Material Safety Data Sheet

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* * * Section 1 - Chemical Product Identification * * *

Product Name: Aluminum Wire

Chemical Formula: Mixture

* * * Section 2 - Composition / Information on Ingredients * * *

CAS #	Component	Percent
7429-90-5	Aluminum	>99
7440-47-3	Chromium	<0.05

Component Information

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

* * * Section 3 - Hazards Identification * * *

Emergency Overview

Solid. Silvery. Odorless. 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 the air.
* Chips, dust or fines are in contact with water.
* Dust or fines are in contact with certain metal oxides (e.g. rust).
* Molten metal is in contact with water/moisture or certain metal oxides.

Dust and fume from processing can cause irritation of eyes, skin and upper respiratory tract.

Potential Health Effects

(If dusts or fumes are generated by processing)

Eyes

Can cause irritation.

Skin

Can cause irritation.

Inhalation

Can cause irritation of upper respiratory tract and other health effects listed below.

Health Effects of Ingredients

Chromium dust and mist Can cause irritation of eyes, skin and respiratory tract.

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

Some products are supplied with a lubricant/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 Of Additional Compounds Which May Be Formed During Processing

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

If the product is heated well above ambient temperatures or machined, oil vapor or mist may be generated. **Oil vapor and mist** Can cause irritation of respiratory tract. Acute overexposures: Can cause bronchitis, asthma, headache, central nervous system effects (nausea, dizziness and loss of coordination) and drowsiness (narcosis).

Welding, plasma arc cutting, and arc spray metallizing 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 fluid in the lungs (pulmonary edema). Effects can be delayed up to 1-2 hours.

Welding fumes IARC/NTP: Listed as possibly carcinogenic to humans by IARC (Group 2B)* Additional Information: In one study, occupational asthma was associated with exposures to fumes from aluminum welding.

Plasma arc cutting can generate oxides of nitrogen. **Oxides of nitrogen (NO and NO_2)** Can cause irritation of eyes, skin and respiratory tract. Acute overexposures: Can cause reduced ability of the blood to carry oxygen (methemaglobin). Can cause cough, shortness of breath, fluid in the lungs (pulmonary edema) and death. Effects may be delayed up to 2-3 weeks. **Nitrogen dioxide (NO_2)** Chronic overexposures: Can cause scarring of the lungs (pulmonary fibrosis).

***IARC Classification Definitions**

Group 2B: The agent is possibly carcinogenic to humans. Generally includes agents for which there is limited evidence in the absence of sufficient evidence in experimental animals.

Medical Conditions Aggravated By Exposure to the Product

Asthma, chronic lung disease, and skin rashes.

* * * Section 4 – First Aid Measures * * *

First Aid: Eyes

Flush eyes with plenty of water or saline for at least 15 minutes. Consult a physician.

First Aid: Skin

Wash skin with soap and water for at least 15 minutes. Consult a physician if irritation persists.

First Aid: Inhalation

Remove to fresh air. If unconscious or severely injured, check for clear airway, breathing and presence of pulse. Perform CPR if there is no pulse or respiration. Consult a physician.

* * * Section 5 – First Fighting Measures * * *

Flammable/Combustible Properties

This product does not present fire or explosion hazards as shipped. Small chips, turnings, dust and fines from processing may be readily ignitable.

Fire/Explosion

May be a potential hazard under the following conditions:
* Dust or fines dispersed in the air can be explosive. Even a minor dust cloud can explode violently.
* Chips, dust or fines in contact with water can generate flammable/explosive hydrogen gas. Hydrogen gas could present an explosion hazard in confined or poorly ventilated spaces.
* Dust or fines in contact with certain metal oxides (e.g., rust). A thermite reaction, with considerable heat generation, can be initiated by a weak ignition source.
* Molten metal in contact with water/moisture or other metal oxides (e.g., rust). Moisture entrapped by molten metal can be explosive. Contact of molten aluminum with other metal oxides can initiate a thermite reaction.

Extinguishing Media

Use Class D extinguishing agents on dusts, fines or molten metal. Use coarse water spray on chips and turnings.
DO NOT USE: Halogenated agents on small chips, dusts or fines. Water around molten metal.

Fire Fighting Equipment/Instructions

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

* * * Section 6 – Accidental Release Measures * * *

Small/Large Spill

If molten: Contain the flow using dry sand or salt flux as a dam. Do not use shovels or hand tools to halt the flow of molten aluminum. Allow the spill to cool before remelting as scrap.

* * * Section 7 – Handling and Storage * * *

Handling/Storage

Product should be kept dry. Avoid generating dust. Avoid contact with sharp edges or heated metal. Hot and cold aluminum are not visually different.

Requirements for Processes Which Generate Dusts or Fumes

If processing of these products includes operations where dust or extremely fine particulate is generated, obtain and follow the safety procedures and equipment guides contained in Aluminum Association Bulletin F-1 and National Fire Protection Association (NFPA) brochures. Cover and reseal partially empty containers. Use non-sparking handling equipment. Provide grounding and bonding where necessary to prevent accumulation of static charges during dust handling and transfer operations. (See Section 15).

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

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

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

* * * Section 8 – Exposure Controls / Personal Protection * * *

Engineering Controls

Use with adequate explosion-proof ventilation to meet the limits listed in Section 8, Exposure Guidelines.

Personal Protective Equipment

Respiratory Protection

Use NIOSH-approved respiratory protection as specified by an Industrial Hygienist or other qualified professional if concentrations exceed the limits listed in Section 8, Exposure Guidelines. Suggested respiratory protection: P95 particulate respirator

Eye Protection

Wear safety glasses/goggles to avoid eye contact.

Skin Protection

Wear impervious gloves to avoid repeated or prolonged skin contact with residual oils and to avoid any skin injury.

General

Personnel who handle and work with **molten metal** should utilize primary protective clothing like face shields, fire resistant tapper's jackets, 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.
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.

Exposure Guidelines

A: Component Exposure Limits

Aluminum (7429-90-5)

ACGIH 10 mg/m3 TWA (metal dust)
OSHA 15 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable fraction)

Chromium (7440-47-3)

ACGIH 0.5 mg/m3 TWA
OSHA 1 mg/m3 TWA

B: Exposure Limits for Additional Compounds Which May Be Formed During Processing

Alumina (non-fibrous) (1344-28-1)

ACGIH 10 mg/m3 TWA (particulate matter containing no asbestos and < 1% crystalline silica)
OSHA 15 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable fraction)

Welding fumes (NOC) (Not Available)

ACGIH 5 mg/m3 TWA

* * * Section 9 – Physical & Chemical Properties * * *

Physical State:	Solid	**Appearance:**	Silvery
Boiling Point:	Not applicable	**Melting Point:**	Range: generally 1190-1215F (643-657C)
Vapor Pressure:	Not applicable	**Vapor Density:**	Not applicable

Solubility in Water:	None	**Specific Gravity:**	See Density
Density:	Range: generally 2.70-2.71 g/cm3	**pH level:**	Not applicable
Odor:	None	**Odor Threshold:**	Not applicable
Octanol-Water Coefficient:	Not applicable		

* * * Section 10 – Chemical Stability & Reactivity Information * * *

Stability

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

Conditions to Avoid

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

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

* * * Section 11 – Toxicological Information * * *

Health Effects of Ingredients

A: General Product Information

No information available for product.

B: Component Analysis - LD50/LC50

No LD50/LC50's are available for this product's components.

Carcinogenicity

A: General Product Information

No information available for product.

B: Component Carcinogenicity

Chromium (7440-47-3)

ACGIH A4 - Not Classifiable as a Human Carcinogen

IARC Monograph 49, 1990

* * * Section 12 – Ecological Information * * *

Ecotoxicity

A: General Product Information

No information available for product.

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

No ecotoxicity data was found for this product's components.

Environmental Fate

No information available for product.

* * * Section 13 – Disposal Considerations * * *

Disposal Instructions

Reuse or recycle material whenever possible. Material may be disposed of at an industrial landfill.

US EPA Waste Number & Descriptions

A: General Product Information

RCRA Status: Must be determined at time material is disposed. If material is disposed as waste, it must be characterized under RCRA according to 40 CFR, Part 261, or state equivalent in the U.S.

B: Component Waste Numbers

RCRA waste codes other than described under Section A may apply depending on use of product. Refer to 40 CFR 261 or state equivalent in the U.S.

* * * Section 14 – Transportation Information * * *

Special Transportation

Notes:	(1)
Proper Shipping Name:	Not regulated
Hazard Class:	-
UN NA Number:	-
Packing Group:	-
RQ:	-
Other - Tech Name:	-
Other - Marine Pollutant:	-

Notes:

(1) When "Not regulated," enter the proper freight classification, "MSDS Number," and "Product Name" on the shipping paperwork.

Canadian TDG Hazard Class & PIN:	Not regulated

* * * Section 15 -- Regulatory Information * * *

US Federal Regulations

A: General Product Information

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.

B: Component Analysis

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

Aluminum (7429-90-5)

SARA 313: 1.0 percent de minimis concentration (fume or dust only)

Chromium (7440-47-3)

SARA 313: < 0.05

SARA 311/312 Physical and Health Hazard Categories:

Immediate (acute) Health Hazard:	None known
Delayed (chronic) Health Hazard:	None known
Fire Hazard:	No
Sudden Release of Pressure:	No
Reactive:	Yes

"The information herein is given in good faith, but no warranty, express or implied, is made."