



MATERIAL SAFETY DATA SHEET

1. Product and Company Identification

| | |
|--------------------------|--|
| Material Name | WROUGHT ALUMINUM PRODUCTS, 1xxx SERIES ALLOYS |
| MSDS Number | 663 |
| Chemical Formula | 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, C49E, C50E, C53A, C53E, C58D, * C65A, C70A, C71A, C71H, C80B, C82J, C88A, C89N, C91Z, C96E, C99A, C99D, C178, C196, C479, C481, C500, C502, C531, C578, * C794, C795, C796, C797, C798, C799, C416F, CW65, CZ60, Clad 1100, KB10, MD56, MD115, MD119, MD230 * MD251, MD335, MR174, RA91, RA179, W005, W006 |
| Manufacturer information | Alcoa Inc. 201 Isabella Street Pittsburgh, PA 15212-5858 US Health and Safety: +1-412-553-4649 |
| Emergency Information | USA: Chemtrec: +1-703-527-3887 +1-800-424-9300 ALCOA: +1-412-553-4001 |
| Website | For a current MSDS, refer to Alcoa websites: www.alcoa.com or Internally at my.alcoa.com EHS Community |

2. Hazards Identification

| | |
|--|--|
| Emergency overview | <p>Solid. Silver colored. Odorless. Non-combustible as supplied. Small chips, fine turnings and dust from processing may be readily ignitable.</p> <p>Explosion/fire hazards may be present when (See Sections 5, 7 and 10 for additional information):</p> <ul style="list-style-type: none">• Dust or fines are dispersed in air.• Chips, fines or dust 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). <p>Dust and fumes from processing: Can cause irritation of the eyes, skin and upper respiratory tract.</p> |
| Potential health effects | <p>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.</p> <p>Eyes Dust and fumes from processing: Can cause irritation.</p> <p>Skin Contact with residual oil/oil coating: Can cause irritation. Prolonged or repeated skin contact may cause dermatitis.</p> <p>Inhalation Dust and fumes from mechanical processing: Can cause irritation of the upper respiratory tract.</p> <p>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.</p> |
| Carcinogenicity and Reproductive Hazard | <p>Product as shipped: Does not present any cancer or reproductive hazards.</p> <p>Dust and fumes from mechanical processing: Does not present any cancer or reproductive hazards.</p> <p>Dust and fumes from welding or elevated temperature processing: Can present a cancer hazard (Welding fumes). Does not present any reproductive hazards.</p> |
| Medical conditions aggravated by exposure to product | Dust or fume from processing: Asthma, chronic lung disease, and skin rashes. |

3. Composition / Information on Ingredients

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|----------------------|---|
| 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 (<0.04%) in alloy(s): C17N, C18B, C19P, C29C, C31C, C47S, C53A, C91Z, C799, 1060, 1120, 1145, 1235, 1350 Lead (7439-92-1): May be present in trace amounts (<0.03%) in alloy(s): C37B,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 fume from processing: Rinse eyes with plenty of water or saline for at least 15 minutes. Consult a physician. | |
| Skin contact | Dust or 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 fume from processing: Remove to fresh air. Check for clear airway, breathing, and presence of pulse. Provide cardiopulmonary resuscitation for persons without pulse or respirations. Consult a physician. | |
| 5. Fire Fighting Measures | | |
| Flammable/Combustible Properties | This product does not present fire or explosion hazards as shipped. Small chips, fine turnings, and dust from processing may be readily ignitable. | |
| Fire / Explosion Hazards | May be a potential hazard under the following conditions: <ul style="list-style-type: none">• 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. | |
| 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 | | |
| Protective equipment for firefighters | Fire fighters should wear NIOSH approved, positive pressure, self-contained breathing apparatus and full protective clothing when appropriate. | |
| 6. Accidental Release Measures | | |
| 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 and rust free. 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. Hot aluminum does not necessarily glow red. | |

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. 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 and containers which come in contact with molten metal must be preheated or specially coated and rust free. Molds and ladles must be preheated or oiled prior to casting. Any surfaces that may contact molten metal (i.e., 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 fume from processing: Use with adequate explosion-proof ventilation to meet the limits listed in Section 8.

Occupational exposure limits

U.S. - OSHA

Components

| | Type | Value | Form |
|----------------------|------------------|----------------------|-----------------------|
| Aluminum (7429-90-5) | TWA | 5 mg/m ³ | (respirable fraction) |
| | TWA (total dust) | 15 mg/m ³ | (total dust) |

Compounds Formed During Processing

| | Type | Value | Form |
|--|------------------|----------------------|-----------------------|
| Aluminum oxide (non-fibrous) (1344-28-1) | TWA | 5 mg/m ³ | (respirable fraction) |
| | TWA (total dust) | 15 mg/m ³ | (total dust) |
| Mineral oil (8012-95-1) | TWA | 5 mg/m ³ | |
| Nitric oxide (10102-43-9) | TWA | 25 ppm | |
| | | 30 mg/m ³ | |
| Nitrogen dioxide (10102-44-0) | Ceiling | 5 ppm | |

| Compounds Formed During Processing | Type | Value | Form |
|--|------------------|---------------------------------|---|
| Ozone (10028-15-6) | TWA | 9 mg/m3 0.1 ppm 0.2 mg/m3 | |
| Alcoa | | | |
| Components | Type | Value | Form |
| Aluminum (7429-90-5) | TWA | 5 mg/m3 10 mg/m3 | (respirable fraction) (8 Hour) |
| Compounds Formed During Processing | Type | Value | Form |
| Aluminum oxide (non-fibrous) (1344-28-1) | TWA | 10 mg/m3 5 mg/m3 | (8 Hour) (respirable fraction) |
| Mineral oil (8012-95-1) | TWA | 0.5 mg/m3 | (8 Hour) |
| ACGIH | | | |
| Components | Type | Value | Form |
| Aluminum (7429-90-5) | TWA | 1 mg/m3 | (respirable fraction) |
| Compounds Formed During Processing | Type | Value | Form |
| Aluminum oxide (non-fibrous) (1344-28-1) | TWA | 1 mg/m3 | (respirable fraction, as Al) |
| Mineral oil (8012-95-1) | STEL | 10 mg/m3 | (sampled by method that does not collect vapor) |
| | TWA | 5 mg/m3 | (sampled by method that does not collect vapor) |
| Nitric oxide (10102-43-9) | TWA | 25 ppm | |
| Nitrogen dioxide (10102-44-0) | STEL | 5 ppm | |
| | TWA | 3 ppm | |
| Ozone (10028-15-6) | TWA | 0.08 ppm 0.1 ppm 0.2 ppm | (moderate work) (light work) (any workload, <= 2 hours) |
| | TWA (heavy work) | 0.05 ppm | (heavy work) |

Personal protective equipment

| | |
|-------------------------------|--|
| Eye / face protection | Wear safety glasses with side shields. |
| Skin protection | Wear impervious gloves to avoid repeated or prolonged skin contact with residual oils and to avoid any skin injury. |
| Respiratory protection | Dust and fume 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. |

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.

9. Physical & Chemical Properties

| | |
|----------------------------------|-----------------------------------|
| Form | Solid. |
| Appearance | Silver colored. |
| Boiling point | Not applicable |
| Melting point | 1189.4 - 1214.6 °F (643 - 657 °C) |
| Flash point | Not applicable |
| Auto-ignition temperature | Not applicable |

| | |
|---|------------------------------|
| Flammability limits in air, lower, % by volume | Not applicable |
| Flammability limits in air, upper, % by volume | Not applicable |
| Vapor pressure | Not applicable |
| Vapor density | Not applicable |
| Solubility (water) | Insoluble |
| Density | 2.7 - 2.71 g/cm ³ |
| pH | Not applicable |
| Odor | Odorless. |
| Partition coefficient (n-octanol/water) | Not applicable |

10. Chemical Stability & Reactivity Information

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|----------------------------|--|
| Chemical stability | Stable under normal conditions of use, storage, and transportation as shipped. |
| Conditions to avoid | <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/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. • 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. 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). |

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).

Component analysis - LD50 No data available for this product.

Compounds Formed During Processing

Toxicology Data - Selected LD50s and LC50s

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

Oral LD50 Rat: >5000 mg/kg

Mineral oil (8012-95-1)

Oral LD50 Mouse: 22 g/kg

Nitric oxide (10102-43-9)

Inhalation LC50 Rat: 1068 mg/m³/4H

Nitrogen dioxide (10102-44-0)

Inhalation LC50 Rat: 88 ppm/4H; Inhalation LC50 Rat: 165 mg/m³/4H; Inhalation LC50 Rat: 220 mg/m³/1H

Ozone (10028-15-6)

Inhalation LC50 Rat: 4800 ppb/4H

Carcinogenicity No information available for product.

Components

ACGIH - Threshold Limit Values - Carcinogens

Aluminum (7429-90-5)

A4 - Not Classifiable as a Human Carcinogen

Compounds Formed During Processing

ACGIH - Threshold Limit Values - Carcinogens

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

A4 - Not Classifiable as a Human Carcinogen

Nitrogen dioxide (10102-44-0)

A4 - Not Classifiable as a Human Carcinogen

Ozone (10028-15-6)

A4 - Not Classifiable as a Human Carcinogen

IARC - Group 2B (Possibly Carcinogenic to Humans)

Welding fumes (RR-00020-4)

Monograph 49 [1990]

12. Ecological Information

Environmental Fate No data available for product.

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 description:

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|----------------------|---------------|
| 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.

15. Regulatory Information

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.

Components

U.S. - CERCLA/SARA - Section 313 - Emission Reporting

| | |
|----------------------|--|
| Aluminum (7429-90-5) | 1.0 % de minimis concentration (dust or fume only) |
|----------------------|--|

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 |

State regulations

Components

U.S. - California - 8 CCR Section 339 - Director's List of Hazardous Substances

| | |
|----------------------|---------|
| Aluminum (7429-90-5) | Present |
|----------------------|---------|

U.S. - Massachusetts - Right To Know List

| | |
|----------------------|---------|
| Aluminum (7429-90-5) | Present |
|----------------------|---------|

U.S. - Minnesota - Hazardous Substance List

| | |
|----------------------|----------------|
| Aluminum (7429-90-5) | Present (dust) |
|----------------------|----------------|

U.S. - New Jersey - Right to Know Hazardous Substance List

| | |
|----------------------|---------|
| Aluminum (7429-90-5) | sn 0054 |
|----------------------|---------|

U.S. - Pennsylvania - RTK (Right to Know) List

| | |
|----------------------|----------------------|
| Aluminum (7429-90-5) | Environmental hazard |
|----------------------|----------------------|

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 New and Existing Chemicals (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 | No |
| Philippines | Philippine Inventory of Chemicals and Chemical Substances (PICCS) | Yes |

| Country(s) or region | Inventory name | On inventory (yes/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)

16. Other Information

| | |
|---------------------------|---|
| MSDS History | <p>Origination date: March 16, 1990</p> <p>Supersedes: October 26, 2006</p> <p>Revision date: May 6, 2009</p> |
| MSDS Status | <p>May 6, 2009: New format.</p> <p>October 26, 2006: Reviewed on a periodic basis in accordance with Alcoa policy. Change(s) in Section: 1, 2, 4, 5, 7, 8, 10, 11, 12 and 15.</p> <p>August 20, 2003: Reviewed on a periodic basis in accordance with Alcoa policy. Change(s) in Section: 1, 3, 8 and 15.</p> |
| Prepared By | <p>Hazardous Materials Control Committee</p> <p>Preparer: Jon N. Peace, 412-553-2293/Robert W. Barr, 412-553-2618</p> |
| MSDS System Number | 115949 |
| Other information | <ul style="list-style-type: none"> 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 65, Standard for Processing and Finishing of Aluminum (NFPA phone: 800-344-3555) NFPA 651, Standard for Manufacture of Aluminum and Magnesium Powder NFPA 70, Standard for National Electrical Code (Electrical Equipment, Grounding and Bonding) NFPA 77, Standard for Static Electricity Guide to Occupational Exposure Values-2009, Compiled by the American Conference of Governmental Industrial Hygienists (ACGIH). Documentation of the Threshold Limit Values and Biological Exposure Indices, Sixth Edition, 1991, Compiled by the American Conference of Governmental Industrial Hygienists, Inc. (ACGIH). NIOSH Pocket Guide to Chemical Hazards, U.S. Department of Health and Human Services, February 2004. Patty's Industrial Hygiene and Toxicology: Volume II: Toxicology, 4th ed., 1994, Patty, F. A.; edited by Clayton, G. D. and Clayton, F. E.: New York: John Wiley & Sons, Inc. expub, www.expub.com, Expert Publishing, LLC. |

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 ***

WROUGHT ALUMINUM PRODUCTS, 1xxx SERIES ALLOYS

WARNING

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

Explosion/fire hazards may be present when:

Dust or fines are dispersed in air; Chips, fines or dust 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 and fumes 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. Chronic overexposures: Can cause scarring of the lungs and lung cancer.

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

FIRST AID

| | |
|---------------------|---|
| Eye contact | Dust and fume from processing: Rinse eyes with plenty of water or saline for at least 15 minutes. Consult a physician. |
| Skin contact | Dust or 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 fume from processing: Remove to fresh air. Check for clear airway, breathing, and presence of pulse. Provide cardiopulmonary resuscitation for persons without pulse or respirations. Consult a physician. |

FIRE FIGHTING

| | |
|--|---|
| Suitable extinguishing media | Use Class D extinguishing agents on fines, dust or molten metal. Use coarse water spray on chips and turnings. |
| Extinguishing media which must not be used for safety reasons | 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. |

SPILL PROCEDURES

| | |
|--------------------------------|--|
| 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 and rust free. Allow the spill to cool before remelting as scrap. |
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HANDLING AND STORAGE

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| 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. |
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See Alcoa Material Safety Data Sheet No. 663 for more information about use and disposal.
Emergency Phone: (412) 553-4001.

Contains:

Aluminum

7429-90-5