

Safety Data Sheet

Product Identifier: Titanium Scrap

SDS ID : NFE-0114

Section 1 - Identification

Product Identifier: Titanium Scrap

Chemical Family: Mixture

Recommended Use: Scrap metal usage.

Restriction on Use: None known.

Manufacturer Information

The David J. Joseph Company
300 Pike Street
Cincinnati, OH 45202

Non-Emergency Contact: Safety Department
Non-Emergency Phone: 513-419-6200
Emergency Contact: DJJ
Emergency Phone: 513-562-1699

Section 2 - Hazard(s) Identification

Classification in accordance with 29 CFR 1910.1200.

Product is supplied as scrap metal consisting of titanium alloy. This alloy is a non-combustible, non-reactive solid material. Solid material, as supplied, is not hazardous. Processing of this material may produce hazardous vapors, fumes, mists and dusts which are considered hazardous under 29 CFR 1910.1200 (Hazard Communication). Dust, particles or powder generated during processing would have the following classification:

Acute Toxicity (Oral), Category 4

Eye Damage / Irritation, Category 2A

Sensitization - Respiratory, Category 1

Sensitization - Skin, Category 1

Germ Cell Mutagenicity, Category 2

Carcinogenicity, Category 1A

Specific Target Organ Toxicity - Single Exposure, Category 2 (systemic toxicity)

Specific Target Organ Toxicity - Repeated Exposure, Category 1 (lungs)

GHS LABEL ELEMENTS

Symbol(s)



Signal Word

DANGER

Hazard Statement(s)

Harmful if swallowed

Causes serious eye irritation

May cause allergy or asthma symptoms or breathing difficulties if inhaled

May cause an allergic skin reaction

Suspected of causing genetic defects

May cause cancer

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May cause damage to systemic toxicity.
Causes damage to lungs through prolonged or repeated exposure.

Precautionary Statement(s)

Prevention

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe dust, mist, fumes or vapors. Use only outdoors or in a well-ventilated area. Wear respiratory protection. Wear appropriate protective gloves/clothing and eye/face protection if contact is possible. Do not eat, drink, or smoke when using this product. Wash thoroughly after handling. Contaminated work clothing should not be allowed out of the workplace.

Response

IF exposed or concerned: Get medical advice/attention. IF INHALED: Remove person to fresh air and keep comfortable for breathing. If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician. IF ON SKIN: Wash with plenty of soap and water. If skin irritation or rash occurs: Get medical advice/attention. Take off contaminated clothing and wash before re-use. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention. IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell. Rinse mouth.

Storage

Store in a secure area.

Disposal

Dispose of material in accordance with all local, regional, national and international regulations.

Hazard(s) Not Otherwise Classified

Dust may present an explosion hazard if allowed to accumulate in an industrial or manufacturing environment. Coatings and oils applied to the product may enhance flammability.

Section 3 - Composition / Information on Ingredients

CAS	Component	Percent
7440-32-6	Titanium	>80
7429-90-5	Aluminum	<8
7440-62-2	Vanadium	<5
7439-98-7	Molybdenum	<5
7440-67-7	Zirconium	<4
7440-47-3	Chromium	<4
7440-31-5	Tin	<4

Component Information/Information on Non-Hazardous Components

Processing of this material may produce hazardous vapors, fumes, mists and dusts which are considered hazardous under 29 CFR 1910.1200 (Hazard Communication).

This data sheet is prepared as a guideline for typical uses of scrap materials. The user should be aware that the composition of the scrap can vary based upon the raw materials, processes used, and protective coatings that may have been applied to the original materials. The list of ingredients above are typical ingredients thought to be present in the scrap material. This list includes contaminants that may or may not be present. The percentages given vary from shipment to shipment and may not be entirely accurate for a given shipment.

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Protective coatings, including paints, lubricants, corrosion inhibitors, etc., may have been applied to the material before it came under the control of the recycler. These coatings may contain hazardous materials. Typical hazardous materials contained in these coatings include: lead, zinc, chromium, and cadmium. Some organic materials may also be present. The supplier (recycler) may have no specific knowledge of the particular contaminant. However, it is anticipated that the hazardous materials present in the coatings would generally represent less than 0.1% of the total material present. The health hazards presented by these contaminants would produce their greatest potential for exposure during processes such as melting, cutting, welding. These processes could generate metal fumes that might produce the health hazards identified in section 2 of this MSDS.

It is suggested that the user protect employees by utilizing engineering controls that reduce exposures to acceptable concentrations. Where engineering controls are not feasible, appropriate personal protective equipment should be utilized.

****Section 4 - First Aid Measures****

Description of Necessary Measures

Inhalation

If adverse effects occur during processing, remove to uncontaminated area. Get immediate medical attention.

Skin Contact

Wash with plenty of soap and water. If skin irritation or rash occurs: Get medical advice/attention. Take off contaminated clothing and wash before re-use. Cuts or abrasions should be treated promptly with thorough cleansing of the affected area.

Eye Contact

Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists, get medical advice/attention. In case of mechanical abrasions and cuts, seek medical attention immediately.

Ingestion

Due to the physical nature of this material, ingestion is unlikely to occur. If ingestion of a large amount does occur, seek medical attention. Do not induce vomiting unless directed to do so by medical personnel.

Most Important Symptoms/Effects

Acute

Processing by-products: Harmful if swallowed. Symptoms/effects may include allergic reactions, eye irritation, and systemic toxicity damage.

Delayed

Processing by-products: Symptoms/effects may include allergic reactions, mutagenic effects, cancer, and lung damage.

Indication of immediate Medical Attention and Special Treatment Needed

Treat symptomatically and supportively.

****Section 5 - Fire Fighting Measures****

Extinguishing Media

Media to use includes regular dry chemical and dry sand.

Unsuitable Extinguishing Media

Molten metal may react violently with water.

Specific Hazards Arising from the Chemical

Coatings and oils applied to the product may enhance flammability. Dust or fine particles may present a flammability hazard if allowed to accumulate in an industrial or manufacturing environment.

Hazardous Combustion Products

This product may release metal oxide fumes by thermal decomposition.

Fire fighting measures

Fight fire with normal precautions from a reasonable distance. Cool materials with water spray until well after the fire is out.

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Special Protective Equipment and Precautions for Firefighters

Fire fighters should wear full-face, self contained breathing apparatus and impervious protective clothing. Fire fighters should avoid inhaling any combustion products.

Section 6 - Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures

If dusts or particulates are generated, eliminate sources of ignition. Wear personal protective clothing and equipment, see Section 8.

Methods and Materials for Containment and Cleaning Up

Containment of this material should not be necessary. If dusts or particulates are generated, eliminate sources of ignition. Small pieces of this product may be collected with a broom and shovel. Collect spilled material in appropriate container for reuse or disposal.

Section 7 - Handling and Storage

Precautions for Safe Handling

Observe good hygiene and safety practices when handling this product. Processing of this material may produce hazardous vapors, fumes, mists, and dusts. Avoid inhaling dusts or fumes produced during product processing. Handle with adequate ventilation during processing. Wash thoroughly after handling.

Condition for Safe storage, Including any incompatibilities

Store in a secure area.

Incompatibility

Titanium may react with bromine trifluoride, carbon dioxide, copper oxide, fluorine, lead oxide, nickel and potassium chlorate.

Section 8 - Exposure Controls / Personal Protection

Exposure Limits

Follow all applicable exposure limits. Keep formation of dusts, particulates and fumes to a minimum.

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Component Exposure Limits

Aluminum (7429-90-5)

ACGIH:	1 mg/m3 TWA (respirable fraction)
OSHA:	15 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable fraction)
NIOSH:	10 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable dust)
Alberta:	10 mg/m3 TWA (dust)
British Columbia:	1.0 mg/m3 TWA (respirable)
Manitoba:	1 mg/m3 TWA (respirable fraction)
New Brunswick:	10 mg/m3 TWA (metal dust)
NW Territories:	10 mg/m3 TWA 20 mg/m3 STEL
Nova Scotia:	1 mg/m3 TWA (respirable fraction)
Nunavut:	10 mg/m3 TWA 20 mg/m3 STEL
Ontario:	1 mg/m3 TWA (respirable)
Quebec:	10 mg/m3 TWA EV
Saskatchewan:	10 mg/m3 TWA (dust) 20 mg/m3 STEL (dust)

Molybdenum (7439-98-7)

ACGIH:	10 mg/m3 TWA (inhalable fraction); 3 mg/m3 TWA (respirable fraction)
Alberta:	10 mg/m3 TWA (total); 3 mg/m3 TWA (respirable)
British Columbia:	3 mg/m3 TWA (respirable); 10 mg/m3 TWA (inhalable)
Manitoba:	10 mg/m3 TWA (inhalable fraction); 3 mg/m3 TWA (respirable fraction)
Nova Scotia:	10 mg/m3 TWA (inhalable fraction); 3 mg/m3 TWA (respirable fraction)
Ontario:	10 mg/m3 TWA (metal, inhalable); 3 mg/m3 TWA (metal, respirable)
Saskatchewan:	10 mg/m3 TWA (inhalable fraction); 3 mg/m3 TWA (respirable fraction) 20 mg/m3 STEL (inhalable fraction); 6 mg/m3 STEL (respirable fraction)

Vanadium (7440-62-2)

OSHA:	0.5 mg/m3 Ceiling (as V2O5, respirable dust); 0.1 mg/m3 Ceiling (as V2O5, fume)
NIOSH:	1 mg/m3 TWA 3 mg/m3 STEL

Chromium (7440-47-3)

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ACGIH:	0.5 mg/m3 TWA
OSHA:	1 mg/m3 TWA
NIOSH:	0.5 mg/m3 TWA
Alberta:	0.5 mg/m3 TWA
British Columbia:	0.5 mg/m3 TWA
Manitoba:	0.5 mg/m3 TWA
New Brunswick:	0.5 mg/m3 TWA
NW Territories:	0.5 mg/m3 TWA 1.5 mg/m3 STEL
Nova Scotia:	0.5 mg/m3 TWA
Nunavut:	0.5 mg/m3 TWA 1.5 mg/m3 STEL
Ontario:	0.5 mg/m3 TWA
Quebec:	0.5 mg/m3 TWAEV
Saskatchewan:	0.5 mg/m3 TWA 1.5 mg/m3 STEL
Yukon:	0.1 mg/m3 TWA 3.0 mg/m3 STEL
Tin (7440-31-5)	
ACGIH:	2 mg/m3 TWA
NIOSH:	2 mg/m3 TWA
Alberta:	2 mg/m3 TWA
British Columbia:	2 mg/m3 TWA
Manitoba:	2 mg/m3 TWA
New Brunswick:	2 mg/m3 TWA
Nova Scotia:	2 mg/m3 TWA
Ontario:	2 mg/m3 TWA
Quebec:	2 mg/m3 TWAEV
Saskatchewan:	2 mg/m3 TWA 4 mg/m3 STEL
Zirconium (7440-67-7)	

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ACGIH:	5 mg/m3 TWA 10 mg/m3 STEL
NIOSH:	5 mg/m3 TWA 10 mg/m3 STEL
Alberta:	5 mg/m3 TWA 10 mg/m3 STEL
British Columbia:	5 mg/m3 TWA 10 mg/m3 STEL
Manitoba:	5 mg/m3 TWA 10 mg/m3 STEL
New Brunswick:	5 mg/m3 TWA 10 mg/m3 STEL
Nova Scotia:	5 mg/m3 TWA 10 mg/m3 STEL
Ontario:	5 mg/m3 TWA 10 mg/m3 STEL
Quebec:	5 mg/m3 TWAEV 10 mg/m3 STEV
Saskatchewan:	5 mg/m3 TWA 10 mg/m3 STEL

Appropriate Engineering Controls

For outdoor applications, special ventilation is not required under normal conditions of use. Under normal conditions of use, no special ventilation equipment is needed. Ventilation should be sufficient to effectively remove and prevent buildup of any dusts or fumes that may be generated during handling or thermal processing.

Individual Protection Measures, such as Personal Protective Equipment

Eyes/Face Protection

Eye protection not required under normal conditions. Wear appropriate eye protection if eye contact is possible.

Skin Protection

Wear gloves and other clothing as required to avoid contact.

Respiratory Protection

Consult with a health and safety professional for specific respirators appropriate for your use. When dusts or thermal processing fumes are generated and ventilation is not sufficient to effectively remove them, appropriate NIOSH approved respiratory protection must be provided. Where concentrations exceed exposure limits or airborne exposure is likely, use NIOSH approved respiratory protection equipment appropriate for the material and its components.

General Information

Use good industrial hygiene practices in handling this material. Eye wash fountain and emergency showers are recommended.

*****Section 9 - Physical and Chemical Properties*****

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Appearance: Depends upon scrap composition, most often appears as a dark gray amorphous powder or lustrous white metal.

Odor: Not available

Physical State: Solid

pH: Not applicable

Melting /Freezing Point: 3100 °F (1700 °C)

Boiling Point: 6000 °F (3300 °C)

Flash Point: Not applicable

OSHA Flammability Class: Non-flammable

UFL: Not available

LFL: Not available

Vapor Pressure: Not applicable

Vapor Density: Not applicable

Specific Gravity: Not available

Solubility (H₂O): Insoluble

Auto Ignition: Not applicable

Section 10 - Chemical Stability & Reactivity Information

Reactivity

No reactivity hazard is expected.

Chemical Stability

Stable under normal conditions.

Possibility of Hazardous reaction

Will not occur.

Conditions to Avoid

Molten metal may react violently with water. Fine particles, dust or fumes may be flammable or explosive.

Incompatible Materials

Titanium may react with bromine trifluoride, carbon dioxide, copper oxide, fluorine, lead oxide, nickel and potassium chlorate.

Hazardous Decomposition Products

Decomposition of this product may yield metallic oxides.

Section 11 - Toxicological Information

Acute Dose Effects

No information available for the product. Operations which supply sufficient energy to the product (i.e. welding, high speed grinding or melting) can release dust or fumes which may make components of the product biologically available. Chronic overexposure to titanium dusts and fumes may cause mild pneumoconiosis and rarely reported allergic sensitization reactions.

Component Analysis - LD50/LC50

Tin (7440-31-5)

Oral LD50 Rat 700 mg/kg

Information on Likely Routes of Exposure

Processing by-products may cause the following.

Inhalation

May cause allergic respiratory sensitization and cancer. Dusts, vapors, and fumes generated during processing may irritate the respiratory system. Overexposure to processing fumes may cause metal fume fever which is an influenza like illness. Symptoms include headache, metallic taste in the mouth, cough, thirst, throat irritation, shortness of breath, fever, sweating and pain in the limbs. Severe acute overexposure or chronic overexposure to dusts or processing fumes may produce more serious toxicities including: siderosis, lung damage, weakness, anorexia, impairment of sleep and vision, personality changes, blood formation effects, nervous and circulatory system damage, kidney damage, and may pose a reproductive hazard.

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Ingestion

Harmful if swallowed. Ingestion is not a likely route of exposure. May cause gastrointestinal disturbances, abdominal pain, fever, vomiting, and diarrhea. Ingestion of large amounts of product may produce more serious toxicities including: shock, metabolic acidosis, decreased white blood cell count, neurological damage, cardiovascular shock, anemia, liver damage, renal failure, lethargy and coma..

Skin

Causes skin irritation. May cause allergic skin reactions. Dust or powder may irritate the skin. This product may produce skin abrasions, lesions, or cuts.

Eye

Dust or powder may irritate eye tissue. Rubbing may cause abrasion of cornea.

Immediate Effects

Processing by-products: Harmful if swallowed. Symptoms/effects may include allergic reactions, respiratory tract irritation, eye irritation, and systemic toxicity damage.

Delayed Effects

Processing by-products: Symptoms/effects may include allergic reactions, mutagenic effects, cancer, and lung damage.

Medical conditions Aggravated by Exposures

No data available.

Irritation/Corrosivity Data

Causes respiratory tract irritation and eye irritation.

Respiratory Sensitizer

May cause allergy or asthma symptoms or breathing difficulties if inhaled

Dermal Sensitization

May cause an allergic skin reaction

Carcinogenicity

Component Carcinogenicity

Aluminum (7429-90-5)

ACGIH: A4 - Not Classifiable as a Human Carcinogen

Chromium (7440-47-3)

ACGIH: A4 - Not Classifiable as a Human Carcinogen

IARC: Monograph 49 [1990]; Supplement 7 [1987] (Group 3 (Not classifiable))

Zirconium (7440-67-7)

ACGIH: A4 - Not Classifiable as a Human Carcinogen

Mutagenicity

Contains component(s) which may cause mutagenic effects.

Reproductive Toxicity

No information available for the product.

Specific Target Organ Toxicity - Single Exposure

systemic toxicity respiratory system

Specific Target Organ Toxicity - Repeated Exposure

lungs

Aspiration Hazard

No information available for the product.

Other Toxicological Information

Under normal conditions of handling, the likelihood of inhaling or ingesting amounts necessary for these effects to occur is very small.

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Section 12 - Ecological Information

Ecotoxicity

Processing by-products: May be harmful to aquatic life.

Component Analysis - Ecotoxicity - Aquatic Toxicity

No ecotoxicity data are available for this product's components.

Persistence & Degradability

No information available for the product.

Bioaccumulation

No information available for the product.

Mobility

No information available for the product.

Section 13 - Disposal Considerations

Disposal Methods

Byproducts and residues from this product may be reprocessed or recycled. Upon disposal, collected dusts and other similar wastes could contain a constituent identified as a hazardous waste. Wastes must be tested using methods described in 40 CFR Part 261 to determine if it meets applicable definitions of hazardous wastes.

See Section 7 for Handling Procedures. See Section 8 for Personal Protective Equipment recommendations.

US EPA Waste Number & Descriptions

Component Waste Numbers

Chromium (7440-47-3)

RCRA: 5.0 mg/L regulatory level

Disposal of Contaminated Packaging

Dispose of waste material according to Local, State, Federal, and Provincial Environmental Regulations.

Section 14 - Transportation Information

US DOT Information

Certain forms of this material (i.e. powders, borings, shavings, turnings, cuttings, dross, etc.) may be subject to U.S. DOT hazardous material shipping requirements. If the products are shipped in quantities which exceed the reportable quantity (RQ) for individual components, they may also meet the requirements of DOT hazardous materials.

DOT Reportable Quantities

Chromium (7440-47-3)

5000 lbs RQ (The RQ for these hazardous substances is limited to those pieces of the metal having a diameter smaller than 100 μ m (0.004 inches).); 2270 kg RQ (The RQ for these hazardous substances is limited to those pieces of the metal having a diameter smaller than 100 μ m (0.004 inches).)

TDG Information

Not regulated as a hazardous material.

Section 15 - Regulatory Information

U.S. Federal Regulations

Processing of this material may produce hazardous vapors, fumes, mists and dusts which are considered hazardous under 29 CFR 1910.1200 (Hazard Communication). The following component analysis applies only to those facilities that are required to report under applicable regulations.

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U.S. Federal Regulations

This material contains one or more of the following chemicals required to be identified under SARA Sections 302/304 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), and/or require an OSHA process safety plan.

Aluminum (7429-90-5)

SARA 313: 1.0 % de minimis concentration (dust or fume only)

Vanadium (7440-62-2)

SARA 313: 1.0 % de minimis concentration (except when contained in an alloy)

Chromium (7440-47-3)

SARA 313: 1.0 % de minimis concentration

CERCLA: 5000 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 µm); 2270 kg final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 µm)

SARA 311/312 Hazardous Categories (40 CFR 370 Subparts B and C)

Acute Health Yes (dust/fumes) **Chronic Health** Yes (dust/fumes) **Fire** No **Pressure** No **Reactive** No

U.S. State Regulations

Other state regulations may apply. Check individual state requirements.

Component Analysis - State

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS #	CA	FL	MA	MN	NJ	PA
Titanium	7440-32-6	Yes	No	No	No	Yes	No
Aluminum	7429-90-5	Yes	No	Yes	Yes	Yes	Yes
Molybdenum	7439-98-7	Yes	No	Yes	Yes	Yes	Yes
Vanadium	7440-62-2	Yes	No	Yes	No	Yes	Yes
Chromium	7440-47-3	Yes	No	Yes	Yes	Yes	Yes
Tin	7440-31-5	Yes	No	Yes	Yes	Yes	Yes
Zirconium	7440-67-7	Yes	No	Yes	No	Yes	Yes

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):

WARNING! This product contains a chemical known to the state of California to cause cancer.

Canada Regulation

This product has been classified in accordance with the criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

Canadian WHMIS Information

WHMIS CLASSIFICATION: D1B, D2A, D2B.

Component Analysis - WHMIS IDL

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Aluminum (7429-90-5)

1 %

Molybdenum (7439-98-7)

1 %

Vanadium (7440-62-2)

1 %

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Chromium (7440-47-3)

0.1 %

Tin (7440-31-5)

1 %

Zirconium (7440-67-7)

1 %

Additional Regulatory Information

All components are on the U.S. EPA TSCA Inventory List.

Component Analysis - Inventory

Component	CAS #	TSCA	CAN
Titanium	7440-32-6	Yes	DSL
Aluminum	7429-90-5	Yes	DSL
Molybdenum	7439-98-7	Yes	DSL
Vanadium	7440-62-2	Yes	DSL
Chromium	7440-47-3	Yes	DSL
Tin	7440-31-5	Yes	DSL
Zirconium	7440-67-7	Yes	DSL

*****Section 16 - Other Information*****

Summary of Changes

Updated: 5/12/2015

NFPA Ratings: Health: 1 Fire: 0 Reactivity: 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

Key/Legend

EPA = Environmental Protection Agency; TSCA = Toxic Substance Control Act; ACGIH = American Conference of Governmental Industrial Hygienists; IARC = International Agency for Research on Cancer; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; TLV = Threshold Limit Value; NFPA = National Fire Protection Association; HMIS = High Efficiency Particulate Air; CERCLA = Comprehensive Environmental Response, Compensation and Liability Act; SARA = Superfund Amendments and Reauthorization Act.

Other Information

Reasonable care has been taken in the preparation of this information, but the manufacturer makes no warranty of merchantability or any other warranty, expressed or implied, with respect to this information. The manufacturer makes no representations and assumes no liability for any direct, incidental or consequential damages resulting from its use.

MSDS History:

New MSDS: 7/8/1998

Revision 2/Regulatory Update: 7/19/2002

Revision 3/Regulatory Update: 10/6/2005

Revision 4/Regulatory Update: 8/7/2008

Revision 5/Regulatory Update: 1/26/2010

Revision 6 / Regulatory Update: 11/11/2011

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