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

### 1.1. Product identifier

|                              |                                                                                                                             |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| <b>Name of the substance</b> | NICKEL                                                                                                                      |
| <b>Identification number</b> | 028-002-00-7 (Index number)                                                                                                 |
| <b>Registration number</b>   | 01-2119438727-29-0003                                                                                                       |
| <b>Synonyms</b>              | None.                                                                                                                       |
| <b>SDS number</b>            | 227019GNV                                                                                                                   |
| <b>Trade Name Synonyms</b>   | Nickel Squares, SUPERELECTRO TM, Full Plate Cathode, Nickel Crowns, D-Crowns, Micro Crowns, Sundries, Ribs, Starting Sheets |

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

|                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Identified uses</b>      | Manufacture and use of parts and products. Other registered uses, for this product, can be found in section 15 of this eSDS.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Uses advised against</b> | <p>Uses by workers in industrial setting:<br/>Design and manufacture of materials or articles which contain nickel, if they are intended for direct and prolonged contact with the skin where the release of nickel exceeds the limit set out in REACH Regulation 1907/2006 (Annex XVII).</p> <p>Manufacture of Ni-containing food contact materials (except Ni-Cr-plated materials) for which migration into foodstuff would exceed 0.14 mg/kg of Ni (according to Council of Europe and EDQM Guidelines on Metals and alloys used in food contact materials and articles, 2013).</p> <p>Manufacture of nickel-containing HIGH SULFUR stainless steel (AISI grade 303, or ISO 7153-1 reference grade N) for surgical implant applications.</p> <p>Manufacture of nickel or chromium-nickel plated heating coils in immersion kettles.</p> <p>Uses by professional workers:<br/>Use of nickel-containing HIGH SULFUR stainless steel (AISI grade 303, or ISO 7153-1 reference grade N) for surgical implant applications.</p> <p>Use of nickel in materials or articles intended for direct and prolonged contact with the skin where the release of nickel exceeds the limit set out in REACH Regulation 1907/2006 (Annex XVII).</p> <p>By consumer:<br/>Use of nickel in materials or articles intended for direct and prolonged contact with the skin where the release of nickel exceeds the limit set out in REACH Regulation 1907/2006 (Annex XVII).</p> <p>Use of Ni-containing food contact materials (with exception of Ni-Cr-plated materials) for which migration into foodstuff would exceed 0.14 mg/kg of Ni (according to Council of Europe and EDQM Guidelines on metals and alloys used as food contact materials and articles, 2013).</p> <p>Use of nickel or chromium-nickel plated heating coils in immersion kettles.</p> |

### 1.3. Details of the supplier of the safety data sheet

|                                        |                                             |
|----------------------------------------|---------------------------------------------|
| <b>Supplier</b>                        |                                             |
| <b>Company name</b>                    | Glencore Nikkelverk AS                      |
| <b>Address</b>                         | Postboks 604<br>4606 Kristiansand<br>Norway |
| <b>Telephone number:</b>               | +47 38 10 10 10                             |
| <b>Contact person</b>                  | product.safety@glencore.com                 |
| <b>E-mail</b>                          | product.safety@glencore.com                 |
| <b>1.4. Emergency telephone number</b> | +1 760 476 3961 (333085)                    |

|                      |                                                                                                         |
|----------------------|---------------------------------------------------------------------------------------------------------|
| <b>General in EU</b> | 112 (Available 24 hours a day. SDS/Product information may not be available for the Emergency Service.) |
|----------------------|---------------------------------------------------------------------------------------------------------|

## SECTION 2: Hazards identification

### 2.1. Classification of the substance or mixture

The substance has been assessed and/or tested for its physical, health and environmental hazards and the following classification applies. The substance/mixture has been assessed and/or tested for its physical, health and environmental hazards and the following classification applies.

#### Classification according to Regulation (EC) No 1272/2008 as amended

##### Health hazards

|                                                    |                                       |                                                                                                   |
|----------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------------------|
| Skin sensitisation                                 | Category 1                            | H317 - May cause an allergic skin reaction.                                                       |
| Carcinogenicity                                    | Category 2                            | H351 - Suspected of causing cancer.                                                               |
| Specific target organ toxicity - repeated exposure | Category 1 (Lung, Respiratory system) | H372 - Causes damage to organs (Lung, Respiratory system) through prolonged or repeated exposure. |

### 2.2. Label elements

#### Label according to Regulation (EC) No. 1272/2008 as amended

**Contains:** Nickel

##### Hazard pictograms



**Signal word** Danger

##### Hazard statements

|      |                                                                                            |
|------|--------------------------------------------------------------------------------------------|
| H317 | May cause an allergic skin reaction.                                                       |
| H351 | Suspected of causing cancer.                                                               |
| H372 | Causes damage to organs (Lung, Respiratory system) through prolonged or repeated exposure. |

#### Precautionary statements

##### Prevention

|      |                                                                                               |
|------|-----------------------------------------------------------------------------------------------|
| P201 | Obtain special instructions before use.                                                       |
| P260 | Do not breathe fumes and dusts.                                                               |
| P273 | Avoid release to the environment.                                                             |
| P261 | Avoid breathing dust/fume/gas/mist/vapours/spray.                                             |
| P270 | Do not eat, drink or smoke when using this product.                                           |
| P272 | Contaminated work clothing should not be allowed out of the workplace.                        |
| P280 | Wear protective gloves/protective clothing/eye protection/face protection/hearing protection. |
| P285 | In case of inadequate ventilation wear respiratory protection.                                |

##### Response

|             |                                                                                                                 |
|-------------|-----------------------------------------------------------------------------------------------------------------|
| P302 + P352 | IF ON SKIN: Wash with plenty of water.                                                                          |
| P308 + P313 | IF exposed or concerned: Get medical advice/attention.                                                          |
| P362 + P364 | Take off contaminated clothing and wash it before reuse.                                                        |
| P304        | IF INHALED:                                                                                                     |
| P341        | If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. |

**Storage** Not available.

**Disposal** Not available.

**Supplemental information on the label** None.

### 2.3. Other hazards

This substance does not meet vPvB / PBT criteria of Regulation (EC) No 1907/2006, Annex XIII. This substance does not meet vPvB / PBT criteria of Regulation (EC) No 1907/2006, Annex XIII. The substance is not included in the list established in accordance with REACH Article 59(1) for having endocrine disrupting properties. The substance is not considered to have endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605.

## SECTION 3: Composition/information on ingredients

### 3.1. Substances

## General information

| Chemical name                                                          | %      | CAS-No. / EC No.       | REACH Registration No. | Index No.    | Notes |
|------------------------------------------------------------------------|--------|------------------------|------------------------|--------------|-------|
| Nickel                                                                 | 85-100 | 7440-02-0<br>231-111-4 | 01-2119438727-29-0003  | 028-002-00-7 |       |
| <b>Classification:</b> Skin Sens. 1;H317, Carc. 2;H351, STOT RE 1;H372 |        |                        |                        |              |       |

### List of abbreviations and symbols that may be used above

ATE: Acute toxicity estimate.

M: M-factor

vPvB: very persistent and very bioaccumulative substance.

PBT: persistent, bioaccumulative and toxic substance.

#: This substance has been assigned Union workplace exposure limit(s).

All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

**Composition comments** This product is registered under the REACH Regulation 1907/2006 as a mono-constituent substance. The full text for all H-statements is displayed in section 16. All concentrations are in percent by weight. For more detailed chemical composition, refer to the certificate of analysis.

## SECTION 4: First aid measures

**General information** IF exposed or concerned: Get medical advice/attention. If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance. Wash contaminated clothing before reuse. Get medical attention/advice if you feel unwell. Seek medical attention for all burns, regardless how minor they may seem.

### 4.1. Description of first aid measures

**Inhalation** Call a physician if symptoms develop or persist. In case of exposure to fumes or particulates: Provide fresh air, warmth and rest, preferably in comfortable upright sitting position.

**Skin contact** Removal of solidified molten material from skin requires medical assistance. In case of contact with molten product, cool rapidly with water and seek immediate medical attention. Do not attempt to remove molten product from skin because skin will tear easily. Remove contaminated clothing immediately and wash skin with soap and water. Cuts or abrasions should be treated promptly with thorough cleansing of the affected area. In case of eczema or other skin disorders: Seek medical attention and take along these instructions. Contact with dust: Immediately remove contaminated clothing. Wash skin with soap and water.

**Eye contact** Do not rub eyes. Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Rinse with water. Remove contact lenses, if present and easy to do. Get medical attention if irritation develops and persists.

**Ingestion** Do NOT induce vomiting. Rinse mouth. Clean mouth with water and drink afterwards plenty of water. Get medical attention if any discomfort continues.

**4.2. Most important symptoms and effects, both acute and delayed** Dust may irritate the respiratory tract, skin and eyes. May cause an allergic skin reaction. Dermatitis. Rash. Prolonged exposure may cause chronic effects. Lung fibrosis.

**4.3. Indication of any immediate medical attention and special treatment needed** Provide general supportive measures and treat symptomatically. Keep victim under observation. Symptoms may be delayed.

## SECTION 5: Firefighting measures

**General fire hazards** Dust may form explosive mixture with air. No unusual fire or explosion hazards noted. Do not use water on molten metal: Explosion hazard could result.

### 5.1. Extinguishing media

**Suitable extinguishing media** Dry chemical, soda ash, lime or sand. Special powder against metal fires. Water spray, fog or mist.

**Unsuitable extinguishing media** Do not use water jet as an extinguisher, as this will spread the fire.

**5.2. Special hazards arising from the substance or mixture** Fire or high temperatures create: Metal oxides. Metal fumes. Dusts or fumes may form explosive mixtures in air. In a fire, ferronickel may form highly toxic substances: iron carbonyl and nickel carbonyl, a known carcinogen.

### 5.3. Advice for firefighters

**Special protective equipment for firefighters** Self-contained breathing apparatus and full protective clothing must be worn in case of fire. Use personal protective equipment as required.

**Special fire fighting procedures** In case of fire and/or explosion do not breathe fumes. Keep unnecessary personnel away. Move containers from fire area if you can do so without risk.

**Specific methods** Use standard firefighting procedures and consider the hazards of other involved materials.

## SECTION 6: Accidental release measures

### 6.1. Personal precautions, protective equipment and emergency procedures

**For non-emergency personnel** Keep unnecessary personnel away. Do not breathe dust. Wear appropriate protective equipment and clothing during clean-up. Ensure adequate ventilation. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Local authorities should be advised if significant spillages cannot be contained. Avoid contact with skin and eyes.

**For emergency responders** Keep unnecessary personnel away. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS. Use personal protection recommended in Section 8 of the SDS.

**6.2. Environmental precautions** Avoid release to the environment. Avoid discharge into drains, water courses or onto the ground. Avoid spreading dust or contaminated materials.

**6.3. Methods and material for containment and cleaning up** Prevent further leakage or spillage if safe to do so. Collect spillage. The product is immiscible with water and will sediment in water systems. Collect dust or particulates using a vacuum cleaner with a HEPA filter. Following product recovery, flush area with water.

Never return spills in original containers for re-use. Ensure that waste and contaminated materials are collected and removed from the work area as soon as possible in a suitably labelled container. Allow spilled material to solidify and scrape up with shovels into a suitable container for recycle or disposal. The product is insoluble in water.

**6.4. Reference to other sections** For personal protection, see section 8 of the SDS. For personal protection, see section 8 of the SDS. For waste disposal, see section 13 of the SDS. For waste disposal, see section 13 of the SDS.

## SECTION 7: Handling and storage

**7.1. Precautions for safe handling** Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe dust. Avoid breathing dust/fume/gas/mist/vapours/spray. Avoid contact with eyes, skin, and clothing. Avoid prolonged exposure. When using, do not eat, drink or smoke. Should be handled in closed systems, if possible. Provide adequate ventilation. Wear appropriate personal protective equipment. Wash hands thoroughly after handling. Observe good industrial hygiene practices. Access to work area should be restricted to people handling the product only. Welding, burning, sawing, brazing, grinding or machining operations may generate fumes and dusts. Use appropriate tools. Avoid contact with sharp edges and hot surfaces. Avoid generation and spreading of dust. Persons susceptible to allergic reactions should not handle this product. Pregnant women should not work with the product, if there is the least risk of exposure. Avoid contact with molten material. Do not use water on molten metal. Do not eat, drink or smoke when using the product.

**7.2. Conditions for safe storage, including any incompatibilities** Store locked up. Store in tightly closed container. Store in a well-ventilated place. Store in a dry place. Store away from incompatible materials (see section 10 of the SDS). Store away from incompatible materials.

**7.3. Specific end use(s)** Industrial use. For detailed information, see section 15. Observe industrial sector guidance on best practices.

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

#### Occupational exposure limits

**Ireland. Occupational Exposure Limits**  
**Material**

**Type**

**Value**

Nickel (CAS 7440-02-0)

TWA

0.5 mg/m<sup>3</sup>

**Biological limit values** No biological exposure limits noted for the ingredient(s).

**Recommended monitoring procedures** Follow the schedule for work place measurements. Follow standard monitoring procedures.

#### Derived no effect levels (DNELs)

##### General population

**Product**

**Value**

**Assessment factor**

**Notes**

Nickel (CAS 7440-02-0)

Long-term, Local, Dermal

0.035 mg/cm<sup>2</sup>

Long-term, Local, Inhalation

60 ng/m<sup>3</sup>

Long-term, Systemic, Inhalation

60 ng/m<sup>3</sup>

Long-term, Systemic, Oral

0.011 mg/kg bw/day

Short-term, Local, Inhalation

0.8 mg/m<sup>3</sup>

Short-term, Systemic, Oral

0.37 mg/kg bw/day

##### Workers

**Product**

**Value**

**Assessment factor**

**Notes**

Nickel (CAS 7440-02-0)

Long-term, Local, Dermal

0.035 mg/cm<sup>2</sup>

|                                 |                        |
|---------------------------------|------------------------|
| Long-term, Local, Inhalation    | 0.05 mg/m <sup>3</sup> |
| Long-term, Systemic, Inhalation | 0.05 mg/m <sup>3</sup> |
| Short-term, Local, Inhalation   | 11.9 mg/m <sup>3</sup> |

#### Predicted no effect concentrations (PNECs)

| Product                 | Value      | Assessment factor | Notes |
|-------------------------|------------|-------------------|-------|
| Nickel (CAS 7440-02-0)  |            |                   |       |
| Freshwater              | 7.1 µg/l   |                   |       |
| Marine water            | 8.6 µg/l   |                   |       |
| Secondary poisoning     | 0.12 mg/kg |                   |       |
| Sediment (freshwater)   | 109 mg/kg  |                   |       |
| Sediment (marine water) | 109 mg/kg  |                   |       |
| Soil                    | 29.9 mg/kg |                   |       |
| STP                     | 0.33 mg/l  |                   |       |

**Exposure guidelines** No exposure standards allocated.

#### 8.2. Exposure controls

**Appropriate engineering controls** Use explosion-proof equipment if high dust/air concentrations are possible. Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If material is ground, cut, or used in any operation which may generate dusts, use appropriate local exhaust ventilation to keep exposures below the recommended exposure limits. Provide easy access to water supply and eye wash facilities.

#### Individual protection measures, such as personal protective equipment

|                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>General information</b>             | Use personal protective equipment as required. Personal protection equipment should be chosen according to the CEN standards and in discussion with the supplier of the personal protective equipment. Keep working clothes separately. Personal protective equipment should be chosen according to the CEN standards and in discussion with the supplier of the personal protective equipment.                                                                                                                                                                                                 |
| <b>Eye/face protection</b>             | Wear dust-resistant safety goggles where there is danger of eye contact. If contact is likely, safety glasses with side shields are recommended. Eye protection should meet standard EN 166. In addition to safety glasses or goggles, a welding helmet with appropriate shaded shield is required during welding, burning, or brazing. A face shield is recommended, in addition to safety glasses or goggles, during sawing, grinding, or machining.                                                                                                                                          |
| <b>Skin protection</b>                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>- Hand protection</b>               | Wear appropriate chemical resistant gloves. Wear suitable protective gloves to prevent cuts and abrasions. E.g. type of ¾ dipped natural latex, with steel, fiberglass and Kevlar liner and long knitted cuff, cut protection level 5. When material is heated, wear gloves to protect against thermal burns. The protective gloves to be used must comply with the specifications of Regulation (EU) 2016/425 and the related standard EN374.                                                                                                                                                  |
| <b>- Other</b>                         | Wear appropriate chemical resistant clothing. Use of an impervious apron is recommended. Regular protective clothing with high visibility according to EN 471 Class 2 is recommended. Regular protective clothing with high visibility is recommended.                                                                                                                                                                                                                                                                                                                                          |
| <b>Respiratory protection</b>          | In case of inadequate ventilation or risk of inhalation of dust, use suitable respiratory equipment with particle filter (type P3). Follow guidance on selection, use, care and maintenance in accordance with EN 529. Check with respiratory protective equipment suppliers.                                                                                                                                                                                                                                                                                                                   |
| <b>Thermal hazards</b>                 | Wear appropriate thermal protective clothing, when necessary.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Hygiene measures</b>                | Observe any medical surveillance requirements. Do not eat, drink or smoke when using the 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. Contaminated work clothing should not be allowed out of the workplace. Routinely wash work clothing and protective equipment to remove contaminants. Private clothes and working clothes should be kept separately. Follow up on any medical surveillance requirements. |
| <b>Environmental exposure controls</b> | Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. Fume scrubbers, filters or engineering modifications to the process equipment may be necessary to reduce emissions to acceptable levels. Contain spills and prevent releases and observe national regulations on emissions. Notify relevant authorities if this material is released to the environment.                                                                                                                            |

## SECTION 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

|                        |                                                                                               |
|------------------------|-----------------------------------------------------------------------------------------------|
| <b>Physical state</b>  | Solid.                                                                                        |
| <b>Form</b>            | Solid forms such as: Pellets, Offcuts, Briquettes, Sheets, Cathodes, Cuts, Uncuts and Crowns. |
| <b>Colour</b>          | Silver-grey                                                                                   |
| <b>Odour</b>           | Odourless.                                                                                    |
| <b>Odour threshold</b> | Odourless.                                                                                    |

|                                                                 |                                                                                                            |
|-----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| <b>Melting point/freezing point</b>                             | 1455 °C (2651 °F)                                                                                          |
| <b>Boiling point or initial boiling point and boiling range</b> | 2730 °C (4946 °F)                                                                                          |
| <b>Flammability</b>                                             | Non flammable.                                                                                             |
| <b>Upper/lower flammability or explosive limits</b>             |                                                                                                            |
| <b>Explosive limit - lower ( %)</b>                             | Non flammable.                                                                                             |
| <b>Explosive limit – upper (%)</b>                              | Non flammable.                                                                                             |
| <b>Flash point</b>                                              | Does not flash.                                                                                            |
| <b>Auto-ignition temperature</b>                                | Property has not been measured.                                                                            |
| <b>Decomposition temperature</b>                                | Toxic gases and vapours (such as nickel carbonyl) may be released in the decomposition of nickel compound. |
| <b>pH</b>                                                       | Not applicable (the material is a solid).                                                                  |
| <b>Kinematic viscosity</b>                                      | Not applicable (the material is a solid).                                                                  |
| <b>Solubility</b>                                               |                                                                                                            |
| <b>Solubility (water)</b>                                       | Insoluble (in water).                                                                                      |
| <b>Partition coefficient (n-octanol/water) (log value)</b>      | Not applicable for inorganic substances.                                                                   |
| <b>Vapour pressure</b>                                          | 1 mm Hg (1810 °C / 3290 °F)                                                                                |
| <b>Density and/or relative density</b>                          |                                                                                                            |
| <b>Density</b>                                                  | Property has not been measured.                                                                            |
| <b>Relative density</b>                                         | 8.9 (25 °C / 77 °F)                                                                                        |
| <b>Vapour density</b>                                           | Not applicable (the material is a solid).                                                                  |
| <b>Particle characteristics</b>                                 | Solid forms.                                                                                               |

## 9.2. Other information

**9.2.1. Information with regard to physical hazard classes** No relevant additional information available.

### 9.2.2. Other safety characteristics

**Evaporation rate** Property has not been measured.

## SECTION 10: Stability and reactivity

|                                                 |                                                                                                                                                                                                                             |
|-------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>10.1. Reactivity</b>                         | Massive metal is non reactive under normal conditions of use, storage and transport.                                                                                                                                        |
| <b>10.2. Chemical stability</b>                 | The product is stable under normal conditions of use, storage and transport.                                                                                                                                                |
| <b>10.3. Possibility of hazardous reactions</b> | Hazardous polymerisation does not occur. Hazardous reactions do not occur.                                                                                                                                                  |
| <b>10.4. Conditions to avoid</b>                | Contact with incompatible materials. Contact with acids will release flammable hydrogen gas.                                                                                                                                |
| <b>10.5. Incompatible materials</b>             | Oxidising materials. Strong acids.                                                                                                                                                                                          |
| <b>10.6. Hazardous decomposition products</b>   | Toxic gases and vapors (such as nickel carbonyl) may be released in the decomposition of nickel compound. Welding, burning, sawing, brazing, grinding or machining operations may generate dusts and fumes of metal oxides. |

## SECTION 11: Toxicological information

**General information** Occupational exposure to the substance or mixture may cause adverse effects.

### Information on likely routes of exposure

|                     |                                                                                                                                                                |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Inhalation</b>   | Dust may irritate respiratory system. Suspected of causing cancer by inhalation. Causes damage to organs through prolonged or repeated exposure by inhalation. |
| <b>Skin contact</b> | Dust or powder may irritate the skin. May cause an allergic skin reaction.                                                                                     |
| <b>Eye contact</b>  | Dust may irritate the eyes.                                                                                                                                    |
| <b>Ingestion</b>    | Ingestion may cause irritation and malaise.                                                                                                                    |

**Symptoms** Dusts may irritate the respiratory tract, skin and eyes. May cause an allergic skin reaction. Dermatitis. Rash. Prolonged exposure may cause chronic effects. Lung fibrosis.

### 11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

**Acute toxicity** The acute oral toxicity of nickel metal has been determined in a well-performed animal study which concluded the acute oral LD50 was greater than >9000 mg/kg body weight. High concentrations of freshly formed fumes/dusts of metal oxides can produce symptoms of metal fume fever. Data on acute toxicity in animals via dermal exposure have not been found. Dermal acute toxicity is expected to be low in view of the low oral toxicity and the negligible absorption via the skin.

| Product                                  | Species                                                                                                                                                                                                                                                                                                                         | Test Results |
|------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| Nickel (CAS 7440-02-0)                   |                                                                                                                                                                                                                                                                                                                                 |              |
| <b>Acute</b>                             |                                                                                                                                                                                                                                                                                                                                 |              |
| <b>Oral</b>                              |                                                                                                                                                                                                                                                                                                                                 |              |
| LD50                                     | Rat                                                                                                                                                                                                                                                                                                                             | > 9000 mg/kg |
| <b>Skin corrosion/irritation</b>         | Due to partial or complete lack of data the classification is not possible. Not irritant in skin irritation study using the rabbit (animal number: 2, dose: 500mg/animal's ear, exposure period: 24 hours, observation period: 7 days).                                                                                         |              |
| <b>Serious eye damage/eye irritation</b> | Due to partial or complete lack of data the classification is not possible. No studies of eye irritation by metallic nickel have been found. Toxicity data from water-soluble nickel compounds can be used to estimate the potential of nickel metal to cause eye irritation. No classification for eye irritation is proposed. |              |
| <b>Respiratory sensitisation</b>         | Based on available data, the classification criteria are not met.                                                                                                                                                                                                                                                               |              |
| <b>Skin sensitisation</b>                | May cause an allergic skin reaction. Sufficient data from human studies exists to warrant classification of Ni metal as a dermal sensitizer.                                                                                                                                                                                    |              |
| <b>Germ cell mutagenicity</b>            | Due to partial or complete lack of data the classification is not possible.                                                                                                                                                                                                                                                     |              |
| <b>Carcinogenicity</b>                   | Suspected of causing cancer. Suspected of causing cancer by inhalation.                                                                                                                                                                                                                                                         |              |

#### IARC Monographs. Overall Evaluation of Carcinogenicity

Nickel (CAS 7440-02-0)

2B Possibly carcinogenic to humans.

|                                                           |                                                                                                                                                     |  |
|-----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|--|
| <b>Reproductive toxicity</b>                              | Due to partial or complete lack of data the classification is not possible.                                                                         |  |
| <b>Specific target organ toxicity - single exposure</b>   | Due to partial or complete lack of data the classification is not possible.                                                                         |  |
| <b>Specific target organ toxicity - repeated exposure</b> | Causes damage to organs (Lung, Respiratory system) through prolonged or repeated exposure.                                                          |  |
| <b>Aspiration hazard</b>                                  | Due to partial or complete lack of data the classification is not possible. Due to the physical form of the product it is not an aspiration hazard. |  |
| <b>Mixture versus substance information</b>               | The product is a substance.                                                                                                                         |  |

#### 11.2. Information on other hazards

|                                        |                                                                                                                                                                                                                                                                                                                                                                 |  |  |
|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
| <b>Endocrine disrupting properties</b> | The substance is not included in the list established in accordance with REACH Article 59(1) for having endocrine disrupting properties. This substance does not have endocrine disrupting properties with respect to human health, as it does not meet the assessment criteria laid out in Regulations (EC) No 1907/2006, (EU) No 2017/2100 and (EU) 2018/605. |  |  |
| <b>Other information</b>               | Welding or plasma arc cutting of metal and alloys can generate ozone, nitric oxides and ultraviolet radiation. Ozone overexposure may result in mucous membrane irritation or pulmonary discomfort. UV radiation can cause skin erythema and welders flash.                                                                                                     |  |  |

## SECTION 12: Ecological information

|                       |                                                                                                                                                                                                    |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>12.1. Toxicity</b> | The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment. |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| Product                                                | Species                                                              |                                             | Test Results                                                                       |
|--------------------------------------------------------|----------------------------------------------------------------------|---------------------------------------------|------------------------------------------------------------------------------------|
| Nickel (CAS 7440-02-0)                                 |                                                                      |                                             |                                                                                    |
| <b>Aquatic</b>                                         |                                                                      |                                             |                                                                                    |
| Algae                                                  | EC50                                                                 | Pseudokirchneriella subcapitata             | 0.18 mg/l, 72 hours<br>> 0.174 - < 0.311 mg/l, 96 hours Static                     |
| Crustacea                                              | EC50                                                                 | Water flea (Daphnia magna)                  | 100 mg/l, 48 hours<br>1 mg/l, 48 hours Static                                      |
| Fish                                                   | LC50                                                                 | Brachydanio rerio<br>Carp (Cyprinus carpio) | 100 mg/l, 96 hours<br>10.4 mg/l, 96 hours Static<br>1.3 mg/l, 96 hours Semi-static |
| <b>12.2. Persistence and degradability</b>             | The product is not biodegradable.                                    |                                             |                                                                                    |
| <b>12.3. Bioaccumulative potential</b>                 | Accumulates in soil and sediment. Potential to bioaccumulate is low. |                                             |                                                                                    |
| <b>Partition coefficient n-octanol/water (log Kow)</b> | Not applicable for inorganic substances.                             |                                             |                                                                                    |
| <b>Bioconcentration factor (BCF)</b>                   |                                                                      |                                             |                                                                                    |
| 270 mg/l                                               |                                                                      |                                             |                                                                                    |
| Species: Aquatic microorganisms                        |                                                                      |                                             |                                                                                    |

|                                                 |                                                                                                                                                                                                                                                                                                                                                                    |
|-------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>12.4. Mobility in soil</b>                   | Nickel in massive forms is not mobile in the environment.                                                                                                                                                                                                                                                                                                          |
| <b>12.5. Results of PBT and vPvB assessment</b> | This substance does not meet vPvB / PBT criteria of Regulation (EC) No 1907/2006, Annex XIII.                                                                                                                                                                                                                                                                      |
| <b>12.6. Endocrine disrupting properties</b>    | The substance is not included in the list established in accordance with REACH Article 59(1) for having endocrine disrupting properties. This substance does not have endocrine disrupting properties with respect to the environment, as it does not meet the assessment criteria laid out in Regulations (EC) No 1907/2006, (EU) No 2017/2100 and (EU) 2018/605. |
| <b>12.7. Other adverse effects</b>              | Nickel in massive forms presents a limited hazard for the environment. Nickel in form of particles or dust is harmful to aquatic organisms and may cause long-term adverse effects in the environment.                                                                                                                                                             |

## SECTION 13: Disposal considerations

### 13.1. Waste treatment methods

|                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Residual waste</b>               | Dispose in accordance with local regulations. Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions). Recover and recycle, if practical. Solid metal and alloys in the form of particles may be reactive. Its hazardous characteristics, including fire and explosion, should be determined prior to disposal. |
| <b>Contaminated packaging</b>       | Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers retain product residue, follow label warnings even after container is emptied.                                                                                                                                                      |
| <b>EU waste code</b>                | The Waste code should be assigned in discussion between the user, the producer and the waste disposal company. 06 04 05*                                                                                                                                                                                                                                                                                                                                                |
| <b>Disposal methods/information</b> | Collect and reclaim or dispose in sealed containers at licensed waste disposal site. This material and its container must be disposed of as hazardous waste. Dispose of contents/container in accordance with local/regional/national/international regulations.                                                                                                                                                                                                        |
| <b>Special precautions</b>          | Dispose in accordance with all applicable regulations.                                                                                                                                                                                                                                                                                                                                                                                                                  |

## SECTION 14: Transport information

### ADR

|                                           |                                   |
|-------------------------------------------|-----------------------------------|
| <b>14.1. UN number</b>                    | Not regulated as dangerous goods. |
| <b>14.2. UN proper shipping name</b>      | Not regulated as dangerous goods. |
| <b>14.3. Transport hazard class(es)</b>   |                                   |
| <b>Class</b>                              | Not assigned.                     |
| <b>Subsidiary risk</b>                    | -                                 |
| <b>Hazard No. (ADR)</b>                   | Not assigned.                     |
| <b>Tunnel restriction code</b>            | Not assigned.                     |
| <b>14.4. Packing group</b>                | Not assigned.                     |
| <b>14.5. Environmental hazards</b>        | No.                               |
| <b>14.6. Special precautions for user</b> | Not assigned.                     |

### RID

|                                           |                                   |
|-------------------------------------------|-----------------------------------|
| <b>14.1. UN number</b>                    | Not regulated as dangerous goods. |
| <b>14.2. UN proper shipping name</b>      | Not regulated as dangerous goods. |
| <b>14.3. Transport hazard class(es)</b>   |                                   |
| <b>Class</b>                              | Not assigned.                     |
| <b>Subsidiary risk</b>                    | -                                 |
| <b>14.4. Packing group</b>                | Not assigned.                     |
| <b>14.5. Environmental hazards</b>        | No.                               |
| <b>14.6. Special precautions for user</b> | Not assigned.                     |

### ADN

|                                           |                                   |
|-------------------------------------------|-----------------------------------|
| <b>14.1. UN number</b>                    | Not regulated as dangerous goods. |
| <b>14.2. UN proper shipping name</b>      | Not regulated as dangerous goods. |
| <b>14.3. Transport hazard class(es)</b>   |                                   |
| <b>Class</b>                              | Not assigned.                     |
| <b>Subsidiary risk</b>                    | -                                 |
| <b>14.4. Packing group</b>                | Not assigned.                     |
| <b>14.5. Environmental hazards</b>        | No.                               |
| <b>14.6. Special precautions for user</b> | Not assigned.                     |

## IATA

|                                    |                                   |
|------------------------------------|-----------------------------------|
| 14.1. UN number                    | Not regulated as dangerous goods. |
| 14.2. UN proper shipping name      | Not regulated as dangerous goods. |
| 14.3. Transport hazard class(es)   |                                   |
| Class                              | Not assigned.                     |
| Subsidiary risk                    | -                                 |
| 14.4. Packing group                | Not assigned.                     |
| 14.5. Environmental hazards        | No.                               |
| 14.6. Special precautions for user | Not assigned.                     |

## IMDG

|                                                               |                                                                                                                                   |
|---------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| 14.1. UN number                                               | Not regulated as dangerous goods.                                                                                                 |
| 14.2. UN proper shipping name                                 | Not regulated as dangerous goods.                                                                                                 |
| 14.3. Transport hazard class(es)                              |                                                                                                                                   |
| Class                                                         | Not assigned.                                                                                                                     |
| Subsidiary risk                                               | -                                                                                                                                 |
| 14.4. Packing group                                           | Not assigned.                                                                                                                     |
| 14.5. Environmental hazards                                   |                                                                                                                                   |
| Marine pollutant                                              | No.                                                                                                                               |
| EmS                                                           | Not assigned.                                                                                                                     |
| 14.6. Special precautions for user                            | Not assigned.                                                                                                                     |
| 14.7. Maritime transport in bulk according to IMO instruments | Not applicable. However, this product is a solid. When transported in bulk, it is not covered under Appendix I of the IMSBC Code. |

## SECTION 15: Regulatory information

### 15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

#### EU regulations

Regulation (EC) No. 1005/2009 on substances that deplete the ozone layer, Annex I and II, as amended

Not listed.

Regulation (EU) 2019/1021 On persistent organic pollutants (recast), as amended

Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 1 as amended

Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 2 as amended

Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 3 as amended

Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex V as amended

Not listed.

Regulation (EC) No. 166/2006 Annex II Pollutant Release and Transfer Registry, as amended

Nickel (CAS 7440-02-0)

Regulation (EC) No. 1907/2006, REACH Article 59(10) Candidate List as currently published by ECHA

Not listed.

#### Authorisations

Regulation (EC) No. 1907/2006, REACH Annex XIV Substances subject to authorization, as amended

Not listed.

#### Restrictions on use

Regulation (EC) No. 1907/2006, REACH Annex XVII Substances subject to restriction on marketing and use as amended

Nickel (CAS 7440-02-0)

Directive 2004/37/EC: on the protection of workers from the risks related to exposure to carcinogens and mutagens at work, as amended.

Not listed.

#### Other EU regulations

Directive 2012/18/EU on major accident hazards involving dangerous substances, as amended

Not listed.

|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Other regulations</b>                | <p>The product is classified and labelled in accordance with Regulation (EC) 1272/2008 (CLP Regulation) as amended.</p> <p>This Safety Data Sheet complies with the requirements of Regulation (EC) No 1907/2006, as amended.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>National regulations</b>             | <p>Follow national regulation for work with chemical agents in accordance with Directive 98/24/EC, as amended. Follow national regulation on the protection of workers from the risks of exposure to carcinogens and mutagens at work, in accordance with Directive 2004/37/EC, as amended. Young people under 18 years old are not allowed to work with this product according to EU Directive 94/33/EC on the protection of young people at work, as amended. According to Directive 92/85/EEC as amended, pregnant women should not work with the product, if there is the least risk of exposure. According to Directive 92/85/EEC as amended, pregnant women should not work with the product, if there is the least risk of exposure.</p> <p>Chemical Safety Assessment has been carried out.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>15.2. Chemical safety assessment</b> | <p>Exposure scenarios relevant for this material are annexed and distributed as separate document to this eSDS.</p> <p>Identified Uses:</p> <p>Uses by workers in industrial settings</p> <p>Production of nickel metal.</p> <p>S4A: Stainless, special steels and special alloys manufacturing.</p> <p>Integrated steel and iron manufacturing.</p> <p>EAF carbon steel.</p> <p>Powder Metallurgy.</p> <p>Metal surface treatment (nickel electroplating and nickel electroforming technologies).</p> <p>Production of nickel salts from nickel metal.</p> <p>Manufacturing of batteries using positive nickel electrodes.</p> <p>Production of catalyst.</p> <p>Use pre-reduced nickel containing catalyst.</p> <p>Production of magnets.</p> <p>Production of nickel-containing products (e.g. electronics).</p> <p>Production of brazing alloys.</p> <p>Use of brazing alloys.</p> <p>Production of silver-nickel contact material.</p> <p>Use of silver-nickel contact material.</p> <p>Sputter Deposition.</p> <p>Thin film deposition by evaporation technique.</p> <p>Uses by professional workers</p> <p>Use of brazing alloys.</p> <p>Use of silver-nickel contact material.</p> <p>Uses by consumers.</p> <p>Drinking water from nickel-containing kettles.</p> <p>Coinage.</p> <p>Direct and prolonged contact with skin.</p> <p>Drinking water from nickel containing pipes and taps.</p> <p>Food contact materials containing nickel.</p> <p>Piercings post containing nickel.</p> <p>Tools and other release surfaces containing nickel.</p> |

## SECTION 16: Other information

### List of abbreviations

PBT: Persistent, bioaccumulative and toxic.

vPvB: Very Persistent and very Bioaccumulative.

LD50: Lethal Dose, 50%.

LC50: Lethal Concentration, 50%.

EC50: Effective Concentration, 50%.

TWA: Time Weighted Average.

ADN: European Agreement Concerning the International Carriage of Dangerous Goods by Inland Waterways.

ADR: Agreement concerning the International Carriage of Dangerous Goods by Road.

CAS: Chemical Abstract Service.

CEN: European Committee for Standardization.

IATA: International Air Transport Association.

IBC Code: International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk.

IMDG: International Maritime Dangerous Goods.

MARPOL: International Convention for the Prevention of Pollution from Ships.

PBT: Persistent, bioaccumulative and toxic.

PEL: Permissible Exposure Limit.

RID: Regulations concerning the International Carriage of Dangerous Goods by Rail.

STEL: Short term exposure limit.

|                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                              | vPvB: Very persistent and very bioaccumulative.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>References</b>                                                                            | Chemical safety report.<br>IUCLID<br>IARC: International Agency for Research on Cancer.<br>ECHA registered substances database<br>Japan Industrial Safety and Health Law, Workplace Environment Assessment Standards<br>Japan. NITE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Information on evaluation method leading to the classification of mixture</b>             | Not applicable.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Full text of any statements, which are not written out in full under sections 2 to 15</b> | H317 May cause an allergic skin reaction.<br>H351 Suspected of causing cancer.<br>H372 Causes damage to organs through prolonged or repeated exposure.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>This SDS contains revisions in the following section(s):</b>                              | All sections.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Training information</b>                                                                  | Follow training instructions when handling this material.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
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