



SAFETY DATA SHEET

1. Identification

| | |
|---|--|
| Product identifier | COATED COIL AND SHEET |
| Other means of identification | |
| SDS number | 1073 |
| Version # | 06 |
| Revision date | June 10, 2015. |
| Other means of identification | |
| Synonyms | Aluminum alloys: * 0359, 0437, 1100, 3003, 3004, 3005, 3105, 5005, 5042, 5050, 5052, 5182, 5352, 5754, 8006 |
| Recommended use | Various fabricated aluminum parts and products |
| Recommended Restrictions | None known. |
| Recommended restrictions | For industrial use only. |
| Manufacturer/Importer/Supplier/Distributor information | |
| Manufacturer | Arconic Inc. 201 Isabella Street Pittsburgh, PA 15212-5858 US Health and Safety Tel: +1-412-553-4649 Health and Safety Fax: +1-412-553-4822 Health and Safety E-mail: SDSInfo@arconic.com |
| | Alumax Mill Products, Inc. 1480 Manheim Pike Lancaster, PA 17604 Phone: +1-717-393-9641 or 1-800-223-0481 |
| Emergency Information | CHEMTREC: +1-703-527-3887 +1-800-424-9300 (24 Hour Emergency Telephone, multiple languages spoken); Arconic: +1-412-553-4001 (24 Hour Emergency Telephone, only English spoken) |
| Website | For a current Safety Data Sheet, refer to Arconic websites: www.arconic.com or internally at my.arconic.com EHS Community |

2. Hazard(s) identification

Classification

The mixture does not meet the criteria for classification.

Potential health effects

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

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

| | |
|------------------------------|------------------|
| Physical hazards | Not classified. |
| Health hazards | Not classified. |
| Environmental hazards | Not classified. |
| OSHA defined hazards | Combustible dust |

Label elements

| | |
|-------------------------|--|
| Hazard symbol | None. |
| Signal word | Warning |
| Hazard statement | May form combustible dust concentrations in air. |

Precautionary statement

| | |
|-------------------|--|
| Prevention | Wash thoroughly after handling. |
| Response | Wash with plenty of soap and water. |
| Storage | Keep dry. |
| Disposal | Reuse or recycle material whenever possible. |

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

Supplemental information The mixture does not meet the criteria for classification.

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

Explosion/fire hazards may be present when (See Sections 5, 7 and 10 for additional information):

- Dust or fines are dispersed in air.
- Chips, dust or fines are in contact with water.
- Dust and fines are in contact with certain metal oxides (e.g., rust, copper oxide).
- Molten metal in contact with water/moisture or certain metal oxides (e.g., rust, copper oxide).

Dust and fume from processing: Can cause irritation of the eyes, skin and upper respiratory tract. Combustion of the coatings can generate toxic and irritating gases.

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 | >94 |
| Magnesium | | 7439-95-4 | <5 |
| Silicon | | 7440-21-3 | <2 |
| Iron | | 7439-89-6 | <2 |
| Manganese | | 7439-96-5 | <1.5 |
| Chromium | | 7440-47-3 | <0.35 |
| Coatings† | | Not Applicable | <10 |
| Strontium chromate‡ | | 7789-06-2 | ≤0.05 |

Additional Information † Coatings include: vinyl, epoxy, polyester, siliconized polyester, acrylic, fluorocarbons, polyurethane, petrolatum, chromium conversion and titanium conversion.

‡ - Backers 1BHL5626, 1BHY5137, 45D43C and 45Y58 only

Additional compounds which may be formed during processing are listed in Section 8.

4. First-aid measures

Eye contact Dust and fumes from processing: Rinse eyes with plenty of water or saline for at least 15 minutes. Consult a physician.

Skin contact Dust and fumes from processing: Wash skin with soap and water for at least 15 minutes. Get medical attention if irritation develops or persists.

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

Ingestion Dust and fumes from processing: If swallowed, dilute by drinking water. Recommend quantities up to 30 mL (~1 oz.) in children and 250 mL (~9 oz.) in adults. Never give anything by mouth to a victim who is unconscious or is having convulsions. Do NOT induce vomiting. Consult a physician.

| | |
|---|---|
| Most important symptoms/effects, acute and delayed | Dust and fumes from processing: Can cause irritation of the upper respiratory tract. Additional health effects from elevated temperature processing (e.g., welding, melting): Dust and fumes from processing: Can cause severe irritation of the respiratory tract. Acute overexposure: Can cause the accumulation of fluid in the lungs (pulmonary edema). Chronic overexposure: Can cause scarring of the lungs (pulmonary fibrosis), central nervous system damage, secondary Parkinson's disease, reproductive harm in males and lung cancer. Contact with residual oil/oil coating: Prolonged skin contact may cause skin irritation and/or dermatitis. See Section 11 of the SDS for additional information on health hazards. |
| Medical conditions aggravated by exposure | Dust and fume from processing: Asthma, chronic lung disease, and skin rashes. |
| Indication of immediate medical attention and special treatment needed | In case of shortness of breath, give oxygen. Provide general supportive measures and treat symptomatically. |
| General information | No specific first aid measures noted. |
| 5. Fire-fighting measures | |
| Suitable extinguishing media | Use Class D extinguishing agents on fines, dust or molten metal. Use coarse water spray on chips and turnings. |
| Unsuitable extinguishing media | DO NOT USE 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. |
| Specific hazards arising from the chemical | May be a potential hazard under the following conditions: <ul style="list-style-type: none"> • Dust clouds may be explosive. Even a minor dust cloud can explode violently. Dust accumulation on the floor, ledges and beams can present a risk of ignition, flame propagation and secondary explosions. • Chips, fines and dust in contact with water can generate flammable/explosive hydrogen gas. These gases could present an explosion hazard in confined or poorly ventilated spaces. • Dust and fines in contact with certain metal oxides (e.g., rust, copper oxide). A thermite reaction, with considerable heat generation, can be initiated by a weak ignition source. • Molten metal in contact with water/moisture or certain metal oxides (e.g., rust, copper oxide). Moisture entrapped by molten metal can be explosive. Contact of molten aluminum with certain metal oxides can initiate a thermite reaction. Finely divided metals (e.g., powders or wire) may have enough surface oxide to produce thermite reactions/explosions. |
| Special protective equipment and precautions for firefighters | Fire fighters should wear NIOSH approved, positive pressure, self-contained breathing apparatus and full protective clothing when appropriate. |
| Fire fighting equipment/instructions | No unusual fire or explosion hazards noted. Use standard fire fighting procedures and consider the hazards of other involved materials. |
| General fire hazards | This product does not present fire or explosion hazards as shipped. Small chips, fine turnings, and dust from processing may be readily ignitable. |
| Explosion data | |
| Sensitivity to mechanical impact | None known. |
| Sensitivity to static discharge | Take precautionary measures against static discharges when there is a risk of dust explosion. |
| 6. Accidental release measures | |
| Personal precautions, protective equipment and emergency procedures | Avoid 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. |
| Personal precautions, protective equipment and emergency procedures For emergency responders | 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. |
| Evacuation procedures | Molten metal: Keep unnecessary personnel away. |
| Methods and materials for containment and cleaning up | Collect scrap for recycling. If molten: Use dry sand to contain the flow of material. All tooling (e.g., shovels or hand tools) and containers which come in contact with molten metal must be preheated or specially coated, rust free and approved for such use. Allow the spill to cool before remelting as scrap. |
| Environmental precautions | No special environmental precautions required. |

7. Handling and storage

Handling

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

Keep material dry.

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.

Avoid all ignition sources. Good housekeeping practices must be maintained. Do not use compressed air to remove settled material from floors, beams or equipment.

Requirements for Remelting of Scrap Material or Ingot

Molten metal and water can be an explosive combination. The risk is greatest when there is sufficient molten metal to entrap or seal off the water. Water and other forms of contamination on or contained in scrap or remelt ingot are known to have caused explosions in melting operations. While the products may have minimal surface roughness and internal voids, there remains the possibility of moisture contamination or entrapment. If confined, even a few drops of water can lead to violent explosions.

All tooling, containers, molds and ladles which come in contact with molten metal must be preheated or specially coated, rust free and approved for such use. Any surfaces that may contact molten metal (e.g., concrete) should be specially coated.

Drops of molten metal in water (e.g. from plasma arc cutting), while not normally an explosion hazard, can generate enough flammable hydrogen gas to present an explosion hazard. Vigorous circulation of the water and removal of the particles minimize the hazards.

During melting operations, the following minimum guidelines should be observed:

- Inspect all materials prior to furnace charging and completely remove surface contamination such as water, ice, snow, deposits of grease and oil or other surface contamination resulting from weather exposure, shipment, or storage.
- Store materials in dry, heated areas with any cracks or cavities pointed downwards.
- Preheat and dry large items adequately before charging into a furnace containing molten metal. This is typically done by use of a drying oven or homogenizing furnace. The drying cycle should bring the metal temperature of the coldest item of the batch to 400°F (200°C) and then hold at that temperature for 6 hours.

Thermite explosions have been reported when aluminum alloys were melted in furnaces used for alloying with lead, bismuth or other metals with low melting temperatures. These metals, when added as high purity ingots, can seep through cracks in furnace liners and become oxidized. During subsequent melts in the furnace, molten aluminum can contact these metal oxides resulting in a thermite explosion.

8. Exposure controls/personal protection

Occupational exposure limits

U.S. - OSHA

Components

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

U.S. - OSHA**Compounds Formed During Processing**

| | Type | Value | Form |
|--|------|---------|----------------------|
| Aluminum oxide (non-fibrous) (CAS 1344-28-1) | TWA | 5 mg/m3 | Respirable fraction. |

Decomposition

| | Type | Value | Form |
|-----------------------------------|------|-------------------|-----------------------|
| Hydrogen fluoride (CAS 7664-39-3) | TWA | 15 mg/m3 3 ppm | Total dust. (as F) |

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

| | Type | Value |
|-------------------------------------|------|-------------|
| Strontium chromate‡ (CAS 7789-06-2) | TWA | 0.005 mg/m3 |

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

| | Type | Value | Form |
|---------------------------------|------|----------|--------------------|
| Magnesium oxide (CAS 1309-48-4) | PEL | 15 mg/m3 | Total particulate. |

Decomposition

| | Type | Value |
|-----------------------------------|---------|------------------|
| Hydrogen chloride (CAS 7647-01-0) | Ceiling | 7 mg/m3 5 ppm |

ACGIH**Components**

| | Type | Value | Form |
|---------------------------|---------------------------|------------|-----------------------|
| Manganese (CAS 7439-96-5) | TWA (inhalable fraction) | 0.2 mg/m3 | (inhalable fraction) |
| | TWA (respirable fraction) | 0.02 mg/m3 | (respirable fraction) |

Compounds Formed During Processing

| | Type | Value | Form |
|--|------|---------|----------------------------|
| Aluminum oxide (non-fibrous) (CAS 1344-28-1) | TWA | 1 mg/m3 | Respirable fraction, as Al |

US ACGIH Threshold Limit Values: Ceiling Limit Value: mg/m3 & ppm

| | Type | Value |
|-----------------------------------|---------|-------|
| Hydrogen chloride (CAS 7647-01-0) | Ceiling | 2 ppm |

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

| | Type | Value | Form |
|-------------------------------------|------|--------------|----------------------|
| 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. |
| | | 0.02 mg/m3 | Respirable fraction. |
| Strontium chromate‡ (CAS 7789-06-2) | TWA | 0.0005 mg/m3 | |

Compounds Formed During Processing

| | Type | Value | Form |
|---------------------------------|------|----------|---------------------|
| Magnesium oxide (CAS 1309-48-4) | TWA | 10 mg/m3 | Inhalable fraction. |

Arconic**Components**

| | Type | Value | Form |
|--------------------------|------|----------|---------------------|
| Aluminum (CAS 7429-90-5) | TWA | 3 mg/m3 | Respirable fraction |
| | | 10 mg/m3 | Total dust |

| Arconic Components | Type | Value | Form |
|--|------|--------------------------|--|
| Manganese (CAS 7439-96-5) | TWA | 0.05 mg/m3 | Total dust. |
| Strontium chromate‡ (CAS 7789-06-2) | TWA | 0.02 mg/m3 0.25 ug/m3 | Respirable fraction. (as Hexavalent Cr) |
| Compounds Formed During Processing | Type | Value | Form |
| Aluminum oxide (non-fibrous) (CAS 1344-28-1) | TWA | 3 mg/m3 | Respirable fraction. |
| Decomposition | Type | Value | Form |
| Hydrogen fluoride (CAS 7664-39-3) | STEL | 1.64 mg/m3 | Peak (as F) (Skin) |
| | TWA | 2 ppm 0.5 mg/m3 | Peak (as F) (Skin) (as F) (Skin) |

Exposure guidelines

US ACGIH Threshold Limit Values: Skin designation

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

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

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

General

Personnel who handle and work with molten metal should utilize primary protective clothing like polycarbonate face shields, fire resistant tapper's jackets, neck shades (snoods), leggings, spats and similar equipment to prevent burn injuries. In addition to primary protection, secondary or day-to-day work clothing that is fire resistant and sheds metal splash is recommended for use with molten metal. Synthetic materials should never be worn even as secondary clothing (undergarments).

Appropriate engineering controls

Dust and fumes from processing: Use with adequate explosion-proof ventilation to meet the limits listed in Section 8.

Individual protection measures, such as personal protective equipment

Eye/face protection

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

Skin protection

Hand protection

Wear impervious gloves to avoid repeated or prolonged skin contact with residual oils and to avoid any skin injury. The need for personal protective equipment (gloves) should be based upon a hazard assessment and recommendations from health / safety professionals. The most suitable glove must be chosen in consultation with the gloves supplier, who can inform about the breakthrough time of the glove material.

Other

The need for personal protective equipment should be based upon a hazard assessment and recommendations from health / safety professionals.

Respiratory protection

Dust and fumes from processing: Use NIOSH-approved respiratory protection as specified by an Industrial Hygienist or other qualified professional if concentrations exceed the limits listed in Section 8. Suggested respiratory protection: N95, Acid gas cartridge for Hydrogen fluoride gas and Hydrogen chloride.

Thermal hazards

Contact with molten material can cause thermal burns. Hot aluminum does not necessarily glow red. When material is heated, wear gloves to protect against thermal burns. Flame retardant protective clothing is recommended.

General hygiene considerations

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

Control parameters

Follow standard monitoring procedures.

Environmental exposure controls

No special environmental precautions required.

9. Physical and chemical properties

Form

Solid. Coated coil or sheet.

Color

Various colors.

Odor

Odorless

Odor threshold

Not applicable

| | |
|---|--|
| pH | Not applicable |
| Density | 2.63 - 3.12 g/cm ³ |
| Melting point/freezing point | 900 - 1200 °F (482.22 - 648.89 °C) / Not applicable |
| Initial boiling point and boiling range | Not applicable |
| Flash point | Not applicable |
| Evaporation rate | Not applicable |
| Flammability (solid, gas) | Not applicable. |
| Upper/lower flammability or explosive limits | |
| Flammability limit - upper (%) | Not applicable |
| Flammability limit - lower (%) | Not applicable |
| Explosive properties | Dust accumulation from this product may present an explosion hazard in the presence of an ignition source. |
| Dust explosion properties | |
| St class | Very strong explosion. |
| Vapor pressure | Not applicable |
| Vapor density | Not applicable |
| Relative density | Not determined |
| Solubility(ies) | Insoluble |
| Partition coefficient (n-octanol/water) | Not applicable |
| Auto-ignition temperature | Not applicable |
| Decomposition temperature | Not applicable |
| Viscosity | Not available. |

10. Stability and reactivity

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|---|---|
| Reactivity | The product is stable and non-reactive under normal conditions of use, storage and transport. |
| Chemical stability | Stable under normal conditions of use, storage, and transportation as shipped. |
| Possibility of hazardous reactions | Hazardous polymerization does not occur. |

Conditions to avoid

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

- Heat: Oxidizes at a rate dependent upon temperature and particle size.
- 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.

Explosions can occur with coils of foil that have been submerged or partially submerged in water for an extended period of time. Water can penetrate between the layers of foil, react with the aluminum surface and generate heat and hydrogen gas. When the coils are removed from the cooling effects of the water, rapid temperature increases can occur causing steam explosions which result in the rupture of the coils and discharge of debris.

Coils of foil may be a potential hazard under the following conditions:

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

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

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

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

Incompatible materials

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

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

Hazardous decomposition products

Combustion of the coatings can generate carbon monoxide, carbon dioxide, hydrogen chloride, hydrogen fluoride, etc..

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.

Strontium chromate [Chromium (VI) compounds]: 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, 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).

Health effects associated with compounds formed during processing

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

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

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

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

Manganese compounds: Chronic overexposures: Can cause inflammation of the lung tissues, scarring of the lungs (pulmonary fibrosis), central nervous system damage, Secondary Parkinson's Disease and reproductive harm in males.

Combustion of the coatings can generate hydrogen chloride.

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

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

Information on likely routes of exposure

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

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

Inhalation Dust and fumes from processing: Can cause irritation of the upper respiratory tract. Chronic overexposures: Can cause scarring of the lungs (pulmonary fibrosis), central nervous system damage, secondary Parkinson's disease, reproductive harm in males and lung cancer.

Additional health effects from elevated temperature processing (e.g., melting): Dust and fumes: Can cause severe irritation of the respiratory tract. Acute overexposures: Can cause the accumulation of fluid in the lungs (pulmonary edema).

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

Symptoms related to the physical, chemical and toxicological characteristics Dust and fumes from processing: Can cause irritation of the eyes, skin and upper respiratory tract. Combustion of the coatings can generate toxic and irritating gases.

Information on toxicological effects

| Components | Species | Test Results |
|--|---|-------------------------------|
| Aluminum (CAS 7429-90-5) | | |
| Acute | | |
| Oral | | |
| LD50 | Rat | > 10000 mg/kg > 2000 mg/kg |
| Strontium chromate‡ (CAS 7789-06-2) | | |
| Acute | | |
| Oral | | |
| LD50 | Rat | 811 mg/kg |
| Compounds Formed During Processing | Species | Test Results |
| Aluminum oxide (non-fibrous) (CAS 1344-28-1) | | |
| Acute | | |
| Inhalation | | |
| LC50 | Rat | > 2.3 mg/l 7.6 mg/l |
| Oral | | |
| LD50 | Rat | > 5000 mg/kg |
| Acute toxicity | Not classified. Based on available data, the classification criteria are not met. | |

| | |
|---|--|
| Skin corrosion/irritation | Not available. |
| Serious eye damage/eye irritation | Can cause mechanical irritation. |
| Respiratory or skin sensitization | Not classified. Based on available data, the classification criteria are not met. |
| Respiratory sensitization | Not classified. Based on available data, the classification criteria are not met. |
| Skin sensitization | Not classified. Based on available data, the classification criteria are not met. |
| Germ cell mutagenicity | Not classified. Based on available data, the classification criteria are not met. |
| Neurological effects | Not classified. Based on available data, the classification criteria are not met. |
| | Health effects from elevated temperature processing (e.g., welding, melting): May cause central nervous system effects. |
| Pre-existing conditions aggravated by exposure | Dust and fume from processing: Asthma, chronic lung disease, and skin rashes. |
| Carcinogenicity | Product as shipped: Does not present any cancer hazards. Dust and fumes from processing: Can present a cancer hazard (Strontium chromate). |

ACGIH Carcinogens

| | |
|--|--|
| Aluminum (CAS 7429-90-5) | A4 Not classifiable as a human carcinogen. |
| Aluminum oxide (non-fibrous) (CAS 1344-28-1) | A4 Not classifiable as a human carcinogen. |
| Chromium (CAS 7440-47-3) | A4 Not classifiable as a human carcinogen. |
| Hydrogen chloride (CAS 7647-01-0) | A4 Not classifiable as a human carcinogen. |
| Hydrogen fluoride (CAS 7664-39-3) | A4 Not classifiable as a human carcinogen. |
| Magnesium oxide (CAS 1309-48-4) | A4 Not classifiable as a human carcinogen. |
| Manganese (CAS 7439-96-5) | A4 Not classifiable as a human carcinogen. |
| Strontium chromate‡ (CAS 7789-06-2) | A1 Confirmed human carcinogen. A2 Suspected human carcinogen. |

IARC Monographs. Overall Evaluation of Carcinogenicity

| | |
|-------------------------------------|---|
| Chromium (CAS 7440-47-3) | 3 Not classifiable as to carcinogenicity to humans. |
| Hydrogen chloride (CAS 7647-01-0) | 3 Not classifiable as to carcinogenicity to humans. |
| Hydrogen fluoride (CAS 7664-39-3) | 3 Not classifiable as to carcinogenicity to humans. |
| Strontium chromate‡ (CAS 7789-06-2) | 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

Strontium chromate‡ (CAS 7789-06-2) Known To Be Human Carcinogen.

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

Strontium chromate‡ (CAS 7789-06-2) Cancer

| | |
|---|--|
| Reproductive toxicity | Additional health effects from elevated temperature processing (e.g., welding, melting): |
| Routes of exposure | Dust and fume from processing: Inhalation. Eye contact. Skin contact. |
| Specific target organ toxicity - single exposure | Not classified. Based on available data, the classification criteria are not met. |
| Specific target organ toxicity - repeated exposure | Not classified. Based on available data, the classification criteria are not met. |
| Aspiration hazard | Not classified. Based on available data, the classification criteria are not met. |

12. Ecological information

Ecotoxicity

| Components | | Species | Test Results |
|--------------------------|------|----------------------------|---------------------------|
| Chromium (CAS 7440-47-3) | | | |
| Aquatic | | | |
| 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 |

| Components | Species | | Test Results |
|----------------------|---------|--|--------------------------|
| Iron (CAS 7439-89-6) | | | |
| Aquatic | | | |
| 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)

Aquatic

| | | | |
|-----------|------|----------------------------|-------------------|
| Crustacea | EC50 | Water flea (Daphnia magna) | 40 mg/l, 48 hours |
|-----------|------|----------------------------|-------------------|

Persistence and degradability The product contains inorganic compounds which are not biodegradable.

Bioaccumulative potential The product is not bioaccumulating.

Mobility in soil Not considered mobile.

Other adverse effects None known.

13. Disposal considerations

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

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

Waste from residues / unused products If reuse or recycling is not possible, disposal must be made according to local or governmental regulations.

Contaminated packaging Dispose of in accordance with local regulations.

14. Transport information

General Shipping Information

Basic Shipping Information

| | |
|-----------------------------|---------------|
| ID number | - |
| Proper shipping name | Not regulated |
| Hazard class | - |
| Packing group | - |

General Shipping Notes

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

DOT Alternate Basic Shipping Description #1

DOT Alternate Basic Shipping Description #1

Basic Shipping Information

| | |
|-----------------------------|-------------------------------|
| ID number | NA3077 |
| Proper shipping name | Hazardous waste, solid, n.o.s |
| Technical name | D007 |
| Hazard class | 9 |
| Packing group | III |

Notes for Alternate DOT Description

- Classification applies to shipments within the domestic U.S. when declared a waste product and meeting the TCLP criteria for Chromium.
- Insert "RQ" reference for packages containing 10 lbs or greater.

Disclaimer

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

15. Regulatory information

US federal regulations

In reference to Title VI of the Clean Air Act of 1990, this material does not contain nor was it manufactured using ozone-depleting chemicals.

All electrical equipment must be suitable for use in hazardous atmospheres involving aluminum powder in accordance with 29 CFR 1910.307. The National Electrical Code, NFPA 70, contains guidelines for determining the type and design of equipment and installation which will meet this requirement.

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

Strontium chromate‡ (CAS 7789-06-2) 0.1 % Annual Export Notification required.

CERCLA Hazardous Substance List (40 CFR 302.4)

Chromium (CAS 7440-47-3) Listed.
Manganese (CAS 7439-96-5) Listed.
Strontium chromate‡ (CAS 7789-06-2) Listed.

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

Strontium chromate‡ (CAS 7789-06-2) Cancer
Eye irritation
Skin sensitization

US OSHA Hazard Categories (9)

Not regulated.

US OSHA Hazard Categories (10)

Not regulated.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

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

SARA 302 Extremely hazardous substance

| Chemical name | CAS number | Reportable quantity | Threshold planning quantity | Threshold planning quantity, lower value | Threshold planning quantity, upper value |
|-------------------|------------|---------------------|-----------------------------|--|--|
| Hydrogen chloride | 7647-01-0 | 5000 | 500 lbs | | |
| Hydrogen fluoride | 7664-39-3 | 100 | 100 lbs | | |

SARA 311/312 Hazardous chemical Yes

SARA 313 (TRI reporting)

| Chemical name | CAS number | % by wt. |
|---------------|------------|----------|
| Aluminum | 7429-90-5 | >94 |
| Manganese | 7439-96-5 | <1.5 |

US state regulations

US. California Proposition 65

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

Strontium chromate‡ (CAS 7789-06-2) Listed: February 27, 1987

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

Strontium chromate‡ (CAS 7789-06-2) Listed: December 19, 2008

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

Strontium chromate‡ (CAS 7789-06-2) Listed: December 19, 2008

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

Strontium chromate‡ (CAS 7789-06-2) Listed: December 19, 2008

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 |

| Country(s) or region | Inventory name | On inventory (yes/no)* |
|-----------------------------|--|------------------------|
| 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 | <p>June 10, 2015: New format. February 15, 2013: Change(s) in Section: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 and 16. September 2, 2009: New format. February 14, 2006: Change(s) in Section: 1, 2, 3, 4, 5, 7, 8, 11, 13, 14 and 15. January 21, 2003: Reviewed on a periodic basis in accordance with Arconic policy. No significant changes were made. Origination date: November 19, 1999</p> <p>Hazardous Materials Control Committee +1-412-553-4649</p> |
| Revision date | June 10, 2015. |
| Version # | 06 |
| Revision information | <p>Product and Company Identification: Product and Company Identification Identification: Emergency Information Identification: Website Composition / Information on Ingredients: Ingredients Physical & Chemical Properties: Multiple Properties Transport Information: Material Transportation Information Regulatory Information: Risk Phrases - Labeling Other information, including date of preparation or last revision: SDS Status Other information, including date of preparation or last revision: Other information 1 GHS: Classification</p> |
| Disclaimer | The information in the sheet was written based on the best knowledge and experience currently available. |

Other information

- Guide to Occupational Exposure Values 2016, 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,
- Ariel, 3E Company, 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.
- Aluminum Association, "Guidelines for Handling Molten Aluminum, The Aluminum Association, 1525 Wilson Boulevard, Suite 600, Arlington, Virginia 22209, 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 ***

COATED COIL AND SHEET

Hazard statement

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

Precautionary statement

Prevention

Keep away from heat/sparks/open flames/hot surfaces. No smoking. Keep container tightly closed. Ground/bond container and receiving equipment. Wash thoroughly after handling. Prevent dust accumulation to minimize explosion hazard. Observe good industrial hygiene practices.

Response

Wash with plenty of soap and water.

Storage

Keep dry.

Disposal

Reuse or recycle material whenever possible.

USA: Chemtrec: +1-703-527-3887 +1-800-424-9300 (24 Hour Emergency Telephone, mul

Arconic Inc., 201 Isabella Street, Pittsburgh, PA 15212-5858 United States +1-412-553-40
Arconic Health and Safety Email: SDSInfo@arconic.com Tel: +1-412-553-4649 and Fax: +

Warning

Supplemental information

Dust and fumes from processing: Can cause mechanical irritation of the eyes, skin and upper respiratory tract. Combustion of the coatings can generate toxic and irritating gases.

This product does not present fire or explosion hazards as shipped. 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 coarse water spray on chips and turnings.

DO NOT USE water in fighting fires around molten metal.

DO NOT USE halogenated extinguishing agents on small chips/fines.

These fire extinguishing agents will react with the burning material.

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. Wear appropriate personal protective equipment.

See Arconic SDS Number 1073.

(multiple languages spoken)

01 (24 Hour Emergency Telephone, English only)
1-412-553-4822



ARCONIC