1. Identification

Product identifier: ALUMINIUM SHEET COIL AND FOIL - BARE AND COATED

Other means of identification

SDS number: 1352

Version #: 04

Revision date: May 31, 2015.

Other means of identification

Synonyms: Alloys 0333, 1050, 1100, 1350, 3003, 3004, 3105, 5005, 5042, 5050, 5052, 5082, 5083, 5086, 5182, 5454, 5754, 6061, 8011

Recommended use: Various fabricated aluminum parts and products

Recommended restrictions: None known.

Manufacturer/Importer/Supplier/Distributor information

Manufacturer: Alcoa Inc.
201 Isabella Street
Pittsburgh, PA 15212-5858 USA
Health and Safety Tel: 1-412-553-4649
Health and Safety Fax: 1-412-553-4822
Health and Safety Email: accmsds@alcoa.com
CHEMTREC: +1-703-527-3887 +1-800-424-9300 (24 Hour Emergency Telephone, multiple languages spoken); ALCOA: +1-412-553-4001 (24 Hour Emergency Telephone, only English spoken)

Emergency Information

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

2. Hazard(s) identification

Classification

When used as intended, this product is an article and should not pose any health hazard.

Potential health effects

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

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

Physical hazards: Not classified.

Health hazards: Not classified.

Environmental hazards: Not classified.

Authority defined hazards: Combustible dust

Label elements

Hazard symbol: None.

Signal word: Warning

Hazard statement: The mixture does not meet the criteria for classification. May form combustible dust concentrations in air.

Precautionary statement

Prevention: Not applicable.

Response: Not applicable.

Storage: Keep dry.

Disposal: Reuse or recycle material whenever possible.

Hazard(s) not otherwise classified (HNOC): None known.

Supplemental information: None.
Specific hazards

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, 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 and fumes from processing: Can cause irritation of the eyes, skin and upper respiratory tract.

3. Composition/information on ingredients

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

Mixtures

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Common name and synonyms</th>
<th>CAS number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum (Aluminum Alloys)</td>
<td></td>
<td>7429-90-5</td>
<td>&gt;82</td>
</tr>
<tr>
<td>Magnesium (Aluminum Alloys)</td>
<td></td>
<td>7439-95-4</td>
<td>&lt;5.0</td>
</tr>
<tr>
<td>Manganese (Aluminum Alloys)</td>
<td></td>
<td>7439-96-5</td>
<td>&lt;1.5</td>
</tr>
<tr>
<td>Iron (Aluminum Alloys)</td>
<td></td>
<td>7439-89-6</td>
<td>&lt;1.0</td>
</tr>
<tr>
<td>Silicon (Aluminum Alloys)</td>
<td></td>
<td>7440-21-3</td>
<td>&lt;1.0</td>
</tr>
<tr>
<td>Chromium (Aluminum Alloys)</td>
<td></td>
<td>7440-47-3</td>
<td>&lt;0.35</td>
</tr>
<tr>
<td>Coatings† (Coatings)</td>
<td>Various</td>
<td></td>
<td>0-30</td>
</tr>
</tbody>
</table>

Additional Information
† Coatings include: vinyl, epoxy, polyester, siliconized polyester, acrylic, fluorocarbons, polyurethane, resins, petroleum, chromium conversion and titanium conversion.
Additional compounds which may be formed during processing are listed in Section 8.

4. First-aid measures

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
If molten material gets on skin, cool rapidly with cold water. Get medical treatment for thermal burn.
- Dust and fumes from processing: Wash with soap and water for at least 15 minutes. Get medical attention if irritation develops or persists.

Inhalation
Dust and fumes from processing: Remove to fresh air. Check for clear airway, breathing, and presence of pulse. If breathing is difficult, provide oxygen. Loosen any tight clothing on neck or chest. Provide cardiopulmonary resuscitation for persons without pulse or respirations. Consult a physician.

Ingestion
Not relevant, due to the form of the product.

Most important symptoms/effects, acute and delayed
Dust and fumes from processing; Can cause irritation of the eyes, skin and upper respiratory tract. See Section 11 of the SDS for additional information on health hazards.

Medical conditions aggravated by exposure
Dust and fume from processing: Asthma, chronic lung disease, and skin rashes.

Indication of immediate medical attention and special treatment needed
In case of shortness of breath, give oxygen. Symptoms may be delayed.

General information
If exposed or concerned: get medical attention/advice.

5. Fire-fighting measures

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

May be a potential hazard under the following conditions:

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

### Special protective equipment and precautions for firefighters

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

### Fire fighting equipment/instructions

Apply extinguishing media carefully to avoid creating airborne dust. Use gentle surface application of Class D extinguishing agent or dry inert granular material (e.g., sand) to cover and ring the burning material. If impossible to extinguish, protect surroundings and allow fire to burn itself out.

### General fire hazards

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

### Explosion data

- **Sensitivity to mechanical impact**: Not sensitive.
- **Sensitivity to static discharge**: Take precautionary measures against static discharges when there is a risk of dust explosion.

### 6. Accidental release measures

#### Personal precautions, protective equipment and emergency procedures

Avoid contact with sharp edges or heated metal. Avoid inhalation of fumes from molten product. Molten, heated and cold aluminum look alike; do not touch unless you know it is cold. Avoid contact even after material solidifies. Use personal protection recommended in Section 8 of the SDS.

#### Personal precautions, protective equipment and emergency procedures for emergency responders

Avoid contact with sharp edges or heated metal. Avoid inhalation of fumes from molten product. Molten, heated and cold aluminum look alike; do not touch unless you know it is cold. Avoid contact even after material solidifies. Use personal protection recommended in Section 8 of the SDS.

#### Evacuation procedures

Molten metal: Persons not wearing appropriate protective equipment should be excluded from area of spill until clean-up has been completed.

#### Methods and materials for containment and cleaning up

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

### 7. Handling and storage

#### Handling

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

#### Storage

Store in a dry place. Protect from water run-on including precipitation.
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) standards listed in Section 16.

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

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

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

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

Occupational exposure limits

<table>
<thead>
<tr>
<th>U.S. - OSHA Components</th>
<th>Type</th>
<th>Value</th>
<th>Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum (CAS 7429-90-5)</td>
<td>TWA</td>
<td>5 mg/m3</td>
<td>Respirable fraction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15 mg/m3</td>
<td>Total dust</td>
</tr>
<tr>
<td>Chromium (CAS 7440-47-3)</td>
<td>TWA</td>
<td>1 mg/m3</td>
<td>Fume</td>
</tr>
<tr>
<td>Manganese (CAS 7439-96-5)</td>
<td>Ceiling</td>
<td>5 mg/m3</td>
<td></td>
</tr>
<tr>
<td>Silicon (CAS 7440-21-3)</td>
<td>TWA</td>
<td>5 mg/m3</td>
<td>Respirable fraction.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15 mg/m3</td>
<td>Total dust</td>
</tr>
<tr>
<td>Additional components</td>
<td>Type</td>
<td>Value</td>
<td>Form</td>
</tr>
<tr>
<td>Aluminum oxide (non-fibrous) (CAS 1344-28-1)</td>
<td>TWA</td>
<td>5 mg/m3</td>
<td>Respirable fraction.</td>
</tr>
<tr>
<td>Chromium (II) compounds</td>
<td>TWA</td>
<td>15 mg/m3</td>
<td>Total dust. (as Cr)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.5 mg/m3</td>
<td></td>
</tr>
<tr>
<td>U.S. - OSHA</td>
<td>Type</td>
<td>Value</td>
<td>Form</td>
</tr>
<tr>
<td>-------------</td>
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<td>---------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Chromium (III) compounds</td>
<td>TWA</td>
<td>0.5 mg/m³ (as Cr)</td>
<td></td>
</tr>
<tr>
<td>Chromium (VI) compounds, certain water insoluble forms</td>
<td>TWA</td>
<td>0.0025 mg/m³ (as Cr(VI))</td>
<td></td>
</tr>
<tr>
<td>Chromium (VI) compounds (CAS 18540-29-9)</td>
<td>TWA</td>
<td>0.0025 mg/m³ (as Cr(VI))</td>
<td></td>
</tr>
<tr>
<td>Hydrogen fluoride (CAS 7664-39-3)</td>
<td>TWA</td>
<td>3 ppm (as F)</td>
<td></td>
</tr>
<tr>
<td>Iron oxide (CAS 1309-37-1)</td>
<td>TWA</td>
<td>10 mg/m³ Fume.</td>
<td></td>
</tr>
<tr>
<td>Manganese compounds, inorganic</td>
<td>Ceiling</td>
<td>5 mg/m³ (as Mn) Fume</td>
<td></td>
</tr>
<tr>
<td>Ozone (CAS 10028-15-6)</td>
<td>TWA</td>
<td>0.2 mg/m³</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.1 ppm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)</th>
<th>Type</th>
<th>Value</th>
<th>Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chromium (VI) compounds, certain water insoluble forms</td>
<td>TWA</td>
<td>0.005 mg/m³ as Cr(VI)</td>
<td></td>
</tr>
<tr>
<td>Chromium (VI) compounds, water soluble forms</td>
<td>TWA</td>
<td>0.005 mg/m³</td>
<td></td>
</tr>
<tr>
<td>Chromium (VI) compounds (CAS 18540-29-9)</td>
<td>TWA</td>
<td>0.005 mg/m³ as Cr(VI)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)</th>
<th>Type</th>
<th>Value</th>
<th>Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrogen chloride (CAS 7647-01-0)</td>
<td>Ceiling</td>
<td>7 mg/m³</td>
<td></td>
</tr>
<tr>
<td>Magnesium oxide (CAS 1309-48-4)</td>
<td>PEL</td>
<td>5 ppm (as Mg)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>15 mg/m³ Total particulate.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ACGIH</th>
<th>Components</th>
<th>Type</th>
<th>Value</th>
<th>Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manganese (CAS 7439-96-5)</td>
<td>TWA (inhalable fraction)</td>
<td>0.2 mg/m³ (inhalable fraction)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TWA (respirable fraction)</td>
<td>0.02 mg/m³ (respirable fraction)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Additional components</th>
<th>Type</th>
<th>Value</th>
<th>Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum oxide (non-fibrous) (CAS 1344-28-1)</td>
<td>TWA</td>
<td>1 mg/m³ Respirable fraction, as Al</td>
<td></td>
</tr>
<tr>
<td>Chromium (VI) compounds, water soluble forms</td>
<td>TWA</td>
<td>0.05 mg/m³ (as Cr)</td>
<td></td>
</tr>
<tr>
<td>Chromium (VI) compounds (CAS 18540-29-9)</td>
<td>TWA</td>
<td>0.05 mg/m³ Soluble compounds as Cr</td>
<td></td>
</tr>
<tr>
<td>Ozone (CAS 10028-15-6)</td>
<td>TWA</td>
<td>0.2 ppm (Heavy, moderate or light workloads (≤2 hours))</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>US ACGIH Threshold Limit Values: Ceiling Limit Value: mg/m³ &amp; ppm</th>
<th>Type</th>
<th>Value</th>
<th>Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrogen chloride (CAS 7647-01-0)</td>
<td>Ceiling</td>
<td>2 ppm</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>US ACGIH Threshold Limit Values: Time Weighted Average (TWA): mg/m³, non-standard units</th>
<th>Components</th>
<th>Type</th>
<th>Value</th>
<th>Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum (CAS 7429-90-5)</td>
<td>TWA</td>
<td>1 mg/m³ Respirable fraction.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chromium (CAS 7440-47-3)</td>
<td>TWA</td>
<td>0.5 mg/m³</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**US ACGIH Threshold Limit Values: Time Weighted Average (TWA): mg/m³, non-standard units**

<table>
<thead>
<tr>
<th>Additional components</th>
<th>Type</th>
<th>Value</th>
<th>Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chromium (III) compounds</td>
<td>TWA</td>
<td>0.5 mg/m³</td>
<td></td>
</tr>
<tr>
<td>Chromium (VI) compounds, certain water insoluble forms</td>
<td>TWA</td>
<td>0.01 mg/m³</td>
<td>(as Cr)</td>
</tr>
<tr>
<td>Chromium (VI) compounds (CAS 18540-29-9)</td>
<td>TWA</td>
<td>0.01 mg/m³</td>
<td>Insoluble compounds as Cr</td>
</tr>
<tr>
<td>Iron oxide (CAS 1309-37-1)</td>
<td>TWA</td>
<td>5 mg/m³</td>
<td>Respirable fraction.</td>
</tr>
<tr>
<td>Magnesium oxide (CAS 1309-48-4)</td>
<td>TWA</td>
<td>10 mg/m³</td>
<td>Inhalable fraction.</td>
</tr>
<tr>
<td>Manganese compounds, inorganic</td>
<td>TWA</td>
<td>0.1 mg/m³</td>
<td>Inhalable fraction.</td>
</tr>
<tr>
<td></td>
<td>TWA</td>
<td>0.02 mg/m³</td>
<td>Respirable fraction.</td>
</tr>
</tbody>
</table>

**Alcoa Components**

<table>
<thead>
<tr>
<th>Components</th>
<th>Type</th>
<th>Value</th>
<th>Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum (CAS 7429-90-5)</td>
<td>TWA</td>
<td>3 mg/m³</td>
<td>Respirable fraction</td>
</tr>
<tr>
<td>Manganese (CAS 7439-96-5)</td>
<td>TWA</td>
<td>10 mg/m³</td>
<td>Total dust</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.05 mg/m³</td>
<td>Total dust.</td>
</tr>
<tr>
<td>Additional components</td>
<td>Type</td>
<td>Value</td>
<td>Form</td>
</tr>
<tr>
<td>----</td>
<td>------</td>
<td>-------</td>
<td>----------------------------</td>
</tr>
<tr>
<td>Aluminum oxide (non-librous) (CAS 1344-28-1)</td>
<td>TWA</td>
<td>3 mg/m³</td>
<td>Respirable fraction</td>
</tr>
<tr>
<td>Chromium (VI) compounds (CAS 18540-29-9)</td>
<td>TWA</td>
<td>10 mg/m³</td>
<td>Total dust</td>
</tr>
<tr>
<td>Hydrogen fluoride (CAS 7664-39-3)</td>
<td>STEL</td>
<td>1.64 mg/m³</td>
<td>Peak (as F) (Skin)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 ppm</td>
<td>Peak (as F) (Skin)</td>
</tr>
<tr>
<td>Manganese compounds, inorganic</td>
<td>TWA</td>
<td>0.05 mg/m³</td>
<td>Total dust, as Mn.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.02 mg/m³</td>
<td>Respirable fraction, as Mn.</td>
</tr>
</tbody>
</table>

**Exposure guidelines**

**US ACGIH Threshold Limit Values: Skin designation**

Hydrogen fluoride (CAS 7664-39-3) Can be absorbed through the skin.

**US. California Code of Regulations, Title 8, Section 5155. Airborne Contaminants**

HYDROGEN FLUORIDE, AS F (CAS 7664-39-3) Can be absorbed through the skin.

**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).

**Appropriate engineering controls**

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

**Individual protection measures, such as personal protective equipment**

**Eye/face protection**

Wear safety glasses with side shields. Wear a face shield when working with molten material.

**Skin protection**

**Hand protection**

Wear impervious gloves to avoid direct skin contact. When handling hot material, use heat resistant gloves. The need for personal protective equipment (gloves) should be based upon a hazard assessment and recommendations from health / safety professionals. The most suitable glove must be chosen in consultation with the gloves supplier, who can inform about the breakthrough time of the glove material.

**Other**

The need for personal protective equipment should be based upon a hazard assessment and recommendations from health / safety professionals.
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: N95, Acid gas cartridges for Hydrogen chloride, Acid gas cartridge for Hydrogen fluoride gas.

Thermal hazards

Contact with molten material can cause thermal burns. Hot aluminum does not necessarily glow red. When material is heated, wear gloves to protect against thermal burns. Wear appropriate thermal protective clothing, when necessary. Flame retardant protective clothing is recommended. Molten metal: Full Face Shield.

General hygiene considerations

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and immediately after handling the product. When using, do not eat, drink or smoke.

Control parameters

Follow standard monitoring procedures.

9. Physical and chemical properties

Form

Bare or coated coil/sheet.

Color

Various colors.

Odor

Odorless

Odor threshold

Not Applicable

pH

Not applicable

Density

2.63 - 3.12 g/cm³

Melting point/freezing point

900 - 1200 °F (482.22 - 648.89 °C)

Initial boiling point and boiling range

Not Applicable

Flash point

Not applicable

Evaporation rate

Not applicable.

Flammability (solid, gas)

Not applicable.

Upper/lower flammability or explosive limits

Flammability limit - upper (%)

Not applicable

Flammability limit - lower (%)

Not applicable

Explosive properties

Dust clouds may be explosive under certain conditions.

Dust explosion properties

St class

Very strong explosion.

Vapor pressure

Not applicable

Vapor density

Not applicable

Relative density

Not determined.

Solubility(ies)

Insoluble

Partition coefficient (n-octanol/water)

Not applicable

Auto-ignition temperature

Not Applicable

Decomposition temperature

Not applicable.

Viscosity

Not applicable.

10. Stability and reactivity

Reactivity

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. Thermite reactions can occur with oxides of lead, copper, iron, bismuth and certain other metals.

Chemical stability

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

Possibility of hazardous reactions

Hazardous polymerization does not occur.
Explosions can occur with coils of foil that have been submerged or partially submerged in water for an extended period of time. Water can penetrate between the layers of foil, react with the aluminum surface and generate heat and hydrogen gas. When the coils are removed from the cooling effects of the water, rapid temperature increases can occur causing steam explosions which result in the rupture of the coils and discharge of debris.

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

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

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.

Grinding, sanding, buffing and polishing operations may generate potentially explosive aluminum dust, fines or particulate that must not be co-mingled with dust, fines or particulate of steel, iron, iron oxide (rust) or other metal oxides. Vacuum and dust collection systems utilized for processing aluminum must be placarded as follows:

**WARNING – Aluminum Metal Only – Fire or Explosion Can Result with Other Metals.**

**Incompatible materials**

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

**Hazardous decomposition products**

Combustion of the coatings can generate Carbon monoxide, Carbon dioxide, Hydrogen chloride, Chlorinated hydrocarbons, Hydrogen fluoride and partially oxidized hydrocarbons.

**11. Toxicological information**

**Health effects associated with ingredients**

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

Silicon (inert dusts): Chronic overexposures: Can cause chronic bronchitis and narrowing of airways.

Chromium dust and fumes: Can cause irritation of eye, skin and respiratory tract. Metallic chromium and trivalent chromium: Not classifiable as to their carcinogenicity to humans by IARC.
Health effects associated with compounds formed during processing
(The following could be expected if welded, remelted or otherwise processed at elevated temperatures)

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

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

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

Manganese compounds: Chronic overexposures: Can cause inflammation of the lung tissues, scarring of the lungs (pulmonary fibrosis), central nervous system damage, Secondary Parkinson's Disease and reproductive harm in males. Ingestion: Can cause irritation of gastrointestinal tract, bleeding, changes in the pH of the body fluids (metabolic acidosis) and liver damage.

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

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

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

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.

Combustion of the coatings can generate Hydrogen chloride or Hydrogen fluoride. Hydrogen chloride gas: Can cause severe irritation and corrosive burns of eyes, skin and upper respiratory tract. Acute overexposures: Can cause the accumulation of fluid in the lungs (pulmonary edema).

Hydrogen fluoride: Can cause severe irritation of the eyes, mucous membranes, skin and respiratory tract. Acute overexposures: Can cause cough, shock, the accumulation of fluid in the lungs (pulmonary edema) and death. Effects can be delayed up to 24 hours.

Information on likely routes of exposure

| Eye contact | Dust and fumes from processing: Can cause irritation. |
| Skin contact | Dust and fumes from processing: Can cause irritation. |
| Inhalation | Dust and fumes from processing: Can cause irritation of the upper respiratory tract. Additional health effects from mechanical processing (e.g., cutting, grinding): None known. |

Additional health effects from elevated temperature processing (e.g., welding, melting): Acute overexposure: Can cause metal fume fever (nausea, fever, chills, shortness of breath malaise) and the accumulation of fluid in the lungs (pulmonary edema). Chronic overexposures: Can cause asthma, benign lung disease (siderosis) scarring of the lungs (pulmonary fibrosis), respiratory sensitization, central nervous system damage, secondary Parkinson's disease, reproductive harm and lung cancer.

Combustion of the coatings can generate Hydrogen chloride and Hydrogen fluoride. Acute overexposures: Can cause severe irritation of the respiratory tract and the accumulation of fluid in the lungs (pulmonary edema). Effects can be delayed up to 24 hours.

| Ingestion | Not relevant, due to the form of the product. |

Symptoms related to the physical, chemical and toxicological characteristics

Dust and fumes from processing: Can cause irritation of the eyes, skin and upper respiratory tract.

Information on toxicological effects
<table>
<thead>
<tr>
<th>Components</th>
<th>Species</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aluminum (CAS 7429-90-5)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Acute</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Inhalation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LC50</td>
<td>Rat</td>
<td>&gt; 2.3 mg/l</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.6 mg/l</td>
</tr>
<tr>
<td><strong>Oral</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LD50</td>
<td>Rat</td>
<td>&gt; 2000 mg/kg</td>
</tr>
<tr>
<td><strong>Aluminum oxide (non-fibrous) (CAS 1344-28-1)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Acute</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Inhalation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LC50</td>
<td>Rat</td>
<td>&gt; 2.3 mg/l</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.6 mg/l</td>
</tr>
<tr>
<td><strong>Oral</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LD50</td>
<td>Rat</td>
<td>&gt; 5000 mg/kg</td>
</tr>
<tr>
<td><strong>Hydrogen chloride (CAS 7647-01-0)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Acute</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Dermal</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LD50</td>
<td>Mouse</td>
<td>1449 mg/kg</td>
</tr>
<tr>
<td><strong>Inhalation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LC50</td>
<td>Mouse</td>
<td>1108 ppm, 1 Hours</td>
</tr>
<tr>
<td></td>
<td>Rat</td>
<td>3124 ppm, 1 Hours</td>
</tr>
<tr>
<td><strong>Oral</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LD50</td>
<td>Rabbit</td>
<td>900 mg/kg</td>
</tr>
<tr>
<td><strong>Hydrogen fluoride (CAS 7664-39-3)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Acute</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Inhalation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LC50</td>
<td>Guinea pig</td>
<td>4327 ppm, 15 Minutes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.54 mg/l, 15 Minutes</td>
</tr>
<tr>
<td></td>
<td>Monkey</td>
<td>1780 ppm, 1 Hours</td>
</tr>
<tr>
<td></td>
<td>Mouse</td>
<td>500 ppm, 1 Hours</td>
</tr>
<tr>
<td></td>
<td>Rat</td>
<td>4970 ppm, 5 Minutes</td>
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<tr>
<td></td>
<td></td>
<td>2689 ppm, 15 Minutes</td>
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<tr>
<td></td>
<td></td>
<td>2042 ppm, 30 Minutes</td>
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<tr>
<td></td>
<td></td>
<td>1278 ppm, 1 Hours</td>
</tr>
<tr>
<td><strong>Iron oxide (CAS 1309-37-1)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Acute</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Oral</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LD50</td>
<td>Rat</td>
<td>&gt; 10000 mg/kg</td>
</tr>
<tr>
<td><strong>Silica, amorphous (CAS 69012-64-2)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Acute</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Oral</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LD50</td>
<td>Mouse</td>
<td>&gt; 15000 mg/kg</td>
</tr>
<tr>
<td></td>
<td>Rat</td>
<td>&gt; 22500 mg/kg</td>
</tr>
</tbody>
</table>

**Acute toxicity**
Not classified. Based on available data, the classification criteria are not met.

**Skin corrosion/irritation**
Not classified. Based on available data, the classification criteria are not met.

**Serious eye damage/eye irritation**
May cause temporary eye irritation. Dust in the eyes will cause irritation.
Respiratory or skin sensitization

Product as shipped: Not a skin sensitizer. Not classified. Based on available data, the classification criteria are not met.

Respiratory sensitization

Product as shipped: Not classified. Based on available data, the classification criteria are not met.

Additional health effects from elevated temperature processing (e.g., welding, plasma cutting, melting): Contains chromium. May produce an allergic reaction. May cause sensitization by inhalation.

Skin sensitization

Not classified. Based on available data, the classification criteria are not met.

Germ cell mutagenicity

Not classified. Based on available data, the classification criteria are not met. Contains no ingredient listed as a mutagen.

Neurological effects

Product as shipped: Not classified. Based on available data, the classification criteria are not met.

Pre-existing conditions aggravated by exposure

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

Carcinogenicity

Product as shipped: Does not present any cancer hazards.

Health effects from elevated temperature processing (e.g., welding, melting): Can present a cancer hazard (Hexavalent chromium compounds, Welding fumes).

IARC Monographs. Overall Evaluation of Carcinogenicity

- Chromium (CAS 7440-47-3) 3 Not classifiable as to carcinogenicity to humans.
- Chromium (III) compounds (CAS CAS No. Not available) 3 Not classifiable as to carcinogenicity to humans.
- Chromium (VI) compounds (CAS 18540-29-9) 1 Carcinogenic to humans.
- Chromium (VI) compounds, certain water insoluble forms (CAS CAS No. Not available) 1 Carcinogenic to humans.
- Chromium (VI) compounds, water soluble forms (CAS CAS No. Not available) 1 Carcinogenic to humans.
- Hydrogen chloride (CAS 7647-01-0) 3 Not classifiable as to carcinogenicity to humans.
- Hydrogen fluoride (CAS 7664-39-3) 3 Not classifiable as to carcinogenicity to humans.
- Iron oxide (CAS 1309-37-1) 3 Not classifiable as to carcinogenicity to humans.
- Silica, amorphous (CAS 69012-64-2) 3 Not classifiable as to carcinogenicity to humans.

US. National Toxicology Program (NTP) Report on Carcinogens

- Chromium (VI) compounds (CAS 18540-29-9) Known To Be Human Carcinogen.
- Chromium (VI) compounds, certain water insoluble forms (CAS CAS No. Not available) Known To Be Human Carcinogen.
- Chromium (VI) compounds, water soluble forms (CAS CAS No. Not available) Known To Be Human Carcinogen.

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

- Chromium (VI) compounds (CAS 18540-29-9) Cancer
- Chromium (VI) compounds, certain water insoluble forms (CAS CAS No. Not available) Cancer
- Chromium (VI) compounds, water soluble forms (CAS CAS No. Not available) Cancer

Reproductive toxicity

Product as shipped: Does not present any reproductive hazards.

Additional health effects from elevated temperature processing (e.g., welding, melting): Can present a reproductive hazard for males (Manganese compounds).

Routes of exposure

Dust and fume from processing: Inhalation. Skin contact. Eye contact.

Specific target organ toxicity - single exposure

Not classified. Based on available data, the classification criteria are not met.

Specific target organ toxicity - repeated exposure

Not classified. Based on available data, the classification criteria are not met.

Aspiration hazard

Not an aspiration hazard.

12. Ecological information

Ecotoxicity

Not expected to be harmful to aquatic organisms.

<table>
<thead>
<tr>
<th>Components</th>
<th>Species</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chromium (CAS 7440-47-3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aquatic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crustacea</td>
<td>EC50</td>
<td>Water flea (Daphnia magna)</td>
</tr>
<tr>
<td>Fish</td>
<td>LC50</td>
<td>Carp (Cyprinus carpio)</td>
</tr>
</tbody>
</table>

Material name: ALUMINIUM SHEET COIL AND FOIL - BARE AND COATED

1352    Version #: 04    Revision date: 05-31-2015    Issue date: 05-31-2015

SDS US
11 / 15
### Components

<table>
<thead>
<tr>
<th>Components</th>
<th>Species</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iron (CAS 7439-89-6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Aquatic</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crustacea</td>
<td>LC50</td>
<td>Cockle (Cerastoderma edule) 100 - 330 mg/l, 48 hours</td>
</tr>
<tr>
<td>Fish</td>
<td>LC50</td>
<td>Common shrimp, sand shrimp (Crangon crangon) 33 - 100 mg/l, 48 hours</td>
</tr>
<tr>
<td>Manganese (CAS 7439-96-5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Aquatic</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crustacea</td>
<td>EC50</td>
<td>Water flea (Daphnia magna) 40 mg/l, 48 hours</td>
</tr>
</tbody>
</table>

### Additional components

<table>
<thead>
<tr>
<th>Components</th>
<th>Species</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aquatic</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fish</td>
<td>LC50</td>
<td>Western mosquitofish (Gambusia affinis) 282 mg/l, 96 hours</td>
</tr>
<tr>
<td>Hydrogen fluoride (CAS 7664-39-3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Aquatic</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fish</td>
<td>LC50</td>
<td>Brown trout (Salmo trutta) 125 mg/l, 48 hours</td>
</tr>
<tr>
<td>Ozone (CAS 10028-15-6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Aquatic</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fish</td>
<td>LC50</td>
<td>Rainbow trout, donaldson trout (Oncorhynchus mykiss) 0.0081 - 0.0106 mg/l, 96 hours</td>
</tr>
</tbody>
</table>

### Persistence and degradability

- The product contains inorganic compounds which are not biodegradable.

### Bioaccumulative potential

- No data available on bioaccumulation.

### Mobility in soil

- No data available.

### Mobility in general

- Not considered mobile.

### Other adverse effects

- None known.

### 13. Disposal considerations

#### Disposal instructions

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

#### Waste codes

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

#### US RCRA Hazardous Waste U List: Reference

| Hydrogen fluoride (CAS 7664-39-3) | U134 |

#### Waste from residues / unused products

- If reuse or recycling is not possible, disposal must be made according to local or governmental regulations.

#### Contaminated packaging

- Dispose of in accordance with local regulations.

### 14. Transport information

#### General Shipping Information

<table>
<thead>
<tr>
<th>Basic Shipping Information</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ID number</td>
<td>-</td>
</tr>
<tr>
<td>Proper shipping name</td>
<td>Not regulated</td>
</tr>
<tr>
<td>Hazard class</td>
<td>-</td>
</tr>
<tr>
<td>Packing group</td>
<td>-</td>
</tr>
</tbody>
</table>

#### General Shipping Notes

- When "Not regulated", enter the proper freight classification, SDS Number and Product Name onto the shipping paperwork.

#### Disclaimer

This section provides basic classification information and, where relevant, information with respect to specific modal regulations, environmental hazards and special precautions. Otherwise, it is presumed that the information is not available/not relevant.
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.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Chromium (VI) compounds, certain water insoluble forms 0.1 % Annual Export Notification required.
(CAS CAS No. Not available)

CERCLA Hazardous Substance List (40 CFR 302.4)

Chromium (CAS 7440-47-3) Listed.
Manganese (CAS 7439-96-5) Listed.

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

Chromium (VI) compounds (CAS 18540-29-9) Cancer
Chromium (VI) compounds, certain water insoluble forms (CAS CAS No. Not available) Cancer
Chromium (VI) compounds, water soluble forms (CAS CAS No. Not available) Cancer
Chromium (VI) compounds (CAS 18540-29-9) Eye irritation
Chromium (VI) compounds, certain water insoluble forms (CAS CAS No. Not available) Eye irritation
Chromium (VI) compounds, water soluble forms (CAS CAS No. Not available) Eye irritation
Chromium (VI) compounds (CAS 18540-29-9) Skin sensitization
Chromium (VI) compounds, certain water insoluble forms (CAS CAS No. Not available) Skin sensitization
Chromium (VI) compounds, water soluble forms (CAS CAS No. Not available) Skin sensitization

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Immediate Hazard - Yes
Delayed Hazard - Yes
Fire Hazard - No
Pressure Hazard - No
Reactivity Hazard - Yes
If particulates/fumes generated during processing.
If particulates/fumes generated during processing.
If molten

SARA 302 Extremely hazardous substance

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS number</th>
<th>Reportable quantity</th>
<th>Threshold planning quantity, lower value</th>
<th>Threshold planning quantity, upper value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ozone</td>
<td>10028-15-6</td>
<td>100</td>
<td>100 lbs</td>
<td></td>
</tr>
<tr>
<td>Hydrogen chloride</td>
<td>7647-01-0</td>
<td>5000</td>
<td>500 lbs</td>
<td></td>
</tr>
<tr>
<td>Hydrogen fluoride</td>
<td>7664-39-3</td>
<td>100</td>
<td>100 lbs</td>
<td></td>
</tr>
</tbody>
</table>

SARA 311/312 Hazardous chemical

Yes

SARA 313 (TRI reporting)

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS number</th>
<th>% by wt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum</td>
<td>7429-90-5</td>
<td>&gt;82</td>
</tr>
<tr>
<td>Manganese</td>
<td>7439-96-5</td>
<td>&lt;1.5</td>
</tr>
<tr>
<td>Manganese compounds, inorganic</td>
<td>CAS No. Not available</td>
<td>1</td>
</tr>
<tr>
<td>Chromium (II) compounds</td>
<td>CAS No. Not available</td>
<td>1</td>
</tr>
<tr>
<td>Chromium (III) compounds</td>
<td>CAS No. Not available</td>
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</tr>
<tr>
<td>Chromium (VI) compounds</td>
<td>18540-29-9</td>
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</tr>
<tr>
<td>Chromium (VI) compounds, certain water insoluble forms</td>
<td>CAS No. Not available</td>
<td>1</td>
</tr>
<tr>
<td>Chromium (VI) compounds, water soluble forms</td>
<td>CAS No. Not available</td>
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</tr>
<tr>
<td>Ozone</td>
<td>10028-15-6</td>
<td>1</td>
</tr>
<tr>
<td>Hydrogen chloride</td>
<td>7647-01-0</td>
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</tr>
<tr>
<td>Hydrogen fluoride</td>
<td>7664-39-3</td>
<td>1</td>
</tr>
</tbody>
</table>
### US state regulations

#### US. California Proposition 65

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

- Chromium (VI) compounds (CAS 18540-29-9) Listed: February 27, 1987
- Chromium (VI) compounds, certain water insoluble forms (CAS CAS No. Not available) Listed: February 27, 1987
- Chromium (VI) compounds, water soluble forms (CAS CAS No. Not available) Listed: February 27, 1987

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

- Chromium (VI) compounds (CAS 18540-29-9) Listed: December 19, 2008
- Chromium (VI) compounds, certain water insoluble forms (CAS CAS No. Not available) Listed: December 19, 2008
- Chromium (VI) compounds, water soluble forms (CAS CAS No. Not available) Listed: December 19, 2008

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

- Chromium (VI) compounds (CAS 18540-29-9) Listed: December 19, 2008
- Chromium (VI) compounds, certain water insoluble forms (CAS CAS No. Not available) Listed: December 19, 2008
- Chromium (VI) compounds, water soluble forms (CAS CAS No. Not available) Listed: December 19, 2008

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

- Chromium (VI) compounds (CAS 18540-29-9) Listed: December 19, 2008
- Chromium (VI) compounds, certain water insoluble forms (CAS CAS No. Not available) Listed: December 19, 2008
- Chromium (VI) compounds, water soluble forms (CAS CAS No. Not available) Listed: December 19, 2008

### International Inventories

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

*A “Yes” indicates that all components of this product comply with the inventory requirements administered by the governing country(s) A “No” indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

### 16. Other information, including date of preparation or last revision

**SDS Status**

- October 12, 2012: Change(s) in Section: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 and 15.
- June 16, 2009: New format.
- Origination date: August 19, 2005

- Hazardous Materials Control Committee
- Preparer: Jim Perriello, +1-865-977-2051.
- SDS System Number: 170975

**Revision date**


**Version #**

- 04
Revision Information

Compliance / Information on Ingredients: Ingredients
Physical & Chemical Properties: Multiple Properties
Transport Information: Agency Name, Packaging Type, and Transport Mode Selection
Regulatory Information: Safety Phrases
HazReg Data: North America
GHS: Qualifiers

Disclaimer

The information in the sheet was written based on the best knowledge and experience currently available.

Other information

- 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
- Guide to Occupational Exposure Values 2015, Compiled by the American Conference of Governmental Industrial Hygienists (ACGIH).
- Ariel, 3E Company, www.3Ecompany.com

Key/Legend:

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

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

*** End of SDS ***
Hazard statement
May form combustible dust concentrations in air.

Precautionary statement
Prevention
Not applicable.
Response
Not applicable.
Storage
Keep dry.
Disposal
Reuse or recycle material whenever possible.

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

FIRE FIGHTING MEASURES: Use Class D extinguishing agents on fines, dust or molten metal. Use coarse water spray on chips and turnings.
DO NOT USE halogenated extinguishing agents on small chips/fines.
DO NOT USE water in fighting fires around molten metal.
These fire extinguishing agents will react with the burning material.

IN CASE OF SPILL: Collect scrap for recycling. If molten: Use dry sand to contain the flow of material. All tooling (e.g., shovels or hand tools) and containers which come in contact with molten metal must be preheated or specially coated, rust free and approved for such use. Allow the spill to cool before remelting as scrap.

See Alcoa SDS Number 1352.