

Safety Data Sheet (SDS)

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

Issue date 07/31/2015

Reviewed on 09/03/2015

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

- **Supplier:**
SOWESCO 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:



GHS08 Health hazard

Carc. 1A H350 May cause cancer.



GHS05 Corrosion

Eye Dam. 1 H318 Causes serious eye damage.



GHS07

Skin Irrit. 2 H315 Causes skin irritation.

Skin Sens. 1 H317 May cause an allergic skin reaction.

STOT SE 3 H335 May cause respiratory irritation.

Label elements

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



GHS05



GHS07



GHS08

- **Signal word:** Danger

Safety Data Sheet (SDS)

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

Issue date 07/31/2015

Reviewed on 09/03/2015

Trade name: Carbon Steel Electrodes for Submerged Arc Welding

- **Hazard-determining components of labeling:**

Iron
Titanium
Lithium
Silica
Aluminium Oxide

- **Hazard statements:**

Causes skin irritation.
May cause an allergic skin reaction.
Causes serious eye damage.
May cause respiratory irritation.
May cause cancer.

- **Precautionary statements:**

Do not handle until all safety precautions have been read and understood.
Obtain special instructions before use.
Do not eat, drink or smoke when using this product.
Do not breathe dust/fume/gas/mist/vapors/spray.
Use only outdoors or in a well-ventilated area.
Store in a well-ventilated place. Keep container tightly closed.
Store locked up.
Wear respiratory protection.
Wear protective gloves/protective clothing/eye protection/face protection.
Wash thoroughly after handling.
Contaminated work clothing must not be allowed out of the workplace.
Take off contaminated clothing and wash it before reuse.
If in eyes: Rinse cautiously with water for several minutes.
Remove contact lenses, if present and easy to do. Continue rinsing.
If eye irritation persists: Get medical advice/attention.
If on skin: Wash with plenty of water.
If skin irritation or rash occurs: Get medical advice/attention.
If inhaled: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
Call a poison center/doctor if you feel unwell.
If exposed or concerned: Get medical advice/attention.
If experiencing respiratory symptoms: Call a poison center/doctor.
Specific treatment (see supplementary first aid instructions on this Safety Data Sheet).
Avoid release to the environment.
Dispose of contents/container in accordance with local/regional/national/international regulations.

- **Unknown acute toxicity:**

42.2 percent of the mixture consists of ingredient(s) of unknown toxicity.

- **Classification system:**

NFPA ratings (scale 0 - 4)



Health = 1
Fire = 0
Reactivity = 0

HMS-ratings (scale 0 - 4)



Health = 1
Fire = 0
Reactivity = 0

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

Safety Data Sheet (SDS)

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

Issue date 07/31/2015

Reviewed on 09/03/2015

Trade name: Carbon Steel Electrodes for Submerged Arc Welding**3 Composition/information on ingredients****Chemical characterization:** Mixtures

- **Description:** Mixture of substances listed below with nonhazardous additions.

Dangerous Components:

CAS: 7439-89-6 RTECS: NO 4565500	Iron ⚠Flam. Sol. 2, H228; ⚠Skin Irrit. 2, H315; STOT SE 3, H335; Eye Irrit. 2B, H320; Combustible Dust	70-99%
CAS: 7440-32-6 RTECS: XR 1700000	Titanium ⚠Skin Sens. 1, H317; Eye Irrit. 2B, H320	0-10%
CAS: 1317-95-9	Silica ⚠Carc. 1A, H350; ⚠STOT SE 3, H335	0-3%
CAS: 1344-28-1 RTECS: BD 1200000	Aluminium Oxide ⚠STOT SE 3, H335	0-3%
CAS: 7440-03-1 RTECS: QT9900000	Niobium ⚠Flam. Sol. 1, H228; Combustible Dust	0-3%
CAS: 7440-39-3 RTECS: CQ 8370000	Barium ⚠Water-react. 2, H261	0-9%
CAS: 7439-93-2 RTECS: OJ 5540000	Lithium ⚠Water-react. 1, H260; ⚠Skin Corr. 1B, H314	0-12%
CAS: 7440-67-7 RTECS: ZH 7070000	Zirconium ⚠Pyr. Sol. 1, H250; Water-react. 1, H260	0-12%
CAS: 7440-44-0 RTECS: FF 5250100	Carbon	0-12%
CAS: 7440-21-3	Silicon ⚠Flam. Sol. 2, H228; ⚠Acute Tox. 4, H302; Eye Irrit. 2B, H320	0-3%
CAS: 7429-90-5 RTECS: BD 0330000	Aluminium ⚠Flam. Sol. 2, H228	0-1%
CAS: 7440-02-0	Nickel ⚠Carc. 2, H351; STOT RE 1, H372; ⚠Skin Sens. 1, H317	0-0.3%
CAS: 13463-67-7	Titanium Dioxide ⚠Carc. 2, H351; ⚠Skin Irrit. 2, H315; Eye Irrit. 2A, H319; STOT SE 3, H335	0-0.3%
CAS: 7439-95-4 RTECS: OM 2100000	Magnesium ⚠Pyr. Sol. 1, H250; Water-react. 1, H260	0-1.2%
CAS: 7439-96-5 RTECS: OO 9275000	Manganese ⚠Pyr. Sol. 1, H250; Water-react. 1, H260	0-4%
CAS: 7439-98-7 RTECS: QA 4680000	Molybdenum	0-0.5%
CAS: 1317-61-9	Iron Oxide	0-1%
CAS: 7440-67-7 RTECS: ZH 7070000	Zirconium ⚠Pyr. Sol. 1, H250; Water-react. 1, H260	0-12%
CAS: 7440-50-8 RTECS: GL 5325000	Copper ⚠STOT SE 3, H335; Aquatic Chronic 4, H413	0-1%
CAS: 7440-62-2 RTECS: YW 1355000	Vanadium	0-10%

Additional information

Note: Certain chemical constituents listed in Section 3 may vary depending upon the Classification of the Carbon Steel Electrodes for Submerged Arc Welding products.

(Contd. on page 4)

Safety Data Sheet (SDS)

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

Issue date 07/31/2015

Reviewed on 09/03/2015

Trade name: Carbon Steel Electrodes for Submerged Arc Welding

4 First-aid measures

Description of first aid measures

- **General information:**
Symptoms of poisoning may occur after several hours; therefore medical observation is advised for at least 48 hours after the accident.
- **After inhalation:**
Supply fresh air. If required, provide artificial respiration. Consult doctor if symptoms persist. In case of unconsciousness, place patient stably in 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.
- **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:**
CO₂, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.

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. Mixtures of silicon, aluminum, and lead explode when heated. If incinerated, product will release the following toxic fumes: Oxides of iron, manganese, silicon, aluminum, nickel, niobium, magnesium, molybdenum, titanium, vanadium, barium, lithium, zirconium, carbon, copper, and fluorides and ozone.

Advice for firefighters

- **Protective equipment:**
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.

At temperatures above 200 °C Zirconium reacts exothermically with the following: fluorine, chloride, bromide, iodine, halocarbons, carbon tetrachloride, carbon, tetra fluoride and Freon's.

6 Accidental release measures

- **Personal precautions, protective equipment and emergency procedures:**
Ensure adequate ventilation.
Wear protective equipment.
Keep unprotected persons away.
Avoid contact with skin, eyes and clothing.

(Contd. on page 5)

Safety Data Sheet (SDS)

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

Issue date 07/31/2015

Reviewed on 09/03/2015

Trade name: Carbon Steel Electrodes for Submerged Arc Welding

- **Environmental precautions:** Do not allow to enter sewers/ surface or ground water.
- **Methods and material for containment and cleaning up:**
 - Ensure adequate ventilation.
 - Pick up mechanically.
 - Dispose contaminated material as waste according to Section 13.
 - Dispose of the collected material according to regulations.
- **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.

7 Handling and storage**Handling**

- **Precautions for safe handling:**
 - Ensure good ventilation/exhaustion at the workplace.
 - No special precautions are necessary if used correctly.
- **Information about protection against explosions and fires:**
 - Keep protective respiratory device available.

Storage

- **Conditions for safe storage, including any incompatibilities:**
 - Store away from strong acids, strong bases, strong oxidizing agents and strong reducing agents.
- **Requirements to be met by storerooms and receptacles:** No special requirements.
- **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:**1317-95-9 Silica**

PEL	see Quartz listing
REL	Long-term value: 0.05* mg/m ³ *respirable dust; See Pocket Guide App. A
TLV	TLV withdrawn

1344-28-1 Aluminium Oxide

PEL	Long-term value: 15*; 15** mg/m ³ *total dust **respirable fraction
REL	Long-term value: 10* 5** mg/m ³ as Al; *total dust **respirable/pyro powd./welding f.
TLV	Long-term value: 1* mg/m ³ as Al; *respirable fraction

7440-03-1 Niobium

TWA	Long-term value: 5
-----	--------------------

(Contd. on page 6)

Safety Data Sheet (SDS)

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

Issue date 07/31/2015

Reviewed on 09/03/2015

Trade name: Carbon Steel Electrodes for Submerged Arc Welding

7440-39-3 Barium	
PEL	Long-term value: 0.5 mg/m ³ as Ba
REL	Long-term value: 0.5 mg/m ³ as Ba and soluble compounds
TLV	Long-term value: 0.5 mg/m ³ as Ba
7440-67-7 Zirconium	
PEL	Long-term value: 5 mg/m ³ as Zr
REL	Short-term value: 10 mg/m ³ Long-term value: 5 mg/m ³ as Zr
TLV	Short-term value: 10 mg/m ³ Long-term value: 5 mg/m ³ as Zr
7440-44-0 Carbon	
PEL	Short-term value: 10 A mg/m ³ Long-term value: 5 A mg/m ³
7439-96-5 Manganese	
PEL	Ceiling limit value: 5 mg/m ³ as Mn
REL	Short-term value: 3 mg/m ³ Long-term value: 1 mg/m ³ as Mn; fume
TLV	Long-term value: 0.02* 0.1* mg/m ³ as Mn; *respirable **inhalable fraction
7440-21-3 Silicon	
PEL	Long-term value: 15* 5** mg/m ³ *total dust **respirable fraction
REL	Long-term value: 10* 5** mg/m ³ *total dust **respirable fraction
TLV	TLV withdrawn
7429-90-5 Aluminium	
PEL	Long-term value: 15*; 15** mg/m ³ *total dust **respirable fraction
REL	Long-term value: 10* 5** mg/m ³ as Al; *total dust **respirable/pyro powd./welding f.
TLV	Long-term value: 1* mg/m ³ as Al; *respirable fraction
7440-02-0 Nickel	
PEL	Long-term value: 1 mg/m ³
REL	Long-term value: 0.015 mg/m ³ as Ni; See Pocket Guide App. A
TLV	Long-term value: 1.5* mg/m ³ elemental, *inhalable fraction

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

(Contd. on page 7)

Safety Data Sheet (SDS)

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

Issue date 07/31/2015

Reviewed on 09/03/2015

Trade name: Carbon Steel Electrodes for Submerged Arc Welding

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:**



Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation. 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.

- **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:**

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.

Safety Data Sheet (SDS)

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

Issue date 07/31/2015

Reviewed on 09/03/2015

Trade name: Carbon Steel Electrodes for Submerged Arc Welding

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.

- **Boiling point/Boiling range:**

Not determined.

- **Flash point:**

Not applicable.

- **Flammability (solid, gaseous):**

Not determined.

- **Ignition temperature:**

Not determined.

- **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:**

- **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:**

- **Organic solvents:**

0.0 %

- **Solids content:**

100.0 %

Other information:

No further relevant information available.

10 Stability and reactivity

- **Reactivity:** Stable under normal conditions.
- **Chemical stability:** Stable under normal conditions.
- **Possibility of hazardous reactions:** Contact with acids or strong bases may cause generation of gas.
- **Conditions to avoid:** No further relevant information available.
- **Incompatible materials:** 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

Safety Data Sheet (SDS)

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

Issue date 07/31/2015

Reviewed on 09/03/2015

Trade name: Carbon Steel Electrodes for Submerged Arc Welding

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 in Section 8 correspond to the ACGIH categories 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 their 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, bromine 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.
- 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.
- 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.
- TITANIUM DIOXIDE may cause irritation of the respiratory system.

(Contd. on page 10)

Safety Data Sheet (SDS)

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

Issue date 07/31/2015

Reviewed on 09/03/2015

Trade name: Carbon Steel Electrodes for Submerged Arc Welding

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.
- 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.
- 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 (Fe₃O₄) 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.
- NICKEL, NICKEL COMPOUNDS may cause 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.
- 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	7500 mg/kg (rat)
7439-96-5 Manganese		
Oral	LD50	9000 mg/kg (rat)
7440-21-3 Silicon		
Oral	LD50	3160 mg/kg (rat)
7429-90-5 Aluminium		
Oral	LD50	>2000 mg/kg (rat)
Inhalative	LC50/4 h	888 mg/l (rat)
13463-67-7 Titanium Dioxide		
Oral	LD50	>10000 mg/kg (rat)
Dermal	LD50	>10000 mg/kg (rabbit)
Inhalative	LC50	>6.82 mg/l (rat)

Primary irritant effect

• **On the skin:**

Irritant to skin and mucous membranes.
May cause an allergic skin reaction.

(Contd. on page 11)

Safety Data Sheet (SDS)

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

Issue date 07/31/2015

Reviewed on 09/03/2015

Trade name: Carbon Steel Electrodes for Submerged Arc Welding

- **On the eye:**
Irritating effect.
Causes serious eye irritation.
- **Sensitization:**
Sensitization possible through skin contact.

Additional toxicological information

The product shows the following danger according to internally approved calculation methods for preparations: Irritant.

Carcinogenic categories· **IARC (International Agency for Research on Cancer):**

- 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	1
13463-67-7	Titanium Dioxide	2B

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

1317-95-9	Silica	K
7440-02-0	Nickel	R

· **OSHA-Ca (Occupational Safety & Health Administration):**

None of the ingredients are listed.

12 Ecological information**Toxicity**· **Aquatic toxicity:****7439-96-5 Manganese**

EC50 40 mg/l (Water flea)

7440-02-0 Nickel

EC50 1.0 mg/l (Water flea)

13463-67-7 Titanium Dioxide

EC50 >1000 mg/l (Water flea)

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.

Safety Data Sheet (SDS)

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

Issue date 07/31/2015

Reviewed on 09/03/2015

Trade name: Carbon Steel Electrodes for Submerged Arc Welding**13 Disposal considerations****Waste treatment methods:****· Recommendation:**

Must not be disposed of together with household garbage. Do not allow product to reach sewage system. Observe all federal, state and local environmental regulations when disposing of this material.

Uncleaned packagings:

- Recommendation:** Disposal must be made according to official regulations

14 Transport information**UN-Number:**

- DOT, ADR, ADN, IMDG, IATA** Non-Regulated Material

UN proper shipping name:

- DOT, ADR, ADN, IMDG, IATA** Non-Regulated Material

Transport hazard class(es):

- DOT, ADR, ADN, IMDG, IATA** Non-Regulated Material

Packing group:

- DOT, ADR, 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	Aluminium 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
7440-32-6	Titanium
7440-62-2	Vanadium
1344-28-1	Aluminium Oxide
7440-03-1	Niobium
7440-39-3	Barium
7439-93-2	Lithium

(Contd. on page 13)

Safety Data Sheet (SDS)

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

Issue date 07/31/2015

Reviewed on 09/03/2015

Trade name: Carbon Steel Electrodes for Submerged Arc Welding

7440-67-7	Zirconium
7440-44-0	Carbon
7439-96-5	Manganese
7440-21-3	Silicon
7439-95-4	Magnesium
7429-90-5	Aluminium
1317-61-9	Iron Oxide
7440-50-8	Copper

California Proposition 65:· **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.

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	Aluminium 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
13463-67-7	Titanium Dioxide

· **GHS label elements**

The product is classified and labeled according to the Globally Harmonized System (GHS).

· **Hazard pictograms:**

GHS05 GHS07 GHS08

(Contd. on page 14)

Safety Data Sheet (SDS)

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

Issue date 07/31/2015

Reviewed on 09/03/2015

Trade name: Carbon Steel Electrodes for Submerged Arc Welding

- **Signal word:** Danger
- **Hazard-determining components of labeling:**
 - Iron
 - Titanium
 - Lithium
 - Silica
 - Aluminium Oxide
- **Hazard statements:**
 - Causes skin irritation.
 - May cause an allergic skin reaction.
 - Causes serious eye damage.
 - May cause respiratory irritation.
 - May cause cancer.
- **Precautionary statements:**
 - Do not handle until all safety precautions have been read and understood.
 - Obtain special instructions before use.
 - Do not eat, drink or smoke when using this product.
 - Do not breathe dust/fume/gas/mist/vapors/spray.
 - Use only outdoors or in a well-ventilated area.
 - Store in a well-ventilated place. Keep container tightly closed.
 - Store locked up.
 - Wear respiratory protection.
 - Wear protective gloves/protective clothing/eye protection/face protection.
 - Wash thoroughly after handling.
 - Contaminated work clothing must not be allowed out of the workplace.
 - Take off contaminated clothing and wash it before reuse.
 - If in eyes: Rinse cautiously with water for several minutes.
 - Remove contact lenses, if present and easy to do. Continue rinsing.
 - If eye irritation persists: Get medical advice/attention.
 - If on skin: Wash with plenty of water.
 - If skin irritation or rash occurs: Get medical advice/attention.
 - If inhaled: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
 - Call a poison center/doctor if you feel unwell.
 - If exposed or concerned: Get medical advice/attention.
 - If experiencing respiratory symptoms: Call a poison center/doctor.
 - Specific treatment (see supplementary first aid instructions on this Safety Data Sheet).
 - Avoid release to the environment.
 - Dispose of contents/container in accordance with local/regional/national/international regulations.

• National regulations:		
The product is subject to be classified according with the latest version of the regulations on hazardous substances.		
• State Right to Know:		
CAS: 7439-89-6 RTECS: NO 4565500	Iron ⚠ Flam. Sol. 2, H228; ⚠ Skin Irrit. 2, H315; STOT SE 3, H335; Eye Irrit. 2B, H320; Combustible Dust	70-99%
CAS: 7440-32-6 RTECS: XR 1700000	Titanium ⚠ Skin Sens. 1, H317; Eye Irrit. 2B, H320	0-0.3%
CAS: 7440-62-2 RTECS: YW 1355000	Vanadium	0-10%
CAS: 1317-95-9	Silica ⚠ Carc. 1A, H350; ⚠ STOT SE 3, H335	0-3%

Safety Data Sheet (SDS)

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

Issue date 07/31/2015

Reviewed on 09/03/2015

Trade name: Carbon Steel Electrodes for Submerged Arc Welding

CAS: 1344-28-1 RTECS: BD 1200000	Aluminium Oxide ⚠ STOT SE 3, H335	0-3%
CAS: 7440-03-1 RTECS: QT9900000	Niobium ⚠ Flam. Sol. 1, H228; Combustible Dust	0-3%
All ingredients are listed.		

Information about limitation of use

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

16 Other information

SOWESCO 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 SOWESCO's 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.

- **Date of preparation - last revision:** 07/31/2015 - 09/03/2015

- **Abbreviations and acronyms:**

ACGIH: American Conference of Governmental Industrial Hygienists
 Acute Tox. 4: Acute toxicity, Hazard Category 4
 ADN: The European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
 ADR: The European Agreement concerning the International Carriage of Dangerous Goods by Road
 Aquatic Chronic 4: Hazardous to the aquatic environment - Chronic Hazard, Category 4
 Carc. 1A: Carcinogenicity, Hazard Category 1A
 Carc. 2: Carcinogenicity, Hazard Category 2
 CAS: Chemical Abstracts Service (division of the American Chemical Society)
 DOT: US Department of Transportation
 EINECS: European Inventory of Existing Commercial Chemical Substances
 ELINCS: European List of Notified Chemical Substances
 Eye Dam. 1: Serious eye damage/eye irritation, Hazard Category 1
 Eye Irrit. 2A: Serious eye damage/eye irritation, Hazard Category 2A
 Eye Irrit. 2B: Serious eye damage/eye irritation, Hazard Category 2B
 Flam. Sol. 1: Flammable solids, Hazard Category 1
 Flam. Sol. 2: Flammable solids, Hazard Category 2
 HMIS: Hazardous Materials Identification System (USA)
 IATA: International Air Transport Association
 IMDG: International Maritime Code for Dangerous Goods
 LC50: Lethal concentration, 50 percent
 LD50: Lethal dose, 50 percent
 NFPA: National Fire Protection Association (USA)
 PBT: Persistent, Bioaccumulative and Toxic
 Pyr. Sol. 1: Pyrophoric Solids, Hazard Category 1
 Skin Corr. 1B: Skin corrosion/irritation, Hazard Category 1B
 Skin Irrit. 2: Skin corrosion/irritation, Hazard Category 2
 Skin Sens. 1: Sensitization - Skin, Hazard Category 1
 STOT SE 3: Specific target organ toxicity - Single exposure, Hazard Category 3
 STOT RE 1: Specific target organ toxicity - Repeated exposure, Hazard Category 1
 vPvB: very Persistent and very Bioaccumulative
 Water-react. 1: Substances and Mixtures which, in contact with water, emit flammable gases, Hazard Category 1
 Water-react. 2: Substances and Mixtures which, in contact with water, emit flammable gases, Hazard Category 2

***All data compared to the previous MSDS version has been altered.**