing compliance status reports demonstrate that the affected source is in compliance with the relevant emission limit;

**(B)** The owner or operator continues to comply with all applicable recordkeeping and monitoring requirements of subpart A of this part and this subpart; and

**(C)** The Administrator does not object to a reduced reporting frequency for the affected source, as provided in paragraphs (h)(3) (ii) and (iii) of this section.

**(ii)** The frequency of submitting ongoing compliance status reports may be reduced only after the owner or operator notifies the Administrator in writing of his or her intention to make such a change, and the Administrator does not object to the intended change. In deciding whether to approve a reduced reporting frequency, the Administrator may review information concerning the source's previous performance history during the 5-year recordkeeping period prior to the intended change, or the recordkeeping period since the source's compliance date, whichever is shorter. Records subject to review may include performance test results, monitoring data, and evaluations of an owner or operator's conformance with emission limitations and work practice standards. Such information may be used by the Administrator to make a judgement about the source's potential for noncompliance in the future. If the Administrator disapproves the owner or operator's request to reduce reporting frequency, the Administrator will notify the owner or operator in writing within 45 days after receiving notice of the owner or operator's intention. The notification from the Administrator to the owner or operator will specify the grounds on which the disapproval is based. In the absence of a notice of disapproval within 45 days, approval is automatically granted.

**(iii)** As soon as the monitoring data required by §63.343(c) show that the source is not in compliance with the relevant emission limit, the frequency of reporting shall revert to semiannual, and the owner shall state this exceedance in the ongoing compliance status report for the next reporting period. After demonstrating ongoing compliance with the relevant emission limit for another full year, the owner or operator may again request approval from the Administrator to reduce the reporting frequency as allowed by paragraph (h)(3) of this section.

**(i) Reports associated with trivalent chromium baths.** The requirements of this paragraph do not alleviate affected sources from complying with the requirements of State or Federal operating permit programs under title V. Owners or operators complying with the provisions of §63.342(e) are not subject to paragraphs (a) through (h) of this section, but must instead submit the following reports:

**(1)** Within 180 days after January 25, 1995, submit an initial notification that includes:

**(i)** The same information as is required by paragraphs (c)(1) (i) through (v) of this section; and

**(ii)** A statement that a trivalent chromium process that incorporates a wetting agent will be used to comply with §63.342(e); and

**(iii)** The list of bath components that comprise the trivalent chromium bath, with the wetting agent clearly identified; and

**(2)** Within 30 days of the compliance date specified in §63.343(a), a notification of compliance status that contains an update of the information submitted in accordance with paragraph (i)(1) of this section or a statement that the information is still accurate; and

**(3)** Within 30 days of a change to the trivalent chromium electroplating process, a report that includes:

(i) A description of the manner in which the process has been changed and the emission limitation, if any, now applicable to the affected source;

(ii) If a different emission limitation applies, the applicable information required by paragraph (c)(1) of this section; and

(iii) The notification and reporting requirements of paragraphs (d), (e), (f), (g), and (h) of this section, which shall be submitted in accordance with the schedules identified in those paragraphs.

[60 FR 4963, Jan. 25, 1995, as amended at 61 FR 27787, June 3, 1996; 62 FR 4465, Jan. 30, 1997, 62 FR 42921, Aug. 11, 1997; 69 FR 42897, July 19, 2004]

**§ 63.348 Implementation and enforcement.**

*Applies to EPA delegation authority.*

[68 FR 37347, June 23, 2003]

Green highlights indicate non-applicability

Yellow highlights indicate some form of applicability

*Times New-Roman, bold and italic font indicates response to rule.*

## TITLE 40--Protection of Environment

### CHAPTER I--ENVIRONMENTAL PROTECTION AGENCY

#### SUBCHAPTER C--AIR PROGRAMS

#### PART 60--STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES

Rule Description - 40 CFR Part 60 - New Source Performance Standards	Applicable?
Large Municipal Waste Combustors that are Constructed on or Before September 20, 1994 (Subpart Cb)	No
Emission Guidelines and Compliance Times for Municipal Solid Waste Landfills (Subpart Cc)	No
Emission Guidelines and Compliance Times for Sulfuric Acid Production Plants (Subpart Cd)	No
Emission Guidelines and Compliance Times for Hospital/Medical/Infectious Waste Incinerators (Subpart Ce)	No
Fossil fuel-fired Steam Generators (Subpart D)	No
Electric Utility Steam Generating Units (Subpart Da)	No
Industrial-Commercial-Institutional Steam Generating Units (Subpart Db)	No
Small Industrial-Commercial-Institutional Steam Generating Units (Subpart Dc)	No
Incinerators (Subpart E)	No
Municipal waste combustors (Subpart Ea)	No
Standards of Performance for Municipal Waste Combustors for Which Construction is Commenced After September 24, 1994 (Subpart Eb)	No
Standards of Performance for Hospital/Medical/Infectious Waste Incinerators for Which Construction is Commenced After June 20, 1996 (Subpart Ec)	No
Portland cement plants (Subpart F)	No
Nitric Acid Plants (Subpart G)	No
Sulfuric Acid Plants (Subpart H)	No
Asphalt Concrete Plants (Subpart I)	No
Petroleum refineries (Subpart J)	No
Storage Vessels for Petroleum Liquids--for Construction, Reconstruction, or Modification, Commenced after June 11, 1973, and prior to May 19, 1978 (Subpart K)	No

Rule Description - 40 CFR Part 60 - New Source Performance Standards	Applicable?
Storage Vessels for Petroleum Liquids--for Construction, Reconstruction, or Modification, Commenced after May 18, 1978, and Prior to July 23, 1984 (Subpart Ka)	No
Volatile Organic Liquid Storage Vessels (including petroleum liquid storage vessels) for which construction, reconstruction, or modification commenced after July 23, 1984 (Subpart Kb)	No
Secondary Lead Smelters (Subpart L)	No
Secondary Brass and Bronze Ingot Production Plants (Subpart M)	No
Iron and Steel Plants (Primary Emissions from Basic Oxygen Furnaces Constructed after June 11, 1973) (Subpart N)	No
Iron and steel plants (secondary emissions from basic oxygen furnaces constructed after January 20, 1983) (Subpart Na)	No
Sewage Treatment Plants (Subpart O)	No
Primary Smelters: Copper (Subpart P)	No
Primary Smelters: Zinc (Subpart Q)	No
Primary Smelters: Lead (Subpart R)	No
Primary Aluminum Reduction Plants (Subpart S)	No
Wet process Phosphoric Acid Plants (Subpart T)	No
Superphosphoric Acid Plants (Subpart U)	No
Diammonium Phosphate Plants (Subpart V)	No
Triple Superphosphate Plants (Subpart W)	No
Granular Triple Superphosphate Storage Facilities (Subpart X)	No
Coal Preparation Plants (Subpart Y)	No
Ferroalloy Production Facilities (Subpart Z)	No
Steel Plants: Electric Arc Furnaces (Subpart AA)	No
Steel Plants: Electric Arc Furnaces and Argon-Oxygen Decarburization Vessels constructed after August 17, 1983 (Subpart AAa)	No
Kraft Pulp Mills (Subpart BB)	No
Glass Manufacturing Plants (Subpart CC)	No
Grain Elevators (Subpart DD)	No
Surface Coating of Metal Furniture (Subpart EE)	No
Stationary Gas Turbines (Subpart GG)	No
Lime Manufacturing Plants (Subpart HH)	No
Lead-acid Battery Manufacturing Plants (Subpart KK)	No
Metallic Mineral Processing Plants (Subpart LL)	No
Automobile and Light-duty Truck Surface Coating Operations (Subpart MM)	No
Phosphate Rock Plants (Subpart NN)	No
Ammonium Sulfate Manufacture Plants (Subpart PP)	No
Graphic Arts Industry: Publication Rotogravure Printing (Subpart QQ)	No
Pressure Sensitive Tape and Label Surface Coating Operations (Subpart RR)	No
Industrial Surface Coating: Large Appliances (Subpart SS)	No
Metal Coil Surface Coating (Subpart TT)	No
Asphalt processing and asphalt roofing manufacture (Subpart UU)	No
Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry (Subpart VV)	No

Rule Description - 40 CFR Part 60 - New Source Performance Standards	Applicable?
Beverage Can Surface Coating Industry (Subpart WW)	No
Bulk Gasoline Terminals (Subpart XX)	No
New Residential Wood Heaters (Subpart AAA)	No
Rubber Tire Manufacturing Industry (Subpart BBB)	No
Polymer Manufacturing Industry (Subpart DDD)	No
Flexible Vinyl and Urethane Coating and Printing (Subpart FFF)	No
Equipment Leaks of VOC in Petroleum Refineries (Subpart GGG)	No
Synthetic Fiber Production Facilities (Subpart HHH)	No
Synthetic Organic Chemical Manufacturing Industry Air Oxidation Unit Processes (Subpart III)	No
Petroleum Dry Cleaners (Subpart JJJ)	No
Onshore Natural Gas Processing Plants (Subpart KKK)	No
Onshore Natural Gas Processing: SO <sub>2</sub> Emissions (Subpart LLL)	No
Synthetic Organic Chemical Manufacturing Industry Distillation Operations (Subpart NNN)	No
Nonmetallic Mineral Processing Plants (Subpart OOO)	No
Wool Fiberglass Insulation Manufacturing Plants (Subpart PPP)	No
Petroleum Refinery Wastewater System VOC Emissions (Subpart QQQ)	No
Synthetic Organic Chemical Manufacturing Industry (SOCMI) Reactor Processes (Subpart RRR)	No
Magnetic Tape Coating Facilities (Subpart SSS)	No
Industrial surface coating: Plastic parts for business machines (Subpart TTT)	No
Calciners and Dryers in Mineral Industries (Subpart UUU)	No
Polymeric Coating of Supporting Substrates Facilities (Subpart VVV)	No
Standards of Performance for Municipal Solid Waste Landfills (Subpart WWW)	No
Standards of Performance for Small Municipal Waste Combustion Units for Which Construction is Commenced After August 30, 1999 or for Which Modification or Reconstruction is Commenced After June 6, 2001 (Subpart AAAA)	No
Subpart BBBB - Emission Guidelines and Compliance Times for Small Municipal Waste Combustion Units Constructed on or Before August 30, 1999	No
Subpart CCCC -- Standards of Performance for Commercial and Industrial Solid Waste Incineration Units for Which Construction Is Commenced After November 30, 1999 or for Which Modification or Reconstruction Is Commenced on or After June 1, 2001	No
Subpart DDDD -- Emissions Guidelines and Compliance Times for Commercial and Industrial Solid Waste Incineration Units that Commenced Construction On or Before November 30, 1999	No

***The facility is not subject to the New Source Performance Standards.***

**e-CFR Data is current as of May 10, 2012**

**Title 40: Protection of Environment**

**PART 61—NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS**

Subpart A—General Provisions

Subpart B—National Emission Standards for Radon Emissions From Underground Uranium Mines

Subpart C—National Emission Standard for Beryllium

Subpart D—National Emission Standard for Beryllium Rocket Motor Firing

Subpart E—National Emission Standard for Mercury

Subpart F—National Emission Standard for Vinyl Chloride

Subpart G [Reserved]

Subpart H—National Emission Standards for Emissions of Radionuclides Other Than Radon From Department of Energy Facilities

Subpart I—National Emission Standards for Radionuclide Emissions From Federal Facilities Other Than Nuclear Regulatory Commission Licensees and Not Covered by Subpart H

Subpart J—National Emission Standard for Equipment Leaks (Fugitive Emission Sources) of Benzene

Subpart K—National Emission Standards for Radionuclide Emissions From Elemental Phosphorus Plants

Subpart L—National Emission Standard for Benzene Emissions from Coke By-Product Recovery Plants

Subpart M—National Emission Standard for Asbestos

Subpart N—National Emission Standard for Inorganic Arsenic Emissions From Glass Manufacturing Plants

Subpart O—National Emission Standard for Inorganic Arsenic Emissions From Primary Copper Smelters

Subpart P—National Emission Standard for Inorganic Arsenic Emissions From Arsenic Trioxide and Metallic Arsenic Production Facilities

Subpart Q—National Emission Standards for Radon Emissions From Department of Energy Facilities

Subpart R—National Emission Standards for Radon Emissions From Phosphogypsum Stacks

Subpart S [Reserved]

Subpart T—National Emission Standards for Radon Emissions From the Disposal of Uranium Mill Tailings

Subpart U [Reserved]

Subpart V—National Emission Standard for Equipment Leaks (Fugitive Emission Sources)

Subpart W—National Emission Standards for Radon Emissions From Operating Mill Tailings

Subpart X [Reserved]

Subpart Y—National Emission Standard for Benzene Emissions From Benzene Storage Vessels

Subparts Z-AA [Reserved]

Subpart BB—National Emission Standard for Benzene Emissions From Benzene Transfer Operations

Subparts CC-EE [Reserved]

Subpart FF—National Emission Standard for Benzene Waste Operations

*40 CFR Part 61 regulations do not apply to this facility.*

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## Method 306B—Surface Tension Measurement for Tanks Used at Decorative Chromium Electroplating and Chromium Anodizing Facilities

Note: This method does not include all of the specifications (*e.g.*, equipment and supplies) and procedures (*e.g.*, sampling and analytical) essential to its performance. Some material is incorporated by reference from other methods in 40 CFR Part 60, Appendix A and in this part. Therefore, to obtain reliable results, persons using this method should have a thorough knowledge of at least Methods 5 and 306.

### 1.0 *Scope and Application*

1.1 Analyte. Not applicable.

1.2 Applicability. This method is applicable to all decorative chromium plating and chromium anodizing operations, and continuous chromium plating at iron and steel facilities where a wetting agent is used in the tank as the primary mechanism for reducing emissions from the surface of the plating solution.

### 2.0 *Summary of Method*

2.1 During an electroplating or anodizing operation, gas bubbles generated during the process rise to the surface of the liquid and burst. Upon bursting, tiny droplets of chromic acid become entrained in ambient air. The addition of a wetting agent to the tank bath reduces the surface tension of the liquid and diminishes the formation of these droplets.

2.2 This method determines the surface tension of the bath using a stalagmometer or a tensiometer to confirm that there is sufficient wetting agent present.

### 3.0 *Definitions [Reserved]*

### 4.0 *Interferences [Reserved]*

### 5.0 *Safety*

5.1 Disclaimer. This method may involve hazardous materials, operations, and equipment. This test method may not address all of the safety problems associated with its use. It is the responsibility of the user to establish appropriate safety and health practices and to determine the applicability of regulatory limitations prior to performing this test method.

### 6.0 *Equipment and Supplies*

6.1 Stalagmometer. Any commercially available stalagmometer or equivalent surface tension measuring device may be used to measure the surface tension of the plating or anodizing tank liquid.

6.2 Tensiometer. A tensiometer may be used to measure the surface tension of the tank liquid provided the procedures specified in ASTM Method D 1331–89, Standard Test Methods for



Surface and Interfacial Tension of Solutions of Surface Active Agents (incorporated by reference—see §63.14) are followed.

*7.0 Reagents and Standards [Reserved]*

*8.0 Sample Collection, Sample Recovery, Sample Preservation, Sample Holding Times, Storage, and Transport [Reserved]*

*9.0 Quality Control [Reserved]*

*10.0 Calibration and Standardization [Reserved]*

*11.0 Analytical Procedure*

11.1 Procedure. The surface tension of the tank bath may be measured by using a tensiometer, a stalagmometer or any other equivalent surface tension measuring device approved by the Administrator for measuring surface tension in dynes per centimeter. If the tensiometer is used, the procedures specified in ASTM Method D 1331–89 must be followed. If a stalagmometer or other device is used to measure surface tension, the instructions provided with the measuring device must be followed.

11.2 Frequency of Measurements.

11.2.1 Measurements of the bath surface tension are performed using a progressive system which decreases the frequency of surface tension measurements required when the proper surface tension is maintained.

11.2.1.1 Initially, following the compliance date, surface tension measurements must be conducted once every 4 hours of tank operation for the first 40 hours of tank operation.

11.2.1.2 Once there are no exceedances during a period of 40 hours of tank operation, measurements may be conducted once every 8 hours of tank operation.

11.2.1.3 Once there are no exceedances during a second period of 40 consecutive hours of tank operation, measurements may be conducted once every 40 hours of tank operation on an on-going basis, until an exceedance occurs. The maximum time interval for measurements is once every 40 hours of tank operation.

11.2.2 If a measurement of the surface tension of the solution is above the 45 dynes per centimeter limit, or above an alternate surface tension limit established during the performance test, the time interval shall revert back to the original monitoring schedule of once every 4 hours. A subsequent decrease in frequency would then be allowed according to Section 11.2.1.

*12.0 Data Analysis and Calculations*

12.1 Log Book of Surface Tension Measurements and Fume Suppressant Additions.



12.1.1 The surface tension of the plating or anodizing tank bath must be measured as specified in Section 11.2.

12.1.2 The measurements must be recorded in the log book. In addition to the record of surface tension measurements, the frequency of fume suppressant maintenance additions and the amount of fume suppressant added during each maintenance addition must be recorded in the log book.

12.1.3 The log book will be readily available for inspection by regulatory personnel.

12.2 Instructions for Apparatus Used in Measuring Surface Tension.

12.2.1 Included with the log book must be a copy of the instructions for the apparatus used for measuring the surface tension of the plating or anodizing bath.

12.2.2 If a tensiometer is used, a copy of ASTM Method D 1331–89 must be included with the log book.

*13.0 Method Performance [Reserved]*

*14.0 Pollution Prevention [Reserved]*

*15.0 Waste Management [Reserved]*

*16.0 References [Reserved]*

*17.0 Tables, Diagrams, Flowcharts, and Validation Data [Reserved]*





# Federal Register

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Monday,  
December 19, 2005

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## Part III

### Environmental Protection Agency

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40 CFR Parts 63, 70, and 71

**Exemption of Certain Area Sources From  
Title V Operating Permit Programs; Final  
Rule**



**ENVIRONMENTAL PROTECTION AGENCY**

**40 CFR Parts 63, 70, and 71**

[OAR-2004-0010; FRL-8008-5]

RIN 2060-AM31

**Exemption of Certain Area Sources From Title V Operating Permit Programs**

**AGENCY:** Environmental Protection Agency (EPA).

**ACTION:** Final rule.

**SUMMARY:** The EPA is finalizing permanent exemptions from the title V operating permit program for five categories of nonmajor (area) sources that are subject to national emission standards for hazardous air pollutants (NESHAP). The EPA is making a finding for these categories, consistent with the Clean Air Act requirement for making such exemptions, that compliance with title V permitting requirements is impracticable, infeasible, or unnecessarily burdensome on the source categories. The five source categories are dry cleaners, halogenated solvent degreasers, chrome electroplaters, ethylene oxide (EO) sterilizers and secondary aluminum smelters. The EPA declines to make a

finding for a sixth category, area sources subject to the NESHAP for secondary lead smelters. A previous deferral from permitting for this category expired on December 9, 2004, subjecting all such sources to the title V program.

**DATES:** This final rule is effective on December 19, 2005.

**ADDRESSES:** *Docket.* Docket No. OAR-2004-0010, containing supporting information used to develop the proposed and final rules, is available for public inspection and copying between 8 a.m. and 4:30 p.m., Monday through Friday (except government holidays) at the Air and Radiation Docket (Air Docket) in the EPA Docket Center, (EPA/DC) EPA West Building, Room B102, 1301 Constitution Avenue, NW., Washington, DC 20004.

**FOR FURTHER INFORMATION CONTACT:** Mr. Jeff Herring, U.S. EPA, Information Transfer and Program Implementation Division, C304-04, Research Triangle Park, North Carolina 27711, telephone number (919) 541-3195, facsimile number (919) 541-5509, or electronic mail at [herring.jeff@epa.gov](mailto:herring.jeff@epa.gov).

**SUPPLEMENTARY INFORMATION:**

**I. General Information**

*A. Does This Action Apply to Me?*

The entities affected by this rulemaking are area sources subject to a

NESHAP promulgated under section 112 of the Clean Air Act (Act) since 1990, listed in the table below. An "area source" under the NESHAP regulations is a source that is not a "major source" of hazardous air pollutants (HAP). A "major source" under the NESHAP regulations is "any stationary source or group of stationary sources located within a contiguous area and under common control that emits or has the potential to emit considering controls, in the aggregate, 10 tons per year or more of any [HAP] or 25 tons per year or more of any combination of [HAP] \* \* \* See definitions of "area source" and "major source" at 40 CFR 63.2.

This final rule affects only whether area sources regulated by certain NESHAP are required to obtain a title V operating permit and whether title V permits may be issued to these and other area sources once EPA has promulgated exemptions from title V for them. It has no other effect on any requirements of the NESHAP regulations, nor on the requirements of State or Federal title V operating permit programs.

The affected categories are:

Category	NESHAP	Estimated number of sources <sup>1</sup>
Perchloroethylene dry cleaning .....	Part 63, Subpart M .....	28,000
Hard and decorative chromium electroplating and chromium anodizing .....	Part 63, Subpart N .....	5,000
Commercial ethylene oxide sterilization .....	Part 63, Subpart O .....	100
Halogenated solvent cleaning .....	Part 63, Subpart T .....	3,800
Secondary aluminum production .....	Part 63, Subpart RRR .....	1,316
Secondary lead smelting .....	Part 63, Subpart X .....	3

*B. How Can I Get Copies of This Document and Other Related Information?*

1. *Docket.* The EPA has established an official public docket for this action under Docket ID No. OAR-2004-0010. The official public docket consists of the documents specifically referenced in this action, any public comments received, and other information related

<sup>1</sup> This estimated number includes both major and area sources, even though only area sources will be affected by this rulemaking. Almost all dry cleaners are area sources. Also, EPA believes less than half of EO sterilizers are area sources (see docket item 106). For other categories listed here, EPA does not have information on the number of area sources.

<sup>2</sup> The proposal of March 25, 2005 estimated up to 30,000 dry cleaners would be affected by this rulemaking. Based on new information available to EPA, we now believe up to 28,000 dry cleaners are potentially affected by this rulemaking.

to this action. Although a part of the official docket, the public docket does not include confidential business information (CBI) or other information whose disclosure is restricted by statute. Documents in the official public docket are listed in the index list in EPA's electronic public docket and comment system, EDOCKET. Documents are available both electronically and in hard copy. Electronic documents may be obtained through EDOCKET. Hard copy documents may be viewed at the Air Docket in the EPA Docket Center, (EPA/DC) EPA West Building, Room B102, 1301 Constitution Ave., NW., Washington, DC 20004. This docket facility is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202)

566-1744, and the telephone number for the Air Docket is (202) 566-1742. A reasonable fee may be charged for copying docket materials.

2. *Electronic Access.* You may access this **Federal Register** document electronically through the EPA Internet under the "**Federal Register**" listings at <http://www.epa.gov/fedrgstr/> or the federal-wide eRulemaking site at <http://www.regulations.gov>.

An electronic version of a portion of the public docket is available through EDOCKET at <http://www.epa.gov/edocket/>. To view public comments, review the index listing of the contents of the official public docket, and access those documents in the public docket that are available electronically. Publicly available docket materials that are not available electronically may be



viewed at the docket facility identified above. Once in the system, select "search," then key in the appropriate docket identification number.

#### C. Where Can I Obtain Additional Information?

In addition to being available in the docket, an electronic copy of today's notice is also available on the World Wide Web through the Technology Transfer Network (TTN). Following signature by the EPA Administrator, a copy of today's notice will be posted on the TTN's policy and guidance page for newly proposed or promulgated rules at <http://www.epa.gov/ttn/oarpg>. The TTN provides information and technology exchange in various areas of air pollution control. If more information regarding the TTN is needed, call the TTN HELP line at (919) 541-5384.

#### D. How Is This Preamble Organized?

The information presented in this preamble is organized as follows:

- I. General Information
  - A. Does This Action Apply to Me?
  - B. How Can I Get Copies of This Document and Other Related Information?
    1. Docket
    2. Electronic Access
  - C. Where Can I Obtain Additional Information?
  - D. How Is This Preamble Organized?
- II. Background
- III. What Does Today's Action Involve?
  - A. What Revisions Are Being Made to Part 63?
  - B. What Revisions Are Being Made to Parts 70 and 71?
- IV. What Are the Reasons for Title V Exemptions?
  - A. General Approach
  - B. Dry Cleaners
  - C. Chrome Electroplaters
  - D. Solvent Degreasers
  - E. EO Sterilizers
  - F. Secondary Aluminum
- V. What Is EPA's Decision for Secondary Lead Smelters?
- VI. May Title V Permits Be Issued To Exempt Area Sources?
- VII. May General Permits Be Issued as an Alternative to Title V Exemptions?
- VIII. What Are EPA's Responses to Significant Comments?
  - A. Is EPA's General Approach to Exemptions Consistent With the Act?
  - B. Does the First Factor Acknowledge Key Title V Requirements?
  - C. Does This Rulemaking Adequately Address Title V Costs?
  - D. What Is our Analysis of Factor Four for the Final Rule?
  - E. Are These Exemptions Consistent With the Legislative History of the Act?
  - F. Is It Reasonable for EPA to Rely on the Information Cited in Support of the Proposal?
  - G. Are Permits Necessary To Define Monitoring for Chrome Electroplaters?

- H. May Degreasers Be Exempted When There Are Multiple Applicable Requirements?
- I. Are the Compliance Requirements of the EO Sterilizer and Secondary Aluminum NESHAP Substantially Equivalent to Title V?
- J. Are the Proposed Revisions to EO Sterilizer NESHAP Appropriate?
- K. Are Title V Permits Allowed for Area Sources Exempted From Title V?
- L. Does This Rulemaking Disregard Cost Estimates for General Permits?
- IX. Effective Date of Today's Final Rule Under the Administrative Procedure Act
- X. Statutory and Executive Order Reviews
  - A. Executive Order 12866: Regulatory Planning and Review
  - B. Paperwork Reduction Act
  - C. Regulatory Flexibility Act (RFA), as Amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), 5 U.S.C. 601 et seq.
  - D. Unfunded Mandates Reform Act
  - E. Executive Order 13132: Federalism
  - F. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments
  - G. Executive Order 13045: Protection of Children From Environmental Health and Safety Risks
  - H. Executive Order 13211: Actions Covering Regulations That Significantly Affect Energy Supply, Distribution, or Use
  - I. National Technology Transfer Advancement Act
  - J. Congressional Review Act

#### II. Background

Section 502(a) of the Clean Air Act (Act) sets forth the sources required to obtain operating permits under title V. These sources include: (1) Any affected source subject to the acid deposition provisions of title IV of the Act; (2) any major source; (3) any source required to have a permit under Part C or D of title I of the Act; (4) "any other source (including an area source) subject to standards or regulations under section 111 [new source performance standards] or 112 [NESHAP]" and (5) any other stationary source in a category designated by regulations promulgated by the Administrator. See 40 CFR 70.3(a) and 71.3(a). The requirements of section 502(a) are primarily implemented through the operating permit program rules: Part 70, which sets out the minimum requirements for title V operating permit programs administered by State, local, and tribal permitting authorities (57 FR 32261, July 21, 1992), and part 71, the federal operating permit program requirements that apply where EPA or a delegate agency authorized by EPA to carry out a Federal permit program is the title V permitting authority (61 FR 34228, July 1, 1996). The area sources subject to NSPS under section 111 or NESHAP under section 112 [addressed in

category (4) above] are identified in §§ 70.3(a)(2) and (3) and §§ 71.3(a)(2) and (3) as among the sources subject to title V permitting requirements.

Section 502(a) of the Act also provides that "the Administrator may, in the Administrator's discretion and consistent with the applicable provisions of [the Clean Air Act], promulgate regulations to exempt one or more source categories (in whole or in part) from the requirements [of title V] if the Administrator finds that compliance with such requirements is impracticable, infeasible, or unnecessarily burdensome on such categories, except that the Administrator may not exempt any major source from such requirements."

In the part 70 final rule of July 21, 1992, EPA permanently exempted from title V two categories of area sources that are subject to section 111 and 112 standards established prior to the part 70 rule (pre-1992 standards): New residential wood heaters subject to subpart AAA of part 60 (NSPS), and asbestos demolition and renovation operations subject to subpart M of part 61 (NESHAP). See §§ 70.3(b)(4) and 71.3(b)(4). The EPA also allowed permitting authorities under part 70 the option to defer permitting for other area sources subject to pre-1992 standards, while for part 71 purposes, we simply deferred issuing permits to them. See 57 FR 32261-32263 (July 21, 1992), and §§ 70.3(b)(1) and 71.3(b)(1).

The post-1992 standards, including the NESHAP for area sources that are the subject of today's final rule, previously have been addressed in §§ 70.3(b)(2) and 71.3(b)(2), which state that EPA will determine whether to exempt from title V permitting any or all area sources subject to post-1992 NSPS or NESHAP at the time each new standard is promulgated. Subsequently, EPA issued title V exemptions for several area sources subject to NESHAP in final rules under part 63:

- All area sources within the NESHAP for publicly owned treatment works (POTW), Subpart VVV. See § 63.1592 (63 FR 64742, October 21, 2002).
- Those area sources conducting cold batch cleaning within the NESHAP for halogenated solvent cleaning, Subpart T. See § 63.468(j) (59 FR 61802, December 2, 1994).
- Three types of area sources within the NESHAP for hard and decorative chromium electroplating and chromium anodizing tanks, Subpart T. See § 63.340(e)(1) (61 FR 27785, June 3, 1996).



The EPA has issued three post-1992 NESHAP that defer the requirement for area sources to obtain title V permits:

- Area sources subject to the NESHAP for perchloroethylene dry cleaning, subpart M; chromium electroplating and anodizing, subpart N; commercial ethylene oxide sterilization, subpart O; and secondary lead smelting, subpart X. See 61 FR 27785, June 3, 1996;

- Area sources subject to the NESHAP for halogenated solvent cleaning, subpart T. See 59 FR 61801, December 2, 1994, as amended by 60 FR 29484, June 5, 1995; and

- Area sources subject to the NESHAP for secondary aluminum production, subpart RRR. See 65 FR 15690, March 23, 2000.

The first two rules established deferrals of area source permitting, which expired on December 9, 1999. The expiration date for these deferrals was extended to December 9, 2004 in another final rule (64 FR 69637, December 14, 1999). The third rule provided deferrals for secondary aluminum area sources, which also expired on December 9, 2004. Thus, today's final rule addresses all six categories of area sources subject to a post-1992 NESHAP that were subject to deferrals from permitting that expired on December 9, 2004.

The EPA published a notice of proposed rulemaking on March 25, 2005 (70 FR 15250), where we proposed to exempt from title V five categories of area sources subject to NESHAP: Dry cleaners, halogenated solvent degreasers, chrome electroplaters, ethylene oxide (EO) sterilizers and secondary aluminum smelters. As support for the proposed exemptions, we discussed why compliance with title V appeared to be impracticable, infeasible, or unnecessarily burdensome on the area sources, consistent with the exemption criteria of section 502(a) of the Act. Also, we discussed a sixth category, area sources subject to the NESHAP for secondary lead smelters, but we did not propose to exempt them.

Today's final rule is unchanged from the proposal, except for a revision to § 63.360(f), which sets forth the title V exemption for area sources subject to the NESHAP for EO sterilizers. The change to the EO sterilizer rule is needed to clarify which sources under the NESHAP are subject to today's title V exemptions, and it is discussed further in section VIII.J of this preamble.

### III. What Does Today's Action Involve?

#### A. What Revisions Are Being Made to Part 63?

Today's final rule exempts five categories of area sources from title V by revising certain language in the NESHAP rules under part 63, as we proposed on March 25, 2005 (70 FR 15250). This is achieved through two types of changes to the NESHAP rules.

First, we have revised each of the five NESHAP to say that area sources subject to the NESHAP are exempt from the obligation to obtain permits under parts 70 or 71, unless the source would be required to obtain these permits for another reason, as defined in the part 70 or 71 rules, such as when the source triggers another applicability provision of §§ 70.3(a) or 71.3(a). For example, if an exempt area source increases its HAP emissions such that it becomes a major source, the former area source will be required to get a title V permit because it is a major source, consistent with §§ 70.3(a)(1) and 71.3(a)(1). Consequently, when a former area source becomes a major source, the major source permit must include all NESHAP requirements that apply to the major source, including the requirements of the NESHAP that formerly provided for the title V exemption.<sup>3</sup> This is so because §§ 70.3(c)(1) and 71.3(c)(1) require permits for major source to include "all applicable requirements for all relevant emissions units in the major source." Also, we added a second sentence to each NESHAP to say "notwithstanding the previous sentence," the source "must continue to comply with the provisions of this subpart applicable to area sources." The purpose of this sentence is to explain that area sources that are exempted from title V are not exempted from any emission limitations, standards, or any other requirements of the NESHAP.

Second, we have revised the table in each NESHAP that shows how the general provisions of subpart A of part 63 apply to that particular NESHAP, except for the dry cleaning NESHAP, which has no such table. For sources other than dry cleaners, the "comment" column for the § 63.1(c)(2) entry in the tables simply states that area sources subject to the subpart are exempt from title V permitting obligations.

<sup>3</sup>Note that when an area source becomes a major source, depending on the specific requirements of the NESHAP, the emissions standards may change from generally achievable control technology (GACT), which may be established for area sources, to maximum achievable control technology (MACT), which is required for major sources, but also may be established for area sources. Also, see § 63.1(c)(5).

We have made one change to the rule language of the proposal. In the final rule, we have revised the regulatory language of § 63.360(f), which sets forth the title V exemption for EO sterilizers. For more discussion of the proposed regulatory language and why we are changing it in the final rule, see section VIII.J below.

Also, we are not making any changes to the NESHAP for secondary lead smelters, consistent with our proposal, because we are not establishing a title V exemption for area sources subject to it. See section V below for a more detailed explanation of our decision regarding lead smelters.

#### B. What Revisions Are Being Made to Parts 70 and 71?

Today's final rule also revises parts 70 and 71, as we proposed, to make the rules more consistent with our interpretation that State and local agencies, tribes, and EPA (permitting authorities) may not issue title V permits to area sources after we promulgate title V exemptions for them. In the proposal, we explained that section 502(a) of the Act provides that only those area sources required to get permits, and not exempted by EPA through notice and comment rulemaking, are properly subject to title V requirements. Also, we explained that section 506(a) of the Act, which provides that permitting authorities "may establish additional permitting requirements not inconsistent with this Act," does not override the more specific language of section 502(a). We also explained that section 506(a) preserves the ability for permitting authorities to establish additional permitting requirements, such as procedural requirements, for sources properly covered by the program, and that section 116 of the Act allows State and other non-federal permitting agencies (State agencies) to issue non-title V permits to area sources that have been exempted from title V. See section VI below for further discussion of our interpretations of the Act in this regard.

First, we proposed to delete the "at least" language of § 70.3(a) that has been interpreted to allow State agencies to require permits from area sources, once we have exempted the area sources from title V, because this language is inconsistent with section 502(a) of the Act. No similar changes are necessary for part 71. Second, we proposed to delete language in § 70.3(b)(3) and § 71.3(b)(3) that allows exempt sources to "opt to apply for a permit under a part 70 program," as it is inconsistent with section 502(a) to let exempted area sources volunteer for a title V permit.



Third, we proposed to delete the prefatory phrase of § 70.3(b)(4), "Unless otherwise required by the state to obtain a part 70 permit," because it suggests that States agencies may require title V permits for exempted area sources, such as for residential wood heaters and asbestos demolition and renovation, which would be inconsistent with section 502(a) of the Act. Today's rule makes these revisions final, unchanged from the proposal.

#### IV. What Are the Reasons for the Title V Exemptions?

##### A. General Approach

In the proposal of March 25, 2005 (70 FR 15250), we explained our general approach to implementing the exemption criteria of section 502(a) of the Act. Section 502(a) of the Act provides, in part, that the Administrator may "promulgate regulations to exempt one or more source categories (in whole or in part) from the requirements of this subsection if the Administrator finds that compliance with such requirements is impracticable, infeasible, or unnecessarily burdensome on such categories, except that the Administrator may not exempt any major source from such requirements." In addition, EPA explained that the legislative history of Section 502(a) suggests that EPA should not grant exemptions where doing so would adversely affect public health, welfare, or the environment. See Chafee-Baucus Statement of Senate Managers, Environment and Natural Resources Policy Division 1990 CAA Leg. Hist. 905, Compiled November, 1993 (in that "[t]he Act requires EPA to protect the public health, welfare and the environment, \* \* \* this provision of the permits title prevents EPA from exempting sources or source categories from the requirements of the permit program if such exemptions would adversely affect public health, welfare, or the environment").

In developing this rulemaking, EPA sought and relied on information from State and local agencies on the level of oversight they perform on these area sources. They responded with information on whether they issue permits, perform routine inspections, provide compliance assistance, and on compliance rates for them. We also received input from State small business ombudsmen and several trade associations representing dry cleaning, metal finishing, solvent cleaning, and the aluminum industry, including information on the sources and the compliance assistance programs currently available for them. In addition, the proposal provided a 60-

day public comment period and public citizens, non-profit organizations, State agency representatives, and affected industry representatives responded with comments, which are included in the docket.

In the proposal, we discussed on a case-by-case basis the extent to which one or more of the four factors supported title V exemptions for a given source category, and then we assessed whether considered together those factors demonstrated that compliance with title V requirements would be "unnecessarily burdensome" on the category, consistent with section 502(a) of the Act. See 70 FR 15253, March 25, 2005.

One commenter said we should have evaluated and discussed all four factors for each category of area sources, suggesting that we ignored factors that did not support title V exemptions for each category of area sources. In response, we have considered, and discuss in this preamble, all four factors for each category of area sources for today's final rule. See the explanation below for an overview of our analysis of each factor. Also, see section IV.B through F for detailed discussion of the four factors for each category of area sources, section VIII.A for detailed EPA response to this comment, and section VIII.D, which provides detailed EPA response to this comment, and other comments, on proposed factor four.

The first factor discussed in the proposal is whether title V would result in significant improvements to the compliance requirements, including monitoring, recordkeeping, and reporting, that are already required by the NESHAP. This preamble refers to this evaluation as probing whether title V is "unnecessary" to improve compliance for these NESHAP requirements at area sources. Thus, a finding that title V does not result in significant improvements to compliance, as compared to operating subject to the NESHAP without a title V permit, is described as supporting a conclusion that title V permitting is "unnecessary" for area sources in that category, consistent with the "unnecessarily burdensome" criterion of section 502(a) of the Act. Title V provides authority to add monitoring requirements in permits in appropriate circumstances, and also imposes a number of monitoring, recordkeeping and reporting requirements that are designed to enhance compliance. We analyze below the extent to which Title V could improve compliance for the area sources covered by today's rule.

Part 70 and 71 set forth, in three principal sections, monitoring

requirements that may be included in title V permits for area sources. Section 70.6(a)(3)(i)(A) requires that title V permits include "[a]ll monitoring and analysis procedures or test methods required under applicable monitoring and testing requirements." This means, for example, that monitoring required by a NESHAP must be included in a title V permit issued to a source covered by a NESHAP. Second, § 70.6(a)(3)(i)(B) goes further, and provides that "[w]here the applicable requirement does not require periodic testing or instrumental or noninstrumental monitoring (which may consist of recordkeeping designed to serve as monitoring), periodic monitoring sufficient to yield reliable data from the relevant time period that are representative of the source's compliance with the permit" may be included in a title V permit. Importantly, however, where periodic monitoring exists in the underlying requirement, such as a NESHAP, permit writers are not authorized by this regulation to add additional periodic monitoring in a permit. See *Appalachian Power Co. v. EPA*, 208 F.3d 1015, 1028 (D.C. Cir. 2000). Finally, § 70.6(c)(1), provides that permits must contain "consistent with [the periodic monitoring rule in § 70.6(a)(3)], compliance certification, testing, monitoring, reporting, and recordkeeping requirements sufficient to assure compliance with the terms and conditions of the permit."<sup>4</sup>

The EPA's interpretation of § 70.6(c)(1) has evolved over time. In November and December 2000, EPA partially granted two petitions for objections to State-issued part 70 permits. See *In the Matter of Pacificorp*, Petition No. VIII-00-1 (November 16, 2000); *In the Matter of Fort James Camas Mill*, Petition No. X-19999-1 (December 22, 2000). In both decisions, EPA held that § 70.6(c)(1) empowers State permitting authorities to review, on a case-by-case basis, the sufficiency of each permittee's monitoring requirements, independent of the authority provided by the periodic monitoring rule. On September 17, 2002, EPA published a proposed rule that would have codified this interpretation of § 70.6(c)(1). See 67 FR 58561. After considering comments, however, EPA issued a final rule (the "umbrella monitoring rule") providing that § 70.6(c)(1) does not allow permit writers to add monitoring requirements beyond those that are authorized by the periodic monitoring rule. See 69 FR

<sup>4</sup> Similar provisions appear in EPA regulations in Part 71 stipulating monitoring provisions for federally-issued title V permits.



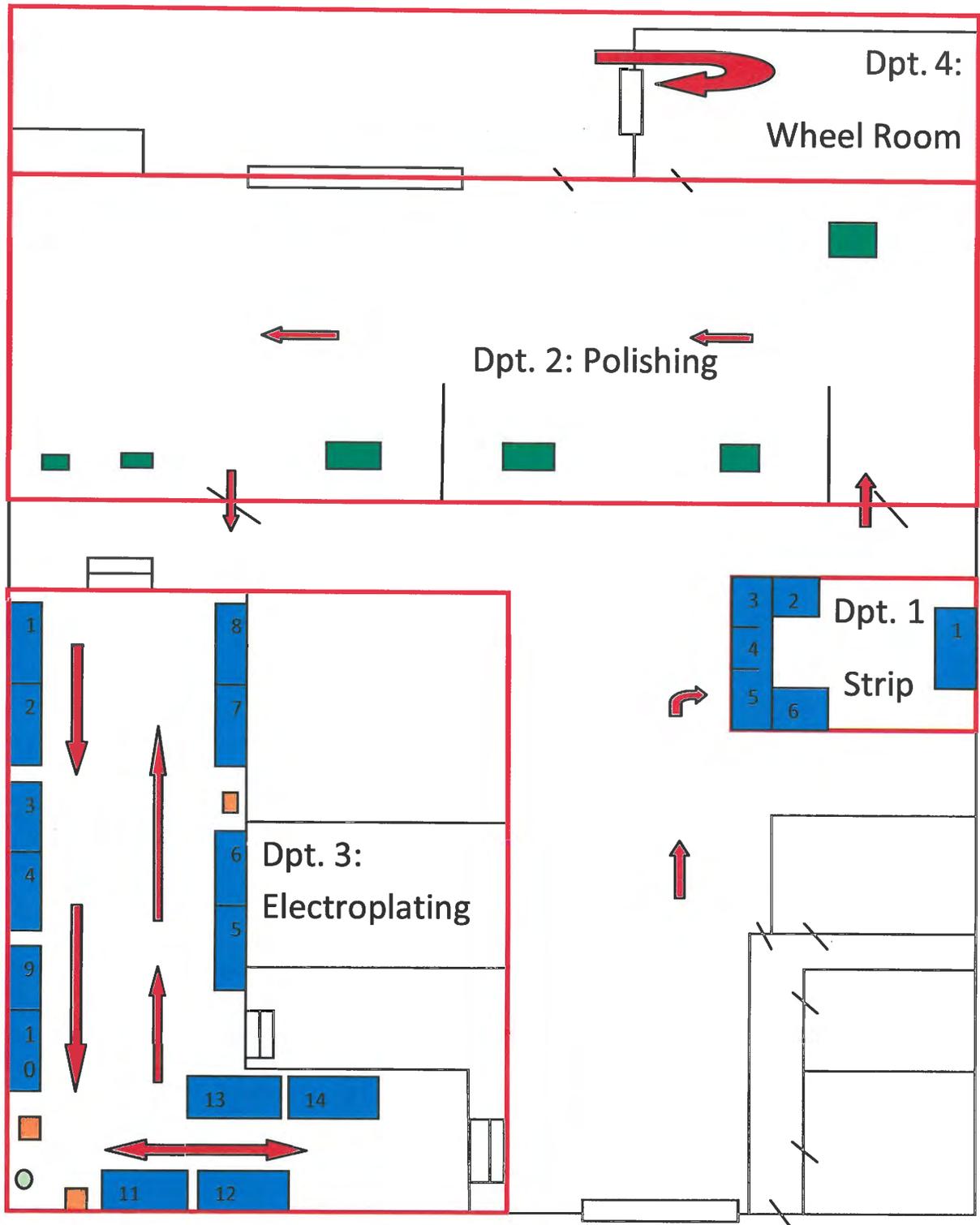
**APPENDIX C**

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**Process Flow Diagram**



# PROCESS FLOW





## Process flow

**Department 1 = Strip area, where all parts are stripped of dirt, oil, rust and paint.**

1. Hot Strip (Caustic Based) - 180\*
  - a. Tank Dimension- 8'x4'x4'
  - b. Gallons- 850 (approx.)
2. Rinse
3. Acid Tank (Hydrochloric) - Room Temp.
4. Rinse
5. Acid Tank (Hydrochloric) – Room Temp.
6. Rinse

**Note:** Tank Dimensions for tanks 2, 3, 4, 5, and 6 are 3'6"X 2'6"x2'6"  
Gallons- 150 (approx.)

**Department 2 = Polishing room, Where all parts are polished by machine and repaired for plating.**

**Department 3 = Plating line, Where all parts are plated copper, nickel, or chrome.**

1. Cleaner tank-160\*alkaline soap cleaner= Where all parts are cleaned for the plating process.
2. Rinse tank – room temp. = parts are rinsed.
3. Acid dip- room temp, acid salt uni-clean as-30=parts are dipped to neutralize cleaner film.
4. Rinse tank-room temp. -parts are rinsed.
5. Cyanide copper -110\* - parts are copper strike for good adhesion (15 sec. to 2 min.)
6. Rinse tank-room temp. -parts are rinsed.
7. Acid copper-room temp. -parts are copper plated anywhere from 15 min. to 30 min.
8. Rinse tank-room temp. -parts are rinsed.
9. Nickel tank-135\* - parts are bright nickel plated anywhere from 15 min. to 30 min.
10. Rinse tank-room temp. -parts are rinsed.
11. Chrome tank-105\* - parts are chromed plated anywhere from 15 sec. to 2 min.
12. Rinse tank-room temp. -parts are rinsed.
13. Chrome strip (caustic based)–room temp with reverse current. -any parts that are rejected need to have chrome removed for rework to take place.
14. Rinse tank-room temp - parts are rinsed.

**Note:** All tanks are 8ft L x 4ft w x 4ft d approximately 850 gallons.

No drains are located in the plating dept. Zero discharge all rinse tanks are added back to process tank.

**Department 4 = Wheel room, Where polishing of wheels are done, No plating required. They are dropped off and picked up in the same area.**

 = polishing lathes,  = plating and strip tanks \* = temperature (Fahrenheit)

**Note:** Plating line process flow chart is not to scale.



**APPENDIX D**

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**Manufacturer Information**



# POLISHING OPERATION PROCEDURES

**Polishers are required to wear all the necessary safety equipment.**

**( 3m particulate dust mask, ear plugs, safety glasses, hot mill gloves, )**

**Additional safety equipment is required when polishing wheels on wheel machine, or removing safety guards on machines.**

**( hooded tyvek suit, face shield, full face respirator, or half face respirator, hard hat.)**

STAGE 1) A 3x133 abrasive belt with a grit of 80, 120, 180, is used to sand parts to remove any rough surfaces. Belt is used on a manual lathe machine with an idler pulley system, Machine is a 10 hp, 3 phase with 1740 rpms.

STAGE 1B) set up wheel with 120 grit is used to sand any accessible surfaces. At end of the day or when wheel is worn, wheel must be cleaned with pumice , apply kold glue, and rolled in 120 turkish emery. Wheels must dry completely before re-use.

STAGE 2) set-up wheel with 180 turkish emery or 220 aluminum oxide grit is used with a lubricant called grease-stick. To remove any visible belt lines caused by stage one. Set-up wheels vary in diameter 6" to 16" inch. Wheels are used on a 10 hp,3 phase,1740 rpms and a 1 1/2 hp, 3600 rpms, 220 volt machine. Here wheels are cleaned with pumice, hot glue is used and 180,220 grit is applied. Wheels must dry completely before re-use.

STAGE 3) Sisal wheel is used with a cutting compound called emery cake, for removal of any lines caused from stage two. Wheels vary in diameter 4" to 14" inch, and is used on a 10 hp, 3 phase, 1740 rpms, and a 1 1/2 hp, 3600 rpms, 220 volt machine.

STAGE 4) Final finish is used with different buffs depending on part, air ways, color buffs, or loose buffs. And is used with a cutting compound ,green chrome rouge. This stage is to bring part to a mirror finish on non-ferrous metals. Buffs are used on a 10 hp 1740 rpms,11/2 hp,3600 rpms, 220 volt, machines. Wheels vary also 4"to 16" in diameter.

STAGE 4B) Parts are checked for quality and wiped down with whiting powder to remove any polishing compound.

NOTE: Wheels are polished on a 10 hp 1740 rpm, 3 phase, wheel machine. all 4 stages are done on machine.

NOTE: ALSO A SMALL BUFFER IS USED FOR SMALL PARTS,3/4 HP, 3450 RPMS, SINGLE PHASE. WE ALSO HAVE A FLEX SHAFT BUFFER FOR BIG OR ODD PARTS,2 HP,1450 RPMS, 220 VOLT MOTOR.



## MATERIALS USED FOR POLISHING OPERATIONS

**STAGE 1A.** A 3"X133" ALUMINUM OXIDE BELT, WITH A GRIT OF 80, 120, OR 180, WHICH IS USED FOR THE REMOVAL OF ROUGH SURFACES.

**STAGE 1B.**  **SET-UP WHEELS ARE MADE EITHER FROM FULL DISC SEWN SECTIONS OR SEWN PIECED BUFFS. USED AS A SET-UP WHEEL WITH KOLD GLUE ( CHEMICAL FAMILY IS INORGANIC AND CONTAINS SODIUM SILICATE, CLAY, WATER, SILICATE, SILICA, GRAPHITE, AND STARCH) AND AN ABRASIVE GRAIN CALLED TURKISH EMERY (CHEMICAL FAMILY IS REFRACTORY OXIDE AND CONTAINS ALUMINUM OXIDE, SILICON DIOXIDE, IRON OXIDE, AND MAGNESIUM OXIDE) , WITH A GRIT OF 120. THE PURPOSE IS FOR POLISHING ANY ACCESSIBLE SURFACES.**

**STAGE 2.**  **SET-UP WHEELS ARE MADE EITHER FROM FULL DISC SEWN SECTIONS OR SEWN PIECED BUFFS. HOT GLUE ( HIGH GRADE ANIMAL GLUE) IS DILUTED WITH WATER TO DESIRED CONSISTENCY AND HEATED TO SPECIFIED TEMPERATURES IN A GLUE POT. USED WITH 180 GRIT OF TURKISH EMERY (CHEMICAL FAMILY IS REFRACTORY OXIDE AND CONTAINS ALUMINUM OXIDE, SILICON DIOXIDE, IRON OXIDE, AND MAGNESIUM OXIDE) AND 220 ALUMINUM OXIDE GRIT ( CHEMICAL FAMILY IS REFRACTORY OXIDE AND CONTAINS ALUMINUM OXIDE, TITANIUM OXIDE, SILICON DIOXIDE, MAGNESIUM OXIDE, IRON OXIDE, AND CALCIUM OXIDE) WITH A LUBRICANT CALLED GREASE STICK (CHEMICAL FAMILY IS ORGANIC AND CONTAINS TALLOW, STEARIC ACID, AND PARAFFIN WAX). THIS PROCESS IS TO REMOVE ANY VISIBLE BELT LINES THAT ARE CAUSED FROM STAGE ONE.**

**STAGE 3.**  **SISAL WHEEL IS A HARD STRONG NON-ABSORBENT FIBER. THE CUTTING COMPOUND IS BLACK EMERY CAKE ( CHEMICAL FAMILY IS ORGANIC-INORGANIC AND CONTAINS FATTY ACIDS, TALLOW, HYDROCARBONS, AND EMERY, ALUMINUM OXIDE) THIS PROCESS IS TO REMOVE ANY LINES CAUSED FROM STAGE 2.**

**STAGE 4A.**  **FINAL FINISH IS COMPLETED WITH A VARIETY OF BUFF WHEELS, SUCH AS, AIRWAY, COLOR BUFFS, AND LOOSE BUFFS. ALL ARE MADE OF MOSTLY CLOTH. THESE WHEELS ARE USED FOR CUT DOWN AND FINISHING. THE CUTTING COMPOUND FOR THIS PROCESS IS GREEN CHROME ROUGE ( CONTAINS FATTY ACIDS, TALLOW, PETROLATEUM, CALCINED ALUMINA, AND GREEN CHROME OXIDE).**

**STAGE 4B.** WITH THE USE OF WHITING POWDER( CHEMICAL FAMILY IS METAL



CARBONATE AND CONTAINS CALCIUM CARBONATE) , IT REMOVES SURFACE RESIDUE AFTER POLISHING.

MISC.

**LUMP PUMICE**( VOLCANIC GLASS, THERE IS NO FREE CRYSTALLINE SILICA PRESENT) COMMONLY USED TO CLEAN AND SHAPE SET-UP WHEELS. VARIOUS HAND AND AIR TOOLS, SUCH AS DIE GRINDER, D.A SANDER, AND DREMEL TOOLS ARE FREQUENTLY USED.

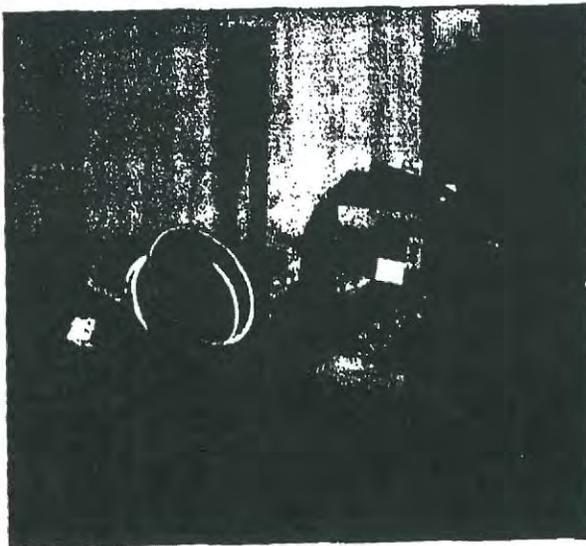


**WE ALSO USE VARIOUS HAND SANDERS AND AIR TOOLS. GRINDERS, DREMELS, ARE USED FOR DETAIL WORK AND HARD TO REACH AREAS.**

**AT END OF DAY SHOP IS SWEEPED AND MACHINES ARE BLOWN DOWN DAILY.**

**NOTE: PARTS THAT ARE GOING TO BE CHROME PLATED ONLY NEED STAGES 1 TO 3 ONLY. PARTS THAT ARE POLISH ONLY NEED STAGES 2 AND 4 ONLY.**

**WHEEL MACHINE**



**LATHE MACHINE**





## **Strip tanks**

**1.ACID TANK = ( HYDRO CHLORIC ACID, H<sub>2</sub>O) To remove rust from steel parts.**

**2.RINSE = H<sub>2</sub>O**

**3.HOT TANK = ( CAUSTIC SODA BEADS, H<sub>2</sub>O ) heated to 160\* for removal of paint from steel parts.**

**4.RINSE = H<sub>2</sub>O**

**5. ELECTRO CLEANER = EN-PREP 160 SE(sodium metasilicate, sodium hydroxide, proprietary additives,) With reverse current to remove chrome from defective parts.**

**THESE TANKS ARE FOR STRIPPING PARTS ONLY.**

**NOTE: CANNOT STRIP PARTS IN THE PLATING LINE, BECAUSE YOU WILL CONTAMINATE THE TANKS.**

**NO REAL UP KEEP ON THESE TANKS, WHEN TANKS GET WEAK JUST ADD CHEMICALS ONCE OR TWICE A YEAR, ONCE A YEAR CLEAN TANK BOTTOMS.**



## **Chemicals used in each tank (1 to 16 )**

**Tank ( 1) pre-soak = bn cleaner( sodium metasilicate , sodium hydroxide), H2o**

**Tank (2) Rinse tank = H2o**

**Tank (3) Electro-cleaner = En-prep 160se ( sodium metasilicate, sodium hydroxide, proprietary additives.) Chrome reducer = ( contains no ingredients classified as hazardous , \* according to m.s.d.s. sheet. ) H2o**

**Tank (4) Rinse tank = H2o**

**Tank (5) Acid dip = sulfuric acid 66\* H2o**

**Tank (6) Rinse tank = H2o**

**Tank (7) Copper tank = ( copper cyanide), (sodium cyanide), ADDITIVES = cu flex 305 ( nothing considered hazardous by state or federal regulations, according to m.s.d.s. sheet, Cu flex 306 ( this product does not contain hazardous materials above de minus reporting levels as defined by the OSHA hazard communication standards (29 CFR 1910.1200) Cu flex 307 ( nitrilotriacetic acid ) cu flex 308 ( this product does not contain hazardous material above de minus reporting levels as defined by the OSHA Hazardous communication standards(29 CFR 1910.1200) Cu flex 309 (potassium hydroxide ) COPPER ANODES = (99.9% copper )**

**Tank (8) Rinse tank = H2o**

**Tank (9) Acid copper tank = (copper sulfate purified concentrate liquid, cupric sulfate, sulfuric acid, ) ADDITIVES = cu flex 331 ( contains nothing considered hazardous by state or federal. \*according to the m.s.d.s. sheet) cu flex 332 ( contains nothing considered hazardous by the state or federal.\*according to the m.s.d.s. sheet) cu flex 333 ( this product does not contain hazardous material above de minus reporting levels as defined by the OSHA hazardous communication standards( 29 CFR 1910.1200) COPPER ANODES = (99.9% copper)**

**Tank (10) Rinse tank = H2o**



Tank (11) **Nickel tank** = ( nickel sulfate, nickel chloride, nickel sulfate liquid, boric acid, sulfuric acid \*to adjust the p.h. when necessary , ) **NICKEL ANODES** (99.9% NICKEL) **ADDITIVES = INFINITY 2000 CARRIER** ( Sodium saccharin ) **INFINITY 2000 AIR WETTER** ( Hazards none according to the m.s.d.s. sheets.) **INFINITY 2000 BRIGHTENER** ( sodium saccharin) **INFINITY 2000 MU ADDITIVE** = ( sodium saccharin) **INFINITY 2000 LEVELER** = ( NO hazardous ingredients as defined by OSHA in 29CFR. According to the m.s.d.s. sheets. H2o

Note: these chemicals are used in the up keep of the nickel tank.

**NICKEL FILTER** = ( diatomaceous earth, filter aid flux calcined diatomaceous earth) THIS PRODUCT MAY CONTAIN 44% crystalline silica <40, cristobalite, quartz<4,) **CARBON** =( activated carbon, )

NICKEL PURIFICATION = HYDROGEN PEROXIDE = only used to purify nickel when extremely contaminated with organic, heavy metals.

Tank (12) **Dead rinse** = ( empty used to drain parts and spray rinse parts)

Note: at end of day dead rinse will be pumped into nickel tank to compensate for evaporation,( recycled )

Tank (13) **Rinse tank** = H2o

Tank (14) **CHROME TANK** = **Econo-chrome 300** ( chromic acid,) **Sulfuric acid,**( **Barium carbonate,**) **ANODES = LEAD** (lead antimony) **FUMETROL 140** = ( this product does not contain hazardous materials as defined by the OSHA hazard communication standard ( 29CFR 1910.1200)

Tank(15) **DEAD RINSE** = ( empty, parts are drained and spray rinsed)

Note: At end of day dead rinse will be pumped back into the chrome tank to compensate for evaporation,(Recycled)

Tank (16) **HOT RINSE** = ( H2o, heated to 120\* so that the parts dry faster when taken out ).



Please read and save these instructions. Read carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with instructions could result in personal injury and/or property damage! Retain instructions for future reference.

# Dayton® Tubeaxial Fans

## Description

Dayton tubeaxial fans are designed to operate in any position and utilizes precision balanced spark resistant aluminum fan blades. Fans can also be used in industrial ventilation systems handling temperatures up to a maximum of 200°F.

Motor, drive belts, and self-aligning sealed ball bearings are isolated from air stream so that contaminated air or vapors can be exhausted without damage to drive or motor. Use in atmospheres corrosive to aluminum is not recommended as damage to fan blade may result.

## Certified Rating for Air and Sound



Dayton Electric Mfg. Co. certifies that the tubeaxial fans shown herein are licensed to bear the AMCA Seal. The air performance shown is based on tests performed in accordance with AMCA Standard 210, "Laboratory Methods of Testing Fans for Rating" and rated in accordance with AMCA Publication 211, "Certified Rating Program - Air Performance."

The sound performance shown is based on tests performed in accordance with AMCA Standard 300, "Reverberant Room Method for Sound Testing of Fans." The sound power level ratings shown are in decibels referred to 10<sup>-12</sup> Watts. The

A-weighted sound levels shown are for Installation Type B: Free Inlet, Ducted Outlet. Sound levels shown do not include the effects of end reflection.

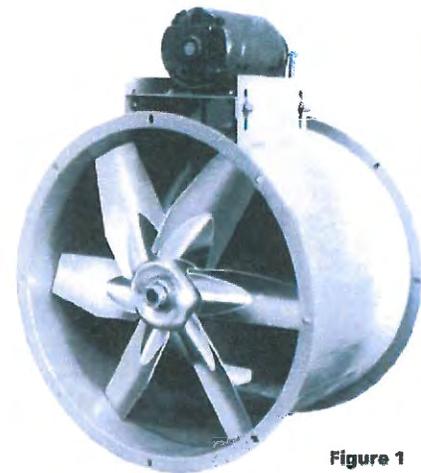


Figure 1

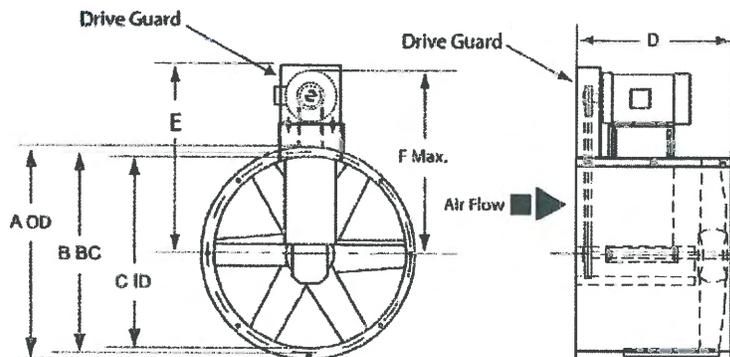


Figure 2

## Dimensions

Model	A	B	C	D	E	F	Shaft Diameter
3C411B	27"	25 <sup>3</sup> / <sub>16</sub> "	24 <sup>3</sup> / <sub>16</sub> "	18"	23 <sup>1</sup> / <sub>16</sub> "	24"	1"
3C412B	33 <sup>3</sup> / <sub>16</sub> "	32 <sup>1</sup> / <sub>2</sub> "	30 <sup>1</sup> / <sub>2</sub> "	24"	29 <sup>1</sup> / <sub>16</sub> "	29"	1 <sup>1</sup> / <sub>16</sub> "
3C413B	37 <sup>3</sup> / <sub>16</sub> "	36 <sup>1</sup> / <sub>2</sub> "	34 <sup>1</sup> / <sub>2</sub> "	29"	31 <sup>1</sup> / <sub>16</sub> "	31"	1 <sup>1</sup> / <sub>16</sub> "
3C414B	39 <sup>3</sup> / <sub>16</sub> "	38"	36 <sup>1</sup> / <sub>2</sub> "	29"	32 <sup>1</sup> / <sub>16</sub> "	32"	1 <sup>1</sup> / <sub>16</sub> "
3C415D	45 <sup>3</sup> / <sub>16</sub> "	44 <sup>1</sup> / <sub>2</sub> "	42 <sup>1</sup> / <sub>2</sub> "	32"	35 <sup>3</sup> / <sub>16</sub> "	37"	1 <sup>1</sup> / <sub>16</sub> "
3C416D	51 <sup>3</sup> / <sub>16</sub> "	50"	48 <sup>1</sup> / <sub>2</sub> "	36"	38 <sup>1</sup> / <sub>16</sub> "	42"	1 <sup>1</sup> / <sub>16</sub> "
4C659B	14 <sup>1</sup> / <sub>16</sub> "	13 <sup>1</sup> / <sub>2</sub> "	12 <sup>1</sup> / <sub>2</sub> "	12"	12 <sup>1</sup> / <sub>16</sub> "	17"	3/8"
4C660B	18 <sup>3</sup> / <sub>16</sub> "	17 <sup>1</sup> / <sub>2</sub> "	16 <sup>1</sup> / <sub>16</sub> "	16 <sup>1</sup> / <sub>2</sub> "	19 <sup>1</sup> / <sub>16</sub> "	19"	3/8"
4C661B	21 <sup>1</sup> / <sub>8</sub> "	19"	18 <sup>1</sup> / <sub>2</sub> "	16 <sup>1</sup> / <sub>2</sub> "	20 <sup>1</sup> / <sub>2</sub> "	20 <sup>1</sup> / <sub>2</sub> "	3/8"

## Unpacking

When unpacking, consider the following:

1. Double groove fan pulley with malleable split taper bushing is assembled on fan.
2. Motor, motor pulley, and belts packed separately when fan is ordered complete.
3. Remove jackscrews from plastic bag attached to motor mounting base for use in assembly. **NOTE:** Not using the jackscrews may shorten bearing life.

ENGLISH

ESPAÑOL



# Dayton® Tubeaxial Fans

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## Specifications

Model	Motor HP	Fan RPM	Drive Requirements †			Grooves
			Motor Sheave Belt Pitch Diameter	RMA* Belt	Fan Sheave Belt Pitch Diameter	
3C411B	1	1312	3.4-A	A48	4.5-A	2
	1½	1468	3.8-A	A48	4.5-A	2
	2	1688	4.4-A	A50	4.5-A	2
	3	1910	5.0-A	A53	4.5-A	2
3C412B	1½	1030	3.4-A	A55	5.8-A	2
	2	1146	3.8-A	A55	5.8-A	2
	3	1320	4.4-A	A60	5.8-A	2
	5	1551	5.2-A	A60	5.8-A	2
3C413B	2	936	3.4-A	A60	6.4-A	2
	3	1074	3.8-A	A64	6.4-A	2
	5	1251	4.6-A	A66	6.4-A	2
3C414B	2	837	3.8-A	A66	8.0-A	2
	3	964	4.4-A	A71	8.0-A	2
	5	1133	5.2-A	A71	8.0-A	2
3C415D	3	746	3.2-A	A71	7.6-A	2
	5	880	3.8-A	A75	7.6-A	2
	7½	1013	4.4-A	A75	7.6-A	2
	10	1147	5.0-A	A75	7.6-A	2
3C416D	5	731	4.4-A	A85	10.6-A	2
	7½	827	5.0-A	A90	10.6-A	2
	10	891	5.4-A	A90	10.6-A	2
4C659B	1/3	2090	2.3-A	3L280	2.0-A	2
	1/2	2253	2.6-A	3L290	2.0-A	2
	3/4	2877	3.2-A	3L300	2.0-A	2
4C660B	1/3	1570	1.5-A	A31	2.0-A	1
	1/2	1800	2.1-A	A31	2.0-A	1
	3/4	2221	2.6-A	A33	2.0-A	1
4C661B	1	2547	3.0-A	A33	2.0-A	1
	1/3	1375	2.1-A	A38	3.0-A	1
	1/2	1487	2.6-A	A38	3.0-A	1
	3/4	1719	3.0-A	A38	3.0-A	1
	1	1988	3.5-A	A38	3.0-A	1
	1½	2255	4.0-A	A38	3.0-A	1

(†) Drive requirements show minimum Motor HP required. Other drives may be used, provided they meet the Fan RPM stated above and have adequate load carrying capacity.

(\* ) Rubber Manufacturer's Association.

## General Safety Information

1. Follow all local electrical and safety codes, as well as the National Electrical Code (NEC) and the Occupational Safety and Health Act (OSHA) in the United States.
2. Motor must be securely and adequately grounded. This can be accomplished by wiring with a grounded, metal-clad raceway system by using a separate ground wire connected to the bare metal of the motor frame, or other suitable means.
3. Always disconnect power source before working on or near a motor or its connected load. If the power disconnect point is out-of-sight, lock it in the open position and tag to prevent unexpected application of power.
4. All moving parts should be guarded.
5. Be careful when touching the exterior of an operating motor - it may be hot enough to be painful or cause injury. With modern motors this condition is normal if rated at normal load and voltage - modern motors are built to operate at higher temperatures.
6. Make certain that the power source conforms to the requirements of your equipment.
7. Wiping or cleaning rags and other flammable waste materials must be placed in a tightly closed metal container and disposed of later in the proper fashion.
8. When cleaning electrical or electronic equipment, always use an approved cleaning agent such as dry cleaning solvent.

**⚠ CAUTION** *This fan has rotating parts. Exercise applicable safety precautions during its handling, assembly, operation and maintenance. Disconnect power before handling, assembling, operating or maintaining. If disconnect means is out of sight, lock it in the open position to prevent unexpected starts.*

**⚠ WARNING** *Install and operate the fan so that the air surrounding the fan at any time must be free of flammable gases, vapors or liquids, combustible dust or ignitable fibers or flyings.*

**⚠ WARNING** *If the fan is used to move air containing flammable gases, vapors or liquids, combustible dust or ignitable fibers or flyings, the fan must be energized before those hazardous substances are introduced into the airstream.*



# Models 3C411B thru 3C414B, 3C415D, 3C416D and 4C659B thru 4C661B

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**Performance**

Model	Blade Dia.	CFM and Sound Power LWA Decibels at Static Pressure Shown									
		Free Air	1/8" S.P.	1/4" S.P.	1/2" S.P.	3/4" S.P.	1" S.P.	1 1/4" S.P.	Fan RPM	Motor HP	Max. BHP*
4C659B	12"	1767	1667	1561	---	---	---	---	2090	1/3	0.24
		84	83	82	---	---	---	---			
		1904	1812	1719	1429	---	---	---	2253	1/2	0.31
		86	85	84	83	---	---	---			
		2432	2360	2287	2126	1905	---	---	2877	3/4	0.60
4C660B	16"	92	92	91	91	90	---	---			
		2119	2152	1820	779	---	---	---	1570	1/3	0.25
		84	84	86	86	---	---	---			
		2727	2530	2288	1335	711	---	---	1800	1/2	0.41
		86	86	87	87	87	---	---			
4C661B	18"	3365	3205	3045	2576	1685	1103	---	2221	3/4	0.69
		91	91	92	93	93	93	---			
		3859	3720	3580	3238	2744	1892	1355	2547	1	1.00
		95	95	96	96	97	97	97			
		3230	2976	2680	1254	---	---	---	1375	1/3	0.34
4C661B	18"	85	84	86	86	---	---	---			
		3494	3261	2997	2192	794	---	---	1487	1/2	0.48
		85	85	26	88	88	---	---			
		4039	3841	3624	3112	1850	923	---	1719	3/4	0.72
		87	87	87	93	91	91	---			
3C411B	24"	4671	4504	4321	3914	3421	2163	---	1988	1	0.91
		90	90	90	93	95	95	---			
		5298	5152	4994	4660	3803	3803	2705	2255	1 1/2	1.29
		94	93	93	95	98	98	98			
		7085	6742	5484	5484	3164	---	---	1312	1	0.98
3C411B	24"	89	88	92	92	92	---	---			
		7925	7626	6562	6562	5634	2914	---	1468	1 1/2	1.38
		92	90	93	93	95	95	---			
		9112	8856	7983	7983	7290	6445	---	1688	2	1.98
		96	96	97	97	98	98	---			
3C412B	30"	10310	10084	9845	9332	8769	8143	7398	1910	3	2.77
		99	98	98	98	98	98	98			
		10955	10415	9815	8395	---	---	---	1030	1 1/2	1.40
		90	89	89	92	---	---	---			
		12190	11710	11180	9990	8485	---	---	1146	2	1.90
3C413B	34"	93	94	94	94	96	---	---			
		14040	13630	13180	12220	11105	9740	---	1320	3	2.91
		97	96	96	96	98	99	---			
		16495	16150	15785	14995	14145	13190	12125	1551	5	4.72
		102	101	100	100	100	101	104			
3C413B	34"	14430	13760	13020	11285	7155	---	---	936	2	1.83
		94	92	92	95	96	---	---			
		16560	15985	15350	13965	12305	7750	---	1074	3	2.78
		100	100	99	99	101	103	---			
		19290	18800	18280	17150	15880	14445	12180	1251	5	4.36
102	103	101	101	101	103	104					

**⚠ WARNING** Do not operate the fan below the minimum flow shown in the performance table. It is mandatory to provide adequate makeup air for the fan.

(\*) BHP does not include drive losses.

**NOTE:** LWA Sound Power Levels are shown. Contact your representative or various engineering documents if other ratings such as 8 octave band dBA levels, dBA or sone levels, are required.





## Technical Information

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# FUMETROL® 140

## Fume And Spray Suppressant

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Fumetrol 140 Fume and Spray Suppressant is a permanently stable, highly effective (see Mist Reduction), fluorinated liquid wetting agent for all chromium plating baths. It provides an excellent balance, between a foam film and surface tension reduction, in order to eliminate misting and reduce drag-out. It has a dual action:

1. Fumetrol 140 suppressant produces a slight but highly efficient foam film at the anodes and cathodes which virtually eliminates fuming and spray losses by scrubbing the escaping gases.
2. Fumetrol 140 suppressant lowers the surface tension to 20 to 30 dynes/cm, substantially lowering drag-out losses as well as reducing the size of escaping bubbles.

Fumetrol 140 suppressant in chromium plating baths offers these significant advantages:

1. More pleasant and healthful working conditions in the plating room as a result of the elimination of irritating chromic acid fumes which may result from inadequate blower capacity.
2. A partial foam blanket allows evaporation and heat loss to occur.
3. Lower chromium replenishment costs resulting from reduced drag-out and spray-loss of plating solution.

**Important Notice Regarding This Information:**

The statements, technical information and recommendations contained in this document are based on tests that are believed to be reliable. However, this document is not contractual, and NOTHING IN IT CONSTITUTES A WARRANTY THAT THE GOODS DESCRIBED ARE FIT FOR A PARTICULAR PURPOSE OF CUSTOMER or that their use does not conflict with any existing patent rights. The exclusive source of any warranty and of any other customer rights whatsoever is the written acknowledgement of a customer's order.

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4. Less danger of contamination of adjacent plating solutions by chromic acid mist.
5. Increased life of ventilating and other plating room equipment.
6. Additions of Fumetrol 140 can be made by automatic pump controlled by an amp hour meter.

**Mist Reduction**

Pilot plant testing has demonstrated that Fumetrol 140 is highly efficient at reducing chromium mist. The airborne chromium measured 6 inches (15 cm) above the solution averaged 0.0027 mg/A-hr with a standard deviation of 0.0032 mg/A-hr. This represents an average reduction of greater than 99.9% compared to a control without Fumetrol 140. Field results may vary if different test methods and sampling locations are used.

**Make-Up**

Fumetrol 140 suppressant is available as a liquid, is packaged in 1 gallon containers and is sold in 1x4 gallon packages. A make-up of 2.5 gallons per 1000 gallons of plating solution of Fumetrol 140 suppressant compound is recommended to achieve effective fume suppression and surface tension reduction. This amount will produce an effective foam blanket at the anodes and cathodes and reduce the surface tension to the desired value of  $25 \pm 5$  dynes/cm.

**MAKE-UP TABLES  
0.25% By Volume**

**Gallons**

Solution Volume	200	400	600	800	1000
Fumetrol 140	0.5	1.0	1.5	2.0	2.5

**Liters**

Solution Volume	200	400	600	800	1000
Fumetrol 140	0.5	1.0	1.5	2.0	2.5

**Maintenance**

The effectiveness of Fumetrol 140 suppressant is continued by maintenance additions of this compound.



Control can be achieved by one of three methods. Surface tension measurement is the most accurate. Secondly, additions can be made based upon amp-hours. Third and least accurate is based upon visual examination of the foam blanket. Surface tension of the plating solution can be measured with the stalagmometer or tensiometer. Contact your Atotech Technical Service Engineer for further details.

Plant experience will determine the proper amount of Fumetrol 140 suppressant required to maintain an operating solution since it is dependent upon the amount of work processed. However, the following table gives general control guidelines:

Control Method	Per	Addition Rate		Comments
		l	fl.oz.	
Surface tension	1,000 gallons per 1 dyne/cm	0.12-0.24	4-8	Target 20-30 dyne/cm
Amp-hours	10,000 Amp hours	0.05-0.1	1.6-3.3	--
Visual-Foam	1,000 gallons	0.5	16	Foam should be at the anode and cathode during plating

**Use of Fumetrol 140 Suppressant**

1. Fumetrol 140 suppressant greatly reduces drag-out of plating solution which may require an adjustment in schedules for addition of bath replenishment materials.
2. Heating and cooling requirements of the tank may require minor adjustments. The partial foam blanket will slightly reduce heat loss because the area immediately around the cathodes and anodes will have foam blanket.
3. Daily maintenance additions of Fumetrol 140 should be made to obtain optimum product performance. Daily adds reduce the amount of Fumetrol 140 required to maintain the bath, because the proper concentration is maintained.
4. Fumetrol 140 can be used for hard chromium deposits. Under some circumstances, on thicker deposits, surface active agents may accentuate pitting caused by base metal defects.
5. Fumetrol 140 may not be readily compatible with other fume suppressants. Contact an Atotech Technical Service Engineer for further details.



## **WASTE DISPOSAL**

Disposal of waste material from the use of this product may be subject to federal, state, and local regulations. Regional requirements may necessitate your operation to obtain certain permits prior to initiating waste treatment activities. Consult your state and local governments for additional regulatory requirements which might be applicable.

## **SAFETY AND INDUSTRIAL HYGIENE**

Care should be taken to avoid contact with this material. Operators with open skin from cuts or abrasions should take additional measures to protect the wound from contamination. Care should be taken to avoid breathing mist or vapors from the use of this product. Operators should be outfitted with protective clothing, eye protection, and respiratory protection, as appropriate. Use this product only in well ventilated areas. A safety shower and emergency eye wash should be readily available.

## **IMMEDIATE FIRST AID**

In case of eye contact, flush eyes with water for AT LEAST 15 minutes. Skin contact requires removing contaminated clothing and thoroughly washing exposed areas with soap and water. If inhaled, move exposed individual to fresh air. If swallowed, provide supportive care while seeking medical attention. A physician or occupational nurse should be contacted following any type exposure.

Please refer to this product's Material Safety Data Sheet for additional information and guidance.

**NOTE:** A "Material Safety Data Sheet" (MSDS) for this product is available on request from Atotech USA, Inc., Customer Service/Sales Support Group, Two Riverview Drive, P.O. Box 6768, Somerset, New Jersey 08875-6768.





# South Coast Air Quality Management District

21865 E. Copley Drive, Diamond Bar, CA 91765-4182  
(909) 396-2000 • <http://www.aqmd.gov>

March 28, 1996

Dear Sir/Madam:

This letter is to inform and update you on the changes impacting chrome plating operations that have occurred since our last communication. The updates are on the following:

1. South Coast Air Quality Management District's (AQMD) approval of another anti-mist additive for Rule 1169;
2. Change of permit conditions;
3. Fact Sheet on permitting requirements at a chrome plating facility and clarification of permitting requirements for waste water treatment operations;
4. Status of equivalency package submitted to EPA by the California Air Resources Board to obtain equivalency between local and federal regulations for chrome plating operations; and,
5. On-going requirements of federal chrome NESHAP.

### Approval of Fumetrol 140

The AQMD has certified another anti-mist additive, Fumetrol 140, to meet the requirements of Rule 1169 (b)(1)(A) (i) and (b)(2)(A)(i). An updated list of approved mist suppressant and list of conditions for its use to comply with Rule 1169 is attached.

### Change of permit conditions

If you were required by permit condition to use only Harshaw MSP-ST, which is no longer being manufactured and available commercially, you may switch over to Fumetrol 140 without a permit modification. Instead, please attach this letter and the attached certification of Fumetrol 140 with your current permit.

However, if you wish to use Fumetrol 140 or any another product instead of the mist suppressant listed in your permit (other than Harshaw MSP-ST), to meet the surface tension limit of 45 dynes/cm, you will have to submit an application for a change of permit condition.

### Fact sheet on permit requirements

The attached fact sheet lists the type of equipment that needs a permit prior to construction or operation. Waste water treatment systems as described in the fact sheet will no longer require a permit. If this type of equipment was previously permitted and does not contain an evaporator in the system, you may cancel the permit. To cancel your permit, please mark "Cancel" and draw a line through the specific permit description line on your next invoice or call your customer service representative at the AQMD.

**Status report on equivalency approach and streamlining, recordkeeping and monitoring requirements**

The California Air Resources Board (CARB) had submitted a package to the U.S. EPA to seek equivalency between the federal and state regulation for chrome plating and anodizing operations. In addition, the submittal sought to streamline monitoring and recordkeeping requirements of the federal regulation. Since AQMD's Rule 1169 is similar to the state's ATCM, we have been participating with these efforts. In the equivalency submittal, CARB seeks for:

- hard chrome plating operations - equivalency between the mg/dscm standard (requires source testing) in the federal NESHAP and the mg/amp-hour standard in the ATCM;
- decorative and anodizing operations - changing the standards in the state's ATCM to conform to the NESHAP standards; and,
- monitoring, recordkeeping and reporting requirements - less burdensome frequency and level of activity.

The package is being reviewed by EPA Region 9 office in San Francisco. A decision is expected this year.

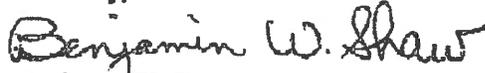
**Federal NESHAP**

On January 10, 1996 we held an informational meeting on the requirements of the NESHAP for decorative chrome operations. We invited all permitted decorative chrome platers in the AQMD for this meeting. During the meeting we provided information on the requirements of the NESHAP, demonstrated how to measure surface tension and provided notification forms that had to be submitted to AQMD. If you were unable to attend this meeting and you are not familiar with the federal requirements for chrome plating operations, please contact either Mohan Balagopalan at (909)396-2704 or Ali Ghasemi at (909)396-2451 to arrange a meeting to discuss the federal regulation.

By this date, you should have submitted an Initial Notification report to us indicating how you plan to comply with this new regulation. If you have not submitted this report, please call immediately one of the people listed above. Failure to supply this report is a violation of federal and state law.

We will continue you informed on any further activities. If you have any questions regarding any of the items discussed, please contact Mohan Balagopalan at (909) 396-2704.

Sincerely,



Benjamin W. Shaw

Senior Manager

Stationary Source Compliance

BWS:EMM:MB:clb

A1-96:Fugate

Attachment

**PERMIT CONDITIONS FOR TANKS USING FUMETROL 140 TO  
COMPLY WITH AQMD'S RULE 1169**

1. A SUFFICIENT AMOUNT OF FUMETROL 140 SHALL BE MAINTAINED IN THE TANK TO PRODUCE A SURFACE TENSION THAT DOES NOT EXCEED 45 DYNES PER CENTIMETER.
2. THE SURFACE TENSION SHALL BE MEASURED WITH EITHER A STALAGMOMETER OR A TENSIONMETER AND THE CALCULATIONS USED TO DETERMINE THE SURFACE TENSION MAINTAINED ON-SITE AS WELL AS THE DATE OF CALIBRATION OF THE TENSIONMETER.
3. TO DEMONSTRATE COMPLIANCE WITH AQMD'S RULE 1169, THE SURFACE TENSION MEASUREMENTS SHALL BE TAKEN ONCE EVERY 40 HOURS OF TANK OPERATION AND RECORDED.
4. TO DEMONSTRATE COMPLIANCE WITH THE FEDERAL NESHAP REQUIREMENTS FOR DECORATIVE CHROME PLATING OPERATIONS, THE SURFACE TENSION MEASUREMENTS SHALL BE MEASURED AS PER THE FOLLOWING SCHEDULE:
  - FOR THE FIRST 40 HOURS OF TANK OPERATION, MEASURE AND RECORD THE SURFACE TENSION ONCE EVERY 4 HOURS; IF THERE ARE NO EXCEEDANCES OF THE SURFACE TENSION
  - FOR THE NEXT 40 HOURS, MEASURE AND RECORD THE SURFACE TENSION ONCE EVERY 8 HOURS OF TANK OPERATION; AND IF THERE ARE NO EXCEEDANCES OF THE SURFACE TENSION
  - MEASURE ONCE EVERY 40 HOURS OF TANK OPERATION AND CONTINUE THEREAFTER WITH THIS SCHEDULE.

ONCE AN EXCEEDANCE OF THE STANDARD OCCURS, THE ORIGINAL MONITORING SCHEDULE MUST BE RESUMED.

5. THE OPERATOR SHALL MAINTAIN A LOG OF THE FOLLOWING:
  - THE TIME, DATE AND YEAR, SURFACE TENSION MEASUREMENTS ARE MADE;
  - THE AMPERE-HOUR READING OF THE TANK AT THE TIME OF THE SURFACE TENSION MEASUREMENTS WERE MADE;
  - THE DATE AND TIME OF ANY ADDITIONS OF SURFACE TENSION ADDITIVE TO THE BATH SOLUTION AND THE AMPERE HOUR READING OF THE TANK AT THE TIME OF ADDITION.



# South Coast Air Quality Management District

21865 E. Copley Drive, Diamond Bar, CA 91765-4182 (909) 396-2000

## APPROVED ANTI-MIST ADDITIVES

The following anti-mist additives can be allowed as a control technique meeting the requirements of Rule 1169(b)(1) or (b)(2):

1. **Fumetrol 101:** if used in conjunction with polyballs, should be acceptable as meeting 95.0% Cr<sup>+6</sup> emission control on hard chrome plating tanks.
2. **Fumetrol 140:** should be acceptable as meeting 99.0% Cr<sup>+6</sup> emission control on decorative and hard chrome plating tanks and anodizing tanks.
3. **Foam-Lok L:** if used in conjunction with polyballs, should be acceptable as meeting 95.0% Cr<sup>+6</sup> emission control on hard chrome plating tanks.
4. **Harshaw MSP-ST:** should be acceptable as meeting 95.0% Cr<sup>+6</sup> emission control on anodizing tanks.
5. **Dis-Mist NP:** should be acceptable as meeting 99.0% Cr<sup>+6</sup> emission control on decorative chrome plating tanks.
6. **Zero-Mist Liquid:** should be acceptable as meeting 99.0% Cr<sup>+6</sup> emission control on decorative chrome plating tanks.

### Summary of Anti-Mist Additives

<b>Fumetrol 101</b>	<b>Hard</b>	<b>95.0%</b>
<b>Fumetrol 140</b>	<b>Decorative/Hard/Anodizing</b>	<b>99.0%</b>
<b>Foam-Lok L</b>	<b>Hard</b>	<b>95.0%</b>
<b>Harshaw MSP-ST</b>	<b>Anodizing</b>	<b>95.0%</b>
<b>Dis-Mist NP</b>	<b>Decorative</b>	<b>99.0%</b>
<b>Zero-Mist Liquid</b>	<b>Decorative</b>	<b>99.0%</b>

The above control efficiencies should only be accepted if the attached conditions are met.



## Permits Required At A Chrome Plating/Anodizing Facility

### **Hard chrome plating:**

*A permit is required for each tank.*

### **Decorative plating :**

*A permit is required for the each chrome plating line, which may include rinse tanks, nickel, and copper tanks.*

### **Trivalent chrome plating:**

*A permit is required for each plating line or individual tanks if it not part of a line.*

### **Chrome anodizing operations:**

*A permit is required for each anodizing line.*

### **Chrome stripping tank**

*A permit is required for each tank.*

### **Control System**

*Each air pollution control system that vents the plating tank(s) or line(s) needs a permit. Control system includes but is not limited to scrubbers, mist control units, mist control with HEPA.*

### **Waste Water Treatment:**

*Waste water treatment system that includes tanks and equipment for reducing hexavalent chromium by pH adjustment, precipitation, gravity separation and/or filtration does not require a permit. If a waste water treatment system consists of an open tank(s) that is used as an evaporator, a permit is needed for the system.*

### **Evaporators:**

*A permit is required for waste water evaporators. The only exception is for evaporators that do not have any air emissions (closed loop system).*

### **Sludge dryers and associated control system**

*A permit is required for a sludge dryer. Any control device venting the sludge dryer also needs a separate permit. The exception for a single permit may be for systems that have an integral control, such as a venturi scrubber that cannot be operated independently.*

### **Degreaser**

*A permit is not required if the:*

- *Open surface area is 10.8 square feet or less and with an internal volume of 92.5 gallons or less, having an organic solvent loss of 3 gallons per day or less; or,*
- *Initial boiling point of the solvent is 302 degrees F or greater; or,*
- *VOC of the cleaning solvent is 2 percent (20 grams/liter) or less by volume.*



# South Coast Air Quality Management District

21865 E. Copley Drive, Diamond Bar, CA 91765-4182 (909) 396-2000

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## SOURCE TEST REPORT

95-0027

### EFFICIENCY TESTING OF FUMETROL 140 FOR CONTROLLING CHROMIUM EMISSIONS FROM A DECORATIVE PLATING TANK

TESTED: 9/19 through 10/17, 1995

ISSUED: FEB 02 1996

REPORTED BY: Rob Castro  
Air Quality Engineer II

#### REVIEWED BY:

  
\_\_\_\_\_  
Mike Garibay  
Air Quality Engineer II

  
\_\_\_\_\_  
Arun Roy Chowdhury  
Supervising Air Quality Engineer



**South Coast  
Air Quality Management District**

21885 E. Copley Drive, Diamond Bar, CA 91765-4182 (909) 396-2000

Test No. 95-0027

-2-

Date 9/19-10/17/95

**EXECUTIVE SUMMARY**

- a. Firm..... Prime Wheel Corporation
- 23920 S. Vermont Ave.
- b. Test Location ..... Harbor City, CA 90710
- c. Unit Tested..... Decorative Chrome Plating Tank
- d. Test Requested by..... Ben Shaw, Senior Enforcement Manager
- f. Date of Test ..... September 19 through October 17, 1995
- g. Source Test Performed by ..... E. Guy, D. Hollinshead, C. Willoughby
- Paul Kuslitz, Atotech  
(818) 305-3014  
Tom Beckwith, Prime Wheel
- h. Test Arrangements Made Through..... (310) 326-5560
- King Waldron, Atotech  
(818) 305-3014  
Dean High, Pacific Envr. Services
- i. Source Test Observed by..... (818) 856-1400



**South Coast  
Air Quality Management District**

21665 E. Garvey Drive, Diamond Bar, CA 91765-4162 (909) 396-3000

Test No. 95-0027

-3-

Date 9/19-10/17/95

**RESULTS**

**Table 1. Summary of Chrome Removal Efficiency.**

	Hex Cr Eff (%)	Total Cr Eff (%)
Run 1 and Run 3	99.93	99.93
Run 1 and Run 4	99.96	99.94
Run 2 and Run 5	99.87	99.82
Run 2 and Run 6	99.59	99.57

99.8152

**Table 2. Summary of Load Conditions and Emission Rate Results.**

Test Runs	Average Amperage (A)	Operating Condition	Hex. Cr. (mg/Ampere-hour)	Total Cr. (mg/Ampere-hour)
Run 1	990	Baseline for low load	25.2492	29.7369
Run 2	3260	Baseline for high load	6.9031	8.8223
Run 3	1292	Controlled	0.0186	0.0217
Run 4	1878	Controlled	0.0091	0.0164
Run 5	2370	Controlled	0.0091	0.0155
Run 6	2264	Controlled	0.0285	0.0378

**Table 3. Test Conditions And Results From Each Run.**

Summary	Run 1	Run 2	Run 3	Run 4	Run 5	Run 6
Date	9/19/95	9/21/95	10/12/95	10/12/95	10/17/95	10/17/95
Time	1308-1548	1200-1411	1141-1358	1457-1637	1202-1419	1510-1620
Sampling Time (hr)	2.4	2	2	1.6	2	1
Plating Time (hr)	2.53	2.02	1.32	0.82	0.74	0.56
Operating Time (hr)	2.67	2.18	2.28	1.73	2.28	1.17
Ampere-hr	2508.31	6375.22	1701.00	1534.00	1759.83	1259.00
Ave Plating Ampere	990.12	3260.44	1291.90	1878.36	2370.14	2263.71
Ave Operating Ampere	940.62	3011.55	746.03	886.71	771.86	1076.07
<b>A. West Stack</b>						
Hex. Cr. (lb/hr)	0.02557706	0.02095306	0.00000873	0.00001377	0.0000109	0.00003748
Hex. Cr. (mg/Ah)	12.35	3.16	0.01	0.01	0.01	0.02
Total Cr. (lb/hr)	0.02961554	0.03095805	0.00001383	0.00001951	0.00002180	0.00005942
Total Cr. (mg/hr)	13445.46	14054.93	6.27	8.86	9.90	26.98
Total Cr. (mg/Ah)	14.29	4.67	0.01	0.01	0.01	0.03
Isokinetic (%)	94.64	105.93	113.38	94.9	89.31	96.78
<b>B. East Stack</b>						
Hex. Cr. (lb/hr)	0.0267353	0.02483762	0.0000070	0.00000642	0.00000228	0.00000602
Hex. Cr. (mg/Ah)	12.904	3.744	0.0043	0.0033	0.0013	0.0023
Total Cr. (lb/hr)	0.03199470	0.02756489	0.00002184	0.00001247	0.00000456	0.00003008
Total Cr. (mg/hr)	14325.59	12514.46	9.92	5.66	2.07	13.66
Total Cr. (mg/Ah)	15.44	4.16	0.0133	0.0064	0.0027	0.0127
Isokinetic (%)	112.71	93.34	109.79	100.81	100.59	102.04



**South Coast  
Air Quality Management District**

21883 E. Copley Drive, Diamond Bar, CA 91769-4182 (909) 296-2000

Test No. 95-0027

-4-

Date 9/19-10/17/95

## **INTRODUCTION**

On September 19 through October 17, 1995, source test engineers from the South Coast Air Quality Management District (SCAQMD) conducted a source test on the decorative chrome plating tank at Prime Wheel Corporation. The purpose of the test was to determine the efficiency of Atotech's Fumetrol 140 in controlling hexavalent and total chromium emissions from a decorative chrome plating tank. Atotech requested the District to approve Fumetrol 140 as being 99% effective in controlling hexavalent chromium emissions from hard chrome plating tanks, decorative chrome plating tanks, and chromic acid anodizing. The test results, however, are limited to the conditions of the Prime Wheel's decorative chrome plating tank during the test.

## **PROCESS DESCRIPTION**

Fumetrol 140 is a mist suppressant which inhibits the chromium emissions from a plating tank by reducing the surface tension. According to Atotech, the mist suppressant is expected to have an efficiency of over 99% in controlling chromium emissions.

Prime Wheel, the host facility, fabricates wheels for the automotive industry. The wheels are cast, pre-treated with nickel plate, and finally decorative chrome plated at the site. The chrome plating tank incorporates two slots at its sides where the mist is captured by a forced draft. A smoke test was conducted by an Atotech representative. 100% capture efficiency was observed by the SCAQMD staff. A dedicated inlet duct is connected to each of the slots. Two inlet ducts are manifolded along with other inlet ducts venting a number of nickel plating tanks. All the exhaust gases are vented to a scrubber. Sampling was taken at these inlet ducts before the scrubber. Figure 1 shows a schematic of this operation.

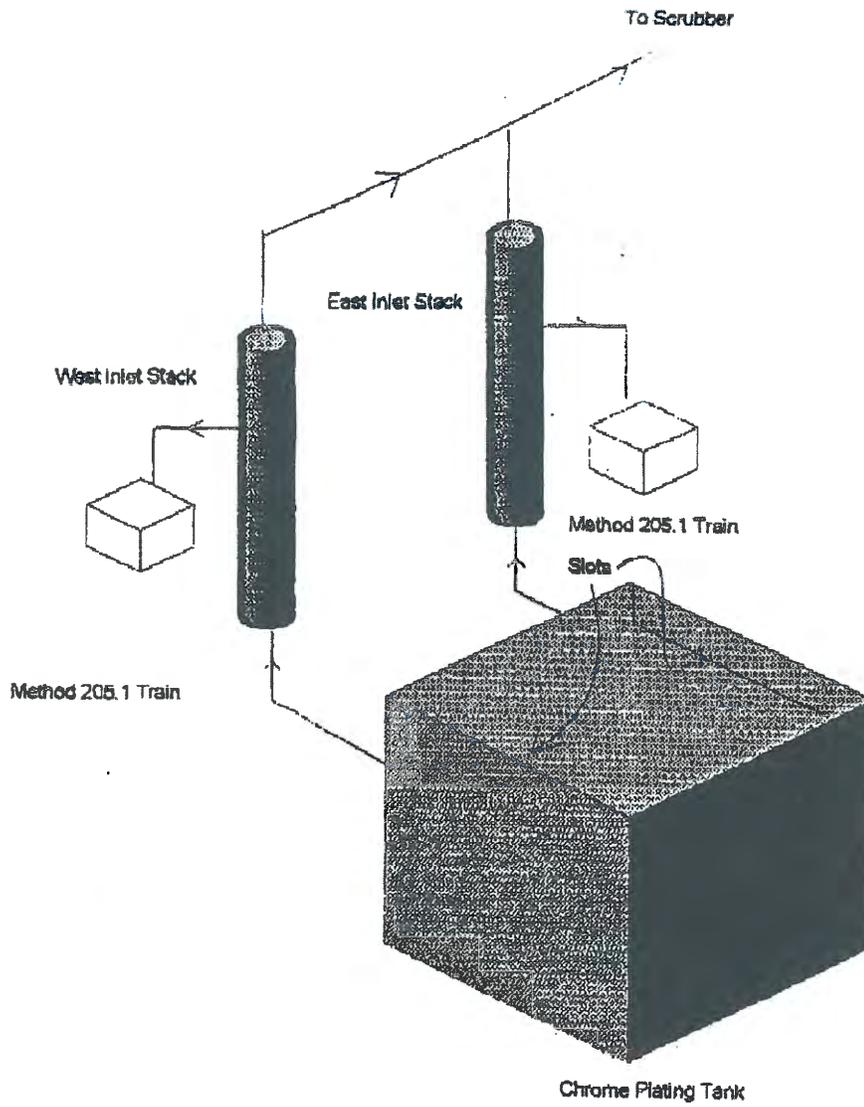


Figure 1. Schematic Diagram of the Chrome Plating Tank In Operation.



**South Coast  
Air Quality Management District**

21863 E. Conley Drive, Diamond Bar, CA 91765-4182 (909) 296-2000

Test No. 95-0027

-14-

Date 9/19-10/17/95

Calculated by RGC

Checked by: MG

**SAMPLE CALCULATIONS ( Run 1-Train 2 at the East Inlet Stack)**

**I. Determination of Inlet Flow Rate (dscfm)**

**a. Inlet Traverse Velocity (fps)**

$$\text{Inlet Traverse Velocity (fps)} = 2.9 \times [Vs \times (Ts - 460)]^{0.5}$$

where  $Vs$  = Average inlet velocity head (in H2O) and  $Ts$  = Average inlet duct temperature (deg. F)

**Table 14. Velocity Head for the East Inlet (see page 15).**

Traverse Pt.	Vel. Hd. " H2O	Temp. deg. F	Calc. Vel. fps	Orifice " H2O	Meter In deg. F	Meter Out deg. F
1	0.1300	81	24.32	2.76	72.00	71.00
2	0.1300	80	24.30	2.77	74.00	72.00
3	0.1300	81	24.32	2.76	79.00	72.00
4	0.1300	80	24.30	2.77	84.00	74.00
5	0.1200	81	23.37	2.55	87.00	76.00
6	0.1300	81	24.32	2.76	89.00	78.00
7	0.1600	81	26.99	3.40	91.00	80.00
8	0.1500	81	26.12	3.19	93.00	81.00
9	0.1500	81	26.12	3.19	94.00	83.00
10	0.1500	81	26.12	3.19	96.00	84.00
11	0.3800	81	41.58	8.08	97.00	85.00
12	0.3100	81	37.56	6.59	97.00	86.00
13	0.0600	80	16.51	1.28	87.00	86.00
14	0.0400	81	19.08	1.70	91.00	86.00
15	0.0800	81	19.08	1.70	94.00	86.00
16	0.0300	81	11.68	0.64	96.00	87.00
17	0.0800	81	19.08	1.70	97.00	88.00
18	0.0700	81	17.85	1.49	98.00	89.00
19	0.0800	81	19.08	1.70	99.00	89.00
20	0.0600	81	16.52	1.28	100.00	90.00
21	0.0700	81	17.85	1.49	100.00	91.00
22	0.0600	81	16.52	1.28	100.00	91.00
23	0.1000	80	21.31	2.13	100.00	91.00
24	0.2400	80	33.01	5.11	98.00	91.00
Total	3.0800	1939	556.98	65.51	2213.00	2007.00
Avc.	0.1283	80.79	23.21	2.73	92.21	83.63



**South Coast  
Air Quality Management District**

21885 E. Ceddy Drive, Diamond Bar, CA 91765-4182 (909) 396-2000

Test No. 95-0027

-13-

Date 9/19-10/17/85

**Table 11. Comparison of Isokinetics with the Total Chrome Emission Rate.**

	West Isokinetic	Emiss @ West Stack (lb/hr)	East Isokinetic	Emiss @ East Stack (lb/hr)
Run 1.	94.64	0.02962	112.71	0.03199
Run 2	105.93	0.03096	93.34	0.02756
Run 3	113.38	0.00001	109.79	0.00002
Run 4	94.90	0.00002	100.81	0.00001
Run 5	89.31	0.00001	100.59	0.00000
Run 6	96.78	0.00006	102.04	0.00003

With the exception of Run 3, the overall average isokinetic for all the runs were within acceptable range. Tables 12 and 13 show the relative bias in emission rate and efficiency due to the isokinetic.

**Table 12. Emission Bias for each Test Run.**

	West Isokinetic	East Isokinetic	Ave Isokinetic	Emission Bias
Run 1	94.64	105.93	100.29	None
Run 2	105.93	93.34	99.64	None
Run 3	113.38	109.79	111.59	Possibly Low
Run 4	94.90	100.81	97.86	None
Run 5	89.31	100.59	94.71	None
Run 6	96.78	103.94	101.36	None

**Table 13. Efficiency Bias for the Test Run.**

	Max Cr Eff (%)	Total Cr Eff (%)	Eff Bias
Run 1 - Run 3	99.89	99.89	Possibly High
Run 1 - Run 4	99.95	99.91	None
Run 2 - Run 5	99.87	99.82	None
Run 2 - Run 6	99.64	99.63	None



South Coast  
Air Quality Management District

21868 E. Coploy Drive, Diamond Bar, CA 91765-4182 (909) 386-2000

Test No. 93-0027

-12-

Date 9/19-10/17/95

According to the company who installed the ammeter and the totalizer, the ammeter is biased high. Hence, with the exception of the baseline testing, the totalizer readings were used in the calculation. The totalizer readings in the baseline testing were not used because they were not calibrated until the controlled test dates. Hence, a correction factor was developed to correct the ammeter readings in the baseline testing. Run 5 from the controlled testing was chosen in establishing the correction factor because of the cautious attentiveness to ammeter readings and elapsed times for this run. The correction factor is as follows:

$$\text{Correction factor} = \text{Totalizer reading in Run 5} / \text{Ammeter in Run 5}$$

$$\text{Correction factor} = 1759/2898.58$$

$$\text{Correction factor} = 0.60685$$

The ammeter readings in Runs 1 and 2 are multiplied by this correction factor to get a corrected ampere reading.

The isokinetic sampling rate for Run 1 on the east stack and Runs 3 and 5 on the west stack came out slightly off than what is acceptable. Table 11 shows the comparison of the isokinetics with its respective total chrome emissions in pounds per hour. Since the emissions are so small and appears to be within the order of magnitude, the deviation of these isokinetic rates should be insignificant.

## TEST CRITIQUE

Testing was conducted on an announced basis during normal working hours. No major problems were encountered during the test.

There was no air agitation during plating. According to Primewheel, initial air agitation is applied once and before the entire plating operation. In approving the Fumetrol 140 for reducing the hexavalent chromium emissions from chrome plating, the lack of air agitation and other operating conditions during the test should be taken into account.

At the request of Paul Kuslitz of Atotech, the dummy parts were used less frequently in the controlled test runs. This resulted in more down-time during the controlled runs. To compensate for this effect and conduct an equitable evaluation, each sampling run was normalized with respect to ampere-hours. Hence the differences in operation will have no effect on the evaluation of Fumetrol 140.

Surface tension was not taken during the test. A sample of the bath solution was taken by an Atotech representative to determine the surface tension at their laboratories. The results of this determination have not been disclosed to the District as of this writing. The evaluation of the effectiveness of Fumetrol 140 should consider the resulting surface tension since it is critical to control performance.

A HEPA filter on each of the inlet ducts was installed after the baseline testing. The velocity during the controlled emissions testing was slightly lower than the velocity during the baseline testing. A smoke test was conducted and showed 100% capture. Hence, the difference in the velocity readings will have no bearing in the final results.



**South Coast  
Air Quality Management District**

21550 E. Conny Drive, Diamond Bar, CA 91765-4182 (909) 386-2000

Test No. 95-0027

-10-

Date 9/18-10/17/95

## **SAMPLING AND ANALYTICAL PROCEDURES**

### ***GAS FLOW RATE***

The sampling was conducted isokinetically and simultaneously at the two collection ducts using District Method 205.1. The gas velocity in the ducts was measured simultaneously with the chromium sampling (traverse sampling). This was done using an S type Pitot tube with a differential pressure manometer, and a type "K" thermocouple with a potentiometer. The standardized volumetric flow rate was calculated using the duct's cross section area and average gas velocity, temperature, pressure, density, and moisture content.

### ***HEXAVALENT CHROMIUM SAMPLING***

Samples for total and hexavalent chromium were collected from the collection ducts isokinetically using SCAQMD Method 205.1. Each of the all glass sampling trains consisted of a one-piece glass probe and nozzle directly connected to the first of two impingers each filled with 100 ml of 0.02N sodium bicarbonate solution, an empty bubbler, a Teflon/fiberglass filter, and a bubbler filled with tared silica gel. The system was connected to a leak free vacuum pump, a dry gas meter, and a calibrated orifice.

The samples were collected simultaneously for different sampling periods including down time. Each sample was collected using an twenty four-point traverse across each duct.

The samples were recovered and analyzed by the SCAQMD laboratory and West Coast Analytical Services for hexavalent chromium content by ion chromatography. Total chromium was analyzed in the SCAQMD laboratory by subsequent acid digestion and flame atomic absorption spectrophotometry (controlled samples) and by UV visible spectrophotometry (uncontrolled samples). A field blank sample train was analyzed in a manner consistent with the above analysis for quality control purposes.

**Management District**

San Diego, CA 91705-1182 (609) 396-2000

**Amperages During Run #1.**

Time	Minutes	Amperes	Amp-hr
1308-1314	6	1000	100.00
1314-1317	3	7000	350.00
1348-1317	31	1000	316.67
1352-1348	4	7000	466.67
1353-1436	43	1000	716.67
1437-1440	3	7000	330.00
1441-1513	32	1000	533.33
1514-1517	3	7000	350.00
1534-1519	15	1000	250.00
1538-1535	3	7000	350.00
1548-1539	9	1000	150.00
Amp-hr by Ammeter	152		4133.33
Amp-hr Corrected			2508.31
Amp-hr by Totalizer			41426.00
Avg. Plating Amp			990.12
Avg. Amp	160		940.62

**Table 6. Amperages During Run #2.**

Time	Minutes	Amperes	Amp-hr
1200-1210	10	4800	800.00
1211-1214	3	2500	125.00
1215-1219	4	5000	333.33
1219-1222	3	2500	125.00
1222-1224	2	5000	166.67
1225-1228	3	2500	125.00
1228-1234	6	5000	500.00
1234-1237	3	2500	125.00
1237-1333	56	6000	3600.00
1333-1336	3	2500	125.00
1340-1346	6	6600	660.00
1348-1351	3	3000	150.00
1351-1407	16	6000	1600.00
1418-1411	3	8000	400.00
Amp-hr by Ammeter	121		10835.00
Amp-hr Corrected			6579.22
Amp-hr by Totalizer			33153.00
Avg. Plating Amp			3280.44
Avg. Amp	131		3011.55



**South Coast  
Air Quality Management District**

21000 E. Gopley Drive, Diamond Bar, Ca 91765-4182 (909) 398-2000

Test No. 95-0027

-6-

Date 9/19-10/17/85

On September 19 and 21, the plating tank was tested with no Fumetrol 140 in the decorative chrome plating tank to establish an emission baseline. Since the process operates intermittently, dummy parts were plated during lapses in operation. The emission sample from Run 1, which was conducted on September 19, was taken with the wheels and dummy parts plated at an average current load of 990 ampere. This was considered as low load by the facility. The emission sample from Run 2, which was conducted on September 21, was taken with an average load of 3260 ampere. This was considered high load.

Test Runs 3 through 6 consisted of controlled emissions testing. The controlled emission tests were conducted on the consequent dates, October 12 through 17. Adequate amount of Fumetrol 140 was applied in the chrome bath solution as determined by Atotech. At the request of Atotech, the dummy parts were used to a lesser extent during the controlled tests. Tables 2 through 10 list the conditions of all the test runs.

**Table 4. Operating Parameters.**

	Bath Temperature (deg F)	Chromic Acid Concentration (oz/gal of Sodium Dichromate Dihydrate)	Sulfuric Acid Concentration (oz/gal)	Surface Tension (Dynes/Cm)
Run 1	80 - 92	32.0	9.9	*
Run 2	80 - 95	32.0	9.9	*
Run 3	82 - 90	32.4	10.0	*
Run 4	90 - 96	31.9	9.9	*
Run 5	75 - 85	30.8	9.6	*
Run 6	85 - 90	30.9	9.5	*

\* Samples of the bath solution were taken by Atotech to their laboratory to determine the surface tension during the test runs. The results of their measurements are not made available as of this report's issue.



|

## USE OF STALAGMOMETER

The stalagmometer must be properly cleaned before being used the first time and after a period of storage. **CAUTION:** Since Nitric Acid fumes are evolved during the cleaning process, the procedure should be done in a fume hood using proper personal protection.

Properly clean the stalagmometer using the following procedure:

1. Set up stalagmometer in stand in a fume hood.
2. Place a clean 150 ml beaker underneath the stalagmometer then fill with reagent grade concentrated nitric acid. Immerse bottom tip (approx. 1/2") of stalagmometer into the beaker.
3. Squeeze rubber bulb and pinch at the arrow up (↑) position to collapse. Place bulb end securely on top end of stalagmometer. Carefully draw the nitric acid by pinching the arrow up (↑) position until the level is above the top etched line. (See figure 1)
4. Allow nitric acid to remain in stalagmometer for 5 minutes and then carefully remove the bulb allowing the acid to completely drain.

**NOTE:** The nitric acid can be stored in a tightly stoppered amber glass bottle and be reused several times.

5. Fill a clean 150 ml beaker with distilled or deionized water. Using the rubber bulb per the instructions in Step #3, rinse and drain stalagmometer with deionized or distilled water until the inside is "water break" free.
6. Fill a clean 150 ml beaker with alcohol. Again using the rubber bulb per Step #3, rinse and drain the stalagmometer twice with alcohol and allow the stalagmometer to dry completely.
7. Take a sample of the solution to be tested and adjust the solution to room temperature. Measure the specific gravity and record the reading.
8. Fill a clean 150 ml beaker with solution to be tested. Immerse bottom end of stalagmometer into the beaker. Fill the stalagmometer per instructions in Step #3, making sure that the solution level is above the top etched line. (See figure 1)
9. Raise the stalagmometer so that the bottom end is completely out of solution. Remove bulb and immediately place a finger on the top end of the stalagmometer. Carefully use the finger to bring the solution level down to the top etched line. Do not release finger at this time.
10. "Wipe" the excess solution on the lower tip by touching it against the side of the beaker.
11. Release fingertip to allow solution to drain and count the number of drops until the level



### **CALCULATIONS FOR CHROMIUM (2.5ml)**

$$\text{Surface tension} = \frac{1440 \times \text{Specific Gravity}}{\text{Dynes/cm} \quad \# \text{ of Drops counted}}$$

This stalagmometer is calibrated at 20 drops at 25° C.

### **CALCULATIONS FOR NICKEL (5.0ml)**

$$\text{Surface tension} = \frac{2880 \times \text{Specific Gravity}}{\text{Dynes/cm} \quad \# \text{ of Drops counted}}$$

This stalagmometer is calibrated at 40 drops at 25° C.

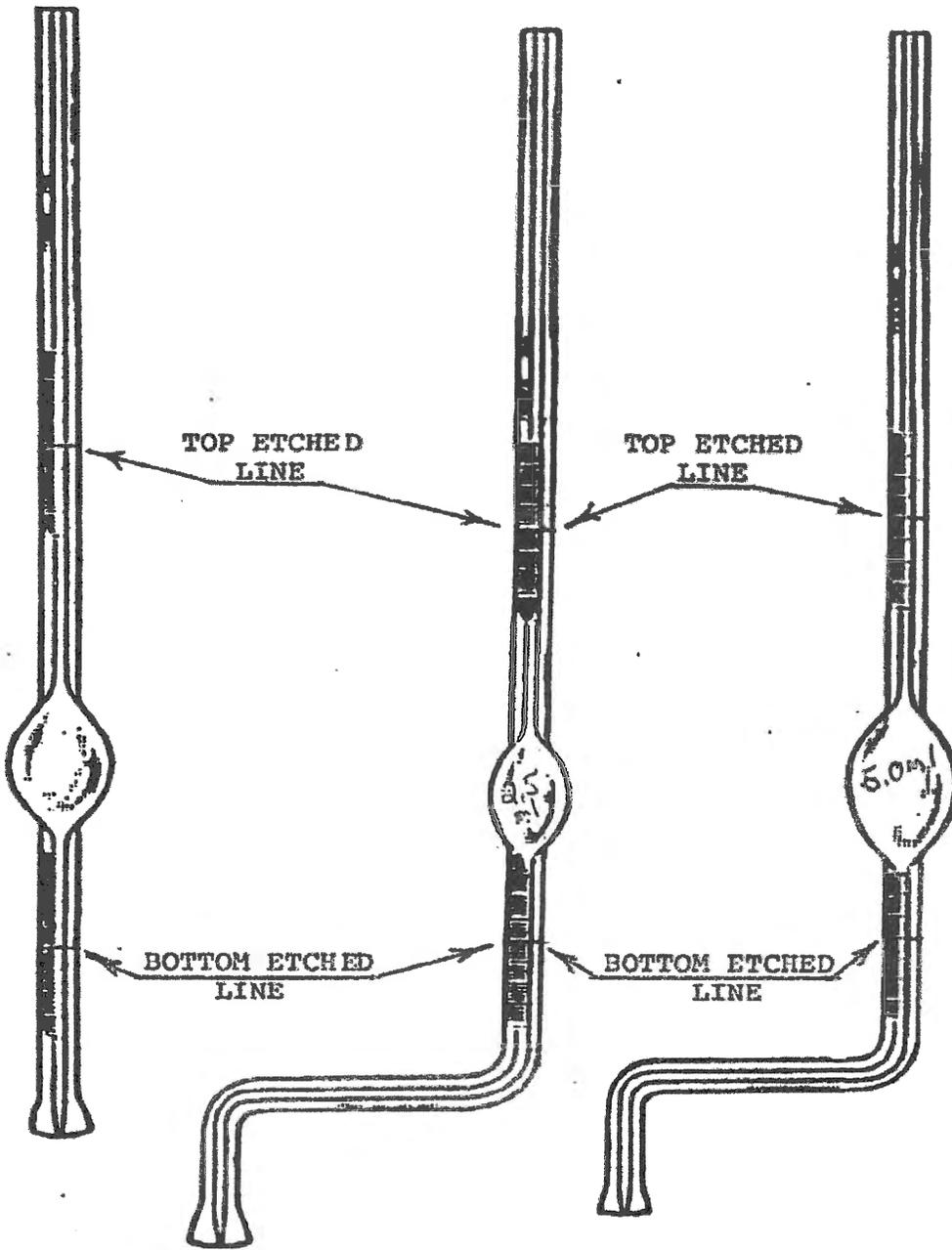
### **IMPORTANT NOTES**

- A. If consecutive samples of similar solutions are to be tested, Steps #1 thru #6 need not be repeated. Simply rinse and drain the stalagmometer twice with the next solution to be tested and then proceed to Step #7.
- B. To measure surface tension in tenths of a drop, refer to attached directions.

### **CONTENTS FOR STALAGMOMETER KIT**

- 1 - Stalagmometer
- 1 - Rubber Bulb
- 1 - Thermometer Clamp
- 1 - Support Stand & Rod
- 1 - 150 ml Beaker
- 1 - Hand Counter





( FIGURE #1 )



**CHEMITHON**  
SURFACE FINISHING, INC.  
12502 N.E. Marx Street  
Portland, OR. 97230-1058  
(503) 256-2777  
Fax (503) 256-1308

# Data Sheet

**McGeon-Rohco, Inc.**  
ROHCO DIVISION

ECONO-CHROME® 300

CHROMIUM PLATING COMPOUND FOR DECORATIVE PLATING

NOTE: This bulletin is for use with the Technical Bulletin #5205 "Decorative Chromium Plating," which describes operating and control procedures, common plating problems and equipment.

Econo-Chrome 300 Chromium Plating Compound has a unique catalyst system which gives decorative chromium plating baths exceptional tolerance to drag-in of sulfate and other undesirable catalytic ions. As a result, Econo-Chrome 300 baths provide exceptional covering power performance. The baths are capable of unusually reliable performance even under adverse chromium plating conditions. The versatile Econo-Chrome 300 baths are also economical because they operate at low solution concentrations without sacrificing performance. Costs for waste water treatment are correspondingly low.

TABLE I

Typical New Econo-Chrome 300 Bath  
Formulations and Operating Conditions

<u>Bath Composition</u>	<u>Concentration</u>
Chromic Acid	150 187 225 263
g/L	20 25 30 35
opg	
Sulfate	0.83 1.05 1.27 1.50
g/L	0.11 0.14 0.17 0.20
opg	
Normal Chromic Acid: Sulfate Ratio	180:1
<u>Operating Conditions</u>	<u>Optimum</u>
Temperature	46°C. (115°F.)
Current Density	11.22 A/dm <sup>2</sup> (100.000 ASF)



TABLE II  
Make Up of Econo-Chrome 300 Baths

Chromic Acid	Concentration			Sulfate for 180:1 Ratio			
	g/liter	lb/g	kg/liter	Sulfate Sulfate Needed		Sulfuric Acid Equivalent*	
mg	g/liter	lb/g	kg/liter	mg	g/liter	fl. oz/gal	ml/liter
20	150	1.06	0.127	0.11	0.83	0.058	0.45
25	187	1.32	0.158	0.14	1.05	0.075	0.59
30	225	1.58	0.190	0.17	1.27	0.089	0.70
35	263	1.85	0.222	0.20	1.50	0.104	0.81

\* as 66° Be Sulfuric Acid

TABLE III

Econo-Chrome 300 Chromium Plating Bath Conversion of Hydrometer Readings (at 70°F/21°C) to Chromic Acid Concentration

Reading (°Ba)	Chromic Acid		Reading (°Ba)	Chromic Acid		Reading (°Ba)	Chromic Acid	
	mg	g/l		mg	g/l		mg	g/l
15.0	20.0	150	20.0	28.5	214	25.0	37.5	281
16.0	21.5	161	21.0	30.0	225	26.0	39.5	296
17.0	23.5	176	22.0	32.0	240	27.0	41.5	311
18.0	25.0	187	23.0	24.0	255	28.0	43.5	326
19.0	26.5	199	24.0	35.5	268	29.0	45.5	341

NOTE: These Baume values apply only to solutions of Econo-Chrome 300 which are free of trivalent chromium and other impurities. As the levels of the impurities increase, they affect the Baume reading for chromic acid content, making it appear higher than actual.



TABLE IV

Econo-Chrome 300 Chromium Plating Bath  
 Conversion of Chromic Acid Adjustment to  
 Amount of Econo-Chrome 300 Required

Chromic Acid Adjustment	<u>Bath Volume (gallons)</u>					
	100	200	400	600	800	1000
	<u>Econo-Chrome 300 Compound Required (pounds)</u>					
<u>(opg)</u>						
1	6.2	12.5	25.0	37.5	50.0	62.5
2	12.5	25.0	50.0	75.0	100	125
3	18.8	37.5	75.0	113	150	188
4	25.0	50.0	100	150	200	250
5	31.2	62.5	125	188	250	312
6	37.5	75.0	150	225	300	375
7	43.7	87.5	225	262	350	437
8	50.0	100	200	300	400	500
9	56.2	113	225	338	450	562
10	62.5	125	250	375	500	625

TABLE IVA

Econo-Chrome 300 Chromium Plating Bath  
 Conversion of Chromic Acid Adjustment to  
 Amount of Econo-Chrome 300 Required

Chromic Acid Adjustment	<u>Bath Volume (liters)</u>				
	1000	2000	3000	4000	5000
	<u>Econo-Chrome 300 Compound Required (Kilograms)</u>				
<u>g/liter</u>					
10	10	20	30	40	50
20	20	40	60	80	100
40	40	80	120	160	200
60	60	120	180	240	300
80	80	160	240	320	400



Page -4-

Econo-Chrome 300Preparing a New Econo-Chrome 300 Bath

Econo-Chrome 300 compound is used to make up baths over a wide range of chromic acid concentrations. Each plater can select the lowest concentrations that meets requirements. Table I covers typical formulations that have proved successful.

Econo-Chrome 300 compound is formulated to maintain an operating bath. When it is used to make up a new Econo-Chrome 300 bath, the bath's catalyst level may initially be too high for optimum performance. However, after production operation, the catalyst level will reach steady state at a somewhat lower level which is conveniently maintained with Econo-Chrome 300 compound.

The initial over-catalyzing of a new bath can be avoided by replacing 15 percent of the indicated Econo-Chrome 300 compound with chromic acid as shown in Table II.

Procedure for Preparing a New Bath

1. Fill the clean tank to about two-thirds full with clean water and heat to 46°C. (115°F.).
2. Use Table II to determine the amount of Econo-Chrome 300 compound and chromic acid needed to give the desired chromic acid concentration. Multiply the g/liter or lb./gal. figure by the total volume of the bath to be prepared and add these amounts of Econo-Chrome 300 compound and chromic acid to the tank. Mix the solution thoroughly until all chemicals have dissolved.

NOTE: It is important that agitation be continued until all of the Econo-Chrome 300 compound and chromic acid are dissolved. If not, misleading interpretations regarding plating performance and sulfate adjustments may arise.

3. Determine from Table II the sulfate concentration and sulfuric acid equivalent needed to give the 180:1 chromic acid-to-sulfate ratio recommended. Multiply this ml/liter or fl. oz/gal. figure by the total volume of the bath to be prepared and add the calculated volume of 66°Be sulfuric acid. Thoroughly mix the solution.

NOTE: Concentrated sulfuric acid should never be added directly to the plating bath because (a) of the personal safety hazard and (b) the acid may damage the tank lining.

One part of concentrated sulfuric acid should be added slowly to ten parts of cold water. Add the dilute sulfuric acid to the tank. Do not add sulfuric acid while parts are being plated.

4. Add water to bring the plating bath up to the proper working level.<sup>1</sup> Continue stirring until all the water has been added.



Procedure for Preparing a New Bath - Continued:

5. Place the cleaned anodes in the tank. (Even new anodes should be cleaned before using.) Use 8 square feet per 100 liters of bath volume (3 square feet of dummy cathode for each 100 gallons). Electrolyze the bath 1-2 hours using 300 amperes for each 380 liters (100 gallons) of bath (i.e., 100 A/dm<sup>2</sup> of dummy cathode).

NOTE: Use a source of clean air and clean airline hose to keep the bath constantly turning over during "dummysing."

<sup>1</sup> Allow for bath displacement by anodes

It is advisable to check the sulfate value after the electrolysis period and make any adjustment needed to obtain the desired sulfate value.

Maintaining Bath Performance

Use only Econo-Chrome 300 Chromium Plating Compound to maintain Econo-Chrome 300 baths. The concentration of chromic acid in the plating bath can be estimated fairly accurately by taking a sample of the bath, cooling it to 21°C (70°F.), and testing it with a Baume hydrometer; see Table III. Add Econo-Chrome 300 compound when the chromic acid concentration drops 7.5 g/liter (1 opg). Use Table IV or IVA to determine the quantity of Econo-Chrome 300 needed to make the adjustment.

See the Technical Bulletin #5205 "Decorative Chromium Plating" regarding the routine control of sulfate by the centrifuge method and for quantitative analyses of chromic acid and trivalent chromium in Econo-Chrome 300 decorative chromium plating baths.

Safe Handling and Storage

Econo-Chrome Chromium Plating Compounds contain chromium chemicals and should be treated as chromic acid. They are noncombustible, but their powerful oxidizing action may cause easily oxidizable materials to ignite. Avoid contact with paper, wood scrap, rags, clothing, flammable solvents, greases, oils and similar flammable materials. This oxidizing potential is intensified in the presence of strong acids such as sulfuric acid.

Concentrated solutions may attack many common metals, particularly at elevated temperatures. Contact with strong reducing agents, alkali or caustic may cause a violent reaction. Do not store near cyanides and sulfides; contact may lead to the release of poisonous gases.

As Econo-Chrome compounds tend to pick up atmospheric moisture, keep container tightly closed when not in use. Moist Econo-Chrome compounds may rust metal containers. Rinse empty containers with plenty of water before discarding.

In case of spill, sweep up dry Econo-Chrome compounds and flush the area with plenty of water to a chemical sewer as permitted by local regulations.



Micel, Inc. 1240 N. Knollwood Circle, Anaheim, California 92801

**MATERIAL SAFETY DATA SHEET**

N.F.P.A. Rating: Health (3), Flammability (0), Reactivity (1)

**I. PRODUCT IDENTIFICATION**

Trade name (as labeled): BN-CLEANER

Chemical names, common names: Sodium Hydroxide Dry Solid, Sodium Salts Mixture

Manufacturer's name: MICEL, INCORPORATED

Address: 1240 N. KNOLLWOOD CIRCLE, ANAHEIM, CA 92801

Emergency phone: 1-800-424-9300

Business phone: 714/995-3300

Name of preparer\*: Technical Dept.

Date prepared: February 22, 1993

**II. HAZARDOUS INGREDIENTS**

Chemical Names	CAS Numbers	Percent*	Exposure Limits in Air		
			ACGIH (TLV)	OSHA (PEL)	OTHER
Sodium metasilicate	6834-92-0	<45%			2 mg/m <sup>3</sup> as corrosive material.
Sodium Hydroxide	001310-73-2	<30%			ACGIH (TLV) - 2 mg/m <sup>3</sup> OSHA (PEL) - 2 mg/m <sup>3</sup>

**NOTE:** this chemical is subject to the reporting requirements of section 313 of SARA title III.

**III. PHYSICAL PROPERTIES**

Vapor density (air=1): N/D

Specific gravity: N/D

Solubility in water: Soluble

Vapor pressure, mmHg at 20 deg C: N/D

Evaporation rate (butyl acetate=1): N/D

Appearance and odor: White to off-white to amber granular powder with no appreciable odor.

**HOW TO DETECT THIS SUBSTANCE\*** (warning properties of substance as a gas, vapor, dust, or mist):

**IV. FIRE AND EXPLOSION**

Flash Point, F (give method): N/D

Autoignition temperature, F: N/D

Flammable limits in air, volume %: lower N/D upper N/D Fire extinguishing materials:

water spray

carbon dioxide

other:

foam

dry chemical

Special firefighting procedures: N/D

Unusual fire and explosion hazards: In water solution caustic may react with amphoteric metals (such as aluminum) generating hydrogen which is flammable and/or explosive if ignited.

**V. HEALTH AND HAZARD INFORMATION****SYMPTOMS OF OVEREXPOSURE** for each potential route of exposure.

Inhaled: Dusts or mists may cause severe irritation to upper respiratory tract.

Contact with skin or eyes: May cause sever irritation with corneal injury and result in permanent impairment of vision, even blindness. Dusts may irritate eyes.

Absorbed through skin: Short single skin contact may cause severe skin burns. A single prolonged skin exposure is not likely to result in absorption of harmful amounts. The dermal LD50 has not been determined.

Swallowed: May cause gastrointestinal irritation or ulceration, and severe burns of the mouth and throat.

Acute: burns, resulting in frequently deep ulceration and ultimate scarring.

Chronic: The chronic local effect may consist of multiple areas of superficial destruction of the skin or of primary irritant dermatitis. Similarly inhalation of dust, spray, or mist may result in varying degrees of irritation or damage to the respiratory tract tissues and an increased susceptibility to respiratory illness.

**FIRST AID: EMERGENCY PROCEDURES**

Eye Contact: Water is the only accepted method of removal of caustic soda from the eyes or skin. You may have 10 seconds or less to avoid serious permanent injury. Therefore IMMEDIATE first aid must be given after an injurious exposure. Moving the victim from water access for transport to medical aid should be done only on the advice of qualified medical personnel. While transporting victim to a medical facility, continue washing if possible. In case of eye contact, wash eyes immediately and continuously for 30 minutes. Call for medical assistance immediately.

Skin Contact: Immediate continued and thorough washing in flowing water for 30 minutes is imperative while removing contaminated clothing before reuse. Destroy contaminated shoes.

Inhaled: Remove to fresh air if effects occur. Consult medical.

Swallowed: DO NOT INDUCE VOMITING. Give large amounts of water or milk if available and transport to medical facility.

**SUSPECTED CANCER AGENT?**

X NO: This product's ingredients are not found in the lists below.

YES: X\_Federal OSHA \_NTP \_IARC X\_Cal/OSHA (see note)

NOTE: California employers using Cal/OSHA-regulated carcinogens must register with Cal/OSHA.

**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:** None established.

**RECOMMENDATIONS TO PHYSICIAN:** CORROSIVE. May cause stricture. If lavage is performed, suggest endotracheal and/or esophagosopic control. Material is strong alkali. If burn is present, treat as any thermal burn, after decontamination. For burns of skin only. Eye irrigation may be necessary for an extended period of time to remove as much caustic as possible. Duration of irrigation and treatment is at discretion of medical personnel. No specific antidote. Supportive care. Treatment based on judgement of the physician in response to reactions of the patient.



Other handling and storage requirements: Avoid storing next to strong acids. Should be stored in clean, dry areas. Product absorbs water and carbon dioxide from air. Keep containers closed and sealed.

Protective measures during maintenance of contaminated equipment:  
Caustic Soda is classified by D.O.T. as a corrosive material.

#### IX. LABELING

Labeling (precautionary statements)\*: DO NOT get in eyes, on skin, on clothing. Avoid breathing dust, mist, or spray. DO NOT take internally. Use with adequate ventilation and employ respiratory protection when exposed to dust, mist, or spray. When handling, wear chemical splash goggles, face shield, rubber gloves and protective clothing. Wash thoroughly after handling. Avoid contact with strong acids to prevent violent or explosive reactions. Keep container closed.

D.O.T. Label\*: Sodium Hydroxide Dry Solid Mixture, Corrosive, U.N. 1823

\*Not required. Space has been provided on this form for optional use

MSDS\BN-CLEANER

# EVERBRITE™ PROTECTIVE COATING

## SALES SPECIFICATIONS

PROPERTIES	METHOD	UNITS	SPECIFICATION
Appearance	D4176	-	Clear and Free From Impurities
Color	D156	Saybolt	N/A
	D1209	PT-Co	
Density @ 20°C	D1298	lb./gal	7.750
Boiling Point	D86	-	182°C
Dielectric	D877	kV	38.1
Vapor Pressure	1	mm Hg	5 @ 40°C
Viscosity	D2161	cSt	N/A
Aniline Point	D611	-	< -3°C
Kauri Butanol	D1133	-	60

1. Head Space Gas Chromatography  
2. Methods - ASTM

## 1. Chemical Product / Company Identification

Product Name EVERBRITE™ Protective Coating  
 Supplier Everbrite, Inc.  
 955 S. Virginia St. #116  
 Reno, NV 89502  
 Telephone 775-324-7223  
 Emergency Phone 800-304-0566

## 2. Hazardous Components

Common Chemical Name:  
 Aromatic Hydrocarbon PEL =100 mg/m<sup>3</sup> TLV  
 =100mg/m<sup>3</sup>

CAS Number 64742-94-5

Synonyms  
 Aromatic 150

## 3. Hazards Identification

Most Important Hazards Skin irritation, Respiratory irritation, dizziness, nausea, loss of consciousness.

Specific Hazards None

Hazard Rating

Health	2
Fire	2
Reactivity	0

## 4. Emergency and First Aid Procedures

Routes of Exposure	Emergency Procedures
Inhalation	Move victim to fresh air, rest and keep warm. Apply artificial respiration if breathing has stopped or oxygen if breathing is irregular. Call physician immediately.
Skin Contact	Remove contaminated clothing. Wash affected areas well with water. If irritation persists, consult physician.
Eye Contact	Hold eyelid open and flush with water for at least 15 minutes. Call a physician.
Ingestion	If conscious, give water or milk to drink. Do not induce vomiting. If victim vomits, turn into recovery position. Contact a physician immediately.

## 5. Fire Fighting Procedures

Extinguishing Media	Alcohol foam, dry chemical powder, carbon dioxide. Water may be ineffective on fire.
Specific Hazard	Vapor is heavier than air and can travel a considerable distance to a source of ignition and flashback.
Specific Methods	Keep away from heat, flame and sparks. Keep containers closed. Cool exposed containers with water. Use water to knock down vapor.

## 6. Accidental Release Measures

Personal Precautions	Extinguish any naked flames or source of ignition. Evacuate personnel from area. Avoid inhalation of vapors.
Environmental	Prevent contamination of ground water and drains. Inform authorities if this occurred.
Disposal Procedures	Cover area with sand or absorbent material to absorb spilled material and sweep up. Use water spray to knock down vapor. Contaminated sand and water should be disposed of according to section 13.



## 7. Handling and Storage

**Precautions for Safety** Ensure good ventilation. Take precautions against static discharge.

**Technical Measures** Store in accordance with all national, regional and local regulations pertaining to the storage, handling, dispensing, and disposal of combustible liquids. No smoking. Naked flames, hot elements or other ignition sources must not be present.

**Storage Conditions** Store in tightly closed clearly labeled containers in cool well-ventilated area.

**Incompatible Materials** Strong oxidizing agents.

**Packaging Material** Store in mild steel vessels.

## 8. Exposure Controls and Personal Protection

**Engineering Measures** Ensure good ventilation. No vessel should be entered until it is gas-free. Workman outside should keep workmen inside the vessel under observation.

**Respiratory** If spraying or using indoors, wear NIOSH/MSHS approved mask.

**Gloves** Viton, Nitrile, PVC  
**Eyes** Safety glasses with splash shields or face shield

**Other Measures** Protective apron, long sleeves, chemical resistant boots.

## 9. Physical and Chemical Properties

**Appearance** Colorless liquid  
**Odor** Aromatic  
**Melting Point** < -60°C  
**Boiling Point** 182°C  
**Flash Point** 64°C (147°F) TCC  
**Vapor Pressure** 5 mm Hg 40°C  
**Vapor Density** > Air  
**Solubility in Water** insoluble  
**Viscosity** 1.29 @40°C cTs  
**V.O.C.** 677.7g/L  
**Explosive Limits** UEL-11.7 LEL-1.8

## 10. Stability and Reactivity

**Stability** Stable  
**Conditions to Avoid** High temperatures and ignition sources

**Materials to Avoid** Strong Oxidizers  
**Hazardous Decomposition** Carbon oxides formed when burned.

## 11. Toxicological Information

**Eye Contact** Severely Irritating  
**Skin Contact** Severely Irritating (Prolonged exposure may cause defatting resulting in dryness.)  
**Inhalation** Practically non-toxic. May cause slight upper airway irritation.  
**Ingestion** Harmful if swallowed. (May be aspirated resulting in inflammation in lungs.)  
**Dermal** LD<sub>50</sub> >2000  
**Oral** LD<sub>50</sub> >2000  
**Chronic Toxicity** No significant neurotoxic, blood, kidney or other effects.  
**Carcinogenicity** Suspected (NTP & ACGIH)  
**Mutagenicity** Data not Available  
**Teratogenicity** Negative

## 12. Ecological Information

**Mobility** Data not Available  
**Biodegradability** Data not Available  
**Bioaccumulation** Data not Available  
**Ecotoxicity** Moderately Toxic

## 13. Disposal Procedures

Disposal should be in accordance with local, regional or national regulations. Contaminated waste and packaging should be destroyed by incineration at an approved incinerator. If recovery of contaminated product is not possible, it should be destroyed by incineration.

## 14. Transportation Information

**Shipping Name** Combustible Liquid, n.o.s.  
**Hazard Class** Combustible  
**Identification Number** UN 1993  
**Packing Group** III  
**Label Drum** None  
**Placard Non-Bulk** Combustible (>1000lbs.)  
**Placard Bulk** UN 1993  
**Shipping Description** Combustible Liquid, n.o.s. (Petroleum Hydrocarbon), 3, UN 1993, PG III

## 15. Regulatory Information

**RCRA** Not Reportable  
**CERCLA** Not Reportable  
**SARA 311/312** Not Reportable  
**SARA 313** Not Reportable

## 16. Other Information

The information contained in this MATERIAL SAFETY DATA SHEET is provided pursuant to 29CFR 1910.1200 to convey information concerning the hazardous nature of the named product. The information supplied was compiled from the most reliable sources available at the time of preparation and in light of the most reasonable foreseeable exposure situations expected from the intended use of this product. The material(s) may present greater or lesser hazard exposure under other circumstances that are beyond the control of the manufacturer. Therefore it is imperative that all directions and warnings on the product label be read and closely followed.

Strip

# MATERIAL SAFETY DATA SHEET

This MSDS complies with OSHA'S Hazard Communication Standard 29 CFR 1910.1200 and OSHA Form 174

## IDENTITY AND MANUFACTURER'S INFORMATION

<b>NFPA Rating:</b> Health-3; Flammability-0; Reactivity-1; Special-0 <b>Manufacturer's Name:</b> BRODY CHEMICAL <b>Address:</b> 4825 S. 6200 W. SLC, UT. 84118		<b>HMSIS Rating:</b> Health-3; Flammability-0; Reactivity-1; Personal Protection-B <b>DOT Hazard Classification:</b> CORROSIVE MATERIAL <b>Identity (trade name as used on label):</b> <b>ALUMINUM BRIGHTENER CONCENTRATE</b>	
<b>Date Prepared:</b> 06/01/04 <b>Prepared By:</b> KM <b>Information Calls:</b> (801) 963-2436 <b>EMERGENCY RESPONSE NUMBER:</b> 1-800-424-8300		<b>MSDS Number:</b> 1003C <b>Revision:</b> 13 <b>NOTICE:</b> JUDGEMENT BASED ON INDIRECT TEST DATA	

## SECTION 1 - MATERIAL IDENTIFICATION AND INFORMATION

COMPONENTS-CHEMICAL NAMES AND COMMON NAMES (Hazardous Components 1% or greater; Carcinogens 0.1% or greater)	CAS Number	Approx. % wt.	OSHA PEL (ppm)	ACGIH TLV (ppm)	Carcinogen Ref. Source **
Ethylene glycol monbutyl ether	111-76-2	10-15	50 ppm	25 ppm	d
Phosphoric Acid	7664-38-2	40-50	1mg/m <sup>3</sup>	1mg/m <sup>3</sup>	d
Hydrofluoric Acid	7664-39-3	10-15	1mg/m <sup>3</sup>	1mg/m <sup>3</sup>	d
Sulfuric Acid	7664-93-9	15-20	1mg/m <sup>3</sup>	1mg/m <sup>3</sup>	d
Ethoxylated Nonyl Phenol	25154-52-3	10-15	N/E	N/E	d

## SECTION 2 - PHYSICAL/CHEMICAL CHARACTERISTICS

<b>Boiling Point:</b> 100°C	<b>Specific Gravity (H<sub>2</sub>O=1):</b> 1.100-1.250
<b>Vapor Pressure: PSIG @ 70°F (Aerosols):</b> N/A	<b>Vapor Pressure (Non-Aerosols)(mm Hg and Temperature):</b> N/D
<b>Vapor Density (Air = 1):</b> N/D	<b>Evaporation Rate (Butyl Acetate = 1):</b> 1
<b>Solubility in Water:</b> Miscible	<b>Water Reactive:</b> No
<b>Appearance and Odor:</b> Brown liquid, characteristic odor.	<b>IPH &lt; 1.8</b>

## SECTION 3 - FIRE AND EXPLOSION HAZARD DATA

<b>FLAMMABILITY as per USA FLAME PROJECTION TEST (aerosols)</b> N/A	<b>Auto Ignition Temperature</b> N/A	<b>Flammability Limits in Air by % in Volume:</b> % LEL: N/A      % UEL: N/A
<b>FLASH POINT AND METHOD USED (non-aerosols):</b> Non-Combustible		<b>EXTINGUISHER MEDIA:</b> Non-Combustible. Use media appropriate to surrounding fire.
<b>SPECIAL FIRE FIGHTING PROCEDURES:</b> Wear self contained breathing apparatus while fighting fire.		
<b>Unusual Fire &amp; Explosion Hazards:</b> None known		

## SECTION 4 - REACTIVITY HAZARD DATA

<b>STABILITY</b> <input checked="" type="checkbox"/> STABLE <input type="checkbox"/> UNSTABLE	<b>HAZARDOUS POLYMERIZATION</b> <input type="checkbox"/> WILL <input checked="" type="checkbox"/> WILL NOT OCCUR
<b>Incompatibility (Mat. to avoid):</b> Oxidizers and strong bases (caustics).	<b>Conditions to Avoid:</b> Contact with strong alkalines.
<b>Hazardous Decomposition Products:</b> Carbon dioxide and monoxide, sulfur oxides and oxides of phosphorus.	

## SECTION 5 - HEALTH HAZARD DATA

<b>PRIMARY ROUTES OF ENTRY:</b> <input checked="" type="checkbox"/> INHALATION <input type="checkbox"/> INGESTION <input type="checkbox"/> SKIN ABSORPTION <input checked="" type="checkbox"/> EYE <input type="checkbox"/> NOT HAZARDOUS	
<b>ACUTE EFFECTS:</b>	
<b>Inhalation:</b> May cause irritations to upper respiratory tract. Not likely to be a problem under normal conditions of handling and use.	<b>Skin Contact:</b> May cause irritation
<b>Eye Contact:</b> May cause burns or irritations.	
<b>Ingestion:</b> May cause respiratory tract irritation.	
<b>CHRONIC EFFECTS:</b>	
<b>Medical Conditions Generally Aggravated by Exposure:</b> Pre-existing conditions affecting respiratory tract, eyes or skin.	

## EMERGENCY FIRST AID PROCEDURES

<b>Eye Contact:</b> Flush (including under lids) with water for at least 15 minutes. Get medical attention.
<b>Skin Contact:</b> Flush with cold water for at least 15 minutes. Use alkaline soap. If irritation occurs, get medical aid.
<b>Inhalation:</b> Remove to fresh air. If breathing is difficult, give oxygen. Call a physician immediately.
<b>Ingestion:</b> DO NOT INDUCE VOMITING. Give large quantities of water if conscious. Call a physician immediately.

## SECTION 6 - CONTROL AND PROTECTIVE MEASURES

<b>Respiratory Protection (specify type):</b> Not generally needed under normal conditions of handling and usage.	<b>Eye Protection:</b> Chemical safety goggles
<b>Protective Gloves:</b> Neoprene or PVC	
<b>Ventilation Requirements:</b> Special ventilation is not generally needed under normal conditions of handling and usage.	
<b>Other Protective Clothing &amp; Equipment:</b> Safety shower and eyewash station.	
<b>Hygienic Work Practices:</b> Avoid contact with skin and avoid breathing vapors. Wash hands before eating, drinking and using restrooms.	

## SECTION 7 - PRECAUTIONS FOR SAFE HANDLING AND USE

<b>Steps To Be Taken if Material is Spilled Or Released:</b> Contain spill. Do not contaminate sewers, ground, or surface waters. Neutralize with soda ash or lime. Soak up in inert absorbent. Place in leak proof containers. Seal and label properly for proper legal disposal.
<b>Waste Disposal Methods:</b> Consult with appropriate regulatory agencies to determine method of disposal in compliance with federal, state, and local regulations.
<b>Precautions To Be Taken in Handling &amp; Storage:</b> Store in original shipping containers. Keep closed when not in use. Protect from extreme heat or cold.
<b>Other Precautions &amp;/or Special Hazards:</b> KEEP OUT OF REACH OF CHILDREN. Follow label directions.

We believe the statements, technical information and recommendations contained herein are reliable, but they are given without warranty or guarantee of any kind.

\*\* Chemical Listed as Carcinogen or Potential Carcinogen. [a] NTP [b] IARC Monograph [c] OSHA [d] Not Listed [e] Animal Data Only

CONSUME  
50 GAL A YEAR

TAP

## MATERIAL SAFETY DATA SHEET

This MSDS complies with OSHA's Hazard Communication Standard 29 CFR 1910.1200 and OSHA Form 174

IDENTITY AND MANUFACTURER'S INFORMATION						
NFPA Rating: Health-1; Flammability-0; Reactivity-0; Special-0 Manufacturer's Name: <b>BRODY CHEMICAL</b> Address: 4825 S. 6200 W. SLC, UT. 84118			HMIS Rating: Health-1; Flammability-0; Reactivity-0; Personal Protection-8 DOT Hazard Classification: <b>NON-HAZARDOUS</b> Identity (trade name as used on label): <b>INDUSTRIAL DEGREASER</b>			
Date Prepared: 08/17/00		Prepared By: CJ		MSDS Number: 4016 Revision- 13		
Information Calls: (801) 963-2436			NOTICE: JUDGEMENT BASED ON INDIRECT TEST DATA			
EMERGENCY RESPONSE NUMBER: 1-800-424-9300						
SECTION 1 - MATERIAL IDENTIFICATION AND INFORMATION						
COMPONENTS-CHEMICAL NAMES AND COMMON NAMES (Hazardous Components 1% or greater; Carcinogens 0.1% or greater)		CAS Number	Approx. % wt.	OSHA PEL (ppm)	ACGIH TLV (ppm)	Carcinogen Ref. Source **
Ethylene Glycol Monobutyl Ether		111-76-2	Under 15%	50	25	d
SECTION 2 - PHYSICAL/CHEMICAL CHARACTERISTICS						
Boiling Point: 100° C.			Specific Gravity (H2O=1): 1.05			
Vapor Pressure: PSIG @ 70°F (Aerosols): N/A			Vapor Pressure (Non-Aerosols)(mm Hg and Temperature): 18mm Hg @ 70° F.			
Vapor Density (Air = 1): < 1			Evaporation Rate (H2O = 1): 1.0			
Solubility in Water: Completely			Water Reactive: None			
Appearance and Odor: Clear yellow liquid, non viscous; butyl cellosolve odor.			pH: 13.05			
SECTION 3 - FIRE AND EXPLOSION HAZARD DATA						
FLAMMABILITY as per USA FLAME PROJECTION TEST (aerosols) N/A		Auto Ignition Temperature N/A		Flammability Limits in Air by % in Volume: % LEL: N/A % UEL: N/A		
FLASH POINT AND METHOD USED (non-aerosols): Non-combustible.			EXTINGUISHER MEDIA: Non-combustible. Use media compatible with surrounding fire.			
SPECIAL FIRE FIGHTING PROCEDURES: Non-combustible. Use procedures applicable to surrounding fire.						
Unusual Fire & Explosion Hazards: Not known.						
SECTION 4 - REACTIVITY HAZARD DATA						
STABILITY <input checked="" type="checkbox"/> STABLE <input type="checkbox"/> UNSTABLE			HAZARDOUS POLYMERIZATION <input type="checkbox"/> WILL <input checked="" type="checkbox"/> WILL NOT OCCUR			
Incompatibility (Mat. to avoid): Strong acids, strong oxidizers.			Conditions to Avoid: None			
Hazardous Decomposition Products: Oxides of carbon, nitrogen, phosphorous. Unidentified organic compounds.						
SECTION 5 - HEALTH HAZARD DATA						
PRIMARY ROUTES OF ENTRY: <input type="checkbox"/> INHALATION <input checked="" type="checkbox"/> INGESTION <input type="checkbox"/> SKIN ABSORPTION <input checked="" type="checkbox"/> EYE <input type="checkbox"/> NOT HAZARDOUS						
<b>ACUTE EFFECTS:</b>						
Inhalation: Inhalation of spray or mist is severely irritating to respiratory tract and mucous membranes. Prolonged contact may cause tissue damage or destruction.						
Eye Contact: Severely irritating. Prolonged contact may cause tissue damage or destruction.			Skin Contact: Irritating. Prolonged contact may cause dermatitis.			
Ingestion: Severely irritating.						
<b>CHRONIC EFFECTS:</b> Repeated episodes of tissue damage may cause scar tissue accumulations.						
Medical Conditions Generally Aggravated by Exposure: Pre-existing irritation may be aggravated by contact.						
EMERGENCY FIRST AID PROCEDURES						
Eye Contact: Wash with cool water 15 minutes. Get medical attention.						
Skin Contact: Rinse off thoroughly with water. If irritation persists, get medical attention.						
Inhalation: Remove to fresh air. If irritation persists, or other symptoms develop, get medical attention.						
Ingestion: DO NOT induce vomiting. Give large quantities of water followed by citrus juice or one ounce of vinegar in water. Follow with milk or olive oil. Call physician immediately.						
SECTION 6 - CONTROL AND PROTECTIVE MEASURES						
Respiratory Protection (specify type): Normally not required.						
Protective Gloves: Rubber.			Eye Protection: Goggles or face shield.			
Ventilation Requirements: Normal ventilation is generally adequate.						
Other Protective Clothing & Equipment: Eye bath and safety shower. Rubber boots and apron if splashing is a problem.						
Hygienic Work Practices: Do not eat or drink in work areas. Wash exposed skin after use.						
SECTION 7 - PRECAUTIONS FOR SAFE HANDLING AND USE						
Steps To Be Taken if Material is Spilled Or Released: Avoid eye contact. Carefully neutralize with acetic acid.						
Waste Disposal Methods: Dispose in accordance with all applicable regulations.						
Precautions To Be Taken in Handling & Storage: Store in original shipping containers. Keep containers sealed when not in use. Protect from freezing. Shelf life: 1 year.						
Other Precautions &/or Special Hazards: Keep out of reach of children.						

*We believe the statements, technical information and recommendations contained herein are reliable, but they are given without warranty or guarantee of any kind.*

\*\* Chemical Listed as Carcinogen or Potential Carcinogen. [a] NTP [b] IARC Monograph [c] OSHA [d] Not Listed [e] Animal Data Only

Consume  
20 GAL YEAR



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## 2. COMPOSITION/INFORMATION ON INGREDIENTS (Continued)

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7647-14-5 Sodium chloride (NaCl)

EXPOSURE LIMITS	PERCENTAGE
PEL:None established	VOL ND
TLV:None established	WT 0-1.20

COMMON NAMES:  
SALT

Listed On(List Legend Below):  
00 22 23 50 51

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497-19-8 Carbonic acid disodium salt

EXPOSURE LIMITS	PERCENTAGE
PEL:Not Established	VOL ND
TLV:Not Established	WT 0.40-1

COMMON NAMES:  
SODA ASH  
SODIUM CARBONATE

Listed On(List Legend Below):  
00 22 23 50 51

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### LIST LEGEND

00 TSCA INVENTORY	13 PA ENVIROMENTAL HAZ SUBSTANCE
18 NY HAZARDOUS SUBSTANCES	21 NJ SPECIAL HEALTH HAZ SUB
22 CANADIAN DOMESTIC SUB LIST	23 NJ REQUIREMENT- 1% OR GREATER
50 PHILIPPINES INVENTORY (PICCS)	51 EINECS
58 MASSACHUSETTS RIGHT TO KNOW	

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## 3. HAZARDS IDENTIFICATION

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\*\*\*\*\* EMERGENCY OVERVIEW \*\*\*\*\*

\* MAY CAUSE BURNS TO THE EYES, SKIN, AND MUCOUS MEMBRANES. MAY \*  
\* CAUSE PERMANENT EYE DAMAGE. INHALATION OF DUST, MIST, OR SPRAY \*  
\* CAN CAUSE SEVERE LUNG DAMAGE. CAN REACT VIOLENTLY WITH WATER, \*  
\* ACIDS AND OTHER SUBSTANCES. \*  
\* \*  
\* Clear white solid with no distinct odor \*  
\*\*\*\*\*

### POTENTIAL HEALTH EFFECTS

#### ROUTES OF ENTRY:

Inhalation, Ingestion.

#### TARGET ORGANS:

Eyes, Skin, Respiratory Tract, Gastrointestinal Tract.

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### 3. HAZARDS IDENTIFICATION (Continued)

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#### IRRITANCY:

Liquid, vapors or mist may be irritating to eyes, skin and respiratory tract.

#### SENSITIZING CAPABILITY:

None known.

#### REPRODUCTIVE EFFECTS:

None known.

#### CANCER INFORMATION:

None known.

#### SHORT-TERM EXPOSURE (ACUTE)

##### INHALATION:

Exposure to vapor, mist or liquid can produce burns of the respiratory tract.

Severe exposures could result in chemical pneumonia.

##### EYES:

Contact can cause severe damage including burns and blindness.

The severity of the effects depend on concentration and how soon after exposure the eyes are washed.

##### SKIN:

Corrosive.

Contact may cause burns and tissue destruction.

Note that irritation may follow an initial latency (delay between the time that the exposure occurs and when the sense of irritation starts). The latent period can vary as much as hours for a dilute solution (0.04%) to minutes with more concentrated solutions (25-50%).

Prolonged or repeated contact, even to dilute concentrations, can cause a high degree of tissue destruction.

##### INGESTION:

Corrosive.

Severe burns and complete tissue perforation of mucous membranes of mouth, throat and stomach.

##### REPEATED EXPOSURE (CHRONIC)

No known chronic effects.

##### SYNERGISTIC MATERIALS:

None known.

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### 3. HAZARDS IDENTIFICATION (Continued)

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#### MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:

None known.

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### 4. FIRST AID MEASURES

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#### EYES:

IMMEDIATELY FLUSH EYES WITH A DIRECTED STREAM OF WATER for at least 15 minutes, forcibly holding eyelids apart to ensure complete irrigation of all eye and lid tissue. Washing eyes within several seconds is essential to achieve maximum effectiveness. GET MEDICAL ATTENTION IMMEDIATELY.

#### SKIN:

Flush thoroughly with cool water under shower while removing contaminated clothing and shoes. Discard non-rubber shoes. Wash clothing before reuse. GET MEDICAL ATTENTION AS SOON AS POSSIBLE.

#### INHALATION:

Remove to fresh air. If breathing is difficult, have trained person administer oxygen. If respiration stops, have a trained person administer artificial respiration. GET MEDICAL ATTENTION IMMEDIATELY.

#### INGESTION:

NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. (If available, give several glasses of milk.) If vomiting occurs spontaneously, keep airway clear and give more water. GET MEDICAL ATTENTION IMMEDIATELY.

#### NOTES TO PHYSICIAN:

No specialized procedures. Treat for clinical symptoms.

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### 5. FIRE FIGHTING MEASURES

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Flash Point: Non-flammable

Method: Not applicable

Autoignition Temperature: Nonflammable

#### FLAMMABLE LIMITS IN AIR, BY % VOLUME

Upper: Not applicable

Lower: Not applicable

#### EXTINGUISHING MEDIA:

Non-flammable / Non-combustible.

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## 5. FIRE FIGHTING MEASURES (Continued)

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Use water spray to keep fire-exposed containers cool.

### FIRE FIGHTING PROCEDURES:

Use water to cool containers but avoid getting water into containers. Wear NIOSH/MSHA approved positive-pressure self-contained breathing apparatus and full protective clothing.

### FIRE AND EXPLOSION HAZARD:

Direct contact with water can cause a violent exothermic reaction.

### SENSITIVITY TO MECHANICAL IMPACT:

Not sensitive.

### SENSITIVITY TO STATIC DISCHARGE:

Not sensitive.

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## 6. ACCIDENTAL RELEASE MEASURES

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### PERSONAL PRECAUTIONS:

Evacuate unnecessary personnel.

Follow protective measures provided under Personal Protection in Section 8.

### ENVIRONMENTAL PRECAUTIONS:

Contain material and prevent accumulation of dust.

CAUTION: This product may react strongly with acids and water.

NEVER FLUSH TO SEWER.

According to 40 CFR 302 Table 302.4 (CERCLA), environmental releases that exceed the RQ must be reported to the National Response Center by calling 800-424-8802 (202-426-2675) and the State Emergency Response Commission and the Local Emergency Planning Committee (40 CFR 355.40) as appropriate.

### METHODS FOR CLEANING UP:

Dry material can be shoveled up, liquid material can be removed with a vacuum truck. Neutralize remaining traces with any dilute inorganic acid (hydrochloric, sulfuric or acetic acid). Flush spill area with water followed by a liberal covering of sodium carbonate. All clean-up material should be removed for proper treatment or disposal. Spills on other than pavement (eg. dirt or sand) may be handled by removing the affected soil and placing in approved containers.

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## 7. HANDLING AND STORAGE

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### HANDLING:

Avoid breathing dust.

Hazardous carbon monoxide gas can form upon contact with food and beverage products in enclosed spaces and can cause death. Follow appropriate tank entry procedures (ANSI Z117.1).

Containers, even those that have been emptied, will retain product residue and vapor and should be handled as if they were full.

Do not get in eyes, on skin or clothing.

Do not take internally

Keep away from acids, to avoid possible violent reaction.

Wash contaminated clothing before reuse.

Wash thoroughly after handling; exposure can cause burns which are not immediately painful or visible.

Wear personal protective equipment as described in Exposure Controls/Personal Protection (Section 8) of the MSDS.

If product is added too rapidly, or without stirring, and becomes concentrated at bottom of mixing vessel, excessive heat may be generated, resulting in DANGEROUS boiling and spattering, and a possible IMMEDIATE AND VIOLENT ERUPTION of highly caustic solution.

### SPECIAL MIXING AND HANDLING INSTRUCTIONS:

Considerable heat is generated when product is mixed with water. Therefore, when making solutions always carefully follow these steps:

ALWAYS wear ALL protective clothing described above. NEVER add water to product. ALWAYS add product, with constant stirring, slowly to surface of lukewarm (80-100°F) water, to assure product is being completely dissolved as it is added.

Product can react EXPLOSIVELY with acids, aldehydes, and many other organic chemicals, add product VERY gradually, while stirring constantly. If product is added too rapidly, or without stirring, and becomes concentrated at bottom of mixing vessel, excessive heat may be generated, resulting in DANGEROUS boiling and spattering, and a possible IMMEDIATE AND VIOLENT ERUPTION of highly caustic solution.

ALWAYS empty and clean containers of all residues before adding product, to avoid possible EXPLOSIVE reaction between product and unknown residue.

Returnable containers should be shipped in accordance with supplier's recommendations. Return shipments should comply with all federal, state, and DOT regulations. All residue should be removed from containers prior to disposal.

Avoid contact with aluminum, tin, zinc, and alloys containing these metals. Avoid contact with leather, wool, acids, organic halogen compounds and organic nitro compounds.

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## 7. HANDLING AND STORAGE (Continued)

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### STORAGE:

Keep container tightly closed and properly labeled.

Keep container closed except when transferring material.

Store in a cool, ventilated area away from incompatible materials (see Section 10).

Hazardous carbon monoxide gas can form upon contact with reducing sugars and food and beverage products in enclosed spaces and can cause death. Follow appropriate tank entry procedures (ANSI Z117.1).

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## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

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### ENGINEERING CONTROLS:

No special ventilation required under normal use.

NOTE: Where carbon monoxide may be generated, special ventilation may be required.

Where engineering controls are not feasible use adequate local exhaust ventilation wherever mist, spray or vapor may be generated.

### PERSONAL PROTECTION

#### RESPIRATORY:

Respiratory protection is not required under normal use.

Wear a NIOSH/MSHA approved respirator following manufacturer's recommendations, where airborne contaminants may occur.

#### EYE/FACE:

Wear chemical safety goggles. (ANSI Z87.1)

#### SKIN:

Wear chemical resistant gloves such as rubber, neoprene or vinyl.

Wash contaminated clothing and dry before reuse.

Wear protective clothing to minimize skin contact.

#### OTHER:

Standard work clothing closed at the neck and wrists.

Discard shoes that cannot be decontaminated.

Emergency shower and eyewash facility should be in close proximity (ANSI Z358.1).

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### 9. PHYSICAL AND CHEMICAL PROPERTIES

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Appearance and Odor: Clear white solid with no distinct odor

Odor Threshold: Not applicable

Specific Gravity (Water=1): 2.13 @ 20°C

Vapor Pressure: 42mm Hg @ 1000°C

Vapor Density (Air=1): Not Applicable

Density: Not available

Evaporation Rate: Not applicable

% Volatiles by Wt: 0

Boiling Point: 1388°C @ 760 mm Hg

Freezing Point: 318°C

Melting Point: Not available

Solubility in Water (% by wt.): Completely soluble

pH: 0.01 moles/liter has pH 12.0

Octanol/Water Partition Coefficient: Not available

Thermal Decomposition Temperature: Not available

Other: COEFFICIENT WATER/OIL DISTRIBUTION: Not determined

VOC (g/l. by wt.): 0

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### 10. STABILITY AND REACTIVITY

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#### CHEMICAL STABILITY:

  X   STABLE                             UNSTABLE

#### REACTS WITH:

<u>  X  </u> AIR	<u>      </u> OXIDIZERS	<u>  X  </u> METALS
<u>  X  </u> WATER	<u>  X  </u> ACIDS	<u>  X  </u> OTHER
<u>      </u> HEAT	<u>      </u> ALKALIS	<u>      </u> NONE

#### HAZARDOUS POLYMERIZATION:

       OCCURS                        X   WILL NOT OCCUR

#### COMMENTS:

Avoid direct contact with water.

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## 10. STABILITY AND REACTIVITY (Continued)

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Product is corrosive to tin, aluminum, zinc and alloys containing these metals and will react with these metals in powder form. Avoid contact with leather, wool, acids, organic halogen compounds, or organic nitro compounds. Hazardous carbon monoxide gas can form upon contact with reducing sugars, food and beverage products in enclosed spaces and can cause death. Follow appropriate tank entry procedures.

See Handling and Storage (Section 7).

### HAZARDOUS DECOMPOSITION PRODUCTS:

None.

Revised

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## 11. TOXICOLOGICAL INFORMATION

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1310-73-2	Sodium hydroxide (Na(OH))		
ACUTE DERMAL LD50 :	(rabbit)		1350 mg/kg
PRIMARY SKIN IRRITATION :	(rabbit)		severe
PRIMARY EYE IRRITATION :	(rabbit)		severe
497-19-8	Carbonic acid disodium salt		
ACUTE ORAL LD50 :	(rat)		4090 mg/kg
ACUTE INHALATION LC50 :	(rat, 2hr)		2300 mg/m3
PRIMARY SKIN IRRITATION :	(rabbit, 24hr)		mild
PRIMARY EYE IRRITATION :	(rabbit, 24hr)		moderate
7647-14-5	Sodium chloride (NaCl)		
ACUTE ORAL LD50 :	(rat)		3000 mg/kg
PRIMARY SKIN IRRITATION :	(rabbit)		mild
PRIMARY EYE IRRITATION :	(rabbit)		moderate

Revised

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## 12. ECOLOGICAL INFORMATION

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497-19-8	Carbonic acid disodium salt		
AQUATIC ECOTOX DATA			
Fish:			
LC50 (96 hr.)	(Bluegill sunfish)	140-180	mg/L
LC50 (96 hr.)	(Mosquitofish)	320-420	mg/L
BCF	No data available		

12. ECOLOGICAL INFORMATION (Continued)

Invertebrates:

LC50 (48 hr.)	(Water flea)	115-320	mg/L
LC50 (96 hr.)	(Scud)	28-38	mg/L
LC50 (96 hr.)	(Tubellarian flatworm)	148-193	mg/L

Amphibians:

No data available

Plants:

LC50 (5 day)	(Diatom)	105-137	mg/L
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TERRESTRIAL ECOTOX DATA

Wildlife:

LD50 (oral)	(Rat as surrogate)	2.88	g/Kg
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Plants:

No data available

ENVIRONMENTAL FATE DATA

There is limited information available on the environmental fate and effects of sodium carbonate (carbonic acid, disodium salt). Limited laboratory toxicity test data indicate that it is moderately toxic to aquatic and terrestrial organisms. Sodium carbonate ( $\text{Na}_2\text{CO}_3$ ) is a contributor to water hardness, and is a component of the buffering capacity of aquatic systems. This material will readily dissociate in water, where the equilibrium distribution of inorganic carbon ( $\text{CO}_2$ ,  $\text{HCO}_3^-$ , and  $\text{CO}_3^{2-}$ ) is based on pH. Due caution should be exercised to avoid the accidental release of this material to aquatic or terrestrial environments.

7647-14-5 Sodium chloride (NaCl)

AQUATIC ECOTOX DATA

Fish:

LC50 (96 hr.)	(Fathead minnow)	7,650	mg/L
LC50 (96 hr.)	(Bluegill sunfish)	12,946	mg/L

Invertebrates:

LC50 (48 hr.)	(Water flea)	3,310	mg/L
LC50 (48 hr.)	(Mosquito larva)	10,200	mg/L
EC50 (48 hr.)	(Pond snail)	3,388	mg/L
LC50 (7 day)	(Water flea)	1,770	mg/L*
*mean value for five laboratory tests			
IC50Repro(7 day)	(Water flea)	1,340	mg/L*
*mean value for five laboratory tests			

Amphibians:

Mortality(5 day)	(Frog)	46.66% @ 1,800	mg/L*
(* concentration as Cl)			
Mortality(5 day)	(Frog)	46.66% @ 1,200	mg/L*
(* concentration as Na)			

Plants:

EC50 (32 day)	(Water-milfoil)	5,962-8,183	mg/L
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## 12. ECOLOGICAL INFORMATION (Continued)

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### TERRESTRIAL ECOTOX DATA

#### Wildlife:

LD50 (oral) (Rat as surrogate) 3,000 mg/Kg

#### Plants:

No data available

### ENVIRONMENTAL FATE DATA

Sodium chloride (NaCl) is a naturally occurring inorganic salt in surface waters, groundwater and the earth's crust. Biological systems typically maintain a necessary osmotic balance of critical salts including sodium chloride. The tolerance of aquatic species to NaCl is variable depending upon whether the organism is freshwater or marine, or if the organism is capable of moving between freshwater and marine environments. In general NaCl has low to moderate toxicity to aquatic or terrestrial species. Continuous discharge of salt to freshwater environments can lead to increased salinity over time. Bulk releases could impact salt intolerant aquatic species and sessile terrestrial lifeforms. Due care should be taken to avoid the accidental release of this material to aquatic or terrestrial environments.

1310-73-2 Sodium hydroxide (Na(OH))

### AQUATIC ECOTOX DATA

#### Fish:

LC50 (96 hr.) (Fathead minnow) 179 mg/L\*

#### Invertebrates:

EC50 (48 hr.) (Water flea) 42 mg/L\*

#### Plants:

EC50 (96 hr.) (Green Algae) 41 mg/L\*

\* data represents a 50% NaOH aqueous solution

### TERRESTRIAL ECOTOX DATA

#### Wildlife:

LD50 (ip) (Mouse) 40 mg/Kg

LDLo (Oral) (Rabbit) 500 mg/Kg

### ENVIRONMENTAL FATE DATA

#### Biotic:

Biodeg. Inorganic, not subject to biodegradation

This material has produced slight to moderate toxicity in laboratory tests with aquatic organisms. This material is strongly alkaline. If released to surface water, this compound will cause the pH to rise dependent on the buffering capacity of the waterbody. Aquatic organisms become increasingly stressed as pH exceeds 9, with many aquatic species being intolerant of pH in excess of 10. This compound does not bioaccumulate in organisms. Due caution should be exercised to prevent the accidental release of this material to the environment.

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### 13. DISPOSAL CONSIDERATIONS

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Recovery and reuse, rather than disposal, should be the ultimate goal of handling efforts.

Dispose of all waste and contaminated equipment in accordance with all applicable federal, state and local health and environmental regulations.

Ensure that all responsible federal, state, and local agencies receive proper notification of spill and disposal methods.

Shipments of waste materials may be subject to manifesting requirements per applicable regulations. Appropriate disposal will depend on the nature of each waste material and should be done by a competent and properly permitted contractor.

The materials resulting from clean-up operations may be hazardous wastes and, therefore, subject to specific regulations. Package, store, transport, and dispose of all (clean-up) materials and any contaminated equipment in accordance with all applicable federal, state, and local regulations.

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### 14. TRANSPORT INFORMATION

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DOT PROPER SHIPPING NAME: Sodium Hydroxide, Solid

DOT HAZARD CLASS: 8

DOT IDENTIFICATION NO: UN1823

DOT PACKING GROUP: II

DOT HAZARDOUS SUBSTANCE: RQ 1,000 Lbs. (Sodium Hydroxide)

DOT MARINE POLLUTANT(S): Not Applicable

ADDITIONAL DESCRIPTION REQUIREMENT: Not Applicable

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### 15. REGULATORY INFORMATION

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#### U.S. FEDERAL REGULATIONS:

OSHA Standard 29 CFR 1910.1200 requires that information be provided to employees regarding the hazards of chemicals by means of a hazard communication program including labeling, material safety data sheets, training and access to written records. We request that you, and it is your legal duty to, make all information in this Material Safety Data Sheet available to your employees.

To aid our customers in complying with regulatory requirements, SARA Title III Hazard Categories for this product are indicated below. If the word "YES" appears next to any category, this product may be reportable by you under the requirements of 40.CFR.370. Please consult those regulations for details.

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15. REGULATORY INFORMATION (Continued)

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TSCA:

All components of this product that are required to be on the TSCA inventory are listed on the inventory.

SARA/TITLE III HAZARD CATEGORIES:

Immediate (Acute) Health:	<u>YES</u>	Reactive Hazard	<u>YES</u>
Delayed (Chronic) Health:	<u>NO</u>	Sudden Release of Pressure	<u>NO</u>
Fire Hazard:	<u>NO</u>		

HMIS HAZARD RATINGS:

HEALTH HAZARD: 3 FIRE HAZARD: 0 REACTIVITY: 2

STATE REGULATIONS:

See Section 2. COMPOSITION/INFORMATION ON INGREDIENTS list legend for applicable state regulation.

INTERNATIONAL REGULATIONS:

Consult the regulations of the importing country.

CANADA:

WHMIS Hazard Class: D1B, E

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16. OTHER INFORMATION

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For additional non-emergency health, safety or environmental information telephone (972) 404-2076 or write to:

Occidental Chemical Corporation  
Product Stewardship Department  
5005 LBJ Freeway  
P.O. Box 809050  
Dallas, Texas 75380

16. OTHER INFORMATION (Continued)

MSDS LEGEND:

- ACGIH = American Conference of Governmental Industrial Hygienists  
CAS = Chemical Abstracts Service Registry Number  
CEILING = Ceiling Limit (15 Minutes)  
CEL = Corporate Exposure Limit  
OSHA = Occupational Safety and Health Administration  
PEL = Permissible Exposure Limit (OSHA)  
STEL = Short Term Exposure Limit (15 Minutes)  
TDG = Transportation of Dangerous Goods (Canada)  
TLV = Threshold Limit Value (ACGIH)  
TWA = Time Weighted Average (8 Hours)  
WHMIS = Worker Hazardous Materials Information System (Canada)  
\* = See Section 3 Hazards Identification - Repeated Exposure (Chronic) Information

IMPORTANT: The information presented herein, while not guaranteed, was prepared by competent technical personnel and is true and accurate to the best of our knowledge. NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR PURPOSE, OR OF ANY OTHER KIND, EXPRESS OR IMPLIED, IS MADE REGARDING PERFORMANCE, STABILITY OR OTHERWISE. This information is not intended to be all-inclusive as to the manner and conditions of use, handling and storage. Other factors may involve other or additional safety or performance considerations. While our technical personnel will be happy to respond to questions regarding safe handling and use procedures, safe handling and use remains the responsibility of the customer. No suggestions for use are intended as, and nothing herein shall be construed as a recommendation to infringe any existing patents or violate any federal, state or local laws, rules, regulations or ordinances.

This Material Safety Data Sheet (MSDS) covers the following materials:

- DIAPHRAGM NO. 2 FLAKE
- BEADS
- CAUSTIC SODA SOLID
- CAUSTIC SODA BEADS
- CAUSTIC SODA FLAKE
- CAUSTIC SODA-DIAPHRAGM COMPOUNDER
- CAUSTIC SODA RAYON NO. 2 FLAKE
- CAUSTIC SODA RAYON NO. 4 FLAKE
- CAUSTIC SODA-SOLID
- CAUSTIC SODA-DIAPHRAGM NO. 2 FLAKE
- CAUSTIC SODA-BEADS
- CAUSTIC SODA- DIAPHRAGM NO. 4 FLAKE

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## 17. WARNING LABEL INFORMATION

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### SIGNAL WORD:

DANGER

### HAZARD WARNINGS:

MAY CAUSE BURNS TO THE EYES, SKIN, AND MUCOUS MEMBRANES.

MAY CAUSE PERMANENT EYE DAMAGE.

INHALATION OF DUST, MIST, OR SPRAY CAN CAUSE SEVERE LUNG DAMAGE.

CAN REACT VIOLENTLY WITH WATER, ACIDS AND OTHER SUBSTANCES.

### PRECAUTIONS:

Avoid contact with eyes, skin and clothing.

Avoid breathing dust, vapors or mist.

Do not swallow.

Use with adequate ventilation and wear respiratory protection when exposure to dust, mist, or spray is possible.

Wear safety glasses with side shields or chemical splash goggles, protective clothing and chemical resistant gloves.

Wash thoroughly after handling; exposure can cause burns which are not immediately painful or visible.

Keep container tightly closed and properly labeled.

Product can react violently with water, acids and other substances. See Handling and Storage (Section 7) of the MSDS for instructions before using.

Avoid contact with aluminum, tin, zinc, and alloys containing these metals. Avoid contact with leather, wool, acids, organic halogen compounds and organic nitro compounds.

Hazardous carbon monoxide gas can form upon contact with food and beverage products in enclosed spaces and can cause death. Follow appropriate tank entry procedures (ANSI Z117.1).

### FIRST AID

#### EYES:

IMMEDIATELY FLUSH EYES WITH A DIRECTED STREAM OF WATER for at least 15 minutes, forcibly holding eyelids apart to ensure complete irrigation of all eye and lid tissue. Washing eyes within several seconds is essential to achieve maximum effectiveness. GET MEDICAL ATTENTION IMMEDIATELY.

#### SKIN:

Flush thoroughly with cool water under shower while removing contaminated clothing and shoes. Discard non-rubber shoes. Wash clothing before reuse. GET MEDICAL ATTENTION AS SOON AS POSSIBLE.

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17. WARNING LABEL INFORMATION (Continued)

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**INHALATION:**

Remove to fresh air. If breathing is difficult, have trained person administer oxygen. If respiration stops, have a trained person administer artificial respiration. GET MEDICAL ATTENTION IMMEDIATELY.

**INGESTION:**

NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. (If available, give several glasses of milk.) If vomiting occurs spontaneously, keep airway clear and give more water. GET MEDICAL ATTENTION IMMEDIATELY.

**IN CASE OF SPILL OR LEAK:**

Leaks should be stopped.

**CAUTION:** This product may react strongly with acids and water.

Scoop or sweep up all spilled product and other contaminated material and place in marked disposal containers

Neutralize residue with dilute acid and flush spill area with water followed by a liberal covering of sodium carbonate.

Dispose of wash water and spill by-products according to federal, state and local regulations.

Spills of 1000 pounds or more must be reported to the National Response Center, 1-800-424-8802.

State and local regulations may have additional reporting requirements, check with the proper state and local authorities.

Wear neoprene or rubber gloves.

**FIRE:**

Material does not burn.

Use extinguishing medium as appropriate for surrounding fire.

**HANDLING AND STORAGE:**

Considerable heat is generated when product is mixed with water. Therefore, when making solutions always carefully follow these steps:

ALWAYS wear ALL protective clothing described above. NEVER add water to product. ALWAYS add product, with constant stirring, slowly to surface of lukewarm (80-100°F) water, to assure product is being completely dissolved as it is added.

Product can react EXPLOSIVELY with acids, aldehydes, and many other organic chemicals, add product VERY gradually, while stirring constantly. If product is added too rapidly, or without stirring, and becomes concentrated at bottom of mixing vessel, excessive heat may be generated, resulting in DANGEROUS boiling and spattering, and a possible IMMEDIATE AND VIOLENT ERUPTION of highly caustic solution.

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17. WARNING LABEL INFORMATION (Continued)

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ALWAYS empty and clean containers of all residues before adding product, to avoid possible EXPLOSIVE reaction between product and unknown residue.

Returnable containers should be shipped in accordance with supplier's recommendations. Return shipments should comply with all federal, state, and DOT regulations. All residue should be removed from containers prior to disposal.

Containers that have been emptied, will retain product residue and vapor and should be handled as if they were full.

**DISPOSAL:**

A spill or release of this material may trigger the emergency release reporting requirements under SARA, Title III (40 CFR, Part 355) and/or CERCLA (40 CFR, Part 300). State or local reporting requirements may differ from federal requirements. Consult counsel for further guidance on your responsibilities under these laws.

Material that cannot be reused or chemically reprocessed should be disposed of in a manner meeting government regulations.

Always package, store, transport and dispose of all waste and contaminated equipment in accordance with all applicable federal, state and local health and environmental regulations.

Appropriate disposal will depend on the nature of each waste material and should be done by a competent and properly permitted contractor.

**INFORMATION REQUIRED BY FEDERAL, STATE OR LOCAL REGULATIONS:**

**This Product Contains:**

CAS#	NAME
1310-73-2	Sodium hydroxide (Na(OH))
7647-14-5	Sodium chloride (NaCl)
497-19-8	Carbonic acid disodium salt

HMIS RATING: HEALTH 3 FLAMMABILITY 0 REACTIVITY 2

LABEL NUMBER: 0198M32413

For Industrial Use Only

ACID

003 08/03/04 MURIATIC ACID ALL GRADES

\*\*\*\*\*  
PRODUCT IDENTIFICATION  
\*\*\*\*\*

PRODUCT NAME: MURIATIC ACID ALL GRADES  
MSDS#: OZ34514  
DATE ISSUED: 03/07/2000  
SUPERSEDES: 1/14/1998  
ISSUED BY: 008730  
REVIEWED DATE: 07/30/2004  
This MSDS has been reviewed on 07/30/2004, and is current as of the DATE ISSUED above.

TAP

MATERIAL SAFETY DATA SHEET

PRODUCT NAME:  
MURIATIC ACID ALL GRADES

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

ISSUE DATE : 01/01/98  
PRODUCT NAME : MURIATIC ACID ALL GRADES  
Distributed by:  
Univar USA Inc.  
6100 Carillon Point  
Kirkland, WA 98033  
425-889-3400  
PRODUCT USE : CHEMICAL PROCESSING/METAL CLEANING  
CHEMICAL NAME : HYDROGEN CHLORIDE  
CHEMICAL FORMULA : HCL  
SYNONYMS/COMMON NAMES : HCL SOLUTION  
AQUEOUS HYDROGEN CHLORIDE  
HYDROCHLORIC ACID

2. COMPOSITION/INFORMATION ON INGREDIENTS

CAS NUMBER / NAME  
7732-18-5 WATER

EXPOSURE LIMITS PERCENTAGE  
PEL:NOT ESTABLISHED VOL ND  
TLV:NOT ESTABLISHED WT 64-91

COMMON NAMES:

LISTED ON(LIST LEGEND BELOW):  
00 19 22 23 50 51

7647-01-0 HYDROCHLORIC ACID

EXPOSURE LIMITS PERCENTAGE  
PEL:5 PPM; 7 MG/M3, CEILING VOL ND

Consume  
50 gal A YEAR

TLV:5 PPM; 7.5 MG/M3, CEILING

WT

9-36

COMMON NAMES:  
HYDROGEN CHLORIDE

LISTED ON(LIST LEGEND BELOW):  
00 01 02 13 18 21 22 45 50 51

LIST LEGEND

- |                                  |                                   |
|----------------------------------|-----------------------------------|
| 00 TSCA INVENTORY                | 01 SARA EXTR HAZ SUB, SECTION 302 |
| 02 SARA TOXIC CHEM, SECTION 313  | 13 PA ENVIROMENTAL HAZ SUBSTANCE  |
| 18 NY HAZARDOUS SUBSTANCES       | 19 PA REQUIREMENT- 3% OR GREATER  |
| 21 NJ SPECIAL HEALTH HAZ SUB     | 22 CANADIAN DOMESTIC SUB LIST     |
| 23 NJ REQUIREMENT- 1% OR GREATER | 45 EPA/OSHA ACCIDENTAL RELEASE    |
| 50 PHILIPPINES INVENTORY (PICCS) | 51 EINECS                         |

3. HAZARDS IDENTIFICATION

\*\*\*\*\* EMERGENCY OVERVIEW \*\*\*\*\*

\*  
 \* CORROSIVE. CAUSES SEVERE BURNS TO EYES, SKIN AND DIGESTIVE TRACT. \*  
 \* SEVERELY IRRITATING TO RESPIRATORY TRACT, EYES AND SKIN. MAY \*  
 \* CAUSE IRRITATION OF DIGESTIVE TRACT. MAY CAUSE DISCOLORATION OF \*  
 \* TEETH. \*  
 \*  
 \* CLEAR TO LIGHT AMBER LIQUID WITH A PUNGENT ODOR. \*  
 \*\*\*\*\*

POTENTIAL HEALTH EFFECTS

ROUTES OF ENTRY:  
INHALATION, INGESTION.

TARGET ORGANS:  
EYES, SKIN, RESPIRATORY TRACT, GASTROINTESTINAL TRACT.

IRRITANCY:  
ALL ROUTES OF EXPOSURE.

SENSITIZING CAPABILITY:  
NONE KNOWN.

REPRODUCTIVE EFFECTS:  
NONE KNOWN.

CANCER INFORMATION:  
NOT KNOWN TO BE CARCINOGENIC.

SHORT-TERM EXPOSURE (ACUTE)

INHALATION:  
BREATHING GAS, FOG, MIST OR SPRAY MAY RESULT IN COUGHING AND A BURNING OR CHOKING SENSATION IN THE THROAT. IF INHALED DEEPLY, FLUID MAY COLLECT IN THE LUNGS (EDEMA). PROLONGED OR REPEATED EXPOSURE TO CONCENTRATIONS IN EXCESS OF THE EXPOSURE LIMITS MAY CAUSE DISCOLORATION OF TEETH.

EYES:  
CONTACT RAPIDLY CAUSES SEVERE IRRITATION OF THE EYES AND EYELIDS. IF NOT QUICKLY REMOVED BY THOROUGH IRRIGATION WITH WATER, THERE MAY BE PROLONGED OR PERMANENT VISUAL IMPAIRMENT OR TOTAL LOSS OF SIGHT. HYDROGEN CHLORIDE GAS ESCAPING FROM THE AQUEOUS SOLUTION IS IMMEDIATELY IRRITATING.

SKIN:

CONTACT MAY CAUSE BURNS AND TISSUE DESTRUCTION.

INGESTION:

CAN CAUSE SEVERE BURNS TO THE MUCOUS MEMBRANES OF THE DIGESTIVE TRACT.

REPEATED EXPOSURE (CHRONIC)

NONE KNOWN.

SYNERGISTIC MATERIALS:

NONE KNOWN.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:

PRE-EXISTING DISORDERS AFFECTING TARGET ORGANS.

SECTION THAT FOLLOWS HAS BEEN REVISED

4. FIRST AID MEASURES

EYES:

IMMEDIATELY FLUSH EYES WITH A DIRECTED STREAM OF WATER FOR AT LEAST 15 MINUTES, FORCIBLY HOLDING EYELIDS APART TO ENSURE COMPLETE IRRIGATION OF ALL EYE AND LID TISSUE. WASHING EYES WITHIN SEVERAL SECONDS IS ESSENTIAL TO ACHIEVE MAXIMUM EFFECTIVENESS. GET MEDICAL ATTENTION IMMEDIATELY.

SKIN:

FLUSH THOROUGHLY WITH COOL WATER UNDER SHOWER WHILE REMOVING CONTAMINATED CLOTHING AND SHOES. DISCARD NON-RUBBER SHOES. WASH CLOTHING BEFORE REUSE. GET MEDICAL ATTENTION AS SOON AS POSSIBLE.

INHALATION:

REMOVE TO FRESH AIR. IF BREATHING IS DIFFICULT, HAVE TRAINED PERSON ADMINISTER OXYGEN. IF RESPIRATION STOPS, HAVE A TRAINED PERSON ADMINISTER ARTIFICIAL RESPIRATION. GET MEDICAL ATTENTION IMMEDIATELY.

INGESTION:

NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. IF SWALLOWED, DO NOT INDUCE VOMITING. GIVE LARGE QUANTITIES OF WATER. (IF AVAILABLE, GIVE SEVERAL GLASSES OF MILK.) IF VOMITING OCCURS SPONTANEOUSLY, KEEP AIRWAY CLEAR AND GIVE MORE WATER. GET MEDICAL ATTENTION IMMEDIATELY.

NOTES TO PHYSICIAN:

NO SPECIALIZED PROCEDURES. TREAT FOR CLINICAL SYMPTOMS.

5. FIRE FIGHTING MEASURES

FLASH POINT: NON-FLAMMABLE

METHOD: NOT APPLICABLE

AUTOIGNITION TEMPERATURE: NOT APPLICABLE

FLAMMABLE LIMITS IN AIR, BY % VOLUME

UPPER: NON-FLAMMABLE

LOWER: NON-FLAMMABLE

EXTINGUISHING MEDIA:

NON-FLAMMABLE / NON-COMBUSTIBLE.

USE AGENTS APPROPRIATE FOR SURROUNDING FIRE.

USE WATER SPRAY TO KEEP FIRE-EXPOSED CONTAINERS COOL.

FIRE FIGHTING PROCEDURES:

KEEP UNAUTHORIZED PERSONNEL REMOVED AND UPWIND. WEAR NIOSH/MSHA APPROVED POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS AND FULL

PROTECTIVE CLOTHING.

FIRE AND EXPLOSION HAZARD:

THIS PRODUCT IS NONFLAMMABLE AND NONEXPLOSIVE UNDER NORMAL CONDITIONS OF USE. AT HIGH TEMPERATURES THIS PRODUCT CAN DECOMPOSE TO GIVE OFF HYDROCHLORIC ACID AND GAS.

VAPORS ARE IRRITATING TO THE EYES AND NOSE. LIQUID IS CORROSIVE TO THE SKIN

THIS PRODUCT ATTACKS MOST METALS WITH THE EVOLUTION OF EXPLOSIVE HYDROGEN GAS.

SENSITIVITY TO MECHANICAL IMPACT:  
NOT SENSITIVE.

SENSITIVITY TO STATIC DISCHARGE:  
NOT SENSITIVE.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS:

EVACUATE UNNECESSARY PERSONNEL.

KEEP UNPROTECTED PERSONNEL UPWIND OF THE SPILL AREA.

FOLLOW PROTECTIVE MEASURES PROVIDED UNDER PERSONAL PROTECTION IN SECTION 8.

ENVIRONMENTAL PRECAUTIONS:

CONTAIN SPILL WITH DIKE TO PREVENT ENTRY INTO SEWERS OR WATERWAYS.

ACCORDING TO 40 CFR 302 TABLE 302.4 (CERCLA), ENVIRONMENTAL RELEASES THAT EXCEED THE RQ MUST BE REPORTED TO THE NATIONAL RESPONSE CENTER BY CALLING 800-424-8802 (202-426-2675) AND THE STATE EMERGENCY RESPONSE COMMISSION AND THE LOCAL EMERGENCY PLANNING COMMITTEE (40 CFR 355.40) AS APPROPRIATE.

METHODS FOR CLEANING UP:

LARGE SPILLS SHOULD BE REMOVED BY VACUUM TRUCK. SMALLER SPILLS MAY BE SOAKED UP AND NEUTRALIZED WITH SODA ASH WHICH SHOULD BE PLACED IN CLOSED CONTAINERS, LABELED AND STORED IN A SAFE PLACE OUTDOORS TO AWAIT PROPER DISPOSAL. SPILLS ON AREAS OTHER THAN PAVEMENT, E.G., DIRT OR SAND, MAY BE HANDLED BY REMOVING THE AFFECTED SOILS AND PLACING IN APPROVED CONTAINERS.

7. HANDLING AND STORAGE

HANDLING:

WEAR PERSONAL PROTECTIVE EQUIPMENT AS DESCRIBED IN EXPOSURE CONTROLS/PERSONAL PROTECTION (SECTION 8) OF THE MSDS.

AVOID BREATHING VAPOR, USE WITH ADEQUATE VENTILATION. WEAR NIOSH/MSHA APPROVED RESPIRATORY PROTECTION IF THERE IS POTENTIAL FOR EXPOSURE ABOVE THE EXPOSURE LIMITS.

KEEP AWAY FROM SOURCES OF IGNITION BECAUSE TOXIC, CORROSIVE AND EXPLOSIVE GASES MAY BE FORMED.

WASH THOROUGHLY AFTER HANDLING.

OPEN CONTAINER CAREFULLY TO AVOID SPURTING.

SPECIAL MIXING AND HANDLING INSTRUCTIONS:

DO NOT ADD WATER DIRECTLY TO PRODUCT, AND DO NOT MIX WITH ALKALIES SUCH AS SODIUM HYDROXIDE (CAUSTIC SODA) OR ALKALI METALS, TO AVOID A

POSSIBLE VIOLENT REACTION. THE PRODUCT MAY BE ADDED TO WATER WITH MIXING AND DILUTION.

STORAGE:

STORE IN A COOL, VENTILATED AREA AWAY FROM INCOMPATIBLE MATERIALS (SEE SECTION 10).

DIKE AND VENT STORAGE TANKS.

DO NOT STORE IN UNLINED CONTAINERS.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS:

GENERAL ROOM VENTILATION PLUS LOCAL EXHAUST AT POINTS OF EMISSION TO MAINTAIN LEVELS OF AIRBORNE CONTAMINANTS BELOW EXPOSURE LIMITS.

PERSONAL PROTECTION

RESPIRATORY:

WEAR A NIOSH/MSEA APPROVED RESPIRATOR FOLLOWING MANUFACTURER'S RECOMMENDATIONS, WHERE AIRBORNE CONTAMINANTS MAY OCCUR.

EYE/FACE:

WEAR CHEMICAL SAFETY GOGGLES PLUS FULL FACE SHIELD TO PROTECT AGAINST SPLASHING WHEN APPROPRIATE (ANSI Z87.1).

SKIN:

WEAR CHEMICAL RESISTANT GLOVES SUCH AS RUBBER, NEOPRENE OR VINYL.

WHENEVER THERE IS A POSSIBILITY OF SPLASH OR CONTACT WEAR A CHEMICAL RESISTANT FULL BODY SUIT AND BOOTS.

OTHER:

EMERGENCY SHOWER AND EYEWASH FACILITY SHOULD BE IN CLOSE PROXIMITY (ANSI Z358.1).

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AND ODOR: CLEAR TO LIGHT AMBER LIQUID WITH A PUNGENT ODOR.

ODOR THRESHOLD: NOT AVAILABLE

SPECIFIC GRAVITY (WATER=1): 1.05 TO 1.18

VAPOR PRESSURE: 14.6 TO 80

VAPOR DENSITY (AIR=1): 1.3 @ 20 C

DENSITY: 8.75 TO 9.83 LB/GAL

EVAPORATION RATE: NOT AVAILABLE

% VOLATILES BY WT: NOT APPLICABLE

BOILING POINT: 140 F (60 C) TO 221 F (105 C)

FREEZING POINT: -29 F (-34 C) TO 5 F (-15 C)

MELTING POINT: NOT AVAILABLE

SOLUBILITY IN WATER (% BY WT.): 100

PH: 0.2% SOLUTION HAS A PH OF 2

OCTANOL/WATER PARTITION COEFFICIENT: NOT AVAILABLE

THERMAL DECOMPOSITION TEMPERATURE: NOT AVAILABLE

OTHER: AQUEOUS HCL SOLUTIONS ON BOILING GO TO A CONSTANT  
BOILING MIXTURE THAT CONTAINS 20.24% HCL @ 110 C

VOC (G/L. BY WT.): NOT APPLICABLE

10. STABILITY AND REACTIVITY

CHEMICAL STABILITY:

STABLE  UNSTABLE

REACTS WITH:

<input type="checkbox"/> AIR	<input type="checkbox"/> OXIDIZERS	<input checked="" type="checkbox"/> METALS
<input type="checkbox"/> WATER	<input type="checkbox"/> ACIDS	<input type="checkbox"/> OTHER
<input checked="" type="checkbox"/> HEAT	<input checked="" type="checkbox"/> ALKALIS	<input type="checkbox"/> NONE

HAZARDOUS POLYMERIZATION:

OCCURS  WILL NOT OCCUR

COMMENTS:

AVOID CONTACT WITH ALKALI METALS OR OTHER ACTIVE METALS AND CERTAIN OF THEIR COMPOUNDS. DO NOT ADD WATER DIRECTLY TO THE PRODUCT. THE PRODUCT MAY BE ADDED TO WATER WITH MIXING AND DILUTION.

HAZARDOUS DECOMPOSITION PRODUCTS:

GENERATES TOXIC AND IRRITATING GASES AT HIGH TEMPERATURES. REACTS WITH METALS WITH THE EVOLUTION OF HYDROGEN WHICH WHEN MIXED IN AIR MAY RESULT IN FIRE OR EXPLOSION IF IGNITED. CHLORINE GAS MAY BE RELEASED BY MIXING WITH STRONG OXIDIZERS.

11. TOXICOLOGICAL INFORMATION

7647-01-0 HYDROCHLORIC ACID  
ACUTE ORAL LD50 : (RABBIT) 900 MG/KG  
ACUTE INHALATION LC50 : (RAT, 1 HR) 3124 PPM

12. ECOLOGICAL INFORMATION

7647-01-0 HYDROCHLORIC ACID  
AQUATIC ECOTOX DATA  
FISH:  
LC50 (96 HR.) (MOSQUITO FISE) 282 MG/L  
LC100(24 HR.) (TROUT) 10 MG/L  
INVERTEBRATES:  
LC50 (48 HR.) (STARFISH) 100 - 330 MG/L  
LC50 (48 HR.) (SHRIMP) 100 - 330 MG/L  
LC50 (48 HR.) (SHORE CRAB) 240 MG/L  
AMPHIBIANS:  
NO DATA AVAILABLE  
PLANTS:  
NO DATA AVAILABLE  
TERRESTRIAL ECOTOX DATA  
WILDLIFE:  
NO DATA AVAILABLE

PLANTS:  
NO DATA AVAILABLE

ENVIRONMENTAL FATE DATA  
BIOTIC:

NO DATA AVAILABLE

ABIOTIC:

DISSOCIATES IN WATER

HYDROCHLORIC ACID CAN BE ACUTELY TOXIC IN AQUATIC LIFE THROUGH REDUCTION IN AQUEOUS PH TO TOXIC LEVELS. TYPICALLY MOST AQUATIC SPECIES ARE INTOLERANT OF PH LEVELS LOWER THAN 5.5 FOR ANY EXTENDED LENGTH OF TIME. REDUCTION IN AQUEOUS PH LEVELS MAY ALSO CAUSE THE LIBERATION OF METALS SUCH AS ALUMINUM WHICH WILL ALSO CONTRIBUTE TO EXHIBITED TOXICITY. HYDROCHLORIC ACID WILL DISSOCIATE IN WATER AND UNDERGO NEUTRALIZATION WITH CARBONATE AND OTHER NATURALLY OCCURRING BUFFERING AGENTS. TERRESTRIAL ORGANISMS WOULD BE SUBJECT TO SEVERE BURNS IF EXPOSED TO HCL DURING AN ACCIDENTAL RELEASE. A LARGE HCL RELEASE COULD LEAD TO A PERSISTENT REDUCTION IN PH IN A POORLY BUFFERED SYSTEM LACKING IN CARBONATES OR OTHER NATURALLY OCCURRING ACID NEUTRALIZERS. CARE SHOULD BE TAKEN TO AVOID ACCIDENTAL RELEASES TO AQUATIC OR TERRESTRIAL ECOSYSTEMS.

#### 13. DISPOSAL CONSIDERATIONS

THE MATERIALS RESULTING FROM CLEAN-UP OPERATIONS MAY BE HAZARDOUS WASTES AND, THEREFORE, SUBJECT TO SPECIFIC REGULATIONS. PACKAGE, STORE, TRANSPORT, AND DISPOSE OF ALL (CLEAN-UP) MATERIALS AND ANY CONTAMINATED EQUIPMENT IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS.

ENSURE THAT ALL RESPONSIBLE FEDERAL, STATE, AND LOCAL AGENCIES RECEIVE PROPER NOTIFICATION OF SPILL AND DISPOSAL METHODS.

SHIPMENTS OF WASTE MATERIALS MAY BE SUBJECT TO MANIFESTING REQUIREMENTS PER APPLICABLE REGULATIONS. APPROPRIATE DISPOSAL WILL DEPEND ON THE NATURE OF EACH WASTE MATERIAL AND SHOULD BE DONE BY A COMPETENT AND PROPERLY PERMITTED CONTRACTOR.

#### 14. TRANSPORT INFORMATION

DOT PROPER SHIPPING NAME: HYDROCHLORIC ACID, SOLUTION

DOT HAZARD CLASS: 8

DOT IDENTIFICATION NUMBER: UN1789

DOT PACKING GROUP: II

DOT HAZARDOUS SUBSTANCE(S): RQ 5,000 LBS. (HYDROCHLORIC ACID)

DOT MARINE POLLUTANT(S): NOT APPLICABLE

ADDITIONAL DESCRIPTION REQUIREMENT: NOT APPLICABLE

#### 15. REGULATORY INFORMATION

##### U.S. FEDERAL REGULATIONS:

OSHA STANDARD 29 CFR 1910.1200 REQUIRES THAT INFORMATION BE PROVIDED TO EMPLOYEES REGARDING THE HAZARDS OF CHEMICALS BY MEANS OF A HAZARD COMMUNICATION PROGRAM INCLUDING LABELING, MATERIAL SAFETY DATA SHEETS, TRAINING AND ACCESS TO WRITTEN RECORDS. WE REQUEST THAT YOU, AND IT IS YOUR LEGAL DUTY TO, MAKE ALL INFORMATION IN THIS MATERIAL SAFETY DATA SHEET AVAILABLE TO YOUR EMPLOYEES.

TO AID OUR CUSTOMERS IN COMPLYING WITH REGULATORY REQUIREMENTS, SARA TITLE III HAZARD CATEGORIES FOR THIS PRODUCT ARE INDICATED BELOW. IF THE WORD "YES" APPEARS NEXT TO ANY CATEGORY, THIS PRODUCT MAY BE REPORTABLE BY YOU UNDER THE REQUIREMENTS OF 40.CFR.370. PLEASE CONSULT THOSE REGULATIONS FOR DETAILS.

UNDER SECTION 302 OF THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986, HYDROGEN CHLORIDE IN THE GAS PHASE IS CLASSIFIED AS AN EXTREMELY HAZARDOUS SUBSTANCE. THIS MATERIAL CONTAINS HYDROGEN CHLORIDE IN AQUEOUS SOLUTION.

THIS PRODUCT CONTAINS A TOXIC CHEMICAL OR CHEMICALS SUBJECT TO THE REPORTING REQUIREMENTS OF SECTION 313 OF TITLE III OF THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 AND 40 CFR 372. SEE SECTION 2, LIST LEGEND 02.

TSCA:

ALL COMPONENTS OF THIS PRODUCT THAT ARE REQUIRED TO BE ON THE TSCA INVENTORY ARE LISTED ON THE INVENTORY.

SARA/TITLE III HAZARD CATEGORIES:

IMMEDIATE (ACUTE) HEALTH: YES REACTIVE HAZARD YES  
DELAYED (CHRONIC) HEALTH: NO SUDDEN RELEASE OF PRESSURE NO  
FIRE HAZARD: NO

HMIS HAZARD RATINGS:

HEALTH HAZARD: 3 FIRE HAZARD: 0 REACTIVITY: 2

STATE REGULATIONS:

SEE SECTION 2. COMPOSITION/INFORMATION ON INGREDIENTS LIST LEGEND FOR APPLICABLE STATE REGULATION.

CONSULT LOCAL LAWS FOR APPLICABILITY.

INTERNATIONAL REGULATIONS:

CONSULT THE REGULATIONS OF THE IMPORTING COUNTRY.

CANADA:

WHMIS HAZARD CLASS: D1B, E

16. OTHER INFORMATION

MSDS LEGEND:

ACGIH = AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS

CAS = CHEMICAL ABSTRACTS SERVICE REGISTRY NUMBER

CEILING = CEILING LIMIT (15 MINUTES)

CEL = CORPORATE EXPOSURE LIMIT

OSHA = OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION

PEL = PERMISSIBLE EXPOSURE LIMIT (OSHA)

STEL = SHORT TERM EXPOSURE LIMIT (15 MINUTES)

TDG = TRANSPORTATION OF DANGEROUS GOODS (CANADA)

TLV = THRESHOLD LIMIT VALUE (ACGIH)

TWA = TIME WEIGHTED AVERAGE (8 HOURS)

WHMIS = WORKER HAZARDOUS MATERIALS INFORMATION SYSTEM (CANADA)

\* = SEE SECTION 3 HAZARDS IDENTIFICATION - REPEATED EXPOSURE (CHRONIC) INFORMATION

THIS MATERIAL SAFETY DATA SHEET (MSDS) COVERS THE FOLLOWING MATERIALS:

- MURIATIC ACID 20BE
- MURIATIC ACID 32% (20 DEG. BE')
- MURIATIC ACID 18%-BELLE
- MURIATIC ACID 20 BE' DEER PARK
- MURIATIC ACID 20 BE' COMMERCIAL NIAGARA
- MURIATIC ACID 20 BE' WATER WHITE NIAGARA
- MURIATIC ACID 20 BE' HIGH GRADE EXCHANGE
- MURIATIC ACID 20 COMMERCIAL
  
- MURIATIC ACID 20 BE' WATER WHITE TACOMA
- MURIATIC ACID 22 BE' WATER WHITE TACOMA
- MURIATIC ACID 18%-NIAGARA
- MURIATIC ACID 10%-DEER PARK
- MUR ACD 20 WW-TAC (CAN)
- MUR ACD 22 WW-TAC (CAN)
- MUR ACID 20 COM NF (CAN)
- MUR ACD 20 WW-NIAG (CAN)

----- FOR ADDITIONAL INFORMATION -----

CONTACT: MSDS COORDINATOR UNIVAR USA INC.  
DURING BUSINESS HOURS, PACIFIC TIME (425)889-3400

----- NOTICE -----

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ALL EXPRESS OR IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A

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PARTICULAR PURPOSE, WITH RESPECT TO THE PRODUCT OR INFORMATION PROVIDED HEREIN,

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AND SHALL UNDER NO CIRCUMSTANCES BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES. \*\*

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\* \* \* E N D O F M S D S \* \* \*

ACID

001 10/01/04 SULFURIC ACID, 66 BE 93.2%

\*\*\*\*\*

PRODUCT IDENTIFICATION

\*\*\*\*\*

PRODUCT NAME: SULFURIC ACID, 66 BE 93.2%

MSDS#: DQ-66BE

TAP

DATE ISSUED: 05/08/2004

SUPERSEDES: NEW

ISSUED BY: 004690

MATERIAL SAFETY DATA SHEET

CHEMICAL PRODUCT/COMPANY IDENTIFICATION

Material Identification

CAS Number	7664-93-9
Formula	H2SO4
Molecular Weight	98.08
CAS Name	SULFURIC ACID
Grade	66 BE

Distributed by:  
 Univar USA Inc.  
 6100 Carillon Point  
 Kirkland, WA 98033  
 425-889-3400

PHONE NUMBERS

Transport Emergency CHEMTREC 1-800-424-9300 (outside U.S.)  
 703-527-3887

COMPOSITION/INFORMATION ON INGREDIENTS

Components

Material	CAS Number	% By Weight
SULFURIC ACID	7664-93-9	93.2
WATER	7732-18-5	6.8

HAZARDS IDENTIFICATION

Potential Health Effects

Exposure to Sulfuric Acid mists by inhalation may cause irritation of the nose and throat with sneezing, sore throat or runny nose; non-specific effects such as headache, nausea and weakness. Gross overexposure may cause irritation of nose, throat, and lungs with cough, difficulty breathing or shortness of breath. Pulmonary edema (body fluid in the lungs) with cough, wheezing, abnormal lung sounds, possibly progressing to severe shortness of breath and bluish discoloration of the skin; symptoms may be delayed. Repeated and/or prolonged exposure to mists may cause corrosion of teeth.

Skin contact with liquid Sulfuric Acid may cause skin corrosion, burns or ulcers. Contact with a 1 % solution may cause slight irritation with itching, redness or swelling. Repeated and/or prolonged exposure to mists may cause irritation with itching, burning, redness, swelling or rash.

Consume  
Total 200 gAL A YEAR

Sulfuric Acid is USED  
IN MANY DIFFERENT TANKS

Eye contact with liquid Sulfuric Acid may cause eye corrosion or ulceration; blindness may result. Repeated and/or prolonged exposure to mists may cause eye irritation with tearing, pain or blurred vision.

Immediate effects of ingestion of Sulfuric Acid may include burns of the mouth, throat, esophagus and stomach, with severe pain, bleeding, vomiting, diarrhea and collapse of blood pressure - damage may appear days after exposure.

Increased susceptibility to the effects of this material may be observed in persons with pre-existing disease of the lungs.

The International Agency for Research on Cancer (IARC) classified "strong inorganic acid mists containing sulfuric acid" as a Category 1 carcinogen, a substance that is "carcinogenic to humans". This classification is for strong inorganic acid mists only and does not apply to sulfuric acid or sulfuric acid solutions. The basis for the IARC classification rests on several epidemiology studies which have several deficiencies. These studies did not account for exposure to other substances, some known to be animal or potential human carcinogens, social influences (smoking, etc.) and included small numbers of subjects. Based on the overall weight of evidence from all human and chronic animal studies, no definitive casual relationship between sulfuric acid mist exposure and respiratory tract tumors has been shown.

"Strong inorganic acid mists containing sulfuric acid" are also listed by The National Toxicology Program (NTP) as "known human carcinogens." This limits the classification to sulfuric acid aerosols and does not extend to the liquid product, unless the acid is used under conditions that result in the formation of mists or aerosols. Fuming acid is covered by the classification.

#### Carcinogenicity Information

The following components are listed by IARC, NTP, OSHA or ACGIH as carcinogens.

STRONG ACID MISTS CONTAINING SULFURIC ACID	1	X	A2
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#### FIRST AID MEASURES

##### First Aid

##### INHALATION

If inhaled, immediately remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Please note: Symptoms may be delayed; prompt medical attention may be required. Call a physician.

##### SKIN CONTACT

In case of contact, immediately flush skin with plenty of water for at least 15 minutes, while removing contaminated clothing and shoes. Call a physician. Wash contaminated clothing before reuse.

While the patient is being transported to a medical facility, continue the application of cold, wet compresses. If medical treatment must be delayed, repeat the flushing with cold water or soak the affected area with cold water to help remove the last traces of sulfuric acid. Creams or ointments should not be applied before or during the washing phase of treatment.

##### EYE CONTACT

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

#### INGESTION

If swallowed, do not induce vomiting. Give large quantity of water. Call a physician immediately. Never give anything by mouth to an unconscious person.

#### Notes to Physicians

Continued washing of the affected area with cold or iced water will be helpful in removing the last traces of sulfuric acid. Creams or ointments should not be applied before or during the washing phase of the treatment.

#### FIRE FIGHTING MEASURES

##### Flammable Properties

Will not burn.

##### Fire and Explosion Hazards:

Reacts with most metals, especially when dilute, to give flammable, potentially explosive hydrogen gas. Follow appropriate National Fire Protection Association (NFPA) codes.

##### Extinguishing Media

Use media appropriate for surrounding material.

Use water spray to cool containers exposed to fire; do not get water inside containers.

##### Fire Fighting Instructions

Evacuate personnel to a safe area. Keep personnel removed and upwind of fire. Generates heat upon addition of water, with possible spattering. Wear full protective clothing. Runoff from fire control may cause pollution. Neutralize run-off with lime, soda ash, etc., to prevent corrosion of metals and formation of hydrogen gas. Wear self-contained breathing apparatus if fumes or mists are present.

#### ACCIDENTAL RELEASE MEASURES

##### Safeguards (Personnel)

NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate

PERSONAL PROTECTIVE EQUIPMENT during clean-up.

##### Accidental Release Measures

Stop flow if possible. Review "Fire and Explosion Hazards" and "Safety Precautions" before proceeding with clean up. Use appropriate protective equipment during clean up. Soak up small spills with dry sand, clay or diatomaceous earth. Dike large spills, and cautiously dilute and neutralize with lime or soda ash, and transfer to waste water treatment system. Prevent liquid from entering sewers, waterways, or low areas.

If this product is spilled and not recovered, or is recovered as a waste for treatment or disposal, the Reportable Quantity is 1,000 lbs. (based on the sulfuric acid content of the solution spilled). Comply with Federal, State, and local regulations on reporting releases.

Vendor Emergency Exposure Limits (EEL) are established to

facilitate site or plant emergency evacuation and specify airborne concentrations of brief durations which should not result in permanent adverse health effects or interfere with escape. EEL's are expressed as airborne concentration multiplied by time (CxT) for up to a maximum of 60 minutes and as a ceiling airborne concentration. These limits are used in conjunction with engineering controls/monitoring and as an aid in planning for episodic releases and spills. For more information on the applicability of EEL's, contact Vendor.

The Vendor Emergency Exposure Limit (EEL) for Sulfuric Acid is 10 mg/m<sup>3</sup> for 15 to 60 minutes and 20 mg/m<sup>3</sup> for up to 15 minutes with a not-to-exceed ceiling of 20 mg/m<sup>3</sup>.

#### HANDLING AND STORAGE

##### Handling (Personnel)

Do not get in eyes, on skin, or on clothing. Avoid breathing vapors or mist. Wash thoroughly after handling.

Keep containers closed. Do not add water to contents while in container because of violent reaction.

##### Storage

Keep out of sun and away from heat, sparks, and flame. Keep container tightly closed and (drum) closure up to prevent leakage. Loosen closure carefully. Relieve internal pressure when received and at least weekly thereafter. Do not use pressure to empty. Be sure closure is securely fastened before moving container. Do not wash out container or use it for other purposes; replace closure after each withdrawal and return it with empty container.

#### EXPOSURE CONTROLS/PERSONAL PROTECTION

##### Engineering Controls

Good general ventilation should be provided to keep vapor and mist concentrations below the exposure limits.

##### Personal Protective Equipment

Have available and wear as appropriate for exposure conditions when handling containers or operating equipment containing sulfuric acid: chemical splash goggles; full-length face shield/chemical splash goggles combination; acid-proof gauntlet gloves, apron, and boots; long sleeve wool, acrylic, or polyester clothing; acid proof suit and hood; and appropriate NIOSH respiratory protection. In case of emergency or where there is a strong possibility of considerable exposure, wear a complete acid suit with hood, boots, and gloves. If acid vapor or mist are present and exposure limits may be exceeded, wear appropriate NIOSH respiratory protection.

##### # Exposure Guidelines

##### Exposure Limits

Sulfuric Acid, 66 Be

PEL	(OSHA)	1 mg/m <sup>3</sup> , 8 Hr. TWA
TLV	(ACGIH)	0.2 mg/m <sup>3</sup> , 8 Hr. TWA
		A2 (Sulfuric acid contained in strong inorganic acid mists)
AEL *	(Vendor)	0.5 mg/m <sup>3</sup> , 8 & 12 Hr. TWA
		1.5 mg/m <sup>3</sup> , 15 minute TWA

\* AEL is Vendor's Acceptable Exposure Limit. Where governmentally imposed occupational exposure limits which are lower than the AEL are in effect,

such limits shall take precedence.

#### PHYSICAL AND CHEMICAL PROPERTIES

##### Physical Data

Boiling Point	279 C @ 760 mm Hg
Vapor Pressure	<0.3 mm Hg @ 25 C (77 F) <0.6 mm Hg @ 38 C (100 F)
Vapor Density	3.4
Melting Point	-35 C
Evaporation Rate	<1 (Butyl Acetate=1.0)
Solubility in Water	100 WT%
pH	<1
Odor	Odorless.
Form	Oily; clear to turbid liquid
Color	Colorless to light gray
Specific Gravity	1.835

#### STABILITY AND REACTIVITY

##### Chemical Stability

Stable, but reacts violently with water and organic materials with evolution of heat.

##### Incompatibility with Other Materials

Vigorous reactions with water; alkaline solutions; metals, metal powder; carbides; chlorates; fuminates; nitrates; picrates; strong oxidizing, reducing, or combustible organic materials. Hazardous gases are evolved on contact with chemicals such as cyanides, sulfides, and carbides.

##### Decomposition

Releases sulfur dioxide at extremely high temperatures.

##### Polymerization

Polymerization will not occur.

#### TOXICOLOGICAL INFORMATION

##### Animal Data

###### EYE:

Animal testing indicates this material is corrosive to the eye, when tested undiluted. Animal testing indicates this material is a moderate eye irritant, when tested as 10 % solution.

###### SKIN:

The concentrated compound is corrosive. Animal testing indicates this material is a slight skin irritant, when tested as 10 % solution.

###### INGESTION:

LD50, rat: 2,140 mg/kg.

###### INHALATION:

8 hour, LC50, guinea pigs: 30 mg/m3.

Single and repeated exposure caused: Irritation of the respiratory tract. Corrosion of the respiratory tract. Lung damage. Labored breathing. Altered respiratory rate. Pulmonary edema. Repeated exposure caused: Altered red blood cell count.

CARCINOGENIC, DEVELOPMENTAL, REPRODUCTIVE, MUTAGENIC EFFECTS:

No adequate animal data are available to define the carcinogenic potential of this material. Limited studies do not suggest effects. In animal testing this material has not caused developmental toxicity. No animal data are available to define the following effects of this material: reproductive toxicity. This material has not produced genetic damage in bacterial cultures. It has not been tested for genetic toxicity in mammalian cell cultures or in animals.

#### ECOLOGICAL INFORMATION

##### Ecotoxicological Information

##### AQUATIC TOXICITY:

Slightly to moderately toxic.

96 hour LC50 - Bluegill sunfish: 10.5 ppm.

48 hour TLM - Flounder: 100-300 ppm

#### DISPOSAL CONSIDERATIONS

##### Waste Disposal

Cleaned-up material may be an RCRA Hazardous Waste on disposal due to the corrosivity characteristic. Do not flush to surface water or sanitary sewer system. Comply with Federal, State, and local regulations. If approved, neutralize and transfer to waste treatment system.

#### TRANSPORTATION INFORMATION

##### Shipping Information

DOT/IMO

Proper Shipping Name       SULFURIC ACID

Hazard Class                8

UN No.                      1830

DOT/IMO Label              CORROSIVE

Packing Group              II

Reportable Quantity       1000 lb (454 kg)

#### REGULATORY INFORMATION

##### U.S. Federal Regulations

TSCA Inventory Status     Reported/Included.

#### TITLE III HAZARD CLASSIFICATIONS SECTIONS 311, 312

Acute                   : Yes

Chronic                 : Yes

Fire                    : No

Reactivity             : Yes

Pressure                : No

#### HAZARDOUS CHEMICAL LISTS

SARA Extremely Hazardous Substance: Yes

CERCLA Hazardous Substance : Yes

SARA Toxic Chemical       : No

State Regulations (U.S.)

Strong inorganic acid mists containing sulfuric acid are known to the State of California to causa cancer.

#### OTHER INFORMATION

NFPA, NPCA-HMIS

NFPA Rating  
Health 3  
Flammability 0  
Reactivity 2

Water Reactive.

NPCA-HMIS Rating  
Health 3  
Flammability 0  
Reactivity 2

Personal Protection rating to be supplied by user depending on use conditions.

Because of its corrosive characteristics and inherent hazards, Sulfuric Acid should not be used in sewer or drain cleaners or any similar application; regardless of whether they are formulated for residential, commercial or industrial use. Vendor will not knowingly sell sulfuric acid to individuals or companies who repackage the product for sale as sewer or drain cleaners, or any other similar use.

The data in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process.

----- FOR ADDITIONAL INFORMATION -----

CONTACT: MSDS COORDINATOR UNIVAR USA INC.  
DURING BUSINESS HOURS, PACIFIC TIME (425) 889-3400

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\* \* \* E N D O F M S D S \* \* \*

MATERIAL SAFETY  
DATA SHEET

ATOTECH USA INC.  
1750 OVERVIEW DRIVE  
P.O. BOX 12000  
ROCK HILL, S.C. 29731-2000

EMERGENCY TELEPHONE  
NUMBER

8:00 am - 5:00 pm  
(803) 817-3500

CHEMTREC - 24 HOURS  
1-800-424-9300

NAME USED ON LABEL: ACTIM&T(TM) 300  
CHEMICAL NAME (if single substance): Mixture  
CHEMICAL FAMILY: Mixture  
FORMULA: Proprietary

\*\*\*\*\*  
HAZARDOUS INGREDIENTS  
\*\*\*\*\*

IDENTITY	CAS No.	%	EXPOSURE LIMITS
Sodium Fluoride	7681-49-4	1-7	ACGIH-TWA(1): 2.5 mg/m3 OSHA-PEL(1): 2.5 mg/m3
Sodium Bisulfate	7681-38-1	60-90	Not Established

(1) Fluorides as F.

\*\*\*\*\*  
PHYSICAL DATA  
\*\*\*\*\*

BOILING POINT: N/APP	MELTING POINT: N/A
SPECIFIC GRAVITY: >1	VAPOR PRESSURE @ 20 C: N/A
VAPOR DENSITY (Air=1):	SOLUBILITY IN WATER: Complete
% VOLATILE: None.	EVAPORATION RATE
pH (aq. soln): <2	(Butyl Acetate=1): N/A

APPEARANCE: Off-white to tan granular solid. Odorless.

\*\*\*\*\*  
FIRE AND EXPLOSION DATA  
\*\*\*\*\*

FLASH POINT (Test Method)	AUTOIGNITION TEMPERATURE	FLAMMABLE LTS.
N/APP	N/A	LEL-N/A UEL-N/A

EXTINGUISHING MEDIA: Nonflammable -- Use extinguishing media appropriate to surrounding fire conditions.

SPECIAL FIRE FIGHTING PROCEDURES: Do not get material on skin or clothing. Avoid inhalation of dusts. Stay upwind, out of low areas, and ventilate closed spaces before entering. Cool containers from the side with water until fire is out. Use water spray to reduce vapor; do not put water directly on leak or spill area. Keep combustibles away from spilled material. Self-contained breathing apparatus (SCBA)

\*N/A = NOT AVAILABLE  
\*\*N/APP = NOT APPLICABLE  
\*\*\*N/E = NOT ESTABLISHED

PMCODE: ECG01

Page 1 of 6

Consume  
100 LBS A YEAR

JUST TO BE SAFE  
NOT Real sure if we ARE going to  
USE SALTS VS. liquid Acid

NAME USED ON LABEL: ACTIM&T(TM) 300

and chemical-protective clothing can be worn but may not provide adequate thermal protection for chemical fire unless stated by the manufacturer. Structural fire fighter's protective clothing may not be effective. Move containers from fire area, if possible to do so without risk.

UNUSUAL FIRE AND EXPLOSION HAZARDS: During fire conditions, hydrogen fluoride and oxides of sulfur may be evolved.

\*\*\*\*\*  
HEALTH HAZARD DATA  
\*\*\*\*\*

EYE CONTACT: Causes mild to severe irritation to the eyes and surrounding areas characterized by redness, swelling, tearing, and pain. Prolonged contact may cause burns.

SKIN CONTACT: Causes mild to severe irritation to the skin characterized by redness, swelling, and pain. Prolonged contact may cause burns.

INHALATION: Causes irritation or burns to the respiratory passages, including the nose, airway, and lungs characterized by sore throat, chest pain, cough, dizziness, headache, nausea, and shortness of breath.

INGESTION: May be harmful if swallowed. Causes irritation or burns to the mouth, throat, and stomach characterized by sore throat, abdominal pain, headache, nausea, vomiting, and diarrhea.

CHRONIC TOXICITY: Repeated exposure to Fluorides disrupts the synthesis of collagen and leads to the breakdown of collagen in bone, tendon, muscle, skin, cartilage, lungs, kidney and trachea.

CARCINOGENICITY:

	NTP	IARC	Other
Yes			
No	X	X	X

\*\*\*\*\*  
SUGGESTED FIRST AID  
\*\*\*\*\*

EYES: Immediately flush eyes with flowing water for at least 15 minutes while holding eyelids away from eyes. Seek medical attention, if irritation persists.

SKIN: Wash exposed areas thoroughly with soap and flowing water, while removing contaminated clothing and shoes. If irritation persists, seek medical attention.

NAME USED ON LABEL: ACTIM&T(TM) 300

INHALATION: Remove exposed individual from source of exposure. If breathing is difficult, oxygen may be administered by certified persons only. Artificial respiration may be performed only if exposed individual is not breathing. If breathing is difficult, seek medical attention.

INGESTION: Drink large quantities of mil or water. Follow with milk of magnesia, beaten eggs, or vegetable oil. Never give anything by mouth to an unconscious or convulsing person. DO NOT induce vomiting. Seek medical attention.

\*\*\*\*\*  
REACTIVITY DATA  
\*\*\*\*\*

STABILITY: Stable

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Moisture, extreme temperatures

INCOMPATIBILITY (Materials to Avoid): Strong acids (causes formation of hydrofluoric acid), Strong alkaline materials. Reacts with water to form a weak sulfuric acid solution. Do not mix with liquid chlorine bleach, ammonia, or similar products.

HAZARDOUS DECOMPOSITION PRODUCTS: Sulfuric acid, hydrogen fluoride, hydrofluoric acid. Sulfur trioxide and sulfur dioxide upon thermal decomposition at temperatures exceeding 800 F.

\*\*\*\*\*  
SPECIAL PROTECTION INFORMATION  
\*\*\*\*\*

VENTILATION: Local exhaust or an enclosed handling system is highly recommended. Mechanical (general) ventilation is required.

RESPIRATORY PROTECTION: Use NIOSH/MSHA-approved respiratory protection if ventilation is inadequate.

EYE AND FACE PROTECTION: Chemical goggles. DO NOT WEAR CONTACT LENSES!

OTHER PERSONAL PROTECTION: Butyl rubber or neoprene gloves, boots, apron, and sleeves. An impervious overall may be substituted for the apron and sleeves when additional protection is needed. An emergency eyewash and drench shower should be available in the immediate work area. Launder contaminated clothing before reuse.

\*N/A = NOT AVAILABLE  
\*\*N/APP = NOT APPLICABLE  
\*\*\*N/E = NOT ESTABLISHED

NAME USED ON LABEL: ACTIM&T(TM) 300

\*\*\*\*\*  
SPECIAL PRECAUTIONS  
\*\*\*\*\*

HANDLING: Do not get in eyes, on skin, or on clothing. Do not breathe dusts. Do not take internally. Use only with adequate ventilation. Wash thoroughly after handling. Avoid contact with strong acids and alkaline materials. Emptied container retains vapor and product residue - Observe all label safeguards until container is cleaned, reconditioned or destroyed. Keep container tightly closed in an upright position.

STORAGE: Store in a cool, dry place away from incompatible material.

\*\*\*\*\*  
ENVIRONMENTAL INFORMATION  
\*\*\*\*\*

SPILL RESPONSE: Wear NIOSH/MSHA-approved respiratory protection and protective clothing to prevent skin & eye contact when cleaning spill. Do not get spilled material on skin or clothing; stop leak if you can do so without risk. Carefully sweep up spilled material and place in a suitable container for disposal. Avoid creating a dusty atmosphere. Ventilate area and CAREFULLY flush area where spill has occurred with water. Retain this water/ residue mixture for evaluation and/or disposal.

RECOMMENDED DISPOSAL: Disposal of waste material from the use of this product may be subject to federal, state, and local regulations. Refer to Part 261 of 40 CFR for the applicability of federal regulations. Consult with your state and local governments for additional regulatory requirements. Disposal of this material must be in a manner compliant with all federal, state, and local regulations.

\*\*\*\*\*  
TRANSPORTATION  
\*\*\*\*\*

HAZARDOUS MATERIAL/DANGEROUS GOODS SHIPMENT IS INDICATED BY (X) BELOW:

(X) NOT REGULATED (NOTE: For reportable quantities which may apply, see Miscellaneous.)

NAME USED ON LABEL: ACTIM&T(TM) 300

\*\*\*\*\*  
MISCELLANEOUS  
\*\*\*\*\*

EPA/DOT - REPORTABLE QUANTITY (RQ) FOR HAZARDOUS SUBSTANCES:

(X) RQ of 1000 lb / 454 Kg for Sodium Fluoride

EPA - Any release of hazardous substance(s) in a quantity equal to or exceeding the RQ in any 24-hour period requires the immediate notification of the National Response Center in Washington, D.C. at (800) 424-8802. Other notification requirements, such as state and local governments, may apply.

DOT - Any package containing a hazardous substance in a quantity equal to or exceeding the RQ is regulated as a hazardous material.

\*\*\*\*\*  
ADDITIONAL INFORMATION  
\*\*\*\*\*

RATINGS:

	F	H	R	PPE	Spec Haz
HMIS	0	3*	0	X	N/APP
NFPA	0	2	0	N/APP	N/APP

F= Flammability      H=Health      R=Reactivity  
PPE= Personal Protection Equipment      Spec Haz= Special Health Hazards  
W=Water Reactive      OX=Oxidizer      \* = Chronic Hazard

SARA Title III Classifications:	Yes	No
Immediate (Acute) Health . . .	X	
Delayed (Chronic) Health . . .	X	
Sudden Release of Pressure . .		X
Reactive . . . . .		X
Fire . . . . .		X

Components of this product are identified below if they are present in excess of de minimus reporting levels. Components that are not required to be identified by specific chemical name may have a generic description.

SARA Title III Section 302 Extremely Hazardous Substances:  
None

SARA Title III Section 313 Toxic Chemicals:  
None

STATE RIGHT-TO-KNOW

\*N/A = NOT AVAILABLE  
\*\*N/APP = NOT APPLICABLE  
\*\*\*N/E = NOT ESTABLISHED

MATERIAL SAFETY  
DATA SHEET

ATOTECH USA INC.  
ROCK HILL, S.C. 29731-2000

NAME USED ON LABEL: ACTIM&T(TM) 300

Components of this product which are specifically identified in the ingredients section of this MSDS may be listed as hazardous by these and/or other states: Massachusetts, New Jersey, Pennsylvania, Florida, New York, Connecticut, Louisiana, Illinois, Rhode Island.

-----  
CAREFULLY READ THE FOLLOWING: The identification of ingredients in this document meets or exceeds the requirements set forth in 29 CFR, 40 CFR, et al. at the date of publication. Ingredients present in a mixture or solution which are generically identified or not referenced in this document are not regulatorily required to be specifically identified or referenced. The information contained herein should be provided to all those who will use, handle, store, transport, or may otherwise be exposed to this product.

ATOTECH USA certifies that all ingredients, whether identified in this MSDS or not, are on the TSCA inventory (for USA manufacture and/or sales only).

THE INFORMATION CONTAINED HEREIN, TO THE BEST OF OUR KNOWLEDGE, IS CONSIDERED TO BE ACCURATE. SUCH INFORMATION IS OFFERED SOLELY FOR YOUR CONSIDERATION, INVESTIGATION, AND VERIFICATION, AND WE DO NOT SUGGEST OR GUARANTEE THAT ANY PRECAUTIONS, PROCEDURES, RECOMMENDATIONS ETC. ARE PREFERRED OR UNIQUE. ATOTECH USA INC. MAKES NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO THE USE OF THIS INFORMATION OR THE USE OF MATERIAL IDENTIFIED HEREIN, IN COMBINATION WITH ANY OTHER MATERIAL OR PROCESS, AND ASSUMES NO RESPONSIBILITY THEREFORE. THIS DOCUMENT WAS DEVELOPED UNDER THE REQUIREMENTS OF THE UNITED STATES, AND AS SUCH MAY NOT SATISFY OTHER STATE OR REGIONAL REQUIREMENTS.

Prepared by the Product Safety Department (PSD)

ISSUED: 12/04/1997

SUPERSEDES: 10/1996

Electro-cleaner  
(Direct Current)

## MATERIAL SAFETY DATA SHEET

EAP

MSDS Number 2108  
MSDS Date 10/22/98  
Spsds Date 10/25/93  
Page Number 1 of 6

### SECTION I - Product and Company Information

**Product Name** ENPREP 160SE

**IMIS Hazard Rating** Health: 3 Fire: 0 Reactivity: 1

**Company Identification** ENTHONE-OMI INC.  
P.O. Box 1900  
New Haven CT 06508

**Contact** Regulatory Affairs  
**Telephone/Fax** (203)934-8611 / (203)799-8179  
**Emergency** CHEMTRÉC  
(800)424-9300

**Preparer** James P. Link  
Regulatory Consultant

ENPREP is a registered trademark of Enthone-OMI Inc.

### SECTION II - Ingredient and Hazard Information

Ingredient Name	CAS Number	Percent	TSCA
SODIUM METASILICATE	6834-92-0	< 80.0	Y
SODIUM HYDROXIDE	1310-73-2	< 25.0	Y
PROPRIETARY ADDITIVE(S)	TRADE SECRET	< 5.0	Y

All ingredients comply with applicable rules or orders under TSCA.

Weight percents listed above are within 5% of the actual value.

**Carcinogen:**

Not listed by NTP, IARC, OSHA.

**Reference:**

NA

### SECTION III - Hazards Identification

**Inhalation:**

Dust may damage upper respiratory tract and lung tissue which may cause chemical pneumonia depending upon severity of exposure.

**Skin Contact:**

---

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www.enthone-omi.com

Consume

200 LBS A YEAR

## MATERIAL SAFETY DATA SHEET

MSDS Number 2108  
MSDS Date 10/22/98  
Spds Date 10/25/93  
Page Number 2 of 6

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Can cause severe burns.

**Eye Contact:**

Causes severe burns with damage to eyes and possible blindness.

**Ingestion:**

Can cause severe burns to mouth, esophagus and stomach.

**Chronic:**

Superficial destruction of skin or primary irritant dermatitis.

Inhalation of dust may result in irritation or damage to respiratory tract tissue and increased susceptibility to respiratory illness.

### SECTION IV - First Aid Measures

**Skin Contact:**

Immediately wash contaminated skin with plenty of water for 15 minutes. Remove contaminated clothing and footwear. Wash clothing before reuse. Discard footwear if it cannot be decontaminated. Seek immediate medical attention.

**Eye Contact:**

Immediately flush eyes with plenty of water for at least 15 minutes holding lids apart to ensure flushing of entire surface. Washing eyes within several seconds of exposure is essential to minimize damage. Seek immediate medical attention.

**Ingestion:**

Never give anything by mouth to an unconscious person, obtain immediate medical attention. If vomiting occurs spontaneously, keep airway clear. If swallowed DO NOT INDUCE VOMITING, give large amounts of water.

Seek immediate medical attention.

**Inhalation:**

Remove person from contaminated area. If breathing has stopped, resuscitate and administer oxygen if available.

Seek immediate medical attention.

### SECTION V - Fire-Fighting Measures

Flash Point Not Applicable

**Special Fire-Fighting Procedures:**

Reaction with water may be highly exothermic.

Wear self-contained breathing apparatus (SCBA) and complete personal protective equipment when potential for exposure to dusts or products of combustion exists.

**Unusual Fire-Fighting Hazards:**

In the presence of water, material may react with amphoteric metals (such as aluminum, zinc, or tin) generating hydrogen gas which will burn or explode if ignited.

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# MATERIAL SAFETY DATA SHEET

MSDS Number 2108  
MSDS Date 10/22/98  
Spds Date 10/25/93  
Page Number 3 of 6

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Thermal decomposition may yield toxic oxides of carbon, sulfur and sodium.

**Extinguishing Media:**

This product is not combustible.  
As appropriate for surrounding fire.

## SECTION VI - Accidental Release Measures

Avoid contact with skin, eyes and clothing. Wear protective equipment (see Section VIII). Sweep or shovel spilled material into clean plastic-lined steel drum and cover. Flush spill area with large amounts of water and neutralize residual traces with dilute acid such as dilute acetic acid. Dispose of in accordance with Local, State, and Federal regulations.

## SECTION VII - Handling and Storage

Store in a cool, dry place. Keep away from acids and organic compounds. Loosen cover cautiously when opening.

**Additional Information:**

Wash thoroughly after handling.

**Work/Hygienic Practices:**

Emergency eye wash and safety shower should be available. Wash thoroughly after handling.

## SECTION VIII - Exposure Controls and Personal Protection

Occupational Exposure Limits

	ACGIH TLV	ACGIH TLV-C	ACGIH STEL	OSHA STEL	OSHA PEL
SODIUM METASILICATE	NA	NA	NA	NA	NA
SODIUM HYDROXIDE	NA	2.00 mg/M3	NA	NA	2.00 mg/M3
PROPRIETARY ADDITIVE(S)	NA	NA	NA	NA	NA

**Respirator:**

Use NIOSH approved respirator when air concentration is greater than the TLV or PEL.

Use cartridge filter for caustic dust.

**Eye Protection:**

Chemical safety goggles recommended.  
Face shield recommended.

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MSDS Number 2108  
MSDS Date 10/22/98  
Spsds Date 10/25/93  
Page Number 4 of 6

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## Protective Clothing or Equipment:

Chemically resistant coveralls, hat, and shoes or boots.  
Natural rubber gloves.  
Neoprene gloves.

## Ventilation:

Local exhaust recommended.

## SECTION IX - Physical and Chemical Properties

Form	Powder
Color	White
Odor	Insignificant
Solubility	Essentially Complete
pH Value	Not Applicable
Boiling Point	Not Applicable
Vapor Pressure (mmHg)	Not Applicable
Melting Point	Not Available
Evaporation Rate	Non Volatile
% Volatile By Weight	Not Applicable
Specific Gravity:	NI

## SECTION X - Stability and Reactivity

### Stability:

Stable under normal conditions. See Incompatibility Information.

### Incompatibility (Materials to Avoid):

Acids, amphoteric metals (such as aluminum, zinc), organic compounds, heated water.

### Hazardous Decomposition Products:

Thermal decomposition may yield toxic oxides of carbon, sulfur and sodium.

### Hazardous Polymerization:

Hazardous polymerization will not occur.

### Conditions to Avoid:

NA

## SECTION XI - Toxicological Information

Route	Species	Exposure and Dose
SODIUM METASILICATE		
Oral	Rat, adult	LD50 1153.0 mg/kg
SODIUM HYDROXIDE		
Oral	Rabbit, adult	LDLo 500.0 mg/kg

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## MATERIAL SAFETY DATA SHEET

MSDS Number 2108  
MSDS Date 10/22/98  
Spsds Date 10/25/93  
Page Number 5 of 6

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### SECTION XII - Ecological Information

Ecological information on this product is not available.

### SECTION XIII - Disposal Considerations

For waste disposal of spent, spilled, or contaminated product contact a permitted TSDF (Treatment, Storage and Disposal Facility). Dispose of in accordance with all applicable Local, State, and Federal regulations.

### SECTION XIV - Transport Information

Please contact the Regulatory Affairs Department at (203) 799-4917 for the most current shipping information.

### SECTION XV - Regulatory Information

None

### SECTION XVI - Other Information

This product does not contain any chemicals subject to the reporting requirements of SARA, TITLE III, Section 313 (40CFR372) or known to the State of California to cause cancer or birth defects (to comply with California Statute [Section 25249.6]).

#### Disclaimer:

This Material Safety Data Sheet may be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Enthone-OMI Inc. furnishes the data contained herein in good faith at customer's request without liability or legal responsibility for same whatsoever, and no warranty or guarantee, express or implied, is made with respect to such data; nor does Enthone-OMI Inc. grant permission, recommendation, or inducement to infringe any patent whether owned by Enthone-OMI Inc. or others. The data is offered solely for your information and consideration. Since conditions of use are beyond Enthone-OMI's control, user assumes all responsibility and risk.

CAS=Chemical Abstract Service

IARC=International Agency for Research on Cancer

NA=Not Applicable

NI=No Relevant Information Available

NTP=National Toxicology Program

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## MATERIAL SAFETY DATA SHEET

MSDS Number 2108  
MSDS Date 10/22/98  
Spds Date 10/25/93  
Page Number 6 of 6

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PEL=Permissible Exposure Limit  
SDT=Standard Draize Test  
STEL=Short Term Exposure Limit  
TLV=ACGIH Threshold Limit Value  
TLV-C=ACGIH Threshold Limit Value, Ceiling  
TRADE SECRET=Claimed As Allowed Under 29 CFR 1910.1200

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TAP

SOAK CLEANER

Micel, Inc. 1240 N. Knollwood Circle, Anaheim, California 92801

MATERIAL SAFETY DATA SHEET

N.F.P.A. Rating: Health (3), Flammability (0), Reactivity (1)

**I. PRODUCT IDENTIFICATION**

Trade name (as labeled): BN-CLEANER

Chemical names, common names: Sodium Hydroxide Dry Solid, Sodium Salts Mixture

Manufacturer's name: MICEL, INCORPORATED

Address: 1240 N. KNOLLWOOD CIRCLE, ANAHEIM, CA 92801

Emergency phone: 1-800-424-9300

Name of preparer\*: Technical Dept.

Business phone: 714/995-3300

Date prepared: February 22, 1993

**II. HAZARDOUS INGREDIENTS**

Chemical Names	CAS Numbers	Percent*	Exposure Limits in Air		
			ACGIH (TLV)	OSHA (PEL)	OTHER
Sodium metasilicate	6834-92-0	<45%		2 mg/m <sup>3</sup>	as corrosive material.
Sodium Hydroxide	001310-73-2	<30%	ACGIH (TLV)	- 2 mg/m <sup>3</sup>	
				OSHA (PEL)	- 2 mg/m <sup>3</sup>

NOTE: this chemical is subject to the reporting requirements of section 313 of SARA title III.

**III. PHYSICAL PROPERTIES**

Vapor density (air=1): N/D

Melting point or range, F: N/D

Specific gravity: N/D

Boiling point or range, F: N/D

Solubility in water: Soluble

Vapor pressure, mmHg at 20 deg C: N/D

Evaporation rate (butyl acetate=1): N/D

Appearance and odor: White to off-white to amber granular powder with no appreciable odor.

HOW TO DETECT THIS SUBSTANCE\* (warning properties of substance as a gas, vapor, dust, or mist):

**IV. FIRE AND EXPLOSION**

Flash Point, F (give method): N/D

Autoignition temperature, F: N/D

Flammable limits in air, volume %: lower N/D upper N/D Fire extinguishing materials:

water spray carbon dioxide other:  
foam dry chemical

Special firefighting procedures: N/D

Unusual fire and explosion hazards: In water solution caustic may react with amphoteric metals (such as aluminum) generating hydrogen which is flammable and/or explosive if ignited.

Consume

600 LBS A YEAR

## V. HEALTH AND HAZARD INFORMATION

### SYMPTOMS OF OVEREXPOSURE for each potential route of exposure.

Inhaled: Dusts or mists may cause severe irritation to upper respiratory tract.

Contact with skin or eyes: May cause severe irritation with corneal injury and result in permanent impairment of vision, even blindness. Dusts may irritate eyes.

Absorbed through skin: Short single skin contact may cause severe skin burns. A single prolonged skin exposure is not likely to result in absorption of harmful amounts. The dermal LD50 has not been determined.

Swallowed: May cause gastrointestinal irritation or ulceration, and severe burns of the mouth and throat.

Acute: burns, resulting in frequently deep ulceration and ultimate scarring.

Chronic: The chronic local effect may consist of multiple areas of superficial destruction of the skin or of primary irritant dermatitis. Similarly inhalation of dust, spray, or mist may result in varying degrees of irritation or damage to the respiratory tract tissues and an increased susceptibility to respiratory illness.

### FIRST AID: EMERGENCY PROCEDURES

Eye Contact: Water is the only accepted method of removal of caustic soda from the eyes or skin. You may have 10 seconds or less to avoid serious permanent injury. Therefore IMMEDIATE first aid must be given after an injurious exposure. Moving the victim from water access for transport to medical aid should be done only on the advice of qualified medical personnel. While transporting victim to a medical facility, continue washing if possible. In case of eye contact, wash eyes immediately and continuously for 30 minutes. Call for medical assistance immediately.

Skin Contact: Immediate continued and thorough washing in flowing water for 30 minutes is imperative while removing contaminated clothing before reuse. Destroy contaminated shoes.

Inhaled: Remove to fresh air if effects occur. Consult medical.

Swallowed: DO NOT INDUCE VOMITING. Give large amounts of water or milk if available and transport to medical facility.

### SUSPECTED CANCER AGENT?

X NO: This product's ingredients are not found in the lists below.

YES: X\_Federal OSHA \_NTP \_IARC X\_Cal/OSHA(see note)\*

NOTE: California employers using Cal/OSHA-regulated carcinogens must register with Cal/OSHA.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: None established.

RECOMMENDATIONS TO PHYSICIAN: CORROSIVE. May cause stricture. If lavage is performed, suggest endotracheal and/or esophagosopic control. Material is strong alkali. If burn is present, treat as any thermal burn, after decontamination. For burns of skin only. Eye irrigation may be necessary for an extended period of time to remove as much caustic as possible. Duration of irrigation and treatment is at discretion of medical personnel. No specific antidote. Supportive care. Treatment based on judgement of the physician in response to reactions of the patient.



Other handling and storage requirements: Avoid storing next to strong acids. Should be stored in clean, dry areas. Product absorbs water and carbon dioxide from air. Keep containers closed and sealed.

Protective measures during maintenance of contaminated equipment:  
Caustic Soda is classified by D.O.T. as a corrosive material.

#### IX. LABELING

Labeling (precautionary statements)\*: DO NOT get in eyes, on skin, on clothing. Avoid breathing dust, mist, or spray. DO NOT take internally. Use with adequate ventilation and employ respiratory protection when exposed to dust, mist, or spray. When handling, wear chemical splash goggles, face shield, rubber gloves and protective clothing. Wash thoroughly after handling. Avoid contact with strong acids to prevent violent or explosive reactions. Keep container closed.

D.O.T. Label\*: Sodium Hydroxide Dry Solid Mixture, Corrosive, U.N. 1823

\*Not required. Space has been provided on this form for optional use

MSDS\BN-CLEANER

Cleaver tank

Micel, Inc. 1176 Osprey Circle, Anaheim, California 92807

MATERIAL SAFETY DATA SHEET

N.F.P.A. Rating: Health (0), Flammability (0), Reactivity (0)

I. PRODUCT IDENTIFICATION

Trade name (as labeled): CHROME REDUCER

Chemical names, common names: Sugar mixture.

Manufacturer's name: MICEL, INCORPORATED

Address: 1176 OSPREY CIRCLE, ANAHEIM, CA 92807

Emergency phone: 1-800-424-9300

Name of preparer\*: Technical Dept.

Business phone: 714/630-4050

Date prepared: September 28, 1993

II. HAZARDOUS INGREDIENTS

<u>Chemical Names</u>	<u>CAS Numbers</u>	<u>Percent*</u>	<u>Exposure Limits in Air</u>		
			<u>ACGIH(TLV)</u>	<u>OSHA(PEL)</u>	<u>OTHER</u>

Contains no ingredients currently classified as hazardous.

III. PHYSICAL PROPERTIES

Vapor density (air=1): N/A

Melting point or range, F: N/A

Specific gravity: 0.706

Boiling point or range, F: N/A

Solubility in water: Complete.

Vapor pressure, mmHg at 20°C: N/A

Evaporation rate (butyl acetate=1): N/A

Appearance and odor: White crystalline solid with no appreciable odor.

HOW TO DETECT THIS SUBSTANCE\* (warning properties of substance as a gas, vapor, dust, or mist):

Consume

50 LBS A YEAR

#### IV. FIRE AND EXPLOSION

Flash Point, F (give method): N/A

Auto-ignition temperature, F: N/A

Flammable limits in air, volume %: lower N/A upper N/A

Fire extinguishing materials:

X water spray carbon dioxide other:

foam dry chemical

Special fire fighting procedures: N/A

Unusual fire and explosion hazards: N/A

#### V. HEALTH AND HAZARD INFORMATION

SYMPTOMS OF OVEREXPOSURE for each potential route of exposure.

Inhaled: None known.

Contact with skin or eyes: None known.

Absorbed through skin: None known.

Swallowed: None known.

Acute: None established.

Chronic: None established.

#### FIRST AID: EMERGENCY PROCEDURES

Eye Contact: Flush eyes thoroughly with running water to remove any possible particles.

Skin Contact: None.

Inhaled: None.

Swallowed: None.

SUSPECTED CANCER AGENT?

NO: This product's ingredients are not found in the lists below.  
: Federal OSHA NTP IARC Cal/OSHA(see note)\*

NOTE: California employers using Cal/OSHA-regulated carcinogens must register with Cal/OSHA.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: None.

RECOMMENDATIONS TO PHYSICIAN: None.

#### VI. REACTIVITY DATA

Stability:  Stable  Unstable

Conditions to avoid: None.

Incompatibility (materials to avoid): Strong oxidizing agents.

Hazardous decomposition products (including combustion products): None

Hazardous polymerization:  May occur  Will not occur

Conditions to avoid:

#### VII. SPILL, LEAK AND DISPOSAL PROCEDURES

Spill response procedures (include employee protection measures):  
Dry sweep and flush remainder with water.

Preparing wastes for disposal (container types, neutralization, etc.):  
Sanitary landfill or incineration in accordance with Federal, State and local regulations.

NOTE: Dispose of all wastes in accordance with federal, state and local regulations.

#### VIII. SPECIAL HANDLING INFORMATION

Ventilation and engineering controls: None.

Respiratory protection: None.

Eye protection (Type): Safety glasses.

Glove (specify material): None.

Other clothing and equipment: None.

Work practices, hygienic practices: None.

Other handling and storage requirements: Store in cool, dry place.

Protective measures during maintenance of contaminated equipment:  
None.

#### IX. LABELING

Labeling (precautionary statements)\*:

H.O.T. Label\*:

\*Not required. Space has been provided on this form for optional use

MSDS\Chrome Reducer

*copy prepared table*

NA



DuPont Chemicals

1252CR

Revised 13-SEP-2000

Printed 25-OCT-2004

# Sodium Cyanide

## CHEMICAL PRODUCT / COMPANY IDENTIFICATION

### Material Identification

"CYANOBRIK", "CYANOGRAN", "CYANO-DOL" are registered trademarks of DuPont.

Corporate MSDS Number DU000290

CAS Number 143-33-9

Formula NaCN

CAS Name SODIUM CYANIDE

Grade "CYANOBRIK"; "CYANOGRAN"

### Tradenames and Synonyms

CYANIDE OF SODIUM  
PRUSSIAE OF SODA

### Company Identification

#### MANUFACTURER/DISTRIBUTOR

DuPont Chemical Solutions Enterprise  
1007 Market Street  
Wilmington, DE 19898  
DuPont Cyanide Hotline  
(For Transportation Emergencies ONLY)  
1-901-357-1546

#### PHONE NUMBERS

Product Information 1-800-441-7515  
Transport Emergency CHEMTREC 1-800-424-9300  
Medical Emergency 1-800-441-3637

## COMPOSITION / INFORMATION ON INGREDIENTS

### Components Material

CAS Number %

\*SODIUM CYANIDE 143-33-9 >96

(Continued)

*Consume*

*100 LBS A YEAR*

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**COMPOSITION/INFORMATION ON INGREDIENTS**(Continued)

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OTHER SODIUM SALTS

<4

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**CONTACT WITH WATER LIBERATES:**

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\*HYDROGEN CYANIDE GAS

74-90-8

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\* Disclosure as a toxic chemical is required under Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR part 372.

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**Components (Remarks)**

Sodium Cyanide in contact with water liberates small amounts of Hydrogen Cyanide (HCN) gas.

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**HAZARDS IDENTIFICATION****# Potential Health Effects**

May be fatal if inhaled, swallowed, or absorbed through the skin or eyes. Contact with acids or weak alkalis liberates poisonous gas. May cause eye burns and skin irritation and rashes. May cause rapid respirations and pulse, reddened eyes, flushed skin, weakness, headache, dizziness, confusion, nausea and vomiting. These may be followed by unconsciousness, convulsions, cessation of breathing, loss of blood pressure, heart beat irregularities, dilation of pupils and death. The lungs may fill with liquid.

**SODIUM CYANIDE:**

Skin contact with Sodium cyanide may cause skin irritation with discomfort or rash; strong solutions may cause skin burns or ulceration. Evidence suggests that significant skin permeation can occur in amounts capable of producing systemic toxicity. There are no reports of human sensitization.

Eye contact with Sodium cyanide may cause eye irritation with discomfort, tearing, or blurring of vision. Prolonged exposure may cause eye corrosion with corneal or conjunctival ulceration.

Inhalation, ingestion or skin contact of Sodium cyanide may cause nonspecific discomfort such as:

Reddening of the eyes  
Irritation of the throat  
Palpitation  
Difficulty in breathing  
Salivation  
Numbness

Nausea  
Headache  
Weakness of arms and legs  
Giddiness  
Collapse  
Convulsions

(Continued)

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## HAZARDS IDENTIFICATION (Continued)

Central nervous system stimulation followed by central nervous system depression may occur with hypoxic convulsions and death due to respiratory arrest.

Higher exposures may lead to rapid respiration and pulse, flushing, cyanosis, acidosis, thyroid effects sometimes observed in individuals with nutritional deficiencies, symptoms associated with Parkinsonian Syndrome, pulmonary edema, and fatality from gross overexposure. In the few cases of disturbance of vision or damage to the optic nerve or retina attributable to cyanide poisoning, the poisoning has been acute and severe, and lethal or near lethal. There are reports of increased incidence of insomnia, agitated sleep, tremors, dermatitis and nose bleed in electroplating workers.

Individuals with preexisting diseases of the central nervous system may have increased susceptibility to the toxicity of excessive exposures.

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### Carcinogenicity Information

None of the components present in this material at concentrations equal to or greater than 0.1% are listed by IARC, NTP, OSHA or ACGIH as a carcinogen.

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## FIRST AID MEASURES

### Compound-Specific First Aid & Notes to Physicians

A step-wise procedure of "First Aid" and "Medical Treatment" is recommended for any cyanide poisoning. Treatment requires immediate action to prevent harm or death. First Aid is given initially, and experience shows that when given promptly it is usually the only treatment needed for typical accidental poisonings. Medical treatment may be needed for more severe poisoning.

First aid treatment uses oxygen and amyl nitrite and can be given by a first responder before medical help arrives.

Medical treatment is given if the patient does not respond to First Aid. Medical Treatment is a more aggressive treatment requiring intravenous injections of sodium nitrite and sodium thiosulfate, and must be administered by qualified medical personnel. It provides a larger quantity of antidote which helps eliminate cyanide from the body. Even if a doctor or nurse is present, the need for fast treatment dictates using the First Aid procedure with oxygen and amyl nitrite while Medical Treatment materials for intravenous injection are being prepared. When antidotal treatment is necessary, it should be started immediately.

**IN CASE OF CYANIDE POISONING, START FIRST AID TREATMENT IMMEDIATELY, THEN CALL A PHYSICIAN.**

(Continued)

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## FIRST AID MEASURES (Continued)

In most cases, cyanide poisoning causes a deceptively healthy pink to red skin color. However, if a physical injury or lack of oxygen is involved, the skin color may be bluish. Reddening of the eyes and pupil dilation are also symptoms of cyanide poisoning. Cyanosis (blue discoloration of the skin) tends to be associated with severe cyanide poisonings whereas red coloration of the skin is more common in industrial accidents that involve less cyanide.

All persons with the potential for cyanide poisoning should be trained to provide immediate First Aid using oxygen and amyl nitrite. Always have on hand the materials listed below in the FIRST AID and MEDICAL TREATMENT Sections. Actions to be taken in case of cyanide poisoning should be planned and practiced before beginning work with cyanides. Identification of community hospital resources and emergency medical squads in order to equip and train them on handling of cyanide emergencies is essential.

### FIRST AID SUPPLIES

Adequate First Aid supplies for cyanide poisoning should be conveniently placed throughout the cyanide areas and should be immediately accessible at all times, but secured against tampering or theft. Supplies should be routinely inspected (typically daily) by people who would use them in an emergency. The total number of each item listed below should be adequate to handle the largest number of exposure cases reasonably anticipated, taking into account that some supplies may be wasted, destroyed, or inaccessible in the emergency.

1. Oxygen Resuscitators - Any positive pressure resuscitator capable of giving oxygen in conjunction with amyl nitrite can be used.

2. Amyl Nitrite Ampoules (antidote) - One box of one dozen ampoules per station is usually satisfactory. Locate stations throughout the cyanide area.

CAUTION: Amyl nitrite is not stable and must be replaced every 1-2 years, or earlier depending on storage conditions. Store in the original dated box away from heat and freezing temperatures. Do not store amyl nitrite or Medical Treatment Kits (see below) in enclosed areas where temperatures can exceed 60-66 deg C (140-150 deg F) or where freezing may occur. Storage in high temperature climates may require replacement before the expiration date, unless cool storage is provided. Avoid excessive cold storage which will reduce the vapor pressure of amyl nitrite and, hence, its effectiveness. A common DuPont practice is to use the resuscitator as the storage point for the amyl nitrite ampoules.

3. A set of cyanide first aid instructions should be located at each amyl nitrite storage location. Workers should be fully trained since in a real emergency there will be insufficient time to "read the book".

(Continued)

## FIRST AID MEASURES(Continued)

### Amyl Nitrite Notes:

1. Amyl nitrite is highly volatile and flammable; do not smoke or use around a source of ignition.
2. If treating a patient in a windy or drafty area, provide something--a rag, shirt, wall, drum, cupped hand, etc.--to prevent the amyl nitrite vapors from being blown away. Keep the ampoule upwind from the nose. The objective is to get amyl nitrite into the patient's lungs.
3. Rescuers should avoid amyl nitrite inhalation to avoid becoming dizzy and losing competence.
4. Lay the patient down. Since amyl nitrite dilates blood vessels and lowers blood pressure, laying the patient down will help prevent unconsciousness.
5. Do not overuse. Monitor the patient for shock which would indicate excessive use. This has not occurred in practice at DuPont plants, and we are not aware of any serious after effects from treatment with amyl nitrite.
6. Review and adhere to proper storage, inspection and replacement requirements given above.

### FIRST AID PROCEDURE

The exposed person should be removed from the contaminated area, contaminated clothing removed and the individual washed off. The rescuer and/or person providing first aid is subject to exposure if the affected person's clothing is wetted with cyanide. For HYDROGEN CYANIDE, rescue of a wetted person should be done wearing self-contained breathing air (SCBA), rubber gloves, and other personal protective equipment as necessary. For SODIUM CYANIDE or POTASSIUM CYANIDE dusts or solutions, SCBA is normally not needed. Contact with HYDROGEN CYANIDE must be avoided by rescuers, but short contact from solid cyanide or solutions is normally not a problem if skin washing is prompt. As soon as possible, even while clothing is being removed or washing is taking place, First Aid should be started.

1. If no symptoms are evident, no treatment is necessary; decontaminate patient.
2. If conscious but symptoms (nausea, difficult breathing, dizziness, etc.) are evident, give oxygen.
3. If consciousness is impaired (non-responsiveness, slurred speech, confusion, drowsiness) or the patient is unconscious but breathing, give oxygen and amyl nitrite by means of a resuscitator.

To give amyl nitrite, break an ampoule in a gauze pad and insert

(Continued)

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## FIRST AID MEASURES (Continued)

into lip of the resuscitator mask for 15 seconds, then take away for fifteen seconds. Repeat 5-6 times. If necessary, use a fresh ampoule every 3 minutes until the patient regains consciousness (usually 1-4 ampoules). Administer oxygen continuously. Guard against the ampoule entering the patient's mouth.

4. If not breathing, give oxygen and amyl nitrite immediately by means of a positive pressure resuscitator (artificial respiration).

Administer amyl nitrite as discussed in #3 and continue to give oxygen simultaneously to aid recovery. If massive exposure occurred, consider keeping the first one or two ampoules in the lip of the resuscitator mask continuously. Guard against the ampoule entering the patient's mouth.

### INHALATION

If consciousness is impaired, oxygen and amyl nitrite should be administered as indicated under First Aid Procedure. Carry the patient to an uncontaminated atmosphere. Keep the patient warm and calm. Call a physician.

### SKIN CONTACT

If consciousness is impaired, oxygen and amyl nitrite should be administered as indicated under First Aid Procedure. Immediately flush with large quantities of water for up to 5 minutes after contact or suspected contact, and completely remove all contaminated clothing (including shoes or boots). Flushing with water for up to 5 minutes is generally sufficient to effectively remove cyanide from the patient's skin. Call a physician.

### EYE CONTACT

Immediately flush the eyes with large quantities of water for up to 5 minutes while holding the eyelids apart. Do not try to neutralize with "acids" or "alkalis". Eye contact will require further evaluation and possibly treatment. Continue rinsing the eye during transport to the hospital. See a physician. Oxygen and amyl nitrite should be used as indicated above.

### INGESTION

If the patient is conscious, immediately have patient spit and rinse mouth with water then give patient activated charcoal slurry. If consciousness is impaired, or the patient is unconscious, immediately administer oxygen and amyl nitrite as discussed in the First Aid Procedure Section. Never give anything by mouth to an unconscious person. Give patient activated charcoal slurry ONLY when consciousness is regained. DO NOT give Syrup of Ipecac or other emetics since they will induce vomiting which could interfere with resuscitator use. Continue to give oxygen. Call a physician.

(Continued)

## **FIRST AID MEASURES**(Continued)

NOTE: To prepare activated charcoal slurry, mix 50 grams of activated charcoal in 400 mL (about 2 cups) water and mix thoroughly. Give 5 mL/kg, or 350 mL for an average adult.

### **MEDICAL TREATMENT**

EXPERIENCE SHOWS THAT FIRST AID GIVEN PROMPTLY IS USUALLY THE ONLY TREATMENT NEEDED FOR TYPICAL INDUSTRIAL CYANIDE POISONING. LARGER CYANIDE POISONINGS INCREASE THE NEED FOR MEDICAL TREATMENT.

Do not over-react. Although prompt action is essential when poisoning has occurred, a lucid, conscious person who can communicate may not have significant cyanide poisoning and Medical Treatment will rarely be necessary. "Treat what you see" is a good rule of thumb. Mildly symptomatic patients who remain alert may be managed by supportive care only.

The half-life of cyanide in the body is about 20-90 minutes. In diagnosis and monitoring of patients, the critical period for treatment is short. Normally the effects from cyanide poisoning occur in the first few minutes and will indicate the degree of poisoning.

"Preventive" use of cyanide antidote in the absence of impaired consciousness is not normally warranted. Keep the patient calm by assurance over the next 30 minutes, and closely monitor the patient's condition. If skin contact with cyanide has been prolonged and/or extensive cyanide has been ingested, watch the individual closely for at least 30 minutes to assure there are no effects from delayed absorption of cyanide into the blood stream.

Consider assuring intravenous access in cases where significant toxicity is possible. Establishment of IV access with normal saline, Ringer's lactate, or other available IV fluid will facilitate administration of the antidote if necessary.

### **MEDICAL TREATMENT KITS**

Medical Treatment Kits for cyanide poisoning should be conveniently located for easy access. Materials for intravenous injection are intended for use only by a physician or fully qualified medical personnel. The location of kits should be carefully planned as part of the emergency program. Kits should always be taken with patient during transport to medical facilities to ensure availability. Suggested locations for kits include:

- o in or near the cyanide area
- o plant medical station
- o guard house entrance
- o local hospital

(Continued)

## FIRST AID MEASURES (Continued)

o doctor's office and residence

CAUTION: Avoid storing amyl nitrite or Medical Treatment Kits in areas subject to extreme heat or freezing conditions. Kits and amyl nitrite should be accessible but secured against tampering. They should be inspected regularly and the amyl nitrite ampoules replaced every 1-2 years (See First Aid Supplies Section). Medical Treatment Kits should contain the following:

1. One box containing one dozen (12) amyl nitrite ampoules.
2. Two sterile ampoules of sodium nitrite solution (10 mL of a 3% solution in each).
3. Two sterile ampoules of sodium thiosulfate solution (50 mL of a 25% solution in each).
4. One 10 mL sterile syringe. One 50 mL sterile syringe. Two sterile intravenous needles. One tourniquet.
5. One dozen gauze pads.
6. Latex gloves.
7. A "Biohazard" bag for disposal of bloody/contaminated equipment.
8. A set of cyanide instructions on first aid and medical treatment.

NOTE: Amyl nitrite ampoules and Medical Treatment Supplies can be purchased through local pharmacies with a physician's prescription.

### MEDICAL TREATMENT PROCEDURE

1. Sodium nitrite: Adult - 10 mL of 3% solution (300 mg)  
Draw solution from the ampoule and inject slowly over 4-5 minutes (2 to 2.5 mL/minute). As soon as practical, monitor blood pressure and continue checking pulse. Slow the rate of injection if hypotension (low blood pressure) occurs.

2. Sodium thiosulfate: Adult - 50 mL of 25% solution (12.5 grams)  
Follow sodium nitrite with sodium thiosulfate injected at a rate of 2.5 mL/minute (10-20 minutes).

The total time for injection of these initial doses of both components at the recommended rates is lengthy, approximately 20-25 minutes.

Consider the body weight and condition of the patient when treating a cyanide exposed patient with sodium nitrite. Both amyl nitrite and sodium nitrite produce methemoglobin, which reduces the oxygen carrying capacity of the blood. Methemoglobinemia is potentially harmful when methemoglobin levels exceed 20-30% (See

(Continued)

## FIRST AID MEASURES (Continued)

Antidotal Effects Section).

If symptoms persist or recur after the initial treatment, repeat the antidote at one half the original doses one hour after the original administration. Monitor methemoglobin levels when practical in every patient treated with the intravenous antidote.

AVOID OVER-TREATMENT.

The above sodium nitrite injection discussed in the Medical Treatment Procedure Section is about one-third the lethal dose, so care should be taken to avoid excessive use. It is not essential that full quantities of antidote be given just because treatment was started. Should injection be stopped for any reason, keep track of the amount administered in case treatment needs to be restarted.

### ANTIDOTAL EFFECTS

Nitrites can produce hypotension through peripheral vasodilatation (widening of the blood vessels). Methemoglobin formation, although considered a therapeutic effect, may cause symptoms if levels exceed 20-30%. Recommended intravenous doses of sodium nitrite discussed in the Medical Treatment Procedure Section usually produce methemoglobin levels under 20%. Headache, nausea, vomiting, and syncope (fainting) may follow nitrite administration, and syncope may occur if the patient is not lying down. While it is important to be aware of the effects from nitrite therapy, there have been no long-lasting effects associated with this treatment regimen for cyanide exposure in DuPont's experience and knowledge.

### RECOVERY AND DISPOSITION

For most accidental poisonings, patients can be revived in a few minutes using oxygen and amyl nitrite with complete recovery within a few hours.

If necessary, the patient should be monitored for 24-48 hours. Any patient whose symptoms require the use of IV antidote should be considered for admittance to an intensive care unit.

Observe for return of symptoms. Monitor methemoglobin levels, blood pH and oxygenation through arterial blood gas analysis. Calculate anion gap from serum electrolytes. Cyanide poisoning causes lactate accumulation and an anion gap metabolic acidosis.

Delayed neurotoxic effects are not expected consequences of cyanide exposure although neurotoxic effects may occur if hypoxia (oxygen deficiency) was prolonged or occurred following massive cyanide exposure.

In the presence of smoke inhalation that can occur during fires, withholding amyl nitrite or sodium nitrite administration should be considered because of the potential for high carboxyhemoglobin levels. However, administration of oxygen and possibly sodium thiosulfate should be continued.

(Continued)

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## **FIRE FIGHTING MEASURES**

### **Flammable Properties**

Will not burn.

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Follow appropriate National Fire Protection Association (NFPA) codes.

Sodium Cyanide may not be completely destroyed in an ordinary fire involving combustible materials such as paper or wood. While sodium cyanide does not support combustion, it can oxidize in a fire.

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### **Extinguishing Media**

Water can be used on fires near sodium cyanide, but judgment should be used in light of runoff problems, especially if containers are opened or burned (See "Incompatibility with Other Materials" and "Fire Fighting Instructions"). In some cases it may be desirable to let a fire burn out by itself. DO NOT use carbon dioxide (CO<sub>2</sub>) which reacts with sodium cyanide to produce hydrogen cyanide in the presence of moisture.

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### **Fire Fighting Instructions**

Sodium Cyanide dissolves readily in water; therefore, cyanide solution runoff may occur if containers are opened or burned. Runoff should be contained to avoid environmental or safety problems. Contained cyanide solution can be detoxified with hypochlorite. In some cases it may be desirable to let a fire burn out by itself since sodium cyanide will not normally be affected by the fire.

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## **ACCIDENTAL RELEASE MEASURES**

### **Safeguards (Personnel)**

NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

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### **Spill Clean Up**

Shovel and sweep up spilled material into a covered container or plastic bag pending transfer. Cover and keep spillage dry. Flush spill area with a dilute solution of sodium hypochlorite or calcium hypochlorite to destroy the cyanide. Call DuPont for guidance. Comply with Federal, State, and local regulations reporting releases. The EPA Reportable Quantity (RQ) is 10 pounds.

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## **HANDLING AND STORAGE**

### **Handling (Personnel)**

Emergency pre-planning and training are needed before beginning to work with sodium cyanide since prompt treatment is essential in cases of cyanide poisoning. Always have Cyanide Antidote on hand.

(Continued)

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## HANDLING AND STORAGE (Continued)

Do not breathe dust, mist, or hydrogen cyanide gas. Do not get in eyes. Avoid contact with skin and clothing. Do not carry foodstuffs, beverages, or tobacco where contamination with cyanide is possible. Wash thoroughly after handling. Wash contaminated clothing before reuse.

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### Storage

Store in properly labeled containers in dry, ventilated, secured areas. Keep containers closed and contents dry. Do not store with acids or acid salts, containers with water or weak alkalis, or oxidizing agents. Do not handle or store food, beverages, or tobacco in cyanide areas. Do not store near combustibles or flammables because subsequent fire fighting with water could lead to cyanide solution runoff. If legal, do not store under sprinkler systems.

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## EXPOSURE CONTROLS/PERSONAL PROTECTION

### Engineering Controls

Use sufficient ventilation to keep employee exposure below recommended limits.

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### Personal Protective Equipment

Recommended minimum protection: Chemical splash goggles and rubber gloves (butyl preferred or neoprene).

Where there is potential for airborne exposures in excess of applicable limits, wear NIOSH approved respiratory protection including self-contained breathing air supply as appropriate.

Have available and use as appropriate: face shield; rubber suits, aprons, and boots; hydrogen cyanide detector; First Aid and Medical Treatment supplies, including oxygen resuscitators.

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### Exposure Guidelines

#### Exposure Limits

##### Sodium Cyanide

PEL (OSHA)	5 mg/m <sup>3</sup> , as CN, 8 Hr. TWA, Skin
TLV (ACGIH)	Ceiling 5 mg/m <sup>3</sup> , as CN, Skin
AEL * (DuPont)	5 mg/m <sup>3</sup> , 15 minute TWA, as CN, Skin

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#### Other Applicable Exposure Limits

##### HYDROGEN CYANIDE GAS

PEL (OSHA)	10 ppm, 11 mg/m <sup>3</sup> , Skin
TLV (ACGIH)	Ceiling 4.7 ppm, 5 mg/m <sup>3</sup> , as CN, Skin
AEL * (DuPont)	5 mg/m <sup>3</sup> , 15 minute TWA, as CN, Skin

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\* AEL is DuPont's Acceptable Exposure Limit. Where governmentally imposed occupational exposure limits which are lower than the AEL are in effect, such limits shall take precedence.

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(Continued)

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**EXPOSURE CONTROLS/PERSONAL PROTECTION**(Continued)

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**Exposure Guideline Comments**

The "Skin" notation in the Exposure Limits Section indicates that liquid or vapor may penetrate the skin (especially if the skin is broken). Control of vapor, dust, and mist inhalation alone may not be sufficient to prevent an excessive dose.

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**PHYSICAL AND CHEMICAL PROPERTIES****Physical Data**

Boiling Point:	1496 C (2725 F) @ 760 mm Hg
Vapor Pressure:	Negligible
Vapor Density:	Not Volatile
Melting Point:	564 C (1047 F)
Solubility in Water:	37 WT% @ 20 C (68 F)
pH:	11-12*
Form:	Solid, Granular, Briquettes
Color:	White
Specific Gravity:	1.6
Bulk Density (Packed):	50-55 lb/cu ft

Solid cyanide has no odor, but it can have a slight ammonia and/or hydrogen cyanide odor if damp.

\*The pH listed above is typical for 5-25% solutions with no pH adjustment.

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**STABILITY AND REACTIVITY****Chemical Stability**

Very stable when dry.

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**Incompatibility with Other Materials**

Large amounts of poisonous, flammable hydrogen cyanide (HCN) gas will be evolved from contact with acids. Reacts violently with strong oxidizing agents when heated. Water or weak alkaline solutions can produce dangerous amounts of hydrogen cyanide in confined areas.

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**Decomposition**

Moisture will cause slow decomposition, releasing poisonous hydrogen cyanide and ammonia gases.

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**Polymerization**

Polymerization will not occur.

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(Continued)

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## TOXICOLOGICAL INFORMATION

### Animal Data

#### Sodium Cyanide

Oral LD50: 15 mg/kg in rats

Dermal LD50: 11.28-14.63 mg/kg in rabbits

Inhalation LC50: no information found but considered to be highly toxic as CN by inhalation

Sodium cyanide has not been tested for skin and eye irritation, or for skin sensitization.

NOTE: Administration of Sodium cyanide to rats, cats, or dogs by the intravenous or intraperitoneal routes resulted in rapid respiration, confusion, unconsciousness, vomiting, decreased blood pressure, cardiac rate changes, seizures and respiratory failure.

Eye: As with other routes of exposure, systemic toxicity and death is possible from contamination of the eye; LD50 dose in rabbits is approximately 5 mg/kg.

Sodium cyanide applied to the skin of rabbits produced tremors, retrocolic spasms, convulsions, abnormal breathing patterns, and prostration.

Ingestion: Repeated administration of cassava diets containing unspecified cyanide ion caused decreased thyroid activity and kidney changes. Long-term administration of 0.5, 1.0, or 2.0 mg/kg/day to dogs produced unspecified acute intoxication symptoms and increased numbers of red blood cells and decreased proteins were observed at doses greater than 1.0 mg/kg/day. Central nervous system changes occurred in all treated dogs.

No animal test reports are available to define carcinogenic hazards of Sodium cyanide. Limited reproductive studies do not suggest effects. Some tests have shown the potential for developmental toxicity but only at exposure levels producing toxic effects in the adult animal.

Sodium cyanide does not produce genetic damage in bacterial cell cultures, and has not been tested in animals.

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## ECOLOGICAL INFORMATION

### Ecotoxicological Information

#### Aquatic Toxicity:

#### Sodium Cyanide:

96 hour LC50 - fathead minnows: 0.43-0.66 mg/L

96 hour LC50 - rainbow trout: .046-.075 mg/L

96 hour LC50 - bluegill sunfish: 0.28 mg/L

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(Continued)

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## DISPOSAL CONSIDERATIONS

### Waste Disposal

This material may be a RCRA Hazardous waste. Do not flush cyanide into sewers which may contain an acid. Detoxify with dilute sodium hypochlorite, hydrogen peroxide, or calcium hypochlorite. Comply with Federal, State, and local regulations on disposal methods used to achieve the constituent based treatment standard, if permitted; or transfer to a licensed disposal contractor.

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## TRANSPORTATION INFORMATION

### Shipping Information

DOT	
Proper Shipping Name	SODIUM CYANIDE
Hazard Class	6.1
I.D. No. (UN/NA)	UN1689
DOT Label(s)	TOXIC
Special Information	MARINE POLLUTANT
Packing Group	I

DOT/IMO	
Proper Shipping Name	SODIUM CYANIDE, SOLID
Hazard Class	6.1
UN No.	1689
DOT/IMO Label	TOXIC
Special Information	MARINE POLLUTANT
Packing Group	I

Reportable Quantity      10 lb (4.54 kg)

### Shipping Containers:

Steel Drums: 50 kg, 100 kg  
"CYANO-DOL" Trucks  
Excel I and Excel II Trucks  
Hopper Railcars  
"FLO-BINS" (3,000 lb. net; 3,600 lbs. gross)  
Bag in a Box (1,000 kg/2,205 lbs.)  
Tuff Paks: 48, 20 kg bags in a box (960 kg or 2,117 lbs.)

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## REGULATORY INFORMATION

### U.S. Federal Regulations

TSCA Inventory Status      Reported/Included.

TITLE III HAZARD CLASSIFICATIONS SECTIONS 311, 312

Acute	: Yes
Chronic	: No
Fire	: No
Reactivity	: Yes
Pressure	: No

(Continued)

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**REGULATORY INFORMATION**(Continued)

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**HAZARDOUS CHEMICAL LISTS**

SARA Extremely Hazardous Substance: Yes  
CERCLA Hazardous Substance : Yes  
SARA Toxic Chemical : Yes

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**Canadian Regulations**

CLASS D Division 1 Subdivision A - Very Toxic Material/Acute Lethality.

CLASS D Division 2 Subdivision B - Toxic Material. Skin or Eye Irritant.

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**OTHER INFORMATION****NFPA, NPCA-HMIS**

NFPA Rating  
Health 3  
Flammability 0  
Reactivity 1

NPCA-HMIS Rating  
Health 3  
Flammability 0  
Reactivity 1

Personal Protection rating to be supplied by user depending on use conditions.

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**Additional Information**

For further information, see DuPont Cyanide Storage and Handling Bulletin.

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The data in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process.

Responsible for MSDS : MSDS Coordinator  
> : DuPont Chemical Solutions Enterprise  
Address : Wilmington, DE 19898  
Telephone : (800) 441-7515

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# Indicates updated section.

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End of MSDS

Copper Cyanide TAN

TAP

MATERIAL SAFETY DATA SHEET

ATOTECH USA INC. 1750 OVERVIEW DRIVE ROCK HILL, S.C. 29730

EMERGENCY TELEPHONE NUMBER 8:00 am - 5:00 pm (803) 817-3500

CHEMTREC - 24 HOURS 1-800-424-9300

NAME USED ON LABEL: CUFLEX 309 CHEMICAL NAME (if single substance): Mixture CHEMICAL FAMILY: Mixture FORMULA: Proprietary

HAZARDOUS INGREDIENTS

Table with 4 columns: IDENTITY, CAS No., %, EXPOSURE LIMITS. Row 1: Potassium Hydroxide, 1310-58-3, <30, ACGIH-STEL(1): 2.0 mg/m3

(1) ACGIH STELs are ceiling concentrations.

PHYSICAL DATA

BOILING POINT: N/E FREEZING POINT: <40 Deg F SPECIFIC GRAVITY: 1.23 - 1.30 VAPOR PRESSURE @ 20 C: N/E VAPOR DENSITY (Air=1): N/E SOLUBILITY IN WATER: Complete % VOLATILE: N/A EVAPORATION RATE (Butyl Acetate=1): N/E pH: 10 - 12

APPEARANCE: Clear, colorless to pale yellow liquid.

FIRE AND EXPLOSION DATA

FLASH POINT (Test Method) N/E AUTOIGNITION TEMPERATURE N/E FLAMMABLE LTS. LEL-N/E UEL-N/E

EXTINGUISHING MEDIA: Nonflammable -- Use extinguishing media appropriate to surrounding fire conditions.

SPECIAL FIRE FIGHTING PROCEDURES: Do not get material on skin or clothing. Avoid inhalation of fumes or mists. Stay upwind, out of low areas, and ventilate closed spaces before entering. Cool containers from the side with water until fire is out. Use water spray to reduce vapor; do not put water directly on leak or spill area. Wear full protective clothing and NIOSH-approved, self-contained breathing apparatus (SCBA) with full facepiece operated in the pressure demand or other positive pressure mode. Move containers from fire area, if possible to do so without risk.

\*N/A = NOT AVAILABLE \*\*N/APP = NOT APPLICABLE \*\*\*N/E = NOT ESTABLISHED

Consume 20 gal A YEAR

NAME USED ON LABEL: CUFLEX 309

UNUSUAL FIRE AND EXPLOSION HAZARDS: During fire conditions, product may evolve oxides of carbon.

\*\*\*\*\*  
HEALTH HAZARD DATA  
\*\*\*\*\*

EYE CONTACT: Corrosive. Causes irritation and burns to the eyes and surrounding areas.

SKIN CONTACT: Corrosive. Causes irritation and burns to the skin.

INHALATION: Corrosive. Causes irritation and burns to the respiratory passages, including the nose, airway, and lungs.

INGESTION: Corrosive. Causes irritation and burns to the mouth, throat, and stomach.

CHRONIC TOXICITY: Effects of long-term exposure to this product have not been determined.

SYMPTOMS OF EXPOSURE: Red, inflamed skin, eyes, and mucous membranes; pain; blurred or diminished vision; abdominal pain, nausea, vomiting, diarrhea; shortness of breath, chest pain; dizziness.

Burns may not be immediately evident.

CARCINOGENICITY:

	NTP	IARC	Other
Yes			
No	X	X	X

\*\*\*\*\*  
SUGGESTED FIRST AID  
\*\*\*\*\*

EYES: Immediately flush eyes with plenty of water for at least 15 minutes forcibly holding eyelids apart to ensure complete irrigation of all eye and lid tissue. Get immediate medical attention.

SKIN: Immediately flush skin with plenty of water while removing contaminated clothing and shoes. Get immediate medical attention. Contaminated clothing should be taken off/removed in a manner which limits further exposure.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration and/or if breathing is difficult give oxygen by trained personnel. Get immediate medical attention.

MATERIAL SAFETY  
DATA SHEET

ATOTECH USA INC.  
ROCK HILL, S.C. 29730

NAME USED ON LABEL: CUFLEX 309

INGESTION: If swallowed, do NOT induce vomiting. Give milk or water. Call a physician or poison control center immediately. Never give anything by mouth to an unconscious person.

\*\*\*\*\*  
REACTIVITY DATA  
\*\*\*\*\*

STABILITY: Stable

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Contact with incompatible materials.

INCOMPATIBILITY (Materials to Avoid): Strong oxidizers, acids, and metals.

HAZARDOUS DECOMPOSITION PRODUCTS: May evolve flammable hydrogen gas upon contact with metals. Oxides of carbon upon thermal decomposition.

\*\*\*\*\*  
SPECIAL PROTECTION INFORMATION  
\*\*\*\*\*

VENTILATION: Local exhaust or an enclosed handling system is highly recommended. Mechanical (general) ventilation is required.

EYE PROTECTION: Use chemical splash goggles and face shield (ANSI Z87.1 or approved equivalent). Do not wear contact lenses when in contact with this product. An emergency eye wash must be readily accessible to the work area.

RESPIRATORY PROTECTION: Use NIOSH approved respiratory equipment when airborne concentrations are equal to or may exceed exposure limits. For emergency or other conditions where exposure levels are not known or may be uncontrolled, use a positive pressure air-supplied or self-contained breathing apparatus (SCBA). Respiratory protection programs must comply with 29 CFR 1910.134.

ADDITIONAL PERSONAL PROTECTIVE EQUIPMENT: Select chemical resistant clothing such as gloves, aprons, boots or whole full body protection where contact may occur. Consult glove/clothing manufacturer to determine the most suitable chemical resistant clothing for user's application. Consideration must be given to durability and permeation resistance. Wash immediately if skin is contaminated. Remove contaminated clothing immediately after use and wash before re-use. Provide a safety shower at any location where skin contact may occur. Always wash skin thoroughly after handling.

NAME USED ON LABEL: CUFLEX 309

\*\*\*\*\*  
SPECIAL PRECAUTIONS  
\*\*\*\*\*

HANDLING: Do not get in eyes, on skin, or on clothing. Do not breathe dust, mist or vapor. Do not take internally. Use only with adequate ventilation. Wash thoroughly after handling. Emptied container retains vapor and product residue - Observe all label safeguards until container is cleaned, reconditioned or destroyed. Keep container tightly closed in an upright position.

STORAGE: Protect from freezing - store above 40 deg F. Store in a cool, dry place away from incompatible material.

\*\*\*\*\*  
ENVIRONMENTAL INFORMATION  
\*\*\*\*\*

SPILL RESPONSE: Wear NIOSH/MSHA-approved respiratory protection and appropriate personal protective equipment when cleaning spill. Do not get spilled material on skin or clothing; stop leak if you can do so without risk. If necessary, dike area of spill to prevent spreading. Cover with sand, clay, or other non-combustible absorbent material. Transfer absorbed material to an appropriate and properly labeled container for disposal. NOTE: Discharge to a public sewerage authority should coincide with all applicable local permits and notification requirements. May be hazardous to aquatic life if released to open waters.

RECOMMENDED DISPOSAL: Disposal of waste material from the use of this product may be subject to federal, state, and local regulations. Refer to Part 261 of 40 CFR for the applicability of federal regulations. Consult with your state and local governments for additional regulatory requirements. Disposal of this material must be in a manner compliant with all federal, state, and local regulations.

\*\*\*\*\*  
TRANSPORTATION  
\*\*\*\*\*

HAZARDOUS MATERIAL/DANGEROUS GOODS SHIPMENT IS INDICATED BY (X) BELOW:

- (X) Department of Transportation (DOT)
- (X) International Air Transportation Association (IATA)
- (X) International Maritime Organization (IMO/IMDG)

MATERIAL SAFETY  
DATA SHEET

ATOTECH USA INC.  
ROCK HILL, S.C. 29730

NAME USED ON LABEL: CUFLEX 309

SHIPPING INFORMATION:

<u>UN(NA) Number</u>	<u>Hazard Class</u>	<u>Subsid. Risk</u>	<u>Labels</u>	<u>Mark (IMO)</u>	<u>Packaging Group</u>
UN1814	8	NONE	CORROSIVE	NONE	III

SHIPPING NAME:

DOT - POTASSIUM HYDROXIDE, SOLUTION, 8, UN1814, PGIII  
IATA - Same  
IMO - Same

DOT QUANTITY LIMITS:

Passenger Air or Rail - 5 L      Cargo Air Only - 60 L  
Packaging Authorization - 49CFR 173.154; 173.203; 173.241  
Special Provisions - T7

IATA PACKAGING:

<u>Passenger Aircraft (PA)</u>	<u>Cargo Aircraft Only (CAO)</u>
PkgInst- 819 Max/Pkg- 5 L	PkgInst- 821 Max/Pkg- 60 L

NOTES: (PA) Single packagings are not permitted.  
(PA)(CAO) Packagings must meet PG II performance standards.

\*\*\*\*\*  
MISCELLANEOUS  
\*\*\*\*\*

EPA/DOT - REPORTABLE QUANTITY (RQ) FOR HAZARDOUS SUBSTANCES:

(X) RQ of 1000 lb / 454 kg for Potassium Hydroxide

EPA - Any release of hazardous substance(s) in a quantity equal to or exceeding the RQ in any 24-hour period requires the immediate notification of the National Response Center in Washington, D.C. at (800) 424-8802. Other notification requirements, such as state and local governments, may apply.

DOT - Any package containing a hazardous substance in a quantity equal to or exceeding the RQ is regulated as a hazardous material.

MATERIAL SAFETY  
DATA SHEET

ATOTECH USA INC.  
ROCK HILL, S.C. 29730

NAME USED ON LABEL: CUFLEX 309

\*\*\*\*\*  
ADDITIONAL INFORMATION  
\*\*\*\*\*

RATINGS:		F	H	R	PPE	Spec Haz
HMIS		0	2	0	X	N/APP
NFPA		0	2	0	N/APP	N/APP

F= Flammability      H=Health      R=Reactivity  
PPE= Personal Protection Equipment      Spec Haz= Special Health Hazards  
W=Water Reactive      OX=Oxidizer      \* = Chronic Hazard

SARA Title III Classifications:	Yes	No
Immediate (Acute) Health . . .	X	
Delayed (Chronic) Health . . .		X
Sudden Release of Pressure . .		X
Reactive . . . . .		X
Fire . . . . .		X

Components of this product are identified below if they are present in excess of de minimus reporting levels. Components that are not required to be identified by specific chemical name may have a generic description.

SARA Title III Section 302 Extremely Hazardous Substances:  
NONE

SARA Title III Section 313 Toxic Chemicals:  
NONE

STATE RIGHT-TO-KNOW

Components of this product which are specifically identified in the ingredients section of this MSDS may be listed as hazardous by these and/or other states: California, Connecticut, Illinois, Indiana, Kentucky, Louisiana, Massachusetts, Minnesota, New Jersey, New York, North Carolina, Pennsylvania and Rhode Island.

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CAREFULLY READ THE FOLLOWING: The identification of ingredients in this document meets or exceeds the requirements set forth in 29 CFR, 40 CFR, et al. at the date of publication. Ingredients present in a mixture or solution which are generically identified or not referenced in this document are not regulatorily required to be specifically identified or referenced. The information contained herein should be provided to all those who will use, handle, store, transport, or may otherwise be exposed to this product.

\*N/A = NOT AVAILABLE  
\*\*N/APP = NOT APPLICABLE  
\*\*\*N/E = NOT ESTABLISHED

MATERIAL SAFETY  
DATA SHEET

ATOTECH USA INC.  
ROCK HILL, S.C. 29730

NAME USED ON LABEL: CUFLEX 309

We certify that all ingredients, whether identified in this MSDS or not, are on the TSCA inventory (for USA manufacture and/or sales only).

THE INFORMATION CONTAINED HEREIN, TO THE BEST OF OUR KNOWLEDGE, IS CONSIDERED TO BE ACCURATE. SUCH INFORMATION IS OFFERED SOLELY FOR YOUR CONSIDERATION, INVESTIGATION, AND VERIFICATION, AND WE DO NOT SUGGEST OR GUARANTEE THAT ANY PRECAUTIONS, PROCEDURES, RECOMMENDATIONS ETC. ARE PREFERRED OR UNIQUE. ATOTECH USA INC. MAKES NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO THE USE OF THIS INFORMATION OR THE USE OF MATERIAL IDENTIFIED HEREIN, IN COMBINATION WITH ANY OTHER MATERIAL OR PROCESS, AND ASSUMES NO RESPONSIBILITY THEREFORE. THIS DOCUMENT WAS DEVELOPED UNDER THE REQUIREMENTS OF THE UNITED STATES, AND AS SUCH MAY NOT SATISFY OTHER STATE OR REGIONAL REQUIREMENTS.

PREPARED BY THE PRODUCT SAFETY DEPARTMENT (PSD)

ISSUED: 07/12/2001

SUPERSEDES: New

# Copper Cyanide

## Section I – Emergency Contacts

<b>Manufacturer:</b> Univertical Chemical Company	<b>Telephone #:</b> (260) 665-1500
<b>Address:</b> 203 Weatherhead Street Angola, Indiana 46703	<b>Emergency Telephone #:</b> Chemtrec (800) 424-9300
<b>Trade Name and Synonyms:</b> Copper Cyanide	
<b>Chemical Name and Synonyms:</b> Copper Cyanide	
<b>Chemical Family:</b> Inorganic metal salt	
<b>Formula:</b> Cu <sup>2</sup> (CN) <sup>2</sup>	<b>CAS #:</b> 544-92-3

## Section II – Hazardous Ingredients

Component	CAS Number	OSHA PEL	IDLH
@ Copper Cyanide	544-92-3	5 mg/m <sup>3</sup>	25 mg/m <sup>3</sup> (as CN)

@ Identifies chemicals listed under SARA Section 313 for release reporting.

## Section III – Health Hazard Data

<b>Primary Routes of Entry:</b>	Inhalation, skin absorption, ingestion, skin or eye contact.
<b>Symptoms of Overexposure:</b>	<b>Skin:</b> Weakness, headache, confusion or nausea. <b>Eyes:</b> Slow gasping respiration, thyroid and blood changes. <b>Inhalation:</b> Irritated eyes and skin, asphyxia. <b>Ingestion:</b> Vomiting, increased respiratory rate.
<b>First Aid Procedures:</b>	<b>Skin:</b> Wash with soap immediately, remove contaminated clothing. <b>Eyes:</b> Irrigate immediately. <b>Inhalation:</b> Remove to fresh air, oxygen support as needed. <b>Ingestion:</b> Medical attention immediately.

## Section IV – Special Protection Information

<b>Protective Clothing:</b>	Rubber gloves and aprons as necessary to avoid skin contact.
<b>Eye Protection:</b>	Goggles or safety glasses.
<b>Respiratory Protection:</b>	Supplied air respirators in emergency situations, respirators if in danger of breathing the dusts.
<b>Ventilation:</b>	Use in a well ventilated area.

## Section V – Physical Data

<b>Boiling Point:</b>	Decomposes	<b>Solubility in Water:</b>	Insoluble	<b>Evaporation Rate:</b>	N/A
<b>Vapor Pressure:</b>	Very low	<b>% Volatiles by Volume:</b>	0	<b>pH (as is):</b>	N/A
<b>Vapor Density:</b>	N/A	<b>Specific Gravity:</b>	2.9	<b>pH (1% solution):</b>	N/A
<b>Appearance and Odor:</b>	Light tan or white powder smelling of bitter almond.				

## Section VI – Fire and Explosion Data

<b>Flash Point:</b>	N/A	<b>Flammable Limits:</b>	LEL; N/A	UEL; N/A	Other
<b>Extinguishing Media:</b>	<input checked="" type="checkbox"/> Water	<input type="checkbox"/> Water Fog	<input type="checkbox"/> CO <sub>2</sub>	<input type="checkbox"/> Dry Chemical	<input type="checkbox"/> Other
<b>Special Fire Fighting:</b>	Remain upwind of fire, heat will decompose the copper cyanide possibly liberating Cyanogen.				
<b>Unusual Fire Hazards:</b>	N/A				

## Section VII – Reactivity Data

<b>Stability:</b>	Stable	<b>Polymerization:</b>	Won't occur
<b>Incompatibility:</b>	Acids		
<b>Hazardous Decomposition:</b>	When mixed with acid hydrogen cyanide gas is formed.		

## Section VIII – Spill and Disposal Procedures

<b>Release or Spill Responses:</b>	If dry, keep it so, if wet, do not flush cyanides into drains or sewers.
<b>Waste Disposal Method:</b>	Contact Federal, State and Local authorities.
<b>Neutralizing Chemicals:</b>	Hypochlorites

## IX – Special Precautions

Do not allow cyanides to drain into sewers or drains. If dry, keep it so to avoid difficulties in clean up. Avoid mixing with acids, lethal hydrogen cyanide gas will be created. Always have a cyanide antidote kit available.
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This MSDS complies with 29 CFR 1910.1200  
MSDS#: 0003

Revision Date: 17-July-00

All statements, technical information and recommendations contained herein are based on available scientific tests or data that Univertical Chemical

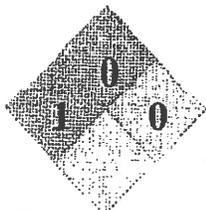
Consume

50 LBS. A YEAR

(Copper) (Anodes, Rounds)

Revision 4/2000

Copper Metal Page 1 of 2



The International Metals & Chemicals Group  
METALSAMERICA/ PPBTECHNOLOGIES

MATERIAL SAFETY DATA SHEET

NUMBER: 2007

SECTION

MANUFACTURER'S NAME: METALSAMERICA

(IMCG as Distributor)

ADDRESS: One Pitcairn Place  
165 Township Line Road  
Jenkintown, PA 19046-3531  
1-215-517-6000

DOT SHIPPING NAME: Copper

CAS NUMBER: 7440-50-8

REPORTABLE QUANTITY: N/A

CHEMICAL NAME AND SYNONYMS:

Copper

TRADE NAME AND SYNONYMS: T-Phos (CDA

122) Oxygen-Free (CDA 102), ETP (CDA 110)

CHEMICAL FAMILY/FORMULA: Cu

EMERGENCY TELEPHONE NUMBER:

Chemtrec: 800-424-9300

Outside USA Call: 202-483-7616

SECTION II - HAZARDOUS INGREDIENTS

Section 313 Supplier Notification

This product contains 99.9% Copper and is subject to the reporting requirements of Section 313 of the Emergency Planning and community Right-To-Know Act of 1986 and of 40 CFR 372. This information must be included in all Material Safety Data Sheets that are copied and distributed for this material.

No other hazardous material is present in concentration greater than 1%.

SECTION III - PHYSICAL DATA:

BOILING POINT:	4700°F	MELTING POINT:	1983°F
SPECIFIC GRAVITY (H <sub>2</sub> O = 1)	8.92	VOLATILITY/VOL (%):	N/A
SOLUBILITY IN WATER:	Insoluble	VAPOR PRESSURE (mm Hg.):	N/A
VAPOR DENSITY (AIR = 1)	N/A	EVAPORATION RATE ( ) = 1:	N/A
APPEARANCE AND ODOR:	Various shapes and sizes Copper color, no odor		

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASHPOINT (METHOD USED): N/A

FLAMMABLE LIMITS: N/A

EXTINGUISHING MEDIA: Dry Chemical

SPECIAL FIRE FIGHTING PROCEDURES: Use approved self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Water contact with molten copper may cause explosion. Potentially explosive reaction with acetylenic compounds; 3-bromopropyne; ethylene oxide; lead azide; and ammonium nitrate. ignites on contact with chlorine; chlorine trifluoride; fluorine (above 121°C).

CONSUME

200 LBS A YEAR

**SECTION V - HEALTH HAZARD DATA**

**THRESHOLD LIMIT VALUE:** OSHA PEL - TWA 1.0 mg(Cu)/m<sup>3</sup> (dust or mist), ACGIH TLV - TWA 0.2(Cu)/m<sup>3</sup> (fume).

**EFFECTS OF OVEREXPOSURE:** Under normal handling and use, exposure to massive forms of copper represents very few hazards. Particulates generated from the use of this substance may pose some health risks. Acute exposure will cause irritation to the eye; foreign body reaction causes chalcosis. Prolonged and repeated exposure to the skin will cause irritation or discoloration. Acute exposure will cause primary gastrointestinal symptoms with nausea and vomiting, abdominal pain and diarrhea. In severe cases headache, sweating, kidney and liver and central nervous system damage progressing to convulsions, coma and possible death (rarely). *Inhalation symptoms* consist primarily of irritation. Cases of "metal fume fever" have been reported. **EMERGENCY AND FIRST AID PROCEDURES:** **EYES:** Irrigate with water for 15 minutes. **SKIN:** Wash contaminated skin and remove contaminated clothing. **INHALATION:** Remove from exposure; place individual under care of physician. **INGESTION:** Induce vomiting in conscious individual. **SEEK MEDICAL ATTENTION IN THE EVENT OF ANY ACCIDENTAL EXPOSURE TO THIS PRODUCT.**

**CARCINOGENICITY INFORMATION:** Not listed as a carcinogen TSCA listed.

**SECTION VI - REACTIVITY DATA**

**STABILITY:** Stable

**INCOMPATIBILITY (MATERIALS TO AVOID):** At temperatures above melting copper oxide fumes may be formed.

**HAZARDOUS DECOMPOSITION PRODUCTS:** Contact with mineral acids will release hydrogen - a dangerous gas.

**HAZARDOUS POLYMERIZATION:** Will not occur

**CONDITIONS TO AVOID:**

**SECTION VII - SPILL OR LEAK PROCEDURES**

**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:** If copper is spilled, it can be safely swept, shoveled or picked up by hand and returned to original container. Keep dust at a minimum.

**WASTE DISPOSAL METHOD:** Place in an approved container and dispose of in accordance with Federal, State, and Local laws.

**SECTION VIII - SPECIAL PROTECTION INFORMATION**

**RESPIRATORY PROTECTION (SPECIFY TYPE):** Approved respirator for dust or fumes.

**VENTILATION:** The area surrounding any plating tank should be suitably ventilated to prevent gases, mists, and particulate matter evolved from the plating tank from collecting to injurious levels. Maintain working environment below the recommended exposure limits.

**PROTECTIVE GLOVES:** Rubber or Leather

**EYE PROTECTION:** If copper metal is converted to particulates, avoid contact with eyes by appropriate safety goggles or glasses with full side shield.

**OTHER PROTECTIVE EQUIPMENT:** Protective coveralls and safety footwear.

**SECTION IX - SPECIAL PRECAUTIONS**

**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:** Keep away from reactive products.

**OTHER PRECAUTIONS:** No other precautions are expected to be necessary.

**SECTION X - OTHER REGULATORY INFORMATION**

Ingredients in this product are TSCA listed.

Ingredients in this product are CDS listed.

N/A

Copper Cyanide Trihydrate

MATERIAL SAFETY  
DATA SHEET

ATOTECH USA INC.  
1750 OVERVIEW DRIVE  
P.O. BOX 12000  
ROCK HILL, S.C. 29731-2000

EMERGENCY TELEPHONE  
NUMBER  
8:00 am - 5:00 pm  
(803) 817-3500

CHEMTREC - 24 HOURS  
1-800-424-9300

NAME USED ON LABEL: CUFLEX 307  
CHEMICAL NAME (if single substance): Mixture  
CHEMICAL FAMILY: Mixture  
FORMULA: Proprietary

\*\*\*\*\*  
HAZARDOUS INGREDIENTS  
\*\*\*\*\*

IDENTITY	CAS No.	%	EXPOSURE LIMITS
Nitrilotriacetic Acid	5064-31-3	<1	Not Established

\*\*\*\*\*  
PHYSICAL DATA  
\*\*\*\*\*

BOILING POINT: N/E	FREEZING POINT: N/E
SPECIFIC GRAVITY: 1.25 - 1.31	VAPOR PRESSURE @ 20 C: N/E
VAPOR DENSITY (Air=1): N/E	SOLUBILITY IN WATER: Soluble
% VOLATILE: N/A	EVAPORATION RATE
pH: >10	(Butyl Acetate=1): N/E

APPEARANCE: Amber to brown liquid.

\*\*\*\*\*  
FIRE AND EXPLOSION DATA  
\*\*\*\*\*

FLASH POINT (Test Method)	AUTOIGNITION TEMPERATURE	FLAMMABLE LTS.
N/E	N/E	LEL-N/E UEL-N/E

EXTINGUISHING MEDIA: Nonflammable -- Use extinguishing media appropriate to surrounding fire conditions.

SPECIAL FIRE FIGHTING PROCEDURES: Do not get material on skin or clothing. Avoid inhalation of fumes or mists. Stay upwind, out of low areas, and ventilate closed spaces before entering. Cool containers from the side with water until fire is out. Use water spray to reduce vapor; do not put water directly on leak or spill area. Wear full protective clothing and NIOSH-approved, self-contained breathing apparatus (SCBA) with full facepiece operated in the pressure demand or other positive pressure mode. Move containers from fire area, if possible to do so without risk.

\*N/A = NOT AVAILABLE  
\*\*N/APP = NOT APPLICABLE  
\*\*\*N/E = NOT ESTABLISHED

Consume  
20 gal A YEAR

NAME USED ON LABEL: CUFLEX 307

UNUSUAL FIRE AND EXPLOSION HAZARDS: During fire conditions, product may evolve oxides of carbon and nitrogen.

\*\*\*\*\*  
HEALTH HAZARD DATA  
\*\*\*\*\*

EYE CONTACT: May cause irritation to the eyes and surrounding areas.

SKIN CONTACT: May cause irritation.

INHALATION: May cause irritation to the respiratory passages, including the nose, airway, and lungs.

INGESTION: May cause irritation to the mouth, throat, and stomach.

CHRONIC TOXICITY: Effects of long-term exposure to this product have not been determined.

SYMPTOMS OF EXPOSURE: Red, inflamed skin, eyes, and mucous membranes; burns and pain; blurred or diminished vision; abdominal pain, nausea, vomiting (vomitus may have a coffee-ground appearance); shortness of breath, chest pain, pulmonary edema (may be delayed); dizziness, shock, weak and rapid pulse.

CARCINOGENICITY:

	NTP	IARC	Other
Yes		X	
No	X		X

The International Agency for Research on Cancer (IARC) lists Nitrilotriacetic Acid and its trisodium salts as possibly carcinogenic to humans.

\*\*\*\*\*  
SUGGESTED FIRST AID  
\*\*\*\*\*

EYES: Immediately flush eyes with plenty of water for at least 15 minutes forcibly holding eyelids apart to ensure complete irrigation of all eye and lid tissue. Get immediate medical attention.

SKIN: Immediately flush skin with plenty of water while removing contaminated clothing and shoes. Get immediate medical attention. Contaminated clothing should be taken off/removed in a manner which limits further exposure.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration and/or if breathing is difficult give oxygen by trained personnel. Get immediate medical attention.

MATERIAL SAFETY  
DATA SHEET

ATOTECH USA INC.  
ROCK HILL, S.C. 29731-2000

NAME USED ON LABEL: CUFLEX 307

INGESTION: If swallowed, do NOT induce vomiting. Give milk or water. Call a physician or poison control center immediately. Never give anything by mouth to an unconscious person.

\*\*\*\*\*  
REACTIVITY DATA  
\*\*\*\*\*

STABILITY: Stable

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Contact with incompatible materials.

INCOMPATIBILITY (Materials to Avoid): Contact with aluminum evolves hydrogen. Avoid copper, nickel, and strong oxidizers.

HAZARDOUS DECOMPOSITION PRODUCTS: Oxides of carbon and nitrogen upon thermal decomposition.

\*\*\*\*\*  
SPECIAL PROTECTION INFORMATION  
\*\*\*\*\*

VENTILATION: Local exhaust or an enclosed handling system is highly recommended. Mechanical (general) ventilation is required.

EYE PROTECTION: Use chemical splash goggles and face shield (ANSI Z87.1 or approved equivalent). Do not wear contact lenses when in contact with this product. An emergency eye wash must be readily accessible to the work area.

RESPIRATORY PROTECTION: Use NIOSH approved respiratory equipment when airborne concentrations are equal to or may exceed exposure limits. For emergency or other conditions where exposure levels are not known or may be uncontrolled, use a positive pressure air-supplied or self-contained breathing apparatus (SCBA). Respiratory protection programs must comply with 29 CFR 1910.134.

ADDITIONAL PERSONAL PROTECTIVE EQUIPMENT: Select chemical resistant clothing such as gloves, aprons, boots or whole full body protection where contact may occur. Consult glove/clothing manufacturer to determine the most suitable chemical resistant clothing for user's application. Consideration must be given to durability and permeation resistance. Wash immediately if skin is contaminated. Remove contaminated clothing immediately after use and wash before re-use. Provide a safety shower at any location where skin contact may occur. Always wash skin thoroughly after handling.

NAME USED ON LABEL: CUFLEX 307

\*\*\*\*\*  
SPECIAL PRECAUTIONS  
\*\*\*\*\*

HANDLING: Do not get in eyes, on skin, or on clothing. Do not breathe dust, mist or vapor. Do not take internally. Use only with adequate ventilation. Wash thoroughly after handling. Emptied container retains vapor and product residue - Observe all label safeguards until container is cleaned, reconditioned or destroyed. Keep container tightly closed in an upright position.

STORAGE: Store in a cool, dry place away from incompatible material.

\*\*\*\*\*  
ENVIRONMENTAL INFORMATION  
\*\*\*\*\*

SPILL RESPONSE: Wear NIOSH/MSHA-approved respiratory protection and appropriate personal protective equipment when cleaning spill. Do not get spilled material on skin or clothing; stop leak if you can do so without risk. If necessary, dike area of spill to prevent spreading. Cover with sand, clay, or other non-combustible absorbent material. Transfer absorbed material to an appropriate and properly labeled container for disposal. NOTE: Discharge to a public sewerage authority should coincide with all applicable local permits and notification requirements. May be hazardous to aquatic life if released to open waters.

RECOMMENDED DISPOSAL: Disposal of waste material from the use of this product may be subject to federal, state, and local regulations. Refer to Part 261 of 40 CFR for the applicability of federal regulations. Consult with your state and local governments for additional regulatory requirements. Disposal of this material must be in a manner compliant with all federal, state, and local regulations.

\*\*\*\*\*  
TRANSPORTATION  
\*\*\*\*\*

HAZARDOUS MATERIAL/DANGEROUS GOODS SHIPMENT IS INDICATED BY (X) BELOW:

(X) NOT REGULATED (NOTE: For reportable quantities which may apply, see Miscellaneous.)

MATERIAL SAFETY  
DATA SHEET

ATOTECH USA INC.  
ROCK HILL, S.C. 29731-2000

NAME USED ON LABEL: CUFLEX 307

\*\*\*\*\*  
MISCELLANEOUS  
\*\*\*\*\*

EPA/DOT - REPORTABLE QUANTITY (RQ) FOR HAZARDOUS SUBSTANCES:

(X) There are no constituents in this product for which reportable quantities may be applicable.

EPA - Any release of hazardous substance(s) in a quantity equal to or exceeding the RQ in any 24-hour period requires the immediate notification of the National Response Center in Washington, D.C. at (800) 424-8802. Other notification requirements, such as state and local governments, may apply.

DOT - Any package containing a hazardous substance in a quantity equal to or exceeding the RQ is regulated as a hazardous material.

\*\*\*\*\*  
ADDITIONAL INFORMATION  
\*\*\*\*\*

RATINGS:

	F	H	R	PPE	Spec Haz
HMIS	1	1	0	X	N/APP
NFPA	1	1	0	N/APP	N/APP

F= Flammability<sup>4</sup>      H=Health      R=Reactivity  
PPE= Personal Protection Equipment      Spec Haz= Special Health Hazards  
W=Water Reactive      OX=Oxidizer      \* = Chronic Hazard

SARA Title III Classifications:	Yes	No
Immediate (Acute) Health . . .	X	
Delayed (Chronic) Health . . .		X
Sudden Release of Pressure . .		X
Reactive . . . . .		X
Fire . . . . .		X

Components of this product are identified below if they are present in excess of de minimus reporting levels. Components that are not required to be identified by specific chemical name may have a generic description.

SARA Title III Section 302 Extremely Hazardous Substances:  
NONE

SARA Title III Section 313 Toxic Chemicals:  
NONE

STATE RIGHT-TO-KNOW

\*N/A = NOT AVAILABLE  
\*\*N/APP = NOT APPLICABLE  
\*\*\*N/E = NOT ESTABLISHED

MATERIAL SAFETY  
DATA SHEET

ATOTECH USA INC.  
ROCK HILL, S.C. 29731-2000

NAME USED ON LABEL: CUFLEX 307

Components of this product which are specifically identified in the ingredients section of this MSDS may be listed as hazardous by these and/or other states: California, Connecticut, Illinois, Indiana, Kentucky, Louisiana, Massachusetts, Michigan, Minnesota, New Jersey, New York, North Carolina, Pennsylvania and Rhode Island.

-----  
CAREFULLY READ THE FOLLOWING: The identification of ingredients in this document meets or exceeds the requirements set forth in 29 CFR, 40 CFR, et al. at the date of publication. Ingredients present in a mixture or solution which are generically identified or not referenced in this document are not regulatorily required to be specifically identified or referenced. The information contained herein should be provided to all those who will use, handle, store, transport, or may otherwise be exposed to this product.

We certify that all ingredients, whether identified in this MSDS or not, are on the TSCA inventory (for USA manufacture and/or sales only).

THE INFORMATION CONTAINED HEREIN, TO THE BEST OF OUR KNOWLEDGE, IS CONSIDERED TO BE ACCURATE. SUCH INFORMATION IS OFFERED SOLELY FOR YOUR CONSIDERATION, INVESTIGATION, AND VERIFICATION, AND WE DO NOT SUGGEST OR GUARANTEE THAT ANY PRECAUTIONS, PROCEDURES, RECOMMENDATIONS ETC. ARE PREFERRED OR UNIQUE. ATOTECH USA INC. MAKES NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO THE USE OF THIS INFORMATION OR THE USE OF MATERIAL IDENTIFIED HEREIN, IN COMBINATION WITH ANY OTHER MATERIAL OR PROCESS, AND ASSUMES NO RESPONSIBILITY THEREFORE. THIS DOCUMENT WAS DEVELOPED UNDER THE REQUIREMENTS OF THE UNITED STATES, AND AS SUCH MAY NOT SATISFY OTHER STATE OR REGIONAL REQUIREMENTS.

PREPARED BY THE PRODUCT SAFETY DEPARTMENT (PSD)

ISSUED: 07/31/2003

SUPERSEDES: 07/16/2002

PMCODE: CIM(obs.8/12/03) Page 6 of 6

\*N/A = NOT AVAILABLE  
\*\*N/APP = NOT APPLICABLE  
\*\*\*N/E = NOT ESTABLISHED

NA

MATERIAL SAFETY DATA SHEET

ATOTECH USA INC. 1750 OVERVIEW DRIVE ROCK HILL, S.C. 29730

EMERGENCY TELEPHONE NUMBER 8:00 am - 5:00 pm (803) 817-3500

CHEMTREC - 24 HOURS 1-800-424-9300

NAME USED ON LABEL: CUFLEX 308 CHEMICAL NAME (if single substance): Mixture CHEMICAL FAMILY: Mixture FORMULA: Proprietary

HAZARDOUS INGREDIENTS

IDENTITY CAS No. % EXPOSURE LIMITS

This product does not contain Hazardous Materials above De Minimus reporting levels as defined by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

PHYSICAL DATA

BOILING POINT: N/E FREEZING POINT: <40 Deg. F SPECIFIC GRAVITY: 1.007 - 1.015 VAPOR PRESSURE @ 20 C: N/E VAPOR DENSITY (Air=1): N/E SOLUBILITY IN WATER: Complete % VOLATILE: N/A EVAPORATION RATE pH: 9.4 - 11.4 (Butyl Acetate=1): N/E

APPEARANCE: Clear light straw liquid.

FIRE AND EXPLOSION DATA

FLASH POINT (Test Method) AUTOIGNITION TEMPERATURE FLAMMABLE LTS. N/E N/E LEL-N/E UEL-N/E

EXTINGUISHING MEDIA: Nonflammable -- Use extinguishing media appropriate to surrounding fire conditions.

SPECIAL FIRE FIGHTING PROCEDURES: Do not get material on skin or clothing. Avoid inhalation of fumes or mists. Stay upwind, out of low areas, and ventilate closed spaces before entering. Cool containers from the side with water until fire is out. Use water spray to reduce vapor; do not put water directly on leak or spill area. Wear full protective clothing and NIOSH-approved, self-contained breathing apparatus (SCBA) with full facepiece operated in the pressure demand or other positive pressure mode. Move containers from fire area, if possible to do so without risk.

\*N/A = NOT AVAILABLE \*\*N/APP = NOT APPLICABLE \*\*\*N/E = NOT ESTABLISHED

Consume 20 gal A YEAR

NAME USED ON LABEL: CUFLEX 308

UNUSUAL FIRE AND EXPLOSION HAZARDS: During fire conditions, product may evolve alkylamines and oxides of carbon, nitrogen, and sulfur.

\*\*\*\*\*  
HEALTH HAZARD DATA  
\*\*\*\*\*

EYE CONTACT: May cause irritation to the eyes and surrounding areas.

SKIN CONTACT: May cause irritation.

INHALATION: May cause irritation to the respiratory passages, including the nose, airway, and lungs.

INGESTION: May cause irritation to the mouth, throat, and stomach.

CHRONIC TOXICITY: Effects of long-term exposure to this product have not been determined.

SYMPTOMS OF EXPOSURE: Red, inflamed skin, eyes, and mucous membranes; pain; blurred or diminished vision; abdominal pain, nausea, vomiting, diarrhea; shortness of breath, chest pain; dizziness.

CARCINOGENICITY:

	NTP	IARC	Other
Yes			
No	X	X	X

\*\*\*\*\*  
SUGGESTED FIRST AID  
\*\*\*\*\*

EYES: Immediately flush eyes with plenty of water for at least 15 minutes forcibly holding eyelids apart to ensure complete irrigation of all eye and lid tissue. Get immediate medical attention.

SKIN: Immediately flush skin with plenty of water while removing contaminated clothing and shoes. Get immediate medical attention. Contaminated clothing should be taken off/removed in a manner which limits further exposure.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration and/or if breathing is difficult give oxygen by trained personnel. Get immediate medical attention.

INGESTION: If swallowed, do NOT induce vomiting. Give milk or water. Call a physician or poison control center immediately. Never give anything by mouth to an unconscious person.

MATERIAL SAFETY  
DATA SHEET

ATOTECH USA INC.  
ROCK HILL, S.C. 29730

NAME USED ON LABEL: CUFLEX 308

\*\*\*\*\*  
REACTIVITY DATA  
\*\*\*\*\*

STABILITY: Stable

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Contact with incompatible materials.

INCOMPATIBILITY (Materials to Avoid): Strong oxidizing and reducing agents, strong acids, and materials reactive with amines and hydroxyl compounds.

HAZARDOUS DECOMPOSITION PRODUCTS: Alkylamines and oxides of carbon, nitrogen, and sulfur upon thermal decomposition.

\*\*\*\*\*  
SPECIAL PROTECTION INFORMATION  
\*\*\*\*\*

VENTILATION: Local exhaust or an enclosed handling system is highly recommended. Mechanical (general) ventilation is required.

EYE PROTECTION: Use chemical splash goggles and face shield (ANSI Z87.1 or approved equivalent). Do not wear contact lenses when in contact with this product. An emergency eye wash must be readily accessible to the work area.

RESPIRATORY PROTECTION: Use NIOSH approved respiratory equipment when airborne concentrations are equal to or may exceed exposure limits. For emergency or other conditions where exposure levels are not known or may be uncontrolled, use a positive pressure air-supplied or self-contained breathing apparatus (SCBA). Respiratory protection programs must comply with 29 CFR 1910.134.

ADDITIONAL PERSONAL PROTECTIVE EQUIPMENT: Select chemical resistant clothing such as gloves, aprons, boots or whole full body protection where contact may occur. Consult glove/clothing manufacturer to determine the most suitable chemical resistant clothing for user's application. Consideration must be given to durability and permeation resistance. Wash immediately if skin is contaminated. Remove contaminated clothing immediately after use and wash before re-use. Provide a safety shower at any location where skin contact may occur. Always wash skin thoroughly after handling.

NAME USED ON LABEL: CUFLEX 308

\*\*\*\*\*

SPECIAL PRECAUTIONS

\*\*\*\*\*

HANDLING: Avoid getting in eyes, on skin, or on clothing. Avoid breathing dust, mist, or vapor. Do not take internally. Use only with adequate ventilation. Wash thoroughly after handling. Emptied container retains vapor and product residue - Observe all label safeguards until container is cleaned, reconditioned or destroyed. Keep container tightly closed in an upright position.

STORAGE: Protect from freezing; store above 40 degrees Fahrenheit. Store in a cool, dry place away from incompatible material.

\*\*\*\*\*

ENVIRONMENTAL INFORMATION

\*\*\*\*\*

SPILL RESPONSE: Wear NIOSH/MSHA-approved respiratory protection and appropriate personal protective equipment when cleaning spill. Do not get spilled material on skin or clothing; stop leak if you can do so without risk. If necessary, dike area of spill to prevent spreading. Cover with sand, clay, or other non-combustible absorbent material. Transfer absorbed material to an appropriate and properly labeled container for disposal. NOTE: Discharge to a public sewerage authority should coincide with all applicable local permits and notification requirements. May be hazardous to aquatic life if released to open waters.

RECOMMENDED DISPOSAL: Disposal of waste material from the use of this product may be subject to federal, state, and local regulations. Refer to Part 261 of 40 CFR for the applicability of federal regulations. Consult with your state and local governments for additional regulatory requirements. Disposal of this material must be in a manner compliant with all federal, state, and local regulations.

\*\*\*\*\*

TRANSPORTATION

\*\*\*\*\*

HAZARDOUS MATERIAL/DANGEROUS GOODS SHIPMENT IS INDICATED BY (X) BELOW:

(X) NOT REGULATED (NOTE: For reportable quantities which may apply, see Miscellaneous.)

MATERIAL SAFETY  
DATA SHEET

ATOTECH USA INC.  
ROCK HILL, S.C. 29730

NAME USED ON LABEL: CUFLEX 308

\*\*\*\*\*  
MISCELLANEOUS  
\*\*\*\*\*

EPA/DOT - REPORTABLE QUANTITY (RQ) FOR HAZARDOUS SUBSTANCES:

(X) There are no constituents in this product for which reportable quantities may be applicable.

EPA - Any release of hazardous substance(s) in a quantity equal to or exceeding the RQ in any 24-hour period requires the immediate notification of the National Response Center in Washington, D.C. at (800) 424-8802. Other notification requirements, such as state and local governments, may apply.

DOT - Any package containing a hazardous substance in a quantity equal to or exceeding the RQ is regulated as a hazardous material.

\*\*\*\*\*  
ADDITIONAL INFORMATION  
\*\*\*\*\*

RATINGS:

	F	H	R	PPE	Spec Haz
HMIS	0	1	0	X	N/APP
NFPA	0	1	0	N/APP	N/APP

F= Flammability      H=Health      R=Reactivity  
PPE= Personal Protection Equipment      Spec Haz= Special Health Hazards  
W=Water Reactive      OX=Oxidizer      \* = Chronic Hazard

SARA Title III Classifications:	Yes	No
Immediate (Acute) Health . . .	X	
Delayed (Chronic) Health . . .		X
Sudden Release of Pressure . .		X
Reactive . . . . .		X
Fire . . . . .		X

Components of this product are identified below if they are present in excess of de minimus reporting levels. Components that are not required to be identified by specific chemical name may have a generic description.

SARA Title III Section 302 Extremely Hazardous Substances:  
NONE

SARA Title III Section 313 Toxic Chemicals:  
NONE

STATE RIGHT-TO-KNOW

\*N/A = NOT AVAILABLE  
\*\*N/APP = NOT APPLICABLE  
\*\*\*N/E = NOT ESTABLISHED

MATERIAL SAFETY  
DATA SHEET

ATOTECH USA INC.  
ROCK HILL, S.C. 29730

NAME USED ON LABEL: CUFLEX 308

Components of this product which are specifically identified in the ingredients section of this MSDS may be listed as hazardous by these and/or other states: California, Connecticut, Illinois, Indiana, Kentucky, Louisiana, Massachusetts, Michigan, Minnesota, New Jersey, New York, North Carolina, Pennsylvania, and Rhode Island.

-----  
CAREFULLY READ THE FOLLOWING: The identification of ingredients in this document meets or exceeds the requirements set forth in 29 CFR, 40 CFR, et al. at the date of publication. Ingredients present in a mixture or solution which are generically identified or not referenced in this document are not regulatorily required to be specifically identified or referenced. The information contained herein should be provided to all those who will use, handle, store, transport, or may otherwise be exposed to this product.

We certify that all ingredients, whether identified in this MSDS or not, are on the TSCA inventory (for USA manufacture and/or sales only).

THE INFORMATION CONTAINED HEREIN, TO THE BEST OF OUR KNOWLEDGE, IS CONSIDERED TO BE ACCURATE. SUCH INFORMATION IS OFFERED SOLELY FOR YOUR CONSIDERATION, INVESTIGATION, AND VERIFICATION, AND WE DO NOT SUGGEST OR GUARANTEE THAT ANY PRECAUTIONS, PROCEDURES, RECOMMENDATIONS\*ETC. ARE PREFERRED OR UNIQUE. ATOTECH USA INC. MAKES NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO THE USE OF THIS INFORMATION OR THE USE OF MATERIAL IDENTIFIED HEREIN, IN COMBINATION WITH ANY OTHER MATERIAL OR PROCESS, AND ASSUMES NO RESPONSIBILITY THEREFORE. THIS DOCUMENT WAS DEVELOPED UNDER THE REQUIREMENTS OF THE UNITED STATES, AND AS SUCH MAY NOT SATISFY OTHER STATE OR REGIONAL REQUIREMENTS.

PREPARED BY THE PRODUCT SAFETY DEPARTMENT (PSD)

ISSUED: 10/11/2001

SUPERSEDES: New

PMCODE: CIN(obs.8/12/03) Page 6 of 6

\*N/A = NOT AVAILABLE  
\*\*N/APP = NOT APPLICABLE  
\*\*\*N/E = NOT ESTABLISHED

Coppel Dynamics Lab

NA

MATERIAL SAFETY  
DATA SHEET

ATOTECH USA INC.  
1750 OVERVIEW DRIVE  
ROCK HILL, S.C. 29730

EMERGENCY TELEPHONE  
NUMBER  
8:00 am - 5:00 pm  
(803) 817-3500

CHEMTREC - 24 HOURS  
1-800-424-9300

NAME USED ON LABEL: CUFLEX 306  
CHEMICAL NAME (if single substance): Mixture  
CHEMICAL FAMILY: Mixture  
FORMULA: Proprietary

\*\*\*\*\*  
HAZARDOUS INGREDIENTS  
\*\*\*\*\*

IDENTITY                      CAS No.                      %                      EXPOSURE LIMITS

This product does not contain Hazardous Materials above De Minimus reporting levels as defined by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

\*\*\*\*\*  
PHYSICAL DATA  
\*\*\*\*\*

BOILING POINT: N/E                      FREEZING POINT: <40 Deg F  
SPECIFIC GRAVITY: 1.000 - 1.015                      VAPOR PRESSURE @ 20 C: N/E  
VAPOR DENSITY (Air=1): N/E                      SOLUBILITY IN WATER: Complete  
% VOLATILE: N/A                      EVAPORATION RATE  
pH: 11 - 12                      (Butyl Acetate=1): N/E

APPEARANCE: Clear, colorless liquid.

\*\*\*\*\*  
FIRE AND EXPLOSION DATA  
\*\*\*\*\*

FLASH POINT (Test Method)                      AUTOIGNITION TEMPERATURE                      FLAMMABLE LTS.  
N/E                      N/E                      LEL-N/E UEL-N/E

EXTINGUISHING MEDIA: Nonflammable -- Use extinguishing media appropriate to surrounding fire conditions.

SPECIAL FIRE FIGHTING PROCEDURES: Do not get material on skin or clothing. Avoid inhalation of fumes or mists. Stay upwind, out of low areas, and ventilate closed spaces before entering. Cool containers from the side with water until fire is out. Use water spray to reduce vapor; do not put water directly on leak or spill area. Wear full protective clothing and NIOSH-approved, self-contained breathing apparatus (SCBA) with full facepiece operated in the pressure demand or other positive pressure mode. Move containers from fire area, if possible to do so without risk.

\*N/A = NOT AVAILABLE  
\*\*N/APP = NOT APPLICABLE  
\*\*\*N/E = NOT ESTABLISHED

Consume  
20 GAL A YEAR

NAME USED ON LABEL: CUFLEX 306

UNUSUAL FIRE AND EXPLOSION HAZARDS: None known.

\*\*\*\*\*

HEALTH HAZARD DATA

\*\*\*\*\*

EYE CONTACT: May cause irritation to the eyes and surrounding areas.

SKIN CONTACT: May cause irritation.

INHALATION: May cause irritation to the respiratory passages, including the nose, airway, and lungs.

INGESTION: May cause irritation to the mouth, throat, and stomach.

CHRONIC TOXICITY: Effects of long-term exposure to this product have not been determined.

SYMPTOMS OF EXPOSURE: Red, inflamed skin, eyes, and mucous membranes; pain; blurred or diminished vision; abdominal pain, nausea, vomiting, diarrhea; shortness of breath, chest pain; dizziness.

CARCINOGENICITY:

	NTP	IARC	Other
Yes			
No	X	X	X

\*\*\*\*\*

SUGGESTED FIRST AID

\*\*\*\*\*

EYES: Immediately flush eyes with plenty of water for at least 15 minutes forcibly holding eyelids apart to ensure complete irrigation of all eye and lid tissue. Get immediate medical attention.

SKIN: Immediately flush skin with plenty of water while removing contaminated clothing and shoes. Get immediate medical attention. Contaminated clothing should be taken off/removed in a manner which limits further exposure.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration and/or if breathing is difficult give oxygen by trained personnel. Get immediate medical attention.

INGESTION: If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.

\*N/A = NOT AVAILABLE

\*\*N/APP = NOT APPLICABLE

\*\*\*N/E = NOT ESTABLISHED

NAME USED ON LABEL: CUFLEX 306

\*\*\*\*\*  
REACTIVITY DATA  
\*\*\*\*\*

STABILITY: Stable

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Contact with incompatible materials.

INCOMPATIBILITY (Materials to Avoid): None known.

HAZARDOUS DECOMPOSITION PRODUCTS: None known.

\*\*\*\*\*  
SPECIAL PROTECTION INFORMATION  
\*\*\*\*\*

VENTILATION: Local exhaust or an enclosed handling system is highly recommended. Mechanical (general) ventilation is required.

EYE PROTECTION: Use chemical splash goggles and face shield (ANSI Z87.1 or approved equivalent). Do not wear contact lenses when in contact with this product. An emergency eye wash must be readily accessible to the work area.

RESPIRATORY PROTECTION: Use NIOSH approved respiratory equipment when airborne concentrations are equal to or may exceed exposure limits. For emergency or other conditions where exposure levels are not known or may be uncontrolled, use a positive pressure air-supplied or self-contained breathing apparatus (SCBA). Respiratory protection programs must comply with 29 CFR 1910.134.

ADDITIONAL PERSONAL PROTECTIVE EQUIPMENT: Select chemical resistant clothing such as gloves, aprons, boots or whole full body protection where contact may occur. Consult glove/clothing manufacturer to determine the most suitable chemical resistant clothing for user's application. Consideration must be given to durability and permeation resistance. Wash immediately if skin is contaminated. Remove contaminated clothing immediately after use and wash before re-use. Provide a safety shower at any location where skin contact may occur. Always wash skin thoroughly after handling.

\*\*\*\*\*  
SPECIAL PRECAUTIONS  
\*\*\*\*\*

HANDLING: Avoid getting in eyes, on skin, or on clothing. Avoid breathing dust, mist or vapor. Do not take internally. Use only with

\*N/A = NOT AVAILABLE  
\*\*N/APP = NOT APPLICABLE  
\*\*\*N/E = NOT ESTABLISHED

NAME USED ON LABEL: CUFLEX 306

adequate ventilation. Wash thoroughly after handling. Emptied container retains vapor and product residue - Observe all label safeguards until container is cleaned, reconditioned or destroyed. Keep container tightly closed in an upright position.

STORAGE: Protect from freezing - store above 40 deg F. Store in a cool, dry place away from incompatible material.

\*\*\*\*\*  
ENVIRONMENTAL INFORMATION  
\*\*\*\*\*

SPILL RESPONSE: Wear NIOSH/MSHA-approved respiratory protection and appropriate personal protective equipment when cleaning spill. Do not get spilled material on skin or clothing; stop leak if you can do so without risk. If necessary, dike area of spill to prevent spreading. Cover with sand, clay, or other non-combustible absorbent material. Transfer absorbed material to an appropriate and properly labeled container for disposal. NOTE: Discharge to a public sewerage authority should coincide with all applicable local permits and notification requirements. May be hazardous to aquatic life if released to open waters.

RECOMMENDED DISPOSAL: Disposal of waste material from the use of this product may be subject to federal, state, and local regulations. Refer to Part 261 of 40 CFR for the applicability of federal regulations. Consult with your state and local governments for additional regulatory requirements. Disposal of this material must be in a manner compliant with all federal, state, and local regulations.

\*\*\*\*\*  
TRANSPORTATION  
\*\*\*\*\*

\*\*\*\*\*  
HAZARDOUS MATERIAL/DANGEROUS GOODS SHIPMENT IS INDICATED BY (X) BELOW:

(X) NOT REGULATED (NOTE: For reportable quantities which may apply, see Miscellaneous.)

\*\*\*\*\*  
MISCELLANEOUS  
\*\*\*\*\*

EPA/DOT - REPORTABLE QUANTITY (RQ) FOR HAZARDOUS SUBSTANCES:

(X) There are no constituents in this product for which reportable quantities may be applicable.

\*N/A = NOT AVAILABLE  
\*\*N/APP = NOT APPLICABLE  
\*\*\*N/E = NOT ESTABLISHED

MATERIAL SAFETY  
DATA SHEET

ATOTECH USA INC.  
ROCK HILL, S.C. 29730

NAME USED ON LABEL: CUFLEX 306

EPA - Any release of hazardous substance(s) in a quantity equal to or exceeding the RQ in any 24-hour period requires the immediate notification of the National Response Center in Washington, D.C. at (800) 424-8802. Other notification requirements, such as state and local governments, may apply.

DOT - Any package containing a hazardous substance in a quantity equal to or exceeding the RQ is regulated as a hazardous material.

\*\*\*\*\*

ADDITIONAL INFORMATION

\*\*\*\*\*

RATINGS:

	F	H	R	PPE	Spec Haz
HMIS	0	1	0	X	N/APP
NFPA	0	1	0	N/APP	N/APP

F= Flammability      H=Health      R=Reactivity  
PPE= Personal Protection Equipment      Spec Haz= Special Health Hazards  
W=Water Reactive      OX=Oxidizer      \* = Chronic Hazard

SARA Title III Classifications:	Yes	No
Immediate (Acute) Health . . .	X	
Delayed (Chronic) Health . . .		X
Sudden Release of Pressure . .		X
Reactive . . . . .		X
Fire . . . . .		X

Components of this product are identified below if they are present in excess of de minimus reporting levels. Components that are not required to be identified by specific chemical name may have a generic description.

SARA Title III Section 302 Extremely Hazardous Substances:  
NONE

SARA Title III Section 313 Toxic Chemicals:  
NONE

STATE RIGHT-TO-KNOW

Components of this product which are specifically identified in the ingredients section of this MSDS may be listed as hazardous by these and/or other states: California, Connecticut, Illinois, Indiana, Kentucky, Louisiana, Massachusetts, Michigan, Minnesota, New Jersey, New York, North Carolina, Pennsylvania and Rhode Island.

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MATERIAL SAFETY  
DATA SHEET

ATOTECH USA INC.  
ROCK HILL, S.C. 29730

NAME USED ON LABEL: CUFLEX 306

CAREFULLY READ THE FOLLOWING: The identification of ingredients in this document meets or exceeds the requirements set forth in 29 CFR, 40 CFR, et al. at the date of publication. Ingredients present in a mixture or solution which are generically identified or not referenced in this document are not regulatorily required to be specifically identified or referenced. The information contained herein should be provided to all those who will use, handle, store, transport, or may otherwise be exposed to this product.

We certify that all ingredients, whether identified in this MSDS or not, are on the TSCA inventory (for USA manufacture and/or sales only).

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PREPARED BY THE PRODUCT SAFETY DEPARTMENT (PSD)

ISSUED: 08/07/2001

SUPERSEDES: New

PMCODE: CIL

Page 6 of 6

\*N/A = NOT AVAILABLE  
\*\*N/APP = NOT APPLICABLE  
\*\*\*N/E = NOT ESTABLISHED

NA

ATOTECH USA  
MATERIAL SAFETY DATA SHEET

PRODUCT NAME: CUFLEX 305

MSDS No.: 11101

REVISION: 2

PREPARED BY: DIR ENV AFFAIRS

ISSUE DATE: 02/01/79

EFFECTIVE DATE: 03/29/00

SECTION A. MATERIAL IDENTIFICATION.

MANUFACTURER: ATOTECH USA

CHEMTREC:

1750 OVERVIEW DRIVE  
ROCK HILL, SC 29730

TELEPHONE #: 800-424-9300  
OR 703-527-3887

TELEPHONE: 803-817-3500 (8:00 am - 5:00 pm ET)

SECTION B. INGREDIENTS AND HAZARDS.

INGREDIENT: CONTAINS NOTHING CONSIDERED HAZARDOUS BY STATE OR FEDERAL REGULATIONS.

CAS NUMBER: NA

EXPOSURE LIMIT: TWA: NA

SUSPECT CARCINOGEN: NO

SECTION C. PHYSICAL DATA.

APPEARANCE: SLIGHTLY COLORED LIQUID

BOILING POINT: 100C

ODOR: SLIGHT

FREEZING POINT: UK

SPECIFIC GRAVITY: 1.08

VAPOR PRESSURE: UK

pH: 9-11

VAPOR DENSITY: UK

EVAPORATION RATE: <BUTYL ACETATE

% VOLATILE BY VOLUME: NA

SOLUBILITY IN WATER: 100%

SECTION D. FIRE AND EXPLOSION HAZARD DATA.

FLASH POINT: NONE

HAZARD SYMBOL CODES

TEST METHOD: NA

NFPA HMIS

LIMITS: LEL: NA

HEALTH: 0 0

UEL: NA

FLAMMABILITY: 0 0

REACTIVITY: 0 0

SPECIAL:

EXTINGUISHING MEDIA: NOT FLAMMABLE

SPECIAL FIRE FIGHTING NONE PROCEDURES:

UNUSUAL FIRE OR NONE EXPLOSION HAZARDS:

SECTION E. REACTIVITY DATA

Consume  
20 GAL A YEAR

MATERIAL IS STABLE.  
HAZARDOUS POLYMERIZATION WILL NOT OCCUR.

CONDITIONS TO            NA  
AVOID:

CHEMICAL                NONE KNOWN  
INCOMPATIBILITIES:

HAZARDOUS DECOMPOSITION    NONE KNOWN  
PRODUCTS:

---

SECTION F.: HEALTH HAZARD DATA.

SUMMARY OF RISKS:            SARA-NA

MEDICAL CONDITIONS        NONE KNOWN  
WHICH MAY BE  
AGGRAVATED BY CONTACT:

TARGET ORGANS:            SKIN, EYES

PRIMARY ENTRY ROUTES:    THROUGH CONTACT

ACUTE EFFECTS:            WHILE THERE IS NO DATA TO SHOW ANY HARMFUL EFFECTS  
IT IS POSSIBLE THAT IRRITATION OF SKIN OR EYES OF  
OF PARTICULARLY SENSITIVE INDIVIDUALS COULD OCCUR.

CHRONIC EFFECTS:         NONE KNOWN

SIGNS & SYMPTOMS OF OVEREXPOSURE:

EYE CONTACT:    POSSIBLE IRRITATION.

SKIN CONTACT:    POSSIBLE SLIGHT IRRITATION ON EXTENDED CONTACT.

INHALATION:      NONE EXPECTED.

INGESTION:        EFFECTS UNKNOWN.  
NOT CONSIDERED TOXIC.

EMERGENCY & FIRST AID PROCEDURES:

EYE CONTACT:    FLUSH WITH WATER FOR AT LEAST 15 MINUTES. IF ANY IRRITATION  
PERSISTS, SEE A PHYSICIAN.

SKIN CONTACT:    WASH WITH SOAP AND WATER.

INHALATION: NA

INGESTION: IF CONSCIOUS, GIVE SEVERAL GLASSES OF WATER AND INDUCE  
VOMITING. GET MEDICAL ATTENTION.

---

SECTION G. SPILL, LEAK AND DISPOSAL PROCEDURES.

SPILL/LEAK PROCEDURES: FLUSH SPILL AREA WITH WATER.

WASTE MANAGEMENT & DISPOSAL PROCEDURES: FLUSH WITH WATER TO SEWER.  
FOLLOW ALL LOCAL, STATE, AND FEDERAL REGULATIONS.

RCRA # (IF DISPOSED AS RECEIVED): NONE

---

SECTION H. SPECIAL PROTECTION INFORMATION

PERSONAL PROTECTIVE EQUIPMENT:  
GOGGLES: CHEMICAL GOGGLES.  
GLOVES: RUBBER.  
RESPIRATOR: NOT REQUIRED.

OTHER: SUFFICIENT TO PREVENT SKIN CONTACT.

WORKPLACE CONSIDERATIONS:  
VENTILATION: NORMAL.  
SAFETY STATIONS: EYE WASH.  
OTHER:

---

SECTION I. SPECIAL PRECAUTIONS

SPECIAL HANDLING & STORAGE PROCEDURES: NORMAL HANDLING AND STORAGE.

D.O.T. CLASS NONE  
IMCO CLASS: NONE

UN REGISTER: NONE  
UN REGISTER: NONE

---

EXPLANATION OF SYMBOLS

NA = NOT APPLICABLE

UK = UNKNOWN

---

THIS MATERIAL SAFETY DATA SHEET IS OFFERED SOLELY FOR YOUR INFORMATION, CONSIDERATION, AND INVESTIGATION. WHILE THE INFORMATION AND RECOMMENDATIONS SET FORTH HEREIN ARE BELIEVED TO BE ACCURATE AS OF THE DATE HEREOF, ATOTECH USA MAKES NO WARRANTY WITH RESPECT THERETO AND DISCLAIMS ALL LIABILITY FROM RELIANCE THEREON.

THIS MATERIAL SAFETY DATA SHEET HAS BEEN PREPARED TO COMPLY WITH TITLE 29 CODE OF FEDERAL REGULATIONS, PART 1910.1200, OSHA HAZARD COMMUNICATION STANDARD, AND TO FULFILL THE ANNUAL CHEMICAL NOTIFICATION REQUIREMENTS OF SARA TITLE III, SECTION 313.

*N/A*  
Acid Copper Tank  
CHEMTREC - 24 HOURS  
1-800-424-9300

NAME USED ON LABEL: M&T(R) P2X COPPER SULFATE PURIFIED CONCENTRATE  
CHEMICAL NAME (if single substance): Mixture  
CHEMICAL FAMILY: Mixture  
FORMULA: Proprietary

\*\*\*\*\*  
HAZARDOUS INGREDIENTS  
\*\*\*\*\*

IDENTITY	CAS No.	%	EXPOSURE LIMITS
Cupric sulfate	7758-98-7	10-18	ACGIH-TWA(1): 1 mg/m3 OSHA-PEL(1): 1 mg/m3

(1) Copper dusts and mists, as Cu.

\*\*\*\*\*  
PHYSICAL DATA  
\*\*\*\*\*

BOILING POINT: >400 C	FREEZING POINT: <50 F
SPECIFIC GRAVITY: 1.16-1.19	VAPOR PRESSURE @ 20 C: N/E
VAPOR DENSITY (Air=1): N/E	SOLUBILITY IN WATER: Complete
% VOLATILE: N/E	EVAPORATION RATE
pH: 1-3.5	(Butyl Acetate=1): N/E

APPEARANCE: Clear, blue liquid. Odorless.

\*\*\*\*\*  
FIRE AND EXPLOSION DATA  
\*\*\*\*\*

FLASH POINT (Test Method) N/APP	AUTOIGNITION TEMPERATURE N/A	FLAMMABLE LTS. LEL-N/A UEL-N/A
------------------------------------	---------------------------------	-----------------------------------

EXTINGUISHING MEDIA: Noncombustible- Use extinguishing media appropriate to surrounding fire conditions.

SPECIAL FIRE FIGHTING PROCEDURES: Do not get material on skin or clothing. Avoid inhalation of or mists. Stay upwind, out of low areas, and ventilate closed spaces before entering. Cool containers from the side with water until fire is out. Use water spray to reduce vapor; do not put water directly on leak or spill area. Keep combustibles away from spilled material. Self-contained breathing apparatus (SCBA) and chemical-protective clothing can be worn but may not provide adequate thermal protection for chemical fire unless

\*N/A = NOT AVAILABLE  
\*\*N/APP = NOT APPLICABLE  
\*\*\*N/E = NOT ESTABLISHED

Consume  
400 LBS to start  
Do NOT need to ADD copper sulfate again

NAME USED ON LABEL: M&T(R) P2X COPPER SULFATE PURIFIED CONCENTRATE

stated by the manufacturer. Structural fire fighter's protective clothing may not be effective. Move containers from fire area, if possible to do so without risk.

UNUSUAL FIRE AND EXPLOSION HAZARDS: During fire conditions, product may evolve irritating fumes.

\*\*\*\*\*  
HEALTH HAZARD DATA  
\*\*\*\*\*

EYE CONTACT: Causes irritation to the eyes and surrounding areas.

SKIN CONTACT: May cause irritation. May cause localized skin discoloration. Repeated or prolonged contact may cause dermatitis.

INHALATION: May cause irritation to the respiratory passages, including the nose, airway, and lungs.

INGESTION: Causes irritation to the mouth, throat, and stomach which may cause abdominal pain, sore throat, headache, vomiting, and diarrhea. May be absorbed through stomach and intestine to cause systemic copper poisoning with symptoms of: headache, cold sweats, weak pulse, jaundice, convulsions, shock, and coma.

CHRONIC TOXICITY: Effects of long-term exposure to this product have not been determined.

CARCINOGENICITY:

	NTP	IARC	Other
Yes			
No	X	X	X

\*\*\*\*\*  
SUGGESTED FIRST AID  
\*\*\*\*\*

EYES: Immediately flush eyes with plenty of water for at least 15 minutes forcibly holding eyelids apart to ensure complete irrigation of all eye and lid tissue. Get immediate medical attention.

SKIN: Immediately flush skin with plenty of water while removing contaminated clothing and shoes. Get immediate medical attention. Contaminated clothing should be taken off/removed in a manner which limits further exposure.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration and/or if breathing is difficult give oxygen by trained personnel. Get immediate medical attention.

PMCODE: LCO

\*N/A = NOT AVAILABLE  
\*\*N/APP = NOT APPLICABLE  
\*\*\*N/E = NOT ESTABLISHED

NAME USED ON LABEL: M&T(R) P2X COPPER SULFATE PURIFIED CONCENTRATE

INGESTION: If swallowed, do NOT induce vomiting. Give milk or water. Call a physician or poison control center immediately. Never give anything by mouth to an unconscious person.

\*\*\*\*\*

REACTIVITY DATA

\*\*\*\*\*

STABILITY: Stable

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: N/A

INCOMPATIBILITY (Materials to Avoid): Magnesium (forms flammable hydrogen gas), reducing agents.

HAZARDOUS DECOMPOSITION PRODUCTS: Decomposes to form Cupric oxide and Sulfur oxide at 600 deg C.

\*\*\*\*\*

SPECIAL PROTECTION INFORMATION

\*\*\*\*\*

VENTILATION: Local exhaust or an enclosed handling system is highly recommended. Mechanical (general) ventilation is required.

EYE PROTECTION: Use chemical splash goggles and face shield (ANSI Z87.1 or approved equivalent). Do not wear contact lenses when in contact with this product. An emergency eye wash must be readily accessible to the work area.

RESPIRATORY PROTECTION: Use NIOSH approved respiratory equipment when airborne concentrations are equal to or may exceed exposure limits. For emergency or other conditions where exposure levels are not known or may be uncontrolled, use a positive pressure air-supplied or self-contained breathing apparatus (SCBA). Respiratory protection programs must comply with 29 CFR 1910.134.

ADDITIONAL PERSONAL PROTECTIVE EQUIPMENT: Select chemical resistant clothing such as gloves, aprons, boots or whole full body protection where contact may occur. Consult glove/clothing manufacturer to determine the most suitable chemical resistant clothing for user's application. Consideration must be given to durability and permeation resistance. Wash immediately if skin is contaminated. Remove contaminated clothing immediately after use and wash before re-use. Provide a safety shower at any location where skin contact may occur. Always wash skin thoroughly after handling.

NAME USED ON LABEL: M&T(R) P2X COPPER SULFATE PURIFIED CONCENTRATE

\*\*\*\*\*  
**SPECIAL PRECAUTIONS**  
\*\*\*\*\*

HANDLING: Do not get in eyes. Avoid contact with skin or clothing. Avoid breathing mist. Do not take internally. Use only with adequate ventilation. Wash thoroughly after handling. Emptied container retains vapor and product residue - Observe all label safeguards until container is cleaned, reconditioned or destroyed. Keep container tightly closed in an upright position.

STORAGE: Protect from freezing - Store above 50 deg F. Store in a cool, dry place away from incompatible material.

\*\*\*\*\*  
**ENVIRONMENTAL INFORMATION**  
\*\*\*\*\*

SPILL RESPONSE: Wear NIOSH/MSHA-approved respiratory protection and appropriate personal protective equipment when cleaning spill. Do not get spilled material on skin or clothing; stop leak if you can do so without risk. If necessary, dike area of spill to prevent spreading. Cover with sand, clay, or other non-combustible absorbent material. Transfer absorbed material to an appropriate and properly labeled container for disposal. NOTE: Discharge to a public sewerage authority should coincide with all applicable local permits and notification requirements. May be hazardous to aquatic life if released to open waters.

RECOMMENDED DISPOSAL: Disposal of waste material from the use of this product may be subject to federal, state, and local regulations. Refer to Part 261 of 40 CFR for the applicability of federal regulations. Consult with your state and local governments for additional regulatory requirements. Disposal of this material must be in a manner compliant with all federal, state, and local regulations.

\*\*\*\*\*  
**TRANSPORTATION**  
\*\*\*\*\*

HAZARDOUS MATERIAL/DANGEROUS GOODS SHIPMENT IS INDICATED BY (X) BELOW:

- (X) Department of Transportation (DOT/HM-181)
- (X) International Air Transportation Association (IATA) 40th Ed.
- (X) International Maritime Organization (IMO/IMDG) Amdt. 27-94

\*N/A = NOT AVAILABLE  
\*\*N/APP = NOT APPLICABLE  
\*\*\*N/E = NOT ESTABLISHED

NAME USED ON LABEL: M&T(R) P2X COPPER SULFATE PURIFIED CONCENTRATE

SHIPPING INFORMATION:

UN(NA) Number	Hazard Class	Subsid. Risk	Labels	Mark (IMO)	Packaging Group
UN3082	9	NONE	CLASS 9	MARINE POLLUTANT	III

SHIPPING NAME:

DOT - Environmentally Hazardous Substances, Liquid, n.o.s.  
(Contains Cupric Sulfate), 9, UN3082, PG III, Marine  
Pollutant

IATA - Same

IMO - Same

DOT QUANTITY LIMITS:

Passenger Air or Rail - None      Cargo Air Only - None

Packaging Authorization - 49CFR 173.155, 203, 141

Special Provisions - 8, T1

IATA PACKAGING

Passenger Aircraft (PA)		Cargo Aircraft Only (CAO)	
PkgInst- 914	Max/Pkg- No Limit	PkgInst- 914	Max/Pkg- No Limit

NOTES: (PA) (CAO) Combination & Single packagings permitted.

\*\*\*\*\*  
MISCELLANEOUS  
\*\*\*\*\*

EPA/DOT - REPORTABLE QUANTITY (RQ) FOR HAZARDOUS SUBSTANCES:

(X) RQ of 10 lb / 4.54 kg for Cupric Sulfate

EPA - Any release of hazardous substance(s) in a quantity equal to or exceeding the RQ in any 24-hour period requires the immediate notification of the National Response Center in Washington, D.C. at (800) 424-8802. Other notification requirements, such as state and local governments, may apply.

DOT - Any package containing a hazardous substance in a quantity equal to or exceeding the RQ is regulated as a hazardous material.

Packagings containing 6 gallons or more meet the Reportable Quantity for Cupric Sulfate. The letters "RQ" must be appended to the Proper Shipping Name (see TRANSPORTATION section).

NAME USED ON LABEL: M&T(R) P2X COPPER SULFATE PURIFIED CONCENTRATE

\*\*\*\*\*  
ADDITIONAL INFORMATION  
\*\*\*\*\*

Ratings:	F	H	R	PPE	Spec Haz
HMIS	0	1	0	X	N/APP
NFPA	0	1	0	N/APP	N/APP

F= Flammability                      H=Health                      R=Reactivity  
 PPE= Personal Protection Equipment      Spec Haz= Special Health Hazards  
 W=Water Reactive                      OX=Oxidizer                      \* = Chronic Hazard

SARA Title III Classifications:	Yes	No
Immediate (Acute) Health . . .	X	
Delayed (Chronic) Health . . .	X	
Sudden Release of Pressure . .		X
Reactive . . . . .		X
Fire . . . . .		X

Components of this product are identified below if they are present in excess of de minimus reporting levels. Components that are not required to be identified by specific chemical name may have a generic description.

SARA Title III Section 302 Extremely Hazardous Substances:  
None

SARA Title III Section 313 Toxic Chemicals:  
Copper Compounds 10-18 %wt

STATE RIGHT-TO-KNOW

Components of this product which are specifically identified in the ingredients section of this MSDS may be listed as hazardous by these and/or other states: Massachusetts, New Jersey, Pennsylvania, Florida, New York, Michigan, Connecticut, Louisiana, Illinois, and Rhode Island.

-----  
CAREFULLY READ THE FOLLOWING: The identification of ingredients in this document meets or exceeds the requirements set forth in 29 CFR, 40 CFR, et al. at the date of publication. Ingredients present in a mixture or solution which are generically identified or not referenced in this document are not regulatorily required to be specifically identified or referenced. The information contained herein should be provided to all those who will use, handle, store, transport, or may otherwise be exposed to this product.

\*N/A = NOT AVAILABLE  
\*\*N/APP = NOT APPLICABLE  
\*\*\*N/E = NOT ESTABLISHED

NAME USED ON LABEL: M&T(R) P2X COPPER SULFATE PURIFIED CONCENTRATE

We certify that all ingredients, whether identified in this MSDS or not, are on the TSCA inventory (for USA manufacture and/or sales only).

THE INFORMATION CONTAINED HEREIN, TO THE BEST OF OUR KNOWLEDGE, IS CONSIDERED TO BE ACCURATE. SUCH INFORMATION IS OFFERED SOLELY FOR YOUR CONSIDERATION, INVESTIGATION, AND VERIFICATION, AND WE DO NOT SUGGEST OR GUARANTEE THAT ANY PRECAUTIONS, PROCEDURES, RECOMMENDATIONS ETC. ARE PREFERRED OR UNIQUE. ATOTECH USA INC. MAKES NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO THE USE OF THIS INFORMATION OR THE USE OF MATERIAL IDENTIFIED HEREIN, IN COMBINATION WITH ANY OTHER MATERIAL OR PROCESS, AND ASSUMES NO RESPONSIBILITY THEREFORE. THIS DOCUMENT WAS DEVELOPED UNDER THE REQUIREMENTS OF THE UNITED STATES, AND AS SUCH MAY NOT SATISFY OTHER STATE OR REGIONAL REQUIREMENTS.

PREPARED BY THE PRODUCT SAFETY DEPARTMENT (PSD)

ISSUED: 06/09/1999

SUPERSEDES: 01/22/1999

*Acid Copper Tank*

NA

MATERIAL SAFETY  
DATA SHEET

ATOTECH USA INC.  
1750 OVERVIEW DRIVE  
ROCK HILL, S.C. 29730

EMERGENCY TELEPHONE  
NUMBER  
8:00 am - 5:00 pm  
(803) 817-3500  
  
CHEMTREC - 24 HOURS  
1-800-424-9300

NAME USED ON LABEL: CUFLEX 333  
CHEMICAL NAME (if single substance): Mixture  
CHEMICAL FAMILY: Mixture  
FORMULA: Proprietary

\*\*\*\*\*  
HAZARDOUS INGREDIENTS  
\*\*\*\*\*

IDENTITY                      CAS No.                      †                      EXPOSURE LIMITS

This product does not contain Hazardous Materials above De Minimus reporting levels as defined by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

\*\*\*\*\*  
PHYSICAL DATA  
\*\*\*\*\*

BOILING POINT: N/E                      FREEZING POINT: N/E  
SPECIFIC GRAVITY: 0.997 - 1.004                      VAPOR PRESSURE @ 20 C: N/E  
VAPOR DENSITY (Air=1): N/E                      SOLUBILITY IN WATER: Complete  
% VOLATILE: N/A                      EVAPORATION RATE  
pH: 8.1 - 9.3                      (Butyl Acetate=1): N/E

APPEARANCE: Pale yellow liquid with mild odor.

\*\*\*\*\*  
FIRE AND EXPLOSION DATA  
\*\*\*\*\*

FLASH POINT (Test Method)                      AUTOIGNITION TEMPERATURE                      FLAMMABLE LTS.  
>200 Deg F                      N/E                      LEL-N/E UEL-N/E

EXTINGUISHING MEDIA: Nonflammable -- Use extinguishing media appropriate to surrounding fire conditions.

SPECIAL FIRE FIGHTING PROCEDURES: Do not get material on skin or clothing. Avoid inhalation of fumes or mists. Stay upwind, out of low areas, and ventilate closed spaces before entering. Cool containers from the side with water until fire is out. Use water spray to reduce vapor; do not put water directly on leak or spill area. Wear full protective clothing and NIOSH-approved, self-contained breathing apparatus (SCBA) with full facepiece operated in the pressure demand or other positive pressure mode. Move containers from fire area, if possible to do so without risk.

\*N/A = NOT AVAILABLE  
\*\*N/APP = NOT APPLICABLE  
\*\*\*N/E = NOT ESTABLISHED

PMCODE: CIV

*Consume*  
*10 gal A YEAR*

MATERIAL SAFETY  
DATA SHEET

ATOTECH USA INC.  
ROCK HILL, S.C. 29730

NAME USED ON LABEL: CUFLEX 333

UNUSUAL FIRE AND EXPLOSION HAZARDS: None known.

\*\*\*\*\*  
HEALTH HAZARD DATA  
\*\*\*\*\*

EYE CONTACT: May cause irritation to the eyes and surrounding areas.

SKIN CONTACT: May cause irritation.

INHALATION: May cause irritation to the respiratory passages,  
including the nose, airway, and lungs.

INGESTION: May cause irritation to the mouth, throat, and stomach.

CHRONIC TOXICITY: Effects of long-term exposure to this product have  
not been determined.

SYMPTOMS OF EXPOSURE: Red, inflamed skin, eyes, and mucous  
membranes; pain; blurred or diminished vision; abdominal pain,  
nausea, vomiting, diarrhea; shortness of breath, chest pain;  
dizziness.

CARCINOGENICITY:

	NTP	IARC	Other
Yes			
No	X	X	X

\*\*\*\*\*  
SUGGESTED FIRST AID  
\*\*\*\*\*

EYES: Immediately flush eyes with plenty of water for at least 15  
minutes forcibly holding eyelids apart to ensure complete irrigation  
of all eye and lid tissue. Get immediate medical attention.

SKIN: Immediately flush skin with plenty of water while removing  
contaminated clothing and shoes. Get immediate medical attention.  
Contaminated clothing should be taken off/removed in a manner which  
limits further exposure.

INHALATION: Remove to fresh air. If not breathing, give artificial  
respiration and/or if breathing is difficult give oxygen by trained  
personnel. Get immediate medical attention.

INGESTION: If swallowed, induce vomiting immediately as directed by  
medical personnel. Never give anything by mouth to an unconscious  
person. Get medical attention immediately.

PMCODE: CIV

Page 2 of 6

\*N/A = NOT AVAILABLE  
\*\*N/APP = NOT APPLICABLE  
\*\*\*N/E = NOT ESTABLISHED

NAME USED ON LABEL: CUFLEX 333

\*\*\*\*\*  
REACTIVITY DATA  
\*\*\*\*\*

STABILITY: Stable

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Contact with incompatible materials.

INCOMPATIBILITY (Materials to Avoid): None.

HAZARDOUS DECOMPOSITION PRODUCTS: None known.

\*\*\*\*\*  
SPECIAL PROTECTION INFORMATION  
\*\*\*\*\*

VENTILATION: Local exhaust or an enclosed handling system is highly recommended. Mechanical (general) ventilation is required.

EYE PROTECTION: Use chemical splash goggles and face shield (ANSI Z87.1 or approved equivalent). Do not wear contact lenses when in contact with this product. An emergency eye wash must be readily accessible to the work area.

RESPIRATORY PROTECTION: Use NIOSH approved respiratory equipment when airborne concentrations are equal to or may exceed exposure limits. For emergency or other conditions where exposure levels are not known or may be uncontrolled, use a positive pressure air-supplied or self-contained breathing apparatus (SCBA). Respiratory protection programs must comply with 29 CFR 1910.134.

ADDITIONAL PERSONAL PROTECTIVE EQUIPMENT: Select chemical resistant clothing such as gloves, aprons, boots or whole full body protection where contact may occur. Consult glove/clothing manufacturer to determine the most suitable chemical resistant clothing for user's application. Consideration must be given to durability and permeation resistance. Wash immediately if skin is contaminated. Remove contaminated clothing immediately after use and wash before re-use. Provide a safety shower at any location where skin contact may occur. Always wash skin thoroughly after handling.

\*\*\*\*\*  
SPECIAL PRECAUTIONS  
\*\*\*\*\*

HANDLING: Avoid getting in eyes, on skin, or on clothing. Avoid breathing dust, mist or vapor. Do not take internally. Use only with

PMCODE: CIV

\*N/A = NOT AVAILABLE  
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\*\*\*N/E = NOT ESTABLISHED

NAME USED ON LABEL: CUFLEX 333

adequate ventilation. Wash thoroughly after handling. Emptied container retains vapor and product residue - Observe all label safeguards until container is cleaned, reconditioned or destroyed. Keep container tightly closed in an upright position.

STORAGE: Store in a cool, dry place away from incompatible material.

\*\*\*\*\*  
ENVIRONMENTAL INFORMATION  
\*\*\*\*\*

SPILL RESPONSE: Wear NIOSH/MSHA-approved respiratory protection and appropriate personal protective equipment when cleaning spill. Do not get spilled material on skin or clothing; stop leak if you can do so without risk. If necessary, dike area of spill to prevent spreading. Cover with sand, clay, or other non-combustible absorbent material. Transfer absorbed material to an appropriate and properly labeled container for disposal. NOTE: Discharge to a public sewerage authority should coincide with all applicable local permits and notification requirements. May be hazardous to aquatic life if released to open waters.

RECOMMENDED DISPOSAL: Disposal of waste material from the use of this product may be subject to federal, state, and local regulations. Refer to Part 261 of 40 CFR for the applicability of federal regulations. Consult with your state and local governments for additional regulatory requirements. Disposal of this material must be in a manner compliant with all federal, state, and local regulations.

\*\*\*\*\*  
TRANSPORTATION  
\*\*\*\*\*

HAZARDOUS MATERIAL/DANGEROUS GOODS SHIPMENT IS INDICATED BY (X) BELOW:

(X) NOT REGULATED (NOTE: For reportable quantities which may apply, see Miscellaneous.)

\*\*\*\*\*  
MISCELLANEOUS  
\*\*\*\*\*

EPA/DOT - REPORTABLE QUANTITY (RQ) FOR HAZARDOUS SUBSTANCES:

(X) There are no constituents in this product for which reportable quantities may be applicable.

MATERIAL SAFETY  
DATA SHEET

ATOTECH USA INC.  
ROCK HILL, S.C. 29730

NAME USED ON LABEL: CUFLEX 333

EPA - Any release of hazardous substance(s) in a quantity equal to or exceeding the RQ in any 24-hour period requires the immediate notification of the National Response Center in Washington, D.C. at (800) 424-8802. Other notification requirements, such as state and local governments, may apply.

DOT - Any package containing a hazardous substance in a quantity equal to or exceeding the RQ is regulated as a hazardous material.

\*\*\*\*\*  
ADDITIONAL INFORMATION  
\*\*\*\*\*

RATINGS:

	F	H	R	PPE	Spec Haz
HMIS	0	2	0	X	N/APP
NFPA	0	2	0	N/APP	N/APP

F= Flammability      H=Health      R=Reactivity  
PPE= Personal Protection Equipment      Spec Haz= Special Health Hazards  
W=Water Reactive      OX=Oxidizer      \* = Chronic Hazard

SARA Title III Classifications:	Yes	No
Immediate (Acute) Health . . .	X	
Delayed (Chronic) Health . . .		X
Sudden Release of Pressure . .		X
Reactive . . . . .		X
Fire . . . . .		X

Components of this product are identified below if they are present in excess of de minimus reporting levels. Components that are not required to be identified by specific chemical name may have a generic description.

SARA Title III Section 302 Extremely Hazardous Substances:  
NONE

SARA Title III Section 313 Toxic Chemicals:  
NONE

STATE RIGHT-TO-KNOW

Components of this product which are specifically identified in the ingredients section of this MSDS may be listed as hazardous by these and/or other states: California, Connecticut, Illinois, Indiana, Kentucky, Louisiana, Massachusetts, Michigan, Minnesota, New Jersey, New York, North Carolina, Pennsylvania and Rhode Island.

PMCODE: CIV

\*N/A = NOT AVAILABLE  
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\*\*\*N/E = NOT ESTABLISHED

MATERIAL SAFETY  
DATA SHEET

ATOTECH USA INC.  
ROCK HILL, S.C. 29730

NAME USED ON LABEL: CUFLEX 333

CAREFULLY READ THE FOLLOWING: The identification of ingredients in this document meets or exceeds the requirements set forth in 29 CFR, 40 CFR, et al. at the date of publication. Ingredients present in a mixture or solution which are generically identified or not referenced in this document are not regulatorily required to be specifically identified or referenced. The information contained herein should be provided to all those who will use, handle, store, transport, or may otherwise be exposed to this product.

We certify that all ingredients, whether identified in this MSDS or not, are on the TSCA inventory (for USA manufacture and/or sales only).

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PREPARED BY THE PRODUCT SAFETY DEPARTMENT (PSD)

ISSUED: 08/30/2001

SUPERSEDES: New

PMCODE: CIV

Page 6 of 6

\*N/A = NOT AVAILABLE  
\*\*N/APP = NOT APPLICABLE  
\*\*\*N/E = NOT ESTABLISHED

Acid Copper Tank

NA

ATOTECH USA

MATERIAL SAFETY DATA SHEET

PRODUCT NAME: CUFLEX 332

MSDS No.: 11126

REVISION: 3

PREPARED BY: DIR ENV AFFAIRS

ISSUE DATE: 01/01/85

EFFECTIVE DATE: 03/29/00

SECTION A. MATERIAL IDENTIFICATION.

MANUFACTURER: ATOTECH USA

CHEMTREC:

1750 OVERVIEW DRIVE  
ROCK HILL, SC 29730

TELEPHONE #: 800-424-9300  
OR 703-527-3887

TELEPHONE: 803-817-3500 (8:00 am - 5:00 pm ET)

SECTION B. INGREDIENTS AND HAZARDS.

INGREDIENT: CONTAINS NOTHING CONSIDERED HAZARDOUS BY STATE OR FEDERAL REGULATIONS.

CAS NUMBER: NA  
EXPOSURE LIMIT: TWA: NA  
SUSPECT CARCINOGEN: NO

SECTION C. PHYSICAL DATA.

APPEARANCE: COLORLESS LIQUID  
ODOR: SLIGHT  
SPECIFIC GRAVITY: 0.99  
pH: 9-10

BOILING POINT: 100C  
FREEZING POINT: UK  
VAPOR PRESSURE: AS WATER  
VAPOR DENSITY: AS WATER  
% VOLATILE BY VOLUME: NA  
SOLUBILITY IN WATER: 100%

EVAPORATION RATE: AS WATER

SECTION D. FIRE AND EXPLOSION HAZARD DATA.

FLASH POINT: NONE  
TEST METHOD: NA

HAZARD SYMBOL CODES

LIMITS: LEL: NA  
UEL: NA

	NFPA	HMIS
HEALTH:	0	0
FLAMMABILITY:	0	0
REACTIVITY:	0	0
SPECIAL:		

EXTINGUISHING MEDIA: NOT FLAMMABLE

SPECIAL FIRE FIGHTING NONE  
PROCEDURES:

UNUSUAL FIRE OR NONE  
EXPLOSION HAZARDS:

SECTION E. REACTIVITY DATA

CIU

Consume

10 GAL A YEAR

MATERIAL IS STABLE.  
HAZARDOUS POLYMERIZATION WILL NOT OCCUR.

CONDITIONS TO  
AVOID:

CHEMICAL NONE KNOWN  
INCOMPATIBILITIES:

HAZARDOUS DECOMPOSITION NONE KNOWN  
PRODUCTS:

---

SECTION F. HEALTH HAZARD DATA.

SUMMARY OF RISKS: SARA-NA

MEDICAL CONDITIONS NONE KNOWN  
WHICH MAY BE  
AGGRAVATED BY CONTACT:

TARGET ORGANS: SKIN, EYES

PRIMARY ENTRY ROUTES: THROUGH CONTACT

ACUTE EFFECTS: WHILE THERE IS NO DATA TO SHOW ANY HARMFUL EFFECTS  
IT IS POSSIBLE THAT IRRITATION OF SKIN OR EYES OF  
OF PARTICULARLY SENSITIVE INDIVIDUALS COULD OCCUR.

CHRONIC EFFECTS: NONE KNOWN

SIGNS & SYMPTOMS OF OVEREXPOSURE:

EYE CONTACT: POSSIBLE IRRITATION.

SKIN CONTACT: POSSIBLE SLIGHT IRRITATION ON EXTENDED CONTACT.

INHALATION: NONE KNOWN.

INGESTION: NONE KNOWN.

EMERGENCY & FIRST AID PROCEDURES:

EYE CONTACT: FLUSH WITH WATER FOR AT LEAST 15 MINUTES. IF ANY IRRITATION  
PERSISTS, SEE A PHYSICIAN.

SKIN CONTACT: WASH WITH SOAP AND WATER.

INHALATION: NA

INGESTION: INDUCE VOMITING

---

SECTION G. SPILL, LEAK AND DISPOSAL PROCEDURES.

SPILL/LEAK FLUSH SPILL AREA WITH WATER.  
PROCEDURES:

WASTE FLUSH WITH WATER TO SEWER.  
MANAGEMENT FOLLOW ALL LOCAL, STATE, AND FEDERAL REGULATIONS.  
& DISPOSAL  
PROCEDURES:

RCRA # (IF DISPOSED AS RECEIVED): NONE

---

SECTION H. SPECIAL PROTECTION INFORMATION

PERSONAL PROTECTIVE EQUIPMENT:  
GOGGLES: CHEMICAL GOGGLES.  
GLOVES: RUBBER.  
RESPIRATOR: NOT REQUIRED.

OTHER: SUFFICIENT TO PREVENT SKIN CONTACT.

WORKPLACE CONSIDERATIONS:  
VENTILATION: NORMAL.  
SAFETY STATIONS: EYE WASH.  
OTHER:

---

SECTION I. SPECIAL PRECAUTIONS

SPECIAL HANDLING NORMAL HANDLING AND STORAGE.  
& STORAGE PROCEDURES:

D.O.T. CLASS NONE  
IMCO CLASS: NONE

UN REGISTER: NONE  
UN REGISTER: NONE

---

EXPLANATION OF SYMBOLS

CIU

NA = NOT APPLICABLE

UK = UNKNOWN

-----  
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THIS MATERIAL SAFETY DATA SHEET HAS BEEN PREPARED TO COMPLY WITH TITLE 29 CODE OF FEDERAL REGULATIONS, PART 1910.1200, OSHA HAZARD COMMUNICATION STANDARD, AND TO FULFILL THE ANNUAL CHEMICAL NOTIFICATION REQUIREMENTS OF SARA TITLE III, SECTION 313.

Acid Copper Tank

NA

ATOTECH USA

MATERIAL SAFETY DATA SHEET

PRODUCT NAME: CUFLEX 331  
MSDS No.: 11125  
REVISION: 4  
PREPARED BY: DIR ENV AFFAIRS  
ISSUE DATE: 07/01/87  
EFFECTIVE DATE: 03/29/00

SECTION A. MATERIAL IDENTIFICATION.

MANUFACTURER: ATOTECH USA  
CHEMTREC:  
1750 OVERVIEW DRIVE  
ROCK HILL, SC 29730  
TELEPHONE: 803-817-3500 (8:00 am - 5:00 pm ET)  
TELEPHONE #: 800-424-9300  
OR 703-527-3887

SECTION B. INGREDIENTS AND HAZARDS.

INGREDIENT: CONTAINS NOTHING CONSIDERED HAZARDOUS BY STATE OR FEDERAL REGULATIONS.  
CAS NUMBER: NA  
EXPOSURE LIMIT: TWA: NA  
SUSPECT CARCINOGEN: NO

SECTION C. PHYSICAL DATA.

APPEARANCE: COLORLESS LIQUID  
ODOR: SLIGHT  
SPECIFIC GRAVITY: 1.01  
pH: 2-3  
BOILING POINT: 100 C  
FREEZING POINT: UK  
VAPOR PRESSURE: AS WATER  
VAPOR DENSITY: AS WATER  
% VOLATILE BY VOLUME: NA  
SOLUBILITY IN WATER: 100%

SECTION D. FIRE AND EXPLOSION HAZARD DATA.

FLASH POINT: NONE  
TEST METHOD: NA  
LIMITS: LEL: NA  
UEL: NA  
HAZARD SYMBOL CODES  
HEALTH: 0 0  
FLAMMABILITY: 0 0  
REACTIVITY: 0 0  
SPECIAL:

EXTINGUISHING MEDIA: NOT FLAMMABLE

SPECIAL FIRE FIGHTING NONE PROCEDURES:

UNUSUAL FIRE OR EXPLOSION HAZARDS: NONE

SECTION E. REACTIVITY DATA

CIT

Consume

10 gal A YEAR

MATERIAL IS STABLE.  
HAZARDOUS POLYMERIZATION WILL NOT OCCUR.

CONDITIONS TO  
AVOID:

CHEMICAL                NONE KNOWN  
INCOMPATIBILITIES:

HAZARDOUS DECOMPOSITION    NONE KNOWN  
PRODUCTS:

---

SECTION F. HEALTH HAZARD DATA.

SUMMARY OF RISKS:        SARA-NA

MEDICAL CONDITIONS        NONE KNOWN  
WHICH MAY BE  
AGGRAVATED BY CONTACT:

TARGET ORGANS:            SKIN, EYES

PRIMARY ENTRY ROUTES:    THROUGH CONTACT

ACUTE EFFECTS:            WHILE THERE IS NO DATA TO SHOW ANY HARMFUL EFFECTS  
IT IS POSSIBLE THAT IRRITATION OF SKIN OR EYES OF  
OF PARTICULARLY SENSITIVE INDIVIDUALS COULD OCCUR.

CHRONIC EFFECTS:         NONE KNOWN

SIGNS & SYMPTOMS OF OVEREXPOSURE:  
EYE CONTACT:    POSSIBLE IRRITATION.

SKIN CONTACT:    POSSIBLE SLIGHT IRRITATION ON EXTENDED CONTACT.

INHALATION:        NONE KNOWN.

INGESTION:         NONE KNOWN.

EMERGENCY & FIRST AID PROCEDURES:

EYE CONTACT:    FLUSH WITH WATER FOR AT LEAST 15 MINUTES. IF ANY IRRITATION  
PERSISTS, SEE A PHYSICIAN.

SKIN CONTACT:    WASH WITH SOAP AND WATER.

INHALATION: NA

INGESTION: INDUCE VOMITING

---

SECTION G. SPILL, LEAK AND DISPOSAL PROCEDURES.

SPILL/LEAK PROCEDURES: FLUSH SPILL AREA WITH WATER.

WASTE MANAGEMENT & DISPOSAL PROCEDURES: FLUSH WITH WATER TO SEWER. FOLLOW ALL LOCAL, STATE, AND FEDERAL REGULATIONS.

RCRA # (IF DISPOSED AS RECEIVED): NONE

---

SECTION H. SPECIAL PROTECTION INFORMATION

PERSONAL PROTECTIVE EQUIPMENT:  
GOGGLES: CHEMICAL GOGGLES.  
GLOVES: RUBBER.  
RESPIRATOR: NOT REQUIRED.

OTHER: SUFFICIENT TO PREVENT SKIN CONTACT.

WORKPLACE CONSIDERATIONS:  
VENTILATION: NORMAL.  
SAFETY STATIONS: EYE WASH.  
OTHER:

---

SECTION I. SPECIAL PRECAUTIONS

SPECIAL HANDLING & STORAGE PROCEDURES: NORMAL HANDLING AND STORAGE.

D.O.T. CLASS NONE  
IMCO CLASS: NONE

UN REGISTER: NONE  
UN REGISTER: NONE

---

EXPLANATION OF SYMBOLS

NA = NOT APPLICABLE

UK = UNKNOWN

---

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Nickel (Anodes & chips)

# INCO<sup>R</sup> S-ROUND<sup>SM</sup> Electrolytic Nickel

U 4.4

Distributed by:  
Atotech USA Inc.  
1750 Overview Drive  
Rock Hill, SC 29731  
(803) 817-3500



Material  
Safety  
Data  
Sheet

## HAZARDOUS INGREDIENTS

Hazardous Ingredients	Calculated Composition	C.A.S. No.	PEL <sup>1</sup> -mg/m <sup>3</sup>	T+V <sup>2</sup> -mg/m <sup>3</sup>
Nickel (Ni)	99.9	7440-02-0	1	1

## PHYSICAL and CHEMICAL DATA

Silver-grey, odorless metal discs of approximately 1 in. (25 mm) diameter and 1/4 in. (6 mm) thickness.

Ingredient	Mol. wt.	Specific Gravity	m.p. °C	b.p. °C	Sol. in H <sub>2</sub> O g/100ml
Ni	58.71	8.9	1453	2732	0

## PHYSICAL HAZARDS

None

Consume

300 LBS A YEAR

REVISED: JANUARY 6, 1997  
ISSUED: JANUARY 15, 1996

## **HEALTH HAZARDS<sup>3</sup>**

### **Nickel**

**LD<sub>50</sub>** ORAL RAT >9000 mg/kg

**Inhalation:** The National Toxicology Program has listed nickel as reasonably anticipated to be a carcinogen based on the production of injection-site tumors. The International Agency for Research on Cancer (IARC) found there was inadequate evidence that metallic nickel is carcinogenic to humans but since there was sufficient evidence that it is carcinogenic to animals, IARC concluded that metallic nickel is possibly carcinogenic to humans. Epidemiological studies of workers exposed to nickel powder and to dust and fume generated in the production of nickel alloys and of stainless steel have not indicated the presence of a significant respiratory cancer hazard.

The inhalation of nickel powder has not resulted in an increased incidence of malignant lung tumors in rodents.

Repeated intratracheal instillation of nickel powder produced an increased incidence of malignant lung tumors in rats. Repeated intratracheal instillation of nickel powder did not produce an increased incidence of malignant lung tumors in hamsters when administered at the maximum tolerated dose. Single intratracheal instillations of nickel powder in hamsters at doses near the LD<sub>50</sub> produced an increased incidence of fibrosarcomas, mesotheliomas and rhabdomyosarcomas.

Inhalation of nickel powder at concentrations 15 times the PEL irritated the respiratory tract in rodents.

**Skin Contact:** Repeated, prolonged and intimate contact with metallic nickel may cause irritation to the skin and nickel sensitivity which may result in allergic skin rashes and/or asthma.

**Wounds:** Nickel metal powder has caused tumors at the site of injection in rodents. However, studies do not suggest a significant risk for humans from nickel-containing prostheses.

**Ingestion:** The U.S. National Institute for Occupational Safety and Health (NIOSH) concluded there is no evidence that nickel and its inorganic compounds are carcinogenic when ingested. The U.S. Food and Drug Administration has affirmed that nickel is generally recognized as safe (GRAS) as a direct human food ingredient.

# **INCO<sup>R</sup> S-ROUNDS<sup>R</sup> Electrolytic Nickel**

U 4.4  
3.

## **Preexisting**

**Conditions:** Prolonged and intimate skin contact can cause an allergic skin rash and/or asthma in previously sensitized individuals.

## **PRECAUTIONS FOR SAFE STORAGE, HANDLING AND USE**

If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne nickel below the PEL. If ventilation alone cannot so control exposure, use NIOSH-approved respirators selected according to OSHA 29 CFR 1910.134. Maintain airborne nickel levels as low as possible.

Avoid repeated skin contact. Wear suitable gloves. Wash skin thoroughly after handling. Launder clothing and gloves as needed.

Do not store near acids. Like other metals, nickel can react with acids to liberate hydrogen gas which can form explosive mixtures in air.

Under special conditions nickel can react with carbon monoxide in reducing atmospheres to form nickel carbonyl, Ni(CO)<sub>4</sub>, an extremely toxic gas.

## **SPILL, LEAK AND DISPOSAL PROCEDURE**

Pick up product and replace in original container.

Nickel-containing waste is normally collected to recover nickel values. Should waste disposal be deemed necessary follow EPA and local regulations.

## **EMERGENCY AND FIRST AID PROCEDURES**

If exposure to nickel carbonyl is suspected, seek medical attention immediately.

For skin rashes, seek medical attention.

Cleanse wounds thoroughly to remove any particles.

REVISED: JANUARY 6, 1997  
ISSUED: JANUARY 15, 1996

**INCO<sup>R</sup> S-ROUNDS<sup>R</sup> Electrolytic Nickel**

U 4.4  
4.

**SARA SECTION 313 SUPPLIER NOTIFICATION**

This product contains the following chemical(s) subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 and of 40 CFR 372:

**Nickel**

Refer to the Hazardous Ingredients section of this MSDS for the appropriate CAS numbers and percent by weight.

**INTERNATIONAL NICKEL INC.**

Park 80 West, Plaza Two  
Saddle Brook, NJ 07662

(201) 843-8600

**Note:**

***It is Inco's belief that information set forth in this Material Safety Data Sheet is accurate. Inco makes no warranty, expressed or implied, with respect thereto and disclaims any liability from reliance thereon.***

---

**Footnotes:**

- R** Trademark of the Inco family of companies.
- 1** OSHA Permissible Exposure Limit
- 2** Threshold Limit Value of the American Conference of Governmental Industrial Hygienists.
- 3** Describes possible health hazards of the product supplied. If user operations change it to other chemical forms, whether as end products, intermediates or fugitive emissions, the possible health hazards of such forms must be determined by the user.

REVISED: JANUARY 6, 1997  
ISSUED: JANUARY 15, 1996

**INCO<sup>R</sup> S-ROUNDS<sup>R</sup> Electrolytic Nickel**

**WARNING!**

**POSSIBLE CANCER HAZARD IF INHALED  
MAY CAUSE ALLERGIC REACTION**

**Before use read Material Safety Data Sheet.  
Do not breathe dust, mist or fume generated by  
handling or using this product.  
Use with adequate ventilation.  
Keep container closed.  
Avoid prolonged or repeated skin contact.  
Wash skin thoroughly after handling.**

**INTERNATIONAL NICKEL INC.  
Park 80 West, Plaza Two  
Saddle Brook, NJ 07762**

**<sup>R</sup> Trademark of the INCO family of companies**

**U 1.1**

**NOTE:**

***The label must be placed under or at least adjacent to the stencilled name of the product on the container. The name of the product on the container must be identical to the name on the MSDS.***

**(U 4 - 01-06-97)**

REPORT NUMBER: 703  
MSDS NO: P16375VS  
MAINFRAME UPLOAD DATE: 02/13/00  
PRODUCT: DIATOMACEOUS EARTH

VOPAK USA INC.  
MATERIAL SAFETY DATA SHEET

PAGE: 001  
VERSION: 003

ORDER NO: 616022  
PROD NO: 249670

Filter Aide Nickel  
TAR

CHEMITHON CORPORATION  
12502 NE MARX ST.

PORTLAND , OR 98230

VOPAK USA INC.  
6100 CARILLON POINT , KIRKLAND

(425)889-3400  
WA 98033

----- EMERGENCY ASSISTANCE -----

FOR EMERGENCY ASSISTANCE INVOLVING CHEMICALS CALL - CHEMTREC  
(800)424-9300

\*\*\*\*\*  
SECTION I PRODUCT IDENTIFICATION  
\*\*\*\*\*

PRODUCT NAME: DIATOMACEOUS EARTH  
MSDS #: P16375VS  
DATE ISSUED: 1/1/99  
SUPERSEDES: 6/3/97  
ISSUED BY: 008606

\*\*\*\*\*  
NFPA FIRE HAZARD SYMBOL

4=Extreme  
3=High  
2=Moderate  
1=Slight  
0=Insignificant

FLAMMABILITY: 0  
HEALTH: \* See Section 3  
REACTIVITY: 0  
Generic Name: FLUX CALCINED DIATOMACEOUS EARTH

Consume

50 LBS A YEAR

PRODUCT: DIATOMACEOUS EARTH

ORDER NO: 616022

PROD NO : 249670

Chemical Name: SILICA

Trade Name(s) (CELITE=C) AQUA-CEL, C100, C110, C219, C224, C226, C233, C234, C235, C238, C239, C241, C251, C263, C2264, C269, C273, C281, C282, C319, C320, C375, C388, C427N C455, C460, C499, C501, C503, C503RV, C513, C522, C535, C538, C542, C545, C546, C552, C560, C566, C572, C578, C579, C580, C581, C582, C585, C591, C592, C599, FILTER AID FOR COOKING OIL, HYFLO DC, C HSC, HYFLO RV, HYFLO SUPER CEL, SUPERFINE SUPER FLOSS, SUPER FLOSS, WHITE MIST, X-4, X-5, X-6, X-7, SILVER FROST K-5

CAS: 68855-54-9

Formula: SiO2

11. PRODUCT INGREDIENTS

INGREDIENT NAME	CAS #	%	PEL AND TLV (except as noted)
FLUX CALCINED DIATOMACEOUS EARTH (DE)	68855-54-9	100	SEE BELOW
THIS PRODUCT MAY CONTAIN UP TO 44% CRYSTALLINE SILICA--			
CRISTOBALITE	1446-46-1	<40	.05mg/M3 RESPIRABLE CRISTOBALITE, OSHA
QUARTZ	14808-60-7	<4	.1MG/M3 RESPIRABLE QUARTO OSHA

SECTION 3 HAZARDS IDENTIFICATION

Summary: THIS PRODUCT CONTAINS CRYSTALLINE SILICA (CS), WHICH IS CONSIDERED A HAZARD BY INHALATION. IARC HAS CLASSIFIED INHALATION OF CS AS CARCINOGENIC FOR HUMANS (GROUP 1). CS IS LISTED BY NTP AS A SUBSTANCE WHICH MAY REASONABLY BE ANTICIPATED TO BE A CARCINOGEN. CS IS ALSO A KNOWN CAUSE OF SILICOSIS, A NONCANCEROUS LUNG DISEASE.

Medical conditions which may be aggravated: PRE-EXISTING UPPER RESPIRATORY AND LUNG DISEASE SUCH AS, BUT NOT LIMITED TO BRONCHITIS, EMPHYSEMA AND ASTHMA.

Target Organ(s) : LUNGS, EYES

Acute Health Effects: TRANSJTORRY UPPER RESPIRATORY OR EYE IRRITATION.

Chronic Health Effects: INHALATION OF CRYSTALLINE SILICA HAS BEEN CLASSIFIED BY IARC AS CARCINOGENIC FOR HUMANS (GROUP 1) INHALATION OF CRYSTALLINE SILICA IS ALSO A KNOWN CAUSE OF SILICOSIS, A NONCANCEROUS LUNG DISEASE CAUSED BY EXCESSIVE EXPOSURE TO CRYSTALLINE SILICA.

(Nickel Tank)  
(For Purification Treatment only)

**AKZO NOBEL**

**EKA NOBEL**

# Material Safety Data Sheet

## PRODUCT INFORMATION

Product Name:	Hydrogen Peroxide (35 & 50% by wt.)
Common Name or Synonym:	Hydrogen Peroxide
Chemical Name:	Hydrogen Peroxide
DOT Number:	UN2014
CAS Registry Number:	7722-84-1
Chemical Family:	Inorganic Peroxide
Chemical Formula:	H <sub>2</sub> O <sub>2</sub>
Formula Weight:	34.02

## HEALTH DATA

### First Aid Measures

**Eye Contact:** Flush eyes with a directed stream of water for at least 15 minutes. Forcibly hold eyelids apart to ensure complete irrigation of all eye and lid tissue. Get immediate medical attention if irritation occurs. Contact lenses should not be worn when working with this chemical.

**Skin Contact:** Immediately flush contaminated skin with water. If the chemical penetrates clothing, immediately remove the clothing and flush the skin with water. Get prompt medical attention if irritation occurs. Wash clothing before reuse.

**Ingestion:** If person is conscious, immediately administer large quantities of water. Never give anything by mouth to an unconscious person. **DO NOT** induce vomiting. **GET IMMEDIATE MEDICAL ATTENTION.**

**Inhalation:** Move the exposed person to fresh air at once. If breathing stops, give artificial respiration. If breathing is difficult, administer oxygen. Seek medical attention if irritation persists.

**Note To Physician:** Direct contact with the eye is likely to cause corneal damage, especially if not washed away immediately. Careful ophthalmologic evaluation is recommended and the possibility of local corticosteroid therapy should be considered. Attempts at evacuating the stomach via emesis induction or gastric lavage should be avoided. In the event of severe distension of the stomach or esophagus due to gas formation, insertion of a gastric tube may be required.

CONSUME  
50 GAL AYBAR

## Material Safety Data Sheet

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**Effects of Overexposure:** Contact of the skin with hydrogen peroxide may cause severe skin irritation. Contact of the eye may cause eye irritation with tearing or blurring of vision and possible blindness. Inhalation may include irritation of the upper respiratory passages; nausea, headache or weakness. Ingestion may include irritation of the gastrointestinal internal tract and abdominal pain; or red blood cell destruction.

**Toxicity: Acute Oral Toxicity:**

**Laboratory Animals**

LD<sub>50</sub> for different species are in the range of 700mg/kg (90% H<sub>2</sub>O<sub>2</sub>) to 9,200 mg/kg (70% H<sub>2</sub>O<sub>2</sub>). LC<sub>50</sub> for rat is greater than 2000 mg/m<sup>3</sup> (75% H<sub>2</sub>O<sub>2</sub>)

Acute Dermal Toxicity (Rabbit):

Practically non-toxic

Primary Skin Irritation (Rabbit):

Mildly irritating

Primary Eye Irritation (Rabbit):

Extremely irritating

Carcinogenicity:

(none identified)

NTP

No

IARC

No

ACGIH

No

OSHA

No

### FIRE AND EXPLOSION HAZARD DATA

**Extinguishing Media:** Use water only to fight fire where hydrogen peroxide is involved.

**Special Fire Fighting Procedure and Personal Protection:** Avoid all bodily contact. Wear self contained breathing apparatus and appropriate protective equipment. In case of external fire, cool hydrogen peroxide and surrounding containers with plenty of water.

**Unusual Fire and Explosive Hazards:** Spontaneous combustion can occur if allowed to remain in contact with oxidizable materials. Drying product on clothing or combustible material may cause fire. Do not allow temperature of storage tank to rise above 100°F (38°C). Do not heat solution to concentrations of 74% or greater. Mixtures with combustible material may be explosive.

**Flashpoint:** Non-Flammable



EKA NOBEL

# Material Safety Data Sheet

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## SPECIAL PROTECTION

**Ventilation:** Provide general or local exhaust ventilation as necessary to keep airborne concentration below exposure limits (TLV-1 ppm for 8 hours).

**Respiratory:** For vapor or mist concentration in excess of 10 ppm, a self contained breathing apparatus should be used. Do not use oxidizable sorbants.

**Gloves:** Wear liquid proof and chemically resistant gloves, such as butyl rubber, neoprene or vinyl.

**Eye Protection:** Wear safety glasses with side shields or chemical goggles. When appropriate, wear a face shield.

**Other Protective Equipment:** Eye wash facility, emergency shower and jump tank should be in close proximity. If skin contact or clothing contamination is possible, use chemical resistant clothing such as polyester or acrylic. Use rubber or neoprene footwear. Launder clothing daily.

## PHYSICAL DATA

<u>PROPERTY</u>	<u>30%</u>	<u>35%</u>	<u>40%</u>	<u>50%</u>
Boiling Pt. @ 760 mm Hg °F	222	226	228	237
°C	106	108	109	114
Freezing Pt. °F	.15	-27	-38	-52
°C	-26	-33	-39	-52
Specific Gravity @ 68 °F	1.11	1.13	1.17	1.19
Vapor Pressure (total) @ 86 °F (mm Hg)	25	23	22	18
Appearance and color	Clear, colorless liquid			
Odor	Slightly Pungent			
Solubility in Water	100%			
Flashpoint	N/A			
% Volatile	Near 100%			
Evaporation rate (butyl acetate = 1)	> 1			



EKA NOBEL

## Material Safety Data Sheet

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### HAZARDOUS REACTIVITY

**Stability:** Unstable when heated or contaminated with heavy metals, reducing agents, rust, dirt or organic materials. Stability is reduced when pH is above 4.0.

**Incompatibility:** Incompatible with cyanides, iron, copper and its alloys, hexavalent chromium compounds, nitric acid, potassium permanganate, reducing agents and other flammables and combustibles.

**Hazardous Products of Decomposition:** Contamination from any source may cause rapid decomposition, oxygen gas release, and dangerous pressures.

**Polymerization:** Will not occur.

### HANDLING AND STORAGE

**Precautions:** Store in a properly vented container or in approved bulk storage facilities. Do not block vent. Store drums on flame retardant pallets. Do not store where contact with incompatible materials could occur, even with a spill. Have water source available for diluting. Keep containers out of sun and away from heat, sparks and flames. Do not add any other product to container. Never return unused product to container. Rinse empty containers thoroughly with clean water before discarding.

### ENVIRONMENTAL PROTECTION

**Procedure in case of spill or release:** Obtain full protective equipment, including respiratory protection. Review fire and explosion hazards and safety precautions before proceeding with cleanup.

Dilute with a large volume of water and contain runoff until hydrogen peroxide decomposes. Do not allow to escape into sewers or natural watercourses before decomposition. May be destroyed with sodium metabisulfite or sodium sulfite (1.7 lbs  $\text{SO}_2$  equivalent per lb. of hydrogen peroxide) after diluting to 5-10% hydrogen peroxide. Care must be exercised because of temperature rise.



**EKA NOBEL**

## **Material Safety Data Sheet**

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**Waste disposal method:** After decomposition, consult with local, state, and federal officials and subject to their approval discharge into a suitable treatment system.

If product is released prior to decomposition it is termed a hazardous waste as defined by 40 CFR 261 and would have the following EPA hazardous waste number: D001.

### **REGULATORY STATUS**

Sara Title III Section 311/312, classifies hydrogen peroxide as an immediate health hazard and a fire hazard. The minimum threshold quantity for reporting is 10,000 pounds.

<b>Extremely Hazardous Substance:</b>	No
<b>CERCLA Hazardous Substance:</b>	No
<b>SARA 313 Toxic Chemicals:</b>	No
<b>TSCA Inventory:</b>	Yes
<b>Process Safety Management</b>	No
<b>RISK Management Program</b>	No

### **TRANSPORTATION DATA:**

Hydrogen Peroxide above 8% concentration is classified as an "oxidizer" by the Department of Transportation and all containers must carry yellow DOT label.

Hydrogen Peroxide over 52% concentration is classified as an "oxidizer and corrosive" by the DOT and must be labeled accordingly.



EXANG

# Material Safety Data Sheet

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## HYDROGEN PEROXIDE (20 - 40%)

### DOMESTIC (DOT)

Proper Shipping Name: Hydrogen Peroxide, aqueous solutions  
Hazard Class: 5.1  
ID Numbers: UN 2014  
Packing Group: II  
Label(s) Required: Oxidizer, Corrosive

### INTERNATIONAL (I.M.O.)

Proper Shipping Name: Hydrogen Peroxide, aqueous solutions  
Hazard Class: 5.1  
ID Numbers: UN 2014  
Packing Group: II  
Label(s) Required: Oxidizer, Corrosive

### AIR (I.C.A.O.)

Proper Shipping Name: Hydrogen Peroxide, aqueous solutions  
Hazard Class: 5.1  
ID Numbers: UN 2014  
Packing Group: II  
Label(s) Required: Oxidizer, Corrosive

## HYDROGEN PEROXIDE (40 - 60%)

### DOMESTIC (DOT)

Proper Shipping Name: Hydrogen Peroxide, stabilized or Hydrogen peroxide aqueous sol.  
Hazard Class: 5.1  
ID Numbers: UN 2014  
Packing Group: II  
Label(s) Required: Oxidizer, Corrosive



EKA NOBEL

## Material Safety Data Sheet

### INTERNATIONAL (I.M.O.)

Proper Shipping Name: Hydrogen Peroxide, stabilized or Hydrogen peroxide aqueous solutions  
Hazard Class: 5.1  
ID Numbers: UN 2014  
Packing Group: II  
Label(s) Required: Oxidizer, Corrosive

### AIR (I.C.A.O.)

**Hydrogen Peroxide in concentrations >40 but not >60  
is forbidden on passenger and cargo aircraft !!!**

OSHA Standard 29 CFR1910.1200 Hazard Communication requires that information be provided to employees concerning hazardous chemicals by means of a hazard communication program including container labels. Material Safety Data Sheet literature, training and access to written records.

Information contained in this section is provided as a service and while based on generally available resources and information, should not be considered to be an all-inclusive regulatory bibliography of the product, particularly regarding non-federal laws and regulations. Users are advised to check with state and local authorities concerning any applicable regulation regarding transportation, handling, use or disposal of this product.



EKA NOBEL

# Material Safety Data Sheet

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## ADDITIONAL INFORMATION

See Eka Nobel, Inc. Technical Data Sheets for product specifications, packaging, and other information.

Hazard ratings for Hydrogen Peroxide according to the Hazardous Materials Identification Systems (HMIS) developed by the National Paint and Coatings Association are:

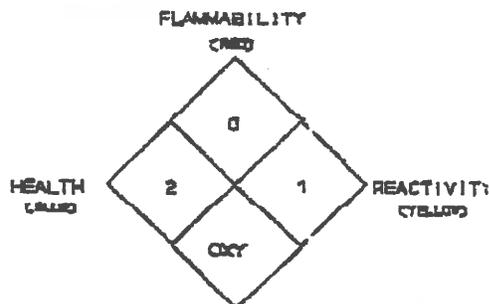
HEALTH	3
FLAMMABILITY	0
REACTIVITY	2
PERSONAL PROTECTION	X

Hazard ratings for Hydrogen Peroxide according to the National Fire Protection Association (NFPA) are:

NFPA Designation 704

### Degree of Hazard

- 4 = Extreme
- 3 = High
- 2 = Moderate
- 1 = Slight
- 0 = Insignificant



REVISED: NOVEMBER 1994



**EKA NOBEL**

## **Material Safety Data Sheet**

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For additional non-emergency information, contact:

**Eka Nobel, Inc.**

1519 Johnson Ferry Road Marietta, Georgia 30062	Telephone:	404/578-0858
	Telefax:	800/241-3900 404/578-1359

2211 Newmarket Parkway Marietta, Georgia	Telephone:	404/956-2520
	Telefax:	800/443-4809 404/984-1260

703 Broadway, Suite 500 Vancouver, WA. 98660	Telephone:	206/695-1646
	Telefax:	206/695-5892

**Eka Nobel Canada, Inc.**

640, rue des Érables Valleyfield, (Quebec) Canada J6T 6G4	Telephone:	514/377-1131
	Telefax:	800/363-5382 514/377-1593

For Emergency Information Contact:

<b>Chemtrec</b>	Telephone:	800/424-9300
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**Eka Nobel**

Nashville Ferry Road Columbus, Mississippi 39701	Telephone:	601/327-0400
	Telefax:	800/821-9486 601/329-3004

640, rue des Érables Valleyfield, (Quebec) Canada J6T 6G4	Telephone:	514/377-1131
	Telefax:	800/363-5382 514/377-1593

# MATERIAL SAFETY DATA SHEET

*Filter Aide nickel*

DATE May, 1990

PRODUCT NAME **CPG-LF  
ACTIVATED CARBON**



## SECTION I

MANUFACTURER'S NAME <b>Calgon Carbon Corporation</b>		EMERGENCY TELEPHONE NO. <b>412-787-6700</b>
ADDRESS <b>P.O. Box 717 Pittsburgh, PA 15230-0717</b>		
CHEMICAL NAME AND SYNONYMS <b>Carbon</b>	FORMULA <b>C</b>	

## SECTION II HAZARDOUS INGREDIENTS

PRINCIPAL HAZARDOUS COMPONENT (S)	CAS #	% BY WEIGHT	ORAL LD <sub>50</sub>	DERMAL LD <sub>50</sub>	TLV (Units)		
					ACGIH	OSHA	OTHER
Chemical Name <b>Carbon</b>	<b>7440-44-0</b>	<b>100%</b>	<b>&gt;10g/Kg* (rat)</b>	<b>—</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>
Common Name <b>Activated Carbon</b>							
Chemical Name							
Common Name							
Chemical Name							
Common Name							
Chemical Name							
Common Name							
Chemical Name							
Common Name							

\*No animal mortalities during course of 14-day study.

**CAUTION!!** Wet activated carbon removes oxygen from air causing a severe hazard to workers inside carbon vessels and enclosed or confined spaces. Before entering such an area, sampling and work procedures for low oxygen levels should be taken to ensure ample oxygen availability, observing all local, state, and federal regulations.

This product is non-hazardous according to the definitions for "health hazard" and "physical hazard" provided in the OSHA Hazard Communication Law (29 CFR part 1910).

## SECTION III PHYSICAL DATA

BOILING POINT (°F)	N/A	SPECIFIC GRAVITY (H <sub>2</sub> O=1)	2.3g/cc real density
VAPOR PRESSURE (mmHg.)	N/A	PERCENT VOLATILE BY VOLUME (%)	N/A
VAPOR DENSITY (AIR=1)	N/A	pH	N/A
SOLUBILITY IN WATER	insoluble	OTHER packing density	0.4 to 0.7g/cc
APPEARANCE AND ODOR	black particulate solid		

While this information and recommendations set forth herein are believed to be accurate as of the date hereof, CALGON CARBON CORPORATION MAKES NO WARRANTY WITH RESPECT HERETO AND DISCLAIMS ALL LIABILITY FROM REVENUE

**CONSUME  
50 LBS A YEAR**

## SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method Used) N/A

EXTINGUISHING MEDIA If involved in fire, flood with plenty of water.

SPECIAL FIRE FIGHTING PROCEDURES None

UNUSUAL FIRE AND EXPLOSION HAZARDS Contact with strong oxidizers such as ozone, liquid oxygen, chlorine, permanganate, etc. may result in fire.

## SECTION V HEALTH HAZARD DATA

### EFFECT OF OVEREXPOSURE

#### A. ACUTE

##### 1. INGESTION

The product is non-toxic through ingestion. The acute oral LD<sub>50</sub> (rat) is >10g/Kg.

##### 2. INHALATION

The acute inhalation LC<sub>50</sub> (rat) is >64.4 mg/t (nominal concentration) for activated carbon.

##### 3. DERMAL EXPOSURE

###### a. TOXIC

Non-toxic

###### b. IRRITATION

The product is not a primary skin irritant. The primary skin irritation index (rabbit) is 0.

###### c. SENSITIZATION

None

**4. EYE IRRITATION**

The physical nature of the product may produce eye irritation.

**B. SUBCHRONIC, CHRONIC, OTHER**

The effects of long-term, low-level exposures to this product have not been determined. Safe handling of this material on a long-term basis should emphasize the avoidance of all effects from repetitive acute exposures.

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**FIRST AID**

**A. EYE**

Flush with plenty of water for at least 15 minutes.

**B. SKIN**

Wash with soap and water.

**C. INGESTION**

N/A

**D. INHALATION**

N/A

**SECTION VI REACTIVITY DATA**

STABILITY	STABLE	X	CONDITIONS TO AVOID	None
	UNSTABLE			

INCOMPATIBILITY (Materials to Avoid) Strong oxidizers such as ozone, liquid oxygen, chlorine, permanganate, etc.

HAZARDOUS DECOMPOSITION PRODUCTS  
Carbon monoxide may be generated in the event of fire.

**SECTION VII SPILL OR LEAK PROCEDURES**

REPORTABLE QUANTITIES (RQ) IN LBS OF EPA HAZARDOUS SUBSTANCES IN PRODUCT	1.	N/A	NOTIFY EPA OF PRODUCT SPILLS EQUAL TO OR EXCEEDING N/A LBS.
	2.		
	3.		

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED  
Sweep up unused carbon and discard in refuse container or repackage.

WASTE DISPOSAL METHOD  
Dispose of unused carbon in refuse container. Dispose of in accordance with local, state, and federal regulations.

**SECTION VIII HANDLING & STORAGE**

PROTECTIVE GLOVES Rubber gloves recommended	EYE PROTECTION Safety glasses or goggles recommended
RESPIRATORY PROTECTION Not required	

RESPIRATORY PROTECTION A NIOSH approved particulate filter respirator is recommended if excessive dust is generated.

VENTILATION	LOCAL EXHAUST Recommended	OTHER
	MECHANICAL (General) Recommended	

STORAGE & HANDLING

**CAUTION!!** Wet activated carbon removes oxygen from air causing a severe hazard to workers inside carbon vessels and enclosed or confined spaces. Before entering such an area, sampling and work procedures for low oxygen levels should be taken to ensure ample oxygen availability, observing all local, state, and federal regulations.

OTHER PRECAUTIONS  
Wash thoroughly after handling. Exercise caution in the storage and handling of all chemical substances.



# BORIC ACID

## Material Safety Data Sheet



Manufactured by:  
North American Chemical Company  
8300 College Boulevard, Overland Park, Kansas 66210

1

### CHEMICAL PRODUCT & COMPANY IDENTIFICATION

PRODUCT NAME: Boric Acid  
MANUFACTURER:  
North American Chemical Company  
8300 College Boulevard  
Overland Park, Kansas 66210

EMERGENCY PHONE NUMBER:  
24 Hour Information Service: 618-372-2291  
CHEMTREC: 800-424-9300  
PREPARATION/REVISION DATE: September 28, 1995  
Supersedes November, 1994 Version

2

### COMPOSITION/INFORMATION ON INGREDIENTS

NOTE: See Section 15 for Exposure Limits.

PRODUCT NAME: Boric Acid  
FORMULA:  $H_2BO_3$   
CHEMICAL NAME: Boric Acid  
SYNONYMS: OrthoBoric Acid, Boracic Acid

COMPONENTS:  
Material: Boric Acid  
CAS Number: 10043-35-3  
Percent: > 99%

Boric Acid is hazardous under the OSHA Hazard Communication Standard based on animal chronic toxicity studies of similar organic Borates.

3

### HAZARDS IDENTIFICATION

**EMERGENCY OVERVIEW:** Boric Acid is a white odorless, powdered substance that is not flammable, combustible, or explosive, and it presents no unusual hazard if involved in a fire. Boric Acid presents little or no hazard (to humans) and has low acute oral and dermal toxicities. Care should be taken to minimize the amount of Boric Acid released to the environment to avoid ecological effects.

**ROUTES OF EXPOSURE:** In the occupational setting, Inhalation is the most important route of exposure. Dermal absorption is usually not important because Boric Acid is not absorbed through the intact skin.

**INHALATION:** Mild irritation to nose and throat may occur when the PEL or TLV are exceeded (see Section 15).

**EYE CONTACT:** Exposure to Boric Acid dust does not cause eye irritation in normal industrial use.

**DERMAL CONTACT:** Boric Acid is non-irritating to the intact skin. Can be

readily absorbed through broken or abraded skin.

**INGESTION:** Boric Acid products are not intended for ingestion. Amounts greater than one teaspoonful, when ingested, may cause gastrointestinal problems.

**CANCER:** Boric Acid is not considered a carcinogen.

**REPRODUCTIVE:** A human study of occupationally exposed Borate worker population showed no adverse reproductive effects. Animal studies of similar organic Borates demonstrated reproductive effects in males.

**TARGET ORGANS:** No target organs have been determined in humans. High dose animal ingestion studies indicate that the testes is the target organ.

**SIGNS AND SYMPTOMS OF EXPOSURE:** Symptoms of accidental over-exposure to Boric Acid have been associated with ingestion or by absorption through large areas of damaged skin. These may include nausea, vomiting, and diarrhea, with delayed effects of skin redness and peeling.

See Section 11 for details on Toxicological Data.

4

### EMERGENCY & FIRST AID PROCEDURES

**EYES:** Continuously flush exposed eyes, occasionally lifting the upper and lower lids. Get medical attention if irritation persists.

**SKIN:** Boric Acid is non-irritating in the normal occupational setting. If irritation occurs, wash affected area with soap or mild detergent and large amounts of water. Get medical attention if irritation persists.

**INHALATION:** No specific treatment is necessary since Boric Acid is not likely to be hazardous by inhalation. Prolonged exposure to dust levels in excess of regulatory limits should always be avoided.

**INGESTION:** If amounts greater than one teaspoon are swallowed, give two glasses of water to drink and seek medical attention.

**NOTE TO PHYSICIAN:** Adult ingestion of a few grams requires observation only. For ingestion in excess of 6 grams, maintain adequate kidney function and force fluids. Gastric lavage is recommended for symptomatic patients only. Hemodialysis should be reserved for massive acute ingestion or patients with renal failure. Boric Acid analysis of urine or blood is useful only for documenting exposure and should not be used for evaluating severity of poisoning or to guide treatment. [Additional reference: Litovitz, T.L., Norman, S.A., Veltri, J.C., Annual Report of the American Association of Poison Control Centers Data Collection System. Am J of Emergency Med. 1986; 4:427-458.]

Boric Acid

Consume  
25 LBS A YEAR

Page 1 of 4

North American Chemical Company

5

## FIRE FIGHTING MEASURES

**GENERAL HAZARD:** Boric Acid is not flammable, combustible, or explosive. Boric Acid presents no unusual hazards when involved in a fire. This product is an inherent fire retardant.

**UEL/LEL:** Not Applicable  
**FLASH POINT:** Not Applicable

**AUTOIGNITION TEMPERATURE:** Not Applicable

**FLAMMABILITY CLASSIFICATION:** Flammability Classification (29 CFR 1910.1200), Non-flammable solid.

**EXTINGUISHING MEDIA:** Any fire extinguishing media may be used on nearby fires.

6

## ACCIDENTAL RELEASE MEASURES

**ACTION TO TAKE FOR SPILLS OR LEAKS:** Boric Acid may damage trees and vegetation (see Ecological Information, Section 12, for further information). For dry spills, sweep, vacuum, or shovel and place in containers for disposal in accordance with applicable regulations (refer to Sections 13 and 15 for additional references and information regarding California and EPA regulations). Avoid contamination of bodies of water during cleanup. Boric Acid will cause localized contamination of surrounding waters depending on amount dissolved

in these waters. Some damage to local vegetation, fish, and other aquatic life may be expected (see Section 12). Under usual conditions, no protective equipment is required.

Boric Acid is a non-hazardous waste when spilled or disposed of as defined in the Resource Conservation and Recovery Act (RCRA) regulations (40 CFR 261). (See Section 15)

7

## HANDLING &amp; STORAGE

**GENERAL:** Dry, indoor storage under normal atmospheric conditions is recommended. To maintain package integrity and to minimize caking of the product, bags should be handled on a "first-in-first-out" basis. Good housekeeping should be maintained to minimize dust accumulation and

generation. Boric Acid may cake in moist conditions.

**HYGIENIC PRACTICES:** Wash hands thoroughly with soap and water after handling, and before eating, drinking, or smoking.

8

## EXPOSURE CONTROLS/PERSONAL PROTECTION

**ENGINEERING CONTROLS:** Use local exhaust ventilation to keep airborne levels below exposure limits (see Section 15).

**EYE PROTECTION:** Use goggles or vented safety glasses in excessively dusty conditions.

**SKIN PROTECTION:** Not required under normal conditions. Use if excessively dusty or if skin is damaged.

**RESPIRATORY PROTECTION:** Use appropriate NIOSH/MSHA certified respirators when levels are expected to exceed exposure limits (see Section 15).

9

## PHYSICAL &amp; CHEMICAL PROPERTIES

**SOLUBILITY IN WATER:** 4.7% at 20°C; 27.5% at 100°C

**APPEARANCE:** White granular or powder solid, odorless.

**MOLECULAR WEIGHT:** 61.83

**BOILING POINT:** Not Applicable

**MELTING POINT:** 169°C

**pH VALUE:**

At 20°C: 1% solution - 5.1

**FLASH POINT:** None

**SPECIFIC GRAVITY (H<sub>2</sub>O = 1 at 4°C):** 1.44

**VAPOR PRESSURE:** Not Applicable

10

## STABILITY &amp; REACTIVITY DATA

**STABILITY:** Stable under normal conditions; forms partial hydrate in moist air. When heated, water is lost forming Metaboric Acid (HBO<sub>2</sub>). On further heating, the material is converted boric oxide (B<sub>2</sub>O<sub>3</sub>).

**INCOMPATIBILITY:** Boric Acid reacts as a weak acid which may cause corrosion of base metals. Reaction with strong reducing agents such as metal

hydrides or alkali metals will generate hydrogen gas which could create an explosive hazard.

**HAZARDOUS DECOMPOSITION PRODUCTS:** None known.

**HAZARDOUS POLYMERIZATION:** Will not occur.

## TOXICOLOGICAL EFFECTS

**EYES:** Boric Acid, when applied to the eyes of albino rabbits (Draize test), produced effects of mild erythema, and mild to moderate discharge in 5 of 8 rabbits. All signs subsided by the fourth day after application. Fifty years of occupational exposure history indicates no human eye injury from exposure to Boric Acid.

**SKIN:** Boric Acid was applied to the skin of albino rabbits. Slight to no irritation persisted 72 hours after application. No evidence of tissue damage was found. Low acute dermal toxicity; LD<sub>50</sub> for rabbits is expected to be greater than 2,000 mg/kg of body weight (test conducted per 16 CFR 1500.41). Boric Acid is not absorbed through intact skin.

**INHALATION:** Human epidemiological studies show no increase in pulmonary disease in occupational populations with chronic exposure to Boric Acid and Sodium Borate dust.

**INGESTION:** Low acute oral toxicity; LD<sub>50</sub> for Sprague-Dawley rats is 3,500 to 4,100 mg/kg of body weight.

**CARCINOGENICITY:** Boric Acid is not listed as a carcinogen by the Environmental Protection Agency (EPA), the State of California, or the International Agency for Research on Cancer (IARC). A report issued by the National Toxicology Program showed "no evidence of carcinogenicity" from a full two-year bioassay on Boric Acid on mice at feed doses of 2,500 to 5,000 ppm in the diet. No mutagenic activity was observed for Boric Acid in a recent battery of four short-term mutagenicity assays.

**REPRODUCTIVE:** A human study of occupationally exposed Borate worker population showed no adverse reproductive effects. Animal studies indicate that Boric Acid reduces or inhibits sperm production, causes testicular atrophy,

and, when given to pregnant animals during gestation, may cause developmental changes. These feed studies were conducted under chronic exposure conditions leading to doses many times in excess of those that could occur through inhalation of dust in the occupational setting.

Dietary levels of Boric Acid of 6,700 ppm in chronic feeding studies in rats and dogs produced testicular changes (Weir, Fisher, 1972). In chronic feeding studies of mice on diets containing 5,000 ppm Boric Acid, testicular atrophy was present, while mice fed 2,500 ppm Boric Acid showed no significant increase in testicular atrophy. In another chronic Boric Acid study, degeneration of seminiferous tubules was present together with a reduction of germ cells in mice fed 4,500 ppm Boric Acid. In a reproduction study on rats, 2,000 ppm of dietary Boric Acid had no adverse effect on lactation, litter size, weight and appearance (Weir, Fisher, 1972). In a continuous breeding study in mice, there was a reduction in fertility rates in males receiving 4,500 ppm Boric Acid, but not for females receiving 4,500 ppm Boric Acid [Fall et al., 1992].

Boric Acid at dietary levels of 1,000 ppm administered to pregnant female rats throughout gestation caused a slight reduction in fetal weight, but was considered close to NOAEL. Doses of 2,000 ppm and above caused fetal malformations and maternal toxicity. In mice, the no effect level for fetal weight reduction and maternal toxicity was 1,000 ppm Boric Acid. Fetal weight loss was noted at dietary levels of 2,000 ppm and above. Malformations (agenesis or shortening of the thirteenth rib) were seen at 4,000 ppm [Heindel et al., 1992].

## ECOLOGICAL DATA

**NOTE:** Boron is the element in Boric Acid which is used to characterize Borate product ecological effects. To convert Boric Acid to boron multiply by 0.1748.

**FISH TOXICITY:** Boron naturally occurs in seawater at an average concentration of 5 mg B/liter. In laboratory studies the acute toxicity (96-hr LC<sub>50</sub>) for under-yearling Coho salmon (*Oncorhynchus kisutch*) in seawater was determined as 40 mg B/L (added as Sodium Metaborate). The Minimum Lethal Dose for minnows exposed to Boric Acid at 20°C for 6 hours is 18,000 to 19,000 mg/l in distilled water, 19,000 to 19,500 in hard water.

Rainbow trout (*S. gairdneri*)

24-day LC<sub>50</sub> = 150.0 mg/B/L

36-day NOEC-LOEC = 0.75-1 mg/B/L

Goldfish (*Carassius auratus*)

7-day NOEC-LOEC = 26.50 mg/B/L

3-day LC<sub>50</sub> = 178 mg/B/L

**BIRD TOXICITY:** Dietary levels of 100 mg/kg resulted in reduced growth of female mallards. As little as 30 mg/kg fed to mallard adults adversely affected the growth rate of offspring.

**INVERTEBRATE TOXICITY:**

Daphnia

48-hour LC<sub>50</sub> = 133 mg/B/L

21-day NOEC-LOEC = 6-13 mg/B/L

**PHYTOTOXICITY:** Although boron is an essential micro-nutrient for healthy growth of plants, it can be harmful to boron-sensitive plants in higher quantities. Plants and trees can easily be exposed by root absorption to toxic levels of boron in the form of water-soluble Borate leached into nearby waters or soil. Care should be taken to minimize the amount of boron released to the environment.

**ENVIRONMENTAL FATE DATA:**

**Persistence/Decomposition:** Boron is naturally occurring and is commonly found in the environment. Boric Acid decomposes in the environment to natural Borate.

**Soil Mobility:** The product is soluble in water and is leachable through normal soil.

## DISPOSAL CONSIDERATIONS

**DISPOSAL GUIDANCE:** Small amounts of Boric Acid can usually be disposed of at municipal landfill sites, and requires no special treatment. Tonnage quantities are not however, recommended for the landfill, and if possible, should be re-used for an appropriate application. Refer to state and local regulations for applicable site-specific requirements. Boric Acid is not currently listed under any sections of the U.S. Environmental Protection Agency

(EPA) Resource Conservation and Recovery Act (RCRA).

**CALIFORNIA HAZARDOUS WASTE DESIGNATION:** California identifies substances with acute LD<sub>50</sub>'s of less than 5,000 mg/kg as "hazardous wastes". Boric Acid is, therefore, a "hazardous waste" if spilled in California, and should be handled in accordance with applicable state regulations.

See Section 15 for details on Regulatory Information.

## TRANSPORT REGULATIONS

**US DEPARTMENT of TRANSPORTATION (DOT) IDENTIFICATION NUMBER:** Boric Acid is not a DOT Hazardous Material or Hazardous Substance.

**INTERNATIONAL TRANSPORTATION:** Boric Acid has no U.N. number, and is not regulated under international rail, highway, water, or air transport regulations.

TSCA NUMBER: 10043-35-3

RCRA (40 CFR 261): Not listed under any section.

CERCLA (SUPERFUND): Not listed under any section.

CLEAN WATER ACT (CWA): Boric Acid is not regulated by any water quality criteria under Section 304, is not listed as priority pollutant under Section 307, and is not listed as a hazardous substance under Section 311.

SAFE DRINKING WATER ACT (SDWA): Not regulated under SDWA, 42 USC 300g-1, 40 CFR 141 et seq. Consult state and local regulations for possible water quality advisories involving boron.

OCCUPATIONAL EXPOSURE LIMITS: Boric Acid is listed/regulated by OSHA, CAL OSHA, or ACGIH as "Particulate Not Otherwise Classified" or "Nuisance Dust".

OSHA: Permissible Exposure Limit: 15 mg/m<sup>3</sup>, total dust  
5 mg/m<sup>3</sup>, respirable dust

ACGIH: Threshold Limit Value: 10 mg/m<sup>3</sup>

CALIFORNIA OSHA: Permissible Exposure Limit: 10 mg/m<sup>3</sup>

INTERNATIONAL AGENCY for RESEARCH on CANCER: Not listed as a carcinogen.

NTP ANNUAL REPORT ON CARCINOGENS: Not listed as a carcinogen.

OSHA CARCINOGEN: Not listed as an OSHA carcinogen.

CONEG MODEL LEGISLATION: Meets all CONEG requirements relating to heavy metal limitations on components of packaging materials.

CALIFORNIA PROPOSITION 65: Not listed as carcinogen or reproductive toxin.

FEDERAL DRUG AGENCY (FDA): Pursuant to 21 CFR 175.104, 175.180, and 181.30, Boric Acid is approved by the FDA for use in adhesive components of packaging materials, as a component of paper coatings on such materials, or for use in the manufacture thereof, which materials are expected to come in contact with dry food products.

WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEMS (WHMIS): With the exception of the 16 section format, this MSDS conforms to current WHMIS standards.

**OTHER INFORMATION:**

**Product Label Text Hazard Information:**

- May be harmful if swallowed.
- May cause reproductive harm or birth defects based on animal data.
- Avoid contamination of food or feed.
- Not for food, drug or pesticidal use.
- Practice good housekeeping.
- Refer to MSDS.
- KEEP OUT OF THE REACH OF CHILDREN.

**National Fire Protection Association (NFPA) Classification:**

4 = Severe, 3 = Serious, 2 = Moderate, 1 = Slight, 0 = Minimal

Health	0
Flammability	0
Reactivity	0

**Hazardous Materials Information Systems (HMIS):**

4 = Extreme, 3 = High, 2 = Moderate, 1 = Slight, 0 = Insignificant

Blue: (Acute Health)	1*
Red: (Flammability)	0
Yellow: (Reactivity)	0

\* Chronic Effects (for explanation see Section 11)

**NOTICE**

Judgements as to the suitability of information herein for purchaser's purposes are necessarily purchaser's responsibility. Therefore, although reasonable care has been taken in the preparation of such information, North American Chemical Company extends no warranties, makes no representations, and assumes no responsibility as to the accuracy or suitability of such information for application to purchaser's intended purposes or for consequences of its use.

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N/A

MATERIAL SAFETY  
DATA SHEET

ATOTECH USA INC.  
1750 OVERVIEW DRIVE  
P.O. BOX 12000  
ROCK HILL, S.C. 29731-2000

EMERGENCY TELEPHONE  
NUMBER  
8:30 a.m.-5:00 p.m.  
(908) 302-3533

CHEMTREC - 24 HOURS  
1-800-424-9300

NAME USED ON LABEL: Nickel Sulfate Liquid  
CHEMICAL NAME (if single substance): Mixture  
CHEMICAL FAMILY: Mixture  
FORMULA: Proprietary

\*\*\*\*\*  
HAZARDOUS INGREDIENTS  
\*\*\*\*\*

Identity	CAS No.	%	TWA	STEL
Nickel sulfate	7786-81-4	40-70	ACGIH 0.1 mg/m3 OSHA 0.1 mg/m3	N/E N/E

\*\*\*\*\*  
PHYSICAL DATA  
\*\*\*\*\*

Boiling Point: >215 deg F	Freezing Point: N/A
Specific Gravity: 1.33	Vapor Pressure @ 20 C: N/E
Vapor Density (Air=1): N/E	Solubility in Water: Complete
% Volatiles: N/A	Evaporation Rate
pH: N/A	(Butyl Acetate=1): N/A
Molecular Weight: N/A	Other: Odorless
Appearance: Green liquid	

\*\*\*\*\*  
FIRE AND EXPLOSION DATA  
\*\*\*\*\*

Flash Point (Test Method) N/APP	Autoignition Temperature N/A	Flammable Lts. LEL-N/A UEL-N/A
------------------------------------	---------------------------------	-----------------------------------

Extinguishing Media: -- Use extinguishing media appropriate to surrounding fire conditions.

Special Fire Fighting Procedures: Do not get material on skin or clothing. Avoid inhalation of fumes or vapors. Stay upwind, out of low areas, and ventilate closed spaces before entering. Cool containers from the side with water until fire is out. Use water spray to reduce vapor; do not put water directly on leak or spill area. Keep combustibles away from spilled material. Self-contained breathing apparatus (SCBA) and chemical-protective clothing can be

PMCODE: JQH

\*N/A = NOT AVAILABLE  
\*\*N/APP = NOT APPLICABLE  
\*\*\*N/E = NOT ESTABLISHED

Consume  
50 gal A YEAR

MATERIAL SAFETY  
DATA SHEET

ATOTECH USA INC.  
ROCK HILL, S.C. 29731-200768

NAME USED ON LABEL: Nickel Sulfate Liquid

worn but may not provide adequate thermal protection for chemical fire unless stated by the manufacturer. Structural fire fighter's protective clothing may not be effective. Move containers from fire area, if possible to do so without risk.

Unusual Fire and Explosion Hazards: When heated to decomposition, irritating fumes may be emitted.

\*\*\*\*\*

HEALTH HAZARD DATA

\*\*\*\*\*

Eye Contact: May cause irritation or allergic reaction to the eyes and surrounding areas.

Skin Contact: May produce a dermatitis known as "nickel itch". Skin sensitization is the most commonly seen toxic reaction to nickel and nickel compounds.

Inhalation: May cause irritation to the respiratory passages including the nose, airway, and lungs.

Ingestion: Can cause irritation to the mouth, throat, and stomach.

Chronic Toxicity: IARC indicated nickel refining and certain nickel compounds were cancer-causing but could not state with certainty which forms of nickel may be carcinogenic. NTP lists nickel powder, nickel subsulfide, nickel oxide, nickel carbonate, nickel carbonyl, and nickelocene as suspect carcinogens. ACGIH does not consider all forms of nickel as carcinogenic and only lists nickel sulfide roasting as carcinogenic (A1a).

Symptoms of Exposure: Red, inflamed skin, eyes, and mucous membranes; tearing and excessive salivation; blurred vision; abdominal discomfort, nausea, vomiting; shortness of breath, chest pain; dizziness.

Carcinogenicity:

	NTP	IARC	Other
Yes	X	X	X
No			

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\*\*\*N/E = NOT ESTABLISHED

MATERIAL SAFETY  
DATA SHEET

ATOTECH USA INC.  
ROCK HILL, S.C. 29731-200768

NAME USED ON LABEL: Nickel Sulfate Liquid

\*\*\*\*\*  
SUGGESTED FIRST AID  
\*\*\*\*\*

EYES: Immediately flush eyes with flowing water for at least 15 minutes. Seek medical attention as soon as possible.

SKIN: Wash exposed areas thoroughly with soap and flowing water, while removing contaminated clothing and shoes. If redness, pain, or irritation develop, seek medical attention.

INHALATION: Remove exposed individual from source of exposure. If breathing is difficult, oxygen may be administered by certified persons only. Artificial respiration may be performed only if exposed individual is not breathing. If breathing is difficult, seek medical attention as soon as possible.

INGESTION: Never give fluids or induce vomiting if exposed person is unconscious or having convulsions. VOMITING MAY BE INDUCED IF EXPOSED PERSON IS CONSCIOUS AND NOT HAVING CONVULSIONS. One to two glasses of water or milk may be given to exposed person only if conscious and not having convulsions. Seek medical attention as soon as possible.

\*\*\*\*\*  
REACTIVITY DATA  
\*\*\*\*\*

Stability: Stable  
Hazardous Polymerization: Will not occur  
Conditions To Avoid: N/A

Incompatibility (Materials to Avoid): Strong acids

Hazardous Decomposition Products: Oxides of nickel

\*\*\*\*\*  
SPECIAL PROTECTION INFORMATION  
\*\*\*\*\*

Ventilation: Local exhaust is recommended.  
Mechanical (general) ventilation is required.

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MATERIAL SAFETY  
DATA SHEET

ATOTECH USA INC.  
ROCK HILL, S.C. 29731-200768

NAME USED ON LABEL: Nickel Sulfate Liquid

Respiratory Protection: Use a NIOSH/MSHA-approved respirator, if ventilation is inadequate.

Eye and Face Protection: Chemical worker's goggles.  
DO NOT WEAR CONTACT LENSES!

Other Personal Protection: Appropriate hand and foot protection. An eyewash and emergency shower should be readily available. Goggles should be worn when working with this product. Chemical-resistant apron and/or coveralls may offer additional protection and are also recommended. Launder contaminated clothing before reuse.

\*\*\*\*\*  
SPECIAL PRECAUTIONS  
\*\*\*\*\*

Storage and Handling: Keep container tightly closed, in upright position. Store in a cool, dry place. Do not put anything else in this container. Empty container may contain hazardous residue. Do not get in eyes, on skin, or on clothing. Do not breathe vapors. Wash thoroughly after handling.

\*\*\*\*\*  
ENVIRONMENTAL INFORMATION  
\*\*\*\*\*

Spill Response: Wear respirator and protective clothing when cleaning spill. Do not get spilled material on skin or clothing; stop leak if you can do so without risk. Remove ignition sources from area where flammable vapors may exist. If necessary, dike area of spill to prevent spreading. If spill is large, cover liquid pools with foam to control vapors, pump liquid into a salvage tank, and retain for evaluation and/or disposal. Remaining material or small spills should be covered with sand, clay, or other noncombustible absorbent material. Using non-sparking tools, transfer absorbed material to a suitable container for disposal. CAREFULLY flush area where spill has occurred with water. Retain this water/residue mixture for evaluation and/or disposal. NOTE: Discharge to a public sewerage authority should coincide with all applicable local permits and notification requirements.

Recommended Disposal: Disposal of waste material from the use of this product may be subject to federal, state, and local regulations. Refer to Part 261 of 40 CFR for the applicability of federal regulations. Consult with your state and local governments for additional regulatory requirements. Disposal of this material must be in a manner compliant with all federal, state, and local regulations.

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MATERIAL SAFETY  
DATA SHEET

ATOTECH USA INC.  
ROCK HILL, S.C. 29731-200768

NAME USED ON LABEL: Nickel Sulfate Liquid

\*\*\*\*\*  
TRANSPORTATION  
\*\*\*\*\*

HAZARDOUS MATERIAL/DANGEROUS GOODS SHIPMENT IS INDICATED BY (X) BELOW:

\*\*\*\*\*MATERIAL IS REGULATED WHEN IT IS SHIPPED  
IN CONTAINERS 100 LBS OR OVER THE RQ QUANTITY AND  
THE CONTAINER MUST BE DESIGNATED AS AN RQ\*\*\*\*\*

- (x) Department of Transportation (DOT/HM-181)
- (x) International Air Transportation Association (IATA) 34th Ed.
- (x) International Maritime Organization (IMO/IMDG) Amdt. 25-89
- ( ) NOT REGULATED (NOTE: For reportable quantities which may apply, see Miscellaneous.)

SHIPPING INFORMATION:

UN(NA) Number	Hazard Class	Subsid. Risk	Labels	Mark (IMO)	Packaging Group
UN3082	9		CLASS 9 (DOT) MISCELLANEOUS (IATA)		PG III

Shipping Name:

- DOT - Environmentally hazardous substances, liquid, n.o.s.  
(contains Nickel sulfate)
- IATA - SAME
- IMO - SAME

DOT QUANTITY LIMITS:

- Passenger Air or Rail - None
- Cargo Air Only - None
- Notes: Packaging Authorization - 49CFR 173.155; 173.203; 173.241
- Special Provisions - 8, N50, T1

IATA PACKAGING:

Passenger Aircraft (PA)	Cargo Aircraft Only (CAO)
PkgInst- 914 Max/Pkg- No limit	PkgInst- 914 Max/Pkg- No limit

Notes:

\*\*\*\*\*  
MISCELLANEOUS  
\*\*\*\*\*

EPA/DOT - REPORTABLE QUANTITY (RQ) FOR HAZARDOUS SUBSTANCES:

- ( ) There are no constituents in this product for which reportable quantities may be applicable.

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\*\*\*N/E = NOT ESTABLISHED

MATERIAL SAFETY  
DATA SHEET

ATOTECH USA INC.  
ROCK HILL, S.C. 29731-200768

NAME USED ON LABEL: Nickel Sulfate Liquid

(x) RQ of 100 lb/45.4 kg for Nickel sulfate

EPA - Any release of hazardous substance(s) in a quantity equal to or exceeding the RQ in any 24-hour period requires the immediate notification of the National Response Center in Washington, D.C. at (800) 424-8802. Other notification requirements, such as state and local governments, may apply. DOT - Any package containing a hazardous substance in a quantity equal to or exceeding the RQ is regulated as a hazardous material.

\*\*\*\*\*  
ADDITIONAL INFORMATION  
\*\*\*\*\*

Ratings:

	F	H	R	PPE	Spec Haz
HMIS	0	2	0	C	N/APP
NFPA	0	2	0	N/APP	N/APP

F= Flammability      H=Health      R=Reactivity  
PPE= Personal Protection Equipment      Spec Haz= Special Health Hazards  
W=Water Reactive      O=Oxidizer

SARA Title III Classifications:

	Yes	No
Immediate (Acute) Health . . .	X	
Delayed (Chronic) Health . . .	X	
Sudden Release of Pressure . .		X
Reactive . . . . .		X
Fire . . . . .		X

Components of this product are identified below if they are present in excess of de minimus reporting levels. Components that are not required to be identified by specific chemical name may have a generic description.

SARA Title III Section 302 Extremely Hazardous Substances:  
None

SARA Title III Section 313 Toxic Chemicals:  
Nickel compounds

TSCA 12(b) notification required:    Yes    \_\_\_ Compound  
  X No

PMCODE: JQH

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\*\*\*N/E = NOT ESTABLISHED

MATERIAL SAFETY  
DATA SHEET

ATOTECH USA INC.  
ROCK HILL, S.C. 29731-200768

NAME USED ON LABEL: Nickel Sulfate Liquid

STATE RIGHT-TO-KNOW

Components of this product which are specifically identified in the ingredients section of this MSDS may be listed as hazardous by these and/or other states: California, Massachusetts, New Jersey, Pennsylvania.

WARNING: This product contains a chemical known to the State of California to cause cancer.

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CAREFULLY READ THE FOLLOWING: The identification of ingredients in this document meets or exceeds the requirements set forth in 29 CFR, 40 CFR, et al. at the date of publication. Ingredients present in a mixture or solution which are generically identified or not referenced in this document are not regulatorily required to be specifically identified or referenced. The information contained herein should be provided to all those who will use, handle, store, transport, or may otherwise be exposed to this product.

We certify that all ingredients, whether identified in this in this MSDS or not, are on the TSCA inventory (for USA manufacture and/or sales only).

THE INFORMATION CONTAINED HEREIN, TO THE BEST OF OUR KNOWLEDGE, IS CONSIDERED TO BE ACCURATE. SUCH INFORMATION IS OFFERED SOLELY FOR YOUR CONSIDERATION, INVESTIGATION, AND VERIFICATION, AND WE DO NOT SUGGEST OR GUARANTEE THAT ANY PRECAUTIONS, PROCEDURES, RECOMENDATIONS ETC. ARE PREFERRED OR UNIQUE. ATOTECH USA INC. MAKES NO WARRANTIES, EXPRESS OR IMPLIED, INLCUDING THE WARRANTIES OF MERCHANTABILITY OR OR FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO THE USE OF THIS INFORMATION OR THE USE OF MATERIAL IDENTIFIED HEREIN, IN COMBINATION WITH ANY OTHER MATERIAL OR PROCESS, AND ASSUMES NO RESPONSIBILITY THEREFORE. THIS DOCUMENT WAS DEVELOPED UNDER THE REQUIREMENTS OF THE UNITED STATES, AND AS SUCH MAY NOT SATISFY OTHER STATE OR REGIONAL REQUIREMENTS.

Prepared by the Product Safety Department (PSD)

Issued: 01/26/96

Supersedes: 04/22/89

PMCODE: JQH

Page 7 of 7

\*N/A = NOT AVAILABLE  
\*\*N/APP = NOT APPLICABLE  
\*\*\*N/E = NOT ESTABLISHED

NA

1



# Material Safety Data Sheet

Y/Ref. :  
O/Ref. : US 3700

<b>NICKEL SULFATE</b>	ISSUED DATE 11/20/85	REVISED DATE 05/26/2000
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**SECTION I - IDENTIFICATION**

<b>Importer :</b> SOGEM USA, Magnolia Building 3120, Highwoods Blvd - # 110 Raleigh, NC 27604 USA	<b>Distributed by:</b> Atotech USA Inc. 1750 Overview Drive Rock Hill, SC 29731 (803) 817-3500	<b>Emergency Telephone Number :</b> transport emergencies : CHEMTREC phone (800) 424 - 9300 <b>Telephone Number for General Information :</b> (919) - 874 - 7171 (Sogem USA INC.)
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**SECTION II - HAZARDOUS COMPONENTS AND IDENTIFICATION INFORMATION**

Hazardous components	CAS#	Weight %	OSHA : PEL-TWA	ACGIH : TLV - TWA	Remarks
NiSO <sub>4</sub> ·6H <sub>2</sub> O	10101-97-0	> 99	0.1 mg/m <sup>3</sup> as Ni	0.1 mg/m <sup>3</sup> as Ni (intended change : 0.05 mg/m <sup>3</sup> - A4)	Soluble compounds, as Ni.

**SECTION III - PHYSICAL AND CHEMICAL CHARACTERISTICS**

<b>Boiling Point</b> : No data.	<b>Specific Gravity (H<sub>2</sub>O = 1)</b> : 2.07
<b>Vapor Pressure (mm Hg.)</b> : Not applicable (N/A)	<b>Melting Point</b> : decomposes at 700 °C
<b>Vapor Density (AIR = 1)</b> : N/A	<b>Evaporation Rate (butyl acetate = 1)</b> : N/A
<b>Solubility in Water</b> : 62 g/100 cc cold water.	<b>Appearance and Odor</b> : green crystals, odorless.

**SECTION IV - FIRE AND EXPLOSION HAZARD DATA**

<b>Flash Point (Method Used)</b> : N/A	<b>Flammable Limits</b> : N/A	<b>LEL</b> : ...	<b>UEL</b> : ...
<b>Extinguishing Media</b> : a) recommended : no specific agents recommended; using water, the obtained NiSO <sub>4</sub> -solution has to be neutralised b) to avoid : no specific agents to avoid			
<b>Special Fire Fighting Procedures</b> : Fire Fighters should wear NIOSH/MSHA approved respirators for SO <sub>x</sub> -gas.			
<b>Unusual Fire and Explosion Hazards</b> : unknown.	<b>N.F.P.A. rating :</b>	<b>Health</b> : 3 Severe	<b>Flammability</b> : 0 none
		<b>Reactivity</b> : 0 none	<b>Contact</b> : 3 Severe.

CONSUME  
100 LBS A YEAR

Productname : Nickel sulfate

2

SECTION 2 REACTIVITY DATA	
<b>Stability</b>	Unstable : no Stable : yes. <b>Conditions to Avoid : temperatures above 700 °C</b>
<b>Incompatibility (Materials to Avoid) :</b>	none known.
<b>Hazardous Decomposition or Byproducts :</b>	when heated in the air, toxic SO <sub>2</sub> /SO <sub>3</sub> -gas can be formed.
<b>Hazardous Polymerization :</b>	May occur : no. <b>Conditions to avoid : none known.</b> Will not occur : yes.
SECTION 3 HEALTH AND ENVIRONMENTAL DATA	
<b>Possible routes of entry :</b>	Inhalation x      Ingestion x      Skin x
<b>Acute hazards :</b>	
<b>Inhalation :</b>	may cause : - irritation of the upper respiratory tract; - sensitization of the respiratory tract.
<b>Ingestion :</b>	LD <sub>50</sub> Oral rat : 275 mg/kg. Nickel sulphate is of moderate toxicity by the oral route.
<b>Skin contact :</b>	exposure to nickel sulphate solutions may cause sensitisation from skin contact.
<b>Eyes contact :</b>	splashes of the acid solution would be mildly irritating to the eyes.
<b>Chronic Effects :</b>	
<b>Carcinogenicity :</b>	nickel compounds have been classified by IARC as group 1 carcinogens. Group 1 : "The agent is carcinogenic to humans. The exposure circumstance entails exposures that are carcinogenic to humans." Neither single nor repeated intramuscular injections of nickel sulphate have resulted in the development of tumours in rodents. Conclusions of a 2-year inhalation study by the U.S. Department of Health and Human Services, National Toxicology Program, NIH Publication 94-3370 : there was no evidence of carcinogenic activity of nickel sulfate hexahydrate in male or female rats exposed to 0.12, 0.25 or 0.50 mg/m <sup>3</sup> , and there was no evidence of carcinogenic activity in male or female mice exposed to 0.25, 0.5 or 1 mg/m <sup>3</sup> .
<b>Inhalation :</b>	Epidemiological studies of Norwegian nickel refinery workers showed that an increased risk of respiratory cancers was present in electrolysis plant workers. These workers had mixed exposure to aerosols of nickel sulphate and nickel chloride and to insoluble forms of nickel. Electrolysis plant workers in an Ontario refinery similarly exposed to nickel sulphate and nickel chloride aerosols, but not to dust from matte roasting operations, did not show any increased incidence of respiratory cancer.
<b>Ingestion :</b>	No data.
<b>Skin contact :</b>	No data.
<b>Eye contact :</b>	No data.
<b>Irritation/sensitization :</b>	Possibility of : - irritation of eyes, skin and upper respiratory tract; - sensitization of skin and respiratory tract.
<b>Medical conditions which may be aggravated by exposure :</b>	none known.
<b>Emergency and first aid procedures :</b>	
<b>Inhalation :</b>	In case of inhalation, remove to fresh air. If necessary, administer oxygen by trained/ qualified individual and obtain medical attention.
<b>Ingestion :</b>	Induce vomiting in a conscious individual. Contact a physician.
<b>Skin contact :</b>	Wash thoroughly with soap and water. Obtain medical attention if irritation occurs.
<b>Eye contact :</b>	Flush thoroughly with water. If irritation occurs, obtain medical attention.

Productname : Nickel sulfate

**Steps to be taken in case material is released or spilled :**

Collect spilled material and send it back to the manufacturer. Minimize the creation of dust. A clean-up procedure which minimizes exposure is required. Place the collected material in closed containers. An approved respirator for dust should be worn if the occupational exposure limit could be exceeded.

**Waste disposal method :**

Waste disposal methods must comply with federal, state, and local disposal or discharge laws.

**Precautions to be taken in handling and storing :**

Containers should be sealed from the atmosphere. Gloves/face mask should be worn if skin or eyes are likely to come in contact with solutions of nickel sulphate. Respiratory protection is necessary if atmospheric content exceeds TLV.

**Other precautions :**

Allergic or hypersensitive persons should not be allowed on jobs involving the exposure to nickel sulphate.

**Respiratory protection (specific type) :**

Use an appropriate respirator, approved by NIOSH/MSHA for toxic dust or fume. A respirator loses its effectiveness when worn with a beard.

**Ventilation :**

Use sufficient local exhaust ventilation to keep dust and fume concentrations below acceptable PEL or TLV levels, as outlined in "Industrial Ventilation, a manual of recommended Practice", an ACGIH publication.

**Protective gloves :**

Wear appropriate gloves.

**Eye protection :**

Wear safety glasses or face shield in operations where eye contact may result.

**Other protective clothing or equipment**

Wear protective clothing.

**Work/Hygienic Practices :**

No eating, drinking or smoking in work areas. Wash hands prior to eating, drinking or smoking. Avoid ingestion, inhalation and skin or eye contact. Practise good housekeeping and personal hygiene procedures.

**General :**

Periodic medical examinations are recommended for individuals regularly exposed to dust, fume or mist.

Product name : Nickel sulfate

4

SECTION 1 - ADDITIONAL INFORMATION	
<b>TRANSPORT INFORMATION :</b>	
UN nr. :	not applicable
IMDG-Code :	" "
ICAO/IATA :	" "
ADR/RID nr. :	" "
<b>REGULATORY INFORMATION :</b>	
a) CERCLA Hazardous Substance :	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
Reportable quantity : 1 lb	
b) SARA, title III, Extremely Hazardous Substance :	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no
Reportable quantity : N.A.	
Threshold planning quantity : N.A.	
c) Toxic Chemical Release Report	
Nickel sulfate is subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-to-know Act of 1986 and 40 CFR Part 372.	
<b>REFERENCES :</b>	
<b>PERMISSIBLE CONCENTRATION REFERENCES</b>	
- OSHA (U.S. Occupational Safety & Health Standards 29 CFR Part 1910-1000)	
- ACGIH TLV - TWA - American Conference of Governmental Industrial Hygienists (Threshold Limit Value - Time Weighted Average), edition 1999.	
<b>HAZARD INFORMATION REFERENCES</b>	
- International Agency for Research on Cancer (IARC) - Monographs on the Evaluation of Carcinogenic Risk of Chemicals to Humans - supplement 4.	
- RTECS : Registry of Toxic Effects of Chemical Substances; NIOSH, edition January 2000.	
- NIOSH : U.S. National Institute for Occupational Safety and Health.	
<b>GENERAL</b>	
- CERCLA (Comprehensive Environmental Response Compensation and Liability Act - 1980 - 42 U.S.C. 9601 et seq ; Hazardous Substances List - 40 CFR Table 302.4	
- SARA (Superfund Amendments and Reauthorization Act of 1986) : Extremely Hazardous Substances List - 40 CFR Part 355.	
Prepared by : UNION MINIERE rue du Marais 31 B-1000 Brussels Belgium	
Individuals exposed to nickel sulphate should be informed of all relevant hazards and recommended safety precautions and should have access to the information contained in this MSDS. Therefore, this Material Safety Data Sheet should be made available by the buyer to each of buyer's plant workers. The buyer assumes all risk in connection with the use and handling of the material. The seller assumes no responsibility or liability in connection with the information supplied in this sheet or for any damage or injury caused by the material; reasonable safety procedures should be followed. The seller assumes no responsibility for injury or damage caused by use of the material even if reasonable safety procedures are followed. The information contained in this sheet is developed from what is believed to be accurate and reliable sources but the seller makes no warranties, either expressed or implied, and assumes no responsibility for the accuracy or completeness of the data contained herein.	

NA

MATERIAL SAFETY  
DATA SHEET

ATOTECH USA INC.  
1750 OVERVIEW DRIVE  
P.O. BOX 12000  
ROCK HILL, S.C. 29731-2000

EMERGENCY TELEPHONE  
NUMBER  
8:00 am - 5:00 pm  
(803) 817-3500

CHEMTREC - 24 HOURS  
1-800-424-9300

NAME USED ON LABEL: NICKEL CHLORIDE HEXAHYDRATE SPEC 101  
CHEMICAL NAME (if single substance): Nickel Chloride Hexahydrate  
CHEMICAL FAMILY: Soluble Nickel Salt  
FORMULA: NiCl2 . 6H2O

\*\*\*\*\*  
HAZARDOUS INGREDIENTS  
\*\*\*\*\*

IDENTITY	CAS No.	%	EXPOSURE LIMITS
Nickel Chloride	7718-54-9	~54	ACGIH-TWA: 0.1 mg/m3 OSHA-PEL: 1 mg/m3

\*\*\*\*\*  
PHYSICAL DATA  
\*\*\*\*\*

BOILING POINT: ~973 C (1)	MELTING POINT: ~1001 C
SPECIFIC GRAVITY: 1.92	VAPOR PRESSURE @ 20 C: N/E
VAPOR DENSITY (Air=1):	SOLUBILITY IN WATER: Soluble
% VOLATILE: None	EVAPORATION RATE
pH (aq. soln): ~6.1	(Butyl Acetate=1): N/E

APPEARANCE: Green-yellow deliquescent solid.

\*\*\*\*\*  
FIRE AND EXPLOSION DATA  
\*\*\*\*\*

FLASH POINT (Test Method) N/APP	AUTOIGNITION TEMPERATURE N/A	FLAMMABLE LTS. LEL-N/A UEL-N/A
------------------------------------	---------------------------------	-----------------------------------

EXTINGUISHING MEDIA: Dry chemical powder.

SPECIAL FIRE FIGHTING PROCEDURES: Do not get material on skin or clothing. Avoid inhalation of dust, fumes or mists. Stay upwind, out of low areas, and ventilate closed spaces before entering. Cool containers from the side with water until fire is out. Use water spray to reduce vapor; do not put water directly on leak or spill area. Keep combustibles away from spilled material. Self-contained breathing apparatus (SCBA) and chemical-protective clothing can be worn but may not provide adequate thermal protection for chemical fire unless stated by the manufacturer. Structural fire fighter's protective clothing may not be effective. Move containers from fire area, if possible to do so without risk.

PMCODE: JPZ

Page 1 of 7

\*N/A = NOT AVAILABLE  
\*\*N/APP = NOT APPLICABLE  
\*\*\*N/E = NOT ESTABLISHED

CONSUME

200 LBS A YEAR

NAME USED ON LABEL: NICKEL CHLORIDE HEXAHYDRATE SPEC 101

UNUSUAL FIRE AND EXPLOSION HAZARDS: May evolve hydrochloric gas if heated above 300 deg C.

\*\*\*\*\*  
HEALTH HAZARD DATA  
\*\*\*\*\*

EYE CONTACT: May cause irritation to the eyes and surrounding areas characterized by redness, swelling, tearing, and pain.

SKIN CONTACT: May cause irritation or an intermediate sensitization which will give allergic dermatosis after further contacts.

INHALATION: May cause irritation to the respiratory passages, including the nose, airway, and lungs characterized by sore throat, chest pain, cough, dizziness, headache, nausea, and shortness of breath. Individuals sensitized to nickel may develop asthma, bronchitis, or other respiratory difficulties.

INGESTION: Toxic. Harmful if swallowed. Causes nausea, vomiting, dizziness, and diarrhea. The gastrointestinal absorption rate of nickel chloride is estimated as relatively small.

CHRONIC TOXICITY: Effects of long-term exposure to this product have not been determined.

CARCINOGENICITY:

	NTP	IARC	ACGIH/NIOSH
Yes	X	X	
No			X

The International Agency for Research on Cancer (IARC) has considered that there is sufficient evidence to conclude that "nickel compounds" (but not nickel metal) are carcinogens for man, by inhalation. The National Toxicology Program has listed "nickel" as an anticipated human carcinogen.

\*\*\*\*\*  
SUGGESTED FIRST AID  
\*\*\*\*\*

EYES: Immediately flush eyes with flowing water for at least 15 minutes while holding eyelids away from eyes. Seek medical attention.

SKIN: Wash exposed areas thoroughly with soap and flowing water, while removing contaminated clothing and shoes. If irritation persists, seek medical attention.

NAME USED ON LABEL: NICKEL CHLORIDE HEXAHYDRATE SPEC 101

INHALATION: Remove exposed individual from source of exposure. If breathing is difficult, oxygen may be administered by certified persons only. Artificial respiration may be performed only if exposed individual is not breathing. If breathing is difficult, seek medical attention.

INGESTION: In case of accidental ingestion of less than 0.5 grams approximately, drink plenty of water. For greater quantities, seek immediate medical attention. Never give anything by mouth to an unconscious or convulsing person. DO NOT induce vomiting unless directed by a physician.

\*\*\*\*\*  
REACTIVITY DATA  
\*\*\*\*\*

STABILITY: Stable

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID:

INCOMPATIBILITY (Materials to Avoid): Sulfuric acid at temperatures greater than 100 deg C (forms hydrochloric gas).

HAZARDOUS DECOMPOSITION PRODUCTS: Hydrochloric gas by thermal decomposition.

\*\*\*\*\*  
SPECIAL PROTECTION INFORMATION  
\*\*\*\*\*

VENTILATION: Local exhaust or an enclosed handling system is highly recommended. Mechanical (general) ventilation is required.

RESPIRATORY PROTECTION: Use NIOSH/MSHA-approved respiratory protection if ventilation is inadequate.

EYE AND FACE PROTECTION: Chemical splash goggles. DO NOT WEAR CONTACT LENSES!

OTHER PERSONAL PROTECTION: Butyl rubber or neoprene gloves, boots, apron, and sleeves. An impervious coverall may be substituted for the apron and sleeves when additional protection is needed. An emergency eyewash and drench shower should be available in the immediate work area. Launder contaminated clothing before reuse.

NAME USED ON LABEL: NICKEL CHLORIDE HEXAHYDRATE SPEC 101

\*\*\*\*\*  
SPECIAL PRECAUTIONS  
\*\*\*\*\*

HANDLING: Do not get in eyes, on skin, or on clothing. Avoid breathing dust, mist or vapor. Do not take internally. Use only with adequate ventilation. Wash thoroughly after handling. Emptied container retains vapor and product residue - Observe all label safeguards until container is cleaned, reconditioned or destroyed. Keep container tightly closed in an upright position.

STORAGE: Store in a cool, dry place away from incompatible material.

\*\*\*\*\*  
ENVIRONMENTAL INFORMATION  
\*\*\*\*\*

SPILL RESPONSE: Wear NIOSH/MSHA-approved respiratory protection and protective clothing to prevent skin & eye contact when cleaning spill. Do not get spilled material on skin or clothing; stop leak if you can do so without risk. Carefully sweep up spilled material and place in a suitable container for disposal. Avoid creating a dusty atmosphere. Ventilate area and CAREFULLY flush area where spill has occurred with water. Retain this water/ residue mixture for evaluation and/or disposal.

RECOMMENDED DISPOSAL: Disposal of waste material from the use of this product may be subject to federal, state, and local regulations. Refer to Part 261 of 40 CFR for the applicability of federal regulations. Consult with your state and local governments for additional regulatory requirements. Disposal of this material must be in a manner compliant with all federal, state, and local regulations.

\*\*\*\*\*  
TRANSPORTATION  
\*\*\*\*\*

HAZARDOUS MATERIAL/DANGEROUS GOODS SHIPMENT IS INDICATED BY (X) BELOW:

- (X) Department of Transportation (DOT/HM-181)
- (X) International Air Transportation Association (IATA) 37th Ed.
- (X) International Maritime Organization (IMO/IMDG) Amdt. 27-94

SHIPPING INFORMATION:

UN(NA) Number	Hazard Class	Subsid. Risk	Labels	Mark (IMO)	Packaging Group
UN3288	6.1	NONE	TOXIC	NONE	III

MATERIAL SAFETY  
DATA SHEET

ATOTECH USA INC.  
ROCK HILL, S.C. 29731-2000

NAME USED ON LABEL: NICKEL CHLORIDE HEXAHYDRATE SPEC 101

SHIPPING NAME:

DOT - TOXIC SOLIDS, INORGANIC, N.O.S.  
(contains NICKEL CHLORIDE)  
IATA - Same  
IMO - Same

DOT QUANTITY LIMITS:

Passenger Air or Rail - 100 Kg      Cargo Air Only - 200 Kg  
Packaging Authorization - 49CFR 173.153, 213, 240  
Special Provisions - None

IATA PACKAGING:

<u>Passenger Aircraft (PA)</u>		<u>Cargo Aircraft Only (CAO)</u>
PkgInst- 619    Max/Pkg- 100 Kg		PkgInst- 619    Max/Pkg- 200 Kg

NOTES: Single and Combination Packagings permitted.

\*\*\*\*\*  
MISCELLANEOUS  
\*\*\*\*\*

EPA/DOT - REPORTABLE QUANTITY (RQ) FOR HAZARDOUS SUBSTANCES:

(X) RQ of 100 lb / 45.4 Kg for Nickel Chloride

EPA - Any release of hazardous substance(s) in a quantity equal to or exceeding the RQ in any 24-hour period requires the immediate notification of the National Response Center in Washington, D.C. at (800) 424-8802. Other notification requirements, such as state and local governments, may apply.

DOT - Any package containing a hazardous substance in a quantity equal to or exceeding the RQ is regulated as a hazardous material.

Single packagings containing greater than 185 pounds of this product meets or exceeds the Reportable Quantity (RQ) of Nickel Chloride. The letters "RQ" must be appended to the Proper Shipping Name (See TRANSPORTATION Section).

MATERIAL SAFETY  
DATA SHEET

ATOTECH USA INC.  
ROCK HILL, S.C. 29731-2000

NAME USED ON LABEL: NICKEL CHLORIDE HEXAHYDRATE SPEC 101

\*\*\*\*\*  
ADDITIONAL INFORMATION  
\*\*\*\*\*

RATINGS:	F	H	R	PPE	Spec Haz
HMIS	0	2*	0	X	N/APP
NFPA	0	2	0	N/APP	N/APP

F= Flammability      H=Health      R=Reactivity  
PPE= Personal Protection Equipment      Spec Haz= Special Health Hazards  
W=Water Reactive      OX=Oxidizer      \* = Chronic Hazard

SARA Title III Classifications:	Yes	No
Immediate (Acute) Health . . .	X	
Delayed (Chronic) Health . . .	X	
Sudden Release of Pressure . .		X
Reactive . . . . .		X
Fire . . . . .		X

Components of this product are identified below if they are present in excess of de minimus reporting levels. Components that are not required to be identified by specific chemical name may have a generic description.

SARA Title III Section 302 Extremely Hazardous Substances:  
None

SARA Title III Section 313 Toxic Chemicals:  
Nickel Compounds ~54 wt%

STATE RIGHT-TO-KNOW

Components of this product which are specifically identified in the ingredients section of this MSDS may be listed as hazardous by these and/or other states: California, Massachusetts, New Jersey, Pennsylvania, Florida, New York, Michigan, Connecticut, Louisiana, Florida, Illinois, Indiana, Kentucky, North Carolina, and Rhode Island.

ATTENTION: This product contains a chemical(s) known to the State of California to cause cancer, birth defects, or other reproductive harm.

CAREFULLY READ THE FOLLOWING: The identification of ingredients in this document meets or exceeds the requirements set forth in 29 CFR, 40 CFR, et al. at the date of publication. Ingredients present in a mixture or solution which are generically identified or not

MATERIAL SAFETY  
DATA SHEET

ATOTECH USA INC.  
ROCK HILL, S.C. 29731-2000

NAME USED ON LABEL: NICKEL CHLORIDE HEXAHYDRATE SPEC 101

referenced in this document are not regulatorily required to be specifically identified or referenced. The information contained herein should be provided to all those who will use, handle, store, transport, or may otherwise be exposed to this product.

ATOTECH USA certifies that all ingredients, whether identified in this MSDS or not, are on the TSCA Inventory (for USA manufacture and/or sales only).

THE INFORMATION CONTAINED HEREIN, TO THE BEST OF OUR KNOWLEDGE, IS CONSIDERED TO BE ACCURATE. SUCH INFORMATION IS OFFERED SOLELY FOR YOUR CONSIDERATION, INVESTIGATION, AND VERIFICATION, AND WE DO NOT SUGGEST OR GUARANTEE THAT ANY PRECAUTIONS, PROCEDURES, RECOMMENDATIONS ETC. ARE PREFERRED OR UNIQUE. ATOTECH USA INC. MAKES NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO THE USE OF THIS INFORMATION OR THE USE OF MATERIAL IDENTIFIED HEREIN, IN COMBINATION WITH ANY OTHER MATERIAL OR PROCESS, AND ASSUMES NO RESPONSIBILITY THEREFORE. THIS DOCUMENT WAS DEVELOPED UNDER THE REQUIREMENTS OF THE UNITED STATES, AND AS SUCH MAY NOT SATISFY OTHER STATE OR REGIONAL REQUIREMENTS.

Prepared by the Product Safety Department (PSD)

ISSUED: 9/21/1998

SUPERSEDES: 8/28/1995

PMCODE: JPZ

Page 7 of 7

\*N/A = NOT AVAILABLE  
\*\*N/APP = NOT APPLICABLE  
\*\*\*N/E = NOT ESTABLISHED

N/A

Nickel Tank

Micel, Inc. 1240 N. Knollwood Circle Anaheim, CA 92801

MATERIAL SAFETY DATA SHEET

N.F.P.A. Rating: Health (1), Flammability (0), Reactivity (0)

**I. PRODUCT IDENTIFICATION**

Trade name (as labeled): INFINITY 2000 AIR WETTER

Chemical names, common names: Wetting Agent for Nickel Plating Bath

Manufacturer's name: MICEL, INCORPORATED

Address: 1240 N. KNOLLWOOD CIRCLE ANAHEIM, CA 92801

Emergency phone: 1-800-424-9300

Name of preparer\*: Technical Dept.

Business phone: 714/995-3300

Date prepared: July 24, 1997

**II. HAZARDOUS INGREDIENTS**

<u>Chemical</u>	<u>Names</u>	<u>CAS</u>	<u>Numbers</u>	<u>Percent*</u>	<u>Exposure</u>	<u>Limits</u>	<u>in</u>	<u>Air</u>
			<u>ACGIH (TLV)</u>	<u>OSHA (PEL)</u>	<u>OTHER</u>			

None.

**III. PHYSICAL PROPERTIES**

Vapor density (air=1): Heavier than air Melting point or range, F: N/D

Specific gravity: 1.019 Boiling point or range, F: N/D

Solubility in water: Complete.

Vapor pressure, mmHg at 20 deg C: N/D

Evaporation rate (butyl acetate=1): Slower than ether

Appearance and odor: Clear liquid with slight alcohol odor.

HOW TO DETECT THIS SUBSTANCE\* (warning properties of substance as a gas, vapor, dust, or mist): N/D

**IV. FIRE AND EXPLOSION**

Flash Point, F (give method): N/A

Autoignition temperature, F: N/A

Flammable limits in air, volume %: lower N/A upper N/A

Fire extinguishing materials:

<input type="checkbox"/> water spray	<input type="checkbox"/> carbon dioxide	<input type="checkbox"/> other:
<input type="checkbox"/> foam	<input type="checkbox"/> dry chemical	

Special fire fighting procedures: None.

usual fire and explosion hazards: None.

Consume

20 gal A YEAR

## V. HEALTH AND HAZARD INFORMATION

SYMPTOMS OF OVEREXPOSURE for each potential route of exposure.

Inhaled: None.

Contact with skin or eyes: Mild irritant

Absorbed through skin: Mild irritant.

Swallowed: Industrial chemicals are never to be taken internally. May cause nausea, vomiting, and abdominal pain.

Acute: N/D

Chronic: N/D

FIRST AID: EMERGENCY PROCEDURES

Eye Contact: Flush with clean water for 15 minutes. Contact a Physician. washing eyes within 1 minute after contact is essential to achieve maximum effectiveness.

Skin Contact: Wash with soap and water.

Inhaled: Remove victim to fresh air.

Swallowed: Do Not induce vomiting. Give large quantities of milk and/or water. Seek medical attention.

NOTE: The above applies to contact with to contact with Infinity Air Wetter, itself, not the operating solutions in which it is used, which typically contain soluble nickel salts in a slightly acidic solution. In the case of contact with the operating solution, follow treatment methods applicable for exposure to slightly acidic solutions of soluble nickel salts.

SUSPECTED CANCER AGENT?

NO: This product's ingredients are not found in the lists below.

YES:    Federal OSHA    NTP    IARC    Cal/OSHA (see note)\*

NOTE: California employers using Cal/OSHA-regulated carcinogens must register with Cal/OSHA.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: N/D

RECOMMENDATIONS TO PHYSICIAN: N/D

## VI. REACTIVITY DATA

Stability:    X    Stable    Unstable

ditions to avoid: Keep containers closed when not in use. Do not store in areas subject to extremely low temperatures as product can freeze. If this occurs, remove to warm area and

haw. Mix well prior to use to insure uniform composition of product.  
compatibility (materials to avoid): None.

Hazardous decomposition products (including combustion products):  
None.

Hazardous polymerization:     \_May occur     X\_Will not occur  
Conditions to avoid:

## VII. SPILL, LEAK AND DISPOSAL PROCEDURES

Spill response procedures (include employee protection measures):  
Stop leaks. Contain spill. Flush to sewer with water.

Preparing wastes for disposal (container types, neutralization, etc.):  
Dispose of in accordance with Federal, State, and Local regulations.

NOTE: Dispose of all wastes in accordance with federal, state and local regulations.

## VIII. SPECIAL HANDLING INFORMATION

Ventilation and engineering controls: Mechanical ventilation recommended.

Respiratory protection: Use NIOSH approved respiratory equipment for dust and mists.

Eye protection (Type): Safety glasses.

Glove (specify material): Rubber.

Other clothing and equipment: Safety showers and eye wash stations should be near handling areas.

Work practices, hygienic practices: N/D

Other handling and storage requirements: N/D

Cap containers closed when not in use. Do not store in areas subject to extremely low temperatures as product can freeze. If this occurs, remove to warm area and thaw. Mix well prior to use to insure uniform composition of product.

Protective measures during maintenance of contaminated equipment:

Infinity Air Wetter is used in conjunction with solutions containing soluble nickel salts. These solutions are operated at elevated temperatures, and frequently require handling concentrated mineral acids. When working with, or near, operating solutions, exercise normal cautions to be used when exposed to solutions of this type.

## IX. LABELING

Labeling (precautionary statements)\*:

D.O.T. Label\*: Not Regulated.

\*Not required. Space has been provided on this form for optional use

MSDS\INFINITY 2000 AIR WETTER

NA

Nichel Tank

Micel, Inc. 1240 N. Knollwood Circle Anaheim, Ca 92801

MATERIAL SAFETY DATA SHEET

N.F.P.A. Rating: Health (3), Flammability (0), Reactivity (0)

I. PRODUCT IDENTIFICATION

Trade name (as labeled): INFINITY 2000 CARRIER

Chemical names, common names: Nickel Plating Additive

Manufacturer's name: MICEL, INCORPORATED

Address: 1240 N. KNOLLWOOD CIRCLE ANAHEIM, CA 92801

Emergency phone: 1-800-424-9300

Name of preparer\*: Technical Dept.

Business phone: 714/995-3300

Date Revised: November 20, 1999

II. HAZARDOUS INGREDIENTS

<u>Chemical Names</u>	<u>CAS Numbers</u>	<u>Percent*</u>			<u>Exposure Limits in Air</u>
		<u>ACGIH (TLV)</u>	<u>OSHA (PEL)</u>	<u>OTHER</u>	
Sodium Saccharin	128-44-9	<15%			

III. PHYSICAL PROPERTIES

Vapor density (air=1): N/D

Melting point or range, F: N/D

Specific gravity: 1.5 - 1.06

Boiling point or range, F: 212°F

Solubility in water: 100%

Vapor pressure, mmHg at 20°C: N/D

Evaporation rate (butyl acetate=1): N/D

Appearance and odor: Clear odorless liquid.

HOW TO DETECT THIS SUBSTANCE\* (warning properties of substance as a gas, vapor, dust, or mist):

IV. FIRE AND EXPLOSION

Flash Point, F (give method): N/A

Auto-ignition temperature, F: N/A

Flammable limits in air, volume %: lower N/A upper N/A

Fire extinguishing materials:

water spray

carbon dioxide

other:

foam

dry chemical

Special fire fighting procedures: Wear self-contained breathing apparatus while extinguishing

Consume

20 GAL A YEAR

Fire.

Unusual fire and explosion hazards: Product is non-flammable as supplied. Do not depend on ambient air supply during fires. Extreme heat may produce oxides of carbon.



Incompatibility (materials to avoid): Strong oxidizing agents.

Hazardous decomposition products (including combustion products): Thermal decomposition may release oxides of carbon.

Hazardous polymerization:        \_May occur        X \_Will not occur  
Conditions to avoid: None.

#### VII. SPILL, LEAK AND DISPOSAL PROCEDURES

Spill response procedures (include employee protection measures):  
Use absorbent material or sand. Scoop up and put in a DOT approved waste container.

Preparing wastes for disposal (container types, neutralization, etc.):  
NOTE: Dispose of all wastes in accordance with federal, state and local regulations.

#### VIII. SPECIAL HANDLING INFORMATION

Ventilation and engineering controls:  
Good general ventilation should be sufficient for most conditions. Local exhaust ventilation may be necessary for some operations.

Respiratory protection: None required if good ventilation is maintained. Otherwise wear self-contained breathing apparatus.

Eye protection (Type): Safety goggles.  
Glove (specify material): Rubber gloves.  
Other clothing and equipment: Long sleeve shirt, long pants, boots and hat.

Work practices, hygienic practices: Wash equipment and clothing thoroughly after handling.

Other handling and storage requirements: Avoid storing next to strong acids. should be stored in clean, dry areas. Keep containers closed and sealed.

Protective measures during maintenance of contaminated equipment: None.

#### IX. LABELING

Labeling (precautionary statements)\*:

D.O.T. Label\*:

\*Not required. Space has been provided on this form for optional use

N/A

Nickel Tank

Micel, Inc. 1240 N. Knollwood Circle Anaheim, Ca 92801

MATERIAL SAFETY DATA SHEET

N.F.P.A. Rating: Health (1), Flammability (0), Reactivity (0)

I. PRODUCT IDENTIFICATION

Trade name (as labeled): INFINITY NICKEL LEVELER

Chemical names, common names: Nickel Plating Additive

Manufacturer's name: MICEL, INCORPORATED

Address: 1240 N. KNOLLWOOD CIRCLE ANAHEIM, CA 92801

Emergency phone: 1-800-424-9300

Name of preparer\*: Technical Dept.

Business phone: 714/995-3300

Date prepared: December 7, 1994

II. HAZARDOUS INGREDIENTS

<u>Chemical Names</u>	<u>CAS Numbers</u>	<u>Percent*</u>			<u>Exposure</u>	<u>Limits</u>	<u>in</u>	<u>Air</u>
		<u>ACGIH (TLV)</u>	<u>OSHA (PEL)</u>	<u>OTHER</u>				

There are no hazardous ingredients as defined by OSHA in 29 CFR. This product is for industrial use only. Please handle with care.

III. PHYSICAL PROPERTIES

Vapor density (air=1): N/D

Melting point or range, F: N/D

Specific gravity: 1.04

Boiling point or range, F: 215°F

Solubility in water: Complete.

Vapor pressure, mmHg at 20°C: N/D

Evaporation rate (butyl acetate=1): N/D

Appearance and odor: Clear liquid with garlic odor.

HOW TO DETECT THIS SUBSTANCE\* (warning properties of substance as a gas, vapor, dust, or mist):

IV. FIRE AND EXPLOSION

Flash Point, F (give method): N/A

Auto-ignition temperature, F: N/A

Flammable limits in air, volume %: lower N/A upper N/A

Fire extinguishing materials:

X water spray

X carbon dioxide

other:

X foam

X dry chemical

CONSUME

20 gal A YEAR

Special fire fighting procedures: This product is non-flammable. The container, however, is. ber drums burn and plastic containers melt. Should this vessel be exposed to flame, cool it with water spray. Always wear protective equipment and/or clothing when extinguishing fires.

Unusual fire and explosion hazards: None.

## V. HEALTH AND HAZARD INFORMATION

SYMPTOMS OF OVEREXPOSURE for each potential route of exposure.

Inhaled: Mild irritant.

Contact with skin or eyes: Mild irritant.

Absorbed through skin: N/A

Swallowed: Mild irritant.

Acute: Not established.

Chronic: Not established.

FIRST AID: EMERGENCY PROCEDURES

Eye Contact: Flush with water for at least 15 minutes. Call a physician.

Skin Contact: Wash with soap and water. Remove contaminated clothing.

Inhaled: Remove to fresh air.

Swallowed: Do not induce vomiting. Give large amounts of water or milk. Call a physician.

SUSPECTED CANCER AGENT?

X NO: This product's ingredients are not found in the lists below.

YES:    Federal OSHA    NTP    IARC    Cal/OSHA (see note)\*

NOTE: California employers using Cal/OSHA-regulated carcinogens must register with Cal/OSHA.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: None determined.

RECOMMENDATIONS TO PHYSICIAN: None.

## VI. REACTIVITY DATA

Stability: X Stable    Unstable

Conditions to avoid: N/D

Incompatibility (materials to avoid): This product has no obvious incompatibilities, however, caution should be observed whenever handling industrial chemicals.

Hazardous decomposition products (including combustion products): None.

Hazardous polymerization:    May occur X Will not occur

Conditions to avoid: None.

## VII. SPILL, LEAK AND DISPOSAL PROCEDURES

Spill response procedures (include employee protection measures):

Soak up spilled material with absorbent compound and dispose. Flush area with water.

Preparing wastes for disposal (container types, neutralization, etc.):

None.

NOTE: Dispose of all wastes in accordance with federal, state and local regulations.

## VIII. SPECIAL HANDLING INFORMATION

Ventilation and engineering controls: Local exhaust recommended.

Respiratory protection: None required.

Eye protection (Type): Safety glasses.

Glove (specify material): Rubber gloves.

Other clothing and equipment: Semi protective rubber apron.

Work practices, hygienic practices: Always handle industrial chemicals with care. Keep away from flame.

Other handling and storage requirements: Store in a cool dry area.

Protective measures during maintenance of contaminated equipment:

Wear protective gear. Ground all electrical equipment.

## IX. LABELING

Labeling (precautionary statements)\*: None

D.O.T. Label\*: This product is not DOT regulated.

\*Not required. Space has been provided on this form for optional use

MSDS\Infinity Nickel Leveler

NA

Nichel Tank

Micel, Inc. 1240 N. Knollwood Circle Anaheim, Ca 92801

MATERIAL SAFETY DATA SHEET

N.F.P.A. Rating: Health (3), Flammability (0), Reactivity (0)

**I. PRODUCT IDENTIFICATION**

Trade name (as labeled): INFINITY 2000-MU ADDITIVE

Chemical names, common names: Nickel Plating Additive

Manufacturer's name: MICEL, INCORPORATED

Address: 1240 N. KNOLLWOOD CIRCLE ANAHEIM, CA 92801

Emergency phone: 1-800-424-9300

Name of preparer\*: Technical Dept.

Business phone: 714-995-3300

Date prepared: March 7, 2001

**II. HAZARDOUS INGREDIENTS**

<u>Chemical Names</u>	<u>CAS Numbers</u>	<u>Percent*</u>			<u>Exposure Limits in Air</u>
		<u>ACGIH(TLV)</u>	<u>OSHA(PEL)</u>	<u>OTHER</u>	
Sodium Saccharin	128-44-9	<10%			

**III. PHYSICAL PROPERTIES**

Vapor density (air=1): N/D

Melting point or range, F: N/D

Specific gravity: 1.5 - 1.06

Boiling point or range, F: 212°F

Solubility in water: 100%

Vapor pressure, mmHg at 20°C: N/D

Evaporation rate (butyl acetate=1): N/D

Appearance and odor: Clear odorless liquid.

HOW TO DETECT THIS SUBSTANCE\* (warning properties of substance as a gas, vapor, dust, or mist):

**IV. FIRE AND EXPLOSION**

Flash Point, F (give method): N/A

Auto-ignition temperature, F: N/A

Flammable limits in air, volume %: lower N/A upper N/A

Fire extinguishing materials:

water spray

carbon dioxide

other:

foam

dry chemical

Special fire fighting procedures: Wear self-contained breathing apparatus while extinguishing

CONSUME

20 GAL A YEAR

fire.

Unusual fire and explosion hazards: Product is non-flammable as supplied. Do not depend on ambient air supply during fires. Extreme heat may produce oxides of carbon.

## V. HEALTH AND HAZARD INFORMATION

SYMPTOMS OF OVEREXPOSURE for each potential route of exposure.

Inhaled: Vapors may be irritating to nose, throat and upper respiratory tract producing symptoms of nausea in poorly ventilated areas.

Contact with skin or eyes: Slightly irritating to skin and eyes.

Absorbed through skin: A single prolonged skin exposure is not likely to result in absorption of harmful amounts.

Swallowed: May cause nausea and vomiting.

Acute: Severe irritation of skin and eyes.

Chronic: The chronic local effect may result in primary irritant dermatitis. Inhalation may result in varying degrees of irritation or damages to the respiratory tract tissues and an increased susceptibility to respiratory illness.

### FIRST AID: EMERGENCY PROCEDURES

Eye Contact: Wash eyes with large amounts of water for at least 15 minutes and obtain medical attention.

Skin Contact: Wash affected skin with soap and water and seek medical attention.

Inhaled: Remove to fresh air. If irritation persists seek medical attention.

Swallowed: If swallowed dilute by drinking copious amounts of water and obtain medical attention.

### SUSPECTED CANCER AGENT?

X\_NO: This product's ingredients are not found in the lists below.

YES: Federal OSHA      NTP      IARC      Cal/OSHA (see note)\*

NOTE: California employers using Cal/OSHA-regulated carcinogens must register with Cal/OSHA.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: None established.

RECOMMENDATIONS TO PHYSICIAN: None.

## VI. REACTIVITY DATA

Stability:      X\_Stable      \_Unstable

Conditions to avoid: None.

compatibility (materials to avoid): Strong oxidizing agents.

Hazardous decomposition products (including combustion products): Thermal decomposition may release oxides of carbon.

Hazardous polymerization:        \_May occur        X \_Will not occur  
Conditions to avoid: None.

#### VII. SPILL, LEAK AND DISPOSAL PROCEDURES

Spill response procedures (include employee protection measures):  
Use absorbent material or sand. Scoop up and put in a DOT approved waste container.

Preparing wastes for disposal (container types, neutralization, etc.):  
NOTE: Dispose of all wastes in accordance with federal, state and local regulations.

#### VIII. SPECIAL HANDLING INFORMATION

Ventilation and engineering controls:  
Good general ventilation should be sufficient for most conditions. Local exhaust ventilation may be necessary for some operations.

Respiratory protection: None required if good ventilation is maintained. Otherwise wear self-contained breathing apparatus.

Eye protection (Type): Safety goggles.  
Glove (specify material): Rubber gloves.  
Other clothing and equipment: Long sleeve shirt, long pants, boots and hat.

Work practices, hygienic practices: Wash equipment and clothing thoroughly after handling.

Other handling and storage requirements: Avoid storing next to strong acids. should be stored in clean, dry areas. Keep containers closed and sealed.

Protective measures during maintenance of contaminated equipment: None.

#### IX. LABELING

Labeling (precautionary statements)\*:

D.O.T. Label\*:

\*Not required. Space has been provided on this form for optional use

MSDS\Infinity 2000MU

NA

Nickel Tank

Micel, Inc. 1240 N. Knollwood Circle Anaheim, CA 92801

MATERIAL SAFETY DATA SHEET

N.F.P.A. Rating: Health (3), Flammability (0), Reactivity (1)

I. PRODUCT IDENTIFICATION

Trade name (as labeled): INFINITY 2000 BRIGHTENER

Chemical names, common names: Nickel Plating Bath Additive

Manufacturer's name: MICEL, INCORPORATED

Address: 1240 N. KNOLLWOOD CIRCLE ANAHEIM CA 92801

Emergency phone: 1-800-424-9300

Name of preparer\*: Technical Dept.

Business phone: 714/995-3300

Date prepared: July 24, 1997

II. HAZARDOUS INGREDIENTS

Chemical Names	CAS Numbers	Percent*			Exposure Limits in Air
		ACGIH(TLV)	OSHA(PEL)	OTHER	
Sodium Saccharin	128-44-9	>10%		Not listed.	

III. PHYSICAL PROPERTIES

Vapor density (air=1): >1.0

Melting point or range, F: N/D

Specific gravity: 1.042

Boiling point or range, F: N/D

Solubility in water: 100%

Vapor pressure, mmHg at 20°C: N/D

Evaporation rate (butyl acetate=1): Slower than ether.

Appearance and odor: Clear odorless liquid with garlic odor.

HOW TO DETECT THIS SUBSTANCE\* (warning properties of substance as a gas, vapor, dust, or mist):

IV. FIRE AND EXPLOSION

Flash Point, F (give method): Not flammable.

Auto-ignition temperature, F: Not flammable.

Flammable limits in air, volume %: lower N/A upper N/A

Fire extinguishing materials:

water spray       carbon dioxide       other:

CONSUME

30 gal A YEAR

foam dry chemical  
Special fire fighting procedures: None.

Unusual fire and explosion hazards: Product is non-flammable as supplied.



Hazardous polymerization:  
Conditions to avoid: None.

\_May occur

\_Will not occur

## VII. SPILL, LEAK AND DISPOSAL PROCEDURES

Spill response procedures (include employee protection measures):

Small spill: Stop at source, contain and flush to sewer with water.

Large spill: Stop at source, contain, remove as much as possible for routine use, and flush with water.

Preparing wastes for disposal (container types, neutralization, etc.):

NOTE: Dispose of all wastes in accordance with federal, state and local regulations.

## VIII. SPECIAL HANDLING INFORMATION

Ventilation and engineering controls: Mechanical ventilation recommended.

Respiratory protection: Use NIOSH approved respirator equipment for dust and mists.

Eye protection (Type): Face shield.

Glove (specify material): Rubber gloves.

Other clothing and equipment: Rubber apron. Safety shower and eyewash stations should be near handling area.

Work practices, hygienic practices: This product is used in conjunction with solutions containing soluble nickel salts. These solutions are operated at elevated temperatures, and frequently require handling concentrated mineral acids. When working with, or near, operating solutions, exercise normal cautions to be used when exposed to solutions of this type.

Other handling and storage requirements: Keep containers closed when not in use. Do not store in areas subject to extremely low temperatures as product may freeze.

Protective measures during maintenance of contaminated equipment: None.

## IX. LABELING

Labeling (precautionary statements)\*:

D.O.T. Label\*:

\*Not required. Space has been provided on this form for optional use

MSDS\Infinity 2000 BRIGHTENER

CHROME (ANODES)

MATERIAL SAFETY DATA SHEET  
I. PRODUCT IDENTIFICATION

Manufacturer's Name: Seafab Metal Co. Tele. (520) 421-3200  
Address 1112 North VIP Blvd, Casa Grande, AZ 85222  
Trade Names **Antimonial Lead and Hard Lead**  
Synonyms Sheet, Plate, Flashing, Batts, Bricks, Anodes, Pipe, Starwire, Rod, Strip, Wire, Burning Bar, Caulking, Billets, Ingots, Castings, Extrusions, Pig  
Intended Use Industrial, Commercial

II. HAZARDOUS INGREDIENTS

Material or Component	Weight %	OSHA/WISHA	ACGIH	TLV/TWA	TLV/STEL	OTHER
		PEL/TWA	CEILING			
Lead (CAS# 7439-92-1)	90-99	50ug/m <sup>3</sup>	None	0.15mg/m <sup>3</sup>	None	30 ug/m <sup>3</sup> Action level
Antimony (CAS# 7440-36-0)	0 - 10	0.5 mg/m <sup>3</sup>	None	0.5mg/m <sup>3</sup>	None	N/A

III. PHYSICAL DATA

Boiling Point @ 760 MM Hg: Greater than 2516° F. Melting Point: 486-680° F  
Specific Gravity (H2O = 1): 9.6-11.3 Vapor Pressure: N/A  
Vapor Density (Air = 1): N/A Solubility in H2O (% by wt.): Negligible  
% Volatiles by Vol: N/A Evaporation Rate (Butyl Acetate = 1): N/A  
Appearance & Odor: Bluish-gray metal; no apparent odor

IV. HEALTH HAZARD INFORMATION

Routes of Exposure When Process or Handling

Inhalation: Dust, vapor and/or fume may be irritating to the respiratory system and can result in both acute and chronic overexposure.  
Skin Absorption: Dust, vapor and/or fume are not readily absorbed through the skin.  
Eye Contact: Dust, vapor and/or fume may cause irritation.  
Ingestion: Dust, vapor and/or fume may be absorbed by the digestive system, and can result in both acute and chronic overexposure.

Effects of Overexposure

Acute Overexposure: If left untreated: headache, chills, nausea, weakness, vomiting, loss of appetit, uncoordinated body movements, convulsions, stupor, and coma.  
Chronic Overexposure: If left untreated: weakness, insomnia, hypertension, slight irritation to skin and eyes, metallic taste in mouth, anemia, constipation, headache, muscle, and joint pains, metal fume fever, ulceration of the nasal septum, neuromuscular dysfunction, paralysis, and encephalopathy. Lead exposure can pose a risk to developing fetuses and may impair the reproductive systems in men and women. Damage to kidneys, red blood cell forming, and central nervous system may occur.

CONSUME

50-100 LBS A YEAR OR OTHER YEAR.



**MSDS**  
**Antimonial Lead Alloys**

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**VII. SPILL OR LEAK PROCEDURES**

**Steps To Be Taken if Material is Released or Spilled:**

Dust material should be vacuumed, or wet swept where vacuuming is not feasible. Particulate matter should be stored in dry containers for later disposal. Do not use compressed air or dry seeping as a means of cleaning.

**Neutralizing Chemicals:** N/A

**Waste Disposal Method:**

Dispose of toxic substances and hazardous wastes in accordance with local, state and federal regulations.

---

**VIII SPECIAL PROTECTION INFORMATION**

**Ventilation Requirements:** Ventilation, as described in the "Industrial Ventilation Manual" produced by the American Conference of Governmental Industrial Hygienists, shall be provided in areas where exposures are above the permissible exposure limits or threshold limit values specified by OSHA or other local, state and federal regulations.

**Specific Personal Protection Equipment**

**Respiratory:** As specified by 29CFR1910.1025 Subpart (f) of the Federal Occupational Safety and Health Administration standard for Occupational Exposure to Lead. Other local and state regulations may also apply.

**Eye:** Face shield or vented goggles should be used around molten metal.

**Glove:** Gloves should be worn when handling the product is necessary.

**Other Clothing and Equipment:**

Coveralls, or other full body clothing, shall be worn during product use and properly laundered after use, with the wash water disposed of in accordance with local, state and federal regulations. Hard hat, safety boots and other safety equipment should be worn as appropriate for the industrial environment. Personal clothing and shoes should be protected from contamination with this product.

MSDS  
Antimonial Lead Alloys

---

**IX. SPECIAL PRECAUTIONS**

**Precautionary Statements:**

There are two major means of heavy metal absorption: namely, inhalation and ingestion. Most inhalation problems can be prevented with adequate use of aforementioned ventilation and respirator information. Always exercise normal, good personal hygiene prior to smoking or eating. Smoking and eating should be confined to non-contaminated areas.

Work clothes and equipment should remain in designated lead contaminated areas, and never taken or laundered with personal clothing. Launder contaminated clothing before reuse.

Wash hands, face, neck and arms thoroughly before eating or smoking.

The product is intended for industrial use only, and should be isolated from children and their environment. Caution must be exercised not to expose anyone to the smoke fumes and dust generated from the use of this product. Do not smoke while using this product.

In accordance with California's Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65), the following statement is issued: "Warning: This product contains a chemical known to the state of California to cause cancer, birth defects or other reproductive harm."

This product contains greater than 0.10% Lead (CAS #7439-92-1) and greater than 1% Antimony which are subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments & Reauthorization Act of 1986 and 40 CFR Part 372.

**Other Handling and Storage Requirements**

Store in dry area where accidental contact with acids is not possible.  
Avoid Skin Contact.

**FOR INDUSTRIAL AND COMMERCIAL USE, OR WHERE PRODUCT IS CONTINUALLY USED.**

Adhere to all personal protection equipment procedures when handling, and ventilation requirements when heavy metal exposures are above permissible exposure limits or threshold limit values.

**Before Using This Product Be Familiar With The Information Contained In:**

The Federal Standard for Occupational Exposure to Lead (29CFR1910.1025): Published in the Federal Register on Tuesday, November 14, 1978, by the Occupational Safety and Health Administration.

Preparation Date: Revised February, 1999.

N/A Chrome Tank

MATERIAL SAFETY DATA SHEET

ATOTECH USA INC.  
1750 OVERVIEW DRIVE  
ROCK HILL, S.C. 29730

EMERGENCY TELEPHONE NUMBER  
8:00 am - 5:00 pm  
(803) 817-3500

CHEMTREC - 24 HOURS  
1-800-424-9300

NAME USED ON LABEL: BARIUM CARBONATE  
CHEMICAL NAME (if single substance): Mixture  
CHEMICAL FAMILY: INORGANIC BARIUM SALT  
FORMULA: BaCO3

HAZARDOUS INGREDIENTS

IDENTITY	CAS No.	‡	EXPOSURE LIMITS
Barium Carbonate	513-77-9	100	ACGIH-TWA(1): 0.5 mg/m3 OSHA-PEL(1): 0.5 mg/m3

(1) Barium, Soluble Compounds, As Ba.

PHYSICAL DATA

BOILING POINT: >1000 deg C (1)	MELTING POINT: ~1000 deg C
SPECIFIC GRAVITY: 3.1	VAPOR PRESSURE @ 20 C: <0.1 mm Hg
VAPOR DENSITY (Air=1): N/APP	SOLUBILITY IN WATER: Insoluble
‡ VOLATILE: NNone	EVAPORATION RATE
pH (1% suspension): 9	(Butyl Acetate=1): N/APP

APPEARANCE: White powder or granules.

(1) Decomposes.

FIRE AND EXPLOSION DATA

FLASH POINT (Test Method) N/APP	AUTOIGNITION TEMPERATURE N/A	FLAMMABLE LTS. LEL-N/A UEL-N/A
------------------------------------	---------------------------------	-----------------------------------

EXTINGUISHING MEDIA: Nonflammable -- Use extinguishing media appropriate to surrounding fire conditions.

SPECIAL FIRE FIGHTING PROCEDURES: Do not get material on skin or clothing. Avoid inhalation of dusts. Stay upwind, out of low areas, and ventilate closed spaces before entering. Cool containers from the side with water until fire is out. Use water spray to reduce vapor; do not put water directly on leak or spill area. Keep combustibles away from spilled material. Self-contained breathing apparatus (SCBA)

PMCODE: JJV

\*N/A = NOT AVAILABLE  
\*\*N/APP = NOT APPLICABLE  
\*\*\*N/E = NOT ESTABLISHED

Consume  
20 LBS A YEAR

MATERIAL SAFETY  
DATA SHEET

ATOTECH USA INC.  
ROCK HILL, S.C. 29730

NAME USED ON LABEL: BARIUM CARBONATE

and chemical-protective clothing can be worn but may not provide adequate thermal protection for chemical fire unless stated by the manufacturer. Structural fire fighter's protective clothing may not be effective. Move containers from fire area, if possible to do so without risk. Do not allow run-off water to enter sewers or streams.

**UNUSUAL FIRE AND EXPLOSION HAZARDS:** Products of decomposition include: Oxides of Barium and Carbon.

\*\*\*\*\*  
**HEALTH HAZARD DATA**  
\*\*\*\*\*

**EYE CONTACT:** May cause irritation to the eyes and surrounding areas characterized by redness, swelling, tearing, and pain.

**SKIN CONTACT:** May cause irritation to the skin characterized by swelling, redness, and pain.

**INHALATION:** May cause irritation to the respiratory passages, including the nose, airway, and lungs. May cause systemic poisoning as by ingestion.

**INGESTION:** Toxic! Harmful if swallowed. Initial effects are severe gastrointestinal irritation, including nausea, vomiting and diarrhea with or without abdominal colic and excessive salivation. There may also be a dryness and a sense of constriction of the mouth and throat. Systemic effects follow and may include ocular changes, causing blurred vision. Hypokalemia (potassium ion deficit) may occur and result in abnormalities of myocardial function and impaired neuromuscular function, which may vary from minimal weakness to paralysis. Other effects may include anxiety, increased blood pressure, twitching, convulsive tremors, and gradually increasing sleepiness with mental confusion. The Central Nervous System is at first stimulated and then depressed. Hemorrhages may occur in the stomach, intestines, and kidneys. kidney damage and kidney failure may occur. Collapse and death from respiratory failure, severe hypokalemia and cardiac arrest may occur.

**CHRONIC TOXICITY:** Prolonged and repeated inhalation of barium compounds may cause the formation of benign pneumoconiosis. Cessation of exposure appears to reverse this effect.

**CARCINOGENICITY:**

	NTP	IARC	Other
Yes			
No	X	X	X

PMCODE: JJV

Page 2 of 7

\*N/A = NOT AVAILABLE  
\*\*N/APP = NOT APPLICABLE  
\*\*\*N/E = NOT ESTABLISHED

MATERIAL SAFETY  
DATA SHEET

ATOTECH USA INC.  
ROCK HILL, S.C. 29730

NAME USED ON LABEL: BARIUM CARBONATE

\*\*\*\*\*  
SUGGESTED FIRST AID  
\*\*\*\*\*

**EYES:** Immediately flush eyes with flowing water for at least 15 minutes while holding eyelids away from eyes. Seek medical attention.

**SKIN:** Wash exposed areas thoroughly with soap and flowing water, while removing contaminated clothing and shoes. If irritation persists, seek medical attention.

**INHALATION:** Remove exposed individual from source of exposure. If breathing is difficult, oxygen may be administered by certified persons only. Artificial respiration may be performed only if exposed individual is not breathing. Seek medical attention.

**INGESTION:** If victim is conscious and not convulsing, give a glass of water and immediately induce vomiting. Never give anything by mouth to an unconscious or convulsing person. Seek immediate medical attention.

**NOTES TO PHYSICIAN:** Possible antidote for poisoning from barium compounds is: Thirty grams of sodium sulfate in 250 mL of water orally and repeated in one hour. Give by gastric tube if symptoms have appeared. The administration of sulfate salts intravenously is hazardous, since they induce the precipitation of barium sulfate in the kidney, with subsequent renal failure. Administration of potassium is critical. Antidote should be administered only by qualified medical personnel.

\*\*\*\*\*  
REACTIVITY DATA  
\*\*\*\*\*

**STABILITY:** Stable.

**HAZARDOUS POLYMERIZATION:** Will not occur.

**CONDITIONS TO AVOID:** N/A

**INCOMPATIBILITY (Materials to Avoid):** Bromine trifluoride and 2-Furanpercarboxylic acid.

**HAZARDOUS DECOMPOSITION PRODUCTS:** If heated to decomposition oxides of barium and carbon can be emitted.

\*\*\*\*\*  
SPECIAL PROTECTION INFORMATION  
\*\*\*\*\*

PMCODE: JJV

Page 3 of 7

\*N/A = NOT AVAILABLE  
\*\*N/APP = NOT APPLICABLE  
\*\*\*N/E = NOT ESTABLISHED

MATERIAL SAFETY  
DATA SHEET

ATOTECH USA INC.  
ROCK HILL, S.C. 29730

NAME USED ON LABEL: BARIUM CARBONATE

\*\*\*\*\*

**VENTILATION:** Local exhaust or an enclosed handling system is highly recommended. Mechanical (general) ventilation is required.

**RESPIRATORY PROTECTION:** Use NIOSH/MSHA-approved respiratory protection if ventilation is inadequate.

**EYE AND FACE PROTECTION:** Chemical dust-resistant goggles. DO NOT WEAR CONTACT LENSES!

**Other Personal Protection:** Butyl rubber or neoprene gloves, boots, apron & sleeves. A chemical-resistant coverall may be substituted for the apron and sleeves for additional protection. An emergency eyewash and drench shower should be available in the immediate work area. Launder contaminated clothing before reuse.

\*\*\*\*\*

**SPECIAL PRECAUTIONS**

\*\*\*\*\*

**HANDLING:** Do not get in eyes, on skin, or on clothing. Avoid breathing dust. Do not take internally. Use only with adequate ventilation. Wash thoroughly after handling. Emptied container retains vapor and product residue - Observe all label safeguards until container is cleaned, reconditioned or destroyed. Keep container tightly closed and in an upright position when not in use.

**STORAGE:** Store in a cool, dry place away from incompatible material.

\*\*\*\*\*

**ENVIRONMENTAL INFORMATION**

\*\*\*\*\*

**SPILL RESPONSE:** Wear NIOSH/MSHA-approved respiratory protection and appropriate personal protective clothing to minimize skin contact when cleaning spill. Do not get spilled material on skin or clothing; stop leak if you can do so without risk. If necessary, dike area of spill to prevent spreading. Carefully sweep up spilled material and transfer to a suitable container for disposal. CAREFULLY flush area where spill has occurred with water. Retain this water/residue mixture for evaluation and/or disposal. NOTE: Discharge to a public sewerage authority should coincide with all applicable local permits and notification requirements. May be hazardous to aquatic life if released to open waters.

**RECOMMENDED DISPOSAL:** Disposal of waste material from the use of this product may be subject to federal, state, and local regulations. Refer to Part 261 of 40 CFR for the applicability of federal

PMCODE: JJV

\*N/A = NOT AVAILABLE  
\*\*N/APP = NOT APPLICABLE  
\*\*\*N/E = NOT ESTABLISHED

MATERIAL SAFETY  
DATA SHEET

ATOTECH USA INC.  
ROCK HILL, S.C. 29730

NAME USED ON LABEL: BARIUM CARBONATE

regulations. Consult with your state and local governments for additional regulatory requirements. Disposal of this material must be in a manner compliant with all federal, state, and local regulations.

Wastes containing more than 0.2% soluble barium is hazardous under the RCRA criteria.

\*\*\*\*\*  
TRANSPORTATION  
\*\*\*\*\*

HAZARDOUS MATERIAL/DANGEROUS GOODS SHIPMENT IS INDICATED BY (X) BELOW:

(X) NOT REGULATED (NOTE: For reportable quantities which may apply, see Miscellaneous.)

\*\*\*\*\*  
MISCELLANEOUS  
\*\*\*\*\*

EPA/DOT - REPORTABLE QUANTITY (RQ) FOR HAZARDOUS SUBSTANCES:

(X) There are no constituents in this product for which reportable quantities may be applicable.

EPA - Any release of hazardous substance(s) in a quantity equal to or exceeding the RQ in any 24-hour period requires the immediate notification of the National Response Center in Washington, D.C. at (800) 424-8802. Other notification requirements, such as state and local governments, may apply.

DOT - Any package containing a hazardous substance in a quantity equal to or exceeding the RQ is regulated as a hazardous material.

\*\*\*\*\*  
ADDITIONAL INFORMATION  
\*\*\*\*\*

Ratings:

	F	H	R	PPE	Spec Haz
HMIS	0	3*	0	X	N/APP
NFPA	0	2	0	N/APP	N/APP

F= Flammability      H=Health      R=Reactivity  
PPE= Personal Protection Equipment      Spec Haz= Special Health Hazards  
W=Water Reactive      OX=Oxidizer      \* = Chronic Hazard

PMCODE: JJV

\*N/A = NOT AVAILABLE  
\*\*N/APP = NOT APPLICABLE  
\*\*\*N/E = NOT ESTABLISHED

MATERIAL SAFETY  
DATA SHEET

ATOTECH USA INC.  
ROCK HILL, S.C. 29730

NAME USED ON LABEL: BARIUM CARBONATE

SARA Title III Classifications:	Yes	No
Immediate (Acute) Health . . .	X	
Delayed (Chronic) Health . . .	X	
Sudden Release of Pressure . .		X
Reactive . . . . .		X
Fire . . . . .		X

Components of this product are identified below if they are present in excess of de minimus reporting levels. Components that are not required to be identified by specific chemical name may have a generic description.

SARA Title III Section 302 Extremely Hazardous Substances:  
None

SARA Title III Section 313 Toxic Chemicals:  
Barium Compounds 100 %wt

STATE RIGHT-TO-KNOW

Components of this product which are specifically identified in the ingredients section of this MSDS may be listed as hazardous by these and/or other states: Massachusetts, New Jersey, Pennsylvania, Florida, Connecticut, Louisiana, Rhode Island, Illinois.

-----  
CAREFULLY READ THE FOLLOWING: The identification of ingredients in this document meets or exceeds the requirements set forth in 29 CFR, 40 CFR, et al. at the date of publication. Ingredients present in a mixture or solution which are generically identified or not referenced in this document are not regulatorily required to be specifically identified or referenced. The information contained herein should be provided to all those who will use, handle, store, transport, or may otherwise be exposed to this product.

We certify that all ingredients, whether identified in this MSDS or not, are on the TSCA inventory (for USA manufacture and/or sales only).

THE INFORMATION CONTAINED HEREIN, TO THE BEST OF OUR KNOWLEDGE, IS CONSIDERED TO BE ACCURATE. SUCH INFORMATION IS OFFERED SOLELY FOR YOUR CONSIDERATION, INVESTIGATION, AND VERIFICATION, AND WE DO NOT SUGGEST OR GUARANTEE THAT ANY PRECAUTIONS, PROCEDURES, RECOMMENDATIONS ETC. ARE PREFERRED OR UNIQUE. ATOTECH USA INC. MAKES NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO THE USE OF THIS INFORMATION OR THE USE OF MATERIAL IDENTIFIED HEREIN, IN COMBINATION WITH ANY OTHER MATERIAL OR PROCESS, AND ASSUMES NO

PMCODE: JJV

\*N/A = NOT AVAILABLE  
\*\*N/APP = NOT APPLICABLE  
\*\*\*N/E = NOT ESTABLISHED

MATERIAL SAFETY  
DATA SHEET

ATOTECH USA INC.  
ROCK HILL, S.C. 29730

NAME USED ON LABEL: BARIUM CARBONATE

RESPONSIBILITY THEREFORE. THIS DOCUMENT WAS DEVELOPED UNDER THE  
REQUIREMENTS OF THE UNITED STATES, AND AS SUCH MAY NOT SATISFY OTHER  
STATE OR REGIONAL REQUIREMENTS.

Prepared by the Product Safety Department (PSD)

ISSUED: 6/25/1998

SUPERSEDES: 4/17/1989

PMCODE: JJV

Page 7 of 7

\*N/A = NOT AVAILABLE  
\*\*N/APP = NOT APPLICABLE  
\*\*\*N/E = NOT ESTABLISHED

MATERIAL SAFETY  
DATA SHEET

ATOTECH USA INC.  
1750 OVERVIEW DRIVE  
ROCK HILL, S.C. 29730

Chrome Tank

EMERGENCY TELEPHONE  
NUMBER  
8:00 am - 5:00 pm  
(803) 817-3500  
  
CHEMTREC - 24 HOURS  
1-800-424-9300

NAME USED ON LABEL: FUMETROL(R) 140 MIST SUPPRESSANT  
CHEMICAL NAME (if single substance): Mixture  
CHEMICAL FAMILY: Mixture  
FORMULA: Proprietary

\*\*\*\*\*  
HAZARDOUS INGREDIENTS  
\*\*\*\*\*

IDENTITY                      CAS No.                      %                      EXPOSURE LIMITS

This product does not contain Hazardous Materials as defined by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

\*\*\*\*\*  
PHYSICAL DATA  
\*\*\*\*\*

BOILING POINT: N/A                      FREEZING POINT: 27-32 DEG F  
SPECIFIC GRAVITY: 1.025                      VAPOR PRESSURE @ 20 C: N/A  
VAPOR DENSITY (Air=1): N/A                      SOLUBILITY IN WATER: Soluble  
% VOLATILE: N/A                      EVAPORATION RATE  
pH: 4-7                      (Butyl Acetate=1): N/A

APPEARANCE: Slightly cloudy white to pale yellow liquid.  
Slight odor.

\*\*\*\*\*  
FIRE AND EXPLOSION DATA  
\*\*\*\*\*

FLASH POINT (Test Method)                      AUTOIGNITION TEMPERATURE                      FLAMMABLE LTS.  
N/A                      N/A                      LEL-N/A UEL-N/A

EXTINGUISHING MEDIA: Water, dry chemical, carbon dioxide, foam.

SPECIAL FIRE FIGHTING PROCEDURES: Do not get material on skin or clothing. Avoid inhalation of fumes or mists. Stay upwind, out of low areas, and ventilate closed spaces before entering. Cool containers from the side with water until fire is out. Use water spray to reduce vapor; do not put water directly on leak or spill area. Keep combustibles away from spilled material. Self-contained breathing apparatus (SCBA) and chemical-protective clothing can be worn but may not provide adequate thermal protection for chemical fire unless stated by the manufacturer. Structural fire fighter's

\*N/A = NOT AVAILABLE  
\*\*N/APP = NOT APPLICABLE  
\*\*\*N/E = NOT ESTABLISHED

PMCODE: SHQ01

CONSUME  
5-10 GAL A YEAR

NAME USED ON LABEL: FUMETROL(R) 140 MIST SUPPRESSANT

protective clothing may not be effective. Move containers from fire area, if possible to do so without risk.

**UNUSUAL FIRE AND EXPLOSION HAZARDS:** During fire conditions, irritating and toxic fumes may be evolved.

\*\*\*\*\*  
**HEALTH HAZARD DATA**  
\*\*\*\*\*

**EYE CONTACT:** May cause irritation to the eyes and surrounding areas characterized by redness, swelling, tearing, and pain.

**SKIN CONTACT:** May cause irritation to the skin characterized by redness, swelling, and pain.

**INHALATION:** May cause irritation to the respiratory passages, including the nose, airway, and lungs characterized by sore throat, chest pain, cough, dizziness, headache, nausea, and shortness of breath.

**INGESTION:** May cause irritation to the mouth, throat, and stomach characterized by sore throat, abdominal pain, headache, nausea, vomiting, and diarrhea.

**CHRONIC TOXICITY:** Effects of long-term exposure to this product have not been determined.

**CARCINOGENICITY:**

	NTP	IARC	Other
Yes			
No	X	X	X

\*\*\*\*\*  
**SUGGESTED FIRST AID**  
\*\*\*\*\*

**EYES:** Immediately flush eyes with flowing water for at least 15 minutes while holding eyelids away from eyes. Seek medical attention, if irritation persists.

**SKIN:** Wash exposed areas thoroughly with soap and flowing water, while removing contaminated clothing and shoes. If irritation persists, seek medical attention.

**INHALATION:** Remove exposed individual from source of exposure. If breathing is difficult, oxygen may be administered by certified persons only. Artificial respiration may be performed only if exposed individual is not breathing. If breathing is difficult, seek medical attention.

\*N/A = NOT AVAILABLE

\*\*N/APP = NOT APPLICABLE

\*\*\*N/E = NOT ESTABLISHED

NAME USED ON LABEL: FUMETROL(R) 140 MIST SUPPRESSANT

**INGESTION:** Give 1 or 2 glasses of water or milk. Never give anything by mouth to an unconscious or convulsing person. DO NOT induce vomiting unless directed by a physician. Seek medical attention.

\*\*\*\*\*  
**REACTIVITY DATA**  
\*\*\*\*\*

**STABILITY:** Stable

**HAZARDOUS POLYMERIZATION:** Will not occur.

**CONDITIONS TO AVOID:** N/A

**INCOMPATIBILITY (Materials to Avoid):** Strong oxidizers

**HAZARDOUS DECOMPOSITION PRODUCTS:** Thermal decomposition may result in the evolution of corrosive & toxic fumes of hydrofluoric acid & ammonia.

\*\*\*\*\*  
**SPECIAL PROTECTION INFORMATION**  
\*\*\*\*\*

**VENTILATION:** Local exhaust or an enclosed handling system is highly recommended. Mechanical (general) ventilation is required.

**RESPIRATORY PROTECTION:** Use NIOSH/MSHA-approved respiratory protection if ventilation is inadequate.

**EYE AND FACE PROTECTION:** Chemical splash goggles. DO NOT WEAR CONTACT LENSES!

**OTHER PERSONAL PROTECTION:** Butyl rubber or neoprene gloves, boots, apron, and sleeves. An impervious coverall may be substituted for the apron and sleeves when additional protection is needed. An emergency eyewash and drench shower should be available in the immediate work area. Launder contaminated clothing before reuse.

\*\*\*\*\*  
**SPECIAL PRECAUTIONS**  
\*\*\*\*\*

**HANDLING:** Avoid contact with eyes, skin, or clothing. Avoid breathing mist or vapor. Do not take internally. Use only with adequate ventilation. Wash thoroughly after handling. Emptied container retains vapor and product residue - Observe all label safeguards

NAME USED ON LABEL: FUMETROL(R) 140 MIST SUPPRESSANT

until container is cleaned, reconditioned or destroyed. Keep container tightly closed in an upright position.

STORAGE: Protect from freezing - Store above 40 deg F. Store in a cool, dry place away from incompatible material.

\*\*\*\*\*  
ENVIRONMENTAL INFORMATION  
\*\*\*\*\*

**SPILL RESPONSE:** Wear NIOSH/MSHA-approved respiratory protection and appropriate personal protective clothing to minimize skin & eye contact when cleaning spill. Do not get spilled material on skin or clothing; stop leak if you can do so without risk. If necessary, dike area of spill to prevent spreading. Cover with sand, clay, or other noncombustible absorbent material. Transfer absorbed material to a suitable container for disposal. CAREFULLY flush area where spill has occurred with water. Retain this water/residue mixture for evaluation and/or disposal. NOTE: Discharge to a public sewerage authority should coincide with all applicable local permits and notification requirements. May be hazardous to aquatic life if released to open waters.

**RECOMMENDED DISPOSAL:** Disposal of waste material from the use of this product may be subject to federal, state, and local regulations. Refer to Part 261 of 40 CFR for the applicability of federal regulations. Consult with your state and local governments for additional regulatory requirements. Disposal of this material must be in a manner compliant with all federal, state, and local regulations.

\*\*\*\*\*  
TRANSPORTATION  
\*\*\*\*\*

HAZARDOUS MATERIAL/DANGEROUS GOODS SHIPMENT IS INDICATED BY (X) BELOW:

(X) NOT REGULATED (NOTE: For reportable quantities which may apply, see Miscellaneous.)

\*\*\*\*\*  
MISCELLANEOUS  
\*\*\*\*\*

EPA/DOT - REPORTABLE QUANTITY (RQ) FOR HAZARDOUS SUBSTANCES:

(X) There are no constituents in this product for which reportable quantities may be applicable.

NAME USED ON LABEL: FUMETROL(R) 140 MIST SUPPRESSANT

EPA - Any release of hazardous substance(s) in a quantity equal to or exceeding the RQ in any 24-hour period requires the immediate notification of the National Response Center in Washington, D.C. at (800) 424-8802. Other notification requirements, such as state and local governments, may apply.

DOT - Any package containing a hazardous substance in a quantity equal to or exceeding the RQ is regulated as a hazardous material.

\*\*\*\*\*

ADDITIONAL INFORMATION

\*\*\*\*\*

RATINGS:	F	H	R	PPE	Spec Haz
HMIS	0	1	0	X	N/APP
NFPA	0	1	0	N/APP	N/APP

F= Flammability                      H=Health                      R=Reactivity  
PPE= Personal Protection Equipment      Spec Haz= Special Health Hazards  
W=Water Reactive                      OX=Oxidizer                      \* = Chronic Hazard

SARA Title III Classifications:	Yes	No
Immediate (Acute) Health . . .		X
Delayed (Chronic) Health . . .		X
Sudden Release of Pressure . .		X
Reactive . . . . .		X
Fire . . . . .		X

Components of this product are identified below if they are present in excess of de minimus reporting levels. Components that are not required to be identified by specific chemical name may have a generic description.

SARA Title III Section 302 Extremely Hazardous Substances:  
None

SARA Title III Section 313 Toxic Chemicals:  
None

STATE RIGHT-TO-KNOW

Components of this product which are specifically identified in the ingredients section of this MSDS may be listed as hazardous by these and/or other states: N/APP.

-----

CAREFULLY READ THE FOLLOWING: The identification of ingredients in this document meets or exceeds the requirements set forth in 29 CFR,

\*N/A = NOT AVAILABLE  
\*\*N/APP = NOT APPLICABLE  
\*\*\*N/E = NOT ESTABLISHED

MATERIAL SAFETY  
DATA SHEET

ATOTECH USA INC.  
ROCK HILL, S.C. 29730

NAME USED ON LABEL: FUMETROL(R) 140 MIST SUPPRESSANT

40 CFR, et al. at the date of publication. Ingredients present in a mixture or solution which are generically identified or not referenced in this document are not regulatorily required to be specifically identified or referenced. The information contained herein should be provided to all those who will use, handle, store, transport, or may otherwise be exposed to this product.

ATOTECH USA certifies that all ingredients, whether identified in this MSDS or not, are on the TSCA inventory (for USA manufacture and/or sales only).

THE INFORMATION CONTAINED HEREIN, TO THE BEST OF OUR KNOWLEDGE, IS CONSIDERED TO BE ACCURATE. SUCH INFORMATION IS OFFERED SOLELY FOR YOUR CONSIDERATION, INVESTIGATION, AND VERIFICATION, AND WE DO NOT SUGGEST OR GUARANTEE THAT ANY PRECAUTIONS, PROCEDURES, RECOMMENDATIONS ETC. ARE PREFERRED OR UNIQUE. ATOTECH USA INC. MAKES NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO THE USE OF THIS INFORMATION OR THE USE OF MATERIAL IDENTIFIED HEREIN, IN COMBINATION WITH ANY OTHER MATERIAL OR PROCESS, AND ASSUMES NO RESPONSIBILITY THEREFORE. THIS DOCUMENT WAS DEVELOPED UNDER THE REQUIREMENTS OF THE UNITED STATES, AND AS SUCH MAY NOT SATISFY OTHER STATE OR REGIONAL REQUIREMENTS.

Prepared by the Product Safety Department (PSD)

ISSUED: 6/16/1998

SUPERSEDES: 5/1998

MATERIAL SAFETY  
DATA SHEET

ATOTECH USA INC.  
1750 OVERVIEW DRIVE  
ROCK HILL, S.C. 29730

Chrome Tank  
EMERGENCY TELEPHONE  
NUMBER  
8:00 am - 5:00 pm  
(803) 817-3500  
CHEMTREC - 24 HOURS  
1-800-424-9300

NAME USED ON LABEL: ECONO-CHROME 300  
CHEMICAL NAME (if single substance): Mixture  
CHEMICAL FAMILY: Mixture  
FORMULA: Proprietary

\*\*\*\*\*  
HAZARDOUS INGREDIENTS  
\*\*\*\*\*

IDENTITY	CAS No.	%	EXPOSURE LIMITS
Chromic Acid	1333-82-0	<90	ACGIH-TWA(1): 0.05 mg/m3 OSHA-PEL(2): 1.00 mg/m3

- (1) Chromium, water-soluble, Chromium VI Compounds, N.O.C.
- (2) Chromium, metal and insoluble salts.

\*\*\*\*\*  
PHYSICAL DATA  
\*\*\*\*\*

BOILING POINT: N/E	FREEZING POINT: N/E
SPECIFIC GRAVITY: N/E	VAPOR PRESSURE @ 20 C: N/E
VAPOR DENSITY (Air=1): N/E	SOLUBILITY IN WATER: Soluble
% VOLATILE: N/A	EVAPORATION RATE
pH: N/E	(Butyl Acetate=1): N/E

APPEARANCE: Dark red flakes or powder.

\*\*\*\*\*  
FIRE AND EXPLOSION DATA  
\*\*\*\*\*

FLASH POINT (Test Method)	AUTOIGNITION TEMPERATURE	FLAMMABLE LTS.
N/E	N/E	LEL-N/E UEL-N/E

EXTINGUISHING MEDIA: Nonflammable -- Use extinguishing media appropriate to surrounding fire conditions.

SPECIAL FIRE FIGHTING PROCEDURES: Do not get material on skin or clothing. Avoid inhalation of fumes or mists. Stay upwind, out of low areas, and ventilate closed spaces before entering. Cool containers from the side with water until fire is out. Use water spray to reduce vapor; do not put water directly on leak or spill area. Wear full protective clothing and NIOSH-approved, self-contained breathing apparatus (SCBA) with full facepiece

\*N/A = NOT AVAILABLE  
\*\*N/APP = NOT APPLICABLE  
\*\*\*N/E = NOT ESTABLISHED

PMCODE: CMR

Consume  
200 LBS A YEAR

NAME USED ON LABEL: ECONO-CHROME 300

operated in the pressure demand or other positive pressure mode. Move containers from fire area, if possible to do so without risk.

UNUSUAL FIRE AND EXPLOSION HAZARDS: During fire conditions, product may evolve chromium oxides or oxygen.

\*\*\*\*\*  
HEALTH HAZARD DATA  
\*\*\*\*\*

EYE CONTACT: Corrosive. Causes irritation and burns to the eyes and surrounding areas. Direct contact may cause severe damage including blindness.

SKIN CONTACT: Toxic, corrosive. May be harmful if absorbed through skin. Contact can cause severe burns. Contact with broken skin may lead to formation of firmly margined "chrome sores." May rarely cause allergic contact dermatitis.

INHALATION: Corrosive. Causes irritation to the respiratory passages, including the nose, airway, and lungs. Inhalation of dusts and mists causes burns of the mucous membranes and irritation of the respiratory tract.

INGESTION: Toxic, corrosive. May be harmful if swallowed. Can cause severe tissue destruction. Kidney failure may follow and result in death. May cause liver and kidney damage.

CHRONIC TOXICITY: Repeated inhalation can cause kidney and liver damage, nasal perforation, skin ulceration, and lung cancer. Transfer of chromic acid to eyes from fingers can cause chronic conjunctival inflammation.

Prolonged or repeated contact may cause conjunctivitis, "chrome sores" on skin (especially broken skin), or ulceration and perforation of the nasal septum.

SYMPTOMS OF EXPOSURE: Red, inflamed skin, eyes, and mucous membranes; burns and pain; blurred or diminished vision; abdominal pain, nausea, vomiting (vomitus may have a coffee-ground appearance); shortness of breath, chest pain, pulmonary edema (may be delayed); dizziness, shock, weak and rapid pulse.

NAME USED ON LABEL: ECONO-CHROME 300

CARCINOGENICITY:

	NTP	IARC	Other
Yes	X	X	X
No			

The National Toxicology Program (NTP) has designated Hexavalent Chromium compounds as Known Human Carcinogens. The International Agency for Research on Cancer (IARC) has identified Hexavalent Chromium Compounds as Probable Human Carcinogens. The American Conference of Governmental Industrial Hygienists (ACGIH) has identified Water-Soluble Hexavalent chromium compounds as a Confirmed Carcinogen.

\*\*\*\*\*

SUGGESTED FIRST AID

\*\*\*\*\*

EYES: Immediately flush eyes with plenty of water for at least 15 minutes forcibly holding eyelids apart to ensure complete irrigation of all eye and lid tissue. Get immediate medical attention.

SKIN: Immediately flush skin with plenty of water while removing contaminated clothing and shoes. Get immediate medical attention. Contaminated clothing should be taken off/removed in a manner which limits further exposure.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration and/or if breathing is difficult give oxygen by trained personnel. Get immediate medical attention.

INGESTION: If swallowed, do NOT induce vomiting. Give milk or water. Call a physician or poison control center immediately. Never give anything by mouth to an unconscious person.

NOTES TO PHYSICIAN: Overexposure to this product could lead to kidney failure and death. It has been reported that there is little value from chelating agents, however, Ascorbic Acid administered intravenously and locally is an effective antidote (converting Cr6 to Cr3) in preventing renal tubular failure. Skin ulcers may be treated by removal from exposure, daily cleaning, debridement, and application of antibiotic cream and dressing. Dialysis may be necessary as indicated. Up to 10 grams Ascorbic Acid in stomach. Plus IV Ascorbic Acid 1 gram in divided doses. Monitor blood chemistries, force fluids for diuresis (of chrome). Do not attempt chelation! Protect renal tubules.

\*\*\*\*\*

REACTIVITY DATA

\*\*\*\*\*

\*N/A = NOT AVAILABLE  
\*\*N/APP = NOT APPLICABLE  
\*\*\*N/E = NOT ESTABLISHED

NAME USED ON LABEL: ECONO-CHROME 300

STABILITY: Stable

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Contact with incompatible materials and heat.

INCOMPATIBILITY (Materials to Avoid): Strong acids, alkali, easily oxidizable materials, metals, and organic materials.

HAZARDOUS DECOMPOSITION PRODUCTS: Oxygen and oxides of chromium upon thermal decomposition.

\*\*\*\*\*  
SPECIAL PROTECTION INFORMATION  
\*\*\*\*\*

VENTILATION: Local exhaust or an enclosed handling system is highly recommended. Mechanical (general) ventilation is required.

EYE PROTECTION: Use chemical splash goggles and face shield (ANSI Z87.1 or approved equivalent). Do not wear contact lenses when in contact with this product. An emergency eye wash must be readily accessible to the work area.

RESPIRATORY PROTECTION: Use NIOSH approved respiratory equipment when airborne concentrations are equal to or may exceed exposure limits. For emergency or other conditions where exposure levels are not known or may be uncontrolled, use a positive pressure air-supplied or self-contained breathing apparatus (SCBA). Respiratory protection programs must comply with 29 CFR 1910.134.

ADDITIONAL PERSONAL PROTECTIVE EQUIPMENT: Select chemical resistant clothing such as gloves, aprons, boots or whole full body protection where contact may occur. Consult glove/clothing manufacturer to determine the most suitable chemical resistant clothing for user's application. Consideration must be given to durability and permeation resistance. Wash immediately if skin is contaminated. Remove contaminated clothing immediately after use and wash before re-use. Provide a safety shower at any location where skin contact may occur. Always wash skin thoroughly after handling.

\*\*\*\*\*  
SPECIAL PRECAUTIONS  
\*\*\*\*\*

HANDLING: Do not get in eyes, on skin, or on clothing. Do not breath dust, mist or vapor. Do not take internally. Use only with adequate ventilation. Wash thoroughly after handling. Emptied container

NAME USED ON LABEL: ECONO-CHROME 300

retains vapor and product residue - Observe all label safeguards until container is cleaned, reconditioned or destroyed. Keep container tightly closed in an upright position.

STORAGE: Store in a cool, dry place away from incompatible material.

\*\*\*\*\*  
ENVIRONMENTAL INFORMATION  
\*\*\*\*\*

SPILL RESPONSE: Wear NIOSH/MSHA-approved respiratory protection and protective clothing when cleaning spill. Do not get spilled material on skin or clothing; stop leak if you can do so without risk. Vacuum (HEPA-filtered) or carefully sweep up spilled material and place in an appropriate & properly labeled container for disposal. Avoid creating a dusty atmosphere.

RECOMMENDED DISPOSAL: Disposal of waste material from the use of this product may be subject to federal, state, and local regulations. Refer to Part 261 of 40 CFR for the applicability of federal regulations. Consult with your state and local governments for additional regulatory requirements. Disposal of this material must be in a manner compliant with all federal, state, and local regulations.

\*\*\*\*\*  
TRANSPORTATION  
\*\*\*\*\*

HAZARDOUS MATERIAL/DANGEROUS GOODS SHIPMENT IS INDICATED BY (X) BELOW:

- (X) Department of Transportation (DOT/HM-181)
- (X) International Air Transportation Association (IATA)
- (X) International Maritime Organization (IMO/IMDG)

SHIPPING INFORMATION:

UN (NA) Number	Hazard Class	Subsid. Risk	Labels	Mark (IMO)	Packaging Group
1463	5.1	8, 6.1	OXIDIZER, CORROSIVE, TOXIC	NONE	II

SHIPPING NAME:

DOT - CHROMIUM TRIOXIDE, ANHYDROUS (MIXTURE), 5.1(8), UN1463, PGII, RQ, TOXIC

IATA - SAME

IMO - SAME

DOT QUANTITY LIMITS:

\*N/A = NOT AVAILABLE

\*\*N/APP = NOT APPLICABLE

\*\*\*N/E = NOT ESTABLISHED

MATERIAL SAFETY  
DATA SHEET

ATOTECH USA INC.  
ROCK HILL, S.C. 29730

NAME USED ON LABEL: ECONO-CHROME 300

Passenger Air or Rail - 5 kg    Cargo Air Only - 25 kg  
Packaging Authorization - 49CFR 173.212, 173.242  
Special Provisions - B106

NOTES:

IATA PACKAGING:

Passenger Aircraft (PA)		Cargo Aircraft Only (CAO)
PkgInst- 508	Max/Pkg- 5 kg	PkgInst- 511 Max/Pkg- 25 kg
Y508	2.5 kg	

NOTES:

\*\*\*\*\*  
MISCELLANEOUS  
\*\*\*\*\*

EPA/DOT - REPORTABLE QUANTITY (RQ) FOR HAZARDOUS SUBSTANCES:

(X) RQ of 10 lb / 4.54 kg for Chromic Acid

EPA - Any release of hazardous substance(s) in a quantity equal to or exceeding the RQ in any 24-hour period requires the immediate notification of the National Response Center in Washington, D.C. at (800) 424-8802. Other notification requirements, such as state and local governments, may apply.

DOT - Any package containing a hazardous substance in a quantity equal to or exceeding the RQ is regulated as a hazardous material.

Packagings containing at least 10 pounds meet the reportable quantity for chromic acid. The letters "RQ" must be appended to the proper shipping name where applicable. (see TRANSPORTATION section)

\*\*\*\*\*  
ADDITIONAL INFORMATION  
\*\*\*\*\*

RATINGS:

	F	H	R	PPE	Spec Haz
HMIS	0	3*	1	X	N/APP
NFPA	0	3	1	N/APP	N/APP

F= Flammability            H=Health            R=Reactivity  
PPE= Personal Protection Equipment    Spec Haz= Special Health Hazards  
W=Water Reactive            OX=Oxidizer            \* = Chronic Hazard

\*N/A = NOT AVAILABLE  
\*\*N/APP = NOT APPLICABLE  
\*\*\*N/E = NOT ESTABLISHED

MATERIAL SAFETY  
DATA SHEET

ATOTECH USA INC.  
ROCK HILL, S.C. 29730

NAME USED ON LABEL: ECONO-CHROME 300

SARA Title III Classifications:	Yes	No
Immediate (Acute) Health . . .	X	
Delayed (Chronic) Health . . .	X	
Sudden Release of Pressure . .		X
Reactive . . . . .		X
Fire . . . . .	X	

Components of this product are identified below if they are present in excess of de minimus reporting levels. Components that are not required to be identified by specific chemical name may have a generic description.

SARA Title III Section 302 Extremely Hazardous Substances:  
NONE

SARA Title III Section 313 Toxic Chemicals:  
Chromium VI Compounds 1333-82-0 <90 %wt

STATE RIGHT-TO-KNOW

Components of this product which are specifically identified in the ingredients section of this MSDS may be listed as hazardous by these and/or other states: California, Connecticut, Indiana, Illinois, Kentucky, Louisiana, Massachusetts, Michigan, Minnesota, New Jersey, North Carolina, Pennsylvania, and Rhode Island.

ATTENTION: This product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

-----  
CAREFULLY READ THE FOLLOWING: The identification of ingredients in this document meets or exceeds the requirements set forth in 29 CFR, 40 CFR, et al. at the date of publication. Ingredients present in a mixture or solution which are generically identified or not referenced in this document are not regulatorily required to be specifically identified or referenced. The information contained herein should be provided to all those who will use, handle, store, transport, or may otherwise be exposed to this product.

We certify that all ingredients, whether identified in this MSDS or not, are on the TSCA inventory (for USA manufacture and/or sales only).

THE INFORMATION CONTAINED HEREIN, TO THE BEST OF OUR KNOWLEDGE, IS CONSIDERED TO BE ACCURATE. SUCH INFORMATION IS OFFERED SOLELY FOR YOUR CONSIDERATION, INVESTIGATION, AND VERIFICATION, AND WE DO NOT SUGGEST OR GUARANTEE THAT ANY PRECAUTIONS, PROCEDURES, RECOMMENDATIONS ETC. ARE PREFERRED OR UNIQUE. ATOTECH USA INC. MAKES

PMCODE: CMR

\*N/A = NOT AVAILABLE  
\*\*N/APP = NOT APPLICABLE  
\*\*\*N/E = NOT ESTABLISHED

NAME USED ON LABEL: ECONO-CHROME 300

NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO THE USE OF THIS INFORMATION OR THE USE OF MATERIAL IDENTIFIED HEREIN, IN COMBINATION WITH ANY OTHER MATERIAL OR PROCESS, AND ASSUMES NO RESPONSIBILITY THEREFORE. THIS DOCUMENT WAS DEVELOPED UNDER THE REQUIREMENTS OF THE UNITED STATES, AND AS SUCH MAY NOT SATISFY OTHER STATE OR REGIONAL REQUIREMENTS.

PREPARED BY THE PRODUCT SAFETY DEPARTMENT (PSD)

ISSUED: 05/18/2001

SUPERSEDES: New

L. D. DAVIS INDUSTRIES, INC.

**MATERIAL SAFETY DATA SHEET**  
(Complies with Hazard Communication Standard 29 CFR 1910.1203)  
**PRODUCT IDENTIFICATION**

MANUFACTURER:	L. D. Davis Industries, Inc. 401 Masons Mill Rd. Huntingdon Valley, PA 19008	DATE:	January 20, 2005
PRODUCT:	AG-3503 <del>AG-3501</del> Hot Glue	TELEPHONE:	1-404-699-1505
	AG3501	EMERGENCY:	CHEMTREC 1-800-424-9300

**PHYSICAL DATA**

APPEARANCE AND ODOR:	AMBERTAN GRANULES
SPECIFIC GRAVITY (WATER = 1):	N/A
VAPOR PRESSURE:	N/A
VAPOR DENSITY:	N/A
MELTING POINT:	N/A
BOILING POINT:	N/A
EVAPORATION RATE (WATER = 1):	N/A
SOLUBILITY IN WATER:	100% SOLUBLE IN WATER

**FIRE AND EXPLOSION DATA**

FLASH POINT:	N/A
FLAMMABLE LIMITS:	N/A
EXTINGUISHING MEDIA:	WATER SPRAY, FOAM, DRY CHEMICAL OR CO2
SPECIAL FIREFIGHTING PROCEDURES:	N/A
UNUSUAL FIRE AND EXPLOSION HAZARDS:	AVOID CONDITIONS WHICH MAY PRODUCE DUST

**HAZARDOUS INGREDIENTS**

COMPONENT	HAZARD DATA
NONE	N/A

**REACTIVITY DATA**

STABILITY:	STABLE
HAZARDOUS POLYMERIZATION:	WILL NOT OCCUR
INCOMPATIBILITY:	NONE KNOWN
HAZARDOUS DECOMPOSITION:	NONE KNOWN

**HEALTH HAZARD INFORMATION**

RESPIRATORY IRRITATION CAN OCCUR IF EXCESSIVE DUST IS CREATED WHEN DUMPING BAGS. MINIMAL DUSTING CAN BE IRRITATING TO EYES AND NASAL PASSAGES.

EMERGENCY FIRST AID PROCEDURES: IF CONTACT SHOULD OCCUR DURING USE, FLUSH FROM EYES OR SKIN WITH WATER. IF IRRITATION DEVELOPS, CONSULT A PHYSICIAN.

**SPILL OR LEAK PROCEDURES**

IN CASE OF SPILL: SWEEP SPILLED MATERIAL AND DISCARD IN SUITABLE CONTAINER. AVOID GENERATING EXCESSIVE DUST WHEN SWEEPING. DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.

**SPECIAL PROTECTION INFORMATION**

RESPIRATORY PROTECTION: USE NIOSH APPROVED DUST RESPIRATOR

VENTILATION: NORMAL AIR DRAFT OR LOCAL EXHAUST

EYE PROTECTION: SAFETY GLASSES RECOMMENDED WHEN DUMPING BAGS

GLOVES: NONE REQUIRED

OTHER PROTECTIVE EQUIPMENT: NONE REQUIRED

**SPECIAL PRECAUTIONS**

WHEN HANDLING THIS PRODUCT, GOOD PERSONAL HYGIENE, SUCH AS WASHING HANDS WITH SOAP AND WATER PRIOR TO EATING, SHOULD BE PRACTICED.

**SECTION 313 SUPPLIER NOTIFICATION**

This product contains the following toxic chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right to Know Act of 1986 and of 40 CFR 372:

<u>CAS NUMBER</u>	<u>CHEMICAL NAME</u>	<u>PERCENT BY WEIGHT</u>
	NONE	

**HMS INFORMATION**

HEALTH: 1      FLAMMABILITY: 0      REACTIVITY: 0      PERSONAL PROTECTION: E

The information in this Material Safety Data Sheet is believed to be reliable, but is provided without warranty regarding its accuracy. Users must determine safe conditions for use and assume liability for any loss, injury, damage, or expense resulting from use of this product (D-F-Y)

# Material Safety Data Sheet

## Aluminum Oxide

MSDS No. 004

Page 1 of 2

\*\*\*\*\* SECTION I \*\*\*\*\*

NAME AND ADDRESS:

EMERGENCY TELEPHONE NUMBER:

INFORMATION TELEPHONE NUMBER:

Health	1
Flam.	0
React.	0
P.P.S.	E

CHEMICAL NAME AND SYNONYMS:

TRADE NAME AND SYNONYMS:

Fused Aluminum Oxide

Lionite, Aluminum Oxide;  
SS, GF, SSK, GFK, SSC, GFC, A/O, AS, AST;  
Lionblast; LB; Lundite; Futsure; Superfine A/O;  
MT-2 Fines; AOF; DCF A/O; DCFT; CF #2 A/O

CHEMICAL FAMILY:

FORMULA: N/A

Refractory Oxide

\*\*\*\*\* SECTION II - HAZARDOUS INGREDIENTS/IDENTITY INFORMATION \*\*\*\*\*

INGREDIENT:	CAS#	Typical %	OSHA PEL	ACGIH TLV	LC50 Car.
Aluminum Oxide (Al <sub>2</sub> O <sub>3</sub> )	1344-28-1	96.4	N/A	10 mg/m <sup>3</sup>	No
Titanium Oxide (TiO <sub>2</sub> )	13463-67-7	2.7	15 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	No
Silicon Dioxide (SiO <sub>2</sub> )	7631-85-9	0.5	See Below	See Below	No
Magnesium Oxide (MgO)	1309-48-4	0.2	15 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	No
Iron Oxide (Fe <sub>2</sub> O <sub>3</sub> )	1309-37-1	0.1	10 mg/m <sup>3</sup>	5 mg(Fe)/m <sup>3</sup>	No
Calcium Oxide (CaO)	1305-78-8	0.1	5 mg/m <sup>3</sup>	2 mg/m <sup>3</sup>	No

PEL & TLV for SiO<sub>2</sub> = (10 mg/m<sup>3</sup>) / (% Respirable SiO<sub>2</sub>+2)  
\* on California Proposition 65 List(1988)

\*\*\*\*\* SECTION III - PHYSICAL / CHEMICAL CHARACTERISTICS \*\*\*\*\*

MELTING POINT (-C):	2050°C	SPECIFIC GRAVITY (H <sub>2</sub> O = 1):	3.95
BOILING POINT (°C):	N/A	PERCENT VOLATILES BY VOLUME (%):	N/A
VAPOR PRESSURE (mmHg):	Essentially 0	EVAPORATION RATE (Butyl Acetate = 1):	N/A
VAPOR DENSITY (Air =1):	N/A		
SOLUBILITY IN WATER:	Insoluble		

APPEARANCE AND ODOR: Lign. to Dark Brown  
No Oder

\*\*\*\*\* SECTION IV - FIRE AND EXPLOSION HAZARD DATA \*\*\*\*\*

FLASH POINT:	Nonflammable	FLAMMABLE LIMITS:	N/A
EXTINGUISHING MEDIA:	N/A		
SPECIAL FIRE FIGHTING PROCEDURES:	N/A		
UNUSUAL FIRE AND EXPLOSION HAZARD:	N/A		

② Alum. Oxide

1-V/4-V

**VI REACTIVITY DATA**

<b>CONDITIONS CONTRIBUTING TO INSTABILITY</b>
No information
<b>INCOMPATIBILITY</b>
No information
<b>HAZARDOUS DECOMPOSITION PRODUCTS</b>
Oxides of carbon
<b>CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION</b>
None known

**VII SPILL OR LEAK PROCEDURES**

<b>STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED</b>
Dry material may be swept up easily. Allow hot solutions to cool completely and gel; then strip away from surface. Clean up residue with warm water.
<b>WASTE DISPOSAL METHOD</b>
Disposal in accordance with local, state, and federal environmental regulations.

**VIII SPECIAL PROTECTION INFORMATION**

<b>VENTILATION REQUIREMENTS</b>
Local exhaust preferred.
<b>PERSONAL PROTECTIVE EQUIPMENT</b>
<b>RESPIRATORY</b>
Dust mask while handling dry material as received.
<b>EYE</b>
Glasses with sideshields
<b>GLOVES</b>
Rubber or plastic, while handling.
<b>OTHER CLOTHING AND EQUIPMENT</b>
Eyewash fountain

# Material Safety Data Sheet

Turkish Emery

(\*Essentially Similar\* to Form OSHA 20)

\*\*\*\*\* SECTION I \*\*\*\*\*

NAME AND ADDRESS:

EMERGENCY TELEPHONE NUMBER:

Health	1
Flam.	0
React.	0
P.P.E.	E

CHEMICAL NAME AND SYNONYMS:

TRADE NAME AND SYNONYMS:

Aluminum Oxide and Magnetite

Turkish Emery, Hecco<sup>®</sup>, Heccolon<sup>®</sup>, Emery

CHEMICAL FAMILY:

FORMULA: N/A

Refractory Oxide

\*\*\*\*\* SECTION II - HAZARDOUS INGREDIENTS \*\*\*\*\*

INGREDIENT:	CAS#	Typical	
		%	TLV*
Aluminum Oxide (Al <sub>2</sub> O <sub>3</sub> )	1344-28-1	67.35	10 Mg/M <sup>3</sup>
Silicon Dioxide (SiO <sub>2</sub> )	7631-86-9	3.50	See Below
Iron Oxide (Fe <sub>3</sub> O <sub>4</sub> )	1317-61-9	24.50	10 Mg/M <sup>3</sup>
Magnesium Oxide (MgO)	1309-48-4	3.50	10 Mg/M <sup>3</sup>
*ACGIH			10 Mg/M <sup>3</sup>

TLV for SiO<sub>2</sub> = \_\_\_\_\_  
(% Respirable SiO<sub>2</sub>+2)

\*\*\*\*\* SECTION III - PHYSICAL DATA \*\*\*\*\*

BOILING POINT (°F):	N/A	SPECIFIC GRAVITY (H <sub>2</sub> O = 1):	3.8
VAPOR PRESSURE (mmHg):	N/A	PERCENT VOLATILES BY VOLUME (%):	N/A
VAPOR DENSITY (Air = 1):	N/A	EVAPORATION RATE (_____ = 1):	N/A
SOLUBILITY IN WATER:	Negligible		
APPEARANCE AND ODOR:	Dark Gray		

\*\*\*\*\* SECTION IV - FIRE AND EXPLOSION HAZARD DATA \*\*\*\*\*

FLASH POINT (method used): N/A  
 EXTINGUISHING MEDIA: N/A  
 SPECIAL FIRE FIGHTING PROCEDURES: NonFlammable  
 FLAMMABLE LIMITS: N/A

UNUSUAL FIRE AND EXPLOSION HAZARD: N/A

② TUCKER LINDY

\*\*\*\*\* SECTION V - HEALTH HAZARD DATA \*\*\*\*\*

THRESHOLD LIMIT VALUE: See Section II.

EFFECTS OF OVEREXPOSURE: Exposure to excessive airborne concentrations may result in acute respiratory disorders. Continued excessive exposure may cause pulmonary fibrosis (silicosis) which may be aggravated by smoking. Individuals with impaired pulmonary function should not be subjected to excessive airborne concentrations. Symptoms of excessive exposure might include deposits of material in eyes, ears, nasal passages and irritation of the mucous membranes, eyes and respiratory tract. Irritation of the skin may also occur due to mechanical/chemical action.

EMERGENCY AND FIRST AID PROCEDURES: Remove from exposure. Irrigate eyes and skin with copious quantities of water. Seek medical attention.

\*\*\*\*\* SECTION VI - REACTIVITY DATA \*\*\*\*\*

STABILITY: N/A  
INCOMPATIBILITY (MATERIALS TO AVOID): N/A  
HAZARDOUS DECOMPOSITION PRODUCTS: N/A  
HAZARDOUS POLYMERIZATION: N/A  
CONDITIONS TO AVOID: N/A

\*\*\*\*\* SECTION VII - SPILL OR LEAK PROCEDURES \*\*\*\*\*

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Normal precautions for inert or nuisance dusts and particulates.

WASTE DISPOSAL METHOD: In compliance with Federal, State and Local regulations.

\*\*\*\*\* SECTION VIII - SPECIAL PROTECTION INFORMATION \*\*\*\*\*

RESPIRATORY PROTECTION: Utilize NIOSH approved respiratory protection for nuisance dust.  
VENTILATION: Utilize local exhaust to keep airborne concentration below TLV.  
PROTECTIVE GLOVES: May be used to prevent dermatitis.  
EYE PROTECTION: If applicable.  
OTHER PROTECTIVE EQUIPMENT: Arm sleeves or barrier creams may be useful in the prevention of dermatitis.

\*\*\*\*\* SECTION IX - SPECIAL PRECAUTIONS \*\*\*\*\*

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: Nothing specified.

OTHER PRECAUTIONS: N/A

Completed by: David K. Bray

PREPARED 9/13/85  
(Date)

Information contained within was obtained from authoritative sources and is believed to be accurate for the manner in which the product is intended to be used. Other uses could result in ramifications which are not included within this document.

U.S. DEPARTMENT OF LABOR  
Occupational Safety and Health Administration

Form Approved  
OMB No. 44-R1387

# MATERIAL SAFETY DATA SHEET

Required under USDL Safety and Health Regulations for Ship Repairing,  
Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

## SECTION I

MANUFACTURER'S NAME <b>R.C.H. Supply Co. Inc.</b>		EMERGENCY TELEPHONE NO. <b>323 583-2388</b>
ADDRESS (Number, Street, City, State, and ZIP Code) <b>4511 Everett Ave. Vernon, CA 90058</b>		
CHEMICAL NAME AND SYNONYMS		TRADE NAME AND SYNONYMS <b>SS-77</b>
CHEMICAL FAMILY <b>Organic/Inorganic</b>	FORMULA <b>#SS-77 Stainless Steel Cpd.</b>	

## SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS	na		BASE METAL	na	
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS			FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					
HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES				%	TLV (Units)
Contains: <b>Fatty Acids, Tallow, Petrolatum, Alum. Oxide</b>					
Note: <b>None are considered Hazardous.</b>					

## SECTION III - PHYSICAL DATA

BOILING POINT (°F.)		SPECIFIC GRAVITY (H <sub>2</sub> O=1)	
VAPOR PRESSURE (mm Hg.)		PERCENT VOLATILE BY VOLUME (%)	
VAPOR DENSITY (AIR=1)		EVAPORATION RATE (-----)	
SOLUBILITY IN WATER	<b>Insol</b>		
APPEARANCE AND ODOR	<b>Fatty Acids</b>		

## SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	<b>385°</b>	FLAMMABLE LIMITS	Low	High
EXTINGUISHING MEDIA	<b>Oil Fire</b>			
SPECIAL FIRE FIGHTING PROCEDURES	<b>None</b>			
UNUSUAL FIRE AND EXPLOSION HAZARDS	<b>None</b>			

55-77

**SECTION V - HEALTH HAZARD DATA**

THRESHOLD LIMIT VALUE

EFFECTS OF OVEREXPOSURE

EMERGENCY AND FIRST AID PROCEDURES

**SECTION VI - REACTIVITY DATA**

STABILITY

UNSTABLE

CONDITIONS TO AVOID

STABLE

XXX

INCOMPATIBILITY (Materials to avoid)

HAZARDOUS DECOMPOSITION PRODUCTS

HAZARDOUS POLYMERIZATION

MAY OCCUR

CONDITIONS TO AVOID

WILL NOT OCCUR

XXX

**SECTION VII - SPILL OR LEAK PROCEDURES**

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

CLEAN WITH WATER

WASTE DISPOSAL METHOD

REGULAR LANDFILL

**SECTION VIII - SPECIAL PROTECTION INFORMATION**

RESPIRATORY PROTECTION (Specify type)

VENTILATION

LOCAL EXHAUST

SPECIAL

MECHANICAL (General)

OTHER

PROTECTIVE GLOVES

EYE PROTECTION

OTHER PROTECTIVE EQUIPMENT

**SECTION IX - SPECIAL PRECAUTIONS**

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

U.S. DEPARTMENT OF LABOR  
Occupational Safety and Health Administration

Form Approved  
OSHA No. 44-R-1387

# MATERIAL SAFETY DATA SHEET

Required under USDL Safety and Health Regulations for Ship Repairing,  
Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

## SECTION I

MANUFACTURER'S NAME <b>R.C.H. SUPPLY CO.</b>		EMERGENCY TELEPHONE NO. <b>323- 583-2388</b>
ADDRESS (Number, Street, City, State, and ZIP Code) <b>4511 EVERETT AVE VERNON, CALIF 90058</b>		
CHEMICAL NAME AND SYNONYMS	TRADE NAME AND SYNONYMS <b>EMERY CAKE</b>	
CHEMICAL FAMILY <b>ORGANIC INORGANIC</b>	FORMULA <b>BLACK EMERY CAKE #120 - 180</b>	

## SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS			FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					
HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES				%	TLV (Units)
CONTAINS FATTY ACIDS, TALLOW, HYDROCARBONS					
AND EMERY, ALUMINUM OXIDE					
NONE OF WHICH ARE CONSIDERED, HAZARDOUS					

## SECTION III - PHYSICAL DATA

BOILING POINT (°F)	<b>380 °F</b>	SPECIFIC GRAVITY (H <sub>2</sub> O=1)	
VAPOR PRESSURE (mm Hg.)		PERCENT VOLATILE BY VOLUME (%)	
VAPOR DENSITY (AIR=1)		EVAPORATION RATE (=1)	
SOLUBILITY IN WATER	<b>INSOL.</b>		
APPEARANCE AND ODOR			

## SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	<b>COV. 380°F</b>	FLAMMABLE LIMITS	LeI	UeI
EXTINGUISHING MEDIA	<b>OIL FIRE</b>			
SPECIAL FIRE FIGHTING PROCEDURES				
UNUSUAL FIRE AND EXPLOSION HAZARDS				

2

Emergency Data

SECTION V - HEALTH HAZARD DATA	
THRESHOLD LIMIT VALUE	N/A
EFFECTS OF OVEREXPOSURE	N/A
EMERGENCY AND FIRST AID PROCEDURES	N/A

SECTION VI - REACTIVITY DATA			
STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	X	
INCOMPATIBILITY (Materials to avoid)			
HAZARDOUS DECOMPOSITION PRODUCTS			
HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	

SECTION VII - SPILL OR LEAK PROCEDURES	
STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED	
REGULAR HOUSEKEEPING	
WASTE DISPOSAL METHOD	
CHECK LOCAL LAND FILL	

SECTION VIII - SPECIAL PROTECTION INFORMATION			
RESPIRATORY PROTECTION (Specify type)			
VENTILATION	LOCAL EXHAUST	YES	SPECIAL
	MECHANICAL (General)		OTHER
PROTECTIVE GLOVES	NO	EYE PROTECTION	
OTHER PROTECTIVE EQUIPMENT			
NONE			

SECTION IX - SPECIAL PRECAUTIONS	
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE	
NONE	
OTHER PRECAUTIONS	
NONE	

(1)

U.S. DEPARTMENT OF LABOR  
Occupational Safety and Health Administration

Form Approved  
OMB No. 44-R-1387

# MATERIAL SAFETY DATA SHEET

Required under USDL Safety and Health Regulations for Ship Repairing,  
Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

## SECTION I

MANUFACTURER'S NAME <b>R.C.H. SUPPLY CO., INC.</b>		EMERGENCY TELEPHONE NO. <b>1-213-583-2388</b>
ADDRESS (Number, Street, City, State, and ZIP Code) <b>4511 EVERETT AVE. VERNON CA. 90058</b>		
CHEMICAL NAME AND SYNONYMS		TRADE NAME AND SYNONYMS <b>#SS-200 and #SS-300</b>
CHEMICAL FAMILY <b>ORGANIC/TNORGANIC</b>	FORMULA <b>WHITE CHROME ROUGE</b>	

## SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS			FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					
HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES				%	TLV (Units)
CONTAINS: FATTY ACIDS, TALLOW, PETROLATUM, CALCINED ALUMINUM					
NOTE: NONE ARE CONSIDERED HAZARDOUS.					

## SECTION III - PHYSICAL DATA

BOILING POINT (°F.)		SPECIFIC GRAVITY (H <sub>2</sub> O=1)	
VAPOR PRESSURE (mm Hg.)		PERCENT VOLATILE BY VOLUME (%)	
VAPOR DENSITY (A:R=1)		EVAPORATION RATE (_____ -3)	
SOLUBILITY IN WATER	INSOL		
APPEARANCE AND ODOR	FATTY ACIDS		

## SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used) COV 385°F	FLAMMABLE LIMITS	Let	Det
EXTINGUISHING MEDIA OIL FIRE			
SPECIAL FIRE FIGHTING PROCEDURES NONE			
UNUSUAL FIRE AND EXPLOSION HAZARDS NONE			

(2)

SECTION V - HEALTH HAZARD DATA	
THRESHOLD LIMIT VALUE	N/A
EFFECTS OF OVEREXPOSURE	N/A
EMERGENCY AND FIRST AID PROCEDURES	N/A

SECTION VI - REACTIVITY DATA			
STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	X	NONE
INCOMPATIBILITY (Materials to avoid)			
HAZARDOUS DECOMPOSITION PRODUCTS			
HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	

SECTION VII - SPILL OR LEAK PROCEDURES	
STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED	
REGULAR HOUSEKEEPING PROCEDURES	
WASTE DISPOSAL METHOD	
CHECK LOCAL LANDFILL	

SECTION VIII - SPECIAL PROTECTION INFORMATION		
RESPIRATORY PROTECTION (Specify type)		
VENTILATION	LOCAL EXHAUST	SPECIAL
	MECHANICAL (General)	OTHER
PROTECTIVE GLOVES	NO	EYE PROTECTION
OTHER PROTECTIVE EQUIPMENT		

SECTION IX - SPECIAL PRECAUTIONS	
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING	
NONE	
OTHER PRECAUTIONS	
NONE	

①

U.S. DEPARTMENT OF LABOR  
Occupational Safety and Health Administration

Form Approved  
OMB No. 34-21387

# MATERIAL SAFETY DATA SHEET

Required under USDL Safety and Health Regulations for Ship Repairing,  
Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

## SECTION I

MANUFACTURER'S NAME <b>R.C.H. SUPPLY COMPANY</b>		EMERGENCY TELEPHONE NO. <b>(213) 583-2388</b>
ADDRESS (Number, Street, City, State, and ZIP Code) <b>4511 EVERETT AVENUE, VERNON, CA 90058</b>		
CHEMICAL NAME AND SYNONYMS		TRADE NAME AND SYNONYMS
CHEMICAL FAMILY <b>ORGANIC</b>	FORMULA <b>GREASE STICK #14</b>	

## SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS			FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					
HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS OR GASES				%	TLV (Units)
CONTAINS: TALLOW, STEARIC ACID AND PARAFFIN WAX					
NONE OF WHICH ARE CONSIDERED HAZARDOUS					

## SECTION III - PHYSICAL DATA

BOILING POINT (°F.)	<b>385 F</b>	SPECIFIC GRAVITY (W <sub>20</sub> /W <sub>20</sub> )	
VAPOR PRESSURE (mm Hg.)		PERCENT VOLATILE BY VOLUME (%)	
VAPOR DENSITY (AIR=1)		EVAPORATION RATE (_____ -1)	
SOLUBILITY IN WATER	<b>INSOL</b>		
APPEARANCE AND ODOR	<b>BLAND</b>		

## SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	<b>CC 385 F</b>	FLAMMABLE LIMITS	Lim	Uer
EXTINGUISHING MEDIA	<b>OIL FIRE</b>			
SPECIAL FIRE FIGHTING PROCEDURES				
UNUSUAL FIRE AND EXPLOSION HAZARDS	<b>NONE</b>			

2

#14 Grease

SECTION V - HEALTH HAZARD DATA	
THRESHOLD LIMIT VALUE	N/A
EFFECTS OF OVEREXPOSURE	N/A
EMERGENCY AND FIRST AID PROCEDURES	N/A

SECTION VI - REACTIVITY DATA		
STABILITY	UNSTABLE	CONDITIONS TO AVOID
	STABLE	X
INCOMPATIBILITY (Materials to avoid)		
HAZARDOUS DECOMPOSITION PRODUCTS		
HAZARDOUS POLYMERIZATION	MAY OCCUR	CONDITIONS TO AVOID
	WILL NOT OCCUR	X

SECTION VII - SPILL OR LEAK PROCEDURES	
STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED	
REGULAR HOUSEKEEPING PROCEDURES	
WASTE DISPOSAL METHOD	
LOCAL LANDFILL	

SECTION VIII - SPECIAL PROTECTION INFORMATION		
RESPIRATORY PROTECTION (Specify type)		
VENTILATION	LOCAL EXHAUST YES	SPECIAL
	MECHANICAL (General)	OTHER
PROTECTIVE GLOVES	NO	EYE PROTECTION
OTHER PROTECTIVE EQUIPMENT	NONE	

SECTION IX - SPECIAL PRECAUTIONS	
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING	
OTHER PRECAUTIONS	
NONE	

11/18/91

U.S. DEPARTMENT OF LABOR  
Occupational Safety and Health Administration

Form Approved  
OMB No. 44-R1287

# MATERIAL SAFETY DATA SHEET

Required under USDL Safety and Health Regulations for Ship Repairing,  
Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

### SECTION I

MANUFACTURER'S NAME <b>R.CH. SUPPLY COMPANY</b>		EMERGENCY TELEPHONE NO. <b>(213) 583-2388</b>
ADDRESS (Number, Street, City, State, and ZIP Code) <b>4511 EVERETT AVENUE, VERNON, CA 90058</b>		
CHEMICAL NAME AND SYNONYMS		TRADE NAME AND SYNONYMS <b>TRIPOLI</b>
CHEMICAL FAMILY <b>ORGANIC &amp; INORGANIC</b>	FORMULA <b>T- 2K</b>	

### SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Unit)	ALLOYS AND METALLIC COATINGS	%	TLV (Unit)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS			FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					
HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES				%	TLV (Unit)
CONTAINS: STEARIC ACID, TALLOW, PETROLATUM AND TRIPOLI POWDER.					
NONE OF WHICH ARE CONSIDERED HAZARDOUS					

### SECTION III - PHYSICAL DATA

BOILING POINT (°F.)	<b>385 F</b>	SPECIFIC GRAVITY (H <sub>2</sub> O=1)	
VAPOR PRESSURE (mm Hg.)	<b>SOLID</b>	PERCENT. VOLATILE BY VOLUME (%)	
VAPOR DENSITY (AIR=1)		EVAPORATION RATE (_____ -1)	
SOLUBILITY IN WATER	<b>INSOL.</b>		
APPEARANCE AND ODOR	<b>BLAND</b>		

### SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	<b>COC 385 F</b>	FLAMMABLE LIMITS	LFL	UFL
EXTINGUISHING MEDIA	<b>OIL FIRE</b>			
SPECIAL FIRE FIGHTING PROCEDURES	<b>NONE</b>			
UNUSUAL FIRE AND EXPLOSION HAZARDS	<b>NONE</b>			

SECTION V - HEALTH HAZARD DATA	
THRESHOLD LIMIT VALUE	
EFFECTS OF OVEREXPOSURE	
EMERGENCY AND FIRST AID PROCEDURES	
NONE SPECIAL	

SECTION VI - REACTIVITY DATA			
STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	XX	
INCOMPATIBILITY (Materials to avoid)			
HAZARDOUS DECOMPOSITION PRODUCTS			
HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	XX	

SECTION VII - SPILL OR LEAK PROCEDURES	
STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED	
REGULAR HOUSEKEEPING PROCEDURES	
WASTE DISPOSAL METHOD	
CHECK LOCAL LANDFILL	

SECTION VIII - SPECIAL PROTECTION INFORMATION			
RESPIRATORY PROTECTION (Specify type)			
		OSHA APPROVED DUST MASK	
VENTILATION	LOCAL EXHAUST	SPECIAL	
	MECHANICAL (General)	OTHER	
		XX	
PROTECTIVE GLOVES		EYE PROTECTION	
YES		YES	
OTHER PROTECTIVE EQUIPMENT			
NONE			

SECTION IX - SPECIAL PRECAUTIONS	
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING	
OTHER PRECAUTIONS	
WASH UP BEFORE GOING HOME	

11/18/91

Form Approved  
OMB No. 44-R1387U.S. DEPARTMENT OF LABOR  
Occupational Safety and Health Administration**MATERIAL SAFETY DATA SHEET**Required under USDL Safety and Health Regulations for Ship Repairing,  
Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)**SECTION I**

MANUFACTURER'S NAME <b>R. CH. SUPPLY COMPANY</b>	EMERGENCY TELEPHONE NO. <b>(213) 583-2388</b>
ADDRESS (Number, Street, City, State, and ZIP Code) <b>4511 EVERETT AVENUE, VERNON, CA 90058</b>	
CHEMICAL NAME AND SYNONYMS	TRADE NAME AND SYNONYMS <b>TRIPOLI</b>
CHEMICAL FAMILY <b>ORGANIC &amp; INORGANIC</b>	FORMULA <b>T-19 TRIPOLI</b>

**SECTION II - HAZARDOUS INGREDIENTS**

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS			FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					
HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES				%	TLV (Units)
CONTAINS: STEARIC ACID, TALLOW, PETROLATUM AND TRIPOLI POWDER					
NONE OF WHICH ARE CONSIDERED HAZARDOUS					

**SECTION III - PHYSICAL DATA**

BOILING POINT (°F.)	385 F	SPECIFIC GRAVITY (H <sub>2</sub> O=1)	
VAPOR PRESSURE (mm Hg.)	SOLID	PERCENT VOLATILE BY VOLUME (%)	
VAPOR DENSITY (AIR=1)		EVAPORATION RATE (_____ =1)	
SOLUBILITY IN WATER	INSOL.		
APPEARANCE AND ODOR	BLAND		

**SECTION IV - FIRE AND EXPLOSION HAZARD DATA**

FLASH POINT (Method used)	COC 385 F	FLAMMABLE LIMITS	Let	Uet
EXTINGUISHING MEDIA	OIL FIRE			
SPECIAL FIRE FIGHTING PROCEDURES	NONE			
UNUSUAL FIRE AND EXPLOSION HAZARDS	NONE			

T-19

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE

EFFECTS OF OVEREXPOSURE

EMERGENCY AND FIRST AID PROCEDURES NONE SPECIAL

SECTION VI - REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	XX	
INCOMPATIBILITY (Materials to avoid)			
HAZARDOUS DECOMPOSITION PRODUCTS			
HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	XX	

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

REGULAR HOUSEKEEPING PROCEDURES

WASTE DISPOSAL METHOD

CHECK LOCAL LANDFILL

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type) OSHA APPROVED DUST MASK

VENTILATION	LOCAL EXHAUST	SPECIAL
	MECHANICAL (General)	GT-HER

PROTECTIVE GLOVES YES EYE PROTECTION YES

OTHER PROTECTIVE EQUIPMENT NONE

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

OTHER PRECAUTIONS WASH UP BEFORE GOING HOME

U.S. DEPARTMENT OF LABOR  
Occupational Safety and Health Administration

Form Approved  
OMB No. 44-R1127

# MATERIAL SAFETY DATA SHEET

Required under USDL Safety and Health Regulations for Ship Repairing,  
Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

## SECTION I

MANUFACTURER'S NAME <b>R.C.H. SUPPLY COMPANY</b>		EMERGENCY TELEPHONE NO. <b>(213) 583-2388</b>
ADDRESS (Number, Street, City, State, and ZIP Code) <b>4511 EVERETT AVENUE, VERNON, CA 90058</b>		
CHEMICAL NAME AND SYNONYMS	TRADE NAME AND SYNONYMS	
CHEMICAL FAMILY	FORMULA <b>SS-320 GREEN CHROME ROUGE</b>	

## SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS			FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					
HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES				%	TLV (Units)
CONTAINS FATTY ACIDS, TALLOW, PETROLATEUM, CALCINED ALUMINA, GREEN CHROME OXIDE, . . . NONE OF WHICH ARE CONSIDERED HAZARDOUS.					

## SECTION III - PHYSICAL DATA

BOILING POINT (°F.)		SPECIFIC GRAVITY (H <sub>2</sub> O=1)	
VAPOR PRESSURE (mm Hg.)		PERCENT VOLATILE BY VOLUME (%)	
VAPOR DENSITY (AIR=1)		EVAPORATION RATE (_____ 2)	
SOLUBILITY IN WATER	INSOL		
APPEARANCE AND ODOR			

## SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used) <b>COV 385 F</b>	FLAMMABLE LIMITS	Lim:	Upl:
EXTINGUISHING MEDIA <b>OIL FIRE</b>			
SPECIAL FIRE FIGHTING PROCEDURES <b>NONE</b>			
UNUSUAL FIRE AND EXPLOSION HAZARDS <b>NONE</b>			

10/24/91

SECTION V - HEALTH HAZARD DATA	
THRESHOLD LIMIT VALUE	N/A
EFFECTS OF OVEREXPOSURE	N/A
EMERGENCY AND FIRST AID PROCEDURES	N/A

SECTION VI - REACTIVITY DATA			
STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	X	
INCOMPATIBILITY (Materials to avoid)			
HAZARDOUS DECOMPOSITION PRODUCTS			
HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	

SECTION VII - SPILL OR LEAK PROCEDURES	
STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED	
REGULAR HOUSEKEEPING PROCEDURES	
WASTE DISPOSAL METHOD	
CHECK LOCAL LAWFULL	

SECTION VIII - SPECIAL PROTECTION INFORMATION			
RESPIRATORY PROTECTION (Specify type)			
VENTILATION	LOCAL EXHAUST	YES	SPECIAL
	MECHANICAL (General)		OTHER
PROTECTIVE GLOVES	NO	EYE PROTECTION	
OTHER PROTECTIVE EQUIPMENT			
NONE			

SECTION IX - SPECIAL PRECAUTIONS	
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING	
NONR	
OTHER PRECAUTIONS	
NONE	

① Pumice

### Material Safety Data Sheet

May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Standard must be consulted for specific requirements.

### U.S. Department of Labor

Occupational Safety and Health Administration  
(Non-Mandatory Form)

Form Approved  
OMB No. 1218-0072



IDENTITY (As Used on Label and List)  
**PUMICE SCOURING STICK**

Note: Blank spaces are not permitted, if any item is not applicable, or no information is available, the space must be marked to indicate that.

#### Section I

Manufacturer's Name	Emergency Telephone Number
Address (Number, Street, City, State, and ZIP Code)	Telephone Number for Information
	Date Prepared
	Signature of Preparer (optional)

#### Section II -- Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity, Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
PUMICE (VOLCANIC GLASS)				
THERE IS NO FREE CRYSTALLINE SILICA PRESENT				

#### Section III -- Physical/Chemical Characteristics

Boiling Point	N.A.	Specific Gravity (H <sub>2</sub> O = 1)	N.A.
Vapor Pressure (mm Hg)	N.A.	Melting Point	2390 °F
Vapor Density (AIR = 1)	N.A.	Evaporation Rate (Butyl Acetate = 1)	N.A.
Solubility in Water	NOT SOLUBLE		
Appearance and Odor	ODORLESS SOLID		

#### Section IV -- Fire and Explosion Hazard Data

Flash Point (Method Used)	N.A.	Flammable Limits	LEL	UEL
Extinguishing Media	N.A.	N.A.	N.A.	N.A.
Special Fire Fighting Procedures	NONE			
Unusual Fire and Explosion Hazards	NONE			

② Pumice

**Section V — Reactivity Data**

Stability	Unstable		Conditions to Avoid
	Stable	X	NONE

Incompatibility (Materials to Avoid) **NONE**

Hazardous Decomposition or Byproducts **NONE**

Hazardous Polymerization	May Occur		Conditions to Avoid
	Will Not Occur	X	NONE

**Section VI — Health Hazard Data**

Route(s) of Entry: Ingestion? **YES** Skin? **NO** Ingestion? **YES**

Health Hazards (Acute and Chronic) **DRY SAWING OR GRINDING MAY RESULT IN THE RELEASE OF DUST PARTICLES WHICH, ACUTE, MAY CAUSE IRRITATION OF EYES, NOSE OR THROAT AND CHRONIC MAY RESULT IN LUNG DISEASE (SILICOSIS) IF EXPOSED FOR PROLONGED TIME**

Carcinogenicity: NTP? **NO** IARC Monographs? **NO** OSHA Regulated? **NO**

Signs and Symptoms of Exposure **IRRITATION OF EYES, NOSE & THROAT OR SHORTNESS OF BREATH.**

Medical Conditions Generally Aggravated by Exposure **PRE EXISTING LUNG DISEASE SUCH AS EMPHYSEMA OR ASTHMA.**

Emergency and First Aid Procedures **IRRIGATE EYES GENEROUSLY WITH CLEAN WATER FOR 15 MIN. IF IRRITATION PERSISTS CALL A PHYSICIAN.**

**Section VII — Precautions for Safe Handling and Use**

Steps to Be Taken in Case Material is Released or Spilled **SWEEP UP AND PROPERLY DISPOSE**

Waste Dispose Method **DISPOSE AS COMMON WASTE**

Precautions to Be Taken in Handling and Storing **NONE**

Other Precautions **WEAR NIOSH APPROVED RESPIRATOR AND TIGHT FITTING GOGGLES WHEN DRY SAWING OR GRINDING, OR SAW & GRIND WHEN WET**

**Section VIII — Control Measures (WHEN SAWING OR GRINDING)**

Respiratory Protection (Specify Type) **NIOSH APPROVED PARTICULATE RESPIRATOR**

Ventilation	Local Exhaust	Special
	Mechanical (General)	Other

**IN CONFINED AREA**

Protective Gloves **WHEN REQUIRED** Eye Protection **TIGHT FITTING GOGGLES**

Other Protective Clothing or Equipment **NONE**

Work-hygiene Practices **N.A.**

**APPENDIX E**

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**Emissions Inventory**



**Uncontrolled PM10 Emissions from Electroplating Process**

PM EF* (grains/A-hr)	Power (A)	PM10* Emissions (grains/hr)	PM,PM10, PM2.5* Emissions (lb/hr)	PM, PM10, PM2.5* Emissions (T/yr)
Chromium VI Bath <sup>a</sup>	5000	345	4.93E-02	2.16E-01
Nickel Bath <sup>b</sup>	2200	1.1088	1.58E-04	6.94E-04
Copper Bath <sup>b</sup>	2200	1.1088	1.58E-04	6.94E-04
<b>TOTAL =</b>		<b>347.2176</b>	<b>4.96E-02</b>	<b>2.17E-01</b>

\*Total PM includes filterable and condensible PM. However, condensible PM is likely to be negligible.

All PM from chromium electroplating sources is likely to be emitted as PM-10. Factors estimated based on assumption that PM consists entirely of chromic acid mist. Assume PM2.5 = PM10

<sup>a</sup> PM EF from AP-42, Table 12.20-1 Chromium Electroplating, July 1996

<sup>b</sup> PM EF assumed to be 2 times Cr+6 EF

**Controlled PM10 Emissions from Electroplating Process**

PM EF* (grains/A-hr)	Power (A)	Control Efficiency (%)	PM10* Emissions (grains/hr)	PM, PM10, PM2.5* Emissions (lb/hr)	PM, PM10, PM2.5* Emissions (T/yr)
Chromium VI Bath <sup>a</sup>	5000	99.815%	6.38E-01	9.12E-05	9.48E-05
Nickel Bath <sup>b</sup>	2200	0.000%	1.11E+00	1.58E-04	6.94E-04
Copper Bath <sup>b</sup>	2200	0.000%	1.11E+00	1.58E-04	6.94E-04
<b>TOTAL =</b>			<b>2.86E+00</b>	<b>4.08E-04</b>	<b>1.48E-03</b>

\*Total PM includes filterable and condensible PM. However, condensible PM is likely to be negligible.

All PM from chromium electroplating sources is likely to be emitted as PM-10. Factors estimated based on assumption that PM consists entirely of chromic acid mist.

<sup>a</sup> PM EF from AP-42, Table 12.20-1 Chromium Electroplating, July 1996

<sup>b</sup> PM EF assumed to be 2 times Cr+6 EF



**CRITERIA EMISSIONS - NATURAL GAS COMBUSTION - Northwest Chrome, Inc.**

**Emission Factors**

NOx	100 lb/10 <sup>6</sup> scf	AP-42, Table 1.4-1, 1998
CO	84 lb/10 <sup>6</sup> scf	AP-42, Table 1.4-1, 1998
CO <sub>2</sub> e	120,000 lb/10 <sup>6</sup> scf	AP-42, Table 1.4-2, 1998
PM-Total <sup>1</sup>	7.6 lb/10 <sup>6</sup> scf	AP-42, Table 1.4-2, 1998
SOx	0.6 lb/10 <sup>6</sup> scf	AP-42, Table 1.4-2, 1998
VOC	5.5 lb/10 <sup>6</sup> scf	AP-42, Table 1.4-2, 1998
Lead	0.0005 lb/10 <sup>6</sup> scf	AP-42, Table 1.4-2, 1998

<sup>1</sup>All PM (total, condensible, and filterable) is assumed to be less than 1.0 micrometer in diameter. Therefore, the PM emission factors presented here may be used to estimate PM-10, PM-2.5 or PM-1

Description	Capacity (MMBtu/hr)	Throughput (scf/hr)	Pounds per Hour									
			NOx Emissions (lb/hr)	CO Emissions (lb/hr)	CO <sub>2</sub> e Emissions (lb/hr)	PM Emissions (lb/hr)	PM-10 Emissions (lb/hr)	PM-2.5 Emissions (lb/hr)	SOx Emissions (lb/hr)	VOC Emissions (lb/hr)	Lead Emissions (lb/hr)	
Electroplating Building Heater	0.175	171.6	0.0172	0.0144	20.5882	0.0013	0.0013	0.0013	0.0009	0.0000001		
Polishing Building Heater	0.175	171.6	0.0172	0.0144	20.5882	0.0013	0.0013	0.0013	0.0009	0.0000001		
<b>TOTAL</b>	<b>3.5E-01</b>	<b>3.4E+02</b>	<b>3.43E-02</b>	<b>2.88E-02</b>	<b>4.12E+01</b>	<b>2.61E-03</b>	<b>2.61E-03</b>	<b>2.61E-03</b>	<b>2.06E-04</b>	<b>1.89E-03</b>	<b>1.72E-07</b>	

emissions.	Capacity (MMBtu/hr)	Throughput (scf/hr)	Tons per Year									
			NOx Emissions (T/yr)	CO Emissions (T/yr)	CO <sub>2</sub> e Emissions (T/yr)	PM Emissions (T/yr)	PM-10 Emissions (T/yr)	PM-2.5 Emissions (T/yr)	SOx Emissions (T/yr)	VOC Emissions (T/yr)	Lead Emissions (T/yr)	
Electroplating Building Heater	0.175	751.5	0.0751	0.0631	90.1765	0.0057	0.0057	0.0057	0.0005	0.0000004		
Polishing Building Heater	0.175	751.5	0.0751	0.0631	90.1765	0.0057	0.0057	0.0057	0.0005	0.0000004		
<b>TOTAL</b>	<b>3.5E-01</b>	<b>1.5E+03</b>	<b>1.50E-01</b>	<b>1.26E-01</b>	<b>1.80E+02</b>	<b>1.14E-02</b>	<b>1.14E-02</b>	<b>1.14E-02</b>	<b>9.02E-04</b>	<b>8.27E-03</b>	<b>7.51E-07</b>	



Description	Pounds per Hour										
	NOx Emissions (lb/hr)	CO Emissions (lb/hr)	CO <sub>2</sub> e Emissions (lb/hr)	PM Emissions (lb/hr)	PM-10 Emissions (lb/hr)	PM-2.5 Emissions (lb/hr)	SOx Emissions (lb/hr)	VOC Emissions (lb/hr)	Lead Emissions (lb/hr)		
Combustion Sources	0.0343	0.0288	41.1765	0.0026	0.0026	0.0026	0.0002	0.0015	0.0000002		
Electroplating Process	n/a	n/a	n/a	0.0004	0.0004	0.0004	n/a	0.0150	n/a		
<b>TOTAL</b>	<b>3.43E-02</b>	<b>2.88E-02</b>	<b>4.12E+01</b>	<b>3.02E-03</b>	<b>3.02E-03</b>	<b>3.02E-03</b>	<b>2.06E-04</b>	<b>1.66E-02</b>	<b>1.72E-07</b>		

Description	Tons per Year										
	NOx Emissions (T/yr)	CO Emissions (T/yr)	CO <sub>2</sub> e Emissions (T/yr)	PM Emissions (lb/hr)	PM-10 Emissions (T/yr)	PM-2.5 Emissions (T/yr)	SOx Emissions (T/yr)	VOC Emissions (T/yr)	Lead Emissions (T/yr)		
Combustion Sources	0.1503	0.1262	180.3529	0.0114	0.0114	0.0114	0.0009	0.0067	0.0000008		
Electroplating Process	n/a	n/a	n/a	0.0015	0.0015	0.0015	n/a	0.0442	n/a		
<b>TOTAL</b>	<b>1.50E-01</b>	<b>1.26E-01</b>	<b>1.80E+02</b>	<b>1.29E-02</b>	<b>1.29E-02</b>	<b>1.29E-02</b>	<b>9.02E-04</b>	<b>5.09E-02</b>	<b>7.51E-07</b>		

All criteria pollutants well below IDEQ modeling thresholds



**Uncontrolled Toxic Emissions from Electroplating Process**

	EF (grains/A-hr)	Power (A)	Emissions (grains/hr)	Emissions (lb/hr)	Emissions (T/yr)
Chromium VI <sup>a</sup>	0.033	5000	165	2.36E-02	1.03E-01
Nickel <sup>b</sup>	0.000504	2200	1.1088	1.58E-04	6.94E-04
Copper <sup>c</sup>	0.000504	2200	1.1088	1.58E-04	6.94E-04

master entry for power  
all other cells copy power from here

<sup>a</sup> EF from AP-42, Table 12.20-1 Chromium Electroplating, July 1996

<sup>b</sup> EF from technical document "Characterization of Emissions from Nickel Plating", June 1999. Emission factor from SCAQMD.

<sup>c</sup> EF assumed to be equivalent to Nickel EF

**Controlled Toxic Emissions from Electroplating Process**

	EF (grains/A-hr)	Power (A)	Control Efficiency (%)	Emissions (grains/hr)	Emissions (lb/hr)	Emissions (T/yr)
Chromium VI	0.033	5000	99.815%	3.05E-01	4.36E-05	1.91E-04
Nickel	0.000504	2200	0.000%	1.11E+00	1.58E-04	6.94E-04
Copper	0.000504	2200	0.000%	1.11E+00	1.58E-04	6.94E-04

**Modeling Analysis**

	Emissions (lb/hr)	EL (lb/hr)	Modeling ?
Chromium VI	4.36E-05	5.60E-07	Y
Nickel	1.58E-04	2.70E-05	Y
Copper	1.58E-04	6.70E-02	N



## TAP Emissions of Miscellaneous Solutions - Northwest Chrome, Inc.

### Cleaner Tanks (Tanks 1 and 3)

	Mass Fraction (lb/lb)	Density (lb/gal)	Throughput (lb/hr)	Throughput (ton/yr)	Throughput (gal/hr)	Throughput (gal/yr)	Emissions (lb/hr)	EL
Sodium Hydroxide	0.25		0.02	0.1			0.01	0.133

### Acid Tank (Tanks 5)

	Mass Fraction (lb/lb)	Density (lb/gal) <sup>a</sup>	Throughput (lb/hr)	Throughput (ton/yr)	Throughput (gal/hr) <sup>e</sup>	Throughput (gal/yr) <sup>d</sup>	Emissions (lb/hr)	EL
Sulfuric Acid	0.05	8.5		0.006	0.135	27	5.74E-02	0.067

### Copper Strike Tank (Tank 9)

	Mass Fraction (lb/lb)	Density (lb/gal) <sup>a</sup>	Throughput (lb/hr)	Throughput (ton/yr)	Throughput (gal/hr) <sup>e</sup>	Throughput (gal/yr) <sup>d</sup>	Emissions (lb/hr)	EL
Sulfuric Acid	0.25	10.33		0.194	0.750	150	1.9369	0.067
Potassium Hydroxide	0.3			0.031	0.002	20	0.007	0.133

### Nickel Tank (Tank 11)

	Mass Fraction (lb/lb)	Density (lb/gal) <sup>a</sup>	Throughput (lb/hr)	Throughput (ton/yr)	Throughput (gal/hr) <sup>e</sup>	Throughput (gal/yr) <sup>d</sup>	Emissions (lb/hr)	EL
Hydrogen Peroxide	0.425	9.66		0.103	0.250	50	1.026	0.1
Sulfuric Acid	0.0001			3.86E-08	4.00E-04	0.08	3.86E-07	0.067
Cristobalite	0.4		0.01	0.025			0.002	0.0033
Quartz	0.04		0.01	0.025			0.0002	0.0067

### Chrome Tank (Tanks 14)

	Mass Fraction (lb/lb)	Density (lb/gal) <sup>a</sup>	Throughput (lb/hr)	Throughput (ton/yr)	Throughput (gal/hr) <sup>e</sup>	Throughput (gal/yr) <sup>d</sup>	Emissions (lb/hr)	EL
Sulfuric Acid	0.014	10.59		0.001	0.045	9	6.67E-03	0.067

### Strip Tanks

	Mass Fraction (lb/lb)	Density (lb/gal)	Throughput (lb/hr)	Throughput (ton/yr)	Throughput (gal/hr) <sup>e</sup>	Throughput (gal/yr) <sup>d</sup>	Emissions (lb/hr)	EL
Sulfuric Acid <sup>b</sup>	0.175	9.91		0.468	2.70	540	4.682	0.067
Hydrogen Chloride	0.36	9.37		0.084	0.25	50	0.84	0.05
Phosphoric Acid	0.45	9.91		0.111	0.25	50	1.115	0.067
EGME <sup>c</sup>	0.125	9.91		0.031	0.01	50	0.012	1.07
EGME	0.15	8.82		0.013	0.002	20	0.003	1.07
Sodium Hydroxide	0.975		0.02	0.1			0.02	0.133

<sup>a</sup> Density of mixture in the tank

<sup>b</sup> Northwest Chrome is planning to use Sulfuric Acid in the acid strip tank, but would like the option to use Hydrogen Chloride also.

<sup>c</sup> EGME is a chemical in Aluminum Brightener which is stored in drums to pretreat products to be plated. The Aluminum Brightener is not mixed in any of the strip tanks and does not have any air emissions.

<sup>d</sup> Throughputs are based on maximum annual usage and accounts for initial makeup of tanks

<sup>e</sup> Hourly throughputs for liquids are based on maximum hourly usage and account for initial makeup of tanks



## TAP Emissions of Miscellaneous Solutions - Northwest Chrome, Inc.

### Cleaner Tanks (Tanks 1 and 3)

	Mass Fraction (lb/lb)	Density (lb/gal)	Throughput (lb/hr)	Throughput (ton/yr)	Throughput (gal/hr)	Throughput (gal/yr)	Emissions (lb/hr)	EL
Sodium Hydroxide	0.25		0.02	0.1			0.01	0.133

### Acid Tank (Tanks 5)

	Mass Fraction (lb/lb)	Density (lb/gal) <sup>a</sup>	Throughput (lb/hr)	Throughput (ton/yr)	Throughput (gal/hr) <sup>e</sup>	Throughput (gal/yr) <sup>d</sup>	Emissions (lb/hr)	EL
Sulfuric Acid	0.05	8.5		0.006	0.135	27	5.74E-02	0.067

### Copper Strike Tank (Tank 9)

	Mass Fraction (lb/lb)	Density (lb/gal) <sup>a</sup>	Throughput (lb/hr)	Throughput (ton/yr)	Throughput (gal/hr) <sup>e</sup>	Throughput (gal/yr) <sup>d</sup>	Emissions (lb/hr)	EL
Sulfuric Acid	0.25	10.33		0.194	0.750	150	1.9369	0.067
Potassium Hydroxide	0.3			0.031	0.002	20	0.007	0.133

### Nickel Tank (Tank 11)

	Mass Fraction (lb/lb)	Density (lb/gal) <sup>a</sup>	Throughput (lb/hr)	Throughput (ton/yr)	Throughput (gal/hr) <sup>e</sup>	Throughput (gal/yr) <sup>d</sup>	Emissions (lb/hr)	EL
Hydrogen Peroxide	0.425	9.66		0.103	0.250	50	1.026	0.1
Sulfuric Acid	0.0001			3.86E-08	4.00E-04	0.08	3.86E-07	0.067
Cristobalite	0.4		0.01	0.025			0.002	0.0033
Quartz	0.04		0.01	0.025			0.0002	0.0067

### Chrome Tank (Tanks 14)

	Mass Fraction (lb/lb)	Density (lb/gal) <sup>a</sup>	Throughput (lb/hr)	Throughput (ton/yr)	Throughput (gal/hr) <sup>e</sup>	Throughput (gal/yr) <sup>d</sup>	Emissions (lb/hr)	EL
Sulfuric Acid	0.014	10.59		0.001	0.045	9	6.67E-03	0.067

### Strip Tanks

	Mass Fraction (lb/lb)	Density (lb/gal)	Throughput (lb/hr)	Throughput (ton/yr)	Throughput (gal/hr) <sup>e</sup>	Throughput (gal/yr) <sup>d</sup>	Emissions (lb/hr)	EL
Sulfuric Acid <sup>b</sup>	0.175	9.91		0.468	2.70	540	4.682	0.067
Hydrogen Chloride	0.36	9.37		0.084	0.25	50	0.84	0.05
Phosphoric Acid	0.45	9.91		0.111	0.25	50	1.115	0.067
EGME <sup>c</sup>	0.125	9.91		0.031	0.01	50	0.012	1.07
EGME	0.15	8.82		0.013	0.002	20	0.003	1.07
Sodium Hydroxide	0.975		0.02	0.1			0.02	0.133

<sup>a</sup> Density of mixture in the tank

<sup>b</sup> Northwest Chrome is planning to use Sulfuric Acid in the acid strip tank, but would like the option to use Hydrogen Chloride also.

<sup>c</sup> EGME is a chemical in Aluminum Brightener which is stored in drums to pretreat products to be plated. The Aluminum Brightener is not mixed in any of the strip tanks and does not have any air emissions.

<sup>d</sup> Throughputs are based on maximum annual usage and accounts for initial makeup of tanks

<sup>e</sup> Hourly throughputs for liquids are based on maximum hourly usage and account for initial makeup of tanks



**TOXIC AIR POLLUTANTS (TAPs) CALCULATIONS - NG COMBUSTION**

**NON-CARCINOGENS (POUNDS PER HOUR)**

Pollutant	CAS #	EF for Natural Gas Combustion (lb/10 <sup>6</sup> scf) <sup>a</sup>	Emissions from Natural Gas Combustion (lb/hr)
Antimony	7440-36-0	0.0E+00	0.00E+00
Barium	7440-39-3	4.4E-03	1.51E-06
Chromium	7440-47-3	1.4E-03	4.80E-07
Cobalt	7440-48-4	8.4E-05	2.88E-08
Copper	7440-50-8	8.5E-04	2.92E-07
Ethylbenzene	100-41-4	0.0E+00	0.00E+00
Fluoride (as F)	16984-48-8	0.0E+00	0.00E+00
Hexane	110-54-3	1.8E+00	6.18E-04
Manganese	7439-96-5	3.8E-04	1.30E-07
Mercury	7439-97-6	2.6E-04	8.92E-08
Molybdenum	7439-98-7	1.1E-03	3.77E-07
Naphthalene	91-20-3	6.1E-04	2.09E-07
Pentane	109-66-0	2.6E+00	8.92E-04
Phosphorous	7723-14-0	0.0E+00	0.00E+00
Selenium	7782-49-2	2.4E-05	8.24E-09
1,1,1-Trichloroethane	71-55-6	0.0E+00	0.00E+00
Toluene	108-88-3	3.4E-03	1.17E-06
o-Xylene	1330-20-7	0.0E+00	0.00E+00
Vanadium	1314-62-1	2.3E-03	7.89E-07
Zinc	7440-66-6	2.9E-02	9.95E-06

**CARCINOGENS (POUNDS PER HOUR)**

Pollutant	CAS #	EF for Natural Gas Combustion (lb/10 <sup>6</sup> scf) <sup>a</sup>	Emissions from Natural Gas Combustion (lb/hr)
Arsenic	7440-38-2	2.0E-04	6.86E-08
Benzene	71-43-2	2.1E-03	7.21E-07
Beryllium	7440-41-7	1.2E-05	4.12E-09
Cadmium	7440-43-9	1.1E-03	3.77E-07
Chromium VI	7440-47-3	0.0E+00	0.00E+00
Formaldehyde	50-00-0	7.5E-02	2.57E-05
Nickel	7440-02-0	2.1E-03	7.21E-07
Benzo(a)pyrene	50-32-8	1.2E-06	4.12E-10
Benz(a)anthracene	56-55-3	1.8E-06	6.18E-10
Benzo(b)fluoranthene	205-82-3	1.8E-06	6.18E-10
Benzo(k)fluoranthene	205-99-2	1.8E-06	6.18E-10
Chrysene	218-01-9	1.8E-06	6.18E-10
Dibenzo(a,h)anthracene	53-70-3	1.2E-06	4.12E-10
Indeno(1,2,3-cd)pyrene	193-39-5	1.8E-06	6.18E-10
Total PAHs		1.1E-05	3.91E-09

<sup>a</sup>EFs from AP-42, Tables 1.4-3 and 1.4-4, 7/98

<sup>b</sup>EFs from AP-42, Tables 1.3-9 and 1.3-11, 9/98

<sup>c</sup>Emissions from two 0.175 MMBTU/hr natural gas heaters. Heat capacity of NG is assumed to be 1020 Btu/scf.



**TOXIC AIR POLLUTANTS (TAPs) CALCULATIONS - NG COMBUSTION**

**NON-CARCINOGENS (TONS PER YEAR)**

Pollutant	CAS #	EF for Natural Gas Combustion (lb/10 <sup>6</sup> scf) <sup>a</sup>	Emissions from Boiler Natural Gas Combustion (T/yr)
Antimony	7440-36-0	0.0E+00	0.00E+00
Barium	7440-39-3	4.4E-03	6.61E-06
Chromium	7440-47-3	1.4E-03	2.10E-06
Cobalt	7440-48-4	8.4E-05	1.26E-07
Copper	7440-50-8	8.5E-04	1.28E-06
Ethylbenzene	100-41-4	0.0E+00	0.00E+00
Fluoride (as F)	16984-48-8	0.0E+00	0.00E+00
Hexane	110-54-3	1.8E+00	2.71E-03
Manganese	7439-96-5	3.8E-04	5.71E-07
Mercury	7439-97-6	2.6E-04	3.91E-07
Molybdenum	7439-98-7	1.1E-03	1.65E-06
Naphthalene	91-20-3	6.1E-04	9.17E-07
Pentane	109-66-0	2.6E+00	3.91E-03
Phosphorous	7723-14-0	0.0E+00	0.00E+00
Selenium	7782-49-2	2.4E-05	3.61E-08
1,1,1-Trichloroethane	71-55-6	0.0E+00	0.00E+00
Toluene	108-88-3	3.4E-03	5.11E-06
o-Xylene	1330-20-7	0.0E+00	0.00E+00
Vanadium	1314-62-1	2.3E-03	3.46E-06
Zinc	7440-66-6	2.9E-02	4.36E-05

**CARCINOGENS (TONS PER YEAR)**

Pollutant	CAS #	EF for Natural Gas Combustion (lb/10 <sup>6</sup> scf) <sup>a</sup>	Emissions from Boiler Natural Gas Combustion (T/yr)
Arsenic	7440-38-2	2.0E-04	3.01E-07
Benzene	71-43-2	2.1E-03	3.16E-06
Beryllium	7440-41-7	1.2E-05	1.80E-08
Cadmium	7440-43-9	1.1E-03	1.65E-06
Chromium VI	7440-47-3	0.0E+00	0.00E+00
Formaldehyde	50-00-0	7.5E-02	1.13E-04
Nickel	7440-02-0	2.1E-03	3.16E-06
Benzo(a)pyrene	50-32-8	1.2E-06	1.80E-09
Benzo(a)anthracene	56-55-3	1.8E-06	2.71E-09
Benzo(b)fluoranthene	205-82-3	1.8E-06	2.71E-09
Benzo(k)fluoranthene	205-99-2	1.8E-06	2.71E-09
Chrysene	218-01-9	1.8E-06	2.71E-09
Dibenzo(a,h)anthracene	53-70-3	1.2E-06	1.80E-09
Indeno(1,2,3-cd)pyrene	193-39-5	1.8E-06	2.71E-09
Total PAHs		1.1E-05	1.71E-08

<sup>a</sup>EFs from AP-42, Tables 1.4-3 and 1.4-4, 7/98

<sup>b</sup>EFs from AP-42, Tables 1.3-9 and 1.3-11, 9/98

<sup>c</sup>Emissions from two 0.175 MMBTU/hr natural gas heaters. Heat capacity of NG is assumed to be 1020 Btu/scf. Based on hours of operation of 8,760 hr/yr.



**TOXIC AIR POLLUTANT EMISSION INVENTORY - NG COMBUSTION**

**NON-CARCINOGENS**

Pollutant	Max Hourly Emissions (lb/hr)	Screening Level (lb/hr)	Modeling? (Y/N)	Emissions (tons/yr)
Antimony	0.00E+00	3.3E-02	No	0.0E+00
Barium	1.51E-06	3.3E-02	No	6.6E-06
Chromium	4.80E-07	3.3E-02	No	2.1E-06
Cobalt	2.88E-08	3.3E-03	No	1.3E-07
Copper	2.92E-07	6.7E-02	No	1.3E-06
Ethylbenzene	0.00E+00	2.9E+01	No	0.0E+00
Fluoride	0.00E+00	1.67E-01	No	0.0E+00
Hexane	6.18E-04	1.2E+01	No	2.7E-03
Manganese	1.30E-07	3.33E-01	No	5.7E-07
Mercury	8.92E-08	3.E-03	No	3.9E-07
Molybdenum	3.77E-07	6.67E-01	No	1.7E-06
Naphthalene	2.09E-07	3.33E+00	No	9.2E-07
Pentane	8.92E-04	1.18E+02	No	3.9E-03
Phosphorous	0.00E+00	7.0E-03	No	0.0E+00
Selenium	8.24E-09	1.3E-02	No	3.6E-08
1,1,1 - Trichlorethane (Methyl Chloroform)	0.00E+00	1.3E+02	No	0.0E+00
Toluene	1.17E-06	2.5E+01	No	5.1E-06
o-Xylene	0.00E+00	2.9E+01	No	0.0E+00
Vanadium	7.89E-07	3.0E-03	No	3.5E-06
Zinc	9.95E-06	6.67E-01	No	4.4E-05

**CARCINOGENS**

Pollutant	Max. Hourly Emissions (lb/hr)	Screening Level (lb/hr)	Modeling? (Y/N)	Emissions (tons/yr)
Arsenic	6.86E-08	1.5E-06	No	3.01E-07
Benzene	7.21E-07	8.0E-04	No	3.16E-06
Beryllium	4.12E-09	2.8E-05	No	1.80E-08
Cadmium	3.77E-07	3.7E-06	No	1.65E-06
Chromium VI	0.00E+00	5.6E-07	No*	0.00E+00
Formaldehyde	2.57E-05	5.1E-04	No	1.13E-04
Nickel	7.21E-07	2.7E-05	No*	3.16E-06
Benzo(a)pyrene	4.12E-10	2.0E-06	No	1.80E-09
Benz(a)anthracene	6.18E-10	NA	NA	2.71E-09
Benzo(b)fluoranthene	6.18E-10	NA	NA	2.71E-09
Benzo(k)fluoranthene	6.18E-10	NA	NA	2.71E-09
Chrysene	6.18E-10	NA	NA	2.71E-09
Dibenzo(a,h)anthracene	4.12E-10	NA	NA	1.80E-09
Indeno(1,2,3-cd)pyrene	6.18E-10	NA	NA	2.71E-09
Total PAHs	3.91E-09	2.00E-06	No	1.71E-08

\*Emissions from combustion alone are not applicable to modeling, but need to be analysed because emissions from electroplating exceed the EL.

**HAPs Inventory**

Pollutant	Emissions (tons/yr)
Arsenic	3.01E-07
Benzene	3.16E-06
Beryllium	1.80E-08
Cadmium	1.65E-06
Ethylbenzene	0.0E+00
Formaldehyde	1.13E-04
Chromium	0.00E+00
Lead	1.72E-07
Mercury	3.9E-07
1,1,1 - Trichlorethane (Methyl Chloroform)	0.0E+00
Naphthalene	9.2E-07
Nickel	3.16E-06
Xylene	0.0E+00
Selenium	3.6E-08
Toluene	5.1E-06
POM	3.03E-08
Dichlorobenzene	8.34E-04
Hexane	2.71E-03
<b>Total</b>	<b>3.67E-03</b>

Note: Emission Factors for lead, POM and dichlorobenzene are as follows (i.e., for those HAPs not listed above):

Lead	5.00E-04	lb/MMscf
POM	8.82E-05	lb/MMscf
Dichlorobenzene	1.20E-03	lb/MMscf



TOXIC AIR POLLUTANT EMISSION INVENTORY - FACILITY WIDE

NON-CARCINOGENS

Pollutant	Max Hourly Emissions (lb/hr)	Screening Level (lb/hr)	Modeling? (Y/N)	Emissions (tons/yr)	24 hr ave max hrly (lb/hr)	AAC (ug/m3)	Model 1 lb/hr 24 hr ave max impacts (ug/m3)	AAC (ug/m3)
Antimony	0.00E+00	3.3E-02	No	0.0E+00			91.55224	
Barium	1.51E-06	3.3E-02	No	6.6E-06				
Chromium	4.80E-07	3.3E-02	No	2.1E-06				
Cobalt	2.88E-08	3.3E-02	No	1.3E-07				
Copper	1.59E-04	6.7E-02	No	7.0E-04				
Cristobalite	2.28E-03	3.3E-03	No	2.5E-02				
Ethylbenzene	0.00E+00	2.9E+01	No	0.0E+00				
Fluoride	0.00E+00	1.67E-01	No	0.0E+00				
Hexane	6.18E-04	1.2E+01	No	2.7E-03				
Hydrogen Chloride	8.43E-01	5.0E-02	No	8.4E-02	0.035			
Hydrogen Peroxide	1.03E+00	1.0E-01	No	1.0E-01	0.043			
Manganese	1.30E-07	3.33E-01	No	5.7E-07				
Mercury	8.92E-08	3.0E-03	No	3.9E-07				
2-Methoxyethanol (EGME)	1.50E-02	1.0E+00	No	4.4E-02				
Molybdenum	3.77E-07	6.67E-01	No	1.7E-06				
Naphthalene*	2.09E-07	2.0E-06	No	9.2E-07				
Pentane	8.92E-04	1.18E+02	No	3.9E-03				
Phosphoric Acid	1.11E+00	6.70E-02	No	1.1E-01	0.046			
Phosphorous	0.00E+00	7.0E-03	No	0.0E+00				
Potassium Hydroxide	7.08E-03	1.3E-01	No	1.9E-01				
Quartz	2.28E-04	6.7E-03	No	2.5E-02				
Selenium	8.24E-09	1.3E-02	No	3.6E-08				
Sodium Hydroxide	2.80E-02	1.3E-01	No	2.0E-01				
Sulfuric Acid	6.68E+00	6.7E-02	Yes	6.7E-03	0.278		25.5	50
1,1,1 - Trichloroethane (Methyl Chloroform)	0.00E+00	1.3E+02	No	0.0E+00				51.0%
Toluene	1.17E-06	2.5E+01	No	5.1E-06				
o-Xylene	0.00E+00	2.9E+01	No	0.0E+00				
Vanadium	7.89E-07	3.0E-03	No	3.5E-06				
Zinc	9.95E-06	6.67E-01	No	4.4E-05				

\*Although listed as a noncarcinogen in the Rules, DEQ has determined that naphthalene is a possible/probable carcinogen. Compliance for naphthalene emissions should be based on the EL or AACC listed in Section 586 for PAH.

From IDEQ 303 for previous air permit for the process (at previous location, under the name Treasure Valley Chrome, P-050005) and verification from facility, air emissions from both tanks ONLY when the materials are poured into bins. This happens on average twice per year. Worst case 24 hour emissions scenario is one hour of emissions per day (more time than it takes to fill tanks), so 24hr ave. lb/day = max 1hr ave. lb/hr emission rate /24

CARCINOGENS

Pollutant	Max. Hourly Emissions (lb/hr)	Screening Level (lb/hr)	Modeling? (Y/N)	Emissions (tons/yr)	Annual ave hourly (lb/hr)	Model 1 lb/hr max annual average impact (ug/m3)	AACC (ug/m3)
Arsenic	6.86E-08	1.5E-06	No	3.01E-07			
Benzene	7.21E-07	8.0E-04	No	3.16E-06			
Beryllium	4.12E-09	2.8E-05	No	1.80E-08			
Cadmium	3.77E-07	3.7E-06	No	1.65E-06			
Chromium VI	4.36E-05	5.6E-07	Yes	1.91E-04	4.36E-05	25.4394	
Formaldehyde	2.57E-05	5.1E-04	No	1.13E-04			
Nickel	1.59E-04	2.7E-05	Yes	6.97E-04	1.59E-04	Yes	4.04E-03
Benzo(a)pyrene	4.12E-10	2.0E-06	No	1.80E-09			4.20E-03
Benz(a)anthracene	6.18E-10	NA	NA	2.71E-09			96.2%
Benzo(b)fluoranthene	6.18E-10	NA	NA	2.71E-09			
Benzo(k)fluoranthene	6.18E-10	NA	NA	2.71E-09			
Chrysene	6.18E-10	NA	NA	2.71E-09			
Dibenzo(a,h)anthracene	4.12E-10	NA	NA	1.80E-09			
Indeno(1,2,3-cd)pyrene	6.18E-10	NA	NA	2.71E-09			
Total PAHs	3.91E-09	2.00E-06	No	1.71E-08			

Subject to MACT 40 CFR Part 63, Subpart N. As such, so long as the facility complies with the MACT standards, no further procedures for demonstrating preconstruction compliance will be required for chromium (IDAPA 98 01 01 210.20 and proposed 2005 TV Chrome PIC P-050005).

HAPs Inventory

Pollutant	Emissions (tons/yr)
Arsenic	3.01E-07
Benzene	3.16E-06
Beryllium	1.80E-08
Cadmium	1.65E-06
Ethylbenzene	0.0E+00
Formaldehyde	1.13E-04
Chromium	1.91E-04
Mercury	3.9E-07
1,1,1 - Trichloroethane (Methyl Chloroform)	0.0E+00
Naphthalene	9.2E-07
Nickel	6.97E-04
Xylene	0.0E+00
Selenium	3.6E-08
Toluene	5.1E-06
Hexane	2.71E-03
Phosphorous	0.00E+00
Total	3.72E-03



### VOLATILE ORGANIC COMPOUNDS - Strip Tanks

Pollutant	Max Hourly Emissions	Emissions
	(lb/hr)	(tons/yr)
2-Methoxyethanol (EGME)	1.50E-02	4.4E-02

### VOLATILE ORGANIC COMPOUNDS - COMBUSTION

Pollutant	Max Hourly Emissions	Emissions
	(lb/hr)	(tons/yr)
Hexane	6.18E-04	2.7E-03
Naphthalene	2.09E-07	9.2E-07
Pentane	8.92E-04	3.9E-03
Toluene	1.17E-06	5.1E-06
Benzene	7.21E-07	3.16E-06
Formaldehyde	2.57E-05	1.13E-04
Benzo(a)pyrene	4.12E-10	1.80E-09
Benz(a)anthracene	6.18E-10	2.71E-09
Benzo(b)fluoranthene	6.18E-10	2.71E-09
Benzo(k)fluoranthene	6.18E-10	2.71E-09
Chrysene	6.18E-10	2.71E-09
Dibenzo(a,h)anthracene	4.12E-10	1.80E-09
Indeno(1,2,3-cd)pyrene	6.18E-10	2.71E-09



# **APPENDIX F**

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## **Modeling Analysis**



# **AIR PERMIT MODELING ANALYSIS NEW PLYMOUTH, IDAHO FACILITY**

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## TABLE OF CONTENTS

<b>Purpose</b> .....	1
<b>Model Description / Justification</b> .....	1
<b>Emission and Source Data</b> .....	1
<b>Ambient Air Boundary / Receptor Network</b> .....	3
<b>AERMAP Input and Elevation Data</b> .....	4
<b>Meteorological Data and Local Parameters</b> .....	4
<b>Land Use Classification</b> .....	4
<b>Evaluation of Compliance with Applicable Impact Standards</b> .....	4
<b>Electronic Copies of the Modeling Files</b> .....	5

## LIST OF ACRONYMS & ABBREVIATIONS

<b>AAC</b>	Acceptable Ambient Concentration
<b>AACC</b>	Acceptable Ambient Concentration for a Carcinogen
<b>BRC</b>	Below Regulatory Concern
<b>EPA</b>	Environmental Protection Agency
<b>IDAPA</b>	Idaho Administrative Procedures Act
<b>IDEQ</b>	Idaho Department of Environmental Quality
<b>MACT</b>	Maximum Achievable Control Technology
<b>NED</b>	National Elevation Dataset
<b>PTC</b>	Permit-to-Construct
<b>SOB</b>	Statement of Basis
<b>TAP</b>	Toxic Air Pollutant
<b>USGS</b>	United States Geological Society



## **AIR PERMIT MODELING ANALYSIS NEW PLYMOUTH, IDAHO FACILITY**

### **Purpose**

This section describes the modeling conducted to verify compliance with all applicable air quality impact limits to support the facility's air permit application. This proposed facility represents a relocation of a facility permitted in 2005 as Treasure Valley Chrome Plating via PTC P-050005. Methodologies followed in this analysis were checked to ensure consistency with Idaho Department of Environmental Quality (IDEQ) review of the Treasure Valley Chrome Plating's permit application, including emission calculations and the modeling analysis. An approved protocol was submitted for this project, based on project timeline.

### **Model Description / Justification**

The model chosen, consistent with IDEQ and Environmental Protection Agency (EPA) guidance, is AERMOD. AERMOD replaced the Industrial Source Complex model ISCST3 as the primary recommended model for facilities with multiple emission sources. AERMOD was applied as recommended in EPA's *Guideline on Air Quality Models*, consistent with guidance in IDEQ's *Air Quality Modeling Guidelines*. Recommended regulatory default options were employed. Terrain data was processed consistent with EPA guidance for AERMAP using United States Geological Society (USGS) National Elevation Dataset (NED) data. BeeLine BEEST modeling software was employed. Meteorological data recommended for this application by the IDEQ Monitoring, Modeling, and Emission Inventory program was supplied by IDEQ. The Prime building downwash algorithm was employed. No criteria pollutants were emitted above IDEQ modeling thresholds. Modeling analyses were performed for two of the three toxic air pollutants (TAPs) conservatively estimated to be emitted at rates above IDEQ emission thresholds, as described in the Permit-to-Construct (PTE) emission inventory. The third, chromium, is not subject to modeling or impact assessment requirements per Idaho Administrative Procedures Act (IDAPA) 58.01.01.210.20 and the Statement of Basis for Treasure Valley Chrome because the process is subject to a Maximum Achievable Control Technology (MACT) standard (40CFR63, Subpart N). Chemical transformation of emissions was not considered despite being likely for at least some of the TAPs modeled.

### **Emission and Source Data**

The inventory of potential emissions shows no criteria pollutant is emitted above IDAPA below regulatory concern thresholds of 10% of the significant emissions threshold or above any IDEQ modeling threshold. The inventory of potential emissions shows that three TAPs, chromium VI, nickel and sulfuric acid, are potentially emitted above IDAPA 585 or 586 thresholds. Each of the TAPs are emitted from electrified baths associated with the electroplating operations, with a small contribution of nickel from the natural gas-fired space heaters.



Because the facility's electroplating tank is subject to 40 CFR Part 63, Subpart N (MACT), in accordance with IDAPA 58.01.01.210.20, no further procedures for demonstrating preconstruction compliance (i.e. modeling or impact assessment) will be required for chromium VI.

The sulfuric acid emissions come from baths in the electroplating process. Emissions occur only when the baths are being filled. Tanks are filled twice per year; a process lasting less than one hour in duration.

The conservative worst case scenario modeled for sulfuric acid assumes one hour of filling baths containing sulfuric acid in a 24-hour period (for comparison against the IDAPA 585 AAC), as per the IDEQ statement of basis for the TVCP permit. Each source (electroplating and the two space heaters) is vented by a stack. Actual stack parameters are used. For the electroplating process, where the indoor emissions are vented by a fan, acfm exhaust flow was from fan specifications which accounted for the static pressure associated with the stack design. No fugitive sources were modeled.

**Table 1 Model Source Data**

Source ID	Source Description	Easting (X) (meters)	Northing (Y) (meters)	Base Elev (meters)	Stk Ht (feet)	Temp (°F)	Exit Vel (fps)	Stk Diam (feet)	ELPTAPS (lb/hr)	NICKEL (lb/hr)
ELECTRPL	Electroplating stack	514197.6	4869324.3	685.2	35	70	19.25	1.33	1	1.59-04
ELSPVHT	Electroplating area space heater	514212.8	4869325.0	685.2	20	350	2.14	0.83		3.61E-07
PSPCHT	Polishing area space heater	514213.2	4869338.2	685.2	20	350	2.14	0.83		3.61E-07

TAPs from the electroplating process were modeled as ELPTAPs, with one lb/hr emissions. Actual impact projections for sulfuric acid were calculated by multiplying through the maximum predicted impact from AERMOD for ELPTAPs (24-hour average for sulfuric acid and annual average for chromium VI) by the actual maximum average lb/hr emission rate for the respective averaging period, as per IDEQ Statement of Basis for the Treasure Valley Chrome Plating permit. No model source factors were used. All sources were very conservatively assumed to operate continuously throughout the analysis period.

Photo 1 shows the model facility layout and model sources on a Google earth aerial photo, with NAD83 UTM coordinates. The property boundary can be seen fairly close around the facility building. The three stacks show up in red on the building roof. Some of the innermost receptors can be seen around the property boundary and beyond.



**Photo 1**  
**Model Facility Layout overlaid upon Google Earth Aerial Photo and NAD83 UTM**  
**Coordinates**



#### **Ambient Air Boundary / Receptor Network**

The facility property boundary is close around the building. Facility staff is trained to notice and stop unauthorized access. Therefore, the property boundary is used as the ambient air boundary. AERMOD model receptors were placed at 10-meter intervals along the ambient air boundary and for the next 10 meters. Receptors beyond 10 meters were placed at 25-meter intervals to at least 125 meters, at 50-meter intervals to 300 meters, and 100-meter intervals out to 600 meters, and at 250-meter density out to 1.5 kilometers, and at 500-meter intervals out to at least 3 kilometers. All required elevation information, including for sources and receptors, was calculated from the NAD elevation data using AERMAP through the BEEST processing software.

The model predicted maximum facility impacts occurred on the property boundary, within the 10-meter grid density, for all modeling analyses. Model predicted maximum impacts dropped off steadily toward the end of the receptor network. The receptor networks employed in the modeling was consistent with IDEQ modeling guidance, and ensured that the analysis meets or exceeds IDEQ receptor network requirements and captures the maximum impact from the



facility. Therefore, no supplemental receptor network or expansion of the model domain was required or included.

### **AERMAP Input and Elevation Data**

All building, source base, and receptor elevations were calculated from USGS 7.5-degree 30m or less horizontal resolution NED data (UTM NAD 83) downloaded from the USGS website, as recommended by IDEQ.

### **Meteorological Data and Local Parameters**

Five years of meteorological data from 2005 to 2009, representative of the Boise, Idaho area, were provided by IDEQ in model-ready form by Cheryl Robinson of IDEQ. That data was used in this modeling analysis.

### **Land Use Classification**

The facility is in an area of mixed residential and low rise industrial activity that would be considered rural by the Auer classification scheme, without any significant structures to routinely channel winds. Therefore, rural dispersion algorithms were used everywhere in the modeling analyses, and no urban areas were included.

### **Evaluation of Compliance with Applicable Impact Standards**

The impact limit standard applicable to this modeling analysis is the IDAPA 58.01.01.586 Acceptable Ambient Concentration for a Carcinogen (AACC) limit for nickel and the IDAPA 01.01.585 Acceptable Ambient Concentration (AAC) limit for sulfuric acid. Per IDEQ guidance, background concentrations are not included in TAP modeling. Table 2 shows the maximum model predicted impact each year for each pollutant for each averaging period modeled. A percent of allowable impact column is included to be consistent with the IDEQ MI forms (Table 7-2 Background Concentrations, Model Predicted Ambient Impact Limits and Comparison with Ambient Air Quality Standards). Calculations of model predicted impacts for nickel and sulfuric acid from modeled normalized emissions of 1 lb/hr in ELPTAPs, and comparison of each modeled TAP impacts against IDAPA 585 or 586 limits, are shown in the emission inventory on worksheet TAP facility wide, columns F – J.

**Table 2 Maximum Model Predicted Impact**

<b>Pollutant</b>	<b>Averaging Period</b>	<b>Background Conc. (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Modeled Worst Case Impact (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>AAC / AACC (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Max Ambient Conc as % of NAAQS</b>	<b>Location Of Highest Model Impact</b>
Sulfuric Acid	24 hour	N/A	25.5	50	51.0%	E property boundary
Nickel	Annual	N/A	4.04-03	4.2E-03	95.5%	W property boundary



Model results show impacts from (conservatively estimated) potential emissions of all pollutants are below respective IDAPA 586 TAP AACC impact limits. Please note that the nickel emissions were calculated with more than double the planned electrification of the tanks (and therefore more than double the emissions) simply to allow the facility flexibility. They also assume continuous operation (8760 hours per year), when in actuality they'll not even be open more than 2,000 to 3,000 hours per year and the nickel tanks will only be electrified a fraction of that time. Combining those two considerations, model predicted maximum nickel impacts are probably at least an order of magnitude higher than actual impacts will be.

### **Electronic Copies of the Modeling Files**

Electronic copies of all input, output, and support modeling files necessary to duplicate the model results have been included on a compact disk and submitted with the PTC application. Those files include:

- NW Chrome 0512 5yrs pp.ext, where:  
pp = nickel, ChrVI, or ELPTAPs for the pollutant modeled, and  
ext = .DTA for AERMOD input files, .LST for AERMOD model output files
- NW Chrome.MAP and.MOU AERMAP input and output files
- BPIP-prime Building downwash input and output files



## STACK PARAMETER VERIFICATION/DOCUMENTATION FORM

Source/ Stack ID: <b>Polishing Area Space Heater/ POLSTK</b>	Stack Description: <b>One stack (POLSTK) will vent the polishing area space heater.</b>	
Stack Coordinates (UTMs): E	N	Datum:
Stack Height: <b>20 feet above ground</b>	Describe how stack height was verified, providing copies of any materials used <sup>a</sup> : <b>Verified via direct measurement.</b>	
Groundlevel Elevation: <b>2250 ft</b>		
Stack Diameter at Point of Release to Atmosphere: <b>0.833 feet</b>	Describe how stack diameter was verified, providing copies of any materials used <sup>b</sup> : <b>Verified via direct measurement.</b>	
Is Stack Capped or a Horizontal Release? <b>Vertical, passive-capped release.</b>		
Stack Flow Rate (velocity or volumetric flow) <sup>c</sup> : <b>2.14075 ft/s</b>	Describe how stack flow was verified, providing copies of any materials used <sup>d</sup> : <b>Verified via manufacturer's specifications</b>	
Stack Temperature <sup>e</sup> : <b>350 °F</b>		
Name of Person Verifying Stack Parameters: <b>Art Garcia</b>		
Company: <b>Northwest Chrome, Inc.</b>	Position: <b>Owner</b>	
Signature:		Date:

- <sup>a.</sup> Values must be distance from a specified ground-level elevation and be accurate to the nearest foot. Acceptable methods include (but not limited to): direct measurement; difference measurement; contractual/purchasing agreements combined with "ball-park" visual verification;
- <sup>b.</sup> The diameter is for the inside of the stack at the point of release to the atmosphere. Acceptable measurement methods are the same as that for stack height.
- <sup>c.</sup> Values used should be representative of typical operational conditions and the location at the point of release to the atmosphere (accounting for in-stack cooling).
- <sup>d.</sup> Acceptable methods include (but not limited to): direct measurement; combustion evaluation; other design calculations; fan specifications.
- <sup>e.</sup> Acceptable methods include (but not limited to): direct measurement; measurements from similar sources; engineering calculations.



Source/ Stack ID: <b>Electroplating Area Space Heater</b>	Stack Description: <b>One stack (ELTRPHTR) will vent the electroplating area space heater.</b>	
Stack Coordinates (UTMs): E	N	Datum:
Stack Height: <b>20 feet above ground</b>	Describe how stack height was verified, providing copies of any materials used <sup>a</sup> : <b>Verified via direct measurement.</b>	
Groundlevel Elevation: <b>2250 ft</b>		
Stack Diameter at Point of Release to Atmosphere: <b>0.833 feet</b>	Describe how stack diameter was verified, providing copies of any materials used <sup>b</sup> : <b>Verified via direct measurement.</b>	
Is Stack Capped or a Horizontal Release? <b>Vertical, passive-capped release.</b>		
Stack Flow Rate (velocity or volumetric flow) <sup>c</sup> : <b>2.14075 ft/s</b>	Describe how stack flow was verified, providing copies of any materials used <sup>d</sup> : <b>Verified via manufacturer's specifications</b>	
Stack Temperature <sup>e</sup> : <b>350 °F</b>	Describe how stack temperature was verified, providing copies of any materials used <sup>e</sup> : <b>Verified via manufacturer's specifications</b>	
Name of Person Verifying Stack Parameters: <b>Art Garcia</b>		
Company: <b>Northwest Chrome, Inc.</b>	Position: <b>Owner</b>	
Signature:		Date:

- <sup>a.</sup> Values must be distance from a specified ground-level elevation and be accurate to the nearest foot. Acceptable methods include (but not limited to): direct measurement; difference measurement; contractual/purchasing agreements combined with "ball-park" visual verification;
- <sup>b.</sup> The diameter is for the inside of the stack at the point of release to the atmosphere. Acceptable measurement methods are the same as that for stack height.
- <sup>c.</sup> Values used should be representative of typical operational conditions and the location at the point of release to the atmosphere (accounting for in-stack cooling).
- <sup>d.</sup> Acceptable methods include (but not limited to): direct measurement; combustion evaluation; other design calculations; fan specifications.
- <sup>e.</sup> Acceptable methods include (but not limited to): direct measurement; measurements from similar sources; engineering calculations.



Source/ Stack ID: <b>Electroplating Vent Stack/ VENTSTK</b>		Stack Description: <b>The venting stack in the electroplating building (VENTSTK) will use a forced air system to vent process emissions primarily from electroplating.</b>	
Stack Coordinates (UTMs): E		N	Datum:
Stack Height: <b>35 feet above ground</b>		Describe how stack height was verified, providing copies of any materials used <sup>a</sup> : <b>Verified via direct measurement.</b>	
Groundlevel Elevation: <b>2250 ft</b>			
Stack Diameter at Point of Release to Atmosphere: <b>1.3333 feet</b>		Describe how stack diameter was verified, providing copies of any materials used <sup>b</sup> : <b>Verified via direct measurement.</b>	
Is Stack Capped or a Horizontal Release? <b>Vertical, passive-capped release.</b>			
Stack Flow Rate (velocity or volumetric flow) <sup>c</sup> : <b>19.25 ft/s</b>		Describe how stack flow was verified, providing copies of any materials used <sup>d</sup> : <b>Verified via manufacturer's specifications</b>	
Stack Temperature <sup>e</sup> : <b>Ambient Air; 70 degrees F.</b>		Describe how stack temperature was verified, providing copies of any materials used <sup>e</sup> : <b>Verified via manufacturer's specifications</b>	
Name of Person Verifying Stack Parameters: <b>Art Garcia</b>			
Company: <b>Northwest Chrome, Inc.</b>		Position: <b>Owner</b>	
Signature:			Date:

a. Values must be distance from a specified ground-level elevation and be accurate to the nearest foot. Acceptable methods include (but not limited to): direct measurement; difference measurement; contractual/purchasing agreements combined with "ball-park" visual verification;

b. The diameter is for the inside of the stack at the point of release to the atmosphere. Acceptable measurement methods are the same as that for stack height.

c. Values used should be representative of typical operational conditions and the location at the point of release to the atmosphere (accounting for in-stack cooling).

d. Acceptable methods include (but not limited to): direct measurement; combustion evaluation; other design calculations; fan specifications.

e. Acceptable methods include (but not limited to): direct measurement; measurements from similar sources; engineering calculations.

