

## Section 1. Identification

<b>GHS product identifier</b>	: Aluminium powder alloys for selective laser melting with Nickel > 1%
<b>Product code</b>	: Not available.
<b>Other means of identification</b>	: Constellium Alu. AM Powder - Ahead® HT1 {20-63 µm ; 20-105 µm ; 63-105 µm ; >20 µm ; >63 µm}
<b>Product type</b>	: Solid.

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

<b>Product use</b>	: Aluminium Alloy Powder
<b>Area of application</b>	: Industrial applications.

<b>Supplier/Manufacturer</b>	: 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  <a href="https://www.constellium.com/contact">https://www.constellium.com/contact</a>
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<b>e-mail address of person responsible for this SDS</b>	: <a href="mailto:stephanie.massambi@constellium.com">stephanie.massambi@constellium.com</a>
<b>Emergency telephone number (with hours of operation)</b>	: +1 734 879 4955 ( 9 a.m to 4 p.m)

## Section 2. Hazards identification

<b>OSHA/HCS status</b>	: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
<b>Classification of the substance or mixture</b>	: H317 SKIN SENSITIZATION - Category 1 H351 CARCINOGENICITY - Category 2 H372 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 1

### GHS label elements

## Section 2. Hazards identification

<b>Hazard pictograms</b>	:	 
<b>Signal word</b>	:	Danger
<b>Hazard statements</b>	:	H317 - May cause an allergic skin reaction. H351 - Suspected of causing cancer. H372 - Causes damage to organs through prolonged or repeated exposure. (central nervous system (CNS), lungs, respiratory tract)
<b><u>Precautionary statements</u></b>		
<b>Prevention</b>	:	P201 - Obtain special instructions before use. P202 - Do not handle until all safety precautions have been read and understood. P280 - Wear protective gloves: 4 - 8 hours (breakthrough time): Butyl rubber gloves. Nitrile gloves.. Wear protective clothing. Wear eye or face protection. P260 - Do not breathe dust. P270 - Do not eat, drink or smoke when using this product. P264 - Wash thoroughly after handling. P272 - Contaminated work clothing must not be allowed out of the workplace.
<b>Response</b>	:	P308 + P313 - IF exposed or concerned: Get medical advice or attention. P363 - Wash contaminated clothing before reuse. P302 + P352 - IF ON SKIN: Wash with plenty of water. P333 + P313 - If skin irritation or rash occurs: Get medical advice or attention.
<b>Storage</b>	:	P405 - Store locked up.
<b>Disposal</b>	:	P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.
<b>Hazards not otherwise classified</b>	:	None known.

## Section 3. Composition/information on ingredients

<b>Substance/mixture</b>	:	Mixture
<b>Other means of identification</b>	:	Constellium Alu. AM Powder - Aheadd® HT1 {20-63 µm ; 20-105 µm ; 63-105 µm ; >20 µm ; >63 µm}

Ingredient name	Other names	%	CAS number
Aluminium powder (pyrophoric)	-	85 - 98.5	7429-90-5
manganese	-	0 - 10	7439-96-5
Nickel powder	-	0 - 10	7440-02-0
copper	-	0 - 10	7440-50-8
Zirconium powder (pyrophoric)	-	0 - 5	7440-67-7
chromium	-	0 - 10	7440-47-3
vanadium	-	0 - 10	7440-62-2
silicon	-	0 - 10	7440-21-3
iron	-	0 - 10	7439-89-6

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 as hazardous to health and hence require reporting in this section.**

## 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. Remove victim to fresh air and keep at rest in a position comfortable for breathing. 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.

### 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** : In case of fire, use special metal fire powder. Dry sand or other suitable absorbent.
- Unsuitable extinguishing media** : Do not use water or foam. Multi-purpose dry chemical (ABC). Carbon dioxide (CO<sub>2</sub>).

**Specific hazards arising from the chemical** : No specific fire or explosion hazard.

**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).

### 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. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

## 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. 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
Aluminium powder (pyrophoric)	<b>NIOSH REL (United States, 10/2016).</b> TWA: 5 mg/m <sup>3</sup> 10 hours. Form: Respirable fraction TWA: 10 mg/m <sup>3</sup> 10 hours. Form: Total
	<b>OSHA PEL (United States, 5/2018).</b> TWA: 5 mg/m <sup>3</sup> , (as Al) 8 hours. Form: Respirable fraction
	TWA: 15 mg/m <sup>3</sup> , (as Al) 8 hours. Form: Total dust
	<b>ACGIH TLV (United States, 3/2020).</b> TWA: 1 mg/m <sup>3</sup> 8 hours. Form: Respirable fraction
manganese	<b>NIOSH REL (United States, 10/2016).</b> TWA: 1 mg/m <sup>3</sup> , (as Mn) 10 hours. Form: Fume
	STEL: 3 mg/m <sup>3</sup> , (as Mn) 15 minutes. Form: Fume
	<b>OSHA PEL (United States, 5/2018).</b> CEIL: 5 mg/m <sup>3</sup> , (as Mn) Form: Fume
	<b>ACGIH TLV (United States, 3/2020).</b> TWA: 0.1 mg/m <sup>3</sup> , (as Mn) 8 hours. Form: Inhalable fraction
	TWA: 0.02 mg/m <sup>3</sup> , (as Mn) 8 hours. Form: Respirable fraction
Nickel powder	<b>NIOSH REL (United States, 10/2016).</b> TWA: 0.015 mg/m <sup>3</sup> , (as Ni) 10 hours.
	<b>ACGIH TLV (United States, 3/2020).</b> TWA: 1.5 mg/m <sup>3</sup> 8 hours. Form: Inhalable fraction
	<b>OSHA PEL (United States, 5/2018).</b> TWA: 1 mg/m <sup>3</sup> , (as Ni) 8 hours.

## Section 8. Exposure controls/personal protection

copper	<p><b>ACGIH TLV (United States, 3/2020).</b> TWA: 1 mg/m<sup>3</sup>, (as Cu) 8 hours. Form: Dust and mist TWA: 0.2 mg/m<sup>3</sup> 8 hours. Form: Fume</p> <p><b>NIOSH REL (United States, 10/2016).</b> TWA: 1 mg/m<sup>3</sup>, (as Cu) 10 hours. Form: Dusts and Mists</p> <p><b>OSHA PEL (United States, 5/2018).</b> TWA: 1 mg/m<sup>3</sup> 8 hours. Form: Dusts and Mists TWA: 0.1 mg/m<sup>3</sup> 8 hours. Form: Fume</p>
Zirconium powder (pyrophoric)	<p><b>ACGIH TLV (United States, 3/2020).</b> TWA: 5 mg/m<sup>3</sup>, (as Zr) 8 hours. STEL: 10 mg/m<sup>3</sup>, (as Zr) 15 minutes.</p> <p><b>NIOSH REL (United States, 10/2016).</b> TWA: 5 mg/m<sup>3</sup>, (as Zr) 10 hours. STEL: 10 mg/m<sup>3</sup>, (as Zr) 15 minutes.</p>
chromium	<p><b>ACGIH TLV (United States, 3/2020).</b> TWA: 0.5 mg/m<sup>3</sup>, (measured as Cr) 8 hours. Form: Inhalable fraction</p> <p><b>NIOSH REL (United States, 10/2016).</b> TWA: 0.5 mg/m<sup>3</sup> 8 hours.</p> <p><b>OSHA PEL (United States, 5/2018).</b> TWA: 1 mg/m<sup>3</sup>, (as Cr) 8 hours.</p>
vanadium silicon	<p>None.</p> <p><b>NIOSH REL (United States, 10/2016).</b> TWA: 5 mg/m<sup>3</sup> 10 hours. Form: Respirable fraction TWA: 10 mg/m<sup>3</sup> 10 hours. Form: Total</p> <p><b>OSHA PEL (United States, 5/2018).</b> TWA: 5 mg/m<sup>3</sup> 8 hours. Form: Respirable fraction TWA: 15 mg/m<sup>3</sup> 8 hours. Form: Total dust</p>
iron	None.

### 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

## Section 8. Exposure controls/personal 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. 4 - 8 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

## Section 9. Physical and chemical properties

### Appearance

- Physical state** : Solid. [Powder]
- Color** : Silver. Greyish.
- Odor** : Odorless.
- Odor threshold** : Not available.
- pH** : Not available.
- Melting point** : Not available.
- Boiling point** : 2467°C (4472.6°F)
- Flash point** : Not available.
- Evaporation rate** : Not available.
- Flammability (solid, gas)** : Not available.
- Lower and upper explosive (flammable) limits** : EMI > 1000 mJ; dP/dt(max) 83 bar/s; P(max) 6.1 bar; Kst 22 bar.m/s; Dust explosion category (class) 1
- Vapor pressure** : Not available.
- Vapor density** : Not available.
- Relative density** : Not available.
- Density** : 2.7 g/cm<sup>3</sup>
- Solubility** : Insoluble in the following materials: cold water and hot water.
- Partition coefficient: n-octanol/water** : Not available.
- Auto-ignition temperature** : Not available.
- Decomposition temperature** : Not available.
- SADT** : Not available.
- Viscosity** : Not available.
- Flow time (ISO 2431)** : Not available.



## Section 9. Physical and chemical properties

**Physical/chemical properties comments** : Particle size : 20-63 µm  
Based on available data, the classification criteria are not met.  
Not Flammable (UN N1 test) /Pyrophoric (UN N2 test) /Water-reactive material (UN N5 test).

## Section 10. Stability and reactivity

**Reactivity** : No specific test data related to reactivity available for this product or its ingredients.

**Chemical stability** : The product is stable.

**Possibility of hazardous reactions** : Under normal conditions of storage and use, hazardous reactions will not occur.  
Under normal conditions of storage and use, hazardous polymerization will not occur.

**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.  
Water hydrolyzes material liberating acidic gas which in contact with metal surfaces can generate flammable and/or explosive hydrogen gas.

**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
manganese	LC50 Inhalation Dusts and mists	Rat	5.14 mg/l	4 hours
	LD50 Oral	Rat	9 g/kg	-
Nickel powder	LC50 Inhalation Dusts and mists	Rat - Male, Female	10.2 mg/l	1 hours
	LD50 Oral	Rat - Male, Female	>9000 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	-
Zirconium powder (pyrophoric)	LD50 Oral	Rat - Female	>5000 mg/kg	-
vanadium	LD50 Oral	Rat - Female	>2000 mg/kg	-
silicon	LD50 Oral	Rat	3160 mg/kg	-
iron	LD50 Oral	Rat	30 g/kg	-

#### Irritation/Corrosion



## Section 11. Toxicological information

Product/ingredient name	Result	Species	Score	Exposure	Observation
manganese	Eyes - Mild irritant	Rabbit	-	24 hours 500 mg	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 mg	-
silicon	Eyes - Mild irritant	Rabbit	-	3 mg	-

### Sensitization

Not available.

### Mutagenicity

**Conclusion/Summary** : Not available.

### Carcinogenicity

**Conclusion/Summary** : Not available.

### Classification

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

### 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
Aluminium powder (pyrophoric)	Category 2	-	lungs
manganese	Category 2	-	central nervous system (CNS), lungs
Nickel powder	Category 1	inhalation	respiratory tract

### Aspiration hazard

Not available.

**Information on the likely routes of exposure** : Routes of entry anticipated: Oral, Dermal, Inhalation.

### 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.

## Section 11. Toxicological information

- 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.
- Potential delayed effects** : Not available.

#### Long term exposure

- Potential immediate effects** : Not available.
- Potential delayed effects** : Not available.

#### Potential chronic health effects

- General** : Causes damage to organs through prolonged or repeated exposure. 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 powder alloys for selective laser melting with Nickel > 1%	3000	13333.3	N/A	N/A	10.2
manganese	9000	N/A	N/A	N/A	5.14
Nickel powder	N/A	N/A	N/A	N/A	2.55
copper	500	2500	N/A	N/A	N/A
vanadium	2500	N/A	N/A	N/A	N/A
silicon	3160	N/A	N/A	N/A	N/A
iron	30000	N/A	N/A	N/A	N/A

## Section 12. Ecological information

### Toxicity

## Section 12. Ecological information

Product/ingredient name	Result	Species	Exposure
Aluminium powder (pyrophoric) manganese	Chronic NOEC 9 mg/l Fresh water	Aquatic plants - Ceratophyllum demersum	3 days
	Acute EC50 31000 µg/l Fresh water	Aquatic plants - Lemna minor	4 days
	Acute LC50 29000 µg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 28 mg/l Fresh water	Fish - Pimephales promelas	96 hours
	Chronic NOEC 1.7 mg/l Fresh water	Daphnia - Water Flea- Ceriodaphnia dubia	8 days
Nickel powder copper	Chronic NOEC 100 mg/l Marine water	Algae - Glenodinium halli	72 hours
	Acute EC50 1100 µg/l Fresh water	Aquatic plants - Lemna minor	4 days
	Chronic NOEC 7 mg/l Fresh water	Aquatic plants - Ceratophyllum demersum	3 days
chromium	Acute EC50 0.2 ppm Marine water	Algae - Bacillariophyta	72 hours
	Acute EC50 5 ppm Marine water	Algae - Macrocyctis pyrifera - Young	4 days
vanadium	Acute EC50 35000 µg/l Fresh water	Aquatic plants - Lemna minor	4 days
	Acute LC50 45 µg/l Fresh water	Crustaceans - Ceriodaphnia reticulata	48 hours
	Acute LC50 22 µg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 13.9 ppm Fresh water	Fish - Anguilla rostrata	96 hours
	Chronic NOEC 50 mg/l Marine water	Algae - Glenodinium halli	72 hours
iron	Chronic NOEC 0.19 µg/l Fresh water	Fish - Cyprinus carpio	4 weeks
	Acute LC50 1550 µg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 1.8 mg/l Fresh water	Fish - Pimephales promelas	96 hours
	Chronic NOEC 500 mg/l Marine water	Algae - Glenodinium halli	72 hours
	Chronic NOEC 100 mg/l Marine water	Algae - Glenodinium halli	72 hours

**Conclusion/Summary** : Not available.

### Persistence and degradability

Not available.

### Bioaccumulative potential

Product/ingredient name	LogP <sub>ow</sub>	BCF	Potential
silicon	57 to 77	-	high

### Mobility in soil

**Soil/water partition coefficient (K<sub>oc</sub>)** : 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

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## Section 13. Disposal considerations

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.

### Additional information

**DOT Classification** : **Reportable quantity** 2500 lbs / 1135 kg. Package sizes shipped in quantities less than the product reportable quantity are not subject to the RQ (reportable quantity) transportation requirements.

**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:** Nickel powder; copper; chromium

**Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)** : Listed

**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**

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## Section 15. Regulatory information

No products were found.

**SARA 304 RQ** : Not applicable.

### SARA 311/312

**Classification** : SKIN SENSITIZATION - Category 1  
 CARCINOGENICITY - Category 2  
 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 1

### Composition/information on ingredients

Name	%	Classification
Aluminium powder (pyrophoric)	85 - 98.5	PYROPHORIC SOLIDS - Category 1 SUBSTANCES AND MIXTURES, WHICH IN CONTACT WITH WATER, EMIT FLAMMABLE GASES - Category 1 COMBUSTIBLE DUSTS SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2
manganese	0 - 10	FLAMMABLE SOLIDS - Category 2 EYE IRRITATION - Category 2B SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2
Nickel powder	0 - 10	SKIN SENSITIZATION - Category 1 CARCINOGENICITY - Category 2 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 1
copper	0 - 10	COMBUSTIBLE DUSTS
Zirconium powder (pyrophoric)	0 - 5	PYROPHORIC SOLIDS - Category 1 SUBSTANCES AND MIXTURES, WHICH IN CONTACT WITH WATER, EMIT FLAMMABLE GASES - Category 1
silicon	0 - 10	FLAMMABLE SOLIDS - Category 2 EYE IRRITATION - Category 2B
iron	0 - 10	FLAMMABLE SOLIDS - Category 1 SELF-HEATING SUBSTANCES AND MIXTURES - Category 1 COMBUSTIBLE DUSTS

### SARA 313

	Product name	CAS number	%
<b>Form R - Reporting requirements</b>	Aluminium powder (pyrophoric)	7429-90-5	85 - 98.5
	manganese	7439-96-5	0 - 10
	Nickel powder	7440-02-0	0 - 10
	copper	7440-50-8	0 - 10
<b>Supplier notification</b>	Aluminium powder (pyrophoric)	7429-90-5	85 - 98.5
	manganese	7439-96-5	0 - 10
	Nickel powder	7440-02-0	0 - 10
	copper	7440-50-8	0 - 10

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; MANGANESE; NICKEL; NICKEL CATALYST; COPPER; ZIRCONIUM

**New York** : The following components are listed: Nickel; Copper

**New Jersey** : The following components are listed: ALUMINUM; MANGANESE; NICKEL; COPPER; ZIRCONIUM

**Pennsylvania** : The following components are listed: ALUMINUM; MANGANESE COMPOUNDS; NICKEL CATALYST; COPPER FUME; ZIRCONIUM; ZIRCONIUM POWDER

## Section 15. Regulatory information

### California Prop. 65

**WARNING:** This product can expose you to Nickel, which is known to the State of California to cause cancer. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

Ingredient name	No significant risk level	Maximum acceptable dosage level
Nickel	-	-

### 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	*	3
Flammability		0
Physical hazards		0

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
SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 1	Calculation method

### History

Date of issue/Date of revision	: 03/30/2023	Date of previous issue	: 02/15/2021	Version	: 2	14/15
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## Section 16. Other information

<b>Date of issue/Date of revision</b>	: 03/30/2023
<b>Date of previous issue</b>	: 02/15/2021
<b>Version</b>	: 2
<b>Prepared by</b>	: Sphera Solutions
<b>Key to abbreviations</b>	: 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
<b>References</b>	: 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.