

## Safety Data Sheet (SDS)

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

Issue date 07/27/2015

Reviewed on 11/30/2016

### 1 Identification

#### Product identifier

- **Trade name:** Carbon and low-alloy steel coated welding electrodes
- **Product number:**
  - Specification: A5.2
  - Classification: R45, R60, R65
  - Carbon and low-alloy 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 and low-alloy steel welding electrodes.
- **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:



GHS07

Skin Irrit. 2 H315 Causes skin irritation.

STOT SE 3 H335 May cause respiratory irritation.

Eye Irrit. 2B H320 Causes eye irritation.

#### Label elements

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



GHS07

- **Signal word:** Warning
- **Hazard-determining components of labeling:**
  - Iron
  - Copper
- **Hazard statements:**
  - Causes skin and eye irritation.
  - May cause respiratory irritation.
- **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.

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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).  
 Dispose of contents/container in accordance with local/regional/national/international regulations.

- **Unknown acute toxicity:**

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

- **Classification system:**

- **NFPA ratings (scale 0 - 4)**



Health = 1  
 Fire = 0  
 Reactivity = 0

- **HMIS-ratings (scale 0 - 4)**



Health = 1  
 Fire = 0  
 Reactivity = 0

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

### 3 Composition/information on ingredients

**Chemical characterization:** Mixtures

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

<b>Dangerous Components:</b>		
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	95-99%
CAS: 7439-96-5 RTECS: OO 9275000	Manganese ⚠ Pyr. Sol. 1, H250; Water-react. 1, H260	0.5-3%
CAS: 7440-21-3	Silicon ⚠ Flam. Sol. 2, H228; ⚠ Acute Tox. 4, H302; Eye Irrit. 2B, H320	0.1-1%
CAS: 7440-50-8 RTECS: GL 5325000	Copper ⚠ STOT SE 3, H335; Aquatic Chronic 4, H413	0.1-1%

**Additional information**

Note: Certain chemical constituents listed in Section 3 may vary depending upon the Classification of the Carbon and Low-Alloy Steel Rods for Oxyfuel Gas Welding products.

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### 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:**

CO<sub>2</sub>, 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 copper, iron, manganese, and silicon.

#### 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.

### 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.

- **Environmental precautions:** Do not allow to enter sewers/ surface or ground water.

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- **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:**
  - Open and handle receptacle with care.
  - Ensure good ventilation/exhaustion at the workplace.
- **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:

##### 7439-96-5 Manganese

PEL	Ceiling limit value: 5 mg/m <sup>3</sup> as Mn
REL	Short-term value: 3 mg/m <sup>3</sup> Long-term value: 1 mg/m <sup>3</sup> fume, as Mn
TLV	Long-term value: 0.02* 0.1* mg/m <sup>3</sup> as Mn; *respirable **inhalable fraction

##### 7440-21-3 Silicon

PEL	Long-term value: 15* 5** mg/m <sup>3</sup> *total dust **respirable fraction
REL	Long-term value: 10* 5** mg/m <sup>3</sup> *total dust **respirable fraction
TLV	TLV withdrawn

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**Trade name: Carbon and Low-Alloy Steel Rods for Oxyfuel Gas Welding****7440-50-8 Copper**

PEL	Long-term value: 1* 0.1** mg/m <sup>3</sup> as Cu *dusts and mists **fume
REL	Long-term value: 1* 0.1** mg/m <sup>3</sup> as Cu *dusts and mists **fume
TLV	Long-term value: 1* 0.2** mg/m <sup>3</sup> *dusts and mists; **fume; as Cu

**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:**



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

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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.

## 9 Physical and chemical properties

### Information on basic physical and chemical properties

#### General Information

- **Appearance:**
  - Form:** 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,

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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 categories found in "Threshold Limit Values for Chemical Substances and Physical Agents" listed in Section 8. Some products will also contain: silicon, manganese, copper and iron. Some elements or compounds may exceed their PELs/TLVs before the total fumes exceed 5 mg/m<sup>3</sup>.

**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.
- 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.
- 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.

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.
- 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.
- 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<sub>3</sub>O<sub>4</sub>) are not regarded as fibrogenic materials.

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- MANGANESE, MANGANESE COMPOUNDS may cause central nervous system effects referred to as 'manganism.' Symptoms include languor, sleepiness, muscular weakness, emotional disturbances, spasticgait, 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.

• **Acute toxicity:**

<b>LD/LC50 values that are relevant for classification:</b>		
<b>7439-89-6 Iron</b>		
Oral	LD50	7500 mg/kg (rat)
<b>7439-96-5 Manganese</b>		
Oral	LD50	9000 mg/kg (rat)
<b>7440-21-3 Silicon</b>		
Oral	LD50	3160 mg/kg (rat)

**Primary irritant effect**

• **On the skin:**

Irritant to skin and mucous membranes.

• **On the eye:**

Irritating effect.

**Additional toxicological information**

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

**Carcinogenic categories**

<ul style="list-style-type: none"> <li>• <b>IARC (International Agency for Research on Cancer):</b> <ul style="list-style-type: none"> <li>Group 1 - Carcinogenic to humans</li> <li>Group 2A - Probably carcinogenic to humans</li> <li>Group 2B - Possibly carcinogenic to humans</li> <li>Group 3 - Not classifiable as to its carcinogenicity to humans</li> <li>Group 4 - Probably not carcinogenic to humans</li> </ul> </li> </ul>
None of the ingredients are listed.
<ul style="list-style-type: none"> <li>• <b>NTP (National Toxicology Program):</b></li> </ul>
None of the ingredients are listed.
<ul style="list-style-type: none"> <li>• <b>OSHA-Ca (Occupational Safety &amp; Health Administration):</b></li> </ul>
None of the ingredients are listed.

## 12 Ecological information

**Toxicity**

<ul style="list-style-type: none"> <li>• <b>Aquatic toxicity:</b></li> </ul>
<b>7439-96-5 Manganese</b>
EC50   40 mg/l (Water flea)
<b>7440-50-8 Copper</b>
EC50   0.04-0.05 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.



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**Trade name: Carbon and Low-Alloy Steel Rods for Oxyfuel Gas Welding****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 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 MARPOL 73/78 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):**

7439-96-5 Manganese

7440-50-8 Copper

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

All ingredients are listed.

**California Proposition 65:****Chemicals known to cause cancer:**

None of the ingredients are listed.

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**Trade name: Carbon and Low-Alloy Steel Rods for Oxyfuel Gas Welding****· 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):**

7439-96-5 Manganese D

7440-50-8 Copper D

**· TLV (Threshold Limit Value established by ACGIH):**

None of the ingredients are listed.

**· NIOSH-Ca (National Institute for Occupational Safety and Health):**

None of the ingredients are listed.

**· GHS label elements**

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

**· Hazard pictograms:**

GHS07

**· Signal word:** Warning**· Hazard-determining components of labeling:**

Iron

Copper

**· Hazard statements:**

Causes skin and eye irritation.

May cause respiratory irritation.

**· 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.

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If experiencing respiratory symptoms: Call a poison center/doctor.

Specific treatment (see supplementary first aid instructions on this Safety Data Sheet).

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	95-99%
CAS: 7439-96-5 RTECS: OO 9275000	Manganese ⚠️ Pyr. Sol. 1, H250; Water-react. 1, H260	0.5-3%
CAS: 7440-21-3	Silicon ⚠️ Flam. Sol. 2, H228; ⚠️ Acute Tox. 4, H302; Eye Irrit. 2B, H320	0.1-1%
CAS: 7440-50-8 RTECS: GL 5325000	Copper ⚠️ STOT SE 3, H335; Aquatic Chronic 4, H413	0.1-1%

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:** 07/27/2015 - 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  
 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 Irrit. 2B: Serious eye damage/eye irritation, Hazard Category 2B  
 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 Irrit. 2: Skin corrosion/irritation, Hazard Category 2  
 STOT SE 3: Specific target organ toxicity - Single exposure, Hazard Category 3  
 vPvB: very Persistent and very Bioaccumulative  
 Water-react. 1: Substances and Mixtures which, in contact with water, emit flammable gases, Hazard Category 1

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