MATERIAL SAFETY DATA SHEET

1. Product and Company Identification

Material Name	Wrought Aluminum Products, 6xxx Series Alloys
SDS Number	1001
Version #	01
Revision Date	March 18, 2015
Chemical Description	Massive, solid metal.
CAS Number	Mixture
Product Use	Various fabricated aluminum parts and products
Recommended Restrictions	Commercial or industrial use.
Synonym(s)	Wrought aluminum products, 6xxx Series alloys with ALCOA 951 pretreatment and dry film lubricant; Includes only alloys: 6111-T4, 6111-T43, 6022-T4, 6022-T4E32, 6022-T4E15, 6022-T40, 6061-T6
Manufacturer	**Apex Aluminum Extrusions** 9767 201 Street Langley BC, V1M 3E7, Canada Tel - 604.882.3542 Fax - 604.882.3516
Emergency Information	USA: Chemtrec: +1-703-527-3887 +1-800-424-9300 (24 Hour Emergency Telephone, multiple languages spoken); ALCOA: +1-412-553-4001 (24 Hour Emergency Telephone, only Enlish spoken)
Website	For a current Safety Data Sheet, refer to our websites: apexextrusions.ca

2. Hazards Identification

Emergency Overview

Solid. Silver colored. Odorless. Non-combustible as supplied. Small chips, fine turnings and dust from processing may be readily ignitable.

Explosion/fire hazards may be present when (See Sections 5, 7 and 10 for more information):

- Dust or fines are dispersed in air.
- Chips, dust or fines are in contact with water.
- Dust and fines are in contact with certain metal oxides (e.g., rust, copper oxide).
- Molten metal in contact with water/moisture or certain metal oxides (e.g., rust, copper oxide). Can cause irritation of the eyes, skin and respiratory tract.

OSHA Regulatory Status

This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).

Potential Health Effects

The following statements summarize the health effects generally expected in cases of overexposures. User specific situations should be assessed by a qualified individual. Additional health information can be found in Section 11.

The health effects listed below are not likely to occur unless processing of this product generates dusts or through direct contact.

Eyes

Dust or fume from processing: Can cause irritation to the eyes.

Skin

Contact with residual oil/oil coating: May cause irritation. Prolonged or repeated skin contact may cause dermatitis.

Dust or fume from processing: Can cause skin irritation.

Inhalation

Health effects from mechanical processing (e.g., cutting, grinding):

Dust: Can cause irritation of the upper respiratory tract.

Chronic overexposures: Can cause reduction in the number of red blood cells (anemia), skin abnormalities (pigmentation changes), scarring of the lungs (pulmonary fibrosis), central nervous s system damage, secondary Parkinson's disease and reproductive harm in males.

Additional health effects from elevated temperature processing (e.g., welding, melting):

Dust and fumes: Can cause irritation of the respiratory tract.

Acute overexposures: Can cause metal fume fever (nausea, fever, chills, shortness of breath and malaise), reduced ability of the blood to carry oxygen (methemaglobin) and the accumulation of fluid in the lungs (pulmonary edema).

Chronic overexposures: Can cause respiratory sensitization, and lung cancer.

Ingestion

Not a likely route of entry.

Carcinogenicity and Reproductive Hazard	Product as shipped: Does not present any cancer or reproductive hazards. Dust from mechanical processing: Does not present any cancer hazards. Can present a reproductive hazard for males (Manganese). Dust and fumes from welding or elevated temperature processing: Can present a cancer hazard (Hexavalent chromium compounds, Welding fumes). Can present a reproductive hazard for males (Manganese compounds).
Medical Conditions Aggravated by Exposure to Product	Dust and fumes from processing: Asthma, chronic lung disease, Secondary Parkinson's disease and skin rashes.
Potential Environmental Effects	Not expected to be harmful to aquatic organisms.

3. Composition / Information on Ingredients

Composition Comments Complete composition is provided below and may include some components classified as non-hazardous.

Components	CAS #	Percent
Metal	--	--
Aluminum	7429-90-5	> 90
Magnesium	7439-95-4	< 3.1
Silicon	7440-21-3	< 1.9
Manganese	7439-96-5	< 1.5
Copper	7440-50-8	< 1.4
Iron	7439-89-6	< 1.2
Zinc	7440-66-6	< 1.1
Chromium	7440-47-3	< 0.5
Dry Lubricant†	Not available	< 1.0

Additional Information

† Proprietary ingredient, mixture: Non hazardous component.

† Proprietary ingredient, mixture: Aliphatic hydrocarbons, fatty acids and surfactants.

Additional compounds which may be formed during processing are listed in Section 8.

4. First Aid Measures

First Aid Procedures

Eye Contact	Dust and fumes from processing: Rinse eyes with plenty of water or saline for at least 15 minutes. Consult a physician.
Skin Contact	Dust and fume from processing or contact with lubricant/residual oil: Wash with soap and water for at least 15 minutes. Get medical attention if irritation develops and persists.
Inhalation	Dust and fumes from processing: Remove to fresh air. Check for clear airway, breathing, and presence of pulse. If breathing is difficult, provide oxygen. Loosen any tight clothing on neck or chest. Provide cardiopulmonary resuscitation for persons without pulse or respirations. Consult a physician.
Ingestion	Not likely, due to the form of the product.
Most Important Symptoms and Effects, Both Acute and Delayed	Health effects from mechanical processing (e.g., cutting, grinding): Dust: Can cause irritation of the upper respiratory tract. Chronic overexposures: Can cause reduction in the number of red blood cells (anemia), skin abnormalities (pigmentation changes), scarring of the lungs (pulmonary fibrosis) secondary Parkinson's disease and reproductive harm in males. Additional health effects from elevated temperature processing (e.g., welding, melting): Dust and fumes from processing: Can cause irritation of the respiratory tract. Acute overexposures: Can cause metal fume fever (nausea, fever, chills, shortness of breath and malaise), the accumulation of fluid in the lungs (pulmonary edema), central nervous system damage and reduced ability of the blood to carry oxygen (methemaglobin). Chronic overexposures: Can cause respiratory sensitization, scarring of the lungs (pulmonary fibrosis) and lung cancer.
Notes to Physician	In case of shortness of breath, give oxygen. Symptoms may be delayed.
General advice	If exposed or concerned: Get medical advice/attention.

5. Fire Fighting Measures

General Fire Hazards

This product does not present fire or explosion hazards as shipped. Small chips, fine turnings, and dust from processing may be readily ignitable.

Extinguishing Media

Suitable Extinguishing Media

Use Class D extinguishing agents on fines, dust or molten metal. Use coarse water spray on chips and turnings.

Unsuitable Extinguishing Media

DO NOT USE halogenated extinguishing agents on small chips/fines.
DO NOT USE water in fighting fires around molten metal.
These fire extinguishing agents will react with the burning material.

Protection of Firefighters

Specific Hazards Arising From the Chemical

May be a potential hazard under the following conditions:

- Dust clouds may be explosive. Even a minor dust cloud can explode violently. Dust accumulation on the floor, ledges and beams can present a risk of ignition, flame propagation and secondary explosions.
- Chips, fines and dust in contact with water can generate flammable/explosive hydrogen gas. These gases could present an explosion hazard in confined or poorly ventilated spaces.
- Dust and fines in contact with certain metal oxides (e.g., rust, copper oxide). A thermite reaction, with considerable heat generation, can be initiated by a weak ignition source.
- Molten metal in contact with water/moisture or certain metal oxides (e.g., rust, copper oxide). Moisture entrapped by molten metal can be explosive. Contact of molten aluminum with certain metal oxides can initiate a thermite reaction. Finely divided metals (e.g., powders or wire) may have enough surface oxide to produce thermite reactions/explosions.

Protective Equipment and Precautions for Firefighters

Fire fighters should wear NIOSH approved, positive pressure, self-contained breathing apparatus and full protective clothing when appropriate.

Hazardous Combustion Products

No hazardous decomposition products are known.

Fire Fighting Equipment/Instructions

Avoid dust formation.

Explosion Data

Sensitivity to Mechanical Impact

Not applicable.

Sensitivity to Static Discharge

Take precautionary measures against static discharges when there is a risk of dust explosion.

6. Accidental Release Measures

Personal Precautions

Avoid generating dust. Avoid contact with sharp edges or heated metal. Molten, heated and cold aluminum look alike; do not touch unless you know it is cold. Use personal protection recommended in Section 8 of the SDS.

Environmental Precautions

No special environmental precautions required.

Evacuation Procedure

Keep unnecessary personnel away.

Spill or Leak Procedure

Collect scrap for recycling. If molten: Contain the flow using dry sand or salt flux as a dam. All tooling (e.g., shovels or hand tools) and containers which come in contact with molten metal must be preheated or specially coated, rust free and approved for such use. Allow the spill to cool before remelting as scrap.

7. Handling and Storage

Handling

Keep material dry. Avoid generating dust. Avoid contact with sharp edges or heated metal. Hot and cold aluminum are not visually different. Use personal protection recommended in Section 8 of the SDS.

Storage

Store in a dry place

Requirements for Processes Which Generate Dusts or Fines

If processing of this product generates dust or if extremely fine particulate is generated, obtain and follow the safety procedures and equipment guides contained in Aluminum Association Bulletin F-1 and National Fire Protection Association (NFPA) brochures listed in Section 16.

Use non-sparking handling equipment, tools and natural bristle brush. Cover and reseal partially empty containers. Provide grounding and bonding where necessary to prevent accumulation of static charges during metal dust handling and transfer operations (See Section 15).

Local ventilation and vacuum systems must be designed to handle explosive dusts. Dry vacuums and electrostatic precipitators must not be used, unless specifically approved for use with flammable/explosive dusts. Dust collection systems must be dedicated to aluminum dust only and should be clearly labeled as such. Do not co-mingle fines of aluminum with fines of iron, iron oxide (rust) or other metal oxides.

Do not allow chips, fines or dust to contact water, particularly in enclosed areas.

Avoid all ignition sources. Good housekeeping practices must be maintained. Dust accumulation on the floor, ledges and beams can present a risk of ignition, flame propagation and secondary explosions. Do not use compressed air to remove settled material from floors, beams or equipment.

Requirements for Remelting of Scrap Material or Ingot

Molten metal and water can be an explosive combination. The risk is greatest when there is sufficient molten metal to entrap or seal off the water. Water and other forms of contamination on or contained in scrap or remelt ingot are known to have caused explosions in melting operations. While the products may have minimal surface roughness and internal voids, there remains the possibility of moisture contamination or entrapment. If confined, even a few drops of water can lead to violent explosions.

All tooling, containers, molds and ladles which come in contact with molten metal must be preheated or specially coated, rust free and approved for such use. Any surfaces that may contact molten metal (e.g., concrete) should be specially coated.

Drops of molten metal in water (e.g. from plasma arc cutting), while not normally an explosion hazard, can generate enough flammable hydrogen gas to present an explosion hazard. Vigorous circulation of the water and removal of the particles minimize the hazards.

During melting operations, the following minimum guidelines should be observed:

- Inspect all materials prior to furnace charging and completely remove surface contamination such as water, ice, snow, deposits of grease and oil or other surface contamination resulting from weather exposure, shipment, or storage.
- Store materials in dry, heated areas with any cracks or cavities pointed downwards.
- Preheat and dry large items adequately before charging into a furnace containing molten metal. This is typically done by use of a drying oven or homogenizing furnace. The drying cycle should bring the metal temperature of the coldest item of the batch to 400°F (200°C) and then hold at that temperature for 6 hours.

Thermite explosions have been reported when aluminum alloys were melted in furnaces used for alloying with lead, bismuth or other metals with low melting temperatures. These metals, when added as high purity ingots, can seep through cracks in furnace liners and become oxidized. During subsequent melts in the furnace, molten aluminum can contact these metal oxides resulting in a thermite explosion.

Dross Handling

Small amounts of beryllium (<0.0002% or <2 ppm) can be present in aluminum alloys either from naturally occurring beryllium in aluminum ore or as a alloying element in the aluminum recycling stream. This beryllium does not present an health hazard during processing (grinding, cutting or welding) of aluminum products. However, beryllium may concentrate in the dross formed when aluminum scrap is remelted. Therefore, the potential for exposures to beryllium when handling dross must be considered. Control of airborne dust levels would be critical in reducing or eliminating this potential. For more information on the hazards associated with handling dross that contains beryllium, refer to Alcoa MSDS No. 1013, Aluminum Dross with Low Beryllium. Copies of this MSDS are available on www.alcoa.com or by calling +412-553-4649.

8. Exposure Controls / Personal Protection

Engineering Controls

Dust and fumes from processing: Use with adequate explosion-proof ventilation designed to handle particulates to meet the limits listed in Section 8, Exposure Guidelines.

Personal Protective Equipment

Eye / Face Protection

Wear safety glasses with side shields. If molten: Goggles/face shield are recommended.

Skin and Body Protection

The need for personal protective equipment should be based upon a hazard assessment and recommendations from health / safety professionals. Wear suitable protective clothing.

Hand Protection	Wear appropriate gloves to avoid any skin injury.
Thermal Hazards	Molten metal: Contact with molten material can cause thermal burns. Hot aluminum does not necessarily glow red. When material is heated, wear gloves to protect against thermal burns. Flame retardant protective clothing is recommended.
Respiratory Protection	If dust and fumes are generated through processing: Use NIOSH-approved respiratory protection as specified by an Industrial Hygienist or other qualified professional if concentrations exceed the limits listed in Section 8. Suggested respiratory protection: P95.
Environmental Exposure Controls	No special environmental precautions required.
Hygiene Measures	Handle in accordance with good industrial hygiene and safety practice. When using, do not eat, drink or smoke. Wash hands before breaks and immediately after handling the product.
Recommended Monitoring Procedures	Follow standard monitoring procedures.
General	Personnel who handle and work with molten metal should utilize primary protective clothing like polycarbonate face shields, fire resistant tapper's jackets, neck shades (snoods), leggings, spats and similar equipment to prevent burn injuries. In addition to primary protection, secondary or day-to-day work clothing that is fire resistant and sheds metal splash is recommended for use with molten metal. Synthetic materials should never be worn even as secondary clothing (undergarments). Minimize breathing oil vapors and mist. Remove oil contaminated clothing; launder or dry-clean before reuse. Remove oil contaminated shoes and thoroughly clean and dry before reuse. Cleanse skin thoroughly after contact, before breaks and meals, and at the end of the work period. Oil coating is readily removed from skin with waterless hand cleaners followed by a thorough washing with soap and water.

Occupational Exposure Limits
U.S. - OSHA

Components	Type	Value	Form
Aluminum (CAS 7429-90-5)	TWA	5mg/m3 15mg/m3	Respirable dust (Total Dust)
Chromium (CAS 7440-47-3)	TWA	1 mg/m3	
Copper (CAS 7440-50-8)	TWA	1 mg/m3 0.1 mg/m3	Dust and mist Fume
Manganese (CAS 7439-96-5)	Ceiling	5 mg/m3	Fume
Silicon (CAS 7440-21-3)	TWA	5 mg/m3 15 mg/m3	Respirable fraction (Total Dust)

Compounds Formed During Processing	Type	Value	Form
Aluminum oxide (non-fibro us) (CAS 1344-28-1)	TWA	5 mg/m3 15 mg/m3	Respirable fraction Total dust
Chromium (II) compounds (CAS Not Available)	TWA	0.5 mg/m3	
Chromium (III) compounds (CAS Not Available)	TWA	0.5 mg/m3	(as Cr)
Chromium (VI) compounds, certain water insoluble forms (CAS Not available)	TWA	0.0025 mg/m3	Action Level (as Cr)
Chromium (VI) compounds (CAS 18540-29-9	TWA	0.005 mg/m3 0.0025 mg/m3	(as Cr) Action (as Cr)
Iron oxide (CAS 1309-37-1)	TWA	10 mg/m3	Fume
Manganese compounds, inorganic (CAS Not Available)	Ceiling	5 mg/m3	(as Mn) Fume
Nitric oxide (CAS 10102-43-9)	TWA	30 mg/m3	
Ozone (CAS 10028-15-6)	TWA	0.2 mg/m3 0.1 ppm	
Zinc oxide (CAS 1314-13-2)	TWA	5 mg/m3 5 mg/m3 15 mg/m3	Respirable fraction Fume Total dust

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Compounds Formed During Processing	Type	Value	Form
Chromium (VI) compounds certain water insoluble forms (CAS Not available)	TWA	0.005 mg/m3 0.005 mg/m3	 (as Cr)
Chromium (VI) compounds, water soluble forms (CAS Not available)	TWA	0.005 mg/m3	

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Compounds Formed During Processing	Type	Value	Form
Chromium (VI) compounds, water soluble forms (CAS Not available)	PEL	1 mg/m3	
Magnesium oxide (CAS 1309-48-4)	PEL	15 mg/m3	Total particulate
Nitrogen dioxide (CAS 10102-44-0)	Ceiling	9 mg/m3 5 ppm	

Alcoa

Components	Type	Value	Form
Aluminum (CAS 7429-90-5)	TWA	3 mg/m3 10 mg/m3	Respirable fraction Total dust
Manganese (CAS 7439-96-5)	TWA	0.05 mg/m3 0.02 mg/m3	Total dust Respirable fraction

Compounds Formed During Processing	Type	Value	Form
Aluminum oxide (non-fibro us) (CAS 1344-28-1)	TWA	3 mg/m3 10 mg/m3	Respirable fraction Total dust
Chromium (VI) compounds (CAS 18540-29-9)	TWA	0.25 µg/m3	
Manganese compounds, inorganic (CAS Not available)	TWA	0.05 mg/m3 0.02 mg/m3	Total dust, as Mn Respirable fraction, as Mn.

ACGIH

Compounds Formed During Processing	Type	Value	Form
Aluminum oxide (non-fibrous) (CAS 1344-28-1)	TWA	1 mg/m3	Respirable fraction, as Al
Chromium (VI) compounds certain water insoluble forms (CAS Not available)	TWA	0.01 mg/m3	as Cr
Chromium (VI) compounds, water soluble forms (CAS Not available)	TWA	0.05 mg/m3	as Cr
Ozone (CAS 10028-15-6)	TWA	0.2 ppm 0.1 ppm 0.08 ppm 0.05 ppm	(Heavy, moderate or light workloads (≤2 hours)) (light work) (moderate work) (heavy work)

US. ACGIH Threshold Limit Values

Components	Type	Value	Form
Aluminum (CAS 7429-90-5)	TWA	1 mg/m3	Respirable fraction
Chromium (CAS 7440-47-3)	TWA	0.5 mg/m3	
Copper (CAS 7440-50-8)	TWA	1 mg/m3 0.2 mg/m3	Dust and mist Fume
Manganese (CAS 7439-96-5)	TWA	0.2 mg/m3	

US. ACGIH Threshold Limit Values

Compounds Formed During Processing	Type	Value	Form
Chromium (III) compounds (CAS Not available)	TWA	0.5 mg/m3	
Chromium (VI) compounds, certain water insoluble forms (CAS Not available)	TWA	0.01 mg/m3	
Chromium (VI) compounds, water soluble forms (CAS Not available)	TWA	0.05 mg/m3	
Iron oxide (CAS 1309-37-1)	TWA	5 mg/m3	Respirable fraction
Magnesium oxide (CAS 1309-48-4)	TWA	10 mg/m3	Inhalable fraction
Manganese compounds, inorganic (CAS Not available)	TWA	0.2 mg/m3	
Nitric oxide (CAS 10102-43-9)	TWA	25 ppm	
Nitrogen dioxide (CAS 10102-44-0)	TWA	0.2 ppm	
Ozone (CAS 10028-15-6)	TWA	0.05 ppm	
Zinc oxide (CAS 1314-13-2)	STEL TWA	10 mg/m3 2 mg/m3	Respirable fraction Respirable fraction.

9. Physical & Chemical Properties

Form	Solid
Color	Silver colored
Odor	Odorless
pH	Not applicable
Auto-ignition Temperature	Not applicable
Density	0.10 - 0.10 lb/in3
Flash Point	Not applicable
Flammability Limits in Air, Upper, % by Volume	Not applicable
Flammability Limits in Air, Lower, % by Volume	Not applicable
Melting point/Freezing point	1029.2 - 1209.2 °F (554 - 654 °C)
Odor Threshold	Not applicable
Partition Coefficient (n-octanol/water)	Not applicable
Percent Volatile	Not applicable
Other Data	
Explosivity	Not applicable
Solubility (water)	Insoluble
Specific Gravity	Not applicable
Relative Density	Not determined
Vapor Density	Not applicable
Vapor Pressure	Not applicable

10. Chemical Stability & Reactivity Information

Chemical Stability
Stable under normal conditions of use, storage, and transportation as shipped

Conditions to Avoid
Chips, fines, dust and molten metal are considerably more reactive with the following:

- Heat: Oxidizes at a rate dependent upon temperature and particle size.
- Water: Slowly generates flammable/explosive hydrogen gas and heat. Generation rate is greatly increased with smaller particles (e.g., fines and dusts). Molten metal can react violently/explosively with water or moisture, particularly when the water is entrapped.

Explosions can occur with coils of foil that have been submerged or partially submerged in water for an extended period of time. Water can penetrate between the layers of foil, react with the aluminum surface and generate heat and hydrogen gas. When the coils are removed from the cooling effects of the water, rapid temperature increases can occur causing steam explosions which result in the rupture of the coils and discharge of debris.

Coils of foil may be a potential hazard under the following conditions:

- Coil has been annealed (annealing removes residual oil that could prevent penetration of water)
- Foil is very thin gauge (5-9 µm thickness which increases surface area)
- Coil has been immersed for an extended period of time (several hours or more)
- Wetted coil has recently been removed from the cooling effects of the water

In such situations, the coils should be isolated (30 meters from any personnel) for at least 72 hours as soon as possible after removal from the water. Coils making crackling sounds or emitting steam should not be approached or transported in commerce. Wetted coils should not be charged into a furnace for remelting until completely dry.

Possibility of Hazardous Reactions Hazardous polymerization does not occur.

Incompatible Materials Chips, fines, dust and molten metal are considerably more reactive with the following:

- Strong oxidizers: Violent reaction with considerable heat generation. Can react explosively with nitrates (e.g., ammonium nitrate and fertilizers containing nitrate) when heated or molten.
- Acids and alkalis: Reacts to generate flammable/explosive hydrogen gas. Generation rate is greatly increased with smaller particles (e.g., fines and dusts).
- Halogenated compounds: Many halogenated hydrocarbons, including halogenated fire extinguishing agents, can react violently with finely divided or molten aluminum.
- Iron oxide (rust) and other metal oxides (e.g., copper and lead oxides): A violent thermite reaction generating considerable heat can occur. Reaction with aluminum fines and dusts requires only very weak ignition sources for initiation. Molten aluminum can react violently with iron oxide without external ignition source.
- Iron powder and water: Explosive reaction forming hydrogen gas when heated above 1470°F (800°C).

Thermite explosions have been reported when aluminum alloys were melted in furnaces used for alloying with lead, bismuth or other metals with low melting temperatures. These metals, when added as high purity ingots, can seep through cracks in furnace liners and become oxidized. During subsequent melts in the furnace, molten aluminum can contact these metal oxides resulting in a thermite explosion.

Hazardous Decomposition Products Dry Lubricant: Decomposition can generate: Carbon monoxide, carbon dioxide, aldehydes and partially oxidized hydrocarbons.

11. Toxicological Information

Health effects associated with ingredients

Aluminum Dust/Fines and Fumes: Low health risk by inhalation. Generally considered to be biologically inert (milling, cutting, grinding).

Silicon (Inert Dusts): Chronic overexposures: Can cause chronic bronchitis and narrowing of airways.

Manganese Dust or Fumes: Chronic overexposures: Can cause inflammation of the lung tissues, scarring of the lungs (pulmonary fibrosis), central nervous system damage, Secondary Parkinson's Disease and reproductive harm in males.

Copper Dust/Mists: Can cause irritation of the eyes, mucous membranes, skin, and respiratory tract.

Chronic overexposures: Can cause reduction in the number of red blood cells (anemia), skin abnormalities (pigmentation changes) and hair discoloration.

Chromium Dust and Fumes: Can cause irritation of eye, skin and respiratory tract.
Metallic chromium and trivalent chromium: Notc classifiable as to their carcinogenicity to humans by IARC.

Dry Lubricant: Can cause irritation of skin. Skin contact (prolonged or repeated): Can cause dermatitis.

Health effects associated with compounds formed during processing

The following could be expected if welded, remelted or otherwise processed at elevated temperatures:

Alumina (Aluminum Oxide): Low health risk by inhalation. Generally considered to be biologically inert.

Magnesium Oxide Fumes: Can cause irritation of the eyes and respiratory tract.
Acute overexposures: Can cause metal fume fever (nausea, fever, chills, shortness of breath and malaise).

Silica, Amorphous: Acute overexposures: Can cause dryness of eyes, nose and upper respiratory tract.

Manganese Oxide Fumes: Can cause irritation of the eyes, skin, and respiratory tract.
Acute overexposures: Can cause metal fume fever (nausea, fever, chills, shortness of breath and malaise).

Copper Fume: Can cause irritation of the eyes, mucous membranes, and respiratory tract.
Acute overexposures: Can cause metal fume fever (nausea, fever, chills, shortness of breath and malaise).

Iron Oxide: Chronic overexposures: Can cause benign lung disease (siderosis).
Ingestion: Can cause irritation of gastrointestinal tract, bleeding, changes in the pH of the body fluids (metabolic acidosis) and liver damage.

Zinc Oxide Fumes: Can cause irritation of upper respiratory tract.
Acute overexposures: Can cause metal fume fever (nausea, fever, chills, shortness of breath and malaise).

Hexavalent Chromium Compounds (Chromium VI): Can cause irritation of eye, skin and respiratory tract.
Skin contact: Can cause irritant dermatitis, allergic reactions and skin ulcers.
Chronic overexposures: Can cause perforation of the nasal septum, respiratory sensitization, asthma, the accumulation of fluid in the lungs (pulmonary edema), lung damage, kidney damage, lung cancer, nasal cancer and cancer of the gastrointestinal tract.
IARC/NTP: Listed as "known to be a human carcinogen" by the NTP. Listed as carcinogenic to humans by IARC (Group 1).

If the product is heated well above ambient temperatures or machined, oil vapor or mist may be generated.

Oil vapor or mist: Can cause irritation of respiratory tract. Acute overexposures: Can cause bronchitis, headache, central nervous system effects (nausea, dizziness and loss of coordination) and drowsiness (narcosis).

Welding, plasma arc cutting, and arc spray metalizing can generate ozone.

Ozone: Can cause irritation of eyes, nose and upper respiratory tract.
Acute overexposures: Can cause shortness of breath, tightness of chest, headache, cough, nausea and narrowing of airways. Effects are reversible on cessation of exposure.
Acute overexposures (high concentrations): Can cause respiratory distress, respiratory tract damage, bleeding and the accumulation of fluid in the lungs (pulmonary edema). Effects can be delayed up to 1-2 hours. Additional information: Studies (inhalation) with experimental animals have found genetic damage, reproductive harm, blood cell damage, lung damage and death.

Welding Fumes: IARC/NTP: Listed as possibly carcinogenic to humans by IARC (Group 2B).
Additional information: In one study, occupational asthma was associated with exposures to fumes from aluminum welding.

Plasma arc cutting of aluminum can generate oxides of nitrogen.

Oxides of Nitrogen (NO and NO2): Can cause irritation of eyes, skin and respiratory tract.
Acute overexposures: Can cause reduced ability of the blood to carry oxygen (methemaglobin). Can cause cough, shortness of breath, accumulation of fluid in the lungs (pulmonary edema) and death. Effects can be delayed up to 2-3 weeks.

Nitrogen dioxide (NO2): Chronic overexposures: Can cause scarring of the lungs (pulmonary fibrosis).

Product	Test Results
6xxx SERIES ALLOYS WITH ALCOA 951 PRETREATMENT (Mixture)	Acute Oral LD50 Rat: 58834.5156 mg/kg estimated

Components	Test Results	
Zinc (7440-66-6)	Acute Oral LD50 Rat:	630 mg/kg

Components Formed During Processing	Test Results	
Nitrogen dioxide (10102-44-0)	Acute Inhalation LC50 Guinea pig:	30 mg/l 1 Hours
	Acute Inhalation LC50 Rat:	88 mg/l 4 Hours
Iron oxide (1309-37-1)	Acute Oral LD50 Rat:	> 10000 mg/kg
Zinc oxide (1314-13-2)	Acute Inhalation LC50 Mouse:	> 5.7 mg/l 4 Hours
	Acute Oral LD50 Mouse:	7950 mg/kg
	Acute Oral LD50 Rat:	> 5000 mg/kg
	Acute Oral LD50 Rat:	> 5 g/kg
	Acute Other LD50 Rat:	240 mg/kg
Aluminum oxide (non-fibrous) (1344-28-1)	Acute Oral LD50 Rat:	> 5000 mg/kg
Silica, amorphous (69012-64-2)	Acute Oral LD50 Mouse:	> 15000 mg/kg
	Acute Oral LD50 Rat:	> 22500 mg/kg

Routes of Exposure	Inhalation. Skin contact. Eye contact.
Acute effects	Dust and fumes from processing: Can cause irritation of the upper respiratory tract. Heating above the melting point releases metallic oxides which may cause metal fume fever by inhalation. The symptoms are shivering, fever, malaise and muscular pain.
Chronic Effects	Dust and fumes from processing: Health effects from mechanical processing (e.g., cutting, grinding): Chronic overexposures: Can cause reduction in the number of red blood cells (anemia), skin abnormalities (pigmentation changes), scarring of the lungs, (pulmonary fibrosis), secondary Parkinson's disease and reproductive harm in males. Additional health effects from elevated temperature processing: Chronic overexposures: Can cause scarring of the lungs and lung cancer.
Skin Corrosion/Irritation	Not classified. Non-corrosive.
Serious Eye Damage/Irritation	Dust and fume from processing: May be irritating to eyes.
Respiratory sensitizer	Product as shipped: Not classified. Based on available data, the classification criteria are not met. Additional health effects from elevated temperature processing (e.g., welding): May cause sensitization by inhalation.
Sensitization	Product as shipped: Not classified. Dust and fume from processing: Additional health effects from elevated temperature processing (e.g., welding): May cause sensitization by skin contact.
Carcinogenicity	Not classified. None of this product's components are listed by ACGIH, IARC or NTP. Dust and fumes from welding or elevated temperature processing: Can present a cancer hazard (Hexavalent chromium compounds Welding fume).

ACGIH Carcinogens

Aluminum (CAS 7429-90-5)	A4 Not classifiable as a human carcinogen.
Aluminum oxide (non-fibrous) (CAS 1344-28-1)	A4 Not classifiable as a human carcinogen.
Chromium (CAS 7440-47-3)	A4 Not classifiable as a human carcinogen.
Chromium (III) compounds (CAS Not available)	A4 Not classifiable as a human carcinogen.
Chromium (VI) compounds (CAS 18540-29-9)	A1 Confirmed human carcinogen.
Chromium (VI) compounds, certain water insoluble forms (CAS Not available)	A1 Confirmed human carcinogen.
Chromium (VI) compounds, water soluble forms (CAS Not available)	A1 Confirmed human carcinogen.
Iron oxide (CAS 1309-37-1)	A4 Not classifiable as a human carcinogen.
Magnesium oxide (CAS 1309-48-4)	A4 Not classifiable as a human carcinogen.
Nitrogen dioxide (CAS 10102-44-0)	A4 Not classifiable as a human carcinogen.
Ozone (CAS 10028-15-6)	A4 Not classifiable as a human carcinogen.

IARC Monographs. Overall Evaluation of Carcinogenicity

Chromium (CAS 7440-47-3)	3 Not classifiable as to carcinogenicity to humans.
Chromium (III) compounds (CAS Not available)	3 Not classifiable as to carcinogenicity to humans.
Chromium (VI) compounds (CAS 18540-29-9)	1 Carcinogenic to humans.
Chromium (VI) compounds, certain water insoluble forms) (CAS Not available)	1 Carcinogenic to humans.
Chromium (VI) compounds, water soluble forms (CAS Not available)	1 Carcinogenic to humans.
Iron oxide (CAS 1309-37-1)	3 Not classifiable as to carcinogenicity to humans.
Silica, amorphous (CAS 69012-64-2)	3 Not classifiable as to carcinogenicity to human

US NTP Report on Carcinogens: Known carcinogen

Chromium (VI) compounds (CAS 18540-29-9)	Known To Be Human Carcinogen.
Chromium (VI) compounds, certain water insoluble forms) (CAS Not available)	Known To Be Human Carcinogen.
Chromium (VI) compounds, water soluble forms (CAS Not available)	Known To Be Human Carcinogen.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Chromium (VI) compounds (CAS 18540-29-9)	Cancer hazard.
Chromium (VI) compounds, certain water insoluble forms) (CAS Not available)	Cancer hazard.
Chromium (VI) compounds, water soluble forms (CAS Not available)	Cancer hazard.

Teratogenicity	Not classified. Based on available data, the classification criteria are not met.
Reproductive Toxicity	Product as shipped: Not classified. Based on available data, the classification criteria are not met. Dust and Fumes From Processing: Can present a reproductive hazard for males (Manganese).
Germ Cell Mutagenicity	Not classified. Contains no ingredient listed as a mutagen.
Interactive Effects	Asthma, chronic lung disease, skin rashes and secondary Parkinson's disease.
Neurological Effects	Product as shipped: Not classified. Dust or fume from processing Chronic exposure to breathing low levels of manganese dust or fume over a long period of time can result in "manganism," a disease of the central nervous system similar to Parkinson's Disease, gait impairment, muscle spasms and behavioral changes.
Specific Target Organ Toxicity - Single Exposure	Not classified. Based on available data, the classification criteria are not met.
Specific Target Organ Toxicity - Repeated Exposure	Not classified. Based on available data, the classification criteria are not met. Dust and fume from processing: Chronic overexposures: Can cause scarring of the lungs, skin abnormalities, reduction in the number of red blood cells, central nervous system damage and secondary Parkinson's disease.
Aspiration Hazard	Not applicable.
Symptoms	Dust and fume from processing: Can cause irritation of the upper respiratory tract. Chronic overexposures: Can cause scarring of the lungs (pulmonary fibrosis), skin abnormalities (pigmentation changes), reduction in the number of red blood cells (anemia), central nervous system damage, secondary Parkinson's disease and reproductive harm in males. Health effects from elevated temperature processing (e.g., welding, melting): Dust and fume from processing: Heating above the melting point releases metallic oxides which may cause metal fume fever by inhalation. The symptoms are shivering, fever, malaise and muscular pain. Acute overexposures: Can cause metal fume fever, the accumulation of fluid in the lungs and reduced ability of the blood to carry oxygen. Chronic overexposures: Can cause scarring of the lungs and lung cancer.
Further information	None known.

12. Ecological Information

Ecotoxicity Not expected to be harmful to aquatic organisms.

Product		Species	Test Results
6xxx SERIES ALLOYS WITH ALCOA 951 PRETREATMENT (CAS Mixture)			
Crustacea	EC50	Daphnia	1.693 mg/l, 48 hours, estimated
Fish	LC50	Fish	2.3261 mg/l, 96 hours, estimated

Components		Species	Test Results
Aluminum (CAS 7429-90-5)			
Aquatic			
Crustacea	LC50	Water flea (Daphnia magna)	3.5 mg/l, 24 hours
Fish	LC50	Rainbow trout, Donaldson trout (Oncorhynchus mykiss)	0.31 mg/l, 96 hours 0.16 mg/l, 96 hours 0.12 mg/l, 96 hours
Chromium (CAS 7440-47-3)			
Aquatic			
Crustacea	EC50	Water flea (Daphnia magna)	0.01 - 0.7 mg/l, 48 hours
Fish	LC50	Fathead minnow (Pimephales promelas)	10 - 100 mg/l, 96 hours
Copper (CAS 7440-50-8)			
Aquatic			
Crustacea	EC50	Water flea (Daphnia obtusa)	0.0076 - 0.026 mg/l, 48 hours
Fish	LC50	Bony fish superclass (Osteichthyes)	0.0051 - 0.015 mg/l, 96 hours
Iron (CAS 7439-89-6)			
Aquatic			
Crustacea	LC50	Cockle (Cerastoderma edule)	100 - 330 mg/l, 48 hours
		Common shrimp, sand shrimp (Crangon crangon)	33 - 100 mg/l, 48 hours
Fish	LC50	Channel catfish (Ictalurus punctatus)	> 500 mg/l, 96 hours
Manganese (CAS 7439-96-5)			
Aquatic			
Crustacea	EC50	Water flea (Daphnia magna)	40 mg/l, 48 hours
Zinc (CAS 7440-66-6)			
Aquatic			
Crustacea	EC50	Water flea (Daphnia magna)	2.8 mg/l, 48 hours
Fish	LC50	Fathead minnow (Pimephales promelas)	0.211 - 0.269 mg/l, 96 hours

Compounds Formed During Processing		Species	Test Results
Aluminum oxide (non-fibrous) (CAS 1344-28-1) **Nitrogen dioxide (CAS 10102-44-0)**			
Aquatic			
Fish	LC50	Trench (Tinca tinca)	19.6 mg/l, 96 hours.

Compounds Formed During Processing		Species	Test Results
Ozone (CAS 10028-15-6)			
Aquatic			
Fish	LC50	Rainbow Trout, Donaldson Trout (Oncorhynchus mykiss)	0.0081 - 0.0106 mg/l, 96 hours
Zinc oxide (CAS 1314-13-2)			
Aquatic			
Fish	LC50	Fathead Minnow (Pimephales promelas)	2246 mg/l, 96 hours

Persistence and Degradability No data is available on the degradability of this product.
Bioaccumulative Potential The product is not bioaccumulating.
Mobility in Soil Not considered mobile.
Mobility in General Not applicable.
Other Adverse Effects None known

13. Disposal Considerations

Disposal Instructions Reuse or recycle material whenever possible. If reuse or recycling is not possible, disposal must be made according to local or governmental regulations.

Waste codes RCRA Status: Not federally regulated in the U.S. if disposed of "as is."
RCRA waste codes other than described here may apply depending on use of the product. Status must be determined at the point of waste generation. Refer to 40 CFR 261 or state equivalent in the U.S. TCLP testing is recommended for Chromium.

Waste from residues / unused products Not applicable.

Contaminated Packaging Not applicable.

14. Transport Information

General Shipping Information

Basic Shipping Requirements:

UN Number -
Proper Shipping Name **Not regulated**
Hazard Class -
Packing group -
General Shipping Notes When "Not regulated", enter the proper freight classification, SDS Number and Product Name onto the shipping paperwork.
Disclaimer This section provides basic classification information and, where relevant, information with respect to specific modal regulations, environmental hazards & special precautions. Otherwise, it is presumed that the information is not available/not relevant.

15. Regulatory Information

Inventory Status

Country(s) or Region	Inventory Name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	No
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	No
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

Inventory Information

Japan - ENCS Inventory: Pure metals are not specifically listed by CAS or ENCS number. The class of compounds for each of these metals is listed on the ENCS inventory.

US Federal Regulations

In reference to Title VI of the Clean Air Act of 1990, this material does not contain nor was it manufactured using ozone-depleting chemicals.
All electrical equipment must be suitable for use in hazardous atmospheres involving aluminum powder in accordance with 29 CFR 1910.307. The National Electrical Code, NFPA 70, contains guidelines for determining the type and design of equipment and installation which will meet this requirement.

US EPCRA (SARA Title III) Section 302 - Extremely Hazardous Spill: Reportable quantity

Nitric oxide (CAS 10102-43-9)	10 LBS
Nitrogen dioxide (CAS 10102-44-0)	10 LBS
Ozone (CAS 10028-15-6)	100 LBS

US EPCRA (SARA Title III) Section 302 - Extremely Hazardous Substance: Threshold Planning Quantity

Nitric oxide (CAS 10102-43-9)	100 LBS
Nitrogen dioxide (CAS 10102-44-0)	100 LBS
Ozone (CAS 10028-15-6)	100 LBS

US EPCRA (SARA Title III) Section 313 - Toxic Chemical: De minimis concentration

Aluminum (CAS 7429-90-5)	1.0 %
Aluminum oxide (non-fibrous) (CAS 1344-28-1)	1.0 %
Chromium (CAS 7440-47-3)	1.0 %
Chromium (II) compounds (CAS Not available)	1.0 % N090
Chromium (III) compounds (CAS Not available)	1.0 % N090
Chromium (VI) compounds (CAS 18540-29-9)	0.1 % N090
Chromium (VI) compounds, certain water insoluble forms (CAS Not available)	0.1 % N090
Chromium (VI) compounds, water soluble forms (CAS Not available)	0.1 % N090
Copper (CAS 7440-50-8)	1.0 %
Manganese (CAS 7439-96-5)	1.0 %
Manganese compounds, inorganic (CAS Not available)	1.0 % N450
Ozone (CAS 10028-15-6)	1.0 %
Zinc (CAS 7440-66-6)	1.0 %
Zinc oxide (CAS 1314-13-2)	1.0 % N982

US EPCRA (SARA Title III) Section 313 - Toxic Chemical: Listed substance

Aluminum (CAS 7429-90-5)	Listed.
Aluminum oxide (non-fibrous) (CAS 1344-28-1)	Listed.
Chromium (CAS 7440-47-3)	Listed.
Chromium (III) compounds (CAS Not available)	Listed. N090
Chromium (VI) compounds (CAS 18540-29-9)	Listed. N090
Chromium (VI) compounds, certain water insoluble forms (CAS Not available)	Listed. N090
Chromium (VI) compounds, water soluble forms (CAS Not available)	Listed. N090
Copper (CAS 7440-50-8)	Listed.
Manganese (CAS 7439-96-5)	Listed.
Manganese compounds, inorganic (CAS Not available)	Listed. N450
Ozone (CAS 10028-15-6)	Listed.
Zinc (CAS 7440-66-6)	Listed.
Zinc oxide (CAS 1314-13-2)	Listed. N982

State Regulations

California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):
This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.

US - California Proposition 65 - CRT: Listed date/Carcinogenic substance

Chromium (VI) compounds (CAS 18540-29-9) Listed:	February 27, 1987 Carcinogenic.
Chromium (VI) compounds, certain water insoluble forms (CAS Not available)	Listed: February 27, 1987 Carcinogenic.
Chromium (VI) compounds, water soluble forms (CAS Not available)	Listed: February 27, 1987 Carcinogenic.

US - California Proposition 65 - CRT: Listed date/Developmental toxin

Chromium (VI) compounds (CAS 18540-29-9)	Listed: December 19, 2008 Developmental toxin.
Chromium (VI) compounds, certain water insoluble forms (CAS Not available)	Listed: December 19, 2008 Developmental toxin.
Chromium (VI) compounds, water soluble forms (CAS Not available)	Listed: December 19, 2008 Developmental toxin.

US - California Proposition 65 - CRT: Listed date/Female reproductive toxin

Chromium (VI) compounds (CAS 18540-29-9)	Listed: December 19, 2008 Female reproductive toxin.
Chromium (VI) compounds, certain water insoluble forms (CAS Not available)	Listed: December 19, 2008 Female reproductive toxin.
Chromium (VI) compounds, water soluble forms (CAS Not available)	Listed: December 19, 2008 Female reproductive toxin.

US - California Proposition 65 - CRT: Listed date/Male reproductive toxin

Chromium (VI) compounds (CAS 18540-29-9)	Listed: December 19, 2008 Male reproductive toxin.
Chromium (VI) compounds, certain water insoluble forms (CAS Not available)	Listed: December 19, 2008 Male reproductive toxin.
Chromium (VI) compounds, water soluble forms (CAS Not available)	Listed: December 19, 2008 Male reproductive toxin.

US - New Jersey RTK - Substances: Listed substance

Aluminum (CAS 7429-90-5)	Listed.
Aluminum oxide (non-fibrous) (CAS 1344-28-1)	Listed.
Chromium (CAS 7440-47-3)	Listed.
Chromium (II) compounds (CAS Not available)	Listed.
Chromium (VI) compounds (CAS 18540-29-9)	Listed.
Chromium (VI) compounds, certain water insoluble forms (CAS Not available)	Listed.
Chromium (VI) compounds, water soluble forms (CAS Not available)	Listed.
Copper (CAS 7440-50-8)	Listed.
Iron oxide (CAS 1309-37-1)	Listed.
Magnesium (CAS 7439-95-4)	Listed.
Magnesium oxide (CAS 1309-48-4)	Listed.
Manganese (CAS 7439-96-5)	Listed.
Manganese compounds, inorganic (CAS Not available)	Listed.
Nitric oxide (CAS 10102-43-9)	Listed.
Nitrogen dioxide (CAS 10102-44-0)	Listed.
Ozone (CAS 10028-15-6)	Listed.
Silica, amorphous (CAS 69012-64-2)	Listed.
Silicon (CAS 7440-21-3)	Listed.
Zinc (CAS 7440-66-6)	Listed.
Zinc oxide (CAS 1314-13-2)	Listed.

US - Pennsylvania RTK - Hazardous Substances: All compounds of This Substance are Considered Environmental Hazards

Chromium (CAS 7440-47-3)	Listed.
Copper (CAS 7440-50-8)	Listed.
Manganese (CAS 7439-96-5)	Listed.
Zinc (CAS 7440-66-6)	Listed.

US - Pennsylvania RTK - Hazardous Substances: Special hazard

Chromium (CAS 7440-47-3)	Special hazard.
Chromium (VI) compounds (CAS 18540-29-9)	Special hazard.

Chromium (VI) compounds, certain water insoluble forms (CAS Not available)	Special hazard.
Chromium (VI) compounds, water soluble forms (CAS Not available)	Special hazard.

US. Pennsylvania RTK - Hazardous Substances

Aluminum (CAS 7429-90-5)	Listed.
Aluminum oxide (non-fibrous) (CAS 1344-28-1)	Listed.
Chromium (CAS 7440-47-3)	Listed.
Chromium (VI) compounds, certain water insoluble forms (CAS Not available)	Listed.
Chromium (VI) compounds, water soluble forms (CAS Not available)	Listed.
Copper (CAS 7440-50-8)	Listed.
Iron oxide (CAS 1309-37-1)	Listed.
Magnesium (CAS 7439-95-4)	Listed.
Magnesium oxide (CAS 1309-48-4)	Listed.
Manganese (CAS 7439-96-5)	Listed.
Nitric oxide (CAS 10102-43-9)	Listed.
Nitrogen dioxide (CAS 10102-44-0)	Listed.
Ozone (CAS 10028-15-6)	Listed.
Silica, amorphous (CAS 69012-64-2)	Listed.
Silicon (CAS 7440-21-3)	Listed.
Zinc (CAS 7440-66-6)	Listed.
Zinc oxide (CAS 1314-13-2)	Listed.

CERCLA (Superfund) Reportable Quantity

Copper: 5000
Zinc: 1000
Chromium: 5000

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard Categories	Immediate Hazard - Yes, If particulates/fumes generated during processing. Delayed Hazard - Yes, If particulates/fumes generated during processing. Fire Hazard - No. Pressure Hazard - No. Reactivity Hazard - Yes, If molten.
Section 302 Extremely Hazardous Substance	No.
Section 311 Hazardous Chemical	No.

16. Other Information

Recommended Restrictions	For industrial use only.
Disclaimer	The information in the sheet was written based on the best knowledge and experience currently available.
This data sheet contains changes from the previous version in section(s):	This document has undergone significant changes and should be reviewed in its entirety.
MSDS Status	April 26, 2013: Change(s) in Section: 1, 2, 5, 6, 7, 8, 10, 11, 12, 15 and 16. November 12, 2012 - USA: Change(s) in Section: 1, 2, 4, 5, 6, 7, 8, 10, 11, 13, 15 and 16. October 5, 2012: Change(s) in Section: 1, 2, 3,4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 and 16. April 15, 2010: New format. February 09, 2007: Reviewed on a periodic basis in accordance with Alcoa policy. Change(s) in Section: 2, 3, 5, 7, 8, 10, 11, 12, 13, and 15. September 20, 2005: Reviewed on a periodic basis in accordance with Alcoa policy. Change(s) in Section: 1, 2, 3, 4, 7, 8, 10, 11, 12 and 15 June 04, 2002: Change(s) in Section: 1. Origination date: October 17, 1997 Preparer: Jim Perriello, +1-865-977-2051 SDS System Number: 149475

Other information

- Guide to Occupational Exposure Values 2012, Compiled by the American Conference of Governmental Industrial Hygienists (ACGIH).
- NIOSH Pocket Guide to Chemical Hazards, U.S. Department of Health and Human Services, September 2005.
- expub, Expert Publishing, LLC., www.expub.com,
- Ariel, 3E Company, www.3Ecompany.com
- Aluminum Association's Bulletin F-1, "Guidelines for Handling Aluminum Fines Generated During Various Aluminum Fabricating Operations." The Aluminum Association, 1525 Wilson Boulevard, Suite 600, Arlington, Virginia 22209, www.aluminum.org.
- Aluminum Association, "Guidelines for Handling Molten Aluminum, The Aluminum Association, 1525 Wilson Boulevard, Suite 600, Arlington, Virginia 22209, www.aluminum.org.
- NFPA 484, Standard for Combustible Metals (NFPA phone: 800-344-3555)
- NFPA 654, Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids
- NFPA 70, Standard for National Electrical Code (Electrical Equipment, Grounding and Bonding)
- NFPA 77, Standard for Static Electricity
- NFPA 68, Standard on Explosion Protection by Deflagration Venting
- NFPA 69, Standard on Explosion Prevention Systems

Key/Legend:

ACGIH	American Conference of Governmental Industrial Hygienists
AICS	Australian Inventory of Chemical Substances
CAS	Chemical Abstract Services
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CPR	Cardio-pulmonary Resuscitation
DOT	Department of Transportation
DSL	Domestic Substances List (Canada)
EC	Effective Concentration
ED	Effective Dose
EINECS	European Inventory of Existing Commercial Chemical Substances
ENCS	Japan - Existing and New Chemical Substances
EWC	European Waste Catalogue
EPA	Environmental Protective Agency
IARC	International Agency for Research on Cancer
LC	Lethal Concentration
LD	Lethal Dose
MAK	Maximum Workplace Concentration (Germany) "maximale Arbeitsplatz-Konzentration"
NDSL	Non-Domestic Substances List (Canada)
NIOSH	National Institute for Occupational Safety and Health
NTP	National Toxicology Program
OEL	Occupational Exposure Limit
OSHA	Occupational Safety and Health Administration
PIN	Product Identification Number
PMCC	Pensky Marten Closed Cup
RCRA	Resource Conservation and Recovery Act
SARA	Superfund Amendments and Reauthorization Act
SIMDUT	Système d'Information sur les Matières Dangereuses Utilisées au Travail
STEL	Short Term Exposure Limit
TCLP	Toxic Chemicals Leachate Program
TDG	Transportation of Dangerous Goods
TLV	Threshold Limit Value
TSCA	Toxic Substances Control Act
TWA	Time Weighted Average
WHMIS	Workplace Hazardous Materials Information System

m meter | cm centimeter | mm millimeter | in inch,
g gram | kg kilogram | lb pound | µg microgram,
ppm parts per million | ft feet

*** End of SDS ***

6xxx SERIES ALLOYS WITH ALCOA 951 PRETREATMENT

EMERGENCY OVERVIEW:

WARNING

Non-combustible as supplied. Small chips, fine turnings and dust from processing may be readily ignitable. Explosion/fire hazards may be present when (See Sections 5, 7 and 10 for additional information):
Dust or fines are dispersed in air, Chips, dust or fines are in contact with water, Dust and fines are in contact with certain metal oxides (e.g., rust, copper oxide), and Molten metal in contact with water/moisture or certain metal oxides (e.g., rust, copper oxide).

Dust and fumes from processing:	Can cause irritation of the eyes, skin and respiratory tract. Prolonged or repeated skin contact may cause dermatitis. Health effects from mechanical processing (e.g., cutting, grinding): Dust: Can cause irritation of the upper respiratory tract. Chronic overexposures: Can cause scarring of the lungs, skin abnormalities, reduction in the number of red blood cells, central nervous system damage, secondary Parkinson's disease and reproductive harm in males.
Additional health effects from elevated temperature processing (e.g., welding, melting):	Dust and fumes: Can cause irritation of the respiratory tract. Acute overexposures: Can cause metal fume fever, reduced ability of the blood to carry oxygen and the accumulation of fluid in the lungs. Chronic overexposures: Can cause respiratorysensitization and lung cancer.
	STORAGE: Store in a dry place.
	IN CASE OF SPILL: Clean up in accordance with all applicable regulations. Avoid generating dust clouds. Collect scrap for recycling. If molten: Contain the flow using dry sand or salt flux as a dam. All tooling (e.g., shovels or hand tools) and containers which come in contact with molten metal must be preheated or specially coated, rust free and approved for such use. Allow the spill to cool before remelting as scrap. See SDS 1008.

FIRST AID:

EYES:	Dust and fumes from processing: Rinse eyes with plenty of water or saline for at least 15 minutes. Consult a physician.
SKIN:	Dust and fume from processing or contact with lubricant/residual oil: Wash with soap and water for at least 15 minutes. Get medical attention if irritation develops or persists.
INHALATION:	Dust and fumes from processing: Remove to fresh air. Check for clear airway, breathing, and presence of pulse. If breathing is difficult, provide oxygen. Loosen any tight clothing on neck or chest. Provide cardiopulmonary resuscitation for persons without pulse or respirations. Consult a physician.
INGESTION:	Not likely, due to the form of the product.
IN CASE OF FIRE:	Use Class D extinguishing agents on fines, dust or molten metal. Use coarse water spray on chips and turnings. **DO NOT USE** halogenated extinguishing agents on small chips/fines. **DO NOT USE** water in fighting fires around molten metal. These fire extinguishing agents will react with the burning material.
HANDLING:	Keep material dry. Avoid generating dust. Avoid contact with sharp edges or heated metal. Hot and cold aluminum are not visually different. Use personal protection recommended in Section 8 of the SDS.
STORAGE:	Store in a dry place.
IN CASE OF SPILL:	Clean up in accordance with all applicable regulations. Avoid generating dust clouds. Collect scrap for recycling. If molten: Contain the flow using dry sand or salt flux as a dam. All tooling (e.g., shovels or hand tools) and containers which come in contact with molten metal must be preheated or specially coated, rust free and approved for such use. Allow the spill to cool before remelting as scrap. See SDS 1008.

USA: Chemtrec: +1-703-527-3887 +1-800-424-9300 (24 Hour Emergency Telephone, multiple languages spoken)