SAFETY DATA SHEET
NICKEL SULPHATE

The safety data sheet is in accordance with Commission Regulation (EU) 2015/830 of 28 May 2015 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

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

Date issued	19.06.2017

1.1. Product identifier

Product name	NICKEL SULPHATE
REACH Reg. No.	01-2119439361-44-0002
CAS no.	10101-97-0
EC no.	232-104-9
Extended SDS with ES incorporated	Yes

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

Use categories nordic (UCN).	
Use of the substance/preparation	Plating agent; Battery manufacturing; Production of nickel salts ; Manufacturing of micro nutrient additives for biogas production ; Production of pigments
Uses advised against	Do-it-yourself nickel electroplating hobby kits for plating.
Standard Industrial Classification (NACE)	

1.3. Details of the supplier of the safety data sheet

Manufacturer

Company name	Norilsk Nickel Harjavalta Oy
Postal address	Teollisuuskatu 1
Postcode	29200
City	Harjavalta
Country	Finland
Tel	+358 2 537 11
E-mail	product.safety@nornickel.fi
Enterprise no.	FI15917284

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 Irrit. 2; H315 Skin Sens. 1; H317 Muta. 2; H341 Acute tox. 4; H302 Acute tox. 4; H332 STOT RE1; H372 Repr. 1B; H360D Carc. 1A; H350i Resp. Sens. 1; H334 Aquatic Acute 1; H400 Aquatic Chronic 1; H410

2.2. Label elements

Hazard Pictograms (CLP)

Signal word	Danger
Hazard statements	H302 Harmful if swallowed. H332 Harmful if inhaled. H315 Causes skin irritation. H317 May cause an allergic skin reaction. H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled. H341 Suspected of causing genetic defects H350i May cause cancer by inhalation. H360D May damage the unborn child. H372 Causes damage to organs through prolonged or repeated exposure H410 Very toxic to aquatic life with long lasting effects.
Precautionary statements	P261 Avoid breathing dust / fume / gas / mist / vapours / spray. P270 Do not eat, drink or smoke when using this product. P363 Wash contaminated clothing before reuse. P273 Avoid release to the environment. P281 Use personal protective equipment as required. P308+P313 IF exposed or concerned: Get medical advice / attention.

2.3. Other hazards

Other hazards	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

Substance	Identification	Classification	Contents
Nickel sulphate hexahydrate	CAS no.: 10101-97-0 EC no.: 232-104-9	Skin Irrit. 2; H315 Skin Sens. 1; H317	100 %

	REACH Reg. No.: 01-2119439361-44-0002	Muta. 2; H341 Acute tox. 4; H302 Acute tox. 4; H332 STOT RE1; H372 Repr. 1B; H360D Carc. 1A; H350i Resp. Sens. 1; H334 Aquatic Acute 1; H400; M-factor 1 Aquatic Chronic 1; H410; M-factor 1
Substance comments	Substance, inorganic salt ($NiSO4 \cdot 6H2O$)	

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation	Remove affected person from source of contamination. Ensure supply of fresh air. Serious cases: If not breathing, give artificial respiration. Get medical attention.
Skin contact	Wash skin thoroughly with soap and water. Remove/Take off immediately all contaminated clothing. Remove contaminated clothing and launder thoroughly before re-use.
Eye contact	Immediately flush with plenty of water or eyewash solution for up to 10 minutes. Contact physician if discomfort continues.
Ingestion	Rinse mouth. Do not give victim anything to drink if he is unconscious. Get medical attention.

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 is non-combustible. Powder. Carbon dioxide ($CO2$). Water spray.
Improper extinguishing media	None.

5.2. Special hazards arising from the substance or mixture

Hazardous combustion products	Sulphurous gases (SOx). Metallic oxides;

5.3. Advice for firefighters

Personal protective equipment	Use personal protective equipment as required.
Other Information	Collect contaminated fire extinguishing water separately. 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	Avoid contact with skin, eyes and clothing. Ensure adequate ventilation. Avoid dust formation. Avoid breathing dust.

6.2. Environmental precautions

Environmental precautionary measures	Do not discharge into drains, water courses or onto the ground.

6.3. Methods and material for containment and cleaning up

Other information	Recover the product and place in a suitable container for reuse.

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

Storage	Store in tightly closed original container in a dry and cool place.
Conditions to avoid	Acids

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

Substance	Identification	Value	TWA Year
Nickel compounds *		TWA (8h): 0,05 mg/m3 Source: HTP Finland TWA (8h): 0,01 mg/m3 Source: HTP Finland Comments: Alveolar dust fraction	TWA Year: 2013

DNEL / PNEC

Substance	Nickel sulphate hexahydrate
DNEL	**Group:** Professional **Route of exposure:** Acute inhalation (systemic) **Value:** 104 **Remarks:** mg Ni/m3

	Group: Professional **Route of exposure:** Acute inhalation (local) **Value:** 1,6 **Remarks:** mg Ni/m3 **Group:** Professional **Route of exposure:** Long-term inhalation (systemic) **Value:** 0,05 **Remarks:** mg Ni/m3 **Group:** Professional **Route of exposure:** Long-term dermal (local) **Value:** 0,00044 **Remarks:** mg Ni/cm2 **Group:** Professional **Route of exposure:** Long-term inhalation (local) **Value:** 0,05 **Remarks:** mg Ni/m3
PNEC	**Comment :** PNEC marine water: 8.6 µg dissolved Ni/L PNEC Freshwater: 7.1 µg dissolved Ni/L PNEC Sediment: 109 mg Ni/kg dry wt.

8.2. Exposure controls

Precautionary measures to prevent exposure

Product-related measures to prevent exposure	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 contact with skin and eyes. Do not breathe dust. Avoid repeated exposure. When using, do not eat, drink or smoke. Ensure that eyewash stations and safety showers are close to the workstation location. Remove soiled or soaked clothing immediately. Clean skin thoroughly after work. Keep away from food, drink and animal feeding stuffs. Wear suitable protective equipment. Keep working clothes separately.

Eye / face protection

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

Hand protection

Suitable gloves type	Wear protective gloves.
Suitable materials	Butyl rubber. Neoprene. Polyvinyl chloride (PVC).

Skin protection

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.

Appropriate environmental exposure control

Environmental exposure controls	The employer shall fulfill requirements of IPPC Directive.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	Crystals or crystalline.
Colour	Light green
Odour	odourless
Odour limit	Comments: Ei määritettävissä.
pH	Value: 6.1 Consentration: 200 g/l
Melting point / melting range	Comments: Nickel sulphate hexahydrate changes its crystal form at 53 °C and looses all crystal water at 280 °C. At 848 °C it decomposes to nickel oxide and sulphuric trioxide. Nikkelisulfaattiheksahydraatin hilarakenne muuttuu 53 °C ja 280 °C se menettää kidevetensä. Aine hajoaa 848 °C nikkelioksidiksi ja rikkitrioksidiksi.
Boiling point / boiling range	Comments: Ei määritettävissä. Technically not feasible.
Flash point	Comments: Technically not feasible. Ei määritettävissä. epäorgaaninen Not Applicable – Inorganic chemical.
Flammability (solid, gas)	The product is not flammable.
Vapour pressure	Comments: Not applicable. Not relevant.
Vapour density	Comments: Not applicable. Not relevant.
Density	Value: 2,07 g/cm³
Spontaneous combustability	Comments: The product is not flammable. does not ignite
Decomposition temperature	Comments: Nickel sulphate hexahydrate changes its crystal form at 53 °C and looses all crystal water at 280 °C. At 848 °C it decomposes to nickel oxide and sulphuric trioxide.
Explosive properties	Not explosive
Oxidising properties	Not oxidizing.

9.2. Other information

Other physical and chemical properties

Physical and chemical properties	Bulk density 1.20-1.25 kg/dm3 Water solubility 625 g/l 0°C; 3407 g/l 100°C

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

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	Acids;

10.6. Hazardous decomposition products

Hazardous decomposition products	Metallic oxides; Sulphur oxides (SOx);

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Substance	Nickel sulphate hexahydrate
Acute toxicity	**Type of toxicity:** Acute **Effect Tested:** LD50 **Route of exposure:** Oral **Value:** 361,9 mg/kg **Animal test species:** Rat **Effect Tested:** LC50 **Route of exposure:** Inhalation. **Duration:** 4 Tunti **Value:** 2480 mg/m³ **Animal test species:** Rat

Other information regarding health hazards

Assessment of acute toxicity classification	Acute tox. 4 Harmful if swallowed. Harmful if inhaled.
Assessment of skin corrosion / irritation, classification	According to the classification criteria of the European Union, the product is not considered as being an eye irritant. Skin irrit. 2 Irritating to skin.
General respiratory or skin sensitisation	Skin sens. 1 H317 – May cause an allergic skin reaction. Resp. sens. 1 H334 – May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Assessment carcinogenicity classification	Carc 1A May cause cancer by inhalation. Repr. 1B May damage the unborn child. Muta 2 Suspected of causing genetic defects <state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard>.
Assessment specific target organ SE, classification	STOT RE 1 Causes damage to organs [Value] through prolonged orrepeated exposure [Value]. NOAEC 0,027 mg Ni/m³ Target Organs Lungs If inhaled
Aspiration hazard, comments	Not Applicable – Inorganic chemical.

SECTION 12: Ecological information

12.1. Toxicity

Substance	Nickel sulphate hexahydrate
Acute aquatic, fish	**Toxicity type:** Acute **Value:** 0,4 – 320 mg/l **Effect dose concentration :** LC50 **Exposure time:** 96 hour(s) **Method:** Fresh water **Test reference:** (Pimephales promelas; Hoang et al., 2004) (Brachydanio rerio; Janssen Pharmaceutica, 1993d

	Toxicity type: Acute **Value:** 24,8 – 350 mg/l **Effect dose concentration :** LC50 **Exposure time:** 96 hour(s) **Method:** Sea water **Test reference:** (Fundulus heteroclitus; Bielmyer et al., 2013) (Fundulus heteroclitus; Eisler and Hennekey, 1977)
Substance	Nickel sulphate hexahydrate
Acute aquatic, algae	**Toxicity type:** Acute **Value:** 0,013 – 4970 mg/l **Effect dose concentration :** LC50 **Exposure time:** 48 hour(s) **Method:** Fresh water **Test reference:** : (Ceriodaphnia dubia; Schubauer-Berigan et al., 1993) (Daphnia magna; Chapman and Recht, 1980) **Toxicity type:** Acute **Value:** 0,23 – 415 mg/l **Effect dose concentration :** LC50 **Exposure time:** 48 hour(s) **Method:** Sea water **Test reference:** (Haliotis refescens; Hunt et al., 2002b) (Penaeus duorarum; Bentley et al.,1975b)
Ecotoxicity	Aquatic acute 1 Aquatic chronic 1 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	Not Applicable – Inorganic chemical.

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

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	No studies have been found.

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	UN3077

14.2. UN proper shipping name

Comments	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (nickel sulphate)

14.3. Transport hazard class(es)

Comments	9

14.4. Packing group

Comments	III

14.5. Environmental hazards

Comments	Dangerous for the environment

14.6. Special precautions for user

Special safety precautions for user	None. Tunnel restriction code (-)

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Transport In Bulk Value (Yes/No)	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)
Legislation and regulations	94/27/EC ; 2007/96/EC

15.2. Chemical safety assessment

Chemical safety assessment performed	Yes

SECTION 16: Other information

List of relevant H-phrases (Section 2 and 3).	H302 Harmful if swallowed. H315 Causes skin irritation. H317 May cause an allergic skin reaction. H332 Harmful if inhaled. H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled. H341 Suspected of causing genetic defects H350i May cause cancer by inhalation. H360D May damage the unborn child. H372 Causes damage to organs through prolonged or repeated exposure H400 Very toxic to aquatic life.

	H410 Very toxic to aquatic life with long lasting effects.
Classification according to Regulation (EC) No 1272/2008 [CLP / GHS]	Skin Irrit. 2; H315 Skin Sens. 1; H317 Muta. 2; H341 Acute tox. 4; H302 Acute tox. 4; H332 STOT RE1; H372 Repr. 1B; H360D Carc. 1A; H350i Resp. Sens. 1; H334 Aquatic Acute 1; H400 Aquatic Chronic 1; H410
Additional information	Disclaimer The information in this document is believed to be correct as of the date issued. However, no warranty of merchantability, fitness for any particular purpose, or any other warranty is expressed or is to be implied regarding the accuracy or completeness of this information, the results to be obtained from the use of this information or the product, the safety of this product, or the hazards related to its use. This information and product are furnished on the condition that the person receiving them shall make his own determination as to the suitability of the product for his particular purpose and on the condition that he assume the risk of his use thereof.
Key literature references and sources for data	Chemical Safety Report
Exposure scenario	NickelSulphate_SDS-ES_DU.pdf