SAFETY DATA SHEET
Nickel


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

Date issued: 12.06.2017

1.1. Product identifier

Product name: Nickel
Synonyms: Nickel Electrolytic, Nickel carbonyl
REACH Reg. No., Comments: 01-2119438727-29-0055
CAS no.: 7440-02-0
EC no.: 231-111-4
Article no.: Severonickel Combine H-1Y, Severonickel Combine H-1, H-2, H-3, H-4, Norilsk Prime (K), Norilsk Standard (K), Nickel Pellets DNK-0, Nickel Pellets DNK-1, Nickel Pellets DNK
Extended SDS with ES incorporated: Yes

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

Use of the substance/preparation: S4A (stainless, special steels and special alloy clusters); Integrated steel and iron; EAF carbon steel; Powder metallurgy; Metal surface treatment (Nickel electroplating and nickel electroforming technologies); Manufacturing of batteries using positive nickel electrodes; Ni catalyst production from NiO-containing catalyst precursor; Use pre-reduced nickel containing catalyst; Production of magnets; Production of nickel containing products (e.g. Electronics); Production of brazing alloys; Production of contact materials; Sputter deposition; Thin film deposition by evaporation techniques. All identified uses are listed in the attached GES.

Uses advised against: Nickel in articles intended for direct and prolonged skin-contact. Nickel-containing food contact materials for which migration into foodstuff would exceed more than 0.1 mg/kg of nickel in accordance with the Council of Europe Guidelines on metals and alloys used as food contact materials (2002). Nickel-containing HIGH SULPHUR stainless steel for surgical implants. Immersion-type kettles which would release more than 0.05 mg/l of nickel into the water in accordance with the Council of Europe Guidelines on metals and alloys used as food contact materials (2002).

1.3. Details of the supplier of the safety data sheet

Manufacturer
Company name: JSC Kola GMK
Postal address: Monchegorsk-7
Postcode: 184507
City: Murmansk Region
Country: Russian Federation
Tel: +7(81536) 7-72-01

This safety data sheet has been created with Eco Publisher (EcoOnline)
1.4. Emergency telephone number

Emergency telephone Description: 3E EH&S Mission Control Center: +44 20 35147487 / Access Code: 334656

SECTION 2: Hazards identification

2.1. Classification of substance or mixture

Classification according to Regulation (EC) No 1272/2008 [CLP / GHS]
- Skin Sens. 1; H317
- STOT RE1; H372
- Carc. 2; H351

2.2. Label elements

Hazard Pictograms (CLP)

- Signal word: Warning
- Hazard statements: H317 May cause an allergic skin reaction.
- Precautionary statements: P202 Do not handle until all safety precautions have been read and understood. P333+P313 If skin irritation or rash occurs: Get medical advice / attention.

2.3. Other hazards

PBT / vPvB
- The PBT and vPvB criteria of Annex XIII to the regulation does not apply to inorganic substances.

SECTION 3: Composition/information on ingredients

3.1. Substances

<table>
<thead>
<tr>
<th>Substance</th>
<th>Identification</th>
<th>Classification</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nickel</td>
<td>CAS no.: 7440-02-0</td>
<td>Skin Sens. 1; H317</td>
<td>99,99 %</td>
</tr>
<tr>
<td></td>
<td>EC no.: 231-111-4</td>
<td>STOT RE1; H372</td>
<td></td>
</tr>
<tr>
<td></td>
<td>REACH Reg. No.: 01-2119438727-29-</td>
<td>Carc. 2; H351</td>
<td></td>
</tr>
</tbody>
</table>

SECTION 4: First aid measures

4.1. Description of first aid measures

- Inhalation: Remove affected person from the immediate area. Ensure supply of fresh air. If breathing is irregular or stopped, administer artificial respiration. Consult a physician.
- Skin contact: Wash off with soap and plenty of water. Remove soiled or soaked clothing immediately. Wash contaminated clothing before re-use.
- Eye contact: Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. If eye irritation persists, consult a specialist.
- Ingestion: Rinse mouth. Consult a physician.

4.2. Most important symptoms and effects, both acute and delayed
General symptoms and effects  Treat symptomatically.

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

Medical treatment  None.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media  The product itself does not burn. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment e.g.: Dry powder; Carbon dioxide (CO2); Water spray jet; Foam;

Improper extinguishing media  None.

5.2. Special hazards arising from the substance or mixture

Fire and explosion hazards  In the event of fire the following can be released: Metallic oxides;

5.3. Advice for firefighters

Personal protective equipment  Use personal protective equipment as required.

Other Information  Nickel is non-flammable, but very fine nickel particles can burn. Do not discharge into the drains/surface waters/groundwater.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures  Refer to protective measures listed in sections 7 and 8. Avoid contact with skin, eyes and clothing. Ensure adequate ventilation.

6.2. Environmental precautions

Environmental precautionary measures  Do not discharge into the drains/surface waters/groundwater.

6.3. Methods and material for containment and cleaning up

Other information  Pick up mechanically. Send in suitable containers for recovery or disposal. (Section 13)

6.4. Reference to other sections

Other instructions  See also section 8,13

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Handling  Take note of Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work. Avoid inhalation of dust and contact with skin and eyes. Use mechanical ventilation in case of handling which causes formation of dust. Avoid generating excess dust.

Protective Safety Measures

Advice on general occupational hygiene  Private clothes and working clothes should be kept separately.

7.2. Conditions for safe storage, including any incompatibilities

This safety data sheet has been created with Eco Publisher (EcoOnline)
Storage
Store in tightly closed original container in a dry and cool place.
Incompatible products: Acids; Oxidiser storage.

7.3. Specific end use(s)
Specific use(s): Exposure scenario is attached.
Generic exposure scenario available from: http://www.nickelconsortia.org/exposure-scenario-library.html

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

<table>
<thead>
<tr>
<th>Substance</th>
<th>Identification</th>
<th>Value</th>
<th>TWA Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nickel*</td>
<td></td>
<td>TWA (8h): 0.01 mg/m³</td>
<td>2013</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Exposure Limit Letter</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Letter description: Ni, alveol fraction</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Source: HTP Finland</td>
<td></td>
</tr>
</tbody>
</table>

DNEL / PNEC

<table>
<thead>
<tr>
<th>Substance</th>
<th>DNEL</th>
<th>Nickel</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Group: Professional</td>
<td>Value: 11.9 mg/m³</td>
</tr>
<tr>
<td></td>
<td>Route of exposure: Acute inhalation (local)</td>
<td>Value: 0.05 mg/m³</td>
</tr>
<tr>
<td></td>
<td>Group: Professional</td>
<td>Route of exposure: Long-term dermal (local)</td>
</tr>
<tr>
<td></td>
<td>Value: 0.035</td>
<td>Remarks: mg Ni/cm²</td>
</tr>
<tr>
<td></td>
<td>Route of exposure: Long-term inhalation (local)</td>
<td>Value: 0.05 mg/m³</td>
</tr>
</tbody>
</table>

8.2. Exposure controls

Precautionary measures to prevent exposure

Avoid contact with skin and eyes. Do not breathe dust. Avoid repeated exposure.

Eye / face protection

Suitable Eye Protection: Use eye protection. Wear full-face visor or shield.

Hand protection

Suitable gloves type: Wear protective gloves. Avoid prolonged skin contact.

Skin protection

This safety data sheet has been created with Eco Publisher (EcoOnline)
Suitable protective clothing
Wear appropriate clothing to prevent reasonably probable skin contact. Wear special protective clothing.

Respiratory protection
Recommended type of equipment
Use respiratory equipment with particle filter, type P3.

Hygiene / environmental
Specific hygiene measures
Isolate contaminated clothing and wash before reuse. Personal protection must be kept separate from other clothes. When using do not eat, drink or smoke.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Physical state</th>
<th>Solid.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colour</td>
<td>Silver-grey</td>
</tr>
<tr>
<td>Odour</td>
<td>Odourless.</td>
</tr>
<tr>
<td>Odour limit</td>
<td>Comments: Not relevant.</td>
</tr>
<tr>
<td>pH</td>
<td>Status: In delivery state</td>
</tr>
<tr>
<td></td>
<td>Comments: insoluble</td>
</tr>
<tr>
<td>Melting point / melting range</td>
<td>Comments: 1455°C</td>
</tr>
<tr>
<td>Boiling point / boiling range</td>
<td>Comments: 2730°C</td>
</tr>
<tr>
<td>Flash point</td>
<td>Comments: Technically not feasible.</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>The product is not flammable.</td>
</tr>
<tr>
<td>Lower explosion limit with unit of measurement</td>
<td>Comments: Not explosive</td>
</tr>
<tr>
<td>Upper explosion limit with units of measurement</td>
<td>Comments: Not explosive</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>Comments: 1 mmHg 1810°C</td>
</tr>
<tr>
<td>Density</td>
<td>Value: 8,9 g</td>
</tr>
<tr>
<td>Spontaneous combustability</td>
<td>Comments: The product is not flammable.</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Comments: Not applicable. Solid</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>Not explosive</td>
</tr>
<tr>
<td>Oxidising properties</td>
<td>no oxidizing</td>
</tr>
</tbody>
</table>

9.2. Other information

SECTION 10: Stability and reactivity

10.1. Reactivity
Reactivity
No dangerous reaction known under conditions of normal use.

10.2. Chemical stability
Stability
Stable under recommended storage conditions.

10.3. Possibility of hazardous reactions

This safety data sheet has been created with Eco Publisher (EcoOnline)
Possibility of hazardous reactions

No dangerous reaction known under conditions of normal use.

10.4. Conditions to avoid

Conditions to avoid
Avoid dust formation.

10.5. Incompatible materials

Materials to avoid
Oxidizing agents; Reacts with acids to form flammable/explosive hydrogen gases.

10.6. Hazardous decomposition products

Hazardous decomposition products
Metallic oxides;

Other information

SECTION 11: Toxicological information

11.1. Information on toxicological effects

<table>
<thead>
<tr>
<th>Substance</th>
<th>Nickel</th>
</tr>
</thead>
</table>
| Acute toxicity | Type of toxicity: Acute
Effect Tested: LD50
Route of exposure: Oral
Value: > 9000 mg/kg

Type of toxicity: Acute
Effect Tested: LC50
Route of exposure: Inhalation.
Value: > 10 mg/l

Type of toxicity: Acute
Effect Tested: NOAEL
Value: 0,012 mg/kg bw /d
Comments: Ni ion released from metallic nickel in water and food contact material

Other information regarding health hazards

Assessment of skin corrosion / irritation, classification
According to the classification criteria of the European Union, the product is not considered as being a skin irritant.
According to the classification criteria of the European Union, the product is not considered as being an eye irritant.

General respiratory or skin sensitisation
Skin sensitizer Skin Sens 1:H317 May cause an allergic skin reaction.
Not classified as sensitizer

Assessment carcinogenicity classification
Classification of the substance: Cat. 2 H351

Assessment specific target organ SE, classification
STOT RE 1 H372 Causes damage to organs lungs through prolonged or repeated exposure via inhalation. LOAEC = 0.1 mg Ni/m³
Target Organs Lungs If inhaled
Not applicable.

SECTION 12: Ecological information

12.1. Toxicity

This safety data sheet has been created with Eco Publisher (EcoOnline)
Substance
Acute aquatic, fish

<table>
<thead>
<tr>
<th>Toxicity type: Acute</th>
<th>Value: 0.4 – 320 mg/l</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effect dose concentration: LC50</td>
<td></td>
</tr>
<tr>
<td>Exposure time: 96 Tunti</td>
<td></td>
</tr>
<tr>
<td>Method: Pimephales promelas; Hoang et al., 2004) (Brachydanio rerio; Janssen Pharmaceutica, 1993d)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Toxicity type: Chronic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value: 40 – 15420 µg/l</td>
</tr>
<tr>
<td>Effect dose concentration: EC10</td>
</tr>
<tr>
<td>Method: Brachydanio rerio(Dave &amp; Xiu, 1991) Brachydanio rerio (Kienle et al., 2009)</td>
</tr>
</tbody>
</table>

Ecotoxicity
Ecotoxicity Reference Value (ERV) Nickel compounds
- acute 120 µg Ni/L (pH 6), 68 µg Ni/L (pH 8)
- chronic = 2.4 µg Ni/L

12.2. Persistence and degradability
Persistence and degradability
No data available.

12.3. Bioaccumulative potential
Bioaccumulative potential
Bioconcentration Terrestrial Compartment BSAF 0.013-1.86
Bioconcentration factor (BCF)
Value: 270

12.4. Mobility in soil
Mobility
Kp-Soil: log Kpsoil 2.86

12.5. Results of PBT and vPvB assessment
Substance
Nickel
PBT assessment results
The PBT and vPvB criteria of Annex XIII to the regulation does not apply to inorganic substances.

12.6. Other adverse effects
Other adverse effects / Remarks
Not applicable.

SECTION 13: Disposal considerations

13.1. Waste treatment methods
Specify the appropriate methods of disposal
Recover and reclaim or recycle, if practical. Treat the disposal of solids as hazardous waste.
Other Information
Contact manufacturer. Dispose of as special waste in compliance with local and national regulations.

SECTION 14: Transport information

14.1. UN number
Comments
Not classified as dangerous in the meaning of transport regulations.

14.2. UN proper shipping name
Comments
-
14.3. Transport hazard class(es)
Comments -

14.4. Packing group
Comments -

14.5. Environmental hazards
Comments -

14.6. Special precautions for user
Special safety precautions for user -

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Transport In Bulk Value No
(Yes/No)

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture
Assessed restrictions Reach 1907/2006 Annex XVII (27 Nickel and its compounds)

15.2. Chemical safety assessment
Chemical safety assessment performed Yes

SECTION 16: Other information

List of relevant H-phrases (Section 2 and 3).
H317 May cause an allergic skin reaction.
H351 Suspected of causing cancer
H372 Causes damage to organs through prolonged or repeated exposure

Classification according to Regulation (EC) No 1272/2008
STOT RE1; H372
Carc. 2; H351

Additional information
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Key literature references and sources for data
Nickel metal CRS

Exposure scenario
Nickel metal GES 2012.pdf