SAFETY DATA SHEET

Cobalt

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	22.06.2017
Revision date	16.09.2022

1.1. Product identifier

Product name	Cobalt
REACH Reg. No.	01-2119517392-44-0018
CAS No.	7440-48-4
EC No.	231-158-0
Article no.	NORILSK PRIME, NORILSK I, NORILSK II, NORILSK III, K1AY, K1A, K1, K2, NORNICKEL, NORNICKEL PRIME, NORNICKEL II, NORNICKEL III
Extended SDS with ES incorporated	Yes

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

Use of the substance / mixture	- Formulation of cobalt for the use in brazing techniques - Industrial use of cobalt containing catalysts, cobalt in passivation processes in surface treatment, cobalt in plating processes in surface treatment, cobalt in the manufacture of inorganic pigments, frits, ceramic ware, glass, cobalt in the production of diamond tools, cobalt in the production of varistors and magnets (calcination/sintering processes), cobalt in thermal spraying in surface treatment, cobalt metal in additive manufacturing (3D-printing), cobalt-containing mixtures in brazing techniques - Passivation processes in surface treatment at large industrial sites with continuous processes - Production and industrial use of cobalt containing alloys, steels and tools - Production of cobalt-containing batteries, hardmetal powder, hardmetal powder for surface technology, sintered hardmetal articles - Use of cobalt as an intermediate in the manufacture of catalysts - Use of cobalt in the manufacture of cobalt carboxylates, resonates and inorganic cobalt substances (intermediate use) - Use of cobalt-containing alloys for sandblasting in industrial settings
Uses advised against	None.

1.3. Details of the supplier of the safety data sheet

Manufacturer

Company name	JSC «Kola GMK»
Postal address	KGMK Industrial Site, Monchegorsk
Postcode	184507
City	Murmansk Region
Country	Russian Federation
Telephone number	+7(81536) 7-72-01
Fax	+7(81536) 7-99-86
Email	product.safety@nornickel.fi

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 the substance or mixture

Classification according to Regulation (EC) No 1272/2008 [CLP / GHS]	Acute Tox. 4; H302 Resp. Sens. 1B; H334 Skin Sens. 1; H317 Repr. 1B; H360Fd Carc. 1B; H350 Muta. 2; H341 Aquatic Chronic 4; H413

2.2. Label elements

Hazard pictograms (CLP)

Signal word	Danger
Hazard statements	H302 Harmful if swallowed. H317 May cause an allergic skin reaction. H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled. H350 May cause cancer . H360Fd May damage fertility. Suspected of damaging the unborn child. H341 Suspected of causing genetic defects . H413 May cause long lasting harmful effects to aquatic life.
Precautionary statements	P202 Do not handle until all safety precautions have been read and understood.

	P261 Avoid breathing dust / fume / gas / mist / vapours / spray. P333+P313 If skin irritation or rash occurs: Get medical advice / attention. P272 Contaminated work clothing should not be allowed out of the workplace. P304+P341 IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. P273 Avoid release to the environment.
Supplemental label information	CLP Annex VI classification Aq. Chr. 4 H413 Self classification Aq. Chr. 3 H412.

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

Substance	Identification	Classification	Contents	Notes
Cobalt	CAS No.: 7440-48-4 EC No.: 231-158-0	Acute Tox. 4; H302 Resp. Sens. 1B; H334 Skin Sens. 1; H317 Repr. 1B; H360Fd Carc. 1B; H350 Muta. 2; H341 Aquatic Chronic 4; H413	99,3 - 99,98 %	

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	Treat symptomatically.

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; 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	Wear self-contained breathing apparatus and protective suit.

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. Avoid breathing dust. Avoid dust formation. Avoid release to the environment.

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. Incompatible products Acids; Oxidising material.

7.3. Specific end use(s)

Specific use(s)	Exposure scenario is attached. Further information :http://www.cobaltreachconsortium.org/BLUE

SECTION 8: Exposure controls / personal protection

8.1. Control parameters

Occupational exposure limits	Country of origin: Australia Limit value (8 h): 0,05 mg/m³ Country of origin: USA - OSHA Limit value (8 h): 0,1 ml/m³ Country of origin: UK Limit value (8 h): 0,1 mg/m³ Country of origin: Sweden Limit value (8 h): 0,02 Comments: Cobalt and inorganic compounds Country of origin: Denmark Limit value (8 h): 0,01 mg/m³ Country of origin: The Netherlands Limit value (8 h): 0,02 ml/m³ Comments: dust and fume

Substance	Identification	Exposure limits	TWA Year
Cobalt and its inorganic compounds*		Limit value (8 h) : 0,02 mg/m³ Source: HTP Finland Comments: Co	TWA Year: 2012

DNEL / PNEC

Substance	Cobalt
DNEL	**Group:** Industrial **Route of exposure:** Long-term inhalation (local) **Reference:** 40 µg/m³ **Group:** Industrial **Route of exposure:** Long-term inhalation (systemic) **Value:** 54,1 µg/m³ **Group:** Industrial **Route of exposure:** Long-term dermal (systemic) **Value:** 7228,9 µg/kg bw/day
PNEC	**Route of exposure:** Freshwater **Value:** 1,06 µg/l **Route of exposure:** Saltwater **Value:** 2,36 µg/l **Route of exposure:** Sediment **Reference:** fresh water 53,8 mg Co/kg sediment dry wt marine water 69,8 mg Co/kg sediment dry wt

Route of exposure: Sewage treatment plant STP
Value: 0,37 mg/l

Route of exposure: Sewage treatment plant STP
Reference: 0.373 mg Co/L

8.2. Exposure controls

Precautionary measures to prevent exposure

Product related 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.
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.

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.

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	Solid.
Colour	Silver. Grey.
Odour	odourless
pH	Status: In delivery state Comments: insoluble
Melting point / melting range	Comments: 1494°C @1013hPa.
Boiling point / boiling range	Comments: 2927°C @1013hPa.

Flash point	Comments: Not relevant.
Flammability	The product is not flammable.
Vapour pressure	Comments: Not relevant.
Relative density	Value: 8,89 Temperature: 20 °C
Partition coefficient: n-octanol/ water	Comments: Not relevant. inorganic
Auto-ignition temperature	Comments: The product is not flammable.
Explosive properties	Not explosive
Oxidising properties	no oxidizing

9.2. Other information

Physical hazards

Particle size	Comments: Massive, solid metal.

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. Heat.

10.5. Incompatible materials

Materials to avoid	Strong oxidizing agents , Acids , Strong bases

10.6. Hazardous decomposition products

Hazardous decomposition products	Metallic oxides;

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Substance	Cobalt
Acute toxicity	**Type of toxicity:** Acute **Effect tested:** LD50

Route of exposure: Oral
Value: 550 mg/kg
Animal test species: Rat

Type of toxicity: Acute
Effect tested: LD50
Route of exposure: Dermal
Value: > 2000 mg/kg

Type of toxicity: Acute
Effect tested: LC100
Route of exposure: Inhalation (dust)
Animal test species: Rat
Comments: 50 µg Co/L D50=2.4 µm mmad = 2,75-3,26) especially fine dust/ powder

Other information regarding health hazards

Assessment of acute toxicity, classification	Acute tox. 4 H302 Harmful if swallowed.
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 Sens 1: H317 May cause an allergic skin reaction. Resp Sens 1 B : H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Mutagenicity	Muta. 2 H341 Suspected of causing genetic defects .
Carcinogenicity, other information	Carc. 1B H350 May cause cancer.
Reproductive toxicity	Repr. 2 H361 Suspected of damaging fertility. Suspected of damaging the unborn child
Assessment of specific target organ toxicity - single exposure, classification	Not relevant.
Assessment of specific target organ toxicity - repeated exposure, classification	Not relevant.
Aspiration hazard, comments	Not relevant.

11.2 Other information

Endocrine disruption	No information available.

SECTION 12: Ecological information

12.1. Toxicity

Substance	Cobalt
Aquatic toxicity, fish	**Value:** 0,8 mg/l **Effect dose concentration:** LC50 **Method:** Fresh water

	Value: 350 µg/l **Effect dose concentration:** NOEC **Method:** Fresh water
Substance	Cobalt
Aquatic toxicity, algae	**Value:** 310,4 µg/l **Effect dose concentration:** EC50 **Method:** Fresh water **Comments:** Co/l **Value:** 24,1 µg/l **Effect dose concentration:** EC50 **Method:** Sea water **Value:** 76,4 µg/l **Effect dose concentration:** NOEC **Method:** Fresh water **Value:** 1,23 µg/l **Effect dose concentration:** NOEC **Method:** Sea water
Substance	Cobalt
Aquatic toxicity, crustacean	**Value:** 0,61 mg/l **Effect dose concentration:** LC50 **Method:** Fresh water **Value:** 2,32 mg/l **Effect dose concentration:** LC50 **Method:** Sea water **Value:** 7,55 µg/l **Effect dose concentration:** NOEC **Method:** Fresh water **Value:** 206 µg/l **Effect dose concentration:** NOEC **Method:** Sea water
Ecotoxicity	CLP Annex VI classification is Aq. Chr. 4 H413 Based on study results classification is Aq.Chr.3 H412 Harmful to aquatic life with long lasting effects. By analogy with similar materials: Cobalt dichloride.

12.2. Persistence and degradability

Persistence and degradability description/evaluation	The methods for determining biodegradability are not applicable to inorganic substances.

12.3. Bioaccumulative potential

Bioaccumulation, comments	Aquatic plants: Bioconcentration factor (BCF) : >100 - 5000. Aquatic invertebrates: BCF <515. Fresh water, Fish: BCF/ BAF <10. Marine, Fish: BCF/ BAF <10.

	The substance has low potential for bioaccumulation.

12.4. Mobility in soil

12.5. Results of PBT and vPvB assessment

Results of PBT and vPvB assessment	Not Classified as PBT/vPvB by current EU criteria.

12.6. Endocrine disrupting properties

Endocrine disrupting properties	No information available.

12.7. Other adverse effects

Additional ecological information	No data available.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Appropriate methods of disposal for the chemical	Recover and reclaim or recycle, if practical.
Appropriate methods of disposal for the contaminated packaging	Contaminated packaging should be emptied as far as possible. Packaging that cannot be cleaned should be disposed as special waste in compliance with local and national regulations.

SECTION 14: Transport information

14.1. UN number

Comments	The product is not covered by international regulation on the transport of dangerous goods (IMDG, IATA, ADR/RID).

14.2. UN proper shipping name

Comments	The product is not covered by international regulation on the transport of dangerous goods (IMDG, IATA, ADR/RID).

14.3. Transport hazard class(es)

Comments	The product is not covered by international regulation on the transport of dangerous goods (IMDG, IATA, ADR/RID).

14.4. Packing group

Comments	The product is not covered by international regulation on the transport of dangerous goods (IMDG, IATA, ADR/RID).

14.5. Environmental hazards

Comments	The product is not covered by international regulation on the transport of dangerous goods (IMDG, IATA, ADR/RID).

14.6. Special precautions for user

Special safety precautions for user	The product is not covered by international regulation on the transport of dangerous goods (IMDG, IATA, ADR/RID).

14.7. Maritime transport in bulk according to IMO instruments

Transport in bulk (yes/no)	No

SECTION 15: Regulatory information

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

Assessed restrictions	Not entered.

15.2. Chemical safety assessment

Substance	Cobalt
Chemical safety assessment performed	Yes

SECTION 16: Other information

List of relevant H-phrases (Section 2 and 3)	H302 Harmful if swallowed. 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 . H350 May cause cancer . H360Fd May damage fertility. Suspected of damaging the unborn child. H413 May cause long lasting harmful effects to aquatic life.
Key literature references and sources for data	Chemical Safety Report
Information added, deleted or revised	Relevant changes compared to the previous version of the safety data sheet are indicated with verticle lines in the left margin.
Version	7
Exposure scenario	Cobalt-ES-2021-06-uses only.docx