EGA SPECTRO ALLOYS

Safety data sheet
All Aluminum Alloys

SECTION 1: Product and Company Identification

1.1. Product identifier

Product Name:	Aluminum Ingot, Sow
Trade Name:	Aluminum Ingot, Sow
Product Form:	Mixture

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture:	Industrial use Production of Aluminum Castings

1.3. Details of the supplier of the safety data sheet

Spectro Alloys Corp.
13220 Doyle Path East
Rosemount, MN 55068

1.4. Emergency telephone number

Emergency number:	On-site Emergency 651-480-6135

SECTION 2: Hazard(s) Identification

2.1. Classification of the substance or mixture

GHS-US classification

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.

2.2. Label elements

GHS US labeling

No labeling applicable

2.3. Other hazards

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.

2.4. Unknown acute toxicity (GHS US)

No data available

SECTION 3: Composition/Information on ingredients

Aluminum alloy composition varies within the wide ranges shown below depending on the alloy being produced. The data below encompassing the maximum percent by weight of each component across all alloys.

Material	Element	Maximum Percent by Weight	CAS Number	EC Number
Aluminum	Al	Remainder	7429-90-5	231-072-3
Boron	B	0.030	7440-42-5	231-151-2
Chromium	Cr	0.50	7440-47-3	231-157-5
Copper	Cu	5.0	7440-50-8	231-142-3
Iron	Fe	2.0	7439-89-6	231-104-6
Lead*	Pb	0.50	7439-92-1	231-100-4
Magnesium	Mg	1.7	7439-95-4	231-159-6
Manganese	Mn	1.2	7439-96-5	231-130-8
Nickel	Ni	2.6	7440-02-0	231-111-4
Phosphorus	P	0.05	7723-14-0	231-768-7
Silicon	Si	18.0	7440-21-3	231-096-4
Strontium	Sr	0.070	7440-24-6	231-133-4
Tin	Sn	0.35	7440-31-5	231-141-8
Titanium	Ti	0.25	7440-32-6	231-158-0
Zinc	Zn	3.00	7440-66-6	231-105-1
Other	N/A	0.50	N/A	N/A

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

SECTION 4: First aid measures

4.1. Description of first aid measures

First Aid Eyes: Flush with tepid water for at least 20 minutes holding the eyelids wide open. Seek medical attention if irritation develops.

First Aid Skin: Brush or vacuum of excess dust and promptly wash the contaminated area with soap and water. Skin cuts and abrasions can be treated with standard first aid. If the material is molten, treat as burn

First Aid Inhalation: Move the exposed person to fresh air a once. If breathing has stopped, perform mouth-to- mouth resuscitation. Keep the affected person warm and at rest. Get medical attention immediately.

First Aid Ingestion: Ingestion of significant amounts is unlikely. If large amounts of this material are swallowed, get medical attention immediately.

First Aid Notes to Physician: Symptoms may be delayed. May cause sensitization of susceptible persons. Treat symptomatically. Dust and fumes from processing can cause irritation of the upper respiratory tract.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media: Use Class D extinguishing agents on dusts, fines or molten metal. Do not use water; in molten state, reacts violently with water. Apply extinguishing media carefully to avoid creating airborne dust.

5.2. Special hazards arising from the substance or mixture

Molten metal in contact with water/moisture or certain metal oxides (e.g. rust) or 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) may have enough surface oxide to produce a thermite reaction/explosion.

5.3. Advice for firefighters

Confine dross powder dust fire, avoid spreading. Apply Class D powder in heavy quantities. DO NOT use water or moist sand. Fire Fighters should wear NIOSH approved, positive pressure, self-contained breathing apparatus and full protective clothing when appropriate.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures:

Avoid dust formation. Protect from water run-on, including precipitation. For dust or fines, pick up released product with appropriate implements and return to original container if reusable. If not reusable, place in appropriate containers for disposal. If material is molten, contain the flow using dry sand or salt flux as a dam. Do not use shovels or hand tools to handle the flow of molten metal. Allow the spill to cool and harden, then follow above.

6.2. Environmental precautions

Prevent further leakage or spillage if it is safe to do so. Prevent product from entering drains. Do not flush into surface water or sanitary sewer system.

6.3. Methods and material for containment and cleaning up

Avoid generating dust. Avoid contact with skin and eyes. Avoid contact with sharp edges or hot metal. Avoid breathing dust/fumes/vapors/gas/mists/sprays. Ensure adequate ventilation. Appropriate personal protective equipment cited in Section 8 should be worn during all clean-up operations.

6.4. Reference to other sections

See also sections 8 and 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling: Product should be kept dry. Avoid generating dust. Avoid contact with sharp edges or hot metal. Avoid contact with skin and eyes. Appropriate personal protective equipment cited in Section 8 should be worn during handling. Good housekeeping practices must be maintained. Avoid release to the environment. Use appropriate personal protective equipment cited in section 8.

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.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions: Keep in a dry and well-ventilated area. Keep material dry. Incompatible with acids, alkalis, water, halogenated compounds, metal oxides, iron powder and water.

7.3. Specific end use(s)

None.

SECTION 8: Exposure controls/personal protection

Respiratory Protection

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.

Ventilation

Local exhaust ventilation is required when dust or fumes are generated. Use general and local exhaust ventilation to keep airborne concentrations of dust below the OSHA, PEL, and TWA shown below.

Protective Gloves

Advisable to avoid cuts and skin abrasions. Gloves and barrier creams may be necessary to prevent skin sensitization and dermatitis.

Eye Protection Other Protective Clothing or Equipment

Approved safety glasses or goggles should be worn when exposed to dusty or hot material. Face shields should be worn around hot metal. Safety eyewash stations should be provided near work areas.

Work/Hygienic Practices

Do not eat, drink, or use tobacco products in work areas. Wash thoroughly after skin contact and before eating, drinking, use of tobacco, or the restroom.

Pre-employment medical evaluations should be provided. Attention should be directed to the skin, Eyes, respiratory tract, blood, kidneys, pulmonary function, and neurological health. Chest x-rays should be included if symptoms are present.

Material	Element	CAS Number	Human Carcinogen[a]	Form	OSHAa 8-Hr PEL mg/m³	ACGIH 8-Hr TLV mg/m³
Aluminum	Al	7429-90-5	No	Dust Fume	15 TD[b] 5 RF[c]	1 ND[d]
Aluminum Oxide						
(Non-fibrous)	Al2O3	1344-28-1	No	All	15 TD 5 RF	1 RF (as Al)
Sodium Chloride	NaCl	7646-14-5	No	All	ND	ND
Potassium Chloride	KCl	7447-40-7	No	All	ND	ND
Boron	B	7440-42-5	No	All	ND	ND
Chromium	Cr	7440-47-3	Yes[a]	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[a]	All	0.05	0.05
Magnesium	Mg	7439-95-4	No	All	ND	ND
Manganese	Mn	7439-96-5	No	Dust Fume	5 C[e]	0.2 0.2
Nickel	Ni	7440-02-0	Yes	All	1	0.05
Silicon	Si	7440-21-3	No	All	15 TD 5 RF	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	ND
Other Metallic Oxides	-	N/A		All	ND	ND

Notes:

[a]: Identified as a potential human carcinogen
[b]TD: Total Dust
[c]RF: Respirable Fraction of Dust
[d]ND: For dust without an explicit OSHA PEL, a nuisance dust PEL applies (15 mg/m3 total dust, 5mg/m3 respirable fraction of dust.)
[e]C: Ceiling Limit

SECTION 9: Physical and chemical properties

- Appearance: Silvery gray solid (dust or solid pieces)
- Specific Gravity: 2.3-3.0
- Melting Point: 1200-1300 °F
- Boiling Point: N/A
- Flammability: Nonflammable
- Upper/Lower Explosive Limits: N/A
- Vapor Pressure: N/A
- Odor: Odorless
- Vapor Density (Air=1): N/A
- Evaporation Rate (Butyl Acetate=1): N/A
- Solubility in Water (At 20°C): N/A
  pH: N/A
- Flash Point: N/A
- NFPA Fire Code: 0

SECTION 10: Stability and reactivity

Stability
Stable and non-reactive at room temperature if handled correctly. Metallic dusts may ignite or explode.
Incompatibility (Materials to Avoid)
NEVER PUT WATER ON MOLTEN ALUMINUM-IT WILL EXPLODE!
Reaction with water, mineral acids, water soluble cutting oils, dilute hydrochloric acid, sulfuric acid, potassium hydroxide, or sodium hydroxide may liberate hydrogen. Generation rate is greatly increased with fines and dust. Avoid contact with acids, bases, and oxidizing agents. For additional information consult Safety Data Sheets for component materials.
A violent thermite reaction generating considerable heat can occur when aluminum dust reacts with iron oxide (rust) and other oxides.
Hazardous Decomposition or By-Products Hazardous Polymerization
No hazardous decomposition products are known.

SECTION 11: Toxicological information

Acute Toxicity
Aluminum (7429-90-5): Oral LD50 Rat >2000 mg/kg
Aluminum Oxide (1344-28-1): Oral LD50 Rat >5000 mg/kg
Iron (7439-89-6) Oral LD50 Rat >984 mg/kg
Magnesium (7439-95-4) Oral LD50 Rat >230 mg/kg
Nickel (7440-02-0): Oral LD50 Rat >9000 mg/kg
Zinc (7440-66-6): Oral LD50 Rat 630 mg/kg
Inhalation
Inhalation of finely divided aluminum powder may cause pulmonary fibrosis (aluminosis). Symptoms include anorexia, shortness of breath, dry cough, chest pain on respiration and epigastric abdominal pain.
Fumes with 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 cramped legs. Chronic overexposure may affect the central nervous system, ultimately leading to emotional disturbances, gait and balance difficulties, and paralysis.
Overexposure to tin dust may cause irritation of the skin and mucous membranes and may result in

benign pneumoconiosis (stannosis).
Chromium and nickel compounds have been associated with allergic reactions, rashes, and lung change. Nickel is a respiratory irritant and may cause pneumonitis.

Skin

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.

Eyes

Dust or fumes containing component elements of aluminum alloys may cause eye irritation.

Ingestion

Ingestion of significant amounts of material is unlikely. Get medical attention.

Unusual Chronic Toxicity

Chromium, nickel, and lead have been identified as potential human carcinogens.

Carcinogenicity (Aluminum)

NTP: No

IARC Monographs: No

OSHA Regulated: No

Signs and Symptoms of Exposure

Irritation of skin and mucus membranes, cough, difficulty in breathing.

Medical Conditions Generally Aggravated by Exposure

None reported

SECTION 12: Ecological information

Ecotoxicity

Has not been demonstrated using standard OECD protocol.

Mobility

Aluminum is not mobile in the environment unless contact is made with aqueous environment with a pH below 5.5 or above 8.5.

Biodegradability

Not relevant for metals.

Bioaccumulation

This product does not contain any substances expected to be bioaccumulating.

SECTION 13: Disposal considerations

Waste Disposal Method

See Section 7 for Handling Procedures. See Section 8 for Personal Protective Equipment recommendations. Reuse or recycle material whenever possible. If reuse or recycling is not possible, disposal must be made according to local or governmental regulations.

SECTION 14: Transport information

Proper Shipping Name

Not regulated for transport

UN Number

Not regulated for transport

Hazard Class

Not regulated for transport

Packing Group

Not regulated for transport

Required Label

Not regulated for transport

Additional Information

Not regulated for transport

SECTION 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. This product is a «Hazardous Chemical» as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

CERCLA HAZARDOUS SUBSTANCES: (40 CFR 302.4) See below.
TSCA STATUS: Not regulated.
SARA TITLE III: Section 311/312 Hazardous Categories: Immediate hazard, delayed hazard, reactivity hazard.

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: Form R reporting required for 1.0% de minimis concentration (fume or dust only)
Aluminum Oxide (1344-28-1): SARA 313: Form R reporting required for 1.0% de minimis concentration (fume or dust only)
Copper (7440-50-8): SARA 313: Form R reporting required for 1.0% de minimis concentration CERCLA: Final RQ 5000 pounds (2270 kg) (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is equal to or exceeds 0.004 inches)
Zinc (7440-66-6): SARA 313: Form R reporting required for 1.0% de minimis concentration (only fume or dust) CERCLA: Final RQ = 1000 pounds (454 kg) (no reporting of releases of this hazardous substance is required if the diameter of the solid metal released is equal to or exceeds 0.004 inches)
Nickel (7440-02-0): SARA 313: Form R reporting required for 0.1% de minimis concentration CERCLA: Final RQ = 100 pounds (45.4 kg) (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is equal to or exceeds 0.004 inches.
Manganese (7439-96-5): SARA 313: form R reporting required for 1.0% de minimis concentration
Chromium (7440-47-3): SARA 313: Form R reporting required for 1.0% de minimis concentration
CERLA: Final RQ = 5000 pounds (2270 kg) (no reporting of releases of this hazardous material is required if the diameter of the pieces of the solid metal released is equal to or exceeds 0.004 inches)
Beryllium (7440-41-7): SARA 313: Form R reporting required for 0.1% de minimis concentration CERLA: Final RQ = 10 pounds (4.54 kg) (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is equal to or exceeds 0.004 inches)

SARA 311/312 Physical and Health Hazard Categories:

Immediate (acute) Health Hazard: Yes, if particulates/fumes generated during processing.
Delayed (chronic) Health Hazard: Yes, if particulates/fumes generated during processing.
Fire Hazard: No
Sudden Release of Pressure: No
Reactive: Yes, if molten

State Regulations

A. General Product Information
Pennsylvania" Special Hazardous Substances": Chromium, Chromium compounds, hexavalent, Nickel. Chemicals known to the State of California to cause cancer: Chromium (hexavalent compounds), Cobalt metal powder, Nickel and certain nickel compounds, Lead and lead compounds. Chemical(s) known to the State of California to cause reproductive/development effects: Lead.

B: Component Analysis-State

The following components appear on one or more of the State Hazardous Substances Lists:

CAS #	Component	CA	FL	MA	MN	NJ	PA
7429-90-5	Aluminum	Yes	No	Yes	Yes	Yes	Yes
1344-28-1	Aluminum Oxide	Yes	No	Yes	No	Yes	Yes
7440-21-3	Silicon	No	No	Yes	Yes	Yes	Yes
7440-50-8	Copper	Yes	No	Yes	Yes	Yes	Yes
7440-66-6	Zinc	Yes	No	Yes	No	Yes	Yes
7439-95-4	Magnesium	Yes	No	Yes	No	Yes	Yes
7440-02-0	Nickel	Yes	No	Yes	Yes	Yes	Yes
7439-89-6	Iron	Yes	No	No	No	No	No
7439-96-5	Manganese	Yes	No	Yes	Yes	Yes	Yes
7440-31-5	Tin	No	No	No	No	No	No
7440-47-3	Chromium	Yes	No	Yes	Yes	Yes	Yes
7440-41-7	Beryllium	Yes	No	No	No	Yes	No
7440-32-6	Chromium	Yes	No	Yes	Yes	Yes	Yes
7439-92-1	Lead	Yes	No	No	No	Yes	No

The following statement(s) are provided under the California State Drinking Water and Toxic Enforcement Act of 1986. (Proposition 65)

Warning: This product contains a chemical known to the State of California to cause cancer.
Warning: This product contains a chemical know to the State of California to cause reproductive/developmental effects.

SECTION 16: Other information

THIS SAFETY DATA SHEET SHOULD BE MADE AVAILABLE BY THE BUYER TO EACH OF THE BUYER'S PLANT WORKERS. CHANGES MADE TO THIS DOCUMENT TOTALLY VOID THE VALIDITY OF THIS SDS.

Notice

The buyer assumes all risk in connection with the use of the material. The information contained in this sheet is developed from what are believed to be accurate and reliable sources. SPECTRO ALLOYS CORP. makes no warranties, expressed or implied and assume no responsibility for the accuracy or completeness of the data contained in this Safety Data Sheet.

Reference

American Conference of Governmental Industrial Hygienists, Threshold Limit Values and Biological Exposure Indices 2009-2010, Cincinnati, 2009
Bretherick, Handbook of Reactive Chemical Hazards, Butterworths, 1995
Merck & Co., Inc., The Merck Index, 14th Edition, Rahway, NJ, 2010
Lewis, Richard J., Sr., Hazardous Chemicals Desk Reference, 3rd Edition, Van Nostrand Reinhold, New York, 1973
Lewis, Richard J., Sr., Hazardous Chemicals Desk Reference, CDROM Edition, John Wiley, New York, 1998
National Fire Protection Association, National Fire Codes, Manual of Hazardous Chemical Reactions, Quincy, MA, 1991
Plunkett, E. R., Handbook of Industrial Toxicology, Chemical Publishing Co., New York, 1976
Sax, M. Irving, Dangerous Properties of Industrial Materials, CDROM Edition, John Wiley, New York, 1999
U.S. Dept. Of Health and Human Services, NIOSH, Pocket Guide to Chemical Hazards, Pub. No. 2005-149 Cincinnati, September 2007

U.S. Dept. Of Health and Human Services, NIOSH, Registry of Toxic Effects of Chemical Substances, 1999
Hawleys Condensed Chemical Dictionary, 13th Edition, John Wiley, New York, 1998
U.S. Dept. Of Labor, OSHA Regulations 29 CFR 1910.1000 Through 29 CFR 1910.1200, January 2005
U.S. Environmental Protection Agency, Title III List of Lists, Pub. EPA 550-B3, Washington, DC, 2001

Dated

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