

SAFETY DATA SHEET

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Prepared by:	JE Compliance Services, Inc.	Revised by:	JE Compliance Services, Inc.
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PRODUCT NAME: Aluminum alloy**Section 1 – Chemical Product and Company Identification**

Vista Metals Corp.
13425 Whittram Avenue
Fontana, California 92335 USA

For additional information contact: cesar@vistametals.com

Emergency Telephone:

- **Emergencies:**
 - 1.909.829.6175 (US, Canada, and North American Numbering Plan-NANP).
 - *Country of call origin exit code* + 1.909. 829.6175 (Outside of US, Canada, and NANP).

REACH Registration No: 01-2119529243-45-0000; 01-2119467174-37-0000; 01-2119480154-42-0000;
01-2119537203-49-0000.

Product name: aluminum, aluminum alloys, aluminum billet including ATP-5, Duramax-10, Duramold-2, Duramold-5

Typical uses: fabricated into extrusions, forgings, and plate.

Section 2 – Hazard Identification**UN GHS Hazard Pictograms**

Possible primary routes of entry: inhalation and eye contact.

Signs and symptoms of exposure: mucous membrane, skin and eye irritation.

Carcinogenicity: this product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm (California Proposition 65).

Physical hazards: stable under normal conditions.

Health hazards: irritant; digestive, eye, respiratory, and skin hazard.

Medical conditions generally aggravated by exposure: none unless excessive, repeat exposure. See **Section 4 – First Aid Measures** and **Section 8 – Exposure Controls and Personal Protection**.



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The following health and physical hazard classes apply:

- Acute toxicity, category 0.
- Flammable solid, category 0.
- Eye irritation, category 1.
- Digestive irritation, category 0.
- Respiratory irritation, category 1.
- Skin irritant, category 1.

CHIP Phrases

Standard EU CHIP phrases provided are unique to this product and its components.

Risk CHIP phrases

- Highly flammable (R11).
- Toxic by inhalation, in contact with skin and if swallowed (R23/24/25)
- Causes burns (R34).
- Irritating to eyes and skin (R36/38).
- Irritating to eyes, respiratory system and skin (R36/37/38).
- May cause sensitization by skin contact (R43).

Safety CHIP phrases

- Do not breathe dust (S22).
- Avoid contact with skin and eyes (S24/25).
- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice (S26).
- Wear suitable protective clothing (S36).
- In case of accident or if you feel unwell, seek medical advice immediately (S45).

Note: Risk phrases applicable only during machining, cutting, drilling, grinding or other related processing operations that result in the disturbance or alteration of the metal or coatings; solid, unmodified billet presents minimal health risks.

Section 3 – Composition and Hazard Information about Ingredients

Ingredient	CAS#	Approx weight % content	CHIP Phrases	Exposure Limit OSHA (type)	LC50	Lethal Dose (LD)**
Aluminum	7429-90-5	80-99	R36/38, S36	10 mg/m ³ (dust) 15 mg/m ³ (TWA total)	NA	NA
Silicon	7440-21-3	0-15	R11*, S22 S26, S36	10 mg/m ³ (ACGIH, TLV) 15 mg/m ³ (TWA total)	NA	LD50: 3,160 mg/kg (rat)



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Ingredient	CAS#	Approx weight % content	CHIP Phrases	Exposure Limit OSHA (type)	LC50	Lethal Dose (LD)**
Zinc	7440-66-6	0-10	R36/37/38, S26, S36	5 mg/m ³ (fume/TWA ceiling) 0.2 mg/m ³ (ACGIH, TLV)	NA	NA
Copper	7440-50-8	0-6	R36/38, S26, S36	0.1 mg/m ³ (TWA)	NA	LDLO: 100 mg/kg: ETA*** (rat intrapleural) LDLO: 120ug/kg: GIT*** (human oral)
Magnesium	7439-95-4	0-6	R11*, R34, R36/37/38, S26, S36	15 mg/m ³ (TWA)	NA	LDLO: 230 mg/kg (dog oral)
Nickel	7440-02-0	0-2	R34, R43, S36, S45, S36	1 mg/m ³ (TWA)	NA	LDLO: 50 mg/kg (mouse intravenous) LDLO: 12 mg/kg (rat intratracheal)
Iron	7439-89-6	0-2	R36/38, S26	10 mg/m ³ (TWA) 5 mg/m ³ (fume)	NA	LD50: 30 g/kg (rat, oral) LDLO: 20 mg/kg (rabbit, intraperitoneal)
Manganese	7439-96-5	0-2	R36/38, R23/24/25, S36, S45, S36	5 mg/m ³ (TWA ceiling) 0.2 mg/m ³ (ACGIH, TLV)	NA	LD50: 9,000 mg/kg (rat, oral) LDLO: 400 mg/kg, 1Y-1:ETA*** (rat, intramuscular)

*See Section 5- Fire Fighting Procedures for additional flammability information.

**LDLO; is the lowest dosage per unit of bodyweight of a substance known to have resulted in death in a group of test animals.

**LD50; the amount of a material, given all at once, which causes the death of 50% (one half) of a group of test animals.

***ETA; equivocal tumorigenic agent. GIT; gastrointestinal tract.



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Section 4 – First Aid Measures

- Eye contact: if the material contacts the eyes:
 - Wipe away any excess material around the eyes.
 - Immediately flush the affected eye(s) with cold, gently flowing water for a minimum of 15 minutes while holding the eyelid(s) open. Obtain medical attention if irritation persists, or if particles are lodged in surface of the eye(s). Take special care if the exposed person is wearing contact lenses.
- Skin contact: gently brush away excess material. During machining operations sharp edges may be created which presents an abrasion hazard. If abrasions do occur seek medical help to stop bleeding.
- Inhalation: if dust is inhaled:
 - Move immediately to an area with fresh air.
 - Pre-existing diseases of the upper respiratory tract and lungs such as bronchitis, emphysema, and asthma may be aggravated by exposure to dust.
- Ingestion:
 - DO NOT induce vomiting.
 - Unlikely under normal conditions of use, but swallowing may result in abdominal discomfort.

Section 5 – Fire Fighting Procedures

- Auto-ignition temperature: not applicable to solid product.
- Flammability: solid product is non-flammable.
 - Silicon and magnesium are highly flammable when in fine powder form, but unlikely to be present even during machining operations.
- Flash point: 400°C/752°F (aluminum).
- Products of combustion: metal oxides, alloy elements, and oxides of carbon and nitrogen.
- Extinguishing media: not a fire hazard unless in powdered or finely divided state. Suspension of aluminum dust in air may pose a severe explosion hazard. In case of aluminum fire, use a class D dry-powder extinguisher. Do not use water or halogenated extinguishing media.
- Fire fighting procedures: do not release runoff from fire control methods to sewers or waterways. Wear a self-contained breathing apparatus (SCBA) with a full face piece operated in pressure-demand or positive pressure mode and full protective clothing. Only fight fire if properly trained.

Section 6 – Accidental Release Measures

- Environmental precautions: keep away from sewers and surface water.
- 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 metal. Allow the spill to cool before re-melting as scrap.

Section 7 – Handling and Storage

- Storage: store away from acids and other incompatible materials.



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- Processing: avoid breathing metal fumes or dust generated during machining operations. Practice good housekeeping. Provide grounding and bonding where necessary to prevent accumulation of static charges during aluminum dust handling and transfer operations.
- Re-melting: molten aluminum 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 contained in aluminum scrap or re-melt 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. Drops of molten aluminum in water (i.e. from plasma arc cutting), while not normally an explosion hazard, can generate enough flammable hydrogen to present an explosion hazard. Circulation of the water and removal of the metal particles minimize the hazards.
- During melting operations, the following minimum guidelines should be observed:
 - Inspect all aluminum 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 such as ingot adequately before charging into a furnace containing molten aluminum. This is typically done by use of a drying oven or homogenizing furnace. The drying cycle should bring the metal of temperature of the coldest item if the batch to 400°F and then hold at that temperature for 6 hours.
 - Ingot that is charged into molten aluminum should always be preheated.

Section 8 – Exposure Controls and Personal Protection

- Exposure limits: machining operations such as burning, welding, sawing, brazing, machining, and grinding may cause health effects if exposures exceed recommended limits as listed under **Section 3 – Composition and Hazard Information about Ingredients.**
- Respiratory protection: use a NIOSH/OSHA approved dust mask if dust is generated during machining operations or otherwise present in concentrations above the Permissible Exposure Limit (PEL) for nuisance particulates. Excessive inhalation to fumes of metal oxide particles can produce an acute reaction known as “metal fume fever”. Symptoms consist of chills and fever, metallic taste in the mouth, dryness and irritation of the throat followed by weakness and muscle pain. Oxide fumes of manganese and copper have been associated with causing metal fume fever. Chronic inhalation of excessive concentrations of metal fumes may result in pneumoconiosis, pulmonary disorders, respiratory irritation, asthma, nosebleed, and ulceration of the nasal septum, as well as respiratory cancer.
- Protective gloves: work gloves are recommended during machining operations. Skin exposure to solid product in itself is not expected to present any significant hazards; however, prolonged skin contact may irritate skin.
- Eye protection: excessive exposure to high concentrations of dust may cause irritation to the eyes. Particles of iron compounds may become imbedded in the eye and cause rust stains unless removed promptly. Use safety glasses or goggles as required for machining operations.
- Environmental exposure controls: Contain spills using dry sand or salt flux as a dam. Do not use shovels or hand tools to halt the flow of molten metal. Allow the spill to cool before re-melting as scrap.



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Section 9 – Physical and Chemical Properties

- Solid, odorless metal with a bright metallic gray color.

MATERIAL:	Aluminum
BOILING POINT:	2,640°C (4,784°F)
SPECIFIC GRAVITY (H2O = 1):	not applicable
MELTING POINT:	482-649°C (900-1,200°F)
FREEZING POINT:	482-649°C (900-1,200°F)
VAPOR PRESSURE (mm Hg):	not applicable
VAPOR DENSITY (AIR = 1):	not applicable
SOLUBILITY IN H2O, % BY	insoluble
% VOLATILES BY VOLUME:	not applicable
APPEARANCE AND ODOR:	gray, odorless
DENSITY @ 20°C:	2.99-3.12 kg/l

Section 10 - Stability and Reactivity

- Stability: stable.
- Conditions to avoid: molten aluminum can react violently with water, rust, and certain metal oxides.
- Incompatibility: may be incompatible with strong acid and alkaline solutions. May form hydrogen when mixed with strong acids.
- Reactivity: molten aluminum may explode on contact with water. In the form of particles, may explode when mixed with halogenated acids, halogenated solvents, bromates, iodates or ammonium nitrate. Aluminum particles on contact with copper, lead, or iron oxides can react vigorously with the release of heat.
- Hazardous reaction/decomposition products: hydrogen gas may be generated when mixed with acids, bases, and solvents. Burning of the metal produces metal oxides, alloy elements, and oxides of carbon and nitrogen.

Section 11 – Toxicological Information

Toxicology limits: **Section 3 – Composition and Hazard Information about Ingredients.**

Acute exposure: mild eye, skin, ingestion, and inhalation irritation.

- Eyes: symptoms include redness and epiphora.
- Skin: symptoms include redness and irritation.
- Ingestion: symptoms may include, but are not limited to, thirst, abdominal pain, gastroenteritis, and inflammation of the digestive tract.



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- Inhalation: symptoms include, but are not limited to, coughing, sneezing, wheezing and shortness of breath.

Chronic exposure: potential irritant for skin sensitization, inhalation toxicity and ingestion toxicity. Persons with pre-existing conditions will have increased sensitivity.

- Skin: repeated or prolonged skin contact may cause irritation, dryness or cracking of the skin.
- Inhalation and inhalation: chronic toxicity occurs within 4 to 10 days following ingestion of large quantities. Repeated or prolonged inhalation or ingestion may cause metabolic abnormalities and sodium retention. Metabolic abnormalities include acidosis, hypernatremia, hypochloremia, alkalosis, hypocalcaemia, or sodium retention may affect the blood, kidneys, respiration, and cardiovascular system. Severe toxicity may affect the behavior/central nervous system. Neurological changes may result metabolic abnormalities that may include, but are not limited to, fatigue, irritability, dizziness, mental confusion, paresthesia, seizures, tetany, and cerebral edema.

Carcinogenicity: California Proposition 65. WARNING: This product contains the following chemicals known by the State of California to cause cancer, birth defects, or other reproductive harm:

CHEMICAL:	CAS NUMBER:
Beryllium	7440-41-7
Cadmium	7440-43-9
Lead	7439-92-1
Nickel	7440-02-0

International Agency for Research on Cancer (IARC): not reviewed.
 American Conference of Industrial Hygienists (ACGIH): not available.
 Reproductive toxicity: not established.
 Teratogenicity: not established.
 Embryotoxicity: not established.
 Mutagenicity: not established.

Section 12 – Ecological Information

- Ecotoxicity: no information found.
- Mobility: not available.
- Persistence and degradability: no information found.
- Bioaccumulative potential: not available.
- PBT assessment: not available.
- Other adverse effects: not available.



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Section 13 – Disposal Considerations

- Waste must be disposed of in accordance with federal, state, and local regulations.

Section 14 – Transport Information

- UN number: not applicable.
- Not a United States Department of Transportation (USDOT) regulated hazardous material (49 CFR 172).
- International Maritime Dangerous Goods (IMDG): not regulated as dangerous good.
- International Air Transport Association (IATA): not regulated as dangerous good.
- European Agreements Concerning the International Carriage of Dangerous Goods by Rail (RID) and by Road (ADR): not regulated as dangerous good.
- Canadian TDG: not regulated as dangerous good.
- Not regulated under the United Nations Economic Commission for Europe (UNECE) European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN 2013).
- Not regulated under the Australian Dangerous Goods Code (ADG7).

Section 15 – Regulatory Information

- US HAP Listed Substances (when in dust form):

CHEMICAL:	CAS NUMBER:
Beryllium compounds	--
Cadmium compounds	--
Chromium compounds	--
Lead compounds	--
Manganese compounds	--
Nickel compounds	--

- SARA Section 313 Notification: This material contains the following SARA 313-listed chemicals:

CHEMICAL:	CAS NUMBER:
Aluminum (fume/dust)	7429-90-5
Beryllium	7440-41-7
Cadmium	7440-43-9
Chromium	7440-47-3
Copper	7440-50-8
Lead	7439-92-1
Manganese	7439-96-5
Nickel	7440-02-0
Zinc (fume or dust)	7440-66-6



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- Please contact Vista Metals Corp. for additional information prior to completing any EPCRA report.
- California Proposition 65: this product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.
- The European Community: all components of this product are listed on MITI, the Ministry of International Trade Industry.
- Canadian Domestic Substances List: all components of this product listed on the Canadian DSL.
- 49 CFR 171 Reportable Quantity: none listed.
- 40 CFR 355 Reportable Quantity: none listed.
- VOC content, material: 0.
- VOC content, less water: 0.
- Clean Air Act Ozone Depleter: none listed.

Section 16 – Other Information/Disclaimer

- Revision date October 2014.
- US NFPA Standard 704 Rating. Health=1 (dust); Fire=0; Reactivity=0.



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