Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) revised in 2012 and GHS Rev 03.

Issue date 09/12/2022 *Reviewed on 09/12/2022*

1 Identification

· ***Product Identifier***

· ***Trade Name: Carbon Steel Electrodes for Submerged Arc Welding***
· ***Product Number:***
Specification: A5.17 / A5.23
Classification: EC1, EM12K
Carbon steel electrodes for submerged arc welding
· ***Relevant identified uses of the substance or mixture and uses advised against:***
For professional use only. Use according to manufacturer's specification.
· ***Product Description:*** Carbon steel electrodes for submerged arc welding.
· ***Application of the substance / the mixture:*** Industry specific application.

· ***Details of the Supplier of the Safety Data Sheet:***
· ***Manufacturer/Supplier:***
Pinnacle Alloys I, LLC
9384 Wallisville Road
Houston, TX 77013
Telephone: 800-856-9353
· ***Emergency telephone number:*** 713-688-9353

2 Hazard(s) Identification

· ***Classification of the substance or mixture:***


Health hazard

Carcinogenicity 1A	H350 May cause cancer.


Corrosion

Eye Damage 1	H318 Causes serious eye damage.

Skin Irritation 2	H315 Causes skin irritation.
Sensitization - Skin 1	H317 May cause an allergic skin reaction.
Specific Target Organ Toxicity - Single Exposure 3	H335 May cause respiratory irritation.

· ***Label elements:***
· ***Hazard pictograms:***

· ***Signal word:*** Danger

· ***Hazard-determining components of labeling:***
Iron
Titanium
Lithium
Silica

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Nickel

· ***Hazard statements:***
H315 Causes skin irritation.
H318 Causes serious eye damage.
H317 May cause an allergic skin reaction.
H350 May cause cancer.
H335 May cause respiratory irritation.

· ***Precautionary statements:***

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P260	Do not breathe dust/fume/gas/mist/vapors/spray.
P264	Wash thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P272	Contaminated work clothing must not be allowed out of the workplace.
P280	Wear protective gloves / eye protection / face protection.
P285	In case of inadequate ventilation wear respiratory protection.
P302+P352	If on skin: Wash with plenty of water.
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338	If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call a poison center/doctor.
P308+P313	IF exposed or concerned: Get medical advice/attention.
P321	Specific treatment (see supplementary first aid instructions on this Safety Data Sheet).
P312	Call a poison center/doctor if you feel unwell.
P362+P364	Take off contaminated clothing and wash it before reuse.
P333+P313	If skin irritation or rash occurs: Get medical advice/attention.
P363	Wash contaminated clothing before reuse.
P403+P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
P501	Dispose of contents/container in accordance with local/regional/national/international regulations.

· ***Unknown acute toxicity:***
This value refers to knowledge of known, established toxicological or ecotoxicological values.
36.2 % of the mixture consists of component(s) of unknown toxicity.

· ***Hazard description:***
Lithium may explode when in contact with water. Exposure to moist air may result in fire. Lithium can react with water to produce flammable hydrogen gas, which may create a fire and explosion hazard. Spontaneous ignition can occur if Lithium is heated to its melting point. Lithium dusts may ignite spontaneously in moist air. Lithium can react with moisture to produce corrosive compounds. NEVER purge open drums with nitrogen before resealing. Store and transport under argon or mineral oil.

· ***Classification system:*** NFPA/HMIS Definitions: 0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme

· ***NFPA ratings (scale 0 - 4)***

Health = 3
Fire = 0
Reactivity = 0

· ***HMIS-ratings (scale 0 - 4)***

Health = *3
Fire = 0
Physical Hazard = 0

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· ***Hazard(s) not otherwise classified (HNOC):*** None known

*
3 Composition/Information on Ingredients

· ***Non-hazardous components:***		
CAS: 7440-62-2 RTECS: YW 1355000	Vanadium	0-10%
CAS: 7440-44-0 RTECS: FF 5250100	Carbon Fiber	2-12%

· ***Chemical characterization: Substance***

· ***Description:*** Mixture of substances listed below with non-hazardous additions.

· ***Dangerous Components:***		
CAS: 7439-89-6 RTECS: NO 4565500	Iron Flammable Solids 2, H228; Skin Irritation 2, H315; Specific Target Organ Toxicity - Single Exposure 3, H335; Eye Irritation 2B, H320; Combustible Dust	70-99%
CAS: 7440-32-6 RTECS: XR 1700000	Titanium Skin Irritation 2, H315; Sensitization - Skin 1, H317; Eye Irritation 2B, H320	0-10%
CAS: 1317-95-9	Silica Carcinogenicity 1A, H350; Specific Target Organ Toxicity - Single Exposure 3, H335	0-3%
CAS: 1344-28-1 RTECS: BD 1200000	Aluminum Oxide Specific Target Organ Toxicity - Single Exposure 3, H335	0-3%
CAS: 7439-93-2 RTECS: OJ 5540000	Lithium Substances and mixtures which, in contact with water, emit flammable gases 1, H260; Skin Corrosion 1B, H314	0-12%
CAS: 7440-03-1 RTECS: QT9900000	Niobium Flammable Solids 1, H228; Combustible Dust	0-3%
CAS: 7440-39-3 RTECS: CQ 8370000	Barium Substances and mixtures which, in contact with water, emit flammable gases 2, H261	0-9%
CAS: 7440-67-7 RTECS: ZH 7070000	Zirconium Pyrophoric Solids 1, H250; Substances and mixtures which, in contact with water, emit flammable gases 1, H260	0-12%
CAS: 7439-96-5 RTECS: OO 9275000	Manganese Pyrophoric Solids 1, H250; Substances and mixtures which, in contact with water, emit flammable gases 1, H260	0-4%
CAS: 7440-21-3	Silicon Flammable Solids 2, H228; Acute Toxicity - Oral 4, H302; Eye Irritation 2B, H320; Combustible Dust	0-3%
CAS: 7439-95-4 RTECS: OM 2100000	Magnesium Pyrophoric Solids 1, H250; Substances and mixtures which, in contact with water, emit flammable gases 1, H260	0-1.2%
CAS: 1317-61-9	Iron Oxide	0-1%
CAS: 7429-90-5 RTECS: BD 0330000	Aluminium Flammable Solids 2, H228	0-0.3%
CAS: 7440-02-0	Nickel Carcinogenicity 2, H351; Specific Target Organ Toxicity - Repeated Exposure 1, H372; Sensitization - Skin 1, H317; Aquatic Acute 3, H402	0-0.3%

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CAS: 13463-67-7	Titanium Dioxide Carcinogenicity 2, H351	0.0.3%

· ***Additional information:***
The exact percentages of the ingredients of this mixture are considered to be proprietary and are withheld in accordance with the provisions of paragraph (i) of §1910.1200 of 29 CFR 1910.1200 Trade Secrets.
Note: Certain chemical constituents listed in Section 3 may vary depending upon the Classification of the Carbon Steel Electrodes for Submerged Arc Welding products.

*
4 First-Aid Measures

· ***Description of first aid measures***
· ***General information:***
Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.
WARNING: DECONTAMINATION WITH LIMITED VOLUMES OF WATER MAY CAUSE A SEVERE REACTION THAT CAN BURN THE SKIN. DECONTAMINATION SHOULD BE DONE WITH COPIOUS AMOUNTS OF WATER TO FLUSH OFF ALL LITHIUM CONTAMINATION AS QUICKLY AS POSSIBLE.
· ***After inhalation:***
In case of unconsciousness place patient stably in the side position for transportation.
If dusts or particulates of Lithium are inhaled, remove victim to fresh air. If necessary, use artificial respiration to support vital functions. Remove or cover gross contamination to avoid exposure to rescuers.
Seek immediate medical attention.
· ***After skin contact:***
Immediately wash with water and soap and rinse thoroughly.
If skin irritation occurs, consult a doctor.
Wash with soap and water.
If solid Lithium contaminates the skin, brush off as much of the solid product as possible and then immediately begin decontamination with very large volumes of water. Minimum flushing time is 15 minutes.
Remove exposed or contaminated clothing, taking care not to contaminate eyes.
Seek immediate medical attention.
· ***After eye contact:***
Do NOT rub eyes. Immediately rinse opened eye(s) for at least 15 minutes under running water, lifting upper and lower lids occasionally. If symptoms persist, consult a physician.
Rinse opened eye for several minutes under running water. Then consult a doctor.
If easy to do so, remove contact lenses if worn.
If eye irritation occurs, consult a doctor.
Rinse opened eye for several minutes under running water.
If solid or molten Lithium enters the eyes, open victim's eyes while under gently running water. Use sufficient force to open eyelids. Have victim "roll" eyes. Minimum flushing is for 30 minutes.
Seek immediate medical attention.
· ***After swallowing:***
Rinse out mouth and then drink plenty of water.
Do not induce vomiting without medical advice.
If Lithium is swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION.
Do not induce vomiting. Never induce vomiting or give diluents (milk or water) to someone who is unconscious, having convulsions, or unable to swallow.
Seek immediate medical attention
· ***Information for doctor***
· ***Most important symptoms and effects, both acute and delayed:*** Burns to eyes and skin.
· ***Indication of any immediate medical attention and special treatment needed:***
Immediate medical treatment is advised in the case of eye contact or ingestion.
This material is corrosive and water reactive.
Wear chemical resistant gloves when treating victims of Lithium contamination.

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* 5 Fire-Fighting Measures

· **Extinguishing media**
· **Suitable extinguishing agents:**
CO2, sand, extinguishing powder. Do not use water.
Lithium is water-reactive; it will also react with carbon dioxide.
DO NOT USE WATER, CARBON DIOXIDE OR SAND.
Use DRY graphite, soda ash, powdered sodium chloride, lithium chloride, or Lith-X.
· **For safety reasons unsuitable extinguishing agents:**
DO NOT USE WATER, CARBON DIOXIDE OR SAND.
Water
· **Special hazards arising from the substance or mixture:**
Amorphous or crystalline silicon both react exothermically when heated with alkali-metal carbonates attaining incandescence and evolving carbon monoxide.
Material in powder form, capable of creating a dust explosion. Mixture of silicon, aluminum, and lead oxide explodes when heated.
Material in powder form is capable of creating a dust explosion. Mixture of silicon, aluminum, and lead oxide explodes when heated.
If heated to its melting point, spontaneous ignition is likely.
Lithium fires burn very hot and are difficult to extinguish. Flammable hydrogen gas and corrosive fumes are produced upon contact with water. Combustion of Lithium is accompanied by the emission of dense, white, opaque fumes that are toxic and may hide the base of the fire. Molten Lithium will burn in air, oxygen, nitrogen, and carbon dioxide. Molten Lithium may react violently with concrete or other materials containing moisture.
Explosion Sensitivity to Mechanical Impact: Not sensitive.
Explosion Sensitivity to Static Discharge: Not sensitive.
· **Advice for firefighters**
· **Special protective equipment for firefighters:**
As in any fire, wear self-contained breathing apparatus pressure-demand (NIOSH approved or equivalent) and full protective gear to prevent contact with skin and eyes.
For Incipient Fires: If incipient Lithium fires are to be fought, proper personal protective equipment must be worn. Personal protective equipment must include face-shields with saftey googles, head protection, gloves, body protection, and respiratory protection. A minimum of two sets of personal protective equipment shall be available to firefighters if incipient fires are to be fought. The gloves and body protection must be fire-retardant. In the event of fire, cool tanks with water spray. Be aware of a dangerous reaction with water, if the container is ruptured.
For Structural Fires: Proper personal protective equipment must be worn by structural firefighters. Proper protective clothing, respiratory protection, and adequate eye protection shall be used by all responding firefighting personnel assigned to a Lithium fire. Additional eye protection shall be worn by personnel wearing Self- Contained Breathing Apparatus protection to protect against the higher degree of emitted light during a Lithium fire. Visual protection equivalent to a No. 6 welding lens shall be used. Refer to NFPA 1500, “Standard on Fire Department Occupational Safety and Health Program” for more information.
For additional information, refer to NFPA 484 Standard for Combustible Metals, Metal Powders, and Metal Dusts, most recent Edition
· **Additional information:**
At temperatures above 200°C Zirconium reacts exothermically with the following: fluorine, chloride, bromide, iodine, halocarbons, carbon tetrachloride, carbon, tetra fluoride and Freon’s.
Lithium fire residues shall be protected to prevent adverse reactions and to prevent the formation of reactive and unstable compounds. Lithium fire residues shall be disposed of in accordance with Federal, State, and local regulations.
These items are not reactive, flammable, or explosive and essentially not hazardous at ambient temperatures. Welding arcs and sparks can ignite combustibles and flammable products. If involved in a fire, these products may generate irritating aluminum fumes and a variety of metal oxides. Emergency responders must wear

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personal protection equipment suitable for the situation. Use the extinguishing media recommended for the burning materials and fire situation. See ANSI Z49.1 “Safety in Welding and Cutting” and “Safe Practices” Code: SP, published by the American Welding Society.

*
6 Accidental Release Measures

· ***Personal precautions, protective equipment and emergency procedures:***
Ensure adequate ventilation.
Avoid contact with skin, eyes and clothing.
Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a spill, clear the affected area and protect people. The minimum Personal Protective Equipment recommended for response to non-incidental/non-fire releases should be Level B: double-gloves (fire resistant gloves over nitrile or rubber gloves), chemical resistant suit and boots, hard-hat, and Self-Contained Breathing Apparatus.
· ***Environmental precautions:*** No special measures required.
· ***Methods and material for containment and cleaning up:***
Dispose of contaminated material as waste according to section 13.
Ensure adequate ventilation.
Dispose of the collected material according to regulations.
Flammable solid. Stop leak if without risk. Do not touch spilled material. Use water spray curtain to divert vapor drift. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all ignition sources.
Solid Lithium: Lithium presents an immediate safety hazard since it can react with moisture in the air and start a fire. Cover the released material quickly. Mineral oil can be used to cover Lithium. Recovered Lithium should be placed under mineral oil, in a suitable container.
Molten Lithium: This material ignites easily and reacts violently with concrete, wood, asphalt, sand, asbestos, and all gases except argon or helium. Use dry graphite or Lith-X to cover the released material and allow it to cool. Recovered Lithium should be placed under mineral oil, in a suitable container.
Spilled Lithium in Mineral Oil: Lithium covered in mineral oil is less reactive. Solid pieces should be picked up or scooped up and placed under mineral oil. If this is not possible, cover material with dry graphite. Place the absorbed material under mineral oil, in a suitable container.
· ***Reference to other sections:***
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

· ***PAC-1:***		
7439-89-6	Iron	3.2 mg/m³
7440-32-6	Titanium	30 mg/m³
7440-62-2	Vanadium	3 mg/m³
1344-28-1	Aluminum Oxide	15 mg/m³
7439-93-2	Lithium	3.3 mg/m³
7440-03-1	Niobium	30 mg/m³
7440-39-3	Barium	1.5 mg/m³
7440-44-0	Carbon Fiber	6 mg/m³
7440-67-7	Zirconium	10 mg/m³
7439-96-5	Manganese	3 mg/m³
7440-21-3	Silicon	45 mg/m³
7439-95-4	Magnesium	18 mg/m³
1317-61-9	Iron Oxide	21 mg/m³

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7440-50-8	Copper	3 mg/m³
7439-98-7	Molybdenum	30 mg/m³
7440-02-0	Nickel	4.5 mg/m³
13463-67-7	Titanium Dioxide	30 mg/m³
· ***PAC-2:***		
7439-89-6	Iron	35 mg/m³
7440-32-6	Titanium	330 mg/m³
7440-62-2	Vanadium	5.8 mg/m³
1344-28-1	Aluminum Oxide	170 mg/m³
7439-93-2	Lithium	36 mg/m³
7440-03-1	Niobium	330 mg/m³
7440-39-3	Barium	180 mg/m³
7440-44-0	Carbon Fiber	330 mg/m³
7440-67-7	Zirconium	83 mg/m³
7439-96-5	Manganese	5 mg/m³
7440-21-3	Silicon	100 mg/m³
7439-95-4	Magnesium	200 mg/m³
1317-61-9	Iron Oxide	230 mg/m³
7440-50-8	Copper	33 mg/m³
7439-98-7	Molybdenum	330 mg/m³
7440-02-0	Nickel	50 mg/m³
13463-67-7	Titanium Dioxide	330 mg/m³
· ***PAC-3:***		
7439-89-6	Iron	150 mg/m³
7440-32-6	Titanium	2,000 mg/m³
7440-62-2	Vanadium	35 mg/m³
1344-28-1	Aluminum Oxide	990 mg/m³
7439-93-2	Lithium	220 mg/m³
7440-03-1	Niobium	2,000 mg/m³
7440-39-3	Barium	1,100 mg/m³
7440-44-0	Carbon Fiber	2,000 mg/m³
7440-67-7	Zirconium	500 mg/m³
7439-96-5	Manganese	1,800 mg/m³
7440-21-3	Silicon	630 mg/m³
7439-95-4	Magnesium	1,200 mg/m³
1317-61-9	Iron Oxide	1,400 mg/m³
7440-50-8	Copper	200 mg/m³
7439-98-7	Molybdenum	2,000 mg/m³
7440-02-0	Nickel	99 mg/m³
13463-67-7	Titanium Dioxide	2,000 mg/m³

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* 7 Handling and Storage

· **Handling**
· **Precautions for safe handling:**
Avoid creating and breathing dust/fume/gas/mist/vapors/spray.
Ensure good ventilation/exhaustion at the workplace.
Avoid getting Lithium ON YOU or IN YOU.
Wash thoroughly with soap and large amounts of water after handling Lithium.
Avoid creating and breathing airborne dusts of Lithium.
Do not eat or drink while handling Lithium.
All employees who handle Lithium should be trained to handle it safely. Employees should be trained on the information in the SDS before working with Lithium.
Keep Lithium away from sparks, flames, and other ignition sources.
Post “No Smoking” signs in the area of use.
Use the smallest possible amount of Lithium in processes and only in designated areas.
Surplus Lithium must be returned to the container and resealed as soon as possible.
Have emergency equipment/materials (e.g., dry graphite) available.
Ensure containers are properly labeled.
Keep containers closed when not in use.
· **Information about protection against explosions and fires:** No special measures required.

· **Conditions for safe storage, including any incompatibilities**
Store away from strong acids, strong bases, strong oxidizing agents and strong reducing agents.
· **Storage**
· **Requirements to be met by storerooms and receptacles:** Store in the original container.
· **Information about storage in one common storage facility:**
The storage area for Lithium must be isolated from other areas so that water cannot enter by spray or drainage from automatic sprinkler systems or any other water source.
· **Further information about storage conditions:** Keep receptacle tightly sealed.
· **Specific end use(s):** No further relevant information available.

* 8 Exposure Controls/Personal Protection

· **Additional information about design of technical systems:**
VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation. Mechanical exhaust may be needed. Because of the potential for reaction with water or moist air, stringent control measures such as isolation or enclosure of operations involving this material may be necessary.

· **Control parameters:**
All ventilation should be designed in accordance with OSHA standard (29 CFR 1910.94). Use local exhaust at filling zones and where leakage and dust formation is probable. Use mechanical (general) ventilation for storage areas. Use appropriate ventilation as required to keep Exposure Limits in Air below TLV & PEL limits.
· **Components with occupational exposure limits:**
The following constituents are the only constituents of the product which have a PEL, TLV or other recommended exposure limit.
At this time, the other constituents have no known exposure limits.

1317-95-9 Silica	
PEL	Long-term value: 0.05* mg/m³ *resp. dust; 30mg/m3/%SiO2+2
REL	Long-term value: 0.05* mg/m³ *respirable dust; See Pocket Guide App. A

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TLV	Long-term value: 0.025* mg/m³ *respirable particulate matter, A2
1344-28-1 Aluminum Oxide	
PEL	Long-term value: 15*; 5** mg/m³ *Total dust; ** Respirable fraction
REL	Long-term value: 10* 5** mg/m³ as Al*Total dust**Respirable/pyro powd./welding f.
TLV	Long-term value: 1* mg/m³ as Al; *as respirable fraction, A4
7440-03-1 Niobium	
TWA	Long-term value: 6
7440-39-3 Barium	
PEL	Long-term value: 0.5 mg/m³ as Ba
REL	Long-term value: 0.5 mg/m³ as Ba
TLV	Long-term value: 0.5 mg/m³ as Ba, A4
7440-67-7 Zirconium	
PEL	Long-term value: 5 mg/m³ as Zr
REL	Short-term value: 10 mg/m³ Long-term value: 5 mg/m³ as Zr
TLV	Short-term value: 10 mg/m³ Long-term value: 5 mg/m³ as Zr; A4
7439-96-5 Manganese	
PEL	Ceiling limit value: 5 mg/m³ as Mn
REL	Short-term value: 3 mg/m³ Long-term value: 1 mg/m³ fume, as Mn
TLV	Long-term value: 0.02* 0.1** mg/m³ as Mn; A4, *respirable **inhalable fraction
7440-21-3 Silicon	
PEL	Long-term value: 15* 5** mg/m³ *total dust **respirable fraction
REL	Long-term value: 10* 5** mg/m³ *total dust **respirable fraction
TLV	TLV withdrawn
1317-61-9 Iron Oxide	
PEL	Short-term value: 80 mg/m³
TWA	Long-term value: 6

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7429-90-5 Aluminium	
PEL	Short-term value: 5** mg/m³ Long-term value: 15* mg/m³ *Total dust; ** Respirable fraction
REL	Short-term value: 5** mg/m³ Long-term value: 10* mg/m³ as Al*Total dust**Respirable/pyro powd./welding f.
TLV	Long-term value: 1* mg/m³ as Al; *as respirable fraction, A4
7440-02-0 Nickel	
PEL	Long-term value: 1 mg/m³
REL	Long-term value: 0.015 mg/m³ as Ni; See Pocket Guide App. A
TLV	Long-term value: 1.5* mg/m³ elemental, *inhalable fraction, A5, BEI
13463-67-7 Titanium Dioxide	
PEL	Long-term value: 15* mg/m³ *total dust
REL	See Pocket Guide App. A
TLV	Long-term value: 0.2* 2.5** mg/m³ resp. fraction, *nanoscale,**finescale, A3

· ***Ingredients with biological limit values:***

7440-02-0 Nickel	
BEI	5 µg/L urine post-shift at end of workweek Nickel (background) 30 µg/L urine post-shift at end of workweek Nickel (background)

· ***Additional information:*** The lists that were valid during the creation of this SDS were used as basis.

· ***Exposure controls:***

· ***Personal protective equipment***

· ***General protective and hygienic measures:***

Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing and wash before reuse.
Wash hands before breaks and at the end of work.
Avoid contact with the eyes and skin.
PROTECTION FROM MOLTEN LITHIUM: Molten Lithium shall be contained in closed systems that prevent its contact with air or reactive materials. When working with molten Lithium, the following protective equipment is recommended: flame-resistant personal protective equipment, foundry-type safety boots, fire retardant gloves, and a flame-resistant bib.
Emergency eye-wash/safety showers: where there is any possibility that an employee's eyes may be exposed to this substance, the employer should provide an eye-wash fountain/safety shower within the immediate work area for emergency use.
LOCATION OF THE EYE-WASH FOUNTAIN/ SAFETY SHOWER MUST BE SELECTED TO AVOID CONTACT OF WATER WITH THE WATER REACTIVE MATERIALS.

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· ***Breathing equipment:***

Suitable respiratory protective device recommended.

Respiratory protection is not generally needed when using Lithium. Maintain airborne contaminant concentrations as low as possible. If respiratory protection is needed, use only protection authorized in the U.S. Federal OSHA Standard (29 CFR 1910.134), applicable U.S. State regulations, or the Canadian CSA Standard Z94.4-93. Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full-facepiece pressure/demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under OSHA's Respiratory Protection Standard (1910.134-1998).
Use NIOSH approved or equivalent fume respirator or air supplied respirator when welding, brazing, cutting, grinding, or soldering in a confined space or general work area where local exhaust and/or ventilation does not keep exposure below the limits outlined in Section 8. Monitor the air quality inside the welder's helmet, and/or worker's breathing zone to determine if a respirator is required and the type needed.

· ***Protection of hands:***

Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.
Select glove material based on penetration times, rates of diffusion and degradation.

Protective gloves

For Solid Lithium: Wear chemical resistant gloves for routine industrial use. Gloves should be worn in a way that they may be quickly removed in the event they become contaminated with material that ignites.
If necessary, refer to U.S. OSHA 29 CFR 1910.138 and appropriate Standards of Canada.
The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.

· ***Material of gloves:***

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material cannot be calculated in advance and has therefore to be checked prior to the application.

· ***Penetration time of glove material:***

The exact break-through time has to be determined and observed by the manufacturer of the protective gloves.

· ***Eye protection:***

Goggles with face-shield

Wear a helmet or face shield with a filter lens around shade number 14. Adjust if needed by selecting the next lighter or darker shade number. See ANSI/ASC Z49.1 Section 4.2 or publication F2.2. Shield other workers by providing screens and flash goggles.

· ***Body protection:***

Protective work clothing

For Solid Lithium: Use body protection appropriate for task taking the flammability and reactivity of the product into consideration. In most cases, protection from the potential fire hazard is of greater concern than the need for chemically impervious clothing. Chemical resistant clothing may not be fire retardant and might char or burn in contact with this product. If chemical resistant clothing is needed, fire retardant garments should be

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worn over the chemical resistant clothes. If a hazard of injury to the feet exists due to falling objects, rolling objects, where objects may pierce the soles of the feet or where employee's feet may be exposed to electrical hazards, wear foot protection, as described in U.S. OSHA 29 CFR 1910.136.
Wear approved head, hand, and body protection, which help to prevent injury from radiation, sparks, and electrical shock. This would include wearing welder's gloves and a protective face shield and may include arm protectors, apron, hats, shoulder protection, as well as dark, non-synthetic, substantial clothing. See ANSI Z49.1. Welders should be trained not to allow electrically live parts to contact the skin or wet clothing and gloves. The welders should insulate themselves from the work and ground and should not touch live electrical parts. Welders should not wear short sleeve shirts or short pants.

· **Limitation and supervision of exposure into the environment:** None

* 9 Physical and Chemical Properties

· **Information on basic physical and chemical properties**
· **General Information**
· **Appearance:**
Form: Metal Cored Wire/Rod or Solid Wire/Rod
Color: Copper or silver/gray metallic color
· **Odor:** Odorless until used
· **Odor threshold:** Not determined.

· **pH-value:** Not applicable.

· **Change in condition**
Melting point/Melting range: Not determined.

· **Flash point:** None

· **Flammability (solid, gaseous):** Not determined.

· **Ignition temperature:** Not applicable

· **Decomposition temperature:** Not determined.

· **Auto igniting:** Product is not self-igniting.

· **Danger of explosion:** Product does not present an explosion hazard.

· **Explosion limits:**
Lower: Not determined.
Upper: Not determined.

· **Vapor pressure:** Not applicable.

· **Density:** Not determined.
· **Relative density:** Not determined.
· **Vapor density:** Not applicable.
· **Evaporation rate:** Not applicable.

· **Solubility in / Miscibility with:**
Water: Insoluble.

· **Partition coefficient (n-octanol/water):** Not determined.

· **Viscosity:**
Dynamic: Not applicable.
Kinematic: Not applicable.

· **Solvent content:**
VOC content: 0.00 %

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Solids content: 100.0 %

· **Other information:** No further relevant information available.

* 10 Stability and Reactivity

· **Reactivity:**
Stable under normal conditions.
May react violently or explosively on contact with water. Will react with water or steam to product hydrogen.
Incompatible (violent reactions) with chlorine, fluorine, oxidizers, calcium, carbide, alkali carbonates, iodine pentafluoride, cobaltic fluoride, rubidium carbide, MnF3, nitrosyl fluoride, AgF. Mixtures of cesium acetylide with silicon react vigorously on heating. Rubidium acetylide reacts vigorously with silicon on warming.
Lithium Ingots, foil, anodes (small pieces of foil), or rods will normally not ignite spontaneously in the air at room temperature. They will react with moisture, carbon dioxide, nitrogen, and oxygen at room temperature. The reaction is exothermic and may heat the material to the point at which it will ignite.
Dusts or finely divided Lithium (powders) can ignite spontaneously in moist air at room temperature. The greater the surface area, the more potentially reactive the Lithium. Interaction to form lithium amalgam is violently exothermic and may be explosive if large pieces of lithium are used (an amalgam is an alloy of mercury and another metal).
For additional information, refer to NFPA 484 Standard for Combustible Metals, Metal Powders, and Metal Dusts, most recent Edition and NFPA 491, “Manual of Hazardous Chemical Reactions”.

· **Chemical stability:** Stable under normal conditions.

· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.

· **Possibility of hazardous reactions:**
May react violently or explosively on contact with water. Will react with water or steam to product hydrogen
Incompatible (violent reactions) with chlorine, fluorine, oxidizers, calcium, carbide, alkali carbonates, iodine pentafluoride, cobaltic fluoride, rubidium carbide, MnF3, nitrosyl fluoride, AgF. Mixtures of cesium acetylide with silicon react vigorously on heating. Rubidium acetylide reacts vigorously with silicon on warming.
May react with strong oxidizers generating heat.
Reacts explosively with water.
Contact with acids or strong bases may cause generation of gas.

· **Conditions to avoid:**
Exposure to water, air, heat, flames and other sources of ignition, moisture, and incompatible chemicals.

· **Incompatible materials:**
Incompatible (violent reactions) with chlorine, fluorine, oxidizers, calcium, carbide, alkali carbonates, iodine pentafluoride, cobaltic fluoride, rubidium carbide, MnF3, nitrosyl fluoride, AgF.
Lithium is not compatible with water, halogenated hydrocarbons (e.g., chloroform, carbon tetrachloride), Teflon, carbon dioxide, strong acids, metals (e.g., mercury, iron, nickel), strong oxidizers, alcohols, nitrogen, acid chlorides, and flammable materials. Molten Lithium can attack plastics and rubbers.
Do not store near acids, metals, chlorinated solvents, water, nitrogen.
Strong acids, strong bases, strong oxidizing agents and strong reducing agents.

· **Hazardous decomposition products:**
Hydrogen gas, lithium hydroxide, lithium carbonate, and lithium oxide.
Welding fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the metal being welded, the processes and procedures followed, and the welding consumables used. Other conditions that also influence the composition and quantity of fumes and gases to which workers may be exposed include: coatings on the metal being welded (such as paint, plating, or galvanizing), the number of welders in operation and the volume of the work area, the quality and amount of ventilation, the position of the welder’s head with respect to the fume plume, and the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning and degreasing procedures). When the electrode is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section 8. Fume and gas decomposition, and not the ingredients in the electrode, are important. The concentration of a given fume or gas component may decrease or increase by many times the original concentration. Also, new compounds not in the electrodes may form. The known gases and fumes that may

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form during welding or cutting and their exposure limits are noted in the list in Section 11 below. Decomposition products of normal operation include those originating from the volatilization, reaction, or oxidation of the materials shown in Section 8, plus those from the base metal and coating, etc. as noted above. Chlorinated solvents may be decomposed into toxic gases such as phosgene.
It is understood, however, that the elements and/or oxides to be mentioned are virtually always present as complex oxides and not as metals (See “Characterization of Arc Welding Fume”, from the American Welding Society). The elements or oxides listed Section 8 correspond to the ACGIH catergories found in “Threshold Limit Values for Chemical Substances and Physical Agents” listed in Section 8. Some products will also contain: iron, manganese, silicon, aluminum, nickel, niobium, magnesium, molybdenum, titanium, vanadium, barium, lithium, zirconium, carbon, copper, and fluorides. Some elements or compounds may exceed thier PELs/TLVs before the total fumes exceed 5 mg/m3.

· ***Additional information:***
Niobium metal is rapidly dissolved by hydrofluoric acid or hydrofluoric-nitric acid mixtures. Niobium ignites in cold fluorine and above 200°C will react exothermically with chlorine, bromide and halocarbons such as carbon tetrachloride, carbon tetra fluoride and Freon’s.

* 11 Toxicological Information

· ***Information on toxicological effects:***
Effects of Over-Exposure: Electric arc welding may create one or more of the following health hazards:
・ARC RAYS can injure eyes and burn skin. Incidences of skin cancer have been reported.
・ELECTRIC SHOCK can kill.
・FUMES AND GASES GENERATED FROM WELDING can be dangerous to your health.
・PRIMARY ROUTES OF ENTRY are the respiratory system, eyes, skin, and/or indigestion.
・NOISE can damage hearing.

Short-term (acute) over-exposure effects:
・WELDING FUMES may result in discomfort, such as dizziness, nausea, or dryness or irritation of the nose, throat, or eyes.
・ALUMINUM OXIDE may cause irritation of the respiratory system.
・IRON, IRON OXIDE have no known effects. Treat as a nuisance dust or fume.
・FLUORIDES, FLUORIDE COMPOUNDS may cause skin and eye burns, pulmonary edema, and bronchitis.
・MAGNESIUM, MAGNESIUM OXIDE overexposure may cause metal fume fever, characterized by metallic taste, tightness of chest, and fever. Symptoms may last 24-48 hours following overexposure.
・MANGANESE, MANGANESE COMPOUNDS may cause metal fume fever, characterized by irritation of the throat, vomiting, nausea, fever, body aches, and chills. Recovery is generally complete within 48 hours of overexposure.
・MOLYBDENUM may cause irritation of the eyes, nose, and throat.
・NICKEL, NICKEL COMPOUNDS may cause metallic taste, nausea, tightness in chest, fever, and allergic reactions.
・SILICA (amorphous) dust and fumes may cause irritation of the respiratory system, skin, and eyes.
・COPPER may cause capillary damage, headache, cold sweat, weak pulse, and kidney and liver damage, central nervous system excitation followed by depression, jaundice, convulsions, paralysis, and coma. Death may occur from shock or renal failure.
・TITANIUM DIOXIDE may cause irritation of the respiratory system.

Long-term (chronic) over-exposure effects:
・ WELDING FUMES in excess levels may cause bronchial asthma, lung fibrosis, pneumoconiosis, or ‘siderosis.’ Overexposure to air contaminants may lead to their accumulation in the lungs, a condition which may be seen as dense areas on chest x-rays. The severity of the change is proportional to the length of exposure. The changes seen are not necessarily associated with symptoms or signs of reduced lung function or disease. In addition, the changes on X-rays may be caused by non-work
factors such as smoking, etc.

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· ALUMINUM OXIDE may cause pulmonary fibrosis and emphysema.

· IRON, IRON OXIDE may cause siderosis or deposits of iron in the lungs, which is believed to affect pulmonary function. Lungs will clear in time when exposure to iron fumes and its compounds ceases. Iron and magnetite (Fe_3O_4) are not regarded as fibrogenic materials.

· MANGANESE, MANGANESE COMPOUNDS may cause central nervous system effects referred to as 'manganism.' Symptoms include languor, sleepiness, muscular weakness, emotional disturbances, spastic gait, and tremors. Behavioral changes and changes in handwriting may also appear. These effects are irreversible. Employees overexposed to manganese should receive regular medical examinations for early detection of manganism.

· MOLYBDENUM prolonged overexposure may result in loss of appetite, weight loss, loss of muscle coordination, difficulty in breathing, and anemia.

· FLUORIDES may cause serious bone erosion (osteoporosis) and mottling of teeth.

· NICKEL, NICKEL COMPOUNDS may lung fibrosis or pneumoconiosis. Studies of nickel refinery workers indicated a higher incidence of lung and nasal cancers.

· SILICA (respirable crystalline silica) overexposure may result in silicosis. Respirable crystalline silica is a known human carcinogen. SILICA (amorphous) long term overexposure may cause pneumoconiosis. Noncrystalline forms of silica (amorphous silica) are considered to have little fibrotic potential.

· COPPER may cause hepatic cirrhosis, brain damage and demyelination, kidney defects, and copper deposition in the cornea as exemplified by humans with Wilson's disease. It has also been reported that copper poisoning has led to hemolytic anemia and accelerates arteriosclerosis.

· TITANIUM DIOXIDE may cause pulmonary irritation and slight fibrosis.

· ***Acute toxicity:***

· ***LD/LC50 values that are relevant for classification:***		
7439-89-6 Iron		
Oral	LD50	7,500 mg/kg (Rat)
1344-28-1 Aluminum Oxide		
Oral	LD50	>10,000 mg/kg (Rat)
Inhalative	LC50/4 h	>2.6 mg/l (Rat)
7439-93-2 Lithium		
Inhalative	LC50/4 h	18 mg/l (Trout)
	LC50/96 hours	62.21 mg/l (Trout)
7440-03-1 Niobium		
Oral	Toxic Dose Low	>10,000,000 µg/kg (Mouse)
		>10,000,000 µg/kg (Rat)
7439-96-5 Manganese		
Oral	LD50	9,000 mg/kg (Rat)
7440-21-3 Silicon		
Oral	LD50	3,160 mg/kg (Rat)
1317-61-9 Iron Oxide		
Oral	LD50	>5,000 mg/kg (Rat)
7429-90-5 Aluminium		
Oral	LD50	>2,000 mg/kg (Rat)
Inhalative	LC50/4 h	888 mg/l (Rat)
13463-67-7 Titanium Dioxide		
Oral	LD50	>10,000 mg/kg (Rat)
Dermal	LD50	>10,000 mg/kg (Rabbit)

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Inhalative	LC50/4 h	>6.82 mg/l (Rat)

· ***Primary irritant effect:***
· ***On the skin:***
Strong caustic effect on skin and mucous membranes.
Irritant to skin and mucous membranes.
May cause an allergic skin reaction.
· ***On the eye:***
Strong irritant with the danger of severe eye injury.
Corrosive effect.
Causes serious eye irritation.
· ***Sensitization:*** Sensitization possible through skin contact.
· ***Subacute to chronic toxicity:***
SYMPTOMS OF OVEREXPOSURE BY ROUTE OF EXPOSURE: In terms of anticipated occupational overexposure situations for employees, the main health effect from overexposure would be irritation or burns of contaminated skin and eyes that have been contaminated with solid Lithium (which reacts with moisture to produce corrosive compounds including lithium hydroxide) or the molten metal.

CHRONIC: Prolonged or repeated skin contact may cause dermatitis (dry, red skin). Lithium poisoning may result in kidney and central nervous system effects.
TARGET ORGANS: ACUTE: Eyes, skin, mucous membranes. CHRONIC: Skin, Nervous System, Kidney, Thyroid.
· ***Additional toxicological information:***
The product shows the following dangers according to internally approved calculation methods for preparations:
Irritant

· ***Carcinogenic categories:***
· ***IARC (International Agency for Research on Cancer):***
(a) Although IARC has classified titanium dioxide as possible carcinogenic to human (2B), their summary concludes: “No significant exposure to titanium dioxide is thought to occur during the use of products which titanium dioxide is bound to other materials, such as in cosmetics or in paints.”
(b) OSHA does not regulate Titanium Dioxide as a carcinogen. However, under 29 CFR 1910.1200 the SDS must convey the fact that Titanium Dioxide is a potential carcinogen to rats.
Group 1 - Carcinogenic to humans
Group 2A - Probably carcinogenic to humans
Group 2B - Possibly carcinogenic to humans
Group 3 - Not classifiable as to its carcinogenicity to humans
Group 4 - Probably not carcinogenic to humans

1317-95-9	Silica	1
7440-02-0	Nickel	2B
13463-67-7	Titanium Dioxide	2B

· ***NTP (National Toxicology Program):***

7440-02-0	Nickel	R

· ***OSHA-Ca (Occupational Safety & Health Administration):***
None of the ingredients are listed.

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* 12 Ecological Information

· **Toxicity:**

· **Aquatic toxicity:**	
7439-93-2 Lithium	
EC50	153.44 mg/l (Green algae) 10 mg/l (Daphnia) (with pH-adjustment)
7439-96-5 Manganese	
EC50	40 mg/l (Water flea)
1317-61-9 Iron Oxide	
EC50	>10,000 mg/l (Activated sludge)
7440-02-0 Nickel	
EC50	1 mg/l (Water flea)
13463-67-7 Titanium Dioxide	
EC50	>1,000 mg/l (Water flea)

· **Persistence and degradability:** No further relevant information available.
· **Other information:**
ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.
Lithium will react with water, moist air, and carbon dioxide in the atmosphere to form stable lithium salts. The effects on exposed animals would primarily be irritation and chemical burns of contaminated tissue. The main effect on plants would be the increase in salinity and alkalinity of contaminated soils if large volumes of Lithium is released. Releases of large quantities of Lithium can be detrimental to an aquatic environment by altering the salinity and alkalinity of a body of water.
· **Behavior in environmental systems:**
· **Bioaccumulative potential:** No further relevant information available.
· **Mobility in soil:** No further relevant information available.
· **Additional ecological information:**
· **General notes:**
Do not allow undiluted product or product that has not been neutralized to reach ground water, water course or sewage system.
· **Results of PBT and vPvB assessment:**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects:** No further relevant information available.

* 13 Disposal Considerations

· **Waste treatment methods**
· **Recommendation:**
Must not be disposed of together with household waste. Do not allow product to reach sewage system.
Observe all federal, state and local environmental regulations when disposing of this material.
· **Waste disposal key:** D003 (Characteristic/Reactivity), applicable to wastes consisting only of this product.

· **Uncleaned packaging**
· **Recommendation:** Disposal must be made according to official regulations.

14 Transport Information

· **UN-Number:**
· **DOT, ADR/ADN, ADN, IMDG, IATA** Non-Regulated Material

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· **UN proper shipping name:**
· **DOT, ADR/ADN, ADN, IMDG, IATA** Non-Regulated Material
· **Transport hazard class(es):**

· **DOT, ADR/ADN, ADN, IMDG, IATA**
· **Class:** Non-Regulated Material
· **Packing group:**
· **DOT, ADR/ADN, IMDG, IATA** Non-Regulated Material
· **Environmental hazards:** Not applicable.
· **Special precautions for user:** Not applicable.
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code:** Not applicable.
· **UN "Model Regulation":** Non-Regulated Material

* 15 Regulatory Information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture:**
· **SARA (Superfund Amendments and Reauthorization):**

· **Section 355 (extremely hazardous substances):**

None of the ingredients are listed.

· **Section 313 (Specific toxic chemical listings):**

7440-62-2	Vanadium
1344-28-1	Aluminum Oxide
7440-39-3	Barium
7439-96-5	Manganese
7429-90-5	Aluminium
7440-50-8	Copper
7440-02-0	Nickel

· **TSCA (Toxic Substances Control Act):**

7439-89-6	Iron	ACTIVE
7440-32-6	Titanium	ACTIVE
7440-62-2	Vanadium	ACTIVE
1344-28-1	Aluminum Oxide	ACTIVE
7439-93-2	Lithium	ACTIVE
7440-03-1	Niobium	ACTIVE
7440-39-3	Barium	ACTIVE
7440-44-0	Carbon Fiber	ACTIVE
7440-67-7	Zirconium	ACTIVE
7439-96-5	Manganese	ACTIVE
7440-21-3	Silicon	ACTIVE
7439-95-4	Magnesium	ACTIVE
1317-61-9	Iron Oxide	ACTIVE
7429-90-5	Aluminium	ACTIVE
7440-50-8	Copper	ACTIVE
7439-98-7	Molybdenum	ACTIVE
7440-02-0	Nickel	ACTIVE

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13463-67-7	Titanium Dioxide	ACTIVE

· ***Hazardous Air Pollutants***

7439-96-5	Manganese

· ***California Proposition 65:***

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

· ***Chemicals known to cause cancer:***	
7440-02-0	Nickel
13463-67-7	Titanium Dioxide
· ***Chemicals known to cause reproductive toxicity for females:***	
None of the ingredients are listed.	
· ***Chemicals known to cause reproductive toxicity for males:***	
None of the ingredients are listed.	
· ***Chemicals known to cause developmental toxicity:***	
None of the ingredients are listed.	
· ***New Jersey Right-to-Know List:***	
7440-32-6	Titanium
7440-62-2	Vanadium
1317-95-9	Silica
1344-28-1	Aluminum Oxide
7439-93-2	Lithium
7440-39-3	Barium
7440-67-7	Zirconium
7439-96-5	Manganese
7440-21-3	Silicon
7439-95-4	Magnesium
7429-90-5	Aluminium
7440-50-8	Copper
7439-98-7	Molybdenum
7440-02-0	Nickel
13463-67-7	Titanium Dioxide

· ***New Jersey Special Hazardous Substance List:***

7440-32-6	Titanium	F3, R1
1317-95-9	Silica	CA
7439-93-2	Lithium	F2, R2
7440-39-3	Barium	F3, R2
7440-67-7	Zirconium	F4, R1
7439-96-5	Manganese	F3, R1
7440-21-3	Silicon	F3
7429-90-5	Aluminium	F3, R1

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7440-02-0	Nickel	CA
· ***Pennsylvania Right-to-Know List:***		
7440-62-2	Vanadium	
1317-95-9	Silica	
1344-28-1	Aluminum Oxide	
7439-93-2	Lithium	
7440-39-3	Barium	
7440-67-7	Zirconium	
7439-96-5	Manganese	
7440-21-3	Silicon	
7439-95-4	Magnesium	
7429-90-5	Aluminium	
7440-50-8	Copper	
7439-98-7	Molybdenum	
7440-02-0	Nickel	
13463-67-7	Titanium Dioxide	
· ***Pennsylvania Special Hazardous Substance List:***		
7440-62-2	Vanadium	E
1344-28-1	Aluminum Oxide	E
7440-39-3	Barium	E
7439-96-5	Manganese	E
7429-90-5	Aluminium	E
7440-50-8	Copper	E
7440-02-0	Nickel	ES

· ***Carcinogenic categories:***

· ***EPA (Environmental Protection Agency):***		
7440-39-3	Barium	D, CBD(inh), NL(oral)
7439-96-5	Manganese	D
7440-50-8	Copper	D
· ***TLV (Threshold Limit Value established by ACGIH):***		
1317-95-9	Silica	A2
1344-28-1	Aluminum Oxide	A4
7440-39-3	Barium	A4
7440-67-7	Zirconium	A4
7429-90-5	Aluminium	A4
7439-98-7	Molybdenum	A3
7440-02-0	Nickel	A5
13463-67-7	Titanium Dioxide	A4
· ***NIOSH-Ca (National Institute for Occupational Safety and Health):***		
1317-95-9	Silica	
7440-02-0	Nickel	

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13463-67-7	Titanium Dioxide

· ***GHS label elements***
The product is classified and labeled according to the Globally Harmonized System (GHS).
· ***Hazard pictograms:***

· ***Signal word:*** Danger

· ***Hazard-determining components of labeling:***
Iron
Titanium
Lithium
Silica
Nickel
· ***Hazard statements:***
H315 Causes skin irritation.
H318 Causes serious eye damage.
H317 May cause an allergic skin reaction.
H350 May cause cancer.
H335 May cause respiratory irritation.
· ***Precautionary statements:***

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P260	Do not breathe dust/fume/gas/mist/vapors/spray.
P264	Wash thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P272	Contaminated work clothing must not be allowed out of the workplace.
P280	Wear protective gloves / eye protection / face protection.
P285	In case of inadequate ventilation wear respiratory protection.
P302+P352	If on skin: Wash with plenty of water.
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338	If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call a poison center/doctor.
P308+P313	IF exposed or concerned: Get medical advice/attention.
P321	Specific treatment (see supplementary first aid instructions on this Safety Data Sheet).
P312	Call a poison center/doctor if you feel unwell.
P362+P364	Take off contaminated clothing and wash it before reuse.
P333+P313	If skin irritation or rash occurs: Get medical advice/attention.
P363	Wash contaminated clothing before reuse.
P403+P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
P501	Dispose of contents/container in accordance with local/regional/national/international regulations.

· ***National regulations:***

The product is not subject to be labelled according with the prevailing version of the regulations on hazardous substances.

· ***Chemical safety assessment:*** A Chemical Safety Assessment has not been carried out.

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Trade Name: Carbon Steel Electrodes for Submerged Arc Welding

16 Other Information

Pinnacle Alloys urges each end user and recipient of this SDS to study it carefully. If necessary, consult an industrial hygienist or other expert to understand this information and safeguard the environment and protect workers from potential hazards associated with the handling or use of this product. This information is believed to be accurate as of the revision date shown above. However, no warranty, expressed or implied, is given. Because the conditions or methods of use are beyond Pinnacle Alloys' control, we assume no liability resulting from the use of this product. Regulatory requirements are subject to change and may differ between various locations. Compliance with all applicable Federal, State, Provincial, and Local laws and regulations remain the responsibility of the user.

· ***Contact:***

· ***Abbreviations and acronyms:***

ADR: The European Agreement concerning the International Carriage of Dangerous Goods by Road
ADN: The European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
VOC: Volatile Organic Compounds (USA, EU)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety and Health
OSHA: Occupational Safety & Health Administration
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
BEI: Biological Exposure Limit
Flammable Solids 1: Flammable solids – Category 1
Flammable Solids 2: Flammable solids – Category 2
Pyrophoric Solids 1: Pyrophoric solids – Category 1
Substances and mixtures which, in contact with water, emit flammable gases 1: Substances and mixtures which in contact with water emit flammable gases – Category 1
Substances and mixtures which, in contact with water, emit flammable gases 2: Substances and mixtures which in contact with water emit flammable gases – Category 2
Acute Toxicity - Oral 4: Acute toxicity – Category 4
Skin Corrosion 1B: Skin corrosion/irritation – Category 1B
Skin Irritation 2: Skin corrosion/irritation – Category 2
Eye Damage 1: Serious eye damage/eye irritation – Category 1
Eye Irritation 2B: Serious eye damage/eye irritation – Category 2B
Sensitization - Skin 1: Skin sensitisation – Category 1
Carcinogenicity 1A: Carcinogenicity – Category 1A
Carcinogenicity 2: Carcinogenicity – Category 2
Specific Target Organ Toxicity - Single Exposure 3: Specific target organ toxicity (single exposure) – Category 3
Specific Target Organ Toxicity - Repeated Exposure 1: Specific target organ toxicity (repeated exposure) – Category 1
Aquatic Acute 3: Hazardous to the aquatic environment - acute aquatic hazard – Category 3

· **** Data compared to the previous version altered.***

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