

MATERIAL SAFETY DATA SHEET

Product Name: PAINTED or PRETREATED ALUMINUM EXTRUSIONS

SECTION I. PRODUCT AND COMPANY IDENTIFICATION

Product Name: PAINTED OR PRETREATED ALUMINUM EXTRUSIONS
Product Use: Various Fabricated Aluminum Parts and Products
Chemical formula: Mixture
Other Designations: Aluminum Alloys 6xxx Series

Manufacturer: Anenda Systems, Inc. – AL 13
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SECTION II. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Properties:

- Solid
- Various Colors
- Odorless
- Non-combustible as supplied

Processes that generate small chips and turnings also produce dust that may be readily ignitable.

POTENTIAL HEALTH EFFECTS (If dust or fumes are generated by processing)

- **Eyes:** Can cause irritation.
- **Skin:** Can cause irritation.
- **Inhalation:** Can cause irritation of upper respiratory tract, metal fume fever and other health effects listed below.

HEALTH EFFECTS OF INGREDIENTS

Aluminum dust, fines and fumes: Low health risk by inhalation. Generally considered to be biologically inert (milling, cutting, grinding).

HEALTH EFFECTS OF ADDITIONAL COMPOUNDS THAT MAY BE FORMED DURING PROCESSING

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

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1. **Magnesium Oxide Fumes:** Can cause irritation of eyes and respiratory tract. Acute overexposures: Can cause nausea, fever, chills, shortness of breath and malaise (metal fume fever).
2. **Alumina (Aluminum Oxide):** Low risk by inhalation. Generally considered to be biologically inert. Welding, plasma arc cutting and arc spray metalizing can generate ozone.
3. **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 with experimental animals by inhalation have found genetic damage, reproductive harm, blood cell damage, lung damage and death.
4. **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.
5. **Oxides of Nitrogen (NO and NO₂):** Plasma arc cutting can generate oxides of nitrogen. 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, the accumulation of fluid in the lungs (pulmonary edema) and death. Effects may be delayed up to 2-3 weeks. Nitrogen dioxide (NO₂), chronic overexposures: Can cause scarring of the lungs (pulmonary fibrosis).

IARC Classification Definitions: (Group 2B) The agent is possibly carcinogenic to humans. Generally includes agents for which there is limited evidence in humans and less than sufficient evidence in experimental animals.

Medical Conditions Aggravated By Exposure to the Product and/or Components

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

SECTION III. COMPOSITION/INFORMATION ON INGREDIENTS

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

Component	CAS#	Percent
Aluminum	7429-90-5	85-95
Magnesium	7439-95-4	<1.2
Coatings which include acrylic and polyester	Not Available	0-15

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Additional compounds which may be formed during processing or recycling are listed below in Section VIII.

SECTION IV. FIRST AID MEASURES

Eyes: Dust or fume from processing: Flush eyes with plenty of water or saline for at least 15 minutes. Consult a physician.

Skin: Dust or fume from processing: Wash skin with soap and water for at least 15 minutes. Consult a physician if irritation persists.

Inhalation: Dust or fume from processing: Remove to fresh air. If unconscious or severely injured, check for clear airway, breathing and presence of pulse. Perform CPR if there is no pulse or respiration. Consult a physician.

SECTION V. FIRE FIGHTING MEASURES

Flammable/Combustible Properties

This product does not present fire or explosion hazards as shipped. Processes that generate small chips and turnings, also produces dust that may be readily ignitable.

Fire/Explosion

May be a potential hazard under the following conditions:

- Dust or fines dispersed in the air can be explosive. Even a minor dust cloud can explode violently.
- Chips, dust or fines in contact with water can generate flammable/explosive hydrogen gas. Hydrogen gas could present an explosion hazard in confined or poorly ventilated spaces.
- Dust or fines in contact with certain metal oxides (e.g., rust). A thermite reaction, with considerable heat generation, can be initiated by a weak ignition source.
- Molten metal in contact with water/moisture or other metal oxides (e.g., rust, copper oxide). Moisture entrapped by molten metal can be explosive. Contact of molten aluminum with other 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

Use Class D extinguishing agents on dusts, fines or molten metal. Use Class ABC Dry Chemical extinguishers for all other fires.

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Unsuitable Extinguishing Media

DO NOT USE:

- Halogenated agents on small chips, dusts or fines.
- Water around molten metal.

These agents will react with the burning material.

Fire Fighting Equipment/Instructions

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

SECTION VI. ACCIDENTAL RELEASE MEASURES

Small/Large Spill

Collect scrap for recycling. *If molten:* Contain the flow using dry sand or salt flux as a dam. Do not use shovels or hand tools to halt the flow of molten aluminum. Allow the spill to cool before remelting as scrap.

SECTION VII. HANDLING AND STORAGE

Handling/Storage

Product should be kept 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 Fumes

If processing of these products includes operations where dust or 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. Cover and reseal partially empty containers. Use non-sparking handling equipment. Provide grounding and bonding where necessary to prevent accumulation of static charges during dust handling and transfer operations. (See SECTION XV).

Local ventilation and vacuum systems must be designed to handle explosive dusts. Dry vacuums and

electrostatic precipitators must not be used. 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.

Requirements for Remelting of Scrap Material and/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 are known to have caused explosions in melting operations. While the

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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 (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 or heavy 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 internal metal temperature of the coldest item of the batch to 400°F and then hold at that temperature for 6 hours.

SECTION VIII. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS

If dust or fumes are generated through processing: Use with adequate explosion-proof ventilation to meet the limits listed in Section 8, Exposure Guidelines.

PERSONAL PROTECTIVE EQUIPMENT

Respiratory Protection

If dust or 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 VIII, Exposure Guidelines. Suggested respiratory protection: N95.

Eye Protection: Wear safety glasses/goggles to avoid eye injury.

Skin Protection: Wear appropriate gloves to avoid any skin injury.

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).

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EXPOSURE GUIDELINES

A: General Product Information: No information available for product.

B: Component Exposure Limits

Aluminum (7429-90-5)

ACGIH 10 mg/m³ TWA (metal dust)

OSHA 15 mg/m³ TWA (total dust); 5 mg/m³ TWA (respirable fraction)

C: Exposure Limits for Additional Compounds Which May Be Formed During Processing

1. Alumina (non-fibrous) (1344-28-1)

ACGIH 10 mg/m³ TWA (particulate matter containing no asbestos and < 1% crystalline silica)

OSHA 15 mg/m³ TWA (total dust); 5 mg/m³ TWA (respirable fraction)

2. Magnesium oxide fume (1309-48-4)

ACGIH 10 mg/m³ TWA (inhalable fraction)

OSHA 15 mg/m³ TWA (total particulate)

3. Ozone (10028-15-6)

ACGIH 0.05 ppm TWA (heavy work); 0.08 ppm TWA (moderate work); 0.10 ppm TWA (light work); 0.20 ppm TWA (heavy, moderate or light workloads, less than or equal to 2 hours)

OSHA 0.1 ppm TWA; 0.2 mg/m³ TWA

4. Nitric oxide (10102-43-9)

ACGIH 25 ppm TWA

OSHA 25 ppm TWA; 30 mg/m³ TWA

5. Nitrogen dioxide (10102-44-0)

ACGIH 3 ppm TWA

ACGIH 5 ppm STEL

OSHA 5 ppm Ceiling; 9 mg/m³ Ceiling

Physical State:

Solid

Appearance:

Various Colors

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SECTION X. CHEMICAL STABILITY AND REACTIVITY INFORMATION

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:

- **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) particularly 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 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:** An explosive reaction forming hydrogen gas occurs when heated above 1470°F (800°C).

SECTION XI. TOXICOLOGICAL INFORMATION

Health Effects of Ingredients

A. General Product Information: No information available for product.

B. Component Analysis - LD50/LC50

SECTION IX. PHYSICAL AND CHEMICAL PROPERTIES

Vapor Pressure:	Not Applicable	Vapor Density:	1025-1210°F (552-654°C)
Solubility in Water:	None	Specific Gravity:	Not Applicable
Density:	Range: generally 2.69-2.70 g/cm ³ (0.097-0.098 lb./in ³)	pH Level:	See Density
			Not Applicable

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Odor: Odorless

Odor Threshold: Not Applicable

Octanol-Water

Coefficient: Not Applicable

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Magnesium (7439-95-4)

Oral LD50 Rat: 230 mg/kg

Carcinogenicity

A. General Product Information: No information available for product.

B. Component Carcinogenicity: None of this product's components are listed by ACGIH, IARC, or NTP.

SECTION XII. ECOLOGICAL INFORMATION

Eco toxicity

A. General Product Information: No information available for product.

B. Component Analysis - Eco toxicity - Aquatic Toxicity

No Eco toxicity data was found for this product's components.

Environmental Fate: No information available for product.

SECTION XIII. DISPOSAL CONSIDERATIONS

Disposal Instructions

Reuse or recycle material whenever possible. Material may be disposed of at an industrial landfill.

US EPA Waste Number & Descriptions

A. General Product Information

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

B. Component Waste Numbers

RCRA waste codes other than described under Section A may apply depending on use of product. Refer to 40 CFR 261 or state equivalent in the U.S.

SECTION XIV. TRANSPORT INFORMATION

Special Transportation

	PSN#1	PSN#2	PSN#3	PSN#4
Notes:	(1)			
Proper Shipping Name:	Not regulated			

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Hazard Class:	-			
UN NA Number:	-			
Packing Group:	-			
RQ:	-			
Other – Tech Name:	-			
Other – Marine Pollutant	-			
Canadian TDG Hazard Class and PIN:	Not regulated			

Notes:

(1) When "Not regulated", enter the proper freight classification, "MSDS Number" and "Product Name" on the shipping paper work.

SECTION XV. REGULATORY INFORMATION

US Federal Regulations

A. General Product Information

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 that will meet this requirement.

B. Component Analysis

This material contains one or more of the following chemicals required to be identified under **SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).**

Aluminum (7429-90-5)

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

SARA 311/312 PHYSICAL AND HEALTH HAZARD CATEGORIES

Immediate (acute) Health Hazard: Yes, if particulates/fumes generated during processing.

Delayed (chronic) Health Hazard: Yes, if particulates/fumes generated during processing.

Fire Hazard: No

Sudden Release of Pressure: No

Reactive: Yes, if molten

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State Regulations

A. General Product Information: No information available for product.

B. Component Analysis - State

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

Component	CAS#	CA	FL	MA	MN	NJ	PA
Aluminum	7429-90-5	Yes	No	Yes	Yes	Yes	Yes
Magnesium	7439-95-4	Yes	No	Yes	No	Yes	Yes

Other Regulations

A. General Product Information: No information available for product.

B. Component Analysis - WHMIS IDL

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

Component	CAS#	Minimum Concentration
Aluminum	7429-90-5	1%

C. Component Analysis – Inventory

Component	CAS#	TSCA	DSL	EINECS	AUST.	MITI
Aluminum	7429-90-5	Yes	Yes	Yes	Yes	No
Magnesium	7439-95-4	Yes	Yes	Yes	Yes	No

MITI Inventory: Pure metals are not specifically listed by CAS or MITI number on the MITI Inventory. However, the class of compounds for each of these metals is listed.

SECTION XVI. OTHER INFORMATION

MSDS History

Original: July 13, 1995

Supersedes: December 12, 2005

Revised: November 25, 2008

Reformatted: November 3, 2012

MSDS Status

11/25/2008: Changes in Sections I, III, and V.

10/29/08: Revised Section I (Corporate Identity)

12/02/05: Reviewed on a periodic basis in accordance with corporate policy.

Changes in Sections I, III, IV, V, VII, VIII, XI and XV.

10/01/02: Changes in Section II.

Prepared By

Hazardous Materials Control Committee

Preparer: Clay A Long (570-385-8801)

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MSDS System Number: 214333

Other Information

- Aluminum Association's Bulletin F-1, "Guidelines for Handling Aluminum Fines Generated During Various Aluminum Fabricating Operations." The Aluminum Association, 900 19th Street, N.W., Washington, DC 20006.
- Aluminum Association, "Guidelines for Handling Molten Aluminum, The Aluminum Association, 900 19th Street, N.W., Washington, DC 20006.
- 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-2005, 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.

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KEY-LEGEND

ACGIH American Conference of Governmental Industrial Hygienists

AICS Australian Inventory of Chemical Substances

CAS Chemical Abstract Service

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

EPA Environmental Protection Act

IARC International Agency for Research on Cancer

LC50 Lethal concentration (50 percent kill)

LCLo Lowest published lethal concentration

LD50 Lethal dose (50 percent kill)

LDLo Lowest published lethal dose

LFL Lower Flammable Limit

MITI Ministry of International Trade & Industry

NFPA National Fire Protection Association

NIOSH National Institute for Occupational Safety and Health

NTP National Toxicology Program

OEL Occupational Exposure Limit

OSHA Occupational Safety and Health Administration

PEL Permissible Exposure Limit

PIN Product Identification Number

PSN Proper Shipping Name

RCRA Resource Conservation and Recovery Act

SARA Superfund Amendments and Reauthorization Act

STEL Short Term Exposure Limit

TCLP Toxic Chemicals Leachate Program

TDG Transportation of Dangerous Goods

TLV Threshold Limit Value

TSCA Toxic Substance Control Act

TWA Time Weighted Average

UFL Upper Flammable Limit

WHMIS Workplace Hazardous Materials Information System

atm atmosphere

cm centimeter

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g gm. gram

in inch

kg kilogram

lb. pound

m meter

mg milligram

ml, ML milliliter

mm millimeter

mppcf million particles per cubic foot

n.o.s. not otherwise specified

ppb parts per billion

ppm parts per million

psia pounds per square inch absolute

u micron

ug microgram

INFORMATION HEREIN IS GIVEN IN GOOD FAITH AS AUTHORITATIVE AND VALID; HOWEVER, NO WARRANTY, EXPRESS OR IMPLIED, CAN BE MADE.

This is the end of the MSDS.