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
2-606 Meridith Road
Calgary NE, Alberta
Canada T2E 5A8
E-mail: info@al13.ca
Website: www.al13.ca
Phone: 1-855-438-2513

SECTION II. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW
Properties: Processes that generate small chips and
turnings also produce dust that may be readily
ignitable.
• Solid
• Various Colors
• Odorless
• Non-combustible as supplied

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 NO\textsubscript{2})**: 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 (NO\textsubscript{2}), 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.

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS#</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum</td>
<td>7429-90-5</td>
<td>85-95</td>
</tr>
<tr>
<td>Magnesium</td>
<td>7439-95-4</td>
<td>&lt;1.2</td>
</tr>
<tr>
<td>Coatings which include acrylic and polyester</td>
<td>Not Available</td>
<td>0-15</td>
</tr>
</tbody>
</table>
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.
MATERIAL SAFETY DATA SHEET

Product Name: PAINTED or PRETREATED ALUMINUM EXTRUSIONS

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.

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
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/PERSOANAL 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).
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
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).

Health Effects of Ingredients
A. **General Product Information**: No information available for product.
B. Component Analysis - LD50/LC50

SECTION IX. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Vapor Pressure:</td>
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<tr>
<td>Solubility in Water:</td>
<td>None</td>
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<tr>
<td>Density:</td>
<td>Range: generally 2.69-2.70 g/cm³ (0.097-0.098 lb./in³)</td>
</tr>
<tr>
<td>Vapor Density:</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Specific Gravity:</td>
<td>See Density</td>
</tr>
<tr>
<td>pH Level:</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Odor:</td>
<td>Odorless</td>
</tr>
<tr>
<td>Octanol-Water Coefficient:</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

SECTION XI. TOXICOLOGICAL INFORMATION
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

<table>
<thead>
<tr>
<th>Notes:</th>
<th>PSN#1</th>
<th>PSN#2</th>
<th>PSN#3</th>
<th>PSN#4</th>
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<tr>
<td>Proper Shipping Name:</td>
<td>(1)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Not regulated</td>
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<td></td>
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</tbody>
</table>
# MATERIAL SAFETY DATA SHEET

**Product Name:** PAINTED or PRETREATED ALUMINUM EXTRUSIONS

| Hazard Class: | - |
| PACK 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
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:

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS#</th>
<th>CA</th>
<th>FL</th>
<th>MA</th>
<th>MN</th>
<th>NJ</th>
<th>PA</th>
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<tbody>
<tr>
<td>Aluminum</td>
<td>7429-90-5</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Magnesium</td>
<td>7439-95-4</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS#</th>
<th>Minimum Concentration</th>
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</thead>
<tbody>
<tr>
<td>Aluminum</td>
<td>7429-90-5</td>
<td>1%</td>
</tr>
</tbody>
</table>

C. Component Analysis – Inventory

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS#</th>
<th>TSCA</th>
<th>DSL</th>
<th>EINECS</th>
<th>AUST.</th>
<th>MITI</th>
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<tbody>
<tr>
<td>Aluminum</td>
<td>7429-90-5</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Magnesium</td>
<td>7439-95-4</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

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)
Other Information

- 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).
MATERIAL SAFETY DATA SHEET
Product Name: PAINTED or PRETREATED ALUMINUM EXTRUSIONS

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
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.