

## ALUMINUM ALLOY 319

**Section 1 – Identification****TRADE NAMES**

Aluminum Foundry Ingot

**CHEMICAL NAME**

Mixture

**FORMULA**

Aluminum Alloys

**MANUFACTURER'S NAME**

SPECTRO ALLOYS, INC

**EMERGENCY TELEPHONE NUMBER**

(651) 437-2815

**ADDRESS**13220 Doyle Path East  
Rosemount, MN 55068**INFORMATION TELEPHONE NUMBERS**Phone: (651) 437-2815  
Fax: (651) 458-3714**Section 2 – Hazards Identification**

Not hazardous in solid form at ambient temperature. Dusts, fines and/or particulates from processing may be readily ignitable. Fine particles and molten metal are highly reactive with water, oxidizers, acids, alkalis, halogenated compounds and certain metal oxides.

**Section 3 – Composition/Information on Ingredients**

Material	Element	Percent By Weight	CAS Number	EC Number
Aluminum	Al	Remainder	7429-90-5	231-072-3
Boron	B		7440-42-5	231-151-2
Chromium	Cr		7440-47-3	231-157-5
Copper	Cu	3.00 - 4.00	7440-50-8	231-142-3
Iron	Fe	1.000 max	7439-89-6	231-104-6
Lead*	Pb	0.050 max	7439-92-1	231-100-4
Magnesium	Mg	0.50	7439-95-4	231-159-6
Manganese	Mn	0.20 - 0.60	7439-96-5	231-130-8
Nickel	Ni	0.35	7440-02-0	231-111-4
Phosphorus	P		7723-14-0	231-768-7
Silicon	Si	6.5 - 7.5	7440-21-3	231-096-4
Strontium	Sr	0.030 max	7440-24-6	231-133-4
Tin	Sn		7440-31-5	231-141-8
Titanium	Ti	0.25 max	7440-32-6	231-158-0
Zinc	Zn	1.0	7440-66-6	231-105-1
Other (each)			N/A	N/A
Other (total)			N/A	N/A

\*Present as impurity. While lead is not intentionally added to this mixture, it could potentially enter through the recycle stream.

**Section 4 – First Aid Measures****EYE CONTACT**

If this material contacts the eyes, immediately wash the eyes with large amounts of water, occasionally lifting the lower and upper lids. Get medical attention immediately.

**SKIN CONTACT**

If this material contacts the skin, brush or vacuum off excess dust and promptly wash the contaminated skin with soap and water. Skin cuts and abrasion can be treated with standard first aid. If the material is molten, treat as a burn.

**INHALATION OF DUST**

If a person breathes large amounts of this material move the exposed person to fresh air at once. If breathing has stopped, perform mouth-to-mouth resuscitation. Keep the affected person warm and at rest. Get medical attention immediately.

**INGESTION**

Ingestion of significant amounts of material is unlikely. If large quantities of this material are swallowed, induce vomiting in conscious individual. Get medical attention immediately.

**NFPA RATINGS (HMIS)**

Health: 1

Fire: 0

Reactivity: 0

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**Section 5 – Fire Fighting Measures**

In solid ingot form there is no fire or explosion hazard.

NEVER PUT WATER ON MOLTEN METAL - IT WILL EXPLODE.

<b>EXTINGUISHING MEDIA</b>	Aluminum alloys will not burn in the solid state. Like other metallic and organic dust and fine powder, aluminum alloy dust and powder may burn under some conditions. To extinguish, use Class D Agents (Lith X).
<b>SPECIAL FIRE FIGHTING PROCEDURES</b>	Confine metal powder dust fire, avoid spreading. Apply Class D (Lith X) powder in heavy quantities. DO NOT USE WATER OR MOIST SAND. Fire fighters should wear self-contained breathing apparatus and protective clothing.
<b>UNUSUAL FIRE AND EXPLOSION HAZARDS</b>	Fire or explosion may occur when material is in the form of dust and exposed to heat or flames, chemical reaction or contact with powerful oxidizers.

**Section 6 – Accidental Release Measures**

No special precautions are necessary for spills of bulk material. Wear gloves to prevent metal cuts.

If quantities of dust are spilled, remove by vacuuming or wet sweeping to prevent heavy concentrations of airborne dust. Do not use compressed air for cleaning. Cleanup personnel should wear approved respirators and protective clothing. Place all collected metal or particulates in a labeled container.

Molten metal spills can cause concrete to explode. Contain the flow using dry sand or salt flux as a dam. Do not use shovels or other hand tools to halt the flow of molten aluminum. Allow the spill to cool entirely before handling. Spilled molten metal can be reclaimed for reuse.

In the United States, this product must be disposed of in accordance with applicable federal, state and local solid waste labeling, shipping and disposal laws and regulations.

CERCLA Reportable Quantity (RQ): None Established.

**Section 7 – Handling and Storage**

<b>PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING</b>	Use good housekeeping practices to prevent accumulations of dust and keep airborne dust concentrations at a minimum. Avoid breathing dust or fumes.  Store metal in a dry area away from incompatible materials. Keep dust away from sources of ignition.  Aluminum alloy sows and ingots may have shrink cavities that may contain moisture. Ice, snow, grease, oil or moisture can cause explosions if charged into a melting furnace. Remove these contaminants before charging ingot to melting furnace. Preheat metal when required to evaporate moisture prior to melting.
<b>OTHER PRECAUTIONS</b>	Hot and cold aluminum are not visually different. Hot aluminum does not necessarily glow red.  Handling molten aluminum presents special hazards. Refer to Aluminum Association Publication 69, "Guidelines for Handling Molten Aluminum". For extensive information, write the Aluminum Association, 818 Connecticut Ave., NW, Washington, DC 20006 for a copy of this publication.
<b>SARA TITLE III THRESHOLD PLANNING QUANTITY (TPQ)</b>	None established.

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

<b>RESPIRATORY PROTECTION</b>	Employees may wear NIOSH or MSHA approved respirators as specified by an Industrial Hygienist or qualified Safety Engineer for protection against airborne dusts or fumes.
<b>VENTILATION</b>	Local exhaust ventilation is required when dust or fumes are generated. Use general and local exhaust ventilation to keep airborne concentrations of dust or fume below the OSHA PEL and TWA shown below.
<b>PROTECTIVE GLOVES</b>	Advisable to avoid cuts and skin abrasions. Gloves and barrier creams may be necessary to prevent skin sensitization and dermatitis
<b>EYE PROTECTION</b>	Approved safety glasses or goggles should be worn when exposed to dusty or hot material. <b>Face shields should be worn around hot metal. Safety eyewash stations should be provided near work areas.</b>
<b>OTHER PROTECTIVE CLOTHING OR EQUIPMENT</b>	Full protective clothing should be worn by workers exposed to heavy concentrations of dust or high heat and during alloying operations to prevent injury from molten metal splashing, spilling, etc.
<b>WORK/HYGIENIC PRACTICES</b>	Do not eat, drink or use tobacco products in work areas. Wash thoroughly after skin contact and before eating, drinking, use of tobacco products or using restrooms. Take a shower and change clothes at the end of the shift. All protective and contaminated clothing must be left at the plant. Launder all other work clothing separately from other household laundry.
	Pre-employment medical evaluations should be provided. Attention should be directed to skin, eyes, respiratory tract, blood, kidneys, pulmonary function and neurological health. Chest x-rays should be included if symptoms are present.

**EXPOSURE LIMITS**

Material	Element	CAS Number	Human Carcinogen <sup>[a]</sup>	Form	OSHA <sup>a</sup> 8-Hr PEL mg/m <sup>3</sup>	ACGIH 8-Hr TLV mg/m <sup>3</sup>
Aluminum	Al	7429-90-5	No	Dust Dust	15 TD <sup>[b]</sup> 5 RF <sup>[c]</sup>	1 ND <sup>[d]</sup>
Boron	B	7440-42-5	No	All	ND	ND
Chromium	Cr	7440-47-3	Yes <sup>[a]</sup>	All	1	0.5
Copper	Cu	7440-50-8	No	Dust Fume	1 0.1	1 0.2
Iron	Fe	7439-89-6	No	All	ND	ND
Lead	Pb	7439-92-1	Yes <sup>[a]</sup>	All	0.05	0.05
Magnesium	Mg	7439-95-4	No	All	ND	ND
Manganese	Mn	7439-96-5	No	Dust Fume	5 C <sup>[e]</sup>	0.2 0.2
Nickel	Ni	7440-02-0	Yes <sup>[a]</sup>	All	1	0.05
Phosphorus	P	7723-14-0	No	All	ND	ND
Silicon	Si	7440-21-3	No	All	15 TD 5 RF	10 ND
Strontium	Sr	7440-24-6	No	All	ND	ND
Tin	Sn	7440-31-5	No	All	2	2
Titanium	Ti	7440-32-6	No	All	ND	ND
Zinc	Zn	7440-66-6	No	Dust Fume	ND 15	ND 5
Other		N/A		All	ND	ND

Notes <sup>[a]</sup>Identified as a potential human carcinogen<sup>[b]</sup>TD: Total Dust<sup>[c]</sup>RF: Respirable Fraction of Dust<sup>[d]</sup>ND: For dusts without an explicit OSHA PEL, a nuisance dust PEL applies (15 mg/m<sup>3</sup> total dust, 5 mg/m<sup>3</sup> respirable fraction of dust.)<sup>[e]</sup>C: Ceiling Limit

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**Section 9 – Physical and Chemical Properties**

<b>Appearance</b>	Silvery gray odorless solid	<b>Vapor pressure</b>	~0 mm Hg
<b>Specific Gravity (H<sub>2</sub>O = 1)</b>	2.6 – 2.9	<b>Odor threshold</b>	N/A
<b>Melting point</b>	1,050 – 1,220 °F (566 – 660 °C)	<b>Vapor density (Air = 1)</b>	N/A
<b>Boiling point</b>	3,733 °F (2,056 °C)	<b>Evaporation rate (Butyl Acetate = 1)</b>	N/A
<b>Flammability</b>	Nonflammable	<b>Solubility in water (at 20°C)</b>	Insoluble
<b>Upper/lower explosive limits</b>	Not applicable	<b>pH</b>	N/A
		<b>Flash point</b>	N/A
		<b>NFPA fire code</b>	0

**Section 10 – Stability and Reactivity**

**STABILITY** Stable at room temperature.

**INCOMPATIBILITY (MATERIALS TO AVOID)** NEVER PUT WATER ON MOLTEN METAL - IT WILL EXPLODE.

Reaction with mineral acids, water-soluble cutting oils, dilute hydrochloric acid, sulfuric acid, potassium hydroxide or sodium hydroxide may liberate hydrogen. Avoid contact with acids, bases and oxidizing agents. For additional information consult Safety Data Sheets for component materials.

**HAZARDOUS DECOMPOSITION OR BY-PRODUCTS** Evolved hydrogen in confined areas may be an explosive hazard (see directly above). Potentially hazardous oxides of metals may be produced when aluminum alloys are heated, welded or in molten state

**HAZARDOUS POLYMERIZATION** Will not occur.

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## Section 11 – Toxicological Information

<b>ROUTES OF ENTRY</b>	Inhalation? Yes Skin? Yes Ingestion? No
<b>HEALTH HAZARDS (ACUTE AND CHRONIC)</b>	Aluminum and aluminum alloys are not generally regarded as industrial toxins. In normal use, few health hazards occur.  No health hazard or toxicity information exists specifically for this material. Data for major components are given instead. For each component in this material, the percent by weight can be used as a rough guide to the component's likely significance.
<b>Inhalation</b>	Cutting, melting or welding may produce dusts or fumes containing the component elements and their oxides. Breathing these dust or fumes may present potentially significant health hazards. These may include mucous membrane irritation and lung changes in workers, potentially leading to pulmonary diseases.  Inhalation of finely divided aluminum powder may cause pulmonary fibrosis (aluminosis). Symptoms include anorexia, shortness of <b>breath, dry cough, chest pain on respiration and</b> epigastric abdominal pain.  Fumes of copper, magnesium, manganese and zinc oxide may cause metal fume fever with flu-like symptoms. Overexposure to manganese fumes may cause chronic manganese poisoning. Early symptoms include headaches, apathy, sleepiness, and weakness or cramps in the legs. Chronic overexposure may affect the central nervous system, ultimately leading to emotional disturbances, gait and balance difficulties, and paralysis.  Overexposure to tin dusts may cause irritation of the skin and mucous membranes, and may result in a benign pneumoconiosis (stannosis).  Chromium and nickel compounds have been associated with allergic reactions, rashes and lung changes. Nickel is a respiratory irritant and may cause pneumonitis.
<b>Skin</b>	Dusts or fumes containing component elements of aluminum alloys may cause skin or mouth irritation. Copper may cause skin and hair discoloration. Magnesium particles imbedded in the skin may cause severe lesions, with slow healing.
<b>Eyes</b>	Dusts or fumes containing component elements of aluminum alloys may cause eye irritation.
<b>Ingestion</b>	Ingestion of significant amounts of material is unlikely.
<b>UNUSUAL CHRONIC TOXICITY</b>	Chromium, lead and nickel have been identified as potential human carcinogens.
<b>CARCINOGENITY (Aluminum)</b>	NTP? No IARC Monographs? No OSHA Regulated? No
<b>SIGNS AND SYMPTOMS OF EXPOSURE</b>	Irritation of skin and mucous membranes; cough; difficulty in breathing.  Exposure to dust or fume may cause irritation of skin and mucous membranes, cough, difficulty in breathing and lung changes in workers, potentially leading to pulmonary diseases.
<b>MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE</b>	None reported.

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**Section 12 – Ecological Information**

<b>ECOTOXICITY</b>	Has not been demonstrated using standard OECD protocol.
<b>MOBILITY</b>	Aluminum is not mobile in the environment unless contact is made with an aqueous environment with a pH below 5.5 or above 8.5.
<b>BIODEGRADABILITY</b>	Not relevant for metals.

**Section 13 – Disposal Considerations**

<b>WASTE DISPOSAL METHOD</b>	Sell waste material for scrap.
<b>RCRA CLASSIFICATION</b>	None established
<b>RCRA HAZARDOUS WASTE NUMBER</b>	None established

**Section 14 – Transport Information**

No specific regulations apply to this material when transported in mass solid form at ambient temperature.

**Section 15 – Regulatory Information**

**USA** This product contains the following toxic chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and 40 CFR 372:

Chemical Name	CAS Number	Percent By Weight
Aluminum (fume or dust only)	7429-90-5	[a] [b]
Chromium	7440-47-3	[a]
Copper	7440-50-8	[a]
Lead	7439-92-1	[a]
Manganese	7439-96-5	[a]
Nickel	7440-02-0	[a]
Zinc (fume or dust only)	7440-66-6	[a] [b]

[a] See Section 3, Composition/Information on Ingredients, for percentage by weight.

[b] Must be adjusted by the fraction of the material that exists as fume or dust.

THIS INFORMATION MUST BE INCLUDED IN ALL SDS' THAT ARE COPIED AND DISTRIBUTED FOR THIS MATERIAL.

**Canada** WHMIS Classification: D2B Toxic material causing other toxic effects

**EU** Warning Symbol(s): None  
Risk Phrase(s): None  
Safety Phrase(s): None

**Section 16 – Other Information**

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**REFERENCES**

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Hawley's Condensed Chemical Dictionary, 14th Edition, John Wiley, New York, 1993

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