

**1. Identification**

|   |   |
|---|---|
| <b>Product identifier</b>                                     | <b>WROUGHT ALUMINUM PRODUCTS, 3xxx SERIES ALLOYS</b>  |
| <b>Version #</b>  | 01  |
| <b>Revision date</b>  | Not Applicable  |
| <b>Other means of identification</b>                          |   |
| <b>Synonyms</b>   | KWAR-01<br>3xxx Series Alloys, 3xxx Cladding, 0033, 0346_DA3113, 3003, 3003F, 3003-C06C, 3005, 3103, 3104, 3104BLND, 3105, 3PORC, Alclad 3003, Alclad 3004, AM01, A018, A042, A075, A090, A091, A092, A102, A104, A105, A126-WAR, A138-WAR, A145, A158, A163, A164, A169, C02D, C03H, C06C, C06D, C06E, C10H,C12H, C122-WAR, C123H C13C, C131H-WAR, C132H-WAR, C134H-WAR,C136H-WAR, C156-WAR, C168H, C18D, C192H, C1A8-WAR, C21H, C22M, C23M, C243H, C24M, C29D, C31D, C32D, C32J, C336H-WAR, C33D, C343H-WAR, C34A, C34D, C35B, C35D, C360F, C374F, C375H-WAR, C3A3-WAR, C3A5-WAR, C434F, C447F, C44R, C45K, C47B, C47D, C47K, C48D, C49B, C49B-WAR, C49K, C50K, C517-WAR, C518-WAR, C519F, C51K, C53B-WAR, C53R, C568, C568-WAR, C56A-WAR, C56K, C56R, C58B-WAR,C604F, C60R, C616F, C617F, C63R, C63Z, C64R, C64Z, C657F, C71D, C72D, C73D, C76S, C783, C788, C78C, C78R, C791, C793, C799F, C80S, C82C, C836F, C837F, C838F, C83C, C841F, C844F, C845F, C84C, C875F, C88S, C898F, C90R, C91D, C94S, C96N, C98C, C98D, C98S, CH14, CZ88 |
| <b>Recommended use</b>  | Various fabricated aluminum parts and products  |
| <b>Recommended restrictions</b>                               | None known.   |
| <b>Manufacturer/Importer/Supplier/Distributor information</b> |   |
| <b>Manufacturer</b>   | Kaiser Aluminum Warrick LLC<br>4000 W. State Route 66<br>Newburgh, IN 47629   |
| <b>Emergency Information</b>                                  | CHEMTREC: +1-703-527-3887 +1-800-424-9300 (24 Hour Emergency Telephone, multiple languages spoken); Kaiser Warrick: +1-877-335-9886 (24 Hour Emergency Telephone, only English spoken)  |
| <b>Website</b>  | For a current Safety Data Sheet, refer to Kaiser website:<br><a href="https://www.kaiseraluminum.com/customer-portal/safety-data-sheets/">https://www.kaiseraluminum.com/customer-portal/safety-data-sheets/</a>  |

**2. Hazard(s) identification****Classification**

Under some use conditions, this material may be considered to be hazardous in accordance with OSHA 29 CFR 1910.1200.

**Potential health effects**

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

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.

|                              |  |
|------------------------------|--|
| <b>Physical hazards</b>      | Not classified.  |
| <b>Health hazards</b>        | Specific target organ toxicity, single exposure Category 1 |
| <b>Environmental hazards</b> | Not classified.  |
| <b>OSHA defined hazards</b>  | Combustible dust   |
| <b>Label elements</b>        |  |
| <b>Hazard symbol</b>         | None.  |
| <b>Signal word</b>           | Warning  |

|  |  |
|--|--|
| <b>Hazard statement</b>                          | The mixture does not meet the criteria for classification. May form combustible dust concentrations in air.  |
| <b>Precautionary statement</b>                   |  |
| <b>Prevention</b>                                | Not applicable.  |
| <b>Response</b>                                  | Not applicable.  |
| <b>Storage</b>                                   | Not applicable.  |
| <b>Disposal</b>                                  | Reuse or recycle material whenever possible. Dispose of contents/container in accordance with local/regional/national/international regulations.   |
| <b>Hazard(s) not otherwise classified (HNOC)</b> | None known.  |
| <b>Supplemental information</b>                  | Non-combustible as supplied.   |
|  | Explosion/fire hazards may be present when: <ul style="list-style-type: none"> <li>• Dust or fines are dispersed in air.</li> <li>• Chips, dust or fines are in contact with water.</li> <li>• Dust and fines are in contact with certain metal oxides (e.g., rust, copper oxide).</li> <li>• Molten metal in contact with water/moisture or certain metal oxides (e.g., rust, copper oxide).</li> </ul> <p>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.</p> |
| <b>Specific hazards</b>                          | Non-combustible as supplied. Small chips, fine turnings, and dust from processing may be readily ignitable.  |
|  | Explosion/fire hazards may be present when: <ul style="list-style-type: none"> <li>• Dust or fines are dispersed in air.</li> <li>• Chips, dust or fines are in contact with water.</li> <li>• Molten metal in contact with water/moisture or certain metal oxides (e.g., rust, copper oxide).</li> </ul>  |

### 3. Composition/information on ingredients

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

#### Mixtures

| Chemical name | Common name and synonyms | CAS number | %    |
|---------------|--------------------------|------------|------|
| Aluminum      |                          | 7429-90-5  | >92  |
| Zinc          |                          | 7440-66-6  | <2.8 |
| Manganese     |                          | 7439-96-5  | <2.0 |
| Silicon       |                          | 7440-21-3  | <1.9 |
| Magnesium     |                          | 7439-95-4  | <1.6 |
| Iron          |                          | 7439-89-6  | <1.1 |
| Chromium      |                          | 7440-47-3  | <0.5 |
| Nickel        |                          | 7440-02-0  | <0.1 |

**Additional Information** Present as impurity. While Nickel is not intentionally added to this mixture, it could potentially enter through the recycle stream. Additional compounds which may be formed during processing are listed in Section 8.

### 4. First-aid measures

|                     |   |
|---------------------|---|
| <b>Eye contact</b>  | Dust and fumes from processing: Rinse eyes with plenty of water or saline for at least 15 minutes. If eye irritation persists: Get medical advice/attention.  |
| <b>Skin contact</b> | Dust and fume from processing or contact with lubricant/residual oil: Wash with soap and water for at least 15 minutes. Get medical attention if irritation develops or persists.   |
| <b>Inhalation</b>   | 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. |
| <b>Ingestion</b>    | Not relevant, due to the form of the product.   |

|   |  |
|---|--|
| <b>Most important symptoms/effects, acute and delayed</b>                     | Dust and fumes from processing: Can cause irritation of the upper respiratory tract. Additional health effects from elevated temperature processing (e.g., welding, melting): Heating above the melting point releases metallic oxides which may cause metal fume fever by inhalation. The symptoms are shivering, fever, malaise and muscular pain.<br>Contact with residual oil/oil coating: Prolonged skin contact may cause skin irritation and/or dermatitis.   |
| <b>Medical conditions aggravated by exposure</b>                              | Asthma, chronic lung disease, and skin rashes.   |
| <b>Indication of immediate medical attention and special treatment needed</b> | Treat symptomatically.   |
| <b>General information</b>  | Dust and fume from processing: If exposed or concerned: get medical attention/advice.  |
| <b>5. Fire-fighting measures</b>  |  |
| <b>Suitable extinguishing media</b>   | Use Class D extinguishing agents on fines, dust or molten metal.<br>Use coarse water spray on chips and turnings.  |
| <b>Unsuitable extinguishing media</b>   | DO NOT USE halogenated extinguishing agents on small chips/fines.<br>DO NOT USE water in fighting fires around molten metal.<br>These fire extinguishing agents will react with the burning material.  |
| <b>Specific hazards arising from the chemical</b>                             | May be a potential hazard under the following conditions: <ul style="list-style-type: none"> <li>• 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.</li> <li>• 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.</li> <li>• 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.</li> <li>• 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.</li> </ul> |
| <b>Hazardous combustion products</b>  | None known.  |
| <b>Special protective equipment and precautions for firefighters</b>          | Firefighters should wear NIOSH approved, positive pressure, self-contained breathing apparatus and full protective clothing when appropriate.  |
| <b>Fire fighting equipment/instructions</b>                                   | Use gentle surface application of Class D extinguishing agent or dry inert granular material (e.g., sand) to cover and ring the burning material. Apply extinguishing media carefully to avoid creating airborne dust. If impossible to extinguish, protect surroundings and allow fire to burn itself out.  |
| <b>General fire hazards</b>   | This product does not present fire or explosion hazards as shipped. Small chips, fine turnings, and dust from processing may be readily ignitable.   |
| <b>Explosion data</b>   |  |
| <b>Sensitivity to mechanical impact</b>                                       | Not sensitive.   |
| <b>Sensitivity to static discharge</b>  | Take precautionary measures against static discharges when there is a risk of dust explosion.  |
| <b>6. Accidental release measures</b>   |  |
| <b>Personal precautions, protective equipment and emergency procedures</b>    | Avoid generating dust. Avoid contact with sharp edges or heated metal. Molten, heated and cold aluminum look alike; do not touch unless you know it is cold. Use personal protection recommended in Section 8 of the SDS.  |
| <b>Personal precautions, protective equipment and emergency procedures</b>    |  |
| <b>For emergency responders</b>   | Avoid generating dust. Avoid contact with sharp edges or heated metal. Molten, heated and cold aluminum look alike; do not touch unless you know it is cold. Use personal protection recommended in Section 8 of the SDS.  |
| <b>Evacuation procedures</b>  | Keep unnecessary personnel away.   |
| <b>Methods and materials for containment and cleaning up</b>                  | Collect scrap for recycling.<br>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.   |
| <b>Environmental precautions</b>  | No special environmental precautions required.   |

## 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.

### Requirements for Processes Which Generate Dusts or Fines

If processing of this product generates dust or if extremely fine particulate is generated, obtain and follow the safety procedures and equipment guides contained in Aluminum Association Bulletin F-1 and National Fire Protection Association (NFPA) brochures listed in Section 16.

Use non-sparking handling equipment, 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.

Good housekeeping practices must be maintained. Avoid all ignition sources. Dust accumulation on the floor, ledges and beams can present a risk of ignition, flame propagation and secondary explosions. 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.

### Dross Handling

Small amounts of beryllium (<0.0002% or <2 ppm) can be present in aluminum alloys either from naturally occurring beryllium in aluminum ore or as a alloying element in the aluminum recycling stream. This beryllium does not present a health hazard during processing (grinding, cutting or welding) of aluminum products. However, beryllium may concentrate in the dross formed when aluminum scrap is remelted. Therefore, the potential for exposures to beryllium when handling dross must be considered. Control of airborne dust levels would be critical in reducing or eliminating this potential.

## 8. Exposure controls/personal protection

### Occupational exposure limits

#### U.S. - OSHA

| Components                | Type    | Value               | Form                               |
|---------------------------|---------|---------------------|------------------------------------|
| Aluminum (CAS 7429-90-5)  | TWA     | 5 mg/m3<br>15 mg/m3 | Respirable fraction<br>Total dust  |
| Chromium (CAS 7440-47-3)  | TWA     | 1 mg/m3             |                                    |
| Manganese (CAS 7439-96-5) | Ceiling | 5 mg/m3             | Fume                               |
| Nickel (CAS 7440-02-0)    | TWA     | 1 mg/m3             |                                    |
| Silicon (CAS 7440-21-3)   | TWA     | 5 mg/m3<br>15 mg/m3 | Respirable fraction.<br>Total dust |

#### Compounds Formed During Processing

| Compounds Formed During Processing                     | Type             | Value                          | Form                                |
|--|------------------|--------------------------------|-------------------------------------|
| Aluminum oxide (non-fibrous) (CAS 1344-28-1)           | TWA              | 5 mg/m3<br>15 mg/m3            | Respirable fraction.<br>Total dust. |
| Chromium (II) compounds                                | TWA              | 0.5 mg/m3                      | (as Cr)                             |
| Chromium (III) compounds                               | TWA              | 0.5 mg/m3                      | (as Cr)                             |
| Chromium (VI) compounds, certain water insoluble forms | TWA              | 0.0025 mg/m3                   | Action Level as Cr(VI))             |
| Chromium (VI) compounds (CAS 18540-29-9)               | TWA              | 0.0025 mg/m3                   | Action Level as Cr(VI)              |
| Iron oxide (CAS 1309-37-1)                             | TWA              | 10 mg/m3                       | Fume.                               |
| Manganese compounds, inorganic                         | Ceiling          | 5 mg/m3                        | (as Mn) Fume                        |
| Nickel compounds, insoluble                            | TWA              | 1 mg/m3                        | (as Ni)                             |
| Nitric oxide (CAS 10102-43-9)                          | TWA              | 30 mg/m3                       |                                     |
| Oil mist, mineral                                      | TWA              | 25 ppm<br>5 mg/m3              | Mist.                               |
| Ozone (CAS 10028-15-6)                                 | TWA              | 0.2 mg/m3                      |                                     |
| Zinc oxide (CAS 1314-13-2)                             | TWA              | 0.1 ppm<br>5 mg/m3             | Fume.                               |
|  |                  | 5 mg/m3<br>5 mg/m3<br>15 mg/m3 | Respirable fraction.<br>Total dust. |
|  | TWA (fume)       | 5 mg/m3                        | Fume.                               |
|  | TWA (total dust) | 15 mg/m3                       | Total dust.                         |

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

| Compounds Formed During Processing                     | Type | Value       | Form      |
|--|------|-------------|-----------|
| Chromium (VI) compounds, certain water insoluble forms | TWA  | 0.005 mg/m3 | as Cr(VI) |
| Chromium (VI) compounds, water soluble forms           | TWA  | 0.005 mg/m3 |           |
| Chromium (VI) compounds (CAS 18540-29-9)               | TWA  | 0.005 mg/m3 | as Cr(VI) |

#### US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

| Components               | Type | Value   | Form                 |
|--------------------------|------|---------|----------------------|
| Aluminum (CAS 7429-90-5) | PEL  | 5 mg/m3 | Respirable fraction. |

**US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)**

| <b>Compounds Formed During Processing</b> | <b>Type</b> | <b>Value</b>         | <b>Form</b>          |
|---|-------------|----------------------|----------------------|
| Magnesium oxide (CAS 1309-48-4)           | PEL         | 15 mg/m <sup>3</sup> | Total particulate.   |
| Nitrogen dioxide (CAS 10102-44-0)         | Ceiling     | 9 mg/m <sup>3</sup>  |                      |
| Oil mist, mineral                         | PEL         | 5 ppm                | Mist.                |
| Zinc oxide (CAS 1314-13-2)                | PEL         | 5 mg/m <sup>3</sup>  | Respirable fraction. |
|   |             | 5 mg/m <sup>3</sup>  | Fume.                |
|   |             | 15 mg/m <sup>3</sup> | Total dust.          |

**US. OSHA Table Z-3 (29 CFR 1910.1000)**

| <b>Components</b>        | <b>Type</b> | <b>Value</b>         | <b>Form</b>          |
|--------------------------|-------------|----------------------|----------------------|
| Aluminum (CAS 7429-90-5) | TWA         | 5 mg/m <sup>3</sup>  | Respirable fraction. |
|                          |             | 15 mg/m <sup>3</sup> | Total dust.          |
|                          |             | 50 mppcf             | Total dust.          |
|                          |             | 15 mppcf             | Respirable fraction. |

| <b>Compounds Formed During Processing</b>    | <b>Type</b> | <b>Value</b>         | <b>Form</b>          |
|--|-------------|----------------------|----------------------|
| Aluminum oxide (non-fibrous) (CAS 1344-28-1) | TWA         | 5 mg/m <sup>3</sup>  | Respirable fraction. |
|  |             | 15 mg/m <sup>3</sup> | Total dust.          |
|  |             | 50 mppcf             | Total dust.          |
|  |             | 15 mppcf             | Respirable fraction. |
| Iron oxide (CAS 1309-37-1)                   | TWA         | 5 mg/m <sup>3</sup>  | Respirable fraction. |
|  |             | 15 mg/m <sup>3</sup> | Total dust.          |
|  |             | 50 mppcf             | Total dust.          |
|  |             | 15 mppcf             | Respirable fraction. |
| Magnesium oxide (CAS 1309-48-4)              | TWA         | 5 mg/m <sup>3</sup>  | Respirable fraction. |
|  |             | 15 mg/m <sup>3</sup> | Total dust.          |
|  |             | 50 mppcf             | Total dust.          |
|  |             | 15 mppcf             | Respirable fraction. |

**ACGIH**

| <b>Components</b>         | <b>Type</b>               | <b>Value</b>           | <b>Form</b>           |
|---------------------------|---------------------------|------------------------|-----------------------|
| Manganese (CAS 7439-96-5) | TWA (inhalable fraction)  | 0.2 mg/m <sup>3</sup>  | (inhalable fraction)  |
|                           | TWA (respirable fraction) | 0.02 mg/m <sup>3</sup> | (respirable fraction) |

| <b>Compounds Formed During Processing</b>    | <b>Type</b> | <b>Value</b>           | <b>Form</b>                                     |
|--|-------------|------------------------|---|
| Aluminum oxide (non-fibrous) (CAS 1344-28-1) | TWA         | 1 mg/m <sup>3</sup>    | Respirable fraction, as Al                      |
| Chromium (VI) compounds, water soluble forms | TWA         | 0.05 mg/m <sup>3</sup> | (as Cr)   |
| Chromium (VI) compounds (CAS 18540-29-9)     | TWA         | 0.05 mg/m <sup>3</sup> | Soluble compounds as Cr                         |
| Ozone (CAS 10028-15-6)                       | TWA         | 0.2 ppm                | (Heavy, moderate or light workloads (≤2 hours)) |

**US ACGIH Threshold Limit Values: Short Term Exposure Limit (STEL): mg/m3**

| <b>Compounds Formed During Processing</b> | <b>Type</b> | <b>Value</b> | <b>Form</b>          |
|---|-------------|--------------|----------------------|
| Zinc oxide<br>(CAS 1314-13-2)             | STEL        | 10 mg/m3     | Respirable fraction. |

**US ACGIH Threshold Limit Values: Time Weighted Average (TWA): mg/m3 & ppm**

| <b>Compounds Formed During Processing</b> | <b>Type</b> | <b>Value</b> |  |
|---|-------------|--------------|--|
| Nitric oxide<br>(CAS 10102-43-9)          | TWA         | 25 ppm       |  |
| Nitrogen dioxide<br>(CAS 10102-44-0)      | TWA         | 0.2 ppm      |  |

**US ACGIH Threshold Limit Values: Time Weighted Average (TWA): mg/m3, non-standard units**

| <b>Components</b>         | <b>Type</b> | <b>Value</b>            | <b>Form</b>                                 |
|---------------------------|-------------|-------------------------|---|
| Aluminum (CAS 7429-90-5)  | TWA         | 1 mg/m3                 | Respirable fraction.                        |
| Chromium (CAS 7440-47-3)  | TWA         | 0.5 mg/m3               |   |
| Manganese (CAS 7439-96-5) | TWA         | 0.1 mg/m3               | Inhalable fraction.                         |
| Nickel (CAS 7440-02-0)    | TWA         | 0.02 mg/m3<br>1.5 mg/m3 | Respirable fraction.<br>Inhalable fraction. |

| <b>Compounds Formed During Processing</b>              | <b>Type</b> | <b>Value</b>            | <b>Form</b>                                 |
|--|-------------|-------------------------|---|
| Chromium (III) compounds                               | TWA         | 0.5 mg/m3               |   |
| Chromium (VI) compounds, certain water insoluble forms | TWA         | 0.01 mg/m3              | (as Cr)                                     |
| Chromium (VI) compounds (CAS 18540-29-9)               | TWA         | 0.01 mg/m3              | Insoluble compounds as Cr                   |
| Iron oxide (CAS 1309-37-1)                             | TWA         | 5 mg/m3                 | Respirable fraction.                        |
| Magnesium oxide (CAS 1309-48-4)                        | TWA         | 10 mg/m3                | Inhalable fraction.                         |
| Manganese compounds, inorganic                         | TWA         | 0.1 mg/m3               | Inhalable fraction.                         |
| Nickel compounds, insoluble                            | TWA         | 0.02 mg/m3<br>0.2 mg/m3 | Respirable fraction.<br>Inhalable fraction. |
| Oil mist, mineral                                      | TWA         | 5 mg/m3                 | Inhalable fraction.                         |
| Zinc oxide (CAS 1314-13-2)                             | TWA         | 2 mg/m3                 | Respirable fraction.                        |

| <b>Components</b>         | <b>Type</b> | <b>Value</b>          | <b>Form</b>                       |
|---------------------------|-------------|-----------------------|-----------------------------------|
| Aluminum (CAS 7429-90-5)  | TWA         | 3 mg/m3<br>10 mg/m3   | Respirable fraction<br>Total dust |
| Manganese (CAS 7439-96-5) | TWA         | 0.05 mg/m3            | Total dust.                       |
| Nickel (CAS 7440-02-0)    | TWA         | 0.02 mg/m3<br>1 mg/m3 | Respirable fraction.              |

  

| <b>Compounds Formed During Processing</b>    | <b>Type</b> | <b>Value</b>             | <b>Form</b>                                       |
|--|-------------|--------------------------|---|
| Aluminum oxide (non-fibrous) (CAS 1344-28-1) | TWA         | 3 mg/m3                  | Respirable fraction.                              |
| Chromium (VI) compounds (CAS 18540-29-9)     | TWA         | 10 mg/m3<br>0.25 µg/m3   | Total dust.                                       |
| Manganese compounds, inorganic               | TWA         | 0.05 mg/m3<br>0.02 mg/m3 | Total dust, as Mn.<br>Respirable fraction, as Mn. |

| Compounds Formed During Processing   | Type  | Value     | Form      |
|--|---|-----------|-----------|
| Nickel compounds, insoluble  | TWA   | 0.1 mg/m3 | Insoluble |
| Oil mist, mineral  | TWA   | 0.5 mg/m3 | (8 Hour)  |
| <b>General</b>   | <p>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).</p> <p>Minimize breathing oil vapors and mist. Remove oil contaminated clothing; launder or dry-clean before reuse. Remove oil contaminated shoes and thoroughly clean and dry before reuse. Cleanse skin thoroughly after contact, before breaks and meals, and at the end of the work period. Oil coating is readily removed from skin with waterless hand cleaners followed by a thorough washing with soap and water.</p> |           |           |
| <b>Appropriate engineering controls</b>                                      | 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.  |           |           |
| <b>Individual protection measures, such as personal protective equipment</b> |   |           |           |
| <b>Eye/face protection</b>   | Wear safety glasses with side shields. If molten: Goggles/face shield are recommended.  |           |           |
| <b>Skin protection</b>   |   |           |           |
| <b>Hand protection</b>   | Wear impervious gloves to avoid repeated or prolonged skin contact with residual oils and to avoid any skin injury.   |           |           |
| <b>Other</b>   | The need for personal protective equipment should be based upon a hazard assessment and recommendations from health / safety professionals.   |           |           |
| <b>Respiratory protection</b>  | 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: P95..  |           |           |
| <b>Thermal hazards</b>   | 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. Flame retardant protective clothing is recommended.  |           |           |
| <b>General hygiene considerations</b>  | Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and immediately after handling the product.   |           |           |
| <b>Control parameters</b>  | Follow standard monitoring procedures.  |           |           |

## 9. Physical and chemical properties

|   |  |
|---|--|
| <b>Form</b>   | Solid.                                     |
| <b>Color</b>  | Silver colored.                            |
| <b>Odor</b>   | Odorless                                   |
| <b>Odor threshold</b>                               | Not applicable                             |
| <b>pH</b>   | Not applicable                             |
| <b>Density</b>                                      | 2.70 - 2.75 g/cm3 (0.098-0.099 lb/in3)     |
| <b>Melting point/freezing point</b>                 | 1149.8 - 1220 °F (621 - 660 °C)            |
| <b>Initial boiling point and boiling range</b>      | Not determined                             |
| <b>Flash point</b>                                  | Not applicable                             |
| <b>Evaporation rate</b>                             | Not applicable                             |
| <b>Flammability (solid, gas)</b>                    | Not applicable.                            |
| <b>Upper/lower flammability or explosive limits</b> |  |
| <b>Flammability limit - upper (%)</b>               | Not applicable                             |
| <b>Flammability limit - lower (%)</b>               | Not applicable                             |
| <b>Explosive properties</b>                         | Dust can form an explosive mixture in air. |



## Dust explosion properties

|  |                        |
|--|------------------------|
| <b>St class</b>                                | Very strong explosion. |
| <b>Vapor pressure</b>                          | Not applicable         |
| <b>Vapor density</b>                           | Not applicable         |
| <b>Relative density</b>                        | Not determined         |
| <b>Solubility(ies)</b>                         | Insoluble              |
| <b>Partition coefficient (n-octanol/water)</b> | Not applicable.        |
| <b>Auto-ignition temperature</b>               | Not applicable         |
| <b>Decomposition temperature</b>               | Not applicable         |
| <b>Viscosity</b>                               | Not applicable         |

## 10. Stability and reactivity

|   |   |
|---|---|
| <b>Reactivity</b>                         | The product is stable and non-reactive under normal conditions of use, storage and transport.   |
| <b>Chemical stability</b>                 | Stable under normal conditions of use, storage, and transportation as shipped.  |
| <b>Possibility of hazardous reactions</b> | Hazardous polymerization does not occur.  |
| <b>Conditions to avoid</b>                | <p>Chips, fines, dust and molten metal are considerably more reactive with the following:</p> <ul style="list-style-type: none"><li>• 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.</li><li>• Heat: Oxidizes at a rate dependent upon temperature and particle size</li></ul> |

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  $\mu\text{m}$  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.

## Incompatible materials

Chips, fines, dust and molten metal are considerably more reactive with the following:

- Acids and alkalis: Reacts to generate flammable/explosive hydrogen gas. Generation rate is greatly increased with smaller particles (e.g., fines and dusts).
- 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.
- 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

No hazardous decomposition products are known.

## 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.

Nickel dust and fume: Can cause irritation of eyes, skin and respiratory tract. Eye contact: Can cause inflammation of the eyes and eyelids (conjunctivitis). Skin contact: Can cause sensitization and allergic contact dermatitis. Chronic overexposures: Can cause perforation of the nasal septum, inflammation of the nasal passages (sinusitis), respiratory sensitization, asthma and scarring of the lungs (pulmonary fibrosis). Nickel alloys IARC/NTP: Reviewed and not recommended for listing by NTP. Listed as possibly carcinogenic to humans by IARC (Group 2B).

Some products are supplied with an oil coating or have residual oil from the manufacturing process. Oil: Can cause irritation of skin. Skin contact (prolonged or repeated): Can cause dermatitis.

### Health effects associated with compounds formed during processing

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

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

Zinc oxide fumes: Can cause irritation of upper 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).

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

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.

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).

Chromium (III) compounds: Can cause irritation of eye, skin and respiratory tract. IARC/NTP: Not classifiable as to their carcinogenicity to humans by IARC.

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).

Nickel compounds: Associated with lung cancer, cancer of the vocal cords and nasal cancer. IARC/NTP: Listed as "known to be a human carcinogen" by the NTP. Listed as carcinogenic to humans by IARC (Group 1).

If the product is heated well above ambient temperatures or machined, oil vapor or mist may be generated.

Oil vapor or mist: Can cause irritation of respiratory tract. Acute overexposures: Can cause bronchitis, headache, central nervous system effects (nausea, dizziness and loss of coordination) and drowsiness (narcosis).

Welding, plasma arc cutting, and arc spray metalizing can generate ozone.

Ozone: Can cause irritation of eyes, nose and upper respiratory tract. Acute overexposures: Can cause shortness of breath, tightness of chest, headache, cough, nausea and narrowing of airways. Effects are reversible on cessation of exposure. Acute overexposures (high concentrations): Can cause respiratory distress, respiratory tract damage, bleeding and the accumulation of fluid in the lungs (pulmonary edema). Effects can be delayed up to 1-2 hours. Additional information: Studies (inhalation) with experimental animals have found genetic damage, reproductive harm, blood cell damage, lung damage and death.

Welding fumes: IARC/NTP: Listed as human lung carcinogen by IARC (Group 1). Additional information: In one study, occupational asthma was associated with exposures to fumes from aluminum welding.

Plasma arc cutting of aluminum can generate oxides of nitrogen.

Oxides of nitrogen (NO and NO2): Can cause irritation of eyes, skin and respiratory tract. Acute overexposures: Can cause reduced ability of the blood to carry oxygen (methemoglobin). Can cause cough, shortness of breath, accumulation of fluid in the lungs (pulmonary edema) and death. Effects can be delayed up to 2-3 weeks.

Nitrogen dioxide (NO2): Chronic overexposures: Can cause scarring of the lungs (pulmonary fibrosis).

### Information on likely routes of exposure

**Eye contact** Dust and fumes from processing: Can cause mechanical irritation.

**Skin contact** Dust and fumes from processing: Can cause irritation.

**Inhalation** Dust: Can cause irritation of the upper respiratory tract.

**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 upper respiratory tract. Heating above the melting point releases metallic oxides which may cause metal fume fever by inhalation. The symptoms are shivering, fever, malaise and muscular pain. Contains nickel. May produce an allergic reaction.

### Information on toxicological effects

| Components                               | Species  | Test Results |
|--|--|--------------|
| Aluminum (CAS 7429-90-5)                 |  |              |
| <u>Acute</u>                             |  |              |
| <b>Oral</b>                              |  |              |
| LD50                                     | Rat  | > 2000 mg/kg |
| Nickel (CAS 7440-02-0)                   |  |              |
| <u>Acute</u>                             |  |              |
| <b>Oral</b>                              |  |              |
| LD50                                     | Rat  | > 9000 mg/kg |
| Zinc (CAS 7440-66-6)                     |  |              |
| <u>Acute</u>                             |  |              |
| <b>Oral</b>                              |  |              |
| LD50                                     | Rat  | 630 mg/kg    |
| <b>Acute toxicity</b>                    | Not classified. Based on available data, the classification criteria are not met.                                  |              |
| <b>Skin corrosion/irritation</b>         | Dust and fume from processing: Non-corrosive.  |              |
| <b>Serious eye damage/eye irritation</b> | Dust in the eyes: May cause minor irritation on eye contact.   |              |
| <b>Respiratory or skin sensitization</b> | Not classified. Based on available data, the classification criteria are not met.                                  |              |
| <b>Respiratory sensitization</b>         | Not classified. Based on available data, the classification criteria are not met.                                  |              |
| <b>Skin sensitization</b>                | Dust and fume from processing: Can cause mechanical irritation. Contains nickel. May produce an allergic reaction. |              |
| <b>Germ cell mutagenicity</b>            | Not classified. Based on available data, the classification criteria are not met.                                  |              |
| <b>Neurological effects</b>              | Not classified. Based on available data, the classification criteria are not met.                                  |              |

**Pre-existing conditions aggravated by exposure**

Asthma, chronic lung disease, and skin rashes.

**Carcinogenicity**

Product as shipped: Does not present any cancer hazards.

Dust from mechanical processing:

Dust and fumes from welding or elevated temperature processing: Can present a cancer hazard (Hexavalent chromium compounds, Nickel compounds, Welding fumes).

**IARC Monographs. Overall Evaluation of Carcinogenicity**

Chromium (CAS 7440-47-3)

3 Not classifiable as to carcinogenicity to humans.

Nickel (CAS 7440-02-0)

1 Carcinogenic to humans.

**US OSHA Hazard Categories (10)**

Not regulated.

**US OSHA Hazard Categories (9)**

Not regulated.

**US. National Toxicology Program (NTP) Report on Carcinogens**

Nickel (CAS 7440-02-0)

Known To Be Human Carcinogen.

Reasonably Anticipated to be a Human Carcinogen.

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

Not regulated.

**Reproductive toxicity**

Product as shipped: Does not present any reproductive hazards.

Dust and fumes from welding or elevated temperature processing: Can present a reproductive hazard (Manganese compounds).

**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 applicable.

**Further information**

None known.

**12. Ecological information****Ecotoxicity**

Not expected to be harmful to aquatic organisms.

| Components                | Species |  | Test Results              |
|---------------------------|---------|--|---------------------------|
| Chromium (CAS 7440-47-3)  |         |  |                           |
| <b>Aquatic</b>            |         |  |                           |
| Crustacea                 | EC50    | Water flea (Daphnia magna)                   | 0.01 - 0.7 mg/l, 48 hours |
| Fish                      | LC50    | Carp (Cyprinus carpio)                       | 14.3 mg/l, 96 hours       |
| Iron (CAS 7439-89-6)      |         |  |                           |
| <b>Aquatic</b>            |         |  |                           |
| Crustacea                 | LC50    | Cockle (Cerastoderma edule)                  | 100 - 330 mg/l, 48 hours  |
|                           |         | Common shrimp, sand shrimp (Crangon crangon) | 33 - 100 mg/l, 48 hours   |
| Fish                      | LC50    | Channel catfish (Ictalurus punctatus)        | > 500 mg/l, 96 hours      |
| Manganese (CAS 7439-96-5) |         |  |                           |
| <b>Aquatic</b>            |         |  |                           |
| Crustacea                 | EC50    | Water flea (Daphnia magna)                   | 40 mg/l, 48 hours         |
| Nickel (CAS 7440-02-0)    |         |  |                           |
| <b>Aquatic</b>            |         |  |                           |
| Crustacea                 | EC50    | Water flea (Daphnia magna)                   | 1 mg/l, 48 hours          |
| Fish                      | LC50    | Fathead minnow (Pimephales promelas)         | 2.923 mg/l, 96 hours      |
| Zinc (CAS 7440-66-6)      |         |  |                           |
| <b>Aquatic</b>            |         |  |                           |
| Crustacea                 | EC50    | Water flea (Daphnia magna)                   | 2.8 mg/l, 48 hours        |

| Components | Species  | Test Results        |
|------------|--|---------------------|
| Fish       | LC50<br>Rainbow trout,donaldson trout<br>(Oncorhynchus mykiss) | 0.56 mg/l, 96 hours |

|                                      |                                     |
|--------------------------------------|-------------------------------------|
| <b>Persistence and degradability</b> | Not inherently biodegradable.       |
| <b>Bioaccumulative potential</b>     | The product is not bioaccumulating. |
| <b>Mobility in soil</b>              | Not considered mobile.              |
| <b>Mobility in general</b>           | Not applicable.                     |
| <b>Other adverse effects</b>         | Not available.                      |

### 13. Disposal considerations

|  |  |
|--|--|
| <b>Disposal instructions</b>                 | Reuse or recycle material whenever possible. If reuse or recycling is not possible, disposal must be made according to local or governmental regulations.  |
| <b>Waste codes</b>                           | RCRA Status: Must be determined at the point of waste generation. If material is disposed as a waste, it must be characterized under RCRA according to 40 CFR, Part 261, or state equivalent in the U.S.<br>TCLP testing is recommended for Chromium in a waste disposal scenario. |
| <b>Waste from residues / unused products</b> | Dispose of in accordance with local regulations.   |
| <b>Contaminated packaging</b>                | Dispose of in accordance with local regulations.   |

### 14. Transport information

#### General Shipping Information

##### Basic Shipping Information

|                             |               |
|-----------------------------|---------------|
| <b>ID number</b>            | -             |
| <b>Proper shipping name</b> | Not regulated |
| <b>Hazard class</b>         | -             |
| <b>Packing group</b>        | -             |

#### 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

|                               |   |
|-------------------------------|---|
| <b>US federal regulations</b> | 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.<br>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, Subpart D)

|                      |  |
|----------------------|--|
| Zinc (CAS 7440-66-6) | 1.0 % One-Time Export Notification only. |
|----------------------|--|

#### CERCLA Hazardous Substance List (40 CFR 302.4)

|                           |         |
|---------------------------|---------|
| Chromium (CAS 7440-47-3)  | Listed. |
| Manganese (CAS 7439-96-5) | Listed. |
| Nickel (CAS 7440-02-0)    | Listed. |
| Zinc (CAS 7440-66-6)      | Listed. |

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

Not regulated.

#### US OSHA Hazard Categories (9)

Not regulated.

#### US OSHA Hazard Categories (10)

Not regulated.

**Superfund Amendments and Reauthorization Act of 1986 (SARA)**

|  |                         |   |
|--|-------------------------|---|
| <b>Section 311/312 hazard categories</b> | Immediate Hazard - Yes  | If particulates/fumes generated during processing |
|  | Delayed Hazard - Yes    | If particulates/fumes generated during processing |
|  | Fire Hazard - No        |   |
|  | Pressure Hazard - No    |   |
|  | Reactivity Hazard - Yes | If molten   |

**SARA 302 Extremely hazardous substance**

Not listed.

**SARA 311/312 Hazardous chemical** Yes**Disclaimer**

The user of this SDS should verify the substance specific concentration information as it relates to regulatory reporting. Listed concentrations may cover a range of formulations and process batch variations.

**Superfund Amendments and Reauthorization Act of 1986 (SARA)****SARA 313 (TRI reporting)**

| Chemical name | CAS number | % by wt. |
|---------------|------------|----------|
| Aluminum      | 7429-90-5  | >92      |
| Zinc          | 7440-66-6  | <2.8     |
| Manganese     | 7439-96-5  | <2.0     |
| Nickel        | 7440-02-0  | <0.1     |

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

Nickel (CAS 7440-02-0) Listed: May 7, 2004

**International Inventories**

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

\*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

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

Origination date: April 1, 2021.

### Further information

Product and Company Identification: Synonyms

Refer to NFPA 654, Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids, for safe handling.

### Disclaimer

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

### Other information

- Guide to Occupational Exposure Values 2012, Compiled by the American Conference of Governmental Industrial Hygienists (ACGIH).
- NIOSH Pocket Guide to Chemical Hazards, U.S. Department of Health and Human Services, September 2005.
- expub, Expert Publishing, LLC., [www.expub.com](http://www.expub.com),
- Ariel, 3E Company, [www.3Ecompany.com](http://www.3Ecompany.com)
- Aluminum Association's Bulletin F-1, "Guidelines for Handling Aluminum Fines Generated During Various Aluminum Fabricating Operations." The Aluminum Association, 1525 Wilson Boulevard, Suite 600, Arlington, Virginia 22209, [www.aluminum.org](http://www.aluminum.org).
- Aluminum Association, "Guidelines for Handling Molten Aluminum, The Aluminum Association, 1525 Wilson Boulevard, Suite 600, Arlington, Virginia 22209, [www.aluminum.org](http://www.aluminum.org).
- 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

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

Not applicable.

### Disposal

Reuse or recycle material whenever possible. Dispose of contents/container in accordance with local/regional/national/international regulations.

## Warning

### Supplemental information

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).

#### 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.