Safety Data Sheet (SDS)

OSHA Hazard Communication Standard 29 CFR 1910.1200. Prepared to GHS Rev.04

*** Section 1 - Product and Company Identification ***

Material Name: Aluminum/Aluminum Alloy Ingot/Sows/Billet/Slabs/Cast Tool & Jig Plate/Jig Plate/Mold Block

Trade Name and/or synonyms:

Die Cast Ingot, Foundry Ingot, RSI, Unalloyed Ingot, Scrap Aluminum, Extrusion Billet, Forging billet, Forging stock, Slab, K100 plate, M-5 block, M-1 block, Tooling plate

Recommended use:

Alloying or cast aluminum ingot, billet, or casting, forging, rolling, drawings, and machining.

MANUFACTURER INFORMATION

TST, INC.
Timco Division, Standard Metals Division, and Tandem Division, ALPASE Division
11601 Etiwanda Avenue, Fontana, CA 92337

Emergency telephone number: (951) 727-3199

*** Section 2 - Hazards Identification ***

General Hazard Statement: Solid metallic products are generally classified as “articles” and do not constitute as hazardous materials in solid form under the definitions of the OSHA Hazard Communication Standard (29 CFR 1910.1200). Any articles manufactured from these solid products would be generally classified as non-hazardous. However, some hazardous elements contained in these products can be emitted under certain processing conditions such as but not limited to: burning, melting, cutting, sawing, brazing, grinding, machining, milling, and welding. Products in the solid state present no fire or explosion hazard. Small chips, fines, and dust may ignite readily. The following classification information is for the hazardous elements which may be released during processing.

GHS CLASSIFICATION:

Flammable Solid – Category 1
Eye Damage/Irritation - Category 2B
Respiratory Sensitizer - Category 1
Skin Sensitizer - Category 1
Germ Cell Mutagenicity - Category 2
Carcinogenicity - Category 1B
Specific Target Organ Toxicity (Repeated Exposure) - Category 1
Hazardous to the Aquatic Environment - Acute Hazard - Category 1
Hazardous to the Aquatic Environment - Chronic Hazard - Category 2

OSHA DEFINED HAZARDS:

Combustible Dust

GHS LABEL ELEMENTS

Symbol(s)

Signal Word

Danger

Hazard Statement(s):

Flammable solid.

Causes eye irritation.
May cause allergy or asthma symptoms or breathing difficulties if inhaled.
May cause an allergic skin reaction.
Suspected of causing genetic defects.
May cause cancer.
Causes damage to respiratory system through prolonged or repeated exposure.
Very toxic to aquatic life.
Toxic to aquatic life with long lasting effects.

Precautionary Statement(s):

Prevention

P210: Keep away from heat/sparks/open flames/hot surfaces. – No smoking.
P241: Use explosion proof electrical/ventilating/lighting equipment.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P260: Do not breathe dust/fume.
P284: In case of inadequate ventilation wear respiratory protection.
P272: Contaminated work clothing should not be allowed out of the workplace.
P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P264: Wash thoroughly after handling.
P270: Do not eat, drink or smoke when using this product.
P273: Avoid release to the environment

Response

P370: In case of fire: Use Class D agent to extinguish.
P305: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists get medical advice/attention.
P304: IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. If experiencing respiratory symptoms: Call a poison center/doctor.
P302: IF ON SKIN: Wash with plenty of soap and water. If skin irritation or rash occurs: Get medical advice/attention. Wash contaminated clothing before reuse.
P308: If exposed or concerned: Get medical advice/attention.
P314: Get medical advice/attention if you feel unwell.
P391: Collect spillage

Storage

P405: Store locked up

Disposal

P501: Dispose of contents/container in accordance with local/regional/national/international regulations

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

CAS #	Component	Percent Content	ACGIH		OSHA
			TLV	STEL	PEL
7429-90-5	Aluminum	>80	10	5	15
7440-21-3	Silicon	<15	10	-	10
7440-50-8	Copper	<7	0.2*	-	0.1**
7440-66-6	Zinc	<9	5	10	5

7439-95-4	Magnesium	<6	10	-	15
7440-02-0	Nickel	<1.5	1.5	-	1
7439-89-6	Iron	<2	-	-	-
7439-96-5	Manganese	<0.6	0.2	-	5
7440-31-5	Tin	<0.2	2	-	2
7440-47-3	Chromium	<0.45	0.5	-	1
7440-41-7	Beryllium	<0.5	0.002	0.005	0.025
7440-32-6	Titanium	<0.3	10	-	15
7439-92-1	Lead	<0.2	0.05	-	30

Percentages of each constituent will vary with the alloy blend. Unless the alloy blend is known, processor should assume that all potential ingredients are present. **Exposure Limits are in TWA in mg/m^3.**
* Fume concentrations TWA; dusts and mists, as Cu: 1 mg/m^3.
** Fume, as Cu: 0.1 mg/m^3 TWA; dusts and mists, as Cu: 1 mg/m^3 TWA

*** Section 4 - 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

Wash thoroughly with mild soap and water. Seek medical attention if irritation develops. Remove any contaminated clothing and launder thoroughly before reuse.

First Aid: Inhalation

Remove exposed person to fresh air. If breathing is difficult, oxygen may be administered. If breathing has stopped, artificial respiration should be started immediately. Seek medical Attention.

First Aid: Ingestion

Not expected to be an important route of entry into the body. If large amounts of product are ingested, seek medical attention and advise physician.

First Aid: Notes to Physician

May cause sensitization of susceptible persons. Treat symptomatically.

*** Section 5 - Fire-Fighting Measures ***

General Fire Hazards:

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

Hazardous Combustion Products:

Dust or fines dispersed in the air can be explosive. Even minor dust clouds are potentially dangerous. Chips, dust or fines in contact with water can generate flammable/explosive hydrogen gas. Hydrogen gas in a confined space or poorly ventilated space could present an explosion hazard. Fines and dust in contact with certain metal oxides (i.e. Rust). Thermite reactions can be initiated easily by weak ignition sources. Molten metal in contact with water/moisture or other metal oxides. Moisture entrapped by molten metal can be explosive. Contact of molten aluminum with other metal oxides can initiate a thermite reaction.

Extinguishing Media:

Use coarse water spray on chips and fines. Use Class D extinguishing agents on dusts, fines or molten metal.

Unsuitable Extinguishing Media:

DO NOT USE: Halogenated agents on small chips, dusts or fines. DO NOT USE: water for extinguishing fires involving motel metal. These extinguishing agents will react with burning 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 ***

Materials and Methods for Clean-Up:

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.

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.

Personal Precautions and Protective Equipment:

Appropriate personal protective equipment cited in Section 8 should be worn during all clean-up operations.

*** Section 7 - Handling and Storage ***

Handling:

Product should be kept dry. Avoid generating dust. Appropriate personal protective equipment cited in Section 8 should be worn during handling. Wet mopping or vacuuming is recommended to clean up dusts that may be generated during handling and processing. Avoid all ignition sources. Use non-sparking handling equipment. Provide grounding and bonding where necessary to prevent accumulation of static charges during aluminum dust handling and transfer operations. Good housekeeping practices must be maintained.

If processing of this product generates dust or fine particles, obtain and follow the safety procedures and equipment guides contained in Aluminum Association Bulletin F-1 and National Fire Protection Agency (NFPA) standards 484, 654, 70, and 77.

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.

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.

Storage:

Keep containers tightly closed in a dry and well-ventilated area.

Incompatibilities:

Acids. Alkalis. Water. Halogenated compounds. Metal oxides. Iron powder and water: may cause an explosive reaction forming hydrogen gas when heated above 1470°F (800°C).

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

Engineering Controls:

For fume exposure, use with local exhaust ventilation to meet the exposure limits as listed in Section 2. If engineering controls fail to mitigate exposure to limits listed, use NIOSH approved respiratory protection. Use with adequate explosion-proof ventilation to meet the limits listed in Section 7.

Personal Protective Equipment: Respiratory

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 2.

Personal Protective Equipment: Eyes

Use tight fitting goggles if excessive levels of dust are generated. Wear a full-face respirator, if needed. If molten: Goggles/face shield are recommended.

Personal Protective Equipment: Hands

The need for personal protective equipment (gloves) should be based upon a hazard assessment and recommendations from health / safety professionals. Wear appropriate gloves to avoid any skin injury. When material is heated, wear gloves to protect against thermal burns.

Personal Protective Equipment: Skin and Body

The need for personal protective equipment should be based upon a hazard assessment and recommendations from health / safety professionals. Wear appropriate gloves and clothing to avoid direct skin contact. Contact with molten material can cause thermal burns. Flame retardant protective clothing is recommended.

Personal Protective Equipment: Hygiene Measures

Do not breathe vapors/dust. When using, do not eat, drink, or smoke. Provide regular cleaning of equipment, work area, and clothing. Avoid contact with skin, eyes, and clothing. Wash hands before breaks and immediately after handling the product. Keep away from food and drink.

*** Section 9 - Physical and Chemical Properties ***

Appearance:	Solid, gray, metallic shapes
Boiling Point:	Not applicable
Freeze-Melt Point:	900°-1200°F (482° – 660° C)
Vapor Pressure (mm):	Not applicable
Vapor Density (air = 1):	Not applicable
Solubility in Water:	Insoluble to slightly soluble
Specific Gravity/Bulk Density:	2.5-2.9 g/cc
Evaporation Rate (Butyl Acetate=1):	Not applicable
pH:	Not applicable
Odor:	None

Coefficient of water/oil Distribution: Not applicable
% Volatile by Volume: Not volatile as shipped
Flash Point: Not applicable
Upper Explosive Limit (UEL): Not applicable
Lower Explosive Limit (LEL): Not applicable

*** Section 10 - Stability and Reactivity ***

Chemical Stability:

Stable if handled and stored as directed.

Conditions to Avoid:

Dust formation. Heat, flames and sparks. Protect from water. Aluminum fines are attacked by strong acids and alkalis and by some halogenated organic compounds especially at elevated temperatures. Operations generating aluminum fines may produce hydrogen gas when exposed to moisture. Hydrogen gas is highly flammable and can accumulate in poorly ventilated areas. Liberates flammable hydrogen gas on contact with water, alcohols, acidic or basic materials, and metals or metallic compounds.

Incompatible Materials:

Acids. Alkalis. Water. Halogenated compounds. Metal oxides. Iron powder and water: may cause an explosive reaction forming hydrogen gas when heated above 1470°F (800°C).

Hazardous Decomposition Products:

Nickel oxides. Cadmium compounds. Fumes of aluminum or aluminum oxide. Welding of aluminum alloys may generate carbon monoxide, carbon dioxide, ozone, and nitrogen oxides. Lead oxides. Lead and chromium compounds.

*** Section 11 - Toxicological Information ***

Acute toxicity:

Component Analysis:

Aluminum (7429-90-5)
Oral LD50 Rat >2000mg/kg

Silicon (7440-21-3)
Oral LD50 Rat 3160 mg/kg

Magnesium (7439-95-4)
Oral LD50 Rat 230 mg/kg

Iron (7439-89-6)
Oral LD50 Rat 984 mg/kg

Nickel (7440-02-0)
Oral LD50 Rat >9000 mg/kg

Manganese (7439-96-5)
Oral LD50 Rat 9 g/kg

Beryllium (7440-41-7)
Oral LD50 Rat 82 mg/kg

Potential Health Effects: Skin Corrosion Property/ Stimulativeness

Contact with dust can cause mechanical irritation or drying of the skin. Contact with oils from processing

Reproductive Toxicity

Lead may damage the reproductive system and cause developmental damage.

Specified Target Organ General Toxicity: Single Exposure

Causes damage to organs (kidneys, respiratory system)

Specified Target Organ General Toxicity: Repeated Exposure

May cause damage to organs through prolonged or repeated exposure (respiratory system). Repeated contact may cause allergic reactions in very susceptible persons. Avoid repeated exposure. Prolonged exposure may cause chronic effects. Repeated or prolonged skin contact may cause skin irritation and/or dermatitis and sensitization of susceptible persons. May cause adverse effects on the bone marrow and blood-forming system. May cause adverse liver effects.

may cause irritation. Prolonged skin contact may defat the skin and produce dermatitis. Repeated or prolonged skin contact may cause allergic reactions with susceptible persons.

Potential Health Effects: Eye Critical Damage/ Stimulativeness

Dust contact with the eyes can lead to mechanical irritation.

Potential Health Effects: Ingestion

May be harmful if swallowed. May cause additional affects as listed under "Inhalation".

Potential Health Effects: Inhalation

May be harmful if inhaled. Inhalation of dust in high concentration may cause irritation of respiratory system.

Respiratory Organs Sensitization/ Skin Sensitization

May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause an allergic skin reaction.

General Cell Mutagenicity

Suspected of causing genetic defects.

Carcinogenicity

A: General Product Information

May cause cancer.

B: Component Carcinogenicity

Aluminum (7429-90-5)

ACGIH: A5 - Not Suspected as a Human Carcinogen

Nickel (7440-02-0)

ACGIH: A4 - Not Classifiable as a Human Carcinogen
NIOSH: Potential occupational carcinogen
NTP: Reasonably Anticipated to be a human carcinogen (possible select carcinogen)
IARC: Monograph 49 [1990]; Supplement 7 [1987] (Group 2b (possibly carcinogenic to humans))

Chromium (7440-47-3)

ACGIH: A4 - Not Classifiable as a Human Carcinogen
IARC: Monograph 49 [1990] (listed under chromium and chromium compounds); Supplement 7 [1987] (Group 3(not classifiable))

Reproductive Toxicity

Lead may damage the reproductive system and cause developmental damage.

Specified Target Organ General Toxicity: Single Exposure

Causes damage to organs (kidneys, respiratory system)

Specified Target Organ General Toxicity: Repeated Exposure

May cause damage to organs through prolonged or repeated exposure (respiratory system). Repeated contact may cause allergic reactions in very susceptible persons. Avoid repeated exposure. Prolonged exposure may cause chronic effects. Repeated or prolonged skin contact may cause skin irritation and/or dermatitis and sensitization of susceptible persons. May cause adverse effects on the bone marrow and blood-forming system. May cause adverse liver effects.
Elevated temperature processing such as welding and plasma arc cutting may release hazardous fumes. Overexposure to metal fumes may cause pulmonary edema (fluid in the lungs) and methemaglobinemia. May also cause pulmonary fibrosis and lung cancer. Lead compounds may be absorbed by ingestion, by inhalation and through the skin. Lead may damage kidney function, the blood forming system and the reproductive system. Inorganic lead compounds can cause developmental damage.

*** Section 12 - Ecological Information ***

General Product Information

Very toxic to aquatic organisms. May cause long-term adverse effects in the aquatic environment.

Persistence/Degradability

Metal powders may cause ecological damage through silting or sedimentation effect in water depriving organisms of habitat and mobility, and/or fouling of gills, lungs and skin thus limiting oxygen uptake.

Bioaccumulation

Metal powders in water or soil may form metal oxides or other metal compounds that could become bioavailable and harm aquatic or terrestrial organisms.

Mobility in Soil

Metal powder would be relatively immobile in soils but some metal compounds may be transported with ground water.

*** Section 13 - Disposal Considerations ***

Waste Disposal Instructions

See Section 7 for Handling Procedures. See Section 8 for Personal Protective Equipment recommendations. TCLP testing should be conducted to determine hazard characteristics if disposed of as waste products.

Disposal of Contaminated Containers or Packaging

Dispose of contents/container in accordance with local/regional/national/international regulations.

*** Section 14 - Transport Information ***

Not currently regulated under Department of Transportation regulations as shipped.

Aluminum Powder is regulated: Aluminum Powder, UN 1396, 4.3, PG II
Restrictions: Passenger Aircraft = 15 kg; Cargo Only Aircraft = 50 kg.

*** Section 15 - Regulatory Information ***

US Federal Regulations

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.

CERCLA HAZARDOUS SUBSTANCES: (40 CFR 302.4) See below.
TSCA STATUS: All components of this product are listed on the TSCA inventory.
SARA TITLE III: Section 311/312 Hazardous Categories:

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)

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
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	Beryllium	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 ***

Abbreviations and Acronyms:

ACGIH = American Conference of Governmental Industrial Hygienists; IARC = International Agency for Research on Cancer; NFPA = National Fire Protection Association; NTP = National Toxicology Program; STEL = Short-term Exposure Limit; TLV = Threshold Limit Value; TSCA = Toxic Substances Control Act; TWA = Time Weighted Average; OSHA = Occupational Health and Safety Administration; PEL = Permissible Exposure Limit; NIOSH = National Institute for Occupational Safety and Health; LD50 = Lethal Dose, 50%; CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act of 1980; SARA = Superfund Amendments and Reauthorization Act

References:

Available upon request.