

## Safety Data Sheet



### Section 1: Identification

#### Product identifier

##### Product Name

- **Aluminum Billets, Extrusions, or Logs**

##### Synonyms

- 6XXX Series Alloys including: 6005, 6005A, 6060, 6061, 6063, 6082, 6105, 6181, 6351, 6360, 6463; Aluminum; Wrought Aluminum Products

#### Relevant identified uses of the substance or mixture and uses advised against

##### Recommended use

- Various extruded aluminum parts, products and cast billet

#### Details of the supplier of the safety data sheet

##### Manufacturer

- AACOA  
2005 Mayflower Road  
Niles, MI 49120  
United States

Telephone (General) • 269-697-6063

#### Emergency telephone number

##### Manufacturer

- 1-800-424-9300 - Chemtrec - North America

### Section 2: Hazard Identification

#### United States (US)

According to: OSHA 29 CFR 1910.1200 HCS

#### Classification of the substance or mixture

##### OSHA HCS 2012

- Not classified

#### Label elements

##### OSHA HCS 2012

**Hazard statements** • No label element(s) required

#### Other hazards

##### OSHA HCS 2012

- Product is solid metallic pieces, logs, or billets. Contact with hot metal may cause thermal burns. In solid state, this product is considered non-hazardous. Dust generated during fabrication, sawing, cutting, grinding, and/or welding of this product is considered hazardous. Under United States Regulations (29 CFR 1910.1200(c) - Hazard Communication Standard), the product(s) listed above are exempt as article(s) under stated normal conditions of use.

### Section 3 - Composition/Information on Ingredients

## Substances

- Material does not meet the criteria of a substance.

## Mixtures

| Composition   |               |                |
|---------------|---------------|----------------|
| Chemical Name | Identifiers   | %              |
| Aluminum      | CAS:7429-90-5 | 94% TO 99%     |
| Silicon       | CAS:7440-21-3 | 0.2% TO 1.3%   |
| Magnesium     | CAS:7439-95-4 | 0.25% TO 1.2%  |
| Manganese     | CAS:7439-96-5 | 0.02% TO 1%    |
| Iron          | CAS:7439-89-6 | 0.1% TO 0.7%   |
| Copper        | CAS:7440-50-8 | 0.1% TO 0.4%   |
| Chromium      | CAS:7440-47-3 | 0.04% TO 0.35% |
| Zinc          | CAS:7440-66-6 | 0.05% TO 0.25% |
| Titanium      | CAS:7440-32-6 | 0.1% TO 0.2%   |

## Section 4: First-Aid Measures

### Description of first aid measures

#### Inhalation

- It is unlikely that emergency treatment will be required. Move victim to fresh air. Administer oxygen if breathing is difficult. Give artificial respiration if victim is not breathing. If signs/symptoms continue, get medical attention.

#### Skin

- If cut by metal, get medical attention, if needed.

#### Eye

- If contact with material occurs flush eyes with water. Get medical attention immediately.

#### Ingestion

- If a piece of metal is swallowed, get medical attention, if needed.

### Most important symptoms and effects, both acute and delayed

- Under normal conditions of use, no health effects are expected.

### Indication of any immediate medical attention and special treatment needed

#### Notes to Physician

- No specific actions or treatments recommended related to exposure to this material.

## Section 5: Fire-Fighting Measures

### Extinguishing media

**Suitable Extinguishing Media** • In case of fire use media as appropriate for surrounding fire.

**Unsuitable Extinguishing Media** • No data available

### Special hazards arising from the substance or mixture

**Unusual Fire and Explosion Hazards** • Material is non-combustible and is not expected to pose a fire or explosion hazard.

**Hazardous Combustion Products** • Acid halides, oxides of carbon, hydrocarbons, hydrogen cyanide, oxides of nitrogen.

### Advice for firefighters

- Wear positive pressure self-contained breathing apparatus (SCBA). Structural firefighters' protective clothing will only provide limited protection.

## Section 6 - Accidental Release Measures

### Personal precautions, protective equipment and emergency procedures

- Personal Precautions**
- No special precautions expected to be necessary if material is used under ordinary conditions and as recommended.
- Emergency Procedures**
- No emergency procedures are expected to be necessary if material is used under ordinary conditions as recommended. Use normal clean up procedures.

### Environmental precautions

- Avoid run off to waterways and sewers.

### Methods and material for containment and cleaning up

- Containment/Clean-up Measures**
- Carefully shovel or sweep up spilled material and place in suitable container.

## Section 7 - Handling and Storage

### Precautions for safe handling

- Handling**
- Use good safety and industrial hygiene practices. Caution, the product may be hot and may have sharp edges. Machining or tooling aluminum extrusions may create sharp edges capable of cutting or penetrating flesh. Wear gloves, eye protection, and skin protection when working with aluminum extrusions. Stock piles, scrap extrusions and cuttings may create trip, slip, or fall hazards if allowed to accumulate. Keep work areas clear and orderly.

### Conditions for safe storage, including any incompatibilities

- Storage**
- Store and handle in accordance with all current regulations and standards.

## Section 8 - Exposure Controls/Personal Protection

### Control parameters

| Exposure Limits/Guidelines |          |  |  |  |
|----------------------------|----------|--|--|--|
|                            | Result   | ACGIH  | NIOSH  | OSHA   |
| Manganese                  | Ceilings | Not established  | Not established  | 5 mg/m <sup>3</sup> Ceiling (fume)   |
|                            | TWAs     | 0.02 mg/m <sup>3</sup> TWA (respirable fraction); 0.1 mg/m <sup>3</sup> TWA (inhalable fraction) | 1 mg/m <sup>3</sup> TWA (fume)   | Not established  |
|                            | STELs    | Not established  | 3 mg/m <sup>3</sup> STEL   | Not established  |
| Chromium (7440-47-3)       | TWAs     | 0.5 mg/m <sup>3</sup> TWA  | 0.5 mg/m <sup>3</sup> TWA  | 1 mg/m <sup>3</sup> TWA  |
| Copper (7440-50-8)         | TWAs     | 0.2 mg/m <sup>3</sup> TWA (fume)   | 1 mg/m <sup>3</sup> TWA (dust and mist); 0.1 mg/m <sup>3</sup> TWA (fume)        | 0.1 mg/m <sup>3</sup> TWA (fume); 1 mg/m <sup>3</sup> TWA (dust and mist)            |
| Silicon (7440-21-3)        | TWAs     | Not established  | 10 mg/m <sup>3</sup> TWA (total dust); 5 mg/m <sup>3</sup> TWA (respirable dust) | 15 mg/m <sup>3</sup> TWA (total dust); 5 mg/m <sup>3</sup> TWA (respirable fraction) |
| Aluminum (7429-90-5)       | TWAs     | 1 mg/m <sup>3</sup> TWA (respirable fraction)  | 10 mg/m <sup>3</sup> TWA (total dust); 5 mg/m <sup>3</sup> TWA (respirable dust) | 15 mg/m <sup>3</sup> TWA (total dust); 5 mg/m <sup>3</sup> TWA (respirable fraction) |

### Exposure Control Notations

#### ACGIH

- Aluminum (7429-90-5): **Carcinogens:** (A4 - Not Classifiable as a Human Carcinogen)
- Aluminum as Aluminum insoluble compounds: **Carcinogens:** (A4 - Not Classifiable as a Human Carcinogen)
- Manganese (7439-96-5): **Carcinogens:** (A4 - Not Classifiable as a Human Carcinogen)

- Chromium (7440-47-3): **Carcinogens:** (A4 - Not Classifiable as a Human Carcinogen)

## Exposure Limits Supplemental

### ACGIH

- Aluminum (7429-90-5): **TLV Basis - Critical Effects:** (pneumoconiosis; lower respiratory tract irritation; neurotoxicity)
- Aluminum as Aluminum insoluble compounds: **TLV Basis - Critical Effects:** (pneumoconiosis; lower respiratory tract irritation; neurotoxicity)
- Copper (7440-50-8): **TLV Basis - Critical Effects:** (metal fume fever (fume))
- Copper as Copper compounds: **TLV Basis - Critical Effects:** (gastrointestinal (dust and mist); irritation (dust and mist))
- Manganese (7439-96-5): **TLV Basis - Critical Effects:** (CNS impairment)
- Chromium (7440-47-3): **TLV Basis - Critical Effects:** (skin and upper respiratory tract irritation)

## Exposure controls

### Engineering Measures/Controls

- Adequate ventilation systems as needed to control concentrations of airborne contaminants below applicable threshold limit values.

### Personal Protective Equipment

#### Respiratory

- In case of insufficient ventilation, wear suitable respiratory equipment.

#### Eye/Face

- Wear safety glasses.

#### Skin/Body

- Wear appropriate gloves.

### Environmental Exposure Controls

- Controls should be engineered to prevent release to the environment, including procedures to prevent spills, atmospheric release and release to waterways. Follow best practice for site management and disposal of waste.

### Key to abbreviations

ACGIH = American Conference of Governmental Industrial Hygiene

STEL = Short Term Exposure Limits are based on 15-minute exposures

NIOSH = National Institute of Occupational Safety and Health

TLV = Threshold Limit Value determined by the American Conference of Governmental Industrial Hygienists (ACGIH)

OSHA = Occupational Safety and Health Administration

TWA = Time-Weighted Averages are based on 8h/day, 40h/week exposures

## Section 9 - Physical and Chemical Properties

### Information on Physical and Chemical Properties

| Material Description                |                    |                              |                                       |
|-------------------------------------|--------------------|------------------------------|---------------------------------------|
| Physical Form                       | Solid              | Appearance/Description       | Solid silver-like metal with no odor. |
| Color                               | Silver             | Odor                         | No odor.                              |
| Odor Threshold                      | Not relevant       |                              |                                       |
| General Properties                  |                    |                              |                                       |
| Boiling Point                       | Not relevant       | Melting Point/Freezing Point | 593 to 704 °C(1099.4 to 1299.2 °F)    |
| Decomposition Temperature           | No data available  | pH                           | No data available                     |
| Specific Gravity/Relative Density   | 2.5 to 2.9 Water=1 | Water Solubility             | Not relevant                          |
| Viscosity                           | No data available  |                              |                                       |
| Volatility                          |                    |                              |                                       |
| Vapor Pressure                      | Not relevant       | Vapor Density                | Not relevant                          |
| Evaporation Rate                    | No data available  |                              |                                       |
| Flammability                        |                    |                              |                                       |
| Flash Point                         | Not relevant       | UEL                          | Not relevant                          |
| LEL                                 | Not relevant       | Autoignition                 | Not relevant                          |
| Flammability (solid, gas)           | Not flammable.     |                              |                                       |
| Environmental                       |                    |                              |                                       |
| Octanol/Water Partition coefficient | No data available  |                              |                                       |

## Section 10: Stability and Reactivity

### Reactivity

- No dangerous reaction known under conditions of normal use.

### Chemical stability

- Stable under normal temperatures and pressures.

### Possibility of hazardous reactions

- Hazardous polymerization will not occur.

### Conditions to avoid

- Avoid generating dust or fumes.

### Incompatible materials

- Acids, bases, oxidizing materials.

### Hazardous decomposition products

- Combustion: acid halides, oxides of carbon, hydrocarbons, hydrogen cyanide, oxides of nitrogen  
Thermal decomposition products: hydrogen cyanide, hydrogen chloride, oxides of carbon, nitrogen.

## Section 11 - Toxicological Information

### Information on toxicological effects

|                             |                   | Components  |
|-----------------------------|-------------------|---|
| Aluminum<br>(94% TO<br>99%) | 7429<br>-90-<br>5 | <b>Multi-dose Toxicity:</b> Inhalation-Man TCLo • 4 mg/m <sup>3</sup> 1 Year(s)-Intermittent; <i>Lungs, Thorax, or Respiration:</i> <b>Cough</b> ; <i>Lungs, Thorax, or Respiration:</i> <b>Dyspnea</b> ; <i>Nutritional and Gross Metabolic:</i> <b>Gross Metabolite Changes:Weight loss or decreased weight gain</b> ; Inhalation-Rat TCLo • 206 mg/m <sup>3</sup> 5 Hour(s) 30 Day(s)-Intermittent; <i>Lungs, Thorax, or Respiration:</i> <b>Fibrosis (interstitial)</b> ; <i>Endocrine:</i> <b>Hypoglycemia</b> ; <i>Blood:</i> <b>Changes in serum composition (e.g., TP, bilirubin cholesterol)</b>   |
| Silicon (0.2%<br>TO 1.3%)   | 7440<br>-21-<br>3 | <b>Acute Toxicity:</b> Ingestion/Oral-Rat LD50 • 3160 mg/kg;<br><b>Irritation:</b> Eye-Rabbit • 3 mg • Mild irritation  |
| Iron (0.1%<br>TO 0.7%)      | 7439<br>-89-<br>6 | <b>Acute Toxicity:</b> Ingestion/Oral-Rat LD50 • 750 mg/kg; <i>Blood:</i> <b>Changes in serum composition (e.g., TP, bilirubin cholesterol)</b> ; <i>Biochemical:</i> <b>Enzyme inhibition, induction, or change in blood or tissue levels:Transaminases</b> ; Ingestion/Oral-Child TDLo • 77 mg/kg; <i>Behavioral:</i> <b>Irritability</b> ; <i>Gastrointestinal:</i> <b>Nausea or vomiting</b> ; <i>Blood:</i> <b>Normocytic anemia</b> ;<br><b>Multi-dose Toxicity:</b> Ingestion/Oral-Rat TDLo • 105 mg/kg 5 Week(s)-Continuous; <i>Liver:</i> <b>Tumors</b> ; <i>Tumorigenic:</i> <b>Active as anti-cancer agent</b> ; <i>Tumorigenic:</i> <b>Protects against induction of experimental tumors</b>  |
| Copper<br>(0.1% TO<br>0.4%) | 7440<br>-50-<br>8 | <b>Acute Toxicity:</b> Ingestion/Oral-Mouse TDLo • 108 mg/kg; <i>Behavioral:</i> <b>Tremor</b> ; <i>Gastrointestinal:</i> <b>Hypermotility, diarrhea</b> ; <i>Gastrointestinal:</i> <b>Nausea or vomiting</b> ; Ingestion/Oral-Mouse TDLo • 158 mg/kg; <i>Kidney, Ureter, and Bladder:</i> <b>Changes in tubules (including acute renal failure, acute tubular necrosis)</b> ; Ingestion/Oral-Mouse TDLo • 232 mg/kg; <i>Kidney, Ureter, and Bladder:</i> <b>Changes primarily in glomeruli</b> ; <i>Blood:</i> <b>Changes in spleen</b> ; <i>Blood:</i> <b>Changes in serum composition (e.g., TP, bilirubin cholesterol)</b> ;<br><b>Multi-dose Toxicity:</b> Ingestion/Oral-Rabbit TDLo • 3 g/kg 60 Day(s)-Continuous; <i>Cardiac:</i> <b>Other changes</b> ; <i>Liver:</i> <b>Hepatitis (hepatocellular necrosis), zonal</b> ; <i>Related to Chronic Data:</i> <b>Death in the Other Multiple Dose data type field</b> ;<br><b>Reproductive:</b> Ingestion/Oral-Rat TDLo • 152 mg/kg (22W pre); <i>Reproductive Effects:</i> <b>Effects on Embryo or Fetus:Fetotoxicity (except death, e.g., stunted fetus)</b> ; <i>Reproductive Effects:</i> <b>Specific Developmental Abnormalities:Central nervous system</b> ; Ingestion/Oral-Rat TDLo • 1210 µg/kg (35W pre); <i>Reproductive Effects:</i> <b>Effects on Fertility:Pre-implantation mortality</b> ; <i>Reproductive Effects:</i> <b>Effects on Fertility:Post-implantation mortality</b> ; Ingestion/Oral-Rat TDLo • 1520 µg/kg (22W pre); <i>Reproductive Effects:</i> <b>Specific Developmental Abnormalities:Musculoskeletal system</b> ;<br><b>Tumorigen / Carcinogen:</b> Ingestion/Oral-Mouse TDLo • 10.08 mg/kg 12 Week(s)-Continuous; |

|                         |           |  |
|-------------------------|-----------|--|
|                         |           | <b>Tumorigenic: Carcinogenic by RTECS criteria; Lungs, Thorax, or Respiration: Other changes</b>   |
| Manganese (0.02% TO 1%) | 7439-96-5 | <b>Acute Toxicity:</b> Ingestion/Oral-Rat LD50 • 9 g/kg; Inhalation-Man TClO • 2300 µg/m³; <b>Brain and Coverings: Other degenerative changes;</b> <b>Behavioral: Changes in motor activity (specific assay); Behavioral: Muscle weakness;</b> <b>Irritation:</b> Eye-Rabbit • 500 mg 24 Hour(s) • Mild irritation; Skin-Rabbit • 500 mg 24 Hour(s) • Mild irritation; <b>Multi-dose Toxicity:</b> Inhalation-Human TClO • 0.5 mg/m³ 39 Week(s)-Intermittent; <b>Brain and Coverings: Other degenerative changes;</b> <b>Peripheral Nerve and Sensation: Sensory change involving peripheral nerve;</b> <b>Behavioral: Irritability;</b> Inhalation-Mouse TClO • 0.7 mg/m³ 24 Hour(s) 22 Week(s)-Continuous; <b>Lungs, Thorax, or Respiration: Fibrosis (interstitial); Immunological Including Allergic: Decrease in cellular immune response;</b> Inhalation-Rat TClO • 0.3 mg/m³ 5 Hour(s) 26 Week(s)-Intermittent; <b>Lungs, Thorax, or Respiration: Fibrosis (interstitial); Immunological Including Allergic: Decrease in cellular immune response;</b> <b>Reproductive:</b> Ingestion/Oral-Mouse TDLo • 322.5 mg/kg (43D male); <b>Reproductive Effects: Paternal Effects: Spermatogenesis;</b> Ingestion/Oral-Rat TDLo • 50 mg/kg (20D post); <b>Reproductive Effects: Specific Developmental Abnormalities: Central nervous system; Reproductive Effects: Effects on Newborn: Biochemical and metabolic; Reproductive Effects: Effects on Newborn: Behavioral</b> |
| Zinc (0.05% TO 0.25%)   | 7440-66-6 | <b>Irritation:</b> Skin-Human • 300 µg 3 Day(s)-Intermittent • Mild irritation; <b>Tumorigen / Carcinogen:</b> Ingestion/Oral-Mouse TDLo • 12.6 mg/kg 46 Week(s)-Continuous; <b>Tumorigenic: Carcinogenic by RTECS criteria; Gastrointestinal: Tumors; Tumorigenic: Facilitates action of known carcinogen</b>   |
| Titanium (0.1% TO 0.2%) | 7440-32-6 | <b>Reproductive:</b> Ingestion/Oral-Rat TDLo • 158 mg/kg (multigeneration); <b>Reproductive Effects: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus); Reproductive Effects: Effects on Embryo or Fetus: Fetal death</b>   |

| GHS Properties                | Classification               |
|-------------------------------|------------------------------|
| Acute toxicity                | OSHA HCS 2012 • Not relevant |
| Skin corrosion/Irritation     | OSHA HCS 2012 • Not relevant |
| Serious eye damage/Irritation | OSHA HCS 2012 • Not relevant |
| Skin sensitization            | OSHA HCS 2012 • Not relevant |
| Respiratory sensitization     | OSHA HCS 2012 • Not relevant |
| Aspiration Hazard             | OSHA HCS 2012 • Not relevant |
| Carcinogenicity               | OSHA HCS 2012 • Not relevant |
| Germ Cell Mutagenicity        | OSHA HCS 2012 • Not relevant |
| Toxicity for Reproduction     | OSHA HCS 2012 • Not relevant |
| STOT-SE                       | OSHA HCS 2012 • Not relevant |
| STOT-RE                       | OSHA HCS 2012 • Not relevant |

**Potential Health Effects**

**Inhalation**

- Acute (Immediate)** • Under normal conditions of use, no health effects are expected.
- Chronic (Delayed)** • No data available

**Skin**

- Acute (Immediate)** • Under normal conditions of use, no health effects are expected.
- Chronic (Delayed)** • No data available

**Eye**

- Acute (Immediate)** • Under normal conditions of use, no health effects are expected.
- Chronic (Delayed)** • No data available

**Ingestion**

- Acute (Immediate)** • Under normal conditions of use, no health effects are expected.
- Chronic (Delayed)** • No data available

**Key to abbreviations**

LD = Lethal Dose

TC = Toxic Concentration

TD = Toxic Dose

**Section 12 - Ecological Information****Toxicity**

- Non-mandatory section - information not compiled for this reason.

**Persistence and degradability**

- Non-mandatory section - information not compiled for this reason.

**Bioaccumulative potential**

- Non-mandatory section - information not compiled for this reason.

**Mobility in Soil**

- Non-mandatory section - information not compiled for this reason.

**Other adverse effects**

- Non-mandatory section - information not compiled for this reason.

**Section 13 - Disposal Considerations****Waste treatment methods****Product waste**

- Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

**Packaging waste**

- Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

**Section 14 - Transport Information**

|     | UN number      | UN proper shipping name | Transport hazard class(es) | Packing group  | Environmental hazards |
|-----|----------------|-------------------------|----------------------------|----------------|-----------------------|
| DOT | Not Applicable | Not Regulated           | Not Applicable             | Not Applicable | NDA                   |

**Special precautions for user**

- None known.

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**

- No data available

**Section 15 - Regulatory Information****Safety, health and environmental regulations/legislation specific for the substance or mixture****SARA Hazard Classifications**

- None

| State Right To Know |           |     |     |     |
|---------------------|-----------|-----|-----|-----|
| Component           | CAS       | MA  | NJ  | PA  |
| Aluminum            | 7429-90-5 | Yes | Yes | Yes |
| Chromium            | 7440-47-3 | Yes | Yes | Yes |

|           |           |     |     |     |
|-----------|-----------|-----|-----|-----|
| Copper    | 7440-50-8 | Yes | Yes | Yes |
| Iron      | 7439-89-6 | No  | No  | No  |
| Magnesium | 7439-95-4 | Yes | Yes | Yes |
| Manganese | 7439-96-5 | Yes | Yes | Yes |
| Silicon   | 7440-21-3 | Yes | Yes | Yes |
| Titanium  | 7440-32-6 | No  | Yes | No  |
| Zinc      | 7440-66-6 | Yes | Yes | Yes |

| Inventory |           |      |
|-----------|-----------|------|
| Component | CAS       | TSCA |
| Aluminum  | 7429-90-5 | Yes  |
| Chromium  | 7440-47-3 | Yes  |
| Copper    | 7440-50-8 | Yes  |
| Iron      | 7439-89-6 | Yes  |
| Magnesium | 7439-95-4 | Yes  |
| Manganese | 7439-96-5 | Yes  |
| Silicon   | 7440-21-3 | Yes  |
| Titanium  | 7440-32-6 | Yes  |
| Zinc      | 7440-66-6 | Yes  |

## United States

### Labor

#### U.S. - OSHA - Process Safety Management - Highly Hazardous Chemicals

|             |           |            |
|-------------|-----------|------------|
| • Copper    | 7440-50-8 | Not Listed |
| • Chromium  | 7440-47-3 | Not Listed |
| • Manganese | 7439-96-5 | Not Listed |
| • Aluminum  | 7429-90-5 | Not Listed |
| • Silicon   | 7440-21-3 | Not Listed |
| • Zinc      | 7440-66-6 | Not Listed |
| • Iron      | 7439-89-6 | Not Listed |
| • Magnesium | 7439-95-4 | Not Listed |
| • Titanium  | 7440-32-6 | Not Listed |

#### U.S. - OSHA - Specifically Regulated Chemicals

|             |           |            |
|-------------|-----------|------------|
| • Copper    | 7440-50-8 | Not Listed |
| • Chromium  | 7440-47-3 | Not Listed |
| • Manganese | 7439-96-5 | Not Listed |
| • Aluminum  | 7429-90-5 | Not Listed |
| • Silicon   | 7440-21-3 | Not Listed |
| • Zinc      | 7440-66-6 | Not Listed |
| • Iron      | 7439-89-6 | Not Listed |
| • Magnesium | 7439-95-4 | Not Listed |
| • Titanium  | 7440-32-6 | Not Listed |

### Environment

#### U.S. - CAA (Clean Air Act) - 1990 Hazardous Air Pollutants

|             |           |            |
|-------------|-----------|------------|
| • Copper    | 7440-50-8 | Not Listed |
| • Chromium  | 7440-47-3 | Not Listed |
| • Manganese | 7439-96-5 | Not Listed |



|             |           |            |
|-------------|-----------|------------|
| • Aluminum  | 7429-90-5 | Not Listed |
| • Silicon   | 7440-21-3 | Not Listed |
| • Zinc      | 7440-66-6 | Not Listed |
| • Iron      | 7439-89-6 | Not Listed |
| • Magnesium | 7439-95-4 | Not Listed |
| • Titanium  | 7440-32-6 | Not Listed |

**U.S. - CERCLA/SARA - Hazardous Substances and their Reportable Quantities**

|             |           |  |
|-------------|-----------|--|
| • Copper    | 7440-50-8 | 5000 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 µm); 2270 kg final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 µm) |
| • Chromium  | 7440-47-3 | 5000 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 µm); 2270 kg final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 µm) |
| • Manganese | 7439-96-5 | Not Listed   |
| • Aluminum  | 7429-90-5 | Not Listed   |
| • Silicon   | 7440-21-3 | Not Listed   |
| • Zinc      | 7440-66-6 | 454 kg final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 µm); 1000 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 µm)  |
| • Iron      | 7439-89-6 | Not Listed   |
| • Magnesium | 7439-95-4 | Not Listed   |
| • Titanium  | 7440-32-6 | Not Listed   |

**U.S. - CERCLA/SARA - Radionuclides and Their Reportable Quantities**

|             |           |            |
|-------------|-----------|------------|
| • Copper    | 7440-50-8 | Not Listed |
| • Chromium  | 7440-47-3 | Not Listed |
| • Manganese | 7439-96-5 | Not Listed |
| • Aluminum  | 7429-90-5 | Not Listed |
| • Silicon   | 7440-21-3 | Not Listed |
| • Zinc      | 7440-66-6 | Not Listed |
| • Iron      | 7439-89-6 | Not Listed |
| • Magnesium | 7439-95-4 | Not Listed |
| • Titanium  | 7440-32-6 | Not Listed |

**U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances EPCRA RQs**

|             |           |            |
|-------------|-----------|------------|
| • Copper    | 7440-50-8 | Not Listed |
| • Chromium  | 7440-47-3 | Not Listed |
| • Manganese | 7439-96-5 | Not Listed |
| • Aluminum  | 7429-90-5 | Not Listed |
| • Silicon   | 7440-21-3 | Not Listed |
| • Zinc      | 7440-66-6 | Not Listed |
| • Iron      | 7439-89-6 | Not Listed |
| • Magnesium | 7439-95-4 | Not Listed |
| • Titanium  | 7440-32-6 | Not Listed |

**U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances TPQs**

|             |           |            |
|-------------|-----------|------------|
| • Copper    | 7440-50-8 | Not Listed |
| • Chromium  | 7440-47-3 | Not Listed |
| • Manganese | 7439-96-5 | Not Listed |
| • Aluminum  | 7429-90-5 | Not Listed |
| • Silicon   | 7440-21-3 | Not Listed |
| • Zinc      | 7440-66-6 | Not Listed |
| • Iron      | 7439-89-6 | Not Listed |
| • Magnesium | 7439-95-4 | Not Listed |
| • Titanium  | 7440-32-6 | Not Listed |

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

|             |           |  |
|-------------|-----------|--|
| • Copper    | 7440-50-8 | 1.0 % de minimis concentration                     |
| • Chromium  | 7440-47-3 | 1.0 % de minimis concentration                     |
| • Manganese | 7439-96-5 | 1.0 % de minimis concentration                     |
| • Aluminum  | 7429-90-5 | 1.0 % de minimis concentration (dust or fume only) |
| • Silicon   | 7440-21-3 | Not Listed   |
| • Zinc      | 7440-66-6 | 1.0 % de minimis concentration (dust or fume only) |
| • Iron      | 7439-89-6 | Not Listed   |
| • Magnesium | 7439-95-4 | Not Listed   |
| • Titanium  | 7440-32-6 | Not Listed   |

**U.S. - CERCLA/SARA - Section 313 - PBT Chemical Listing**

|             |           |            |
|-------------|-----------|------------|
| • Copper    | 7440-50-8 | Not Listed |
| • Chromium  | 7440-47-3 | Not Listed |
| • Manganese | 7439-96-5 | Not Listed |
| • Aluminum  | 7429-90-5 | Not Listed |
| • Silicon   | 7440-21-3 | Not Listed |
| • Zinc      | 7440-66-6 | Not Listed |
| • Iron      | 7439-89-6 | Not Listed |
| • Magnesium | 7439-95-4 | Not Listed |
| • Titanium  | 7440-32-6 | Not Listed |

**U.S. - RCRA (Resource Conservation & Recovery Act) - Basis for Listing - Appendix VII**

|            |           |   |
|------------|-----------|---|
| • Copper   | 7440-50-8 | Not Listed  |
| • Chromium | 7440-47-3 | Included in waste streams:<br>F032, F034, F035, F037, F038, |

|   |           |   |
|---|-----------|---|
|   |           | F039                                    |
| • Manganese   | 7439-96-5 | Not Listed                              |
| • Aluminum  | 7429-90-5 | Not Listed                              |
| • Silicon   | 7440-21-3 | Not Listed                              |
| • Zinc  | 7440-66-6 | Not Listed                              |
| • Iron  | 7439-89-6 | Not Listed                              |
| • Magnesium   | 7439-95-4 | Not Listed                              |
| • Titanium  | 7440-32-6 | Not Listed                              |
| <b>U.S. - RCRA (Resource Conservation &amp; Recovery Act) - Constituents for Detection Monitoring</b>                                 |           |   |
| • Copper  | 7440-50-8 | (total)                                 |
| • Chromium  | 7440-47-3 | (total)                                 |
| • Manganese   | 7439-96-5 | Not Listed                              |
| • Aluminum  | 7429-90-5 | Not Listed                              |
| • Silicon   | 7440-21-3 | Not Listed                              |
| • Zinc  | 7440-66-6 | (total)                                 |
| • Iron  | 7439-89-6 | Not Listed                              |
| • Magnesium   | 7439-95-4 | Not Listed                              |
| • Titanium  | 7440-32-6 | Not Listed                              |
| <b>U.S. - RCRA (Resource Conservation &amp; Recovery Act) - D Series Wastes - Max Conc of Contaminants for the Tox Characteristic</b> |           |   |
| • Copper  | 7440-50-8 | Not Listed                              |
| • Chromium  | 7440-47-3 | 5.0 mg/L regulatory level               |
| • Manganese   | 7439-96-5 | Not Listed                              |
| • Aluminum  | 7429-90-5 | Not Listed                              |
| • Silicon   | 7440-21-3 | Not Listed                              |
| • Zinc  | 7440-66-6 | Not Listed                              |
| • Iron  | 7439-89-6 | Not Listed                              |
| • Magnesium   | 7439-95-4 | Not Listed                              |
| • Titanium  | 7440-32-6 | Not Listed                              |
| <b>U.S. - RCRA (Resource Conservation &amp; Recovery Act) - Hazardous Constituents - Appendix VIII to 40 CFR 261</b>                  |           |   |
| • Copper  | 7440-50-8 | Not Listed                              |
| • Chromium  | 7440-47-3 | hazardous constituent - no waste number |
| • Manganese   | 7439-96-5 | Not Listed                              |
| • Aluminum  | 7429-90-5 | Not Listed                              |
| • Silicon   | 7440-21-3 | Not Listed                              |
| • Zinc  | 7440-66-6 | Not Listed                              |
| • Iron  | 7439-89-6 | Not Listed                              |
| • Magnesium   | 7439-95-4 | Not Listed                              |
| • Titanium  | 7440-32-6 | Not Listed                              |
| <b>U.S. - RCRA (Resource Conservation &amp; Recovery Act) - List for Hazardous Constituents</b>                                       |           |   |
| • Copper  | 7440-50-8 | (total)                                 |
| • Chromium  | 7440-47-3 | (total)                                 |
| • Manganese   | 7439-96-5 | Not Listed                              |
| • Aluminum  | 7429-90-5 | Not Listed                              |
| • Silicon   | 7440-21-3 | Not Listed                              |
| • Zinc  | 7440-66-6 | (total)                                 |
| • Iron  | 7439-89-6 | Not Listed                              |
| • Magnesium   | 7439-95-4 | Not Listed                              |
| • Titanium  | 7440-32-6 | Not Listed                              |
| <b>U.S. - RCRA (Resource Conservation &amp; Recovery Act) - Phase 4 LDR Rule - Universal Treatment Standards</b>                      |           |   |

|             |           |   |
|-------------|-----------|---|
| • Copper    | 7440-50-8 | Not Listed  |
| • Chromium  | 7440-47-3 | 2.77 mg/L (total, wastewater);<br>0.60 mg/L TCLP (total, nonwastewater) |
| • Manganese | 7439-96-5 | Not Listed  |
| • Aluminum  | 7429-90-5 | Not Listed  |
| • Silicon   | 7440-21-3 | Not Listed  |
| • Zinc      | 7440-66-6 | 2.61 mg/L (wastewater); 4.3 mg/L TCLP (nonwastewater)                   |
| • Iron      | 7439-89-6 | Not Listed  |
| • Magnesium | 7439-95-4 | Not Listed  |
| • Titanium  | 7440-32-6 | Not Listed  |

**U.S. - RCRA (Resource Conservation & Recovery Act) - TSD Facilities Ground Water Monitoring**

|             |           |            |
|-------------|-----------|------------|
| • Copper    | 7440-50-8 | (total)    |
| • Chromium  | 7440-47-3 | (total)    |
| • Manganese | 7439-96-5 | Not Listed |
| • Aluminum  | 7429-90-5 | Not Listed |
| • Silicon   | 7440-21-3 | Not Listed |
| • Zinc      | 7440-66-6 | (total)    |
| • Iron      | 7439-89-6 | Not Listed |
| • Magnesium | 7439-95-4 | Not Listed |
| • Titanium  | 7440-32-6 | Not Listed |

**United States - California**

**Environment**

**U.S. - California - Proposition 65 - Carcinogens List**

|             |           |            |
|-------------|-----------|------------|
| • Copper    | 7440-50-8 | Not Listed |
| • Chromium  | 7440-47-3 | Not Listed |
| • Manganese | 7439-96-5 | Not Listed |
| • Aluminum  | 7429-90-5 | Not Listed |
| • Silicon   | 7440-21-3 | Not Listed |
| • Zinc      | 7440-66-6 | Not Listed |
| • Iron      | 7439-89-6 | Not Listed |
| • Magnesium | 7439-95-4 | Not Listed |
| • Titanium  | 7440-32-6 | Not Listed |

**U.S. - California - Proposition 65 - Developmental Toxicity**

|             |           |            |
|-------------|-----------|------------|
| • Copper    | 7440-50-8 | Not Listed |
| • Chromium  | 7440-47-3 | Not Listed |
| • Manganese | 7439-96-5 | Not Listed |
| • Aluminum  | 7429-90-5 | Not Listed |
| • Silicon   | 7440-21-3 | Not Listed |
| • Zinc      | 7440-66-6 | Not Listed |
| • Iron      | 7439-89-6 | Not Listed |
| • Magnesium | 7439-95-4 | Not Listed |
| • Titanium  | 7440-32-6 | Not Listed |

**U.S. - California - Proposition 65 - Maximum Allowable Dose Levels (MADL)**

|             |           |            |
|-------------|-----------|------------|
| • Copper    | 7440-50-8 | Not Listed |
| • Chromium  | 7440-47-3 | Not Listed |
| • Manganese | 7439-96-5 | Not Listed |
| • Aluminum  | 7429-90-5 | Not Listed |
| • Silicon   | 7440-21-3 | Not Listed |

|   |           |            |
|---|-----------|------------|
| • Zinc  | 7440-66-6 | Not Listed |
| • Iron  | 7439-89-6 | Not Listed |
| • Magnesium   | 7439-95-4 | Not Listed |
| • Titanium  | 7440-32-6 | Not Listed |
| <b>U.S. - California - Proposition 65 - No Significant Risk Levels (NSRL)</b> |           |            |
| • Copper  | 7440-50-8 | Not Listed |
| • Chromium  | 7440-47-3 | Not Listed |
| • Manganese   | 7439-96-5 | Not Listed |
| • Aluminum  | 7429-90-5 | Not Listed |
| • Silicon   | 7440-21-3 | Not Listed |
| • Zinc  | 7440-66-6 | Not Listed |
| • Iron  | 7439-89-6 | Not Listed |
| • Magnesium   | 7439-95-4 | Not Listed |
| • Titanium  | 7440-32-6 | Not Listed |
| <b>U.S. - California - Proposition 65 - Reproductive Toxicity - Female</b>    |           |            |
| • Copper  | 7440-50-8 | Not Listed |
| • Chromium  | 7440-47-3 | Not Listed |
| • Manganese   | 7439-96-5 | Not Listed |
| • Aluminum  | 7429-90-5 | Not Listed |
| • Silicon   | 7440-21-3 | Not Listed |
| • Zinc  | 7440-66-6 | Not Listed |
| • Iron  | 7439-89-6 | Not Listed |
| • Magnesium   | 7439-95-4 | Not Listed |
| • Titanium  | 7440-32-6 | Not Listed |
| <b>U.S. - California - Proposition 65 - Reproductive Toxicity - Male</b>      |           |            |
| • Copper  | 7440-50-8 | Not Listed |
| • Chromium  | 7440-47-3 | Not Listed |
| • Manganese   | 7439-96-5 | Not Listed |
| • Aluminum  | 7429-90-5 | Not Listed |
| • Silicon   | 7440-21-3 | Not Listed |
| • Zinc  | 7440-66-6 | Not Listed |
| • Iron  | 7439-89-6 | Not Listed |
| • Magnesium   | 7439-95-4 | Not Listed |
| • Titanium  | 7440-32-6 | Not Listed |

## United States - Pennsylvania

|   |           |                     |
|---|-----------|---------------------|
| <b>Labor</b>  |           |                     |
| <b>U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List</b>    |           |                     |
| • Copper  | 7440-50-8 | (dust; fume; metal) |
| • Chromium  | 7440-47-3 |                     |
| • Manganese   | 7439-96-5 |                     |
| • Aluminum  | 7429-90-5 |                     |
| • Silicon   | 7440-21-3 | Not Listed          |
| • Zinc  | 7440-66-6 |                     |
| • Iron  | 7439-89-6 | Not Listed          |
| • Magnesium   | 7439-95-4 | Not Listed          |
| • Titanium  | 7440-32-6 | Not Listed          |
| <b>U.S. - Pennsylvania - RTK (Right to Know) - Special Hazardous Substances</b> |           |                     |
| • Copper  | 7440-50-8 | Not Listed          |
| • Chromium  | 7440-47-3 |                     |

|             |           |            |
|-------------|-----------|------------|
| • Manganese | 7439-96-5 | Not Listed |
| • Aluminum  | 7429-90-5 | Not Listed |
| • Silicon   | 7440-21-3 | Not Listed |
| • Zinc      | 7440-66-6 | Not Listed |
| • Iron      | 7439-89-6 | Not Listed |
| • Magnesium | 7439-95-4 | Not Listed |
| • Titanium  | 7440-32-6 | Not Listed |

## Section 16 - Other Information

- Revision Date** • 19/October/2016
- Last Revision Date** • 14/October/2016
- Preparation Date** • 14/October/2016
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**Key to abbreviations**

NDA = No Data Available