

**DW-A588**

Version number: 2.0  
Replaces version of: 2019-04-15 (1)

Revision: 2023-11-23

**SECTION 1: Identification of the substance/mixture and of the company/undertaking**

**1.1 Product identifier**

Trade name **DW-A588**

**1.2 Relevant identified uses of the substance or mixture and uses advised against**

Relevant identified uses Welding and soldering product  
The product is intended for professional use

Specific process or activity welding (welding process)

**1.3 Details of the supplier of the safety data sheet**

Kobelco Welding of Europe B.V.  
Eisterweg 8  
6422 PN Heerlen  
Netherlands

Telephone: +31(0)45-5471111  
e-mail: info@kobelcowelding.nl

e-mail (competent person) info@kobelcowelding.nl

**1.4 Emergency telephone number**

Emergency information service +31(0)45-5471111  
This number is only available during the following office hours: Mon-Fri 09:00 - 17:00

**SECTION 2: Hazards identification**

**2.1 Classification of the substance or mixture**

Classification (acc. to GB CLP)  
This mixture does not meet the criteria for classification.

| Code   | Supplemental hazard information   |
|--------|---|
| EUH208 | contains nickel powder. May produce an allergic reaction                        |
| EUH210 | safety data sheet available on request  |
| EUH212 | Warning! Hazardous respirable dust may be formed when used. Do not breathe dust |

**2.2 Label elements**

Labelling (acc. to GB CLP)

- signal word Not required.
- pictograms Not required.
- supplemental hazard information
  - EUH208 Contains nickel powder. May produce an allergic reaction.
  - EUH210 Safety data sheet available on request.
  - EUH212 Warning! Hazardous respirable dust may be formed when used. Do not breathe dust.

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**2.3 Other hazards**

There is no additional information.  
Avoid breathing dust. Avoid contact with eyes. Avoid skin contact.  
When this product is used in a welding process, the most significant hazards are electric shock, fumes, gases, radiation, spatter, slag and heat.  
Shock: electric shock can kill.  
Fumes: Overexposure to welding fumes may result in symptoms like dizziness, nausea, dryness or irritation of the nose, throat or eyes. Chronic overexposure to welding fumes may affect pulmonary function and nervous system.  
Gases: gases may cause gas poisoning.  
Radiation: arc rays can severely damage eyes or skin.  
Spatter, slag and heat: spatter and slag can damage eyes. Spatter, slag, melting material, arc rays and hot welds can cause burn injuries and start fires.

**Substance(s) formed under the conditions of use.**

The welding fumes produced from this welding electrode may contain the listed constituent(s) of Sec.3 and/or their complex metallic oxides as well as solid particles or other constituents from the consumables, base metal, or base metal coating not listed Sec.3. The welding fumes may contain Mn, Ni, Cr(VI) and their compounds. Refer to Sec.8 and 10.

**Results of PBT and vPvB assessment**

Does not contain a PBT-/vPvB-substance in a concentration of  $\geq 0,1\%$ .

**Endocrine disrupting properties**

Does not contain an endocrine disruptor (ED) in a concentration of  $\geq 0,1\%$ .


**SECTION 3: Composition/information on ingredients**

**3.1 Substances**

Not relevant (mixture).

**3.2 Mixtures**

The product does not contain (other) ingredients which are classified according to present knowledge of the supplier and contribute to the classification of the product and hence require reporting in this section.

| Name of substance | Identifier  | Wt% | Classification acc. to GHS  | Pictograms  | Notes |
|-------------------|---|-----|---|---|-------|
| Nickel            | CAS No<br>7440-02-0<br><br>EC No<br>231-111-4<br><br>Index No<br>028-002-01-4 | < 1 | Skin Sens. 1 / H317<br>Carc. 2 / H351<br>STOT RE 1 / H372<br>Aquatic Chronic 3 / H412 |  |       |

**Remarks**

For full text of H-phrases: see SECTION 16.

**SECTION 4: First aid measures**

**4.1 Description of first aid measures**

**General notes**

Do not leave affected person unattended. Remove victim out of the danger area. Keep affected person warm, still and covered. Take off immediately all contaminated clothing. In all cases of doubt, or when symptoms persist, seek medical advice. In case of unconsciousness place person in the recovery position. Never give anything by mouth. Disconnect and turn off the power. If the victim is semi- or unconscious, open the airway. If the victim cannot breath, give artificial respiration. If there is no pulse, massage the chest and apply artificial respiration.

**Electrical shock**

Disconnect and turn off the power. If the victim is semi- or unconscious, open the airway. If the victim cannot breath, give artificial respiration. If there is no pulse, massage the chest and apply artificial respiration.

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**Following inhalation**

Provide fresh air. If breathing is irregular or stopped, immediately seek medical assistance and start first aid actions. If experiencing respiratory symptoms: Call a doctor.

**Following skin contact**

Brush off loose particles from skin. Rinse skin with water/shower. Wash with plenty of soap and water. If skin irritation or rash occurs: Get medical advice/attention.

**Following eye contact**

Do not rub the eyes. Mechanical stress can cause damage to the cornea. Irrigate copiously with clean, fresh water for at least 15 minutes, holding the eyelids apart. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

**Following ingestion**

Rinse mouth with water (only if the person is conscious). Call a doctor if you feel unwell.

**4.2 Most important symptoms and effects, both acute and delayed****Symptoms.**

Short-term (acute) overexposure to welding fumes may result in discomfort such as metal fume fever, dizziness, nausea, or dryness or irritation of nose, throat, or eyes. May aggravate pre-existing respiratory problems (e.g. asthma, emphysema).

Long-term (chronic) overexposure to welding fumes can lead to siderosis (iron deposits in lung), central nervous system effects, bronchitis and other pulmonary effects. Refer to Section 11 for more information.

**Hazards.**

Welding hazards are complex and may include physical and health hazards such as but not limited to electric shock, physical strains, radiation burns (eye flash), thermal burns due to hot metal or spatter and potential health effects of overexposure to welding fume or dust. Refer to Section 11 for more information.

**4.3 Indication of any immediate medical attention and special treatment needed**

Treat symptomatically.

**SECTION 5: Firefighting measures****5.1 Extinguishing media****Suitable extinguishing media**

As shipped, this product is non flammable. However, welding arc and spark can ignite combustible and flammable products, Co-ordinate firefighting measures to the fire surroundings, Dry extinguishing powder, Carbon dioxide (CO<sub>2</sub>), Water spray

**5.2 Special hazards arising from the substance or mixture**

No further relevant information available.

**Hazardous combustion products**

During fire hazardous fumes/smoke could be produced.

**5.3 Advice for firefighters**

In case of fire and/or explosion do not breathe fumes. Co-ordinate firefighting measures to the fire surroundings. Do not allow firefighting water to enter drains or water courses. Collect contaminated firefighting water separately. Fight fire with normal precautions from a reasonable distance.

**Special protective equipment for firefighters**

Self-contained breathing apparatus (SCBA). Standard protective clothing for firefighters.

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**SECTION 6: Accidental release measures****6.1 Personal precautions, protective equipment and emergency procedures**

For non-emergency personnel

Remove persons to safety.

For emergency responders

Wear breathing apparatus if exposed to vapours/dust/spray/gases. Use personal protective equipment as required. If airborne dust and/or fume is present, use adequate engineering controls and, if needed, personal protection to prevent overexposure. Refer to recommendations in Section 8.

**6.2 Environmental precautions**

Keep away from drains, surface and ground water. Retain contaminated washing water and dispose of it.

**6.3 Methods and material for containment and cleaning up**

Advice on how to contain a spill

Covering of drains.

Advice on how to clean up a spill

Take up mechanically.

Other information relating to spills and releases

Place in appropriate containers for disposal. Ventilate affected area.

**6.4 Reference to other sections**

Hazardous combustion products: see section 5. Personal protective equipment: see section 8. Incompatible materials: see section 10. Disposal considerations: see section 13.

**SECTION 7: Handling and storage****7.1 Precautions for safe handling**

Keep away from fire.

Recommendations

**Reduction of fumes and dusts.**

Keep formation of airborne dusts to a minimum. Provide appropriate exhaust ventilation at places where dust is formed. Read and understand the manufacturer's instruction and the possible precautionary label on the product.

**Prevention of electric shock.**

Do not touch live electrical parts such as the welding wire and welding machine terminals. Wear insulated gloves and safety boots. If welding must be performed in damp locations or with wet clothing, on metal structures or when in cramped positions such as sitting, kneeling or lying, or if there is a high risk of unavoidable or accidental contact with workpiece, use the following equipment: Semiautomatic DC Welder, DC Manual (Stick) Welder, or AC Welder with Reduced Voltage Control.

**Prevention of fire and explosion.**

Remove flammable and combustible materials and liquids.

**Prevention of harm when handling welding consumables.**

Handle with care to avoid stings and cuts. Hold the welding wire manually when loosening the wire.

Advice on general occupational hygiene

Wash hands after use. Do not eat, drink and smoke in work areas. Remove contaminated clothing and protective equipment before entering eating areas. Never keep food or drink in the vicinity of chemicals. Never place chemicals in containers that are normally used for food or drink. Keep away from food, drink and animal feedingsuffs.

**7.2 Conditions for safe storage, including any incompatibilities**

Managing of associated risks

- explosive atmospheres

Removal of dust deposits.

- flammability hazards

Keep away from fire. Keep away from combustible material.

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- incompatible substances or mixtures

Acids, Alkalis, Oxidisers

Control of effects

Protect against external exposure, such as

High temperatures, Humidity

Consideration of other advice

Store in a well-ventilated place. Keep container tightly closed.

- general rule

Store welding consumables inside a room without humidity. Do not store welding consumables directly on the ground or beside a wall. Keep welding consumables away from chemical substances like acids which could cause chemical reactions.

- ventilation requirements

Use local and general ventilation.

- packaging compatibilities

Keep only in original container.

### 7.3 Specific end use(s)

Welding (welding process).

## SECTION 8: Exposure controls/personal protection

### 8.1 Control parameters

#### National limit values

| Occupational exposure limit values (Workplace Exposure Limits) |                  |            |            |           |                          |            |                           |          |           |
|--|------------------|------------|------------|-----------|--------------------------|------------|---------------------------|----------|-----------|
| Country  | Name of agent    | CAS No     | Identifier | TWA [ppm] | TWA [mg/m <sup>3</sup> ] | STEL [ppm] | STEL [mg/m <sup>3</sup> ] | Notation | Source    |
| GB   | dust             |            | WEL        |           | 10                       |            |                           | i        | EH40/2005 |
| GB   | dust             |            | WEL        |           | 4                        |            |                           | r        | EH40/2005 |
| GB   | titanium dioxide | 13463-67-7 | WEL        |           | 10                       |            |                           | i        | EH40/2005 |
| GB   | titanium dioxide | 13463-67-7 | WEL        |           | 4                        |            |                           | r        | EH40/2005 |
| GB   | manganese        | 7439-96-5  | WEL        |           | 0.2                      |            |                           | i        | EH40/2005 |
| GB   | manganese        | 7439-96-5  | WEL        |           | 0.05                     |            |                           | r        | EH40/2005 |
| GB   | nickel           | 7440-02-0  | WEL        |           | 0.1                      |            |                           |          | EH40/2005 |

**Notation**

- i inhalable fraction
- r respirable fraction
- STEL short-term exposure limit: a limit value above which exposure should not occur and which is related to a 15-minute period (unless otherwise specified)
- TWA time-weighted average (long-term exposure limit): measured or calculated in relation to a reference period of 8 hours time-weighted average (unless otherwise specified)

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**Relevant DNELs/DMELs/PNECs and other threshold levels**

| Relevant DNELs of components of the mixture |           |           |                        |                                    |                   |                            |
|---|-----------|-----------|------------------------|------------------------------------|-------------------|----------------------------|
| Name of substance                           | CAS No    | End-point | Threshold level        | Protection goal, route of exposure | Used in           | Exposure time              |
| nickel powder                               | 7440-02-0 | DNEL      | 0.05 mg/m <sup>3</sup> | human, inhalatory                  | worker (industry) | acute - systemic effects   |
| nickel powder                               | 7440-02-0 | DNEL      | 0.05 mg/m <sup>3</sup> | human, inhalatory                  | worker (industry) | chronic - systemic effects |
| nickel powder                               | 7440-02-0 | DNEL      | 0.05 mg/m <sup>3</sup> | human, inhalatory                  | worker (industry) | chronic - local effects    |
| nickel powder                               | 7440-02-0 | DNEL      | 11.9 mg/m <sup>3</sup> | human, inhalatory                  | worker (industry) | acute - local effects      |

| Relevant PNECs of components |           |           |                 |                       |                              |                              |
|------------------------------|-----------|-----------|-----------------|-----------------------|------------------------------|------------------------------|
| Name of substance            | CAS No    | End-point | Threshold level | Organism              | Environmental compartment    | Exposure time                |
| nickel powder                | 7440-02-0 | PNEC      | 7.1 µg/l        | aquatic organisms     | freshwater                   | short-term (single instance) |
| nickel powder                | 7440-02-0 | PNEC      | 8.6 µg/l        | aquatic organisms     | marine water                 | short-term (single instance) |
| nickel powder                | 7440-02-0 | PNEC      | 0.33 mg/l       | aquatic organisms     | sewage treatment plant (STP) | short-term (single instance) |
| nickel powder                | 7440-02-0 | PNEC      | 109 mg/kg       | aquatic organisms     | freshwater sediment          | short-term (single instance) |
| nickel powder                | 7440-02-0 | PNEC      | 109 mg/kg       | aquatic organisms     | marine sediment              | short-term (single instance) |
| nickel powder                | 7440-02-0 | PNEC      | 29.9 mg/kg      | terrestrial organisms | soil                         | short-term (single instance) |

**8.2 Exposure controls**

**Appropriate engineering controls**

Use enough ventilation, local exhaust at the arc, or both, to keep the fumes and gases below the TLVs in the worker's breathing zone and the general area. Use extra ventilation when welding galvanized plate or coated plate. Determine the composition and quantity of fumes and gases to which workers are exposed by taking an air sample from inside the welder's helmet if worn or in the worker's breathing zone. Improve ventilation if exposures are not below limits.

**Individual protection measures (personal protective equipment)**

**Eye/face protection**



Wear helmet or use face shield with filter lens. As a rule of thumb, start with a shade which is too dark to see the weld zone. Then go to the next lighter shade which gives sufficient view of the weld zone. Provide protective screens and flash goggles, if necessary, to shield others.

**Skin protection**



Wear hand, head, and body protection which help to prevent injury from radiation, sparks and electrical shock. At a minimum this includes welder's gloves and a protective face shield, and may include arm protectors, aprons, hats, shoulder protection, as well as dark substantial clothing. Wear dry gloves free of holes or split seams. Train the welder not to permit electrically live parts or electrodes to contact skin or clothing or gloves if they are wet. Insulate yourself from the work piece and ground using dry plywood, rubber mats or other dry insulation.

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### Hand protection



Welding gloves according to EN12477:2001 and A1:2005 in case of arc welding. For special purposes, it is recommended to check the resistance to chemicals of the protective gloves mentioned above together with the supplier of these gloves. The exact break through time should be requested at the protective glove manufacturer and must be observed.

- breakthrough time of the glove material

Use gloves with a minimum breakthrough time of the glove material:

- other protection measures



Take recovery periods for skin regeneration. Preventive skin protection (barrier creams/ointments) is recommended. Wash hands thoroughly after handling. Wear head, hand and bodyprotection which help to prevent injury from radiation, sparks and electric shock. At a minimum this includes welder's gloves and protective face shield and may include arm protectors, aprons, hats, shoulder protection as well as dark substantial clothing.

Train the welder not to touch live electrical parts and to insulate himself from work and ground.

### Ear protection



Wear earplugs or earmuffs when using engine driven arc welding machine or pulsed arc welding machine that generates high-level noise.

### Advice on hygiene measures

Do not eat, drink or smoke when using this product. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

### Respiratory protection



Keep your head out of fumes. Use enough ventilation and local exhaust to keep fumes and gases from your breathing zone and the general area. Use respirable fume respirator or air supplied respirator when welding in confined space or where local exhaust or ventilation does not keep exposure below TLV. Keep head out of the fumes and gases.

### Environmental exposure controls

Take appropriate precautions to avoid uncontrolled release into the environment. Keep away from drains, surface and ground water.

## SECTION 9: Physical and chemical properties

### 9.1 Information on basic physical and chemical properties

|  |                                       |
|--|---------------------------------------|
| Physical state   | solid: wire or rod                    |
| Colour   | grey - silver - copper                |
| Odour  | odourless                             |
| Melting point/freezing point                             | not determined                        |
| Boiling point or initial boiling point and boiling range | not determined                        |
| Evaporation rate   | not determined                        |
| Flammability   | non-combustible                       |
| Lower and upper explosion limit                          | LEL: UEL: not determined not relevant |
| Flash point  | not applicable                        |

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|                           |   |
|---------------------------|---|
| Auto-ignition temperature | information on this property is not available |
| Decomposition temperature | no data available                             |
| pH (value)                | not applicable                                |
| Kinematic viscosity       | not relevant                                  |
| Solubility                | not determined                                |

|   |                                   |
|---|-----------------------------------|
| Partition coefficient n-octanol/water (log value) | this information is not available |
|---|-----------------------------------|

|                 |                |
|-----------------|----------------|
| Vapour pressure | not determined |
|-----------------|----------------|

Density and/or relative density

|                         |   |
|-------------------------|---|
| Density                 | not determined                                |
| Relative vapour density | information on this property is not available |

|                          |                   |
|--------------------------|-------------------|
| Particle characteristics | no data available |
|--------------------------|-------------------|

**9.2 Other information**

There is no additional information.

|  |   |
|--|---|
| Information with regard to physical hazard classes | hazard classes acc. to GHS (physical hazards): not relevant |
|--|---|

Other safety characteristics

|                   |  |
|-------------------|--|
| Temperature class | T2 (maximum permissible surface temperature on the equipment: 300°C) |
|-------------------|--|

### SECTION 10: Stability and reactivity

**10.1 Reactivity**

Contact with chemical substances could cause generation of gas.

**10.2 Chemical stability**

The material is stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

**10.3 Possibility of hazardous reactions**

Contact with acids, alkalis and oxidizing agents could cause reaction and generation of gas.

**10.4 Conditions to avoid**

Keep away from heat Acids Alkalis Oxidisers.

**10.5 Incompatible materials**

Oxidisers, Acids, Alkalis



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**10.6 Hazardous decomposition products**

Manganese has a low exposure limit, in some countries, that may be easily exceeded. Welding fumes and gases are generated as byproducts during the welding. The composition and quantity of fumes and gases cannot be recognized simply. The composition and quantity of the fumes and gases are dependent upon the base metal being welded (included coating such as solvent, paint, plating), the welding process, welding procedure, welding parameter and electrodes used. Other conditions which also influence the quantity of the fumes and gases to which workers may be exposed include the number of welding spots, the volume of the worker area, the quality and amount of ventilation, the position of the welder's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning and degreasing activities.). The fumes and gases are different in percent and form from the ingredients listed in Section 3. The fumes and gases include those originating from the volatilization, reaction, or oxidation of the materials shown in Section 3, plus those from the base metal and coating, etc., as noted above. Reasonably expected fume constituents produced during arc welding include the oxides of iron, manganese and other metals present in the welding consumable or base metal. And, it is known that these metal oxides are complex oxides, not single compounds. Hexavalent chromium compounds may be in the welding fume of consumables or base metals which contain chromium. Nickel compounds may be in the welding fume of consumables or base metals which contain Nickel. Gaseous and particulate fluoride may be in the welding fume of consumables which contain fluoride. Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc.

**SECTION 11: Toxicological information**

**11.1 Information on toxicological effects**

The International Agency for Research on Cancer (IARC) has determined welding fumes and ultraviolet radiation from welding are carcinogenic to humans (Group 1). According to IARC, welding fumes cause cancer of the lung and positive associations have been observed with cancer of the kidney. Also according to IARC, ultraviolet radiation from welding causes ocular melanoma. IARC identifies gouging, brazing, carbon arc or plasma arc cutting, and soldering as processes closely related to welding. Read and understand the manufacturer's instructions, Safety Data Sheets and the precautionary labels before using this product.

**Classification procedure**

The method for classification of the mixture is based on ingredients of the mixture (additivity formula).

**Classification acc. to GHS**

This mixture does not meet the criteria for classification.

**Acute toxicity**

Short-term (acute) overexposure to welding fumes may result in discomfort such as metal fume fever, dizziness, nausea, or dryness or irritation of nose, throat, or eyes. May aggravate pre-existing respiratory problems (e.g. asthma, emphysema).

**Cr:** The presence of chromium/chromate in welding fumes can cause irritation of nasal membranes and skin.

**Ni:** The presence of nickel compounds in fume can cause metallic taste, nausea, tightness of chest, fever.

**F:** Exposure to the fluoride ion in welding fumes may cause hypocalcemia-calcium deficiency in the blood that can result in muscle cramps and inflammation and necrosis of mucous membranes.

**Gases:** Some toxic gases associated with welding may cause pulmonary edema, asphyxiation, and death.

| Acute toxicity of components |           |                |          |              |         |
|------------------------------|-----------|----------------|----------|--------------|---------|
| Name of substance            | CAS No    | Exposure route | Endpoint | Value        | Species |
| Nickel                       | 7440-02-0 | oral           | LD50     | >9,000 mg/kg | rat     |

**Skin corrosion/irritation**

Shall not be classified as corrosive/irritant to skin.

**Serious eye damage/eye irritation**

Shall not be classified as seriously damaging to the eye or eye irritant.

**Respiratory or skin sensitisation**

Contains nickel powder. May produce an allergic reaction.

**Ni:** Nickel and its compounds are skin sensitizers with symptoms ranging from slight itch to severe dermatitis.

**Cr:** Chromates may cause allergic reactions, including skin rash. Asthma has been reported in some sensitized individuals. Skin contact may result in irritation, ulceration, sensitization, and contact dermatitis.

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**Germ cell mutagenicity**

Shall not be classified as germ cell mutagenic.

**Carcinogenicity**

Shall not be classified as carcinogenic.

**Reproductive toxicity**

Shall not be classified as a reproductive toxicant.

**Summary of evaluation of the CMR properties**

Welding fumes (not otherwise specified) are possibly carcinogenic to humans.

**SiO2:** Crystalline silica is classified as a human carcinogen (Group I) by the IARC (International Agency for Research on Cancer).

**Ni:** Nickel is considered carcinogenic. Long term overexposure to nickel fumes may also cause pulmonary fibrosis and oedema.

**Cr:** Chromium (in some forms) is considered carcinogenic. Hexavalent chromium and its compounds are on the IARC and NTP lists as posing a cancer risk to humans.

**Arc rays:** Skin cancer has been reported.

| Name acc. to inventory | CAS No    | Wt%  | Classification | Remarks | Number | Date indication |
|------------------------|-----------|------|----------------|---------|--------|-----------------|
| welding fumes          |           | 100  | 1              |         |        | 2018            |
| nickel                 | 7440-02-0 | 0.99 | 2B             |         |        | 1990            |

Legend

- 1 Carcinogenic to humans
- 2B Possibly carcinogenic to humans

**Specific target organ toxicity - single exposure**

Shall not be classified as a specific target organ toxicant (single exposure).

**Specific target organ toxicity - repeated exposure**

Shall not be classified as a specific target organ toxicant (repeated exposure).

Long term exposure to welding and allied processes gasses, dusts and fumes may contribute to pulmonary irritation or pneumoconiosis and other pulmonary effects. The severity of the change is proportional to the length of the exposure. The changes may be caused by non-work factors such as smoking, etc.

**Ni:** Nickel is considered carcinogenic. Long term overexposure to nickel fumes may also cause pulmonary fibrosis and oedema.

**Cr:** Chromates may cause ulceration, perforation of the nasal septum, and severe irritation of the bronchial tubes and lungs. Liver damage have also been reported. Chromates contain the hexavalent form of chromium.

**Mn:** Overexposure to manganese compounds may affect the central nervous system, symptoms of which are languor, sleepiness, muscular weakness, emotional disturbances and spastic gait. The effect of manganese on the nervous system is irreversible.

**Fe:** Inhalation of too much iron oxide fume over a long time can cause siderosis, sometimes called "iron pigmentation" of the lung, which can be seen on a chest x-ray but causes little or no disability. Chronic overexposure to iron (>50-100 mg Fe per day) can result in pathological deposition of iron in body tissues of which are fibrosis of the pancreas, diabetes mellitus and liver cirrhosis.

**SiO2:** Overexposure to crystalline silica present in dust from flux can cause severe lung damage (silicosis). Respiratory overexposure to airborne crystalline silica is known to cause silicosis, a form of disabling pulmonary fibrosis which can be progressive and may lead to death.

**F:** Chronic fluoride absorption can result in osseous fluorosis, increased radiographic density of the bones and mottling of the teeth.

**Aspiration hazard**

Shall not be classified as presenting an aspiration hazard.

**Other information**

Organic polymers may be used in the manufacture of various welding consumables. Overexposure to their decomposition byproducts may result in a condition known as polymer fume fever. Polymer fume fever usually occurs within 4 to 8 hours of exposure with the presentation of flu like symptoms, including mild pulmonary irritation with or without an increase in body temperature. Signs of exposure can include an increase in white blood cell count. Resolution of symptoms typically occurs quickly, usually not lasting longer than 48 hours.

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**11.2 Information on other hazards**

Endocrine disrupting properties

Does not contain an endocrine disruptor (ED) in a concentration of  $\geq 0,1\%$ .

**SECTION 12: Ecological information**

**12.1 Toxicity**

Shall not be classified as hazardous to the aquatic environment.

| Aquatic toxicity (acute) of components of the mixture |           |                         |             |                       |               |
|---|-----------|-------------------------|-------------|-----------------------|---------------|
| Name of substance                                     | CAS No    | Endpoint                | Value       | Species               | Exposure time |
| nickel powder   | 7440-02-0 | LC50                    | 15.3 mg/l   | fish                  | 96 h          |
| nickel powder   | 7440-02-0 | EC50                    | 406 µg/l    | aquatic invertebrates | 24 h          |
| nickel powder   | 7440-02-0 | ErC50                   | 237 µg/l    | algae                 | 72 h          |
| nickel powder   | 7440-02-0 | NOEC                    | 0.5 mg/l    | aquatic invertebrates | 72 h          |
| nickel powder   | 7440-02-0 | LOEC                    | >4,407 µg/l | aquatic invertebrates | 48 h          |
| nickel powder   | 7440-02-0 | growth (EbCx) 10%       | 662.6 µg/l  | aquatic invertebrates | 48 h          |
| nickel powder   | 7440-02-0 | growth rate (Er-Cx) 10% | 18.3 µg/l   | algae                 | 72 h          |

| Aquatic toxicity (chronic) of components of the mixture |           |                   |            |                       |               |
|---|-----------|-------------------|------------|-----------------------|---------------|
| Name of substance                                       | CAS No    | Endpoint          | Value      | Species               | Exposure time |
| nickel powder   | 7440-02-0 | ErC50             | 8,363 µg/l | fish                  | 40 d          |
| nickel powder   | 7440-02-0 | LC50              | ≤144 µg/l  | aquatic invertebrates | 21 d          |
| nickel powder   | 7440-02-0 | EC50              | ≤108 µg/l  | aquatic invertebrates | 21 d          |
| nickel powder   | 7440-02-0 | EbC50             | 6.2 µg/l   | aquatic invertebrates | 30 d          |
| nickel powder   | 7440-02-0 | NOEC              | 0.057 mg/l | fish                  | 32 d          |
| nickel powder   | 7440-02-0 | LOEC              | 0.12 mg/l  | fish                  | 32 d          |
| nickel powder   | 7440-02-0 | growth (EbCx) 10% | 404.3 µg/l | aquatic invertebrates | 10 d          |

**12.2 Persistence and degradability**

No further relevant information available.

**12.3 Bioaccumulative potential**

No further relevant information available.

**12.4 Mobility in soil**

Not mobile.

**12.5 Results of PBT and vPvB assessment**

Does not contain a PBT-/vPvB-substance in a concentration of  $\geq 0,1\%$ .

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**12.6 Endocrine disrupting properties**

Does not contain an endocrine disruptor (ED) in a concentration of  $\geq 0,1\%$ .

**12.7 Other adverse effects**

No further relevant information available.

**SECTION 13: Disposal considerations**

**13.1 Waste treatment methods**

Sewage disposal-relevant information

Do not empty into drains. Avoid release to the environment.

Waste treatment of containers/packagings

Handle contaminated packages in the same way as the substance itself.

**Remarks**

Please consider the relevant national or regional provisions. Waste shall be separated into the categories that can be handled separately by the local or national waste management facilities.

**SECTION 14: Transport information**

- 14.1 UN number** not subject to transport regulations
- 14.2 UN proper shipping name** not relevant
- 14.3 Transport hazard class(es)** none
- 14.4 Packing group** not assigned
- 14.5 Environmental hazards** non-environmentally hazardous acc. to the dangerous goods regulations
- 14.6 Special precautions for user**  
There is no additional information.
- 14.7 Maritime transport in bulk according to IMO instruments**  
No data available.

**Additional information for each of the UN Model Regulations**

**International Maritime Dangerous Goods Code (IMDG) - additional information**

Not subject to IMDG.

**International Civil Aviation Organization (ICAO-IATA/DGR) - additional information**

Not subject to ICAO-IATA.

**SECTION 15: Regulatory information**

- 15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**
- Relevant provisions of the European Union (EU)**
- Seveso Directive**

| 2012/18/EU (Seveso III) |                                       |   |       |
|-------------------------|---------------------------------------|---|-------|
| No                      | Dangerous substance/hazard categories | Qualifying quantity (tonnes) for the application of lower and upper-tier requirements | Notes |
|                         | not assigned                          |   |       |

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**Regulation concerning the establishment of a European Pollutant Release and Transfer Register (PRTR)**

| Pollutant release and transfer registers (PRTR) |           |         |   |
|---|-----------|---------|---|
| Name acc. to inventory                          | CAS No    | Remarks | Threshold for releases to air (kg/year) |
| nickel  | 7440-02-0 | (8)     | 50                                      |

Legend

(8) All metals shall be reported as the total mass of the element in all chemical forms present in the release

**Water Framework Directive (WFD)**

| List of pollutants (WFD) |   |           |           |         |
|--------------------------|---|-----------|-----------|---------|
| Name of substance        | Name acc. to inventory  | CAS No    | Listed in | Remarks |
| nickel powder            | nickel  | 7440-02-0 | b)        |         |
| nickel powder            | nickel compounds  |           | b)        |         |
| nickel powder            | nickel compounds  | 7440-02-0 | c)        |         |
| nickel powder            | Substances and preparations, or the breakdown products of such, which have been proved to possess carcinogenic or mutagenic properties or properties which may affect steroidogenic, thyroid, reproduction or other endocrine-related functions in or via the aquatic environment |           | a)        |         |
| nickel powder            | Metals and their compounds  |           | a)        |         |

Legend

- a) Indicative list of the main pollutants
- b) List of priority substances in the field of water policy
- c) Environmental Quality Standards for Priority Substances and certain other pollutants

**Regulation on persistent organic pollutants (POP)**

None of the ingredients are listed.

**National regulations (GB)**

**List of substances subject to authorisation (GB REACH, Annex 14) / SVHC - candidate list**

None of the ingredients are listed.

**Restrictions according to GB REACH, Annex 17**

| Dangerous substances with restrictions (GB REACH, Annex 17) |                        |                           |    |
|---|------------------------|---------------------------|----|
| Name  | Name acc. to inventory | Conditions of restriction | No |
| nickel powder   | Nickel                 | R27                       | 27 |

Legend

R27

- 1. Shall not be used:
    - (a) in any post assemblies which are inserted into pierced ears and other pierced parts of the human body unless the rate of nickel release from such post assemblies is less than 0.2 µg/cm<sup>2</sup>/week (migration limit);
    - (b) in articles intended to come into direct and prolonged contact with the skin such as:
      - earrings,
      - necklaces, bracelets and chains, anklets, finger rings,
      - wrist-watch cases, watch straps and tighteners,
      - rivet buttons, tighteners, rivets, zippers and metal marks, when these are used in garments,
- If the rate of nickel release from the parts of these articles coming into direct and prolonged contact with the skin is greater than 0.5

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Legend

µg/cm<sup>2</sup>/week.

(c) in articles referred to in point (b) where these have a non-nickel coating unless such coating is sufficient to ensure that the rate of nickel release from those parts of such articles coming into direct and prolonged contact with the skin will not exceed 0.5 µg/cm<sup>2</sup>/week for a period of at least two years of normal use of the article.

2. Articles which are the subject of paragraph 1 shall not be placed on the market unless they conform to the requirements set out in that paragraph.

3. The standards adopted by the European Committee for Standardisation (CEN) shall be used as the test methods for demonstrating the conformity of articles to paragraphs 1 and 2.

**15.2 Chemical Safety Assessment**

No chemical safety assessment has been carried out for this mixture.

**SECTION 16: Other information**

**Indication of changes (revised safety data sheet)**

Complete revised version.

**Abbreviations and acronyms**

| Abbr.           | Descriptions of used abbreviations  |
|-----------------|---|
| ADR             | Accord relatif au transport international des marchandises dangereuses par route (Agreement concerning the International Carriage of Dangerous Goods by Road)                         |
| Aquatic Chronic | Hazardous to the aquatic environment - chronic hazard   |
| Carc.           | Carcinogenicity   |
| CAS             | Chemical Abstracts Service (service that maintains the most comprehensive list of chemical substances)  |
| CMR             | Carcinogenic, Mutagenic or toxic for Reproduction   |
| DGR             | Dangerous Goods Regulations (see IATA/DGR)  |
| DMEL            | Derived Minimal Effect Level  |
| DNEL            | Derived No-Effect Level   |
| EbC50           | ≡ EC50: in this method, that concentration of test substance which results in a 50 % reduction in either growth (EbC50) or growth rate (ErC50) relative to the control                |
| EC50            | Effective Concentration 50 %. The EC50 corresponds to the concentration of a tested substance causing 50 % changes in response (e.g. on growth) during a specified time interval      |
| EC No           | The EC Inventory (EINECS, ELINCS and the NLP-list) is the source for the seven-digit EC number, an identifier of substances commercially available within the EU (European Union)     |
| ED              | Endocrine disruptor   |
| EH40/2005       | EH40/2005 Workplace exposure limits ( <a href="http://www.nationalarchives.gov.uk/doc/open-government-licence/">http://www.nationalarchives.gov.uk/doc/open-government-licence/</a> ) |
| EINECS          | European Inventory of Existing Commercial Chemical Substances   |
| ELINCS          | European List of Notified Chemical Substances   |
| ErC50           | ≡ EC50: in this method, that concentration of test substance which results in a 50 % reduction in either growth (EbC50) or growth rate (ErC50) relative to the control                |
| GB CLP          | The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use) (Amendment etc.) (EU Exit) Regulations 2019, SI 2019/720 (as amended)                            |
| GB REACH        | The REACH etc. (Amendment etc.) (EU Exit) Regulations 2019, SI 2019/758 (as amended)  |
| GHS             | "Globally Harmonized System of Classification and Labelling of Chemicals" developed by the United Nations   |
| IATA            | International Air Transport Association   |
| IATA/DGR        | Dangerous Goods Regulations (DGR) for the air transport (IATA)  |

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| Abbr.      | Descriptions of used abbreviations  |
|------------|---|
| ICAO       | International Civil Aviation Organization   |
| IMDG       | International Maritime Dangerous Goods Code   |
| index No   | The Index number is the identification code given to the substance in Part 3 of Annex VI to Regulation (EC) No 1272/2008  |
| LC50       | Lethal Concentration 50%: the LC50 corresponds to the concentration of a tested substance causing 50 % lethality during a specified time interval                       |
| LD50       | Lethal Dose 50 %: the LD50 corresponds to the dose of a tested substance causing 50 % lethality during a specified time interval  |
| LEL        | Lower explosion limit (LEL)   |
| LOEC       | Lowest Observed Effect Concentration  |
| NLP        | No-Longer Polymer   |
| NOEC       | No Observed Effect Concentration  |
| PBT        | Persistent, Bioaccumulative and Toxic   |
| PNEC       | Predicted No-Effect Concentration   |
| ppm        | Parts per million   |
| REACH      | Registration, Evaluation, Authorisation and Restriction of Chemicals  |
| RID        | Règlement concernant le transport International ferroviaire des marchandises Dangereuses (Regulations concerning the International carriage of Dangerous goods by Rail) |
| Skin Sens. | Skin sensitisation  |
| STEL       | Short-term exposure limit   |
| STOT RE    | Specific target organ toxicity - repeated exposure  |
| TWA        | Time-weighted average   |
| UEL        | Upper explosion limit (UEL)   |
| vPvB       | Very Persistent and very Bioaccumulative  |
| WEL        | Workplace exposure limit  |

**Key literature references and sources for data**

The REACH etc. (Amendment etc.) (EU Exit) Regulations 2019, SI 2019/758 (as amended). The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use) (Amendment etc.) (EU Exit) Regulations 2019, SI 2019/720 (as amended). GB mandatory classification and labelling.

Agreement concerning the International Carriage of Dangerous Goods by Road (ADR). Regulations concerning the International Carriage of Dangerous Goods by Rail (RID). International Maritime Dangerous Goods Code (IMDG). Dangerous Goods Regulations (DGR) for the air transport (IATA).

**Classification procedure**

Physical and chemical properties: The classification is based on tested mixture.

Health hazards, Environmental hazards: The method for classification of the mixture is based on ingredients of the mixture (additivity formula).

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**List of relevant phrases (code and full text as stated in section 2 and 3)**

| Code | Text  |
|------|---|
| H317 | May cause an allergic skin reaction.                            |
| H351 | Suspected of causing cancer.                                    |
| H372 | Causes damage to organs through prolonged or repeated exposure. |
| H412 | Harmful to aquatic life with long lasting effects.              |

**Disclaimer**

The information given in this SDS is based on the present level of our knowledge and experience. 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 KOBELCO STEEL, LTD.'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. 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.

**Warning text on the label**

WARNING: PROTECT yourself and others. Read and understand this information.  
FUMES AND GASES can be hazardous to your health.  
ARC RAYS can injure eyes and burn skin.  
ELECTRIC SHOCK can KILL.

- Before use, read and understand the manufacturer's instructions, Material Safety Data Sheets (MSDSs), and your employer's safety practices.
- Keep your head out of the fumes.
- Use adequate ventilation, exhaust at the arc, or both, to keep fumes and gases from your breathing zone and the general area.
- Wear correct eye, ear, and body protection.
- Do not touch free electrical parts.

**Annex to the extended Safety Data Sheet (eSDS)**

**Exposure Scenario:**

Read and understand the "Recommendations for Exposure Scenarios, Risk Management Measures and to identify Operational Conditions under which metals, alloys and metallic articles may be safely welded", which is available from your supplier and at <http://european-welding.org/health-safety>.