Safety Data Sheet (SDS)

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

Issue date 09/14/2022 *Reviewed on 09/14/2022*

1 Identification

· ***Product Identifier***

· ***Trade Name: Carbon Steel Electrodes for Shielded Metal Arc Welding***
· ***Product Number:***
Specification: A5.1
Classification: E6010, E6011, E6012, E6013, E7014, E7024
Carbon steel coated welding electrodes
Specification: A5.1
Classification: E7018, E7018-1
Low hydrogen carbon steel coated welding electrodes
· ***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 or low hydrogen carbon steel coated welding electrodes.
· ***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. Route of exposure: Inhalation.
Specific Target Organ Toxicity - Repeated Exposure 1	H372-H373	Causes damage to organs through prolonged or repeated exposure. May cause damage to the respiratory system through prolonged or repeated exposure. Route of exposure: Inhalation.


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.

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

· **Signal word:** Danger

· **Hazard-determining components of labeling:**
Iron
Silica
Calcium Oxide
Nickel
· **Hazard statements:**

H315	Causes skin irritation.
H318	Causes serious eye damage.
H317	May cause an allergic skin reaction.
H350	May cause cancer. Route of exposure: Inhalation.
H335	May cause respiratory irritation.
H372-H373	Causes damage to organs through prolonged or repeated exposure. May cause damage to the respiratory system through prolonged or repeated exposure. Route of exposure: Inhalation.

· **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/protective clothing/eye protection/face 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.
P308+P313	IF exposed or concerned: Get medical advice/attention.
P321	Specific treatment (see supplementary first aid instructions on this Safety Data Sheet).
P314	Get medical advice/attention 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.
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.
6 % of the mixture consists of component(s) of unknown toxicity.
· **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

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· **HMIS-ratings (scale 0 - 4)**

HEALTH	*3
FIRE	0
REACTIVITY	0

Health = *3
Fire = 0
Physical Hazard = 0

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

3 Composition/Information on Ingredients

· **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	25-50%
CAS: 7789-75-5 RTECS: EW 1760000	Calcium fluoride Skin Irritation 2, H315; Specific Target Organ Toxicity - Single Exposure 3, H335; Eye Irritation 2B, H320	2-12%
CAS: 471-34-1 RTECS: EV 9580000	Calcium Carbonate	2-12%
CAS: 13463-67-7	Titanium Dioxide Carcinogenicity 2, H351	2-12%
CAS: 1344-09-8	Silicic acid, sodium salt Acute Toxicity - Oral 4, H302; Skin Irritation 2, H315; Eye Irritation 2A, H319; Specific Target Organ Toxicity - Single Exposure 3, H335	2-12%
CAS: 9004-34-6	Cellulose	2-12%
CAS: 68476-25-5	Feldspar Skin Irritation 2, H315; Specific Target Organ Toxicity - Single Exposure 3, H335; Eye Irritation 2B, H320	2-12%
CAS: 1344-28-1 RTECS: BD 1200000	Aluminum Oxide Specific Target Organ Toxicity - Single Exposure 3, H335	≤2.5%
CAS: 546-93-0	Magnesium Carbonate	≤2.5%
CAS: 1317-95-9	Silica Carcinogenicity 1A, H350; Specific Target Organ Toxicity - Single Exposure 3, H335	≤2.5%
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	≤2.5%
CAS: 7440-02-0	Nickel Carcinogenicity 2, H351; Specific Target Organ Toxicity - Repeated Exposure 1, H372; Sensitization - Skin 1, H317; Aquatic Acute 3, H402	≤2.5%
CAS: 7440-21-3	Silicon Flammable Solids 2, H228; Acute Toxicity - Oral 4, H302; Eye Irritation 2B, H320; Combustible Dust	≤2.5%
CAS: 12001-26-2	Mica	≤2.5%

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CAS: 584-08-7 RTECS: TS 7750000	Potassium Carbonate Acute Toxicity - Oral 4, H302	≤2.5%
CAS: 1305-78-8 RTECS: EW 3100000	Calcium Oxide Skin Corrosion 1A, H314; Eye Damage 1, H318	≤2.5%
CAS: 1313-59-3	Sodium oxide Oxidizing Solids 1, H271; Skin Corrosion 1C, H314	≤2.5%
CAS: 7439-98-7 RTECS: QA 4680000	Molybdenum	≤2.5%
CAS: 7631-86-9	Silicon Dioxide Carcinogenicity 1B, H350; Skin Irritation 2, H315; Specific Target Organ Toxicity - Single Exposure 3, H335; Eye Irritation 2B, H320	≤2.5%
CAS: 12136-45-7	Potassium Oxide Substances and mixtures which, in contact with water, emit flammable gases 3, H261; Skin Corrosion 1A, H314; Eye Damage 1, H318	≤2.5%

· ***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 Shielded Metal Arc Welding products.

*
4 First-Aid Measures

· ***Description of first aid measures***
· ***General information:***
Symptoms of poisoning may occur after exposure to dust, fumes or particulates; seek medical attention if feeling unwell.
· ***After inhalation:***
Supply fresh air; consult doctor in case of complaints.
In case of unconsciousness place patient stably in the side position for transportation.
· ***After skin contact:***
Immediately wash with water and soap and rinse thoroughly.
If skin irritation occurs, consult a doctor.
· ***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.
If easy to do so, remove contact lenses if worn.
· ***After swallowing:***
Rinse out mouth and then drink plenty of water.
Do not induce vomiting without medical advice.
If swallowed and symptoms occur, consult a doctor.
· ***Information for doctor***
· ***Most important symptoms and effects, both acute and delayed:*** No further relevant information available.
· ***Indication of any immediate medical attention and special treatment needed:***
No further relevant information available.

*
5 Fire-Fighting Measures

· ***Extinguishing media***
· ***Suitable extinguishing agents:***
Use fire fighting measures that suit the environment.
CO_2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
· ***For safety reasons unsuitable extinguishing agents:*** No further relevant information.

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· ***Special hazards arising from the substance or mixture:***
If incinerated, product will release the following toxic fumes: Oxides of aluminum, calcium carbon, iron, magnesium, manganese, molybdenum, nickel, potassium, silicon, sodium, strontium, titanium, zirconium, and nitrogen (NOx), and fluorides and ozone.
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.
· ***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.
· ***Additional information:***
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 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.
· ***Environmental precautions:*** Do not allow product to reach sewage system or any water course.
· ***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.
· ***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
7789-75-5	Calcium fluoride	15 mg/m³
471-34-1	Calcium Carbonate	45 mg/m³
13463-67-7	Titanium Dioxide	30 mg/m³
1344-09-8	Silicic acid, sodium salt	5.9 mg/m³
1344-28-1	Aluminum Oxide	15 mg/m³
546-93-0	Magnesium Carbonate	45 mg/m³
7439-96-5	Manganese	3 mg/m³
7440-02-0	Nickel	4.5 mg/m³
7440-21-3	Silicon	45 mg/m³

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12001-26-2	Mica	9 mg/m³
584-08-7	Potassium Carbonate	5.6 mg/m³
1305-78-8	Calcium Oxide	6 mg/m³
1313-59-3	Sodium oxide	0.5 mg/m³
1633-05-2	Strontium Carbonate	71 mg/m³
7439-98-7	Molybdenum	30 mg/m³
7631-86-9	Silicon Dioxide	18 mg/m³
12136-45-7	Potassium Oxide	0.18 mg/m³
· ***PAC-2:***		
7439-89-6	Iron	35 mg/m³
7789-75-5	Calcium fluoride	170 mg/m³
471-34-1	Calcium Carbonate	210 mg/m³
13463-67-7	Titanium Dioxide	330 mg/m³
1344-09-8	Silicic acid, sodium salt	65 mg/m³
1344-28-1	Aluminum Oxide	170 mg/m³
546-93-0	Magnesium Carbonate	260 mg/m³
7439-96-5	Manganese	5 mg/m³
7440-02-0	Nickel	50 mg/m³
7440-21-3	Silicon	100 mg/m³
12001-26-2	Mica	99 mg/m³
584-08-7	Potassium Carbonate	62 mg/m³
1305-78-8	Calcium Oxide	110 mg/m³
1313-59-3	Sodium oxide	5 mg/m³
1633-05-2	Strontium Carbonate	780 mg/m³
7439-98-7	Molybdenum	330 mg/m³
7631-86-9	Silicon Dioxide	740 mg/m³
12136-45-7	Potassium Oxide	2 mg/m³
· ***PAC-3:***		
7439-89-6	Iron	150 mg/m³
7789-75-5	Calcium fluoride	1,000 mg/m³
471-34-1	Calcium Carbonate	1,300 mg/m³
13463-67-7	Titanium Dioxide	2,000 mg/m³
1344-09-8	Silicic acid, sodium salt	390 mg/m³
1344-28-1	Aluminum Oxide	990 mg/m³
546-93-0	Magnesium Carbonate	1,600 mg/m³
7439-96-5	Manganese	1,800 mg/m³
7440-02-0	Nickel	99 mg/m³
7440-21-3	Silicon	630 mg/m³
12001-26-2	Mica	590 mg/m³
584-08-7	Potassium Carbonate	370 mg/m³
1305-78-8	Calcium Oxide	660 mg/m³
1313-59-3	Sodium oxide	50 mg/m³

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1633-05-2	Strontium Carbonate	4,700 mg/m³
7439-98-7	Molybdenum	2,000 mg/m³
7631-86-9	Silicon Dioxide	4,500 mg/m³
12136-45-7	Potassium Oxide	54 mg/m³

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.
Open and handle receptacle with care.
· ***Information about protection against explosions and fires:*** Keep protective respiratory device available.

· ***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:*** Not required.
· ***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:*** No further data; see section 7.

· ***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.

7789-75-5 Calcium fluoride	
PEL	Long-term value: 2.5 mg/m³ as F
REL	Long-term value: 2.5 mg/m³ as F
TLV	Long-term value: 2.5 mg/m³ as F, A4; BEI
471-34-1 Calcium Carbonate	
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
13463-67-7 Titanium Dioxide	
PEL	Long-term value: 15* mg/m³ *total dust

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REL	See Pocket Guide App. A
TLV	Long-term value: 0.2* 2.5** mg/m³ resp. fraction, *nanoscale,**finescale, A3
9004-34-6 Cellulose	
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	Long-term value: 10 mg/m³
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
546-93-0 Magnesium Carbonate	
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
1317-95-9 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
TLV	Long-term value: 0.025* mg/m³ *respirable particulate matter, A2
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
7440-02-0 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

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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
12001-26-2 Mica	
PEL	Long-term value: 20 mppcf ppm <1% crystalline silica
REL	Long-term value: 3* mg/m³ *respirable dust; containing < 1% quartz
TLV	Long-term value: 0.1 mg/m³ *resp.fraction
1305-78-8 Calcium Oxide	
PEL	Long-term value: 5 mg/m³
REL	Long-term value: 2 mg/m³
TLV	Long-term value: 2 mg/m³
7439-98-7 Molybdenum	
PEL	Long-term value: 15* mg/m³ *Total dust, as Mo
TLV	Long-term value: 10* 3** mg/m³ as Mo; *inhalable fraction ** respirable fraction
7631-86-9 Silicon Dioxide	
ACGH	Short-term value: 3 mg/m³ Long-term value: 10 mg/m³
IDLH	Short-term value: 3000 mg/m³ Long-term value: 4 mg/m³ IDLH: Immediately dangerous to life or health
TWA	Short-term value: 6 mg/m³ Long-term value: 4 mg/m³
· ***Ingredients with biological limit values:***	
7789-75-5 Calcium fluoride	
BEI	2 mg/L urine prior to shift Fluoride (background, nonspecific) 3 mg/L urine end of shift Fluoride (background, nonspecific)

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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.
Store protective clothing separately.
Avoid contact with the eyes and skin.
· ***Breathing equipment:***

Suitable respiratory protective device recommended.

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

· ***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.

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· **Eye protection:**

Helmet or 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:**

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

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9 Physical and Chemical Properties

· **Information on basic physical and chemical properties**

· **General Information**

· **Appearance:**

Form:	Flux Coated Wire/Rod
Color:	Silver/gray wire covered by various colored fluxes
· **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.

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

· **Viscosity:**

Dynamic:	Not applicable.
Kinematic:	Not applicable.

· **Solvent content:**

VOC content:	0.00 %
Solids content:	100 %

· **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.
· **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.
Contact with acids or strong bases may cause generation of gas.
· **Conditions to avoid:** No further relevant information available.
· **Incompatible materials:**
Incompatible (violent reactions) with chlorine, fluorine, oxidizers, calcium, carbide, alkali carbonates, iodine pentafluoride, cobaltic fluoride, rubidium carbide, MnF3, nitrosyl fluoride, AgF.
Strong acids, strong bases, strong oxidizing agents and strong reducing agents.
· **Hazardous decomposition products:**
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 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: aluminum, amorphous silica fume, antimony, barium, calcium oxide, chromium, copper, fluorspar or fluorides, complex oxides of iron, manganese, molybdenum, nickel, niobium, silica, strontium, tungsten, and or

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zirconium. Some elements or compounds may exceed thier PELs/TLVs before the total fumes exceed 5 mg/m3.

* 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.
· CALCIUM OXIDE dust or fumes may cause irritation of the respiratory system, skin, and eyes.
· FLUORIDES, FLUORIDE COMPOUNDS may cause skin and eye burns, pulmonary edema, and bronchitis.
· IRON, IRON OXIDE have no known effects. Treat as a nuisance dust or fume.
· 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.
· MICA dust may cause irritation of the respiratory system, skin, and eyes.
· 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.
· POTASSIUM OXIDE dust or fumes may cause irritation of the respiratory system, skin, and eyes.
· SILICA (amorphous) dust and fumes may cause irritation of the respiratory system, skin, and eyes.
· SODIUM OXIDE dust or fumes may cause irritation of the respiratory system, skin, and eyes.
· STRONTIUM COMPOUNDS (strontium salts) are generally non-toxic and are normally present in the human body. In large oral doses, they may cause gastrointestinal disorders, vomiting, and diarrhea.
· 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.
· ALUMINUM OXIDE may cause pulmonary fibrosis and emphysema.
· CALCIUM OXIDE prolonged overexposure may cause ulceration of the skin and perforation of the nasal septum, dermatitis, and pneumonia.
· FLUORIDES may cause serious bone erosion (osteoporosis) and mottling of teeth.
· 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

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irreversible. Employees overexposed to manganese should receive regular medical examinations for early detection of manganism.

· MICA prolonged overexposure may cause scarring of the lungs and pneumoconiosis, characterized by cough, shortness of breath, weakness, and weight loss.

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

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

· POTASSIUM OXIDE prolonged overexposure may cause ulceration of the skin and perforation of the nasal septum, dermatitis, and pneumonia.

· 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.

· SODIUM OXIDE prolonged overexposure may cause ulceration of the skin and perforation of the nasal septum, dermatitis, and pneumonia.

· STRONTIUM COMPOUNDS at high doses are known to concentrate bone. Major signs of chronic toxicity, which involve the skeleton, have been labelled as “strontium rickets.”

· 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)
7789-75-5 Calcium fluoride		
Oral	LD50	4,250 mg/kg (Rat)
471-34-1 Calcium Carbonate		
Oral	LD50	6,450 mg/kg (Rat)
13463-67-7 Titanium Dioxide		
Oral	LD50	>10,000 mg/kg (Rat)
Dermal	LD50	>10,000 mg/kg (Rabbit)
Inhalative	LC50/4 h	>6.82 mg/l (Rat)
1344-09-8 Silicic acid, sodium salt		
Oral	LD50	>2,000 mg/kg (Rat)
Dermal	LD50	>4,640 mg/kg (Rabbit)
9004-34-6 Cellulose		
Oral	LD50	>5,000 mg/kg (Rat)
Dermal	LD50	>2,000 mg/kg (Rabbit)
1344-28-1 Aluminum Oxide		
Oral	LD50	>10,000 mg/kg (Rat)
Inhalative	LC50/4 h	>2.6 mg/l (Rat)
7439-96-5 Manganese		
Oral	LD50	9,000 mg/kg (Rat)
7440-21-3 Silicon		
Oral	LD50	3,160 mg/kg (Rat)
584-08-7 Potassium Carbonate		
Oral	LD50	1,870 mg/kg (Rat)

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1305-78-8 Calcium Oxide		
Oral	LD50	500 mg/kg (Rat)
7439-98-7 Molybdenum		
Oral	LD50	>5,000 mg/kg (Rat)
Dermal	LD50	>2,000 mg/kg (Rat)
Inhalative	LC50/4 h	800 mg/l (Trout)
		>5.84 mg/l (Rat)
7631-86-9 Silicon Dioxide		
Oral	LD50	10,000 mg/kg (Rat) (OECD 401)
Dermal	LD50	5,000 mg/kg (Rabbit) (OECD 402)
Inhalative	LC50/4 h	>140->2,000 mg/l (Rat) (OCED 403) Maximum attainable concentration, mortality does not appear.
		10,000 mg/l (Zebra fish) (OECD 203)

· ***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.

· ***Additional toxicological information:***

The product shows the following dangers according to internally approved calculation methods for preparations:
Irritant
Carcinogenic

· ***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

7789-75-5	Calcium fluoride	3
13463-67-7	Titanium Dioxide	2B
1317-95-9	Silica	1
7440-02-0	Nickel	2B
7631-86-9	Silicon Dioxide	3

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

7440-02-0	Nickel	R

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

12 Ecological Information

· **Toxicity:**

· **Aquatic toxicity:**	
13463-67-7 Titanium Dioxide	
EC50	>1,000 mg/l (Water flea)
7439-96-5 Manganese	
EC50	40 mg/l (Water flea)
7440-02-0 Nickel	
EC50	1 mg/l (Water flea)
7631-86-9 Silicon Dioxide	
EC50	>1,000 mg/l (Daphnia) (OECD 202)

· **Persistence and degradability:** No further relevant information available.
· **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.

· **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
· **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.

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· **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):**

1344-28-1	Aluminum Oxide
7439-96-5	Manganese
7440-02-0	Nickel

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

7439-89-6	Iron	ACTIVE
7789-75-5	Calcium fluoride	ACTIVE
471-34-1	Calcium Carbonate	ACTIVE
13463-67-7	Titanium Dioxide	ACTIVE
1344-09-8	Silicic acid, sodium salt	ACTIVE
9004-34-6	Cellulose	ACTIVE
68476-25-5	Feldspar	ACTIVE
1344-28-1	Aluminum Oxide	ACTIVE
546-93-0	Magnesium Carbonate	ACTIVE
7439-96-5	Manganese	ACTIVE
7440-02-0	Nickel	ACTIVE
7440-21-3	Silicon	ACTIVE
584-08-7	Potassium Carbonate	ACTIVE
1305-78-8	Calcium Oxide	ACTIVE
1313-59-3	Sodium oxide	ACTIVE
1633-05-2	Strontium Carbonate	ACTIVE
7439-98-7	Molybdenum	ACTIVE
7631-86-9	Silicon Dioxide	ACTIVE
12136-45-7	Potassium Oxide	ACTIVE
	Zirconium Silicate	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.

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· **Chemicals known to cause cancer:**		
13463-67-7	Titanium Dioxide	
7440-02-0	Nickel	
· **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:**		
13463-67-7	Titanium Dioxide	
9004-34-6	Cellulose	
1344-28-1	Aluminum Oxide	
546-93-0	Magnesium Carbonate	
1317-95-9	Silica	
7439-96-5	Manganese	
7440-02-0	Nickel	
7440-21-3	Silicon	
12001-26-2	Mica	
8049-17-0	Ferrosilicon	
1305-78-8	Calcium Oxide	
7439-98-7	Molybdenum	
12136-45-7	Potassium Oxide	
· **New Jersey Special Hazardous Substance List:**		
1317-95-9	Silica	CA
7439-96-5	Manganese	F3, R1
7440-02-0	Nickel	CA
7440-21-3	Silicon	F3
8049-17-0	Ferrosilicon	F2, R2
1305-78-8	Calcium Oxide	CO, R1
12136-45-7	Potassium Oxide	CO, R2
· **Pennsylvania Right-to-Know List:**		
13463-67-7	Titanium Dioxide	
9004-34-6	Cellulose	
1344-28-1	Aluminum Oxide	
1317-95-9	Silica	
7439-96-5	Manganese	
7440-02-0	Nickel	
7440-21-3	Silicon	
12001-26-2	Mica	
1305-78-8	Calcium Oxide	
7439-98-7	Molybdenum	

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7631-86-9	Silicon Dioxide	
· **Pennsylvania Special Hazardous Substance List:**		
1344-28-1	Aluminum Oxide	E
7439-96-5	Manganese	E
7440-02-0	Nickel	ES

· **Carcinogenic categories:**

· **EPA (Environmental Protection Agency):**		
7439-96-5	Manganese	D
· **TLV (Threshold Limit Value established by ACGIH):**		
7789-75-5	Calcium fluoride	A4
13463-67-7	Titanium Dioxide	A4
1344-28-1	Aluminum Oxide	A4
1317-95-9	Silica	A2
7440-02-0	Nickel	A5
7439-98-7	Molybdenum	A3
· **NIOSH-Ca (National Institute for Occupational Safety and Health):**		
13463-67-7	Titanium Dioxide	
1317-95-9	Silica	
7440-02-0	Nickel	

· **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
Silica
Calcium Oxide
Nickel
· **Hazard statements:**
H315 Causes skin irritation.
H318 Causes serious eye damage.
H317 May cause an allergic skin reaction.
H350 May cause cancer. Route of exposure: Inhalation.
H335 May cause respiratory irritation.
H372-H373 Causes damage to organs through prolonged or repeated exposure. May cause damage to the respiratory system through prolonged or repeated exposure. Route of exposure: Inhalation.
· **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.

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P272	Contaminated work clothing must not be allowed out of the workplace.
P280	Wear protective gloves/protective clothing/eye protection/face 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.
P308+P313	IF exposed or concerned: Get medical advice/attention.
P321	Specific treatment (see supplementary first aid instructions on this Safety Data Sheet).
P314	Get medical advice/attention 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.
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.

· ***Information about limitation of use:***

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

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 2: Flammable solids – Category 2
Pyrophoric Solids 1: Pyrophoric solids – Category 1

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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 3: Substances and mixtures which in contact with water emit flammable gases – Category 3
Oxidizing Solids 1: Oxidizing solids – Category 1
Acute Toxicity - Oral 4: Acute toxicity – Category 4
Skin Corrosion 1A: Skin corrosion/irritation – Category 1A
Skin Corrosion 1C: Skin corrosion/irritation – Category 1C
Skin Irritation 2: Skin corrosion/irritation – Category 2
Eye Damage 1: Serious eye damage/eye irritation – Category 1
Eye Irritation 2A: Serious eye damage/eye irritation – Category 2A
Eye Irritation 2B: Serious eye damage/eye irritation – Category 2B
Sensitization - Skin 1: Skin sensitisation – Category 1
Carcinogenicity 1A: Carcinogenicity – Category 1A
Carcinogenicity 1B: Carcinogenicity – Category 1B
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.***