SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Revision Date 30-Nov-2024 **Revision Number** 4

Section 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier

Product Description: Nickel on silica-alumina, catalyst
Cat No. : **31276**
Molecular Formula 66+5% Ni

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

Recommended Use Laboratory chemicals.
Uses advised against No Information available

1.3. Details of the supplier of the safety data sheet

Company

Thermo Fisher (Kandel) GmbH
Erlenbachweg 2, 76870 Kandel, Germany
Tel: +49 (0) 721 84007 280
Fax: +49 (0) 721 84007 300

Swiss distributor - Fisher Scientific AG
Neuhofstrasse 11, CH 4153 Reinach
Tel: +41 (0) 56 618 41 11
https://www.fishersci.ch/ch/en/customer-help-support/forms/email-us.html

E-mail address begel.sdsdesk@thermofisher.com

1.4. Emergency telephone number

For information **US** call: 001-800-227-6701 / **Europe** call: +32 14 57 52 11
Emergency Number **US:**001-201-796-7100 / **Europe:** +32 14 57 52 99
CHEMTREC Tel. No.**US:**001-800-424-9300 / **Europe:**001-703-527-3887

customers in Switzerland:
Tox Info Suisse Emergency Number: **145 (24hr)**
Tox Info Suisse: +41-44 251 51 51 (Emergency number from abroad)
Chemtrec (24h) Toll-Free: 0800 564 402
Chemtrec Local: +41-43 508 20 11 (Zurich)

Poison Centre - Emergency information services

Ireland : National Poisons Information Centre (NPIC) -
01 809 2166 (8am-10pm, 7 days a week)
Malta : +356 2395 2000
Cyprus : +357 2240 5611

Section 2: HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

CLP Classification - Regulation (EC) No 1272/2008

Physical hazards

Flammable solids	Category 2 (H228)

Health hazards

Skin Sensitization	Category 1 (H317)
Carcinogenicity	Category 1A (H350i)
Specific target organ toxicity - (repeated exposure)	Category 1 (H372)

Environmental hazards

Chronic aquatic toxicity	Category 4 (H413)

Full text of Hazard Statements: see section 16

2.2. Label elements

Signal Word **Danger**

Hazard Statements

H228 - Flammable solid
H317 - May cause an allergic skin reaction
H350i - May cause cancer by inhalation
H372 - Causes damage to organs through prolonged or repeated exposure
H413 - May cause long lasting harmful effects to aquatic life

Precautionary Statements

P302 + P352 - IF ON SKIN: Wash with plenty of soap and water
P201 - Obtain special instructions before use
P280 - Wear protective gloves/protective clothing/eye protection/face protection
P308 + P313 - IF exposed or concerned: Get medical advice/attention
P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking

Additional EU labelling

Restricted to professional users

2.3. Other hazards

Toxicity to Soil Dwelling Organisms
This product does not contain any known or suspected endocrine disruptors

Section 3: Composition/information on ingredients

3.2. Mixtures

Component	CAS No	EC No	Weight %	CLP Classification - Regulation (EC) No 1272/2008
Nickel	7440-02-0	231-111-4	50.0	Flam. Sol. 2 (H228) Skin Sens. 1 (H317) Carc. 2 (H351) STOT RE 1 (H372) Aquatic Chronic 3 (H412)
Nickel oxide (NiO)	1313-99-1	EEC No. 215-215-7	25.0	Skin Sens. 1 (H317) Carc. 1A (H350i) STOT RE 1 (H372) Aquatic Chronic 4 (H413)
Aluminum oxide (Al2O3)	1344-28-1	215-691-6	13	-
Silica, amorphous	7631-86-9	EEC No. 231-545-4	12.0	-

Full text of Hazard Statements: see section 16

Section 4: First aid measures

4.1. Description of first aid measures

General Advice If symptoms persist, call a physician.

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.

Skin Contact Wash off immediately with plenty of water for at least 15 minutes. If skin irritation persists, call a physician.

Ingestion Clean mouth with water and drink afterwards plenty of water. Get medical attention if symptoms occur.

Inhalation Remove to fresh air. If not breathing, give artificial respiration. Get medical attention if symptoms occur.

Self-Protection of the First Aider Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination.

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

May cause allergic skin reaction. Symptoms of allergic reaction may include rash, itching, swelling, trouble breathing, tingling of the hands and feet, dizziness, lightheadedness, chest pain, muscle pain or flushing

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

Notes to Physician Treat symptomatically.

Section 5: Firefighting measures

5.1. Extinguishing media

Suitable Extinguishing Media
approved class D extinguishers. Do not use water or foam.

Extinguishing media which must not be used for safety reasons
No information available.

5.2. Special hazards arising from the substance or mixture

Thermal decomposition can lead to release of irritating gases and vapors.

Hazardous Combustion Products
Silicon dioxide, Nickel oxides, Fumes of aluminum or aluminum oxide.

5.3. Advice for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

Section 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Ensure adequate ventilation. Use personal protective equipment as required. Avoid dust formation.

6.2. Environmental precautions

Do not flush into surface water or sanitary sewer system. Should not be released into the environment. Do not allow material to contaminate ground water system.

6.3. Methods and material for containment and cleaning up

Sweep up and shovel into suitable containers for disposal. Keep in suitable, closed containers for disposal.

6.4. Reference to other sections

Refer to protective measures listed in Sections 8 and 13.

Section 7: Handling and storage

7.1. Precautions for safe handling

Wear personal protective equipment/face protection. Ensure adequate ventilation. Do not get in eyes, on skin, or on clothing. Avoid ingestion and inhalation. Avoid dust formation.

Hygiene Measures
Handle in accordance with good industrial hygiene and safety practice. Keep away from food, drink and animal feeding stuffs. Do not eat, drink or smoke when using this product. Remove and wash contaminated clothing and gloves, including the inside, before re-use. Wash hands before breaks and after work.

7.2. Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place.

Technical Rules for Hazardous Substances (TRGS) 510 Storage Class (LGK) (Germany)	Storage Class/LGK 4.1B
Switzerland - Storage of hazardous substances	Storage class - SC 4.1

https://www.kvu.ch/de/themen/stoffe-und-produkte
https://www.kvu.ch/fr/themes/substances-et-produits
https://www.kvu.ch/it/temi/sostanze-e-prodotti

7.3. Specific end use(s)

Use in laboratories

Section 8: Exposure controls/personal protection

8.1. Control parameters

Exposure limits
List source(s): **UK** - EH40/2005 Work Exposure Limits, Forth edition. Published 2020. **IRE -** 2010 Code of Practice for the Safety, Health and Welfare at Work (Chemical Agents) Regulations 2001. Published by the Health and Safety Authority. **CH** - The Government of Switzerland has set a directive on limit values for working materials (Grenzwerte am Arbeitsplatz) which is based on the Swiss Federal Regulation "Verordnung über die Verhütung von Unfällen und Berufskrankheiten". This directive is administered, periodically revised and enforced by SUVA (Swiss National Accident Insurance Fund).

Component	European Union	The United Kingdom	France	Belgium	Spain
Nickel		STEL: 1.5 mg/m³ 15 min TWA: 0.5 mg/m³ 8 hr Skin	TWA / VME: 1 mg/m³ (8 heures). TWA / VME: 1 mg/m³ (8 heures). metal gratings	TWA: 1 mg/m³ 8 uren	TWA / VLA-ED: 1 mg/m³ (8 horas)
Nickel oxide (NiO)		STEL: 1.5 mg/m³ 15 min TWA: 0.5 mg/m³ 8 hr Skin	TWA / VME: 1 mg/m³ (8 heures).		TWA / VLA-ED: 0.2 mg/m³ (8 horas)
Aluminum oxide (Al2O3)		STEL: 30 mg/m³ 15 min STEL: 12 mg/m³ 15 min TWA: 10 mg/m³ 8 hr TWA: 4 mg/m³ 8 hr	TWA / VME: 10 mg/m³ (8 heures).	TWA: 1 mg/m³ 8 uren	TWA / VLA-ED: 10 mg/m³ (8 horas) TWA / VLA-ED: 1 mg/m³ (8 horas)
Silica, amorphous		STEL: 18 mg/m³ 15 min STEL: 7.2 mg/m³ 15 min TWA: 6 mg/m³ 8 hr TWA: 2.4 mg/m³ 8 hr			

Component	Italy	Germany	Portugal	The Netherlands	Finland
Nickel		TWA: 0.03 mg/m³ (8 Stunden). AGW - exposure factor 8 TWA: 0.006 mg/m³ (8 Stunden). AGW - exposure factor 8	TWA: 1.5 mg/m³ 8 horas		TWA: 0.01 mg/m³ 8 tunteina
Nickel oxide (NiO)		TWA: 0.03 mg/m³ (8 Stunden). AGW - exposure factor 8	TWA: 0.2 mg/m³ 8 horas		TWA: 0.01 mg/m³ 8 tunteina TWA: 0.05 mg/m³ 8 tunteina
Aluminum oxide (Al2O3)		TWA: 1.25 mg/m³ (8 Stunden). AGW - exposure factor 2 TWA: 10 mg/m³ (8 Stunden). AGW - exposure factor 2 TWA: 4 mg/m³ (8 Stunden). MAK TWA: 1.5 mg/m³ (8 Stunden). MAK	TWA: 1 mg/m³ 8 horas		
Silica, amorphous		TWA: 4 mg/m³ (8 Stunden). AGW - TWA: 0.02 mg/m³ (8 Stunden). MAK Höhepunkt: 0.16 mg/m³			TWA: 5 mg/m³ 8 tunteina

Component	Austria	Denmark	Switzerland	Poland	Norway
Nickel	TRK-KZGW: 2 mg/m³	TWA: 0.05 mg/m³ 8	TWA: 0.5 mg/m³ 8	TWA: 0.25 mg/m³ 8	TWA: 0.05 mg/m³ 8

	15 Minuten TRK-TMW: 0.5 mg/m³	timer STEL: 0.1 mg/m³ 15 minutter	Stunden	godzinach	timer STEL: 0.15 mg/m³ 15 minutter. value calculated
Nickel oxide (NiO)	TRK-KZGW: 2 mg/m³ 15 Minuten TRK-TMW: 0.5 mg/m³		TWA: 0.05 mg/m³ 8 Stunden		TWA: 0.05 mg/m³ 8 timer
Aluminum oxide (Al2O3)	MAK-KZGW: 10 mg/m³ 15 Minuten MAK-TMW: 5 mg/m³ 8 Stunden	TWA: 5 mg/m³ 8 timer TWA: 2 mg/m³ 8 timer STEL: 10 mg/m³ 15 minutter STEL: 4 mg/m³ 15 minutter	STEL: 24 mg/m³ 15 Minuten TWA: 3 mg/m³ 8 Stunden TWA: 10 mg/m³ 8 Stunden	TWA: 2.5 mg/m³ 8 godzinach TWA: 1.2 mg/m³ 8 godzinach	TWA: 10 mg/m³ 8 timer STEL: 20 mg/m³ 15 minutter. set equal to the limit value for Nuisance dust;value calculated
Silica, amorphous	MAK-TMW: 4 mg/m³ 8 Stunden		TWA: 4 mg/m³ 8 Stunden		TWA: 1.5 mg/m³ 8 timer STEL: 3 mg/m³ 15 minutter. value calculated respirable dust

Component	Bulgaria	Croatia	Ireland	Cyprus	Czech Republic
Nickel	TWA: 0.05 mg/m³	TWA-GVI: 0.5 mg/m³ 8 satima.	TWA: 0.5 mg/m³ 8 hr. STEL: 1.5 mg/m³ 15 min		TWA: 0.05 mg/m³ 8 hodinách. respirable fraction of aerosol Ceiling: 1 mg/m³
Aluminum oxide (Al2O3)		TWA-GVI: 10 mg/m³ 8 satima. total dust, inhalable particles TWA-GVI: 4 mg/m³ 8 satima. respirable dust			
Silica, amorphous			TWA: 6 mg/m³ 8 hr. total inhalable dust TWA: 2.4 mg/m³ 8 hr. respirable dust STEL: 18 mg/m³ 15 min STEL: 7.2 mg/m³ 15 min		TWA: 0.1 mg/m³ 8 hodinách. respirable fraction TWA: 4.0 mg/m³ 8 hodinách. amorphous SiO2

Component	Estonia	Gibraltar	Greece	Hungary	Iceland
Nickel	TWA: 0.5 mg/m³ 8 tundides.		TWA: 1 mg/m³	TWA: 0.01 mg/m³ 8 órában. AK	TWA: 0.05 mg/m³ 8 klukkustundum. Ni dust and powder Ceiling: 0.1 mg/m³ Ni dust and powder
Nickel oxide (NiO)	TWA: 0.1 mg/m³ 8 tundides. Ni				
Aluminum oxide (Al2O3)	TWA: 10 mg/m³ 8 tundides. total dust TWA: 4 mg/m³ 8 tundides. respirable dust		TWA: 10 mg/m³ TWA: 5 mg/m³	TWA: 52 mg/m³ 8 órában. AK Al	TWA: 10 mg/m³ 8 klukkustundum. Al Ceiling: 20 mg/m³ Al
Silica, amorphous	TWA: 2 mg/m³ 8 tundides. amorphous respirable dust				

Component	Latvia	Lithuania	Luxembourg	Malta	Romania
Nickel	TWA: 0.05 mg/m³	TWA: 0.5 mg/m³ IPRD			TWA: 0.1 mg/m³ 8 ore STEL: 0.5 mg/m³ 15 minute
Aluminum oxide (Al2O3)	TWA: 6 mg/m³	TWA: 5 mg/m³ inhalable fraction IPRD Al TWA: 2 mg/m³ respirable fraction IPRD Al			TWA: 2 mg/m³ 8 ore TWA: 3 mg/m³ 8 ore TWA: 1 mg/m³ 8 ore STEL: 5 mg/m³ 15 minute STEL: 10 mg/m³ 15 minute STEL: 3 mg/m³ 15 minute
Silica, amorphous	TWA: 1 mg/m³				

Component	Russia	Slovak Republic	Slovenia	Sweden	Turkey
Nickel	MAC: 0.05 mg/m³	TWA: 0.5 mg/m³ 8 hodinách STEL: 0.05 mg/m³ 15 minútach	TWA: 0.006 mg/m³ 8 urah respirable fraction STEL: 0.048 mg/m³ 15 minutah respirable fraction	TLV: 0.5 mg/m³ 8 timmar. NGV	
Nickel oxide (NiO)		TWA: 0.5 mg/m³ 8 hodinách STEL: 0.05 mg/m³ 15 minútach			
Aluminum oxide (Al2O3)	TWA: 6 mg/m³ 0043 in the form of disintegration aerosol TWA: 1 mg/m³ 0045 containing up to 20% Cr2O3;catalyst IM-2201 MAC: 3 mg/m³	TWA: 4 mg/m³ inhalable dust TWA: 1.5 mg/m³ respirable dust		TLV: 5 mg/m³ 8 timmar. Al NGV TLV: 2 mg/m³ 8 timmar. Al NGV	
Silica, amorphous	TWA: 1 mg/m³ 1151 in the form of condensation aerosol, containing >60% Silicon dioxide;limit is for total mass of aerosols TWA: 2 mg/m³ 1152 in the form of condensation aerosol, containing 10-60% Silicon dioxide;limit is for total mass of aerosols TWA: 1 mg/m³ 1153 also vitreous, in the form of disintegration aerosol;limit is for total mass of aerosols MAC: 3 mg/m³ MAC: 6 mg/m³		TWA: 4 mg/m³ 8 urah inhalable fraction, gel		

Biological limit values
List source(s):

Component	Italy	Finland	Denmark	Bulgaria	Romania
Nickel		Nickel: 0.1 µmol/L urine after the shift after a working week or exposure period.		Nickel: 45 µg/L urine after several work shifts	Nickel: 3 µg/L urine end of shift

Component	Gibraltar	Latvia	Slovak Republic	Luxembourg	Turkey
Nickel		Nickel: 3 µg/L urine	Nickel: 0.03 mg/L blood end of exposure or work shift		

Monitoring methods
BS EN 14042:2003 Title Identifier: Workplace atmospheres. Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents.
MDHS14/3 General methods for sampling and gravimetric analysis of respirable and inhalable dust
MDHS42/2 Nickel and inorganic compounds of nickel in air (except nickel carbonyl) Laboratory method using flame atomic absorption spectrometry or electrothermal atomic absorption spectrometry

Derived No Effect Level (DNEL) / Derived Minimum Effect Level (DMEL)
See table for values

Component	Acute effects local	Acute effects	Chronic effects local	Chronic effects

	(Dermal)	systemic (Dermal)	(Dermal)	systemic (Dermal)
Nickel 7440-02-0 (50.0)			DNEL = 0.035mg/cm2	
Nickel oxide (NiO) 1313-99-1 (25.0)			DNEL = 0.012mg/cm2	

Component	Acute effects local (Inhalation)	Acute effects systemic (Inhalation)	Chronic effects local (Inhalation)	Chronic effects systemic (Inhalation)
Nickel 7440-02-0 (50.0)	DNEL = 11.9mg/m³		DNEL = 0.05mg/m³	DNEL = 0.05mg/m³
Nickel oxide (NiO) 1313-99-1 (25.0)	DNEL = 18.9mg/m³		DNEL = 0.05mg/m³	DNEL = 0.05mg/m³

Predicted No Effect Concentration (PNEC)
See values below.

Component	Fresh water	Fresh water sediment	Water Intermittent	Microorganisms in sewage treatment	Soil (Agriculture)
Nickel 7440-02-0 (50.0)	PNEC = 7.1µg/L	PNEC = 109mg/kg sediment dw		PNEC = 0.33mg/L	PNEC = 29.9mg/kg soil dw
Nickel oxide (NiO) 1313-99-1 (25.0)	PNEC = 7.1µg/L	PNEC = 109mg/kg sediment dw		PNEC = 0.33mg/L	PNEC = 29.9mg/kg soil dw
Aluminum oxide (Al2O3) 1344-28-1 (13)	PNEC = 0.3136µg/L		PNEC = 3.136µg/L	PNEC = 20mg/L	

Component	Marine water	Marine water sediment	Marine water Intermittent	Food chain	Air
Nickel 7440-02-0 (50.0)	PNEC = 8.6µg/L	PNEC = 109mg/kg sediment dw		PNEC = 0.12mg/kg food	
Nickel oxide (NiO) 1313-99-1 (25.0)	PNEC = 8.6µg/L	PNEC = 109mg/kg sediment dw		PNEC = 0.12mg/kg food	

8.2. Exposure controls

Engineering Measures
Ensure adequate ventilation, especially in confined areas.
Wherever possible, engineering control measures such as the isolation or enclosure of the process, the introduction of process or equipment changes to minimise release or contact, and the use of properly designed ventilation systems, should be adopted to control hazardous materials at source

Personal protective equipment

Eye Protection Wear safety glasses with side shields (or goggles) (European standard - EN 166)

Hand Protection Protective gloves

Glove material	Breakthrough time	Glove thickness	EU standard	Glove comments
Natural rubber Nitrile rubber Neoprene PVC	See manufacturers recommendations	-	EN 374	(minimum requirement)

Skin and body protection Long sleeved clothing.

Inspect gloves before use. observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. (Refer to manufacturer/supplier for information) gloves are suitable for the task: Chemical compatability, Dexterity, Operational conditions, User susceptibility, e.g. sensitisation effects, also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion. gloves with care avoiding skin contamination.

Respiratory Protection When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.

	To protect the wearer, respiratory protective equipment must be the correct fit and be used and maintained properly
Large scale/emergency use	Use a NIOSH/MSHA or European Standard EN 136 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced **Recommended Filter type:** Particulates filter conforming to EN 143
Small scale/Laboratory use	Use a NIOSH/MSHA or European Standard EN 149:2001 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced. **Recommended half mask:-** Particle filtering: EN149:2001 When RPE is used a face piece Fit Test should be conducted
Environmental exposure controls	Prevent product from entering drains. Do not allow material to contaminate ground water system. Local authorities should be advised if significant spillages cannot be contained.

Section 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical State	Solid	
Appearance	Grey	
Odor	Odorless	
Odor Threshold	No data available	
Melting Point/Range	No data available	
Softening Point	No data available	
Boiling Point/Range	No information available	
Flammability (liquid)	Not applicable	Solid
Flammability (solid,gas)	No information available	
Explosion Limits	No data available	
Flash Point	No information available	**Method -** No information available
Autoignition Temperature	No data available	
Decomposition Temperature	No data available	
pH	No information available	
Viscosity	Not applicable	Solid
Water Solubility	Insoluble in water	
Solubility in other solvents	No information available	
Partition Coefficient (n-octanol/water)		
Vapor Pressure	No data available	
Density / Specific Gravity	No data available	
Bulk Density	No data available	
Vapor Density	Not applicable	Solid
Particle characteristics	No data available	

9.2. Other information

Molecular Formula	66+5% Ni
Flammable solids	Burning rate or burning time = > 2.2 mm/s or < 45 secs Wetted zone passed - No
Evaporation Rate	Not applicable - Solid

Section 10: Stability and reactivity

10.1. Reactivity

None known, based on information available

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

Hazardous Polymerization No information available.
Hazardous Reactions None under normal processing.

10.4. Conditions to avoid

Incompatible products. Excess heat.

10.5. Incompatible materials

Oxidizing agent.

10.6. Hazardous decomposition products

Silicon dioxide. Nickel oxides. Fumes of aluminum or aluminum oxide.

Section 11: Toxicological information

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

Product Information

(a) acute toxicity;
Oral Based on available data, the classification criteria are not met
Dermal Based on available data, the classification criteria are not met
Inhalation Based on available data, the classification criteria are not met

Toxicology data for the components

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Nickel	LD50 > 9000 mg/kg (Rat)	-	LC50 > 10.2 mg/L (Rat) 1 h
Nickel oxide (NiO)	LD50 > 5000 mg/kg (Rat)	-	LC50 > 5.08 mg/L (Rat) 4 h
Aluminum oxide (Al2O3)	> 5000 mg/kg (Rat) (OECD Guideline 401)	-	> 2.3 mg/l 4 h (OECD Guideline 403)
Silica, amorphous	>5000 mg/kg (Rat)	>2000 mg/kg (Rabbit)	-

(b) skin corrosion/irritation; No data available

(c) serious eye damage/irritation; No data available

(d) respiratory or skin sensitization;
Respiratory No data available
Skin Category 1

May cause sensitization by skin contact

(e) germ cell mutagenicity; No data available

(f) carcinogenicity; Category 1A

The table below indicates whether each agency has listed any ingredient as a carcinogen

Component	EU	UK	Germany	IARC
Nickel			Cat. 1	Group 2B
Nickel oxide (NiO)	Carc Cat. 1A		Cat. 1	Group 1

Aluminum oxide (Al2O3)			Cat. 2 (Fibre dust)	

(g) reproductive toxicity; No data available

(h) STOT-single exposure; No data available

(i) STOT-repeated exposure; Category 1

Route of exposure Inhalation
Target Organs Lungs.

(j) aspiration hazard; Not applicable
Solid

Symptoms / effects,both acute and delayed Symptoms of allergic reaction may include rash, itching, swelling, trouble breathing, tingling of the hands and feet, dizziness, lightheadedness, chest pain, muscle pain or flushing.

11.2. Information on other hazards

Endocrine Disrupting Properties Assess endocrine disrupting properties for human health. This product does not contain any known or suspected endocrine disruptors.

Section 12: Ecological information

12.1. Toxicity

Ecotoxicity effects The product contains following substances which are hazardous for the environment. Contains a substance which is:. Very toxic to aquatic organisms. May cause long-term adverse effects in the environment. Do not allow material to contaminate ground water system.

Component	Freshwater Fish	Water Flea	Freshwater Algae
Nickel	LC50: > 100 mg/L, 96h (Brachydanio rerio) LC50: = 1.3 mg/L, 96h semi-static (Cyprinus carpio) LC50: = 10.4 mg/L, 96h static (Cyprinus carpio)	EC50: = 1 mg/L, 48h Static (Daphnia magna) EC50: > 100 mg/L, 48h (Daphnia magna)	EC50: 0.174 - 0.311 mg/L, 96h static (Pseudokirchneriella subcapitata) EC50: = 0.18 mg/L, 72h (Pseudokirchneriella subcapitata)
Nickel oxide (NiO)	LC50: > 100 mg/L, 96h static (Brachydanio rerio)	EC50: > 100 mg/L, 48h (Daphnia magna)	EC50: > 127.3 mg/L, 72h (Pseudokirchneriella subcapitata)
Silica, amorphous	LC50: 5000 mg/L/96 h	EC50: 7600 mg/L/48h	EC50: 440 mg/L/72h

12.2. Persistence and degradability Product contains heavy metals. Discharge into the environment must be avoided. Special pre-treatment is necessary

Persistence Insoluble in water, May persist.
Degradability Not relevant for inorganic substances.
Degradation in sewage treatment plant Contains substances known to be hazardous to the environment or not degradable in waste water treatment plants.

12.3. Bioaccumulative potential May have some potential to bioaccumulate; Product has a high potential to bioconcentrate

12.4. Mobility in soil Spillage unlikely to penetrate soil Is not likely mobile in the environment due its low water solubility.

12.5. Results of PBT and vPvB assessment No data available for assessment.

12.6. Endocrine disrupting properties

Endocrine Disruptor Information This product does not contain any known or suspected endocrine disruptors

12.7. Other adverse effects

Persistent Organic Pollutant This product does not contain any known or suspected substance

Ozone Depletion Potential This product does not contain any known or suspected substance

Section 13: Disposal considerations

13.1. Waste treatment methods

Waste from Residues/Unused Products Waste is classified as hazardous. Dispose of in accordance with the European Directives on waste and hazardous waste. Dispose of in accordance with local regulations.

Contaminated Packaging Dispose of this container to hazardous or special waste collection point. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep product and empty container away from heat and sources of ignition.

European Waste Catalogue (EWC) According to the European Waste Catalog, Waste Codes are not product specific, but application specific.

Other Information Do not flush to sewer. Waste codes should be assigned by the user based on the application for which the product was used. Can be landfilled or incinerated, when in compliance with local regulations.

Switzerland - Waste Ordinance Disposal should be in accordance with applicable regional, national and local laws and regulations. Ordinance on the Avoidance and the Disposal of Waste (Waste Ordinance, ADWO) SR 814.600
https://www.fedlex.admin.ch/eli/cc/2015/891/en

Section 14: Transport information

IMDG/IMO

14.1. UN number	UN3178
14.2. UN proper shipping name	Flammable solid, inorganic, n.o.s.
Technical Shipping Name	(Nickel powder)
14.3. Transport hazard class(es)	4.1
14.4. Packing group	II

ADR

14.1. UN number	UN3178
14.2. UN proper shipping name	Flammable solid, inorganic, n.o.s.
Technical Shipping Name	(Nickel powder)
14.3. Transport hazard class(es)	4.1
14.4. Packing group	II

IATA

14.1. UN number UN3178
14.2. UN proper shipping name Flammable solid, inorganic, n.o.s.
Technical Shipping Name (Nickel powder)
14.3. Transport hazard class(es) 4.1
14.4. Packing group II

14.5. Environmental hazards No hazards identified

14.6. Special precautions for user No special precautions required.

14.7. Maritime transport in bulk according to IMO instruments Not applicable, packaged goods

Section 15: Regulatory information

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

International Inventories
Europe (EINECS/ELINCS/NLP), China (IECSC), Taiwan (TCSI), Korea (KECL), Japan (ENCS), Japan (ISHL), Canada (DSL/NDSL), Australia (AICS), New Zealand (NZIoC), Philippines (PICCS). US EPA (TSCA) - Toxic Substances Control Act, (40 CFR Part 710)

Component	CAS No	EINECS	ELINCS	NLP	IECSC	TCSI	KECL	ENCS	ISHL
Nickel	7440-02-0	231-111-4	-	-	X	X	KE-25818	X	-
Nickel oxide (NiO)	1313-99-1	215-215-7	-	-	X	X	KE-25858	X	X
Aluminum oxide (Al2O3)	1344-28-1	215-691-6	-	-	X	X	KE-01012	X	X
Silica, amorphous	7631-86-9	231-545-4	-	-	X	X	KE-31032	X	X

Component	CAS No	TSCA	TSCA Inventory notification - Active-Inactive	DSL	NDSL	AICS	NZIoC	PICCS
Nickel	7440-02-0	X	ACTIVE	X	-	X	X	X
Nickel oxide (NiO)	1313-99-1	X	ACTIVE	X	-	X	X	X
Aluminum oxide (Al2O3)	1344-28-1	X	ACTIVE	X	-	X	X	X
Silica, amorphous	7631-86-9	X	ACTIVE	X	-	X	X	X

Legend: X - Listed '-' - Not Listed **KECL** - NIER number or KE number (http://ncis.nier.go.kr/en/main.do)

Authorisation/Restrictions according to EU REACH

Component	CAS No	REACH (1907/2006) - Annex XIV - Substances Subject to Authorization	REACH (1907/2006) - Annex XVII - Restrictions on Certain Dangerous Substances	REACH Regulation (EC 1907/2006) article 59 - Candidate List of Substances of Very High Concern (SVHC)
Nickel	7440-02-0	-	Use restricted. See entry 27. (see link for restriction details) Use restricted. See entry 75. (see link for restriction details)	-
Nickel oxide (NiO)	1313-99-1	-	Use restricted. See entry 28. (see link for restriction details) Use restricted. See entry 75. (see link for restriction details) Use restricted. See	-

			entry 27. (see link for restriction details)	
Aluminum oxide (Al2O3)	1344-28-1	-	-	-
Silica, amorphous	7631-86-9	-	-	-

REACH links
https://echa.europa.eu/substances-restricted-under-reach

Seveso III Directive (2012/18/EC)

Component	CAS No	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Major Accident Notification	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Safety Report Requirements
Nickel	7440-02-0	Not applicable	Not applicable
Nickel oxide (NiO)	1313-99-1	Not applicable	1 tonne
Aluminum oxide (Al2O3)	1344-28-1	Not applicable	Not applicable
Silica, amorphous	7631-86-9	Not applicable	Not applicable

Regulation (EC) No 649/2012 of the European Parliament and of the Council of 4 July 2012 concerning the export and import of dangerous chemicals
Not applicable

Contains component(s) that meet a 'definition' of per & poly fluoroalkyl substance (PFAS)?
Not applicable

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 .
Take note of Dir 76/769/EEC relating to restrictions on the marketing and use of certain dangerous substances and preparations

National Regulations

UK - Take note of Control of Substances Hazardous to Health Regulations (COSHH) 2002 and 2005 Amendment

WGK Classification Water endangering class = 2 (self classification)

Component	Germany - Water Classification (AwSV)	Germany - TA-Luft Class
Nickel	WGK2	Class II : 0.5 mg/m³ (Massenkonzentration) Krebserzeugende Stoffe - Class II : 0.5 mg/m³ (Massenkonzentration)
Nickel oxide (NiO)	WGK1	
Aluminum oxide (Al2O3)	nwg	
Silica, amorphous	nwg	

Component	France - INRS (Tables of occupational diseases)
Nickel oxide (NiO)	Tableaux des maladies professionnelles (TMP) - RG 37,RG 37bis
Silica, amorphous	Tableaux des maladies professionnelles (TMP) - RG 25

Swiss Regulations
Article 4 para. 4 of the Ordinance on the protection of young people in the workplace (SR 822.115) and Article 1 lit. f of the EAER regulation on hazardous work and young people (SR 822.115.2).
Take note on Article 13 Maternity Ordinance (SR 822.111.52) with regards expectant and nursing mothers.

Component	Switzerland - Ordinance on the Reduction of Risk from handling of hazardous substances preparation (SR 814.81)	Switzerland - Ordinance on Incentive Taxes on Volatile Organic Compounds (OVOC)	Switzerland - Ordinance of the Rotterdam Convention on the Prior Informed Consent Procedure
Nickel 7440-02-0 (50.0)	Prohibited and Restricted Substances		

15.2. Chemical safety assessment

Chemical Safety Assessment/Reports (CSA/CSR) are not required for mixtures

Section 16: Other information

Full text of H-Statements referred to under sections 2 and 3

H228 - Flammable solid
H317 - May cause an allergic skin reaction
H350 - May cause cancer
H350i - May cause cancer by inhalation
H372 - Causes damage to organs through prolonged or repeated exposure
H413 - May cause long lasting harmful effects to aquatic life
H351 - Suspected of causing cancer

Legend

CAS - Chemical Abstracts Service

EINECS/ELINCS - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances
PICCS - Philippines Inventory of Chemicals and Chemical Substances
IECSC - Chinese Inventory of Existing Chemical Substances
KECL - Korean Existing and Evaluated Chemical Substances

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
ENCS - Japanese Existing and New Chemical Substances
AICS - Australian Inventory of Chemical Substances
NZIoC - New Zealand Inventory of Chemicals

WEL - Workplace Exposure Limit
ACGIH - American Conference of Governmental Industrial Hygienists
DNEL - Derived No Effect Level
RPE - Respiratory Protective Equipment
LC50 - Lethal Concentration 50%
NOEC - No Observed Effect Concentration
PBT - Persistent, Bioaccumulative, Toxic

TWA - Time Weighted Average
IARC - International Agency for Research on Cancer
Predicted No Effect Concentration (PNEC)
LD50 - Lethal Dose 50%
EC50 - Effective Concentration 50%
POW - Partition coefficient Octanol:Water
vPvB - very Persistent, very Bioaccumulative

ADR - European Agreement Concerning the International Carriage of Dangerous Goods by Road
IMO/IMDG - International Maritime Organization/International Maritime Dangerous Goods Code
OECD - Organisation for Economic Co-operation and Development
BCF - Bioconcentration factor

ICAO/IATA - International Civil Aviation Organization/International Air Transport Association
MARPOL - International Convention for the Prevention of Pollution from Ships
ATE - Acute Toxicity Estimate
VOC - (volatile organic compound)

Key literature references and sources for data

https://echa.europa.eu/information-on-chemicals
Suppliers safety data sheet, Chemadvisor - LOLI, Merck index, RTECS

Classification and procedure used to derive the classification for mixtures according to Regulation (EC) 1272/2008 [CLP]:

Physical hazards	On basis of test data
Health Hazards	Calculation method
Environmental hazards	Calculation method

Training Advice

Chemical hazard awareness training, incorporating labelling, Safety Data Sheets (SDS), Personal Protective Equipment (PPE) and hygiene.
Use of personal protective equipment, covering appropriate selection, compatibility, breakthrough thresholds, care, maintenance, fit and standards.
First aid for chemical exposure, including the use of eye wash and safety showers.

Prepared By	Health, Safety and Environmental Department
Revision Date	30-Nov-2024
Revision Summary	Not applicable.

This safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006.

COMMISSION REGULATION (EU) 2020/878 amending Annex II to Regulation (EC) No 1907/2006 .

For Switzerland - Compiled in accordance with the technical provisions referred to in Annex 2, Number 3, ChemO (SR 813.11 - Ordinance on Protection against Dangerous Substances and Preparations).

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

End of Safety Data Sheet