

MATERIAL SAFETY DATA SHEET

1. Product and Company Identification

Material name WROUGHT ALUMINUM PRODUCTS, 1xxx SERIES ALLOYS
MSDS Number 663
Version # 06
Revision date July 27, 2012.
CAS Number Mixture
Product use Various fabricated aluminum parts and products
Synonym(s) 1xxx series alloys, * 1xxx Cladding, Alcoa Spectrochemical Standards. 1120, 1350, 1350BS, 1350EC, 1435, 980LR, 990LR, 995LR, AL5, * C01A, C01B, C01C, C01H, C02A, C02J, C03A, C09Z, C14C, C17N, C18B, C18E, C19B, C19P, C22H, C22U, C23U, C27B, C29C, * C30E, C30J, C31C, C33S, C33U, C34U, C35A, C37B, C43K, C46C, C47C, C47S, C49A, C50E, C50R, C52R, C53A, C58D, * C65A, C70A, C71A, C80B, C82J, C88A, C89N, C91Z, C96Z, C99A, C99D, C99J, C178, C196, C479, C481, C500, C502, C515F, C531, C533F, C577F, C578, C586F, * C794, C795, C796, C797, C798, C799, C416F, C426F, CW65, CZ60, Clad 1100, KB10, MD56, MD115, MD119, MD230, MD251, MD335, MR174, RA91, RA179, W005, W006

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Website For a current Material Safety Data Sheet, refer to Alcoa websites: www.alcoa.com or internally at my.alcoa.com EHS Community

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 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).
- Molten metal in contact with water/moisture or certain metal oxides (e.g., rust, copper oxide).

Dust from processing: Can cause irritation of the eyes, skin and upper respiratory tract.
Additional health effects from elevated temperature processing (e.g., welding, plasma arc cutting):
Acute overexposures: Can cause the accumulation of fluid in the lungs and reduced ability of the blood to carry oxygen.

Potential health effects

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

Eyes Dust and fumes from processing: Can cause irritation.

Skin Dust and fumes from processing: Can cause irritation.
Contact with residual oil/oil coating: Can cause irritation. Prolonged or repeated skin contact may cause dermatitis.

Inhalation

Health effects from mechanical processing (e.g., cutting, grinding): Dust: Can cause irritation of the upper respiratory tract.

Additional health effects from elevated temperature processing (e.g., welding, plasma arc cutting): Acute overexposures: Can cause the accumulation of fluid in the lungs (pulmonary edema) and reduced ability of the blood to carry oxygen (methemoglobin). Chronic overexposures: Can cause scarring of the lungs (pulmonary fibrosis) and lung cancer.

Carcinogenicity and Reproductive Hazard

Product as shipped: Does not present any cancer or reproductive hazards.
Dust from mechanical processing: Does not present any cancer or reproductive hazards.
Dust and fumes from welding or elevated temperature processing: Can present a cancer hazard (Welding fumes). Does not present any reproductive hazards.

Medical conditions aggravated by exposure to product

Dust and fume from processing: Asthma, chronic lung disease, and skin rashes.

Potential environmental effects

This material is not expected to be harmful to aquatic life.

3. Composition / Information on Ingredients

Composition comments

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

Components	CAS #	Percent
Aluminum	7429-90-5	>= 98.9

Additional Information

Nickel (7440-02-0): May be present in trace amounts (<0.06%) in alloy(s): C01A, C17N, C18B, C19P, C29C, C31C, C426F, C50E, C52R, C515F, C53A, C586F, C88A, C91Z, C98Z, C799, ECE6, 1060, 1120, 1145, 1200A, 1235, 1350

Lead (7439-92-1): May be present in trace amounts (<0.03%) in alloy(s): C37B, C426F, C88A, C99J, 1050, 1100

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 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.

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

Special hazards arising from the substance or mixture

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.

Explosion data

Sensitivity to mechanical impact

Not applicable

Sensitivity to static discharge

Not applicable

6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

Avoid generating dust. Avoid contact with sharp edges or heated metal. Use personal protection recommended in Section 8 of the SDS.

For emergency responders

No additional information.

Environmental precautions

No special environmental precautions required.

Evacuation procedures

Molten metal: 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.

Methods and material for containment and cleaning up

Not available.

Reference to other sections

For personal protection, see section 8 of the SDS. For waste disposal, see section 13 of the SDS.

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. Hot aluminum does not necessarily glow red.

Storage

Keep material dry.

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 small chunks, fines or dust to contact water, particularly in enclosed areas.

Avoid all ignition sources. Good housekeeping practices must be maintained. 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.

8. Exposure Controls / Personal Protection

Engineering controls

Dust and fumes from processing: Use with adequate explosion-proof ventilation to meet the limits listed in Section 8.

Personal protective equipment

Eye / face protection

Wear safety glasses with side shields.

Skin and body protection

Wear impervious gloves to avoid repeated or prolonged skin contact with residual oils and to avoid any skin injury.

Thermal hazards

Hot aluminum does not necessarily glow red.

Respiratory protection

Dust and fumes from 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.

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 (7429-90-5)	TWA	15 mg/m ³	(Total dust)

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

Components	Type	Value	Form
Aluminum (7429-90-5)	PEL	5 mg/m3 15 mg/m3	Respirable dust. Total dust.
Compounds Formed During Processing	Type	Value	Form
Aluminum oxide (non-fibrous) (1344-28-1)	PEL	5 mg/m3 15 mg/m3	Respirable fraction. Total dust.
Mineral oil (8012-95-1)	PEL	5 mg/m3	Mist.
Nitric oxide (10102-43-9)	PEL	30 mg/m3	
Nitrogen dioxide (10102-44-0)	Ceiling	25 ppm 9 mg/m3	
Ozone (10028-15-6)	PEL	5 ppm 0.2 mg/m3 0.1 ppm	
Alcoa Components	Type	Value	Form
Aluminum (7429-90-5)	TWA	3 mg/m3 10 mg/m3	Respirable fraction Total dust
Compounds Formed During Processing	Type	Value	Form
Aluminum oxide (non-fibrous) (1344-28-1)	TWA	3 mg/m3	Respirable fraction.
Mineral oil (8012-95-1)	TWA	10 mg/m3 0.5 mg/m3	Total dust.
ACGIH Compounds Formed During Processing	Type	Value	Form
Aluminum oxide (non-fibrous) (1344-28-1)	TWA	1 mg/m3	Respirable fraction, as Al
Ozone (10028-15-6)	TWA	0.1 ppm 0.08 ppm 0.05 ppm	(light work) (moderate work) (heavy work)
US. ACGIH Threshold Limit Values	Type	Value	Form
Aluminum (7429-90-5)	TWA	1 mg/m3	Respirable fraction.
Compounds Formed During Processing	Type	Value	Form
Mineral oil (8012-95-1)	TWA	5 mg/m3	Inhalable fraction.
Nitric oxide (10102-43-9)	TWA	25 ppm	
Nitrogen dioxide (10102-44-0)	STEL	5 ppm	
Ozone (10028-15-6)	TWA	3 ppm	
	TWA	0.05 ppm	

9. Physical & Chemical Properties

Appearance	Silver colored.
Form	Solid.
Odor	Odorless
Odor threshold	Not applicable
pH	Not applicable
Vapor pressure	Not applicable
Vapor density	Not applicable
Boiling point	Not determined
Melting point/Freezing point	1189.4 - 1214.6 °F (643 - 657 °C)

Solubility (water)	Insoluble
Density	2.7 - 2.71 g/cm ³
Flash point	Not applicable
Flammability limits in air, upper, % by volume	Not applicable
Flammability limits in air, lower, % by volume	Not applicable
Auto-ignition temperature	Not applicable
Partition coefficient (n-octanol/water)	Not applicable

10. Chemical Stability & Reactivity Information

Chemical stability	Stable under normal conditions of use, storage, and transportation.
Conditions to avoid	<p>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.</p> <p>Coils of foil may be a potential hazard under the following conditions:</p> <ul style="list-style-type: none"> • 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 <p>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.</p>
Incompatible materials	Strong acids and oxidizing agents.
Hazardous decomposition products	No hazardous decomposition products are known.
Possibility of hazardous reactions	<p>Chips, fines, dust and molten metal are considerably more reactive with the following:</p> <ul style="list-style-type: none"> • Water: Slowly generates flammable and explosive hydrogen gas and heat. Generation rate is greatly increased with smaller particles (e.g., fines and dusts). Water/aluminum mixtures may be hazardous when confined. • Heat: Oxidizes at a rate dependent upon temperature and particle size. • 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. • Iron powder and water: Explosive reaction forming hydrogen gas when heated above 1470°F (800°C).

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).

Some products are supplied with an oil coating or have residual oil from the manufacturing process.
Oil: 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.

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 (methemoglobin). 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).

Compounds 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

Aluminum oxide (non-fibrous) (1344-28-1)

Acute Oral LD50 Rat: > 5000 mg/kg

Component analysis - LD50

No data available for this product.

Routes of exposure

Eye contact. Skin contact. Inhalation.

Acute effects

Not applicable.

Chronic effects

Not applicable.

Skin corrosion/irritation

Non-corrosive.

Serious eye damage/eye irritation

Dust and fume from processing: May irritate eyes.

Respiratory hazards

Dust and fume from processing: May cause irritation to the respiratory system.

Sensitization

Not a skin sensitizer.

Carcinogenicity

Contains no ingredient listed as a carcinogen

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.

Mineral oil (CAS 8012-95-1)

A2 Suspected 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.

A4 Not classifiable as a human carcinogen.

US NTP Report on Carcinogens: Known carcinogen

Mineral oil (CAS 8012-95-1)

Known To Be Human Carcinogen.

Teratogenicity

Not applicable.

Reproductive toxicity

Contains no ingredient listed as toxic to reproduction

Germ cell mutagenicity

Contains no ingredient listed as a mutagen

Synergistic materials

None known.

Interactive effects

Not available.

Neurological effects

Not classified.

Specific target organ toxicity - single exposure

Not classified.

Specific target organ toxicity - repeated exposure Not classified.

Aspiration hazard Not applicable.

12. Ecological Information

Ecotoxicological data

Components

Test Results

Aluminum (7429-90-5)

LC50 Rainbow trout,donaldson trout (Oncorhynchus mykiss): 0.16 mg/l 96 hours

LC50 Rainbow trout,donaldson trout (Oncorhynchus mykiss): 0.31 mg/l 96 hours

LC50 Rainbow trout,donaldson trout (Oncorhynchus mykiss): 0.12 mg/l 96 hours

LC50 Water flea (Daphnia magna): 3.5 mg/l 24 hours

Compounds Formed During Processing

Test Results

Ozone (10028-15-6)

LC50 Rainbow trout,donaldson trout (Oncorhynchus mykiss): 0.0081 - 0.0106 mg/l 96 hours

Nitrogen dioxide (10102-44-0)

LC50 Tench (Tinca tinca): 19.6 mg/l 96 hours

Aluminum oxide (non-fibrous) (1344-28-1)

Ecotoxicity This material is not expected to be harmful to aquatic life.

Persistence and degradability The product contains inorganic compounds which are not biodegradable.

Bioaccumulation / Accumulation Will not bio-accumulate.

Partition coefficient Not applicable

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: Must be determined at the point of waste generation. If material is disposed as a waste, it must be characterized under RCRA according to 40 CFR, Part 261, or state equivalent in the U.S.

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, MSDS 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 and 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

Country(s) or region	Inventory name	On inventory (yes/no)*
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)	Yes
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)

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.

Drug Enforcement Administration (DEA). List 2, Essential Chemicals (21 CFR 1310.02(b) and 1310.04(f)(2))

Not regulated

DEA Essential Chemical Code Number

Not regulated

Drug Enforcement Administration (DEA). List 1 & 2 Exempt Chemical Mixtures (21 CFR 1310.12(c))

Not regulated

DEA Exempt Chemical Mixtures Code Number

Not regulated

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 %
Ozone (CAS 10028-15-6)	1.0 %

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.
Ozone (CAS 10028-15-6)	Listed.

State regulations This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm. 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 - New Jersey RTK - Substances: Listed substance

Aluminum (CAS 7429-90-5)	Listed.
Aluminum oxide (non-fibrous) (CAS 1344-28-1)	Listed.
Mineral oil (CAS 8012-95-1)	Listed.
Nitric oxide (CAS 10102-43-9)	Listed.
Nitrogen dioxide (CAS 10102-44-0)	Listed.
Ozone (CAS 10028-15-6)	Listed.

US - Pennsylvania RTK - Hazardous Substances: Listed substance

Aluminum (CAS 7429-90-5)	Listed.
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Aluminum oxide (non-fibrous) (CAS 1344-28-1)	Listed.
Mineral oil (CAS 8012-95-1)	Listed.
Nitric oxide (CAS 10102-43-9)	Listed.
Nitrogen dioxide (CAS 10102-44-0)	Listed.
Ozone (CAS 10028-15-6)	Listed.

CERCLA (Superfund) reportable quantity

None

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories Immediate Hazard - Yes, If particulates are generated during processing
 Delayed Hazard - Yes, If particulates are 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

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 July 27, 2012: Reviewed on a periodic basis in accordance with Alcoa policy. Change(s) in Section: 1, 2, 3, 6, 8, 11, 12 and 15.
 May 6, 2009: New format.
 Change(s) in Section: 1, 2, 4, 5, 7, 8, 10, 11, 12 and 15.
 August 20, 2003: Reviewed on a periodic basis in accordance with Alcoa policy. Change(s) in Section: 1, 3, 8 and 15.
 Origination date: March 16, 1990

Preparer: Jim Perriello, +1-865-977-2051

MSDS System Number: 115949

Other information

- 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

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 MSDS ***