

Section 1. Identification

GHS product identifier	: Aluminium Metal Alloys
Product code	: Aluminium metal alloy 1XXX, 2XXX, 3XXX, 4XXX, 5XXX, 6XXX, 7XXX, 8XXX, remelt alloys
	Not applicable, Alloys.: > 1% Ni, > 1% Li or > 0.1% Pb
Other means of identification	: Aluminium ingots, aluminium billets, aluminium slabs, coils, extruded products...
Product type	: Solid.

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

Product use	: Uses of substances as such or in preparations at industrial sites. Metal-working Industry.
Area of application	: Industrial applications.
Supplier/Manufacturer	: Plymouth, Michigan, U.S. - Aluminium Research and Development Center / Constellium 45330 Commerce Center Drive Plymouth, MI 48170 USA Constellium International Washington Plaza 40-44, rue Washington 75008 Paris France Telephone no.: +33 (0)1 73 01 46 00 https://www.constellium.com/contact

e-mail address of person responsible for this SDS : stephanie.massambi@constellium.com

Emergency telephone number (with hours of operation) : +1 734 879 4955 (9 a.m to 4 p.m)



Section 2. Hazards identification

OSHA/HCS status	: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Classification of the substance or mixture	: H317 SKIN SENSITIZATION - Category 1 H351 CARCINOGENICITY - Category 2

GHS label elements

United States

Section 2. Hazards identification

Hazard pictograms	:	 
Signal word	:	Warning
Hazard statements	:	H317 - May cause an allergic skin reaction. H351 - Suspected of causing cancer.
<u>Precautionary statements</u>		
Prevention	:	P201 - Obtain special instructions before use. P202 - Do not handle until all safety precautions have been read and understood. P280 - Wear protective gloves: 1 - 4 hours (breakthrough time): Butyl rubber gloves. Nitrile gloves.. Wear protective clothing. Wear eye or face protection. P261 - Avoid breathing dust. P272 - Contaminated work clothing must not be allowed out of the workplace.
Response	:	P308 + P313 - IF exposed or concerned: Get medical advice or attention. P302 + P352 - IF ON SKIN: Wash with plenty of water. P333 + P313 - If skin irritation or rash occurs: Get medical advice or attention. P363 - Wash contaminated clothing before reuse.
Storage	:	P405 - Store locked up.
Disposal	:	P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.
Hazards not otherwise classified	:	Does not pose any health hazard under normal conditions of use and as delivered. Fines particles from processing (grinding, cutting, polishing and welding) may be readily ignitable, or create an explosive atmosphere and needs to be controlled. Fine particles in contact with water or humidity in air may release flammable gases in hazardous quantities, and may in some cases set off thermal reactions in contact with iron oxide and certain other metal oxides. For liquid aluminium, there is a risk of explosions if in contact with water, and reacts violently in contact with rust, oxides of some other metals or nitrate.

Section 3. Composition/information on ingredients

Substance/mixture	:	Mixture
Other means of identification	:	Aluminium ingots, aluminium billets, aluminium slabs, coils, extruded products...

Ingredient name	Other names	%	Identifiers
aluminum, non flammable solid	-	≥75	CAS: 7429-90-5
silicon	-	≤15	CAS: 7440-21-3
zinc	-	≤12	CAS: 7440-66-6
copper	-	≤10	CAS: 7440-50-8
Magnesium, non flammable solid	-	≤5	CAS: 7439-95-4
iron	-	≤3	CAS: 7439-89-6
manganese	-	≤2	CAS: 7439-96-5
nickel	-	<1	CAS: 7440-02-0
lithium	-	<1	CAS: 7439-93-2
silver	-	≤0.7	CAS: 7440-22-4
titanium	-	≤0.5	CAS: 7440-32-6
bismuth	-	≤0.5	CAS: 7440-69-9
strontium	-	≤0.5	CAS: 7440-24-6
chromium	-	≤0.5	CAS: 7440-47-3
Zirconium	-	≤0.5	CAS: 7440-67-7

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Section 3. Composition/information on ingredients

vanadium	-	≤0.5	CAS: 7440-62-2
lead	-	≤0.1	CAS: 7439-92-1

*REACH Registrants

Al, Zn, Cu, Mg, Mn, Ti, Zr: Constellium Isoire (Only Representative Constellium Rolled Products Ravenswood, LLC)

Al, Zn, Mg: Constellium Neuf Brisach

Al, Mg: Constellium Singen

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

- Eye contact** : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.
- Inhalation** : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
- Skin contact** : Wash with plenty of soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.
- Ingestion** : Wash out mouth with water. Remove dentures if any. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

Potential acute health effects

- Eye contact** : No known significant effects or critical hazards.
- Inhalation** : No known significant effects or critical hazards.
- Skin contact** : May cause an allergic skin reaction.
- Ingestion** : No known significant effects or critical hazards.

Over-exposure signs/symptoms

- Eye contact** : No specific data.
- Inhalation** : No specific data.
- Skin contact** : Adverse symptoms may include the following:
irritation
redness
- Ingestion** : No specific data.

Section 4. First aid measures

Indication of immediate medical attention and special treatment needed, if necessary

- Notes to physician** : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
- Specific treatments** : No specific treatment.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

- Suitable extinguishing media** : This product does not present fire or explosion hazards as shipped. Small chips, dust and fines may be ignitable. Avoid sparks and prevent electrostatic charges from accumulating. Use an extinguishing agent suitable for the surrounding fire. Use an extinguishing agent suitable for the surrounding fire. Use approved Class D extinguisher or smother with dry sand, dry clay or dry ground limestone.

- Unsuitable extinguishing media** : Do not use water or foam. Halogen (HCFC) extinguisher.

- Specific hazards arising from the chemical** : Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

- Hazardous thermal decomposition products** : Decomposition products may include the following materials:
metal oxide/oxides

- Special protective actions for fire-fighters** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.
- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

- For non-emergency personnel** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
- For emergency responders** : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

- Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities.

United States

Section 6. Accidental release measures

Methods and materials for containment and cleaning up

- Small spill** : Move containers from spill area. Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Place spilled material in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor.
- Large spill** : Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Dispose of via a licensed waste disposal contractor.

Section 7. Handling and storage

Precautions for safe handling

- Protective measures** : Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Avoid exposure - obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not ingest. Avoid release to the environment. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.
- Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

- Conditions for safe storage, including any incompatibilities** : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
aluminum, non flammable solid	ACGIH TLV (United States, 7/2023) [Aluminum, metal and insoluble compounds] A4. TWA 8 hours: 1 mg/m ³ . Form: Respirable fraction. NIOSH REL (United States, 10/2020) TWA 10 hours: 10 mg/m ³ . Form: Total. TWA 10 hours: 5 mg/m ³ . Form: Respirable fraction. OSHA PEL (United States, 5/2018) TWA 8 hours: 15 mg/m ³ (as Al). Form: Total dust. TWA 8 hours: 5 mg/m ³ (as Al). Form: Respirable fraction. CAL OSHA PEL (United States, 5/2018) TWA 8 hours: 5 mg/m ³ . Form: powder. NIOSH REL (United States, 10/2020) TWA 10 hours: 10 mg/m ³ . Form: Total.
silicon	

Section 8. Exposure controls/personal protection

Zinc
Copper

TWA 10 hours: 5 mg/m³. Form: Respirable fraction.

OSHA PEL (United States, 5/2018)

TWA 8 hours: 15 mg/m³. Form: Total dust.

TWA 8 hours: 5 mg/m³. Form: Respirable fraction.

CAL OSHA PEL (United States, 5/2018)

TWA 8 hours: 5 mg/m³. Form: respirable fraction.

TWA 8 hours: 10 mg/m³. Form: total dust.

None.

ACGIH TLV (United States, 7/2023) [copper dusts and mists]

TWA 8 hours: 1 mg/m³ (as Cu). Form: Dust and mist.

ACGIH TLV (United States, 7/2023) [copper fume]

TWA 8 hours: 0.2 mg/m³. Form: Fume.

NIOSH REL (United States, 10/2020)

TWA 10 hours: 1 mg/m³ (as Cu). Form: Dusts and Mists.

OSHA PEL (United States, 5/2018)

TWA 8 hours: 0.1 mg/m³. Form: Fume.

TWA 8 hours: 1 mg/m³. Form: Dusts and Mists.

CAL OSHA PEL (United States, 5/2018)

TWA 8 hours: 0.1 mg/m³ (as Cu).

None.

None.

ACGIH TLV (United States, 7/2023) [Manganese and inorganic compounds] A4.

TWA 8 hours: 0.02 mg/m³ (as Mn). Form: Respirable fraction.

TWA 8 hours: 0.1 mg/m³ (as Mn). Form: Inhalable fraction.

NIOSH REL (United States, 10/2020) [manganese compounds and fume]

TWA 10 hours: 1 mg/m³ (as Mn). Form: Fume.

STEL 15 minutes: 3 mg/m³ (as Mn). Form: Fume.

OSHA PEL (United States, 5/2018)

CEIL: 5 mg/m³ (as Mn). Form: Fume.

CAL OSHA PEL (United States, 5/2018)

STEL 15 minutes: 3 mg/m³ (as Mn).

TWA 8 hours: 0.2 mg/m³ (as Mn).

ACGIH TLV (United States, 7/2023) A5.

TWA 8 hours: 1.5 mg/m³. Form: Inhalable fraction.

NIOSH REL (United States, 10/2020) [nickel metal and other compounds] NIA.

TWA 10 hours: 0.015 mg/m³ (as Ni).

OSHA PEL (United States, 5/2018) [Nickel, metal and insoluble compounds]

TWA 8 hours: 1 mg/m³ (as Ni).

CAL OSHA PEL (United States, 5/2018)

TWA 8 hours: 0.5 mg/m³ (as Ni).

None.

ACGIH TLV (United States, 7/2023)

TWA 8 hours: 0.1 mg/m³. Form: Dust and fumes.

NIOSH REL (United States, 10/2020) [silver metal dust and soluble compounds]

TWA 10 hours: 0.01 mg/m³ (as Ag). Form: METAL DUST AND SOLUBLE.

OSHA PEL (United States, 5/2018) [Silver, metal and soluble compounds]

Magnesium, non flammable
solid iron
manganese

nickel

lithium
silver

Section 8. Exposure controls/personal protection

titanium	TWA 8 hours: 0.01 mg/m ³ (as Ag).
bismuth	CAL OSHA PEL (United States, 5/2018)
strontium	TWA 8 hours: 0.01 mg/m ³ (as Ag).
chromium	None.
	None.
	None.
	ACGIH TLV (United States, 7/2023)
	TWA 8 hours: 0.5 mg/m ³ (measured as Cr). Form: Inhalable fraction.
	NIOSH REL (United States, 10/2020)
	TWA 8 hours: 0.5 mg/m ³ .
	OSHA PEL (United States, 5/2018) [Chromium metal and insol salts]
	TWA 8 hours: 1 mg/m ³ (as Cr).
	CAL OSHA PEL (United States, 5/2018)
	TWA 8 hours: 0.5 mg/m ³ .
Zirconium	ACGIH TLV (United States, 7/2023) [Zirconium and compounds] A4.
	TWA 8 hours: 5 mg/m ³ (as Zr).
	STEL 15 minutes: 10 mg/m ³ (as Zr).
	NIOSH REL (United States, 10/2020) [zirconium compounds]
	TWA 10 hours: 5 mg/m ³ (as Zr).
	STEL 15 minutes: 10 mg/m ³ (as Zr).
	CAL OSHA PEL (United States, 5/2018) [zirconium compounds]
	STEL 15 minutes: 10 mg/m ³ (as Zr).
	TWA 8 hours: 5 mg/m ³ (as Zr).
vanadium	NIOSH REL (United States, 10/2020) [VANADIUM DUST]
	CEIL 15 minutes: 0.05 mg/m ³ (as V). Form: Dust.
	ACGIH TLV (United States, 7/2023) [Lead and inorganic compounds] A3.
	TWA 8 hours: 0.05 mg/m ³ (as Pb).
	NIOSH REL (United States, 10/2020)
	TWA 8 hours: 0.05 mg/m ³ .
	OSHA PEL (United States, 5/2018) [Lead inorganic]
	TWA 8 hours: 50 µg/m ³ (as Pb).
	CAL OSHA PEL (United States, 5/2018) [lead (metallic) and inorganic compounds, dust and fume]
	TWA 8 hours: 0.05 mg/m ³ (as Pb). Form: dust and fume.
lead	

Biological exposure indices

<u>Ingredient name</u>	<u>Exposure indices</u>
nickel	ACGIH BEI (United States, 7/2023) [nickel and inorganic compounds] BEI: 30 µg/l, nickel [in urine after exposure to soluble compounds]. Sampling time: post-shift at end of workweek. BEI: 5 µg/l, nickel [in urine after exposure to elemental nickel and poorly soluble compounds]. Sampling time: post-shift at end of workweek.
chromium	ACGIH BEI (United States, 7/2023)

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Section 8. Exposure controls/personal protection

lead

BEI: 0.7 µg/l, total chromium [in urine].
Sampling time: end of shift at end of workweek.

ACGIH BEI (United States, 7/2023) [lead and inorganic compounds]

BEI: 200 µg/l, lead [in blood]. Sampling time: not critical.

Appropriate engineering controls

- : If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Environmental exposure controls

- : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures

- : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection

- : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

Skin protection

Hand protection

- : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated. 1 - 4 hours (breakthrough time): Butyl rubber gloves. Nitrile gloves.

Body protection

- : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection

- : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection

- : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use. Recommended: Filter type: P3

United States

Section 9. Physical and chemical properties

The conditions of measurement of all properties are at standard temperature and pressure unless otherwise indicated.

Appearance

Physical state	: Solid. [Massive metal. (1013 mbar / 20°C)]
Color	: Silver. Greyish.
Odor	: Odorless.
Odor threshold	: Not available.
pH	: Not available.
Melting point/freezing point	: 660°C (1220°F)

Boiling point or initial boiling point and boiling range	: 2467°C (4472.6°F)
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Flash point	: Not applicable.
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Flammability	: Not available.
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Lower and upper explosion limit/flammability limit	: Not applicable.
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Vapor pressure	: Not available.
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Relative vapor density	: Not applicable.
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Relative density	: Not available.
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Density	: 2.7 g/cm ³
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Solubility(ies)	Media	Result
	cold water	Not soluble
	hot water	Not soluble

Partition coefficient: n-octanol/water	: Not applicable.
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Auto-ignition temperature	: Not applicable.
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Decomposition temperature	: Not available.
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SADT	: Not available.
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Viscosity	: Dynamic (room temperature): Not available. Kinematic (room temperature): Not available. Kinematic (40°C (104°F)): Not available.
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Particle characteristics

Median particle size	: Not available.
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Other information

Physical/chemical properties comments	: No additional information.
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Section 10. Stability and reactivity

Reactivity	: No specific test data related to reactivity available for this product or its ingredients.
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Chemical stability	: The product is stable.
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Possibility of hazardous reactions	: Under normal conditions of storage and use, hazardous reactions will not occur. Molten metals reacts violently with water to generate flammable and explosive hydrogen gas. Suspensions of aluminum dust in air may pose a severe explosion hazard, especially in a confined atmosphere. Under normal conditions of storage and use, hazardous polymerization will not occur.
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United States

Section 10. Stability and reactivity

- Conditions to avoid** : Avoid melting wet or cold materials as molten metal may cause explosions in contact with water or wet surfaces. Suspensions of aluminum dust in air may pose a severe explosion hazard, especially in a confined atmosphere.
- Incompatible materials** : Reactive or incompatible with the following materials: oxidizing materials, acids, alkalis and moisture.
Halogenated compounds.
- Hazardous decomposition products** : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
aluminum, non flammable solid	LD50 Oral	Rat	>5000 mg/kg	-
silicon	LD50 Oral	Rat	3160 mg/kg	-
copper	LC50 Inhalation Dusts and mists	Rat - Male, Female	>5.11 mg/l	4 hours
	LD50 Dermal	Rat - Male, Female	>2000 mg/kg	-
iron	LD50 Oral	Rat	30 g/kg	-
manganese	LC50 Inhalation Dusts and mists	Rat	5.14 mg/l	4 hours
	LD50 Oral	Rat	9 g/kg	-
silver	LC50 Inhalation Dusts and mists	Rat - Male, Female	>5.6 mg/l	4 hours
	LD50 Oral	Rat - Male, Female	3702 mg/kg	-
bismuth	LD50 Oral	Rat	5 g/kg	-
Zirconium	LD50 Oral	Rat - Female	>5000 mg/kg	-
vanadium	LD50 Oral	Rat - Female	>2000 mg/kg	-
lead	LC50 Inhalation Dusts and mists	Rat - Male, Female	>5.05 mg/l	4 hours
	LD50 Dermal	Rat - Male, Female	>2000 mg/kg	-
	LD50 Oral	Rat - Male, Female	>2000 mg/kg	-

Conclusion/Summary : Not available.

Irritation/Corrosion

Conclusion/Summary

Skin : Not available.

Eyes : Not available.

Respiratory : Not available.

Respiratory or skin sensitization

Conclusion/Summary

Skin : Not available.

Respiratory : Not available.

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Section 11. Toxicological information

Mutagenicity

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Classification

Product/ingredient name	OSHA	IARC	NTP
nickel	-	2B	Reasonably anticipated to be a human carcinogen.
chromium	-	3	-
lead	-	2B	Reasonably anticipated to be a human carcinogen.

Reproductive toxicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Name	Category	Route of exposure	Target organs
nickel	Category 1	inhalation	respiratory tract
lead	Category 1	inhalation	blood system, central nervous system (CNS), kidneys

Aspiration hazard

Not available.

Information on the likely routes of exposure : Routes of entry anticipated: Dermal.

Potential acute health effects

Eye contact : No known significant effects or critical hazards.
Inhalation : No known significant effects or critical hazards.
Skin contact : May cause an allergic skin reaction.
Ingestion : No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : No specific data.
Inhalation : No specific data.
Skin contact : Adverse symptoms may include the following:
 irritation
 redness
Ingestion : No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : Not available.

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Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

General : Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Carcinogenicity : Suspected of causing cancer. Risk of cancer depends on duration and level of exposure.

Mutagenicity : No known significant effects or critical hazards.

Reproductive toxicity : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Product/ingredient name	Oral (mg/kg)	Dermal (mg/kg)	Inhalation (gases) (ppm)	Inhalation (vapors) (mg/l)	Inhalation (dusts and mists) (mg/l)
Aluminium Metal Alloys	23905.8	8181.7	N/A	N/A	N/A
silicon	3160	N/A	N/A	N/A	N/A
copper	N/A	2500	N/A	N/A	N/A
iron	30000	N/A	N/A	N/A	N/A
manganese	9000	N/A	N/A	N/A	5.14
silver	3702	N/A	N/A	N/A	N/A
bismuth	5000	N/A	N/A	N/A	N/A
vanadium	2500	N/A	N/A	N/A	N/A
lead	2500	2500	N/A	N/A	N/A

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
Aluminium Metal Alloys	EC50 >100 mg/l	Algae	72 hours
	EC50 >100 mg/l	Daphnia	48 hours
	LC50 >100 mg/l	Fish	96 hours
aluminum, non flammable solid	Chronic NOEC 9 mg/l Fresh water	Aquatic plants - <i>Ceratophyllum demersum</i>	3 days
zinc	Acute EC50 10000 µg/l Fresh water	Aquatic plants - <i>Lemna minor</i>	4 days
	Acute EC50 34 µg/l Fresh water	Crustaceans - <i>Ceriodaphnia dubia</i> - Neonate	48 hours
	Acute IC50 65 µg/l Marine water	Algae - <i>Nitzschia closterium</i> - Exponential growth phase	4 days
	Acute LC50 68 µg/l Fresh water	Daphnia - <i>Daphnia magna</i> Fish	48 hours
	Acute LC50 12.21 µg/l Marine water	- <i>Periophthalmus waltoni</i> - Adult	96 hours
	Chronic EC10 6.3 µg/l	Daphnia - <i>Daphnia magna</i> - Neonate	21 days
	Chronic NOEC 0.25 mg/l Marine water	Algae - <i>Ulva pertusa</i>	
	Chronic NOEC 9 mg/l Fresh water	Aquatic plants - <i>Ceratophyllum</i>	96 hours
			3 days

Section 12. Ecological information

iron manganese	Chronic NOEC 178 µg/l Marine water Chronic NOEC 2.6 µg/l Fresh water Chronic NOEC 100 mg/l Marine water Acute LC50 29000 µg/l Fresh water Acute LC50 354 mg/l Fresh water	<i>demersum</i> Crustaceans - <i>Palaemon elegans</i> Fish - <i>Cyprinus carpio</i> Algae - <i>Glenodinium halli</i> Daphnia - <i>Daphnia magna</i> Fish - <i>Poecilia reticulata</i>	21 days 4 weeks 72 hours 48 hours 96 hours
	Chronic NOEC 1.7 mg/l Fresh water Acute EC50 2 ppm Marine water	Daphnia - <i>Ceriodaphnia dubia</i> Algae - <i>Macrocystis pyrifera</i> - Young	8 days 4 days
nickel	Chronic NOEC 100 mg/l Marine water Chronic NOEC 1.7 mg/l Fresh water Acute EC50 1.4 µg/l Marine water Acute EC50 0.24 µg/l Fresh water Acute LC50 11 µg/l Fresh water	Algae - <i>Glenodinium halli</i> Daphnia - <i>Daphnia magna</i> Algae - <i>Chroomonas</i> sp. Daphnia - <i>Daphnia magna</i> Crustaceans - <i>Ceriodaphnia reticulata</i>	72 hours 21 days 4 days 48 hours 48 hours
	Acute LC50 2.13 µg/l Fresh water Chronic NOEC 5 mg/l Marine water Acute EC50 >100 mg/l Fresh water Acute EC50 0.2 ppm Marine water Acute EC50 5 ppm Marine water	Fish - <i>Pimephales promelas</i> Algae - <i>Glenodinium halli</i> Daphnia - <i>Daphnia magna</i> Algae - <i>Bacillariophyta</i> Algae - <i>Macrocystis pyrifera</i> - Young	96 hours 72 hours 48 hours 72 hours 4 days
lithium silver	Acute EC50 35000 µg/l Fresh water Acute LC50 45 µg/l Fresh water	Aquatic plants - <i>Lemna minor</i> Crustaceans - <i>Ceriodaphnia reticulata</i>	4 days 48 hours
	Acute LC50 22 µg/l Fresh water Acute LC50 13.9 ppm Fresh water Chronic NOEC 50 mg/l Marine water Chronic NOEC 5 ppb Fresh water	Daphnia - <i>Daphnia magna</i> Fish - <i>Anguilla rostrata</i> Algae - <i>Glenodinium halli</i> Daphnia - <i>Daphnia magna</i> - Neonate	48 hours 96 hours 72 hours 21 days
bismuth chromium	Chronic NOEC 0.19 µg/l Fresh water Chronic NOEC 500 mg/l Marine water Acute EC50 105 ppb Marine water	Fish - <i>Cyprinus carpio</i> Algae - <i>Glenodinium halli</i> Algae - <i>Chaetoceros</i> sp. - Exponential growth phase	4 weeks 72 hours 72 hours
	Acute EC50 0.489 mg/l Marine water Acute EC50 8000 µg/l Fresh water Acute LC50 530 µg/l Fresh water	Algae - <i>Ulva pertusa</i> Aquatic plants - <i>Lemna minor</i> Crustaceans - <i>Ceriodaphnia reticulata</i>	96 hours 4 days 48 hours
vanadium lead	Acute LC50 0.594 mg/l Fresh water Acute LC50 0.44 ppm Fresh water	Daphnia - <i>Daphnia magna</i> Fish - <i>Cyprinus carpio</i> - Juvenile (Fledgling, Hatchling, Weanling)	48 hours 96 hours
	Chronic NOEC 0.25 mg/l Marine water Chronic NOEC 0.03 µg/l Fresh water	Algae - <i>Ulva pertusa</i> Fish - <i>Cyprinus carpio</i>	96 hours 4 weeks

Conclusion/Summary : Not available.

Persistence and degradability

Conclusion/Summary : Not available.

Bioaccumulative potential

Product/ingredient name	LogP _{ow}	BCF	Potential
silicon	57 to 77	-	High
silver	-	70	Low

Mobility in soil

United States

Section 12. Ecological information

Soil/water partition coefficient (K_{oc}) : Not available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

	DOT Classification	IMDG	IATA
UN number	Not regulated.	Not regulated.	Not regulated.
UN proper shipping name	-	-	-
Transport hazard class(es)	-	-	-
Packing group	-	-	-
Environmental hazards	No.	No.	No.

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to IMO instruments : Not available.

Section 15. Regulatory information

U.S. Federal regulations : **TSCA 8(a) CDR Exempt/Partial exemption:** Not determined
United States inventory (TSCA 8b): All components are active or exempted.
Clean Water Act (CWA) 307: zinc; copper; nickel; silver; chromium; lead

TSCA 12(b) - Chemical export notification

United States

Section 15. Regulatory information

Name	One time notification		Annual notification		
	4	5	5(f)	6	7
zinc	Not listed	Not listed	Not listed	Listed	Not listed

Clean Air Act Section 112 : Listed

(b) Hazardous Air Pollutants (HAPs)

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Not listed

SARA 302/304

Composition/information on ingredients

No products were found.

SARA 304 RQ : Not applicable.

SARA 311/312

Classification : SKIN SENSITIZATION - Category 1
CARCINOGENICITY - Category 2

Composition/information on ingredients

Name	%	Classification
nickel	<1	SKIN SENSITIZATION - Category 1 CARCINOGENICITY - Category 2 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 1
lithium	<1	SUBSTANCES AND MIXTURES, WHICH IN CONTACT WITH WATER, EMIT FLAMMABLE GASES - Category 1 SKIN CORROSION - Category 1B SERIOUS EYE DAMAGE - Category 1
lead	≤0.1	HNOC - Corrosive to digestive tract TOXIC TO REPRODUCTION - Category 1A TOXIC TO REPRODUCTION - Effects on or via lactation SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 1

SARA 313

	Product name	CAS number	%
Form R - Reporting requirements	aluminum, non flammable solid	7429-90-5	≥75
	zinc	7440-66-6	≤12
	copper	7440-50-8	≤10
	manganese	7439-96-5	≤2
	nickel	7440-02-0	<1
	lead	7439-92-1	≤0.1

Section 15. Regulatory information


Supplier notification	aluminum, non flammable solid	7429-90-5	≥75
	zinc	7440-66-6	≤12
	copper	7440-50-8	≤10
	manganese	7439-96-5	≤2
	nickel	7440-02-0	<1
	lead	7439-92-1	≤0.1

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

State regulations

- Massachusetts** : The following components are listed: ALUMINUM; SILICON DUST; ZINC; COPPER; MAGNESIUM; MANGANESE
- New York** : The following components are listed: Zinc; Copper
- New Jersey** : The following components are listed: ALUMINUM; SILICON; ZINC; COPPER; MAGNESIUM; MANGANESE; NICKEL
- Pennsylvania** : The following components are listed: SILICON; ZINC COMPOUNDS; COPPER FUME; MAGNESIUM; MANGANESE COMPOUNDS

California Prop. 65

 **WARNING:** This product can expose you to chemicals including Lead, which is known to the State of California to cause cancer and birth defects or other reproductive harm. This product can expose you to chemicals including Nickel, which is known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

Ingredient name	No significant risk level	Maximum acceptable dosage level
Nickel	-	-
Lead	Yes.	Yes.

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

Section 16. Other information

Hazardous Material Information System (U.S.A.)

Health	*	2
Flammability		0
Physical hazards		0

United States

Section 16. Other information

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings and the associated label are not required on SDSs or products leaving a facility under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered trademark and service mark of the American Coatings Association, Inc.

The customer is responsible for determining the PPE code for this material. For more information on HMIS® Personal Protective Equipment (PPE) codes, consult the HMIS® Implementation Manual.

[National Fire Protection Association \(U.S.A.\)](#)



[Procedure used to derive the classification](#)

Classification	Justification
SKIN SENSITIZATION - Category 1	Calculation method
CARCINOGENICITY - Category 2	Calculation method

[History](#)

Date of issue/Date of revision	: 11/20/2024
Date of previous issue	: No previous validation
Version	: 1
Prepared by	: Sphera Solutions

[Key to abbreviations](#)

: ATE = Acute Toxicity Estimate
: AMP = Acceptable maximum peak above the acceptable ceiling concentration for an 8-hr shift
: BCF = Bioconcentration Factor
: GHS = Globally Harmonized System of Classification and Labelling of Chemicals
: IATA = International Air Transport Association
: IBC = Intermediate Bulk Container
: IMDG = International Maritime Dangerous Goods
: LogPow = logarithm of the octanol/water partition coefficient
: MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
: N/A = Not available
: UN = United Nations

[References](#)

: HCS (U.S.A.) - Hazard Communication Standard
: International transport regulations

Indicates information that has changed from previously issued version.

[Notice to reader](#)

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.