SAFETY DATA SHEET

Based upon Regulation (EC) No 1907/2006, as amended by Regulation (EU) No 2020/878

leach residues, zinc ore-calcine, zinc cobalt

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

1.1. Product identifier

Product name : leach residues, zinc ore-calcine, zinc cobalt
Synonyms : [leach residues, zinc ore-calcine, zinc cobalt]; Cobalt cement ; Nickel cement; Cobalt Nickel cement
Registration number REACH : 01-2119467169-28-0000 (Nyrstar Belgium NV/SA)
01-2119467169-28-0005 (Nyrstar Budel BV)
Product type REACH : Substance/UVCB
CAS number : 69012-72-2
EC number : 273-769-5

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

1.2.1 Relevant identified uses

Industrial use

1.2.2 Uses advised against

No uses advised against known

1.3. Details of the supplier of the safety data sheet

Supplier of the safety data sheet

Nyrstar Belgium N.V. on behalf of Nyrstar Sales & Marketing A.G.
Zinkstraat 1
B-2490 Balen
☎ +32 14 44 95 00
🖷 +32 14 81 05 31
infoSDS@nyrstar.com

Nyrstar Budel B.V. on behalf of Nyrstar Sales & Marketing A.G.
Hoofdstraat 1
6024 AA Budel-Dorplein
☎ +32 14 44 96 80
🖷 +32 14 44 95 52
infoSDS@nyrstar.com

Manufacturer of the product

Nyrstar Sales & Marketing SA
1 Rue de Jargonnant
CH-1207 Geneva
infoSDS@nyrstar.com

1.4. Emergency telephone number

24h/24h (Telephone advice: English, French, German, Dutch) :
+32 14 58 45 45 (BIG)

24h/24h :
Slovensko - Toxikologické informačné centrum: +421 2 547 741 66

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classified as dangerous according to the criteria of Regulation (EC) No 1272/2008

Class	Category	Hazard statements
Carc.	category 1A	H350: May cause cancer.
Muta.	category 2	H341: Suspected of causing genetic defects.
Repr.	category 1A	H360FD: May damage fertility if swallowed. May damage the unborn child if swallowed.
Acute Tox.	category 3	H301: Toxic if swallowed.
Resp. Sens.	category 1B	H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Skin Sens.	category 1A	H317: May cause an allergic skin reaction.
STOT RE	category 1	H372: Causes damage to organs (respiratory system) through prolonged or repeated exposure if inhaled.
Acute Tox.	category 4	H332: Harmful if inhaled.
Eye Dam.	category 1	H318: Causes serious eye damage.
Skin Irrit.	category 2	H315: Causes skin irritation.
Aquatic Acute	category 1	H400: Very toxic to aquatic life.
Aquatic Chronic	category 1	H410: Very toxic to aquatic life with long lasting effects.

2.2. Label elements

Signal word Danger

H-statements

H350	May cause cancer.
H341	Suspected of causing genetic defects.
H360FD	May damage fertility if swallowed. May damage the unborn child if swallowed.
H301	Toxic if swallowed.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H317	May cause an allergic skin reaction.
H372	Causes damage to organs (respiratory system) through prolonged or repeated exposure if inhaled.
H332	Harmful if inhaled.
H318	Causes serious eye damage.
H315	Causes skin irritation.
H410	Very toxic to aquatic life with long lasting effects.

P-statements

P280	Wear protective gloves, protective clothing and eye protection/face protection.
P284	Wear respiratory protection.
P304 + P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P302 + P352	IF ON SKIN: Wash with plenty of water and soap.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call a POISON CENTER/doctor.

Supplemental information

Restricted to professional users.

2.3. Other hazards

The criteria of PBT and vPvB as listed in Annex XIII of Regulation (EC) No 1907/2006 do not apply to inorganic substances

Pulverization rapidly increases toxic concentration

SECTION 3: Composition/information on ingredients

3.1. Substances

Name REACH Registration No	CAS No EC No	Conc. (C)	Classification according to CLP	Note	Remark	M-factors and ATE
leach residues, zinc ore-calcine, zinc cobalt 01-2119467169-28	69012-72-2 273-769-5	C>99%	Carc. 1A; H350 Muta. 2; H341 Repr. 1A; H360FD Acute Tox. 3; H301 Resp. Sens. 1B; H334 Skin Sens. 1A; H317 STOT RE 1; H372 Acute Tox. 4; H332 Eye Dam. 1; H318 Skin Irrit. 2; H315 Aquatic Acute 1; H400 Aquatic Chronic 1; H410		UVCB	M: 10 (Acute, BIG) M: 100 (Chronic, BIG)
lead(II)sulphate	7446-14-2 231-198-9	0.35% <C<35.13%	Repr. 1A; H360Df Acute Tox. 4; H332 Acute Tox. 4; H302 STOT RE 2; H373 Aquatic Acute 1; H400 Aquatic Chronic 1; H410 Repr. 2; H361f: C≥2,5%, (CLP Annex VI (ATP 0)) STOT RE 2; H373: C≥0,5%, (CLP Annex VI (ATP 0))	(1)(2)(10)	Component UVCB	M: 1 (Acute, BIG)
copper sulphate	7758-98-7 231-847-6	1.35% <C<99.9%	Acute Tox. 4; H302 Eye Dam. 1; H318 Skin Irrit. 2; H315 Aquatic Acute 1; H400 Aquatic Chronic 1; H410	(1)(2)(6)(10)	Component UVCB	

copper dihydroxide	20427-59-2 243-815-9	0.23% <C<18.44%	Acute Tox. 2; H330 Acute Tox. 4; H302 Eye Dam. 1; H318 Aquatic Acute 1; H400 Aquatic Chronic 1; H410	(1)(2)(10)	Component UVCB	M: 10 (Acute, CLP Annex VI (ATP 17)) M: 10 (Chronic, CLP Annex VI (ATP 17)) ATE inhalation (dust or mist): 0.47 mg/l ATE oral: 500 mg/kg
zinc hydroxide 01-2119484821-33	20427-58-1 243-814-3	0.3% <C<9.12%	Aquatic Acute 1; H400 Aquatic Chronic 2; H411	(1)	Component UVCB	M: 10 (Acute, ECHA (registration dossier))
zinc sulphate (anhydrous)	7733-02-0 231-793-3	0.73% <C<51.85%	Acute Tox. 4; H302 Eye Dam. 1; H318 Aquatic Acute 1; H400 Aquatic Chronic 1; H410	(1)(10)	Component UVCB	M: 1 (Acute, ECHA (registration dossier)) M: 1 (Chronic, ECHA (registration dossier))
zinc 01-2119467174-37	7440-66-6 231-175-3	0.1%<C<3%		(2)(10)	Component UVCB	
copper	7440-50-8 231-159-6	0.4% <C<32%		(2)(10)	Component UVCB	
cadmium sulphate	10124-36-4 233-331-6	0.18% <C<37.09%	Carc. 1B; H350 Muta. 1B; H340 Repr. 1B; H360FD Acute Tox. 2; H330 Acute Tox. 3; H301 STOT RE 1; H372 Aquatic Acute 1; H400 Aquatic Chronic 1; H410 Carc. 1B; H350: C≥0,01%, (CLP Annex VI (ATP 0)) STOT RE 1; H372: C≥7%, (CLP Annex VI (ATP 0)) STOT RE 2; H373: 0,1%≤C<7%, (CLP Annex VI (ATP 0))	(1)(2)(4)(10)	Component UVCB	M: 10 (Acute, ECHA) M: 10 (Chronic, ECHA)
cobalt oxide	1307-96-6 215-154-6	1.4% <C<21.1%	Acute Tox. 3; H301 Skin Sens. 1; H317 Aquatic Acute 1; H400 Aquatic Chronic 1; H410	(1)(2)(10)	Component UVCB	M: 10 (Acute, CLP Annex VI (ATP 1)) M: 10 (Chronic, CLP Annex VI (ATP 1))
nickel monoxide	1313-99-1 215-215-7	0.63% <C<50.9%	Carc. 1A; H350i Skin Sens. 1; H317 STOT RE 1; H372 Aquatic Chronic 4; H413	(1)(2)(10)	Component UVCB	
Iron hydroxide	11113-66-9 234-345-0	0.16% <C<24.14%			Component UVCB	
lead powder; [particle diameter <1mm]	7439-92-1 231-100-4	0.06% <C<6%	Repr. 1A; H360FD Lact. ; H362 STOT RE 1; H372 Aquatic Acute 1; H400 Aquatic Chronic 1; H410 Repr. 1A; H360D: C≥0,03%, (CLP Annex VI (ATP 9))	(1)(2)(4)(10)	Component UVCB	M: 1 (Acute, CLP Annex VI (ATP 15)) M: 10 (Chronic, CLP Annex VI (ATP 15)) M: 10 (Acute, CLP Annex VI (ATP 21)) M: 100 (Chronic, CLP Annex VI (ATP 21))
silicon dioxide	7631-86-9 231-545-4	0%<C<1.4%		(2)	Component UVCB	

diarsenic trioxide	1327-53-3 215-481-4	0% <C<3.96%	Carc. 1A; H350 Acute Tox. 2; H300 Skin Corr. 1B; H314 Eye Dam. 1; H318 Aquatic Acute 1; H400 Aquatic Chronic 1; H410	(1)(2)(4)(10) (11)	Component UVCB	M: 1 (Acute, ECHA (registration dossier)) M: 1 (Chronic, ECHA (registration dossier))
antimony trioxide	1309-64-4 215-175-0	0.12% <C<3.59%	Carc. 2; H351	(1)(2)	Component UVCB	
calcium sulfate, dihydrate 01-2119444918-26	10101-41-4 231-900-3	0%<C<2%		(2)	Component UVCB	

(1) For H- and EUH-statements in full: see section 16
(2) Substance with a Community workplace exposure limit
(4) Enumerated in candidate list of substances of very high concern (SVHC) for authorisation (Article 59 of Regulation (EC) No. 1907/2006)
(6) Enumerated in Annex VI of Regulation (EC) No. 1272/2008 but the classification has been adapted after evaluation of available test data
(10) Subject to restrictions of Annex XVII of Regulation (EC) No. 1907/2006
(11) Enumerated in Annex XIV of Regulation (EC) No. 1907/2006: list of substances subject to authorisation

3.2. Mixtures

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

General:
Observe (own) safety. If possible, approach victim and check vital functions. In case of injury and/or intoxication, call the European emergency number 112. Treat symptoms starting with most life-threatening injuries and disorders. Keep victim under observation, possibility of delayed symptoms.

After inhalation:
Remove victim into fresh air. Immediately consult a doctor/medical service.

After skin contact:
If possible, wipe up/dry remove chemical. Then rinse/shower immediately with (lukewarm) water. If irritation persists, consult a doctor/medical service.

After eye contact:
Rinse immediately with plenty of water for 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Consult a doctor/medical service.

After ingestion:
Rinse mouth with water. Immediately consult a doctor/medical service. Do not wait for symptoms to occur to consult Poison Center.

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

4.2.1 Acute symptoms

After inhalation:
AFTER INHALATION OF DUST: Dry/sore throat. Coughing. Metal taste. Nausea. Vomiting. Feeling of weakness. Headache. FOLLOWING SYMPTOMS MAY APPEAR LATER: Possible inflammation of the respiratory tract. Risk of lung oedema. Risk of pneumonia. Decreased renal function.

After skin contact:
No effects known.

After eye contact:
Inflammation/damage of the eye tissue. Corrosion of the eye tissue.

After ingestion:
Nausea. Vomiting. Abdominal pain. Diarrhoea. Headache. AFTER INGESTION OF HIGH QUANTITIES: Increased salivation. Decreased renal function. Cramps/uncontrolled muscular contractions. Enlargement/affection of the liver.

4.2.2 Delayed symptoms
No effects known.

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

If applicable and available it will be listed below.

SECTION 5: Firefighting measures

5.1. Extinguishing media

5.1.1 Suitable extinguishing media:
Adapt extinguishing media to the environment for surrounding fires.

5.1.2 Unsuitable extinguishing media:
Not applicable.

5.2. Special hazards arising from the substance or mixture

On burning: release of toxic and corrosive gases/vapours (sulphur oxides) and formation of metal oxides.

5.3. Advice for firefighters

5.3.1 Instructions:

Dilute toxic gases with water spray. Take account of toxic/corrosive precipitation water. Use water moderately and if possible collect or contain it. Take account of toxic fire-fighting water.

5.3.2 Special protective equipment for fire-fighters:

Gloves (EN 374). Face shield (EN 166). Protective clothing (EN 14605 or EN 13034). Dust cloud production: self-contained breathing apparatus (EN 136 + EN 137). Dust cloud production: dust-tight suit (EN 13982). Heat/fire exposure: self-contained breathing apparatus (EN 136 + EN 137).

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Prevent dust cloud formation. No naked flames. Exposure to fire/heat: keep upwind. Exposure to fire/heat: consider evacuation. Exposure to fire/heat: have neighbourhood close doors and windows.

6.1.1 Protective equipment for non-emergency personnel

See section 8.2

6.1.2 Protective equipment for emergency responders

Gloves (EN 374). Face shield (EN 166). Protective clothing (EN 14605 or EN 13034). Dust cloud production: self-contained breathing apparatus (EN 136 + EN 137). Dust cloud production: dust-tight suit (EN 13982).

Suitable protective clothing

See section 8.2

6.2. Environmental precautions

Contain released product, collect/pump into suitable containers. Plug the leak, cut off the supply. Dam up the solid spill. Knock down/dilute dust cloud with water spray. Take account of toxic/corrosive precipitation water. Prevent soil and water pollution. Prevent spreading in sewers.

6.3. Methods and material for containment and cleaning up

Stop dust cloud by covering with sand/earth. Scoop solid spill into closing containers. Carefully collect the spill/leftovers. Clean contaminated surfaces with an excess of water. Take collected spill to manufacturer/competent authority. Wash clothing and equipment after handling.

6.4. Reference to other sections

See section 13.

SECTION 7: Handling and storage

The information in this section is a general description. If applicable and available, exposure scenarios are attached in annex. Always use the relevant exposure scenarios that correspond to your identified use.

7.1. Precautions for safe handling

Avoid raising dust. Keep away from naked flames/heat. Observe very strict hygiene - avoid contact. Keep container tightly closed. Do not discharge the waste into the drain.

7.2. Conditions for safe storage, including any incompatibilities

7.2.1 Safe storage requirements:

Meet the legal requirements. Store in a dry area. Store at room temperature. Keep out of direct sunlight. Keep locked up. Unauthorized persons are not admitted. Keep container tightly closed.

7.2.2 Keep away from:

Heat sources, oxidizing agents, (strong) acids.

7.2.3 Suitable packaging material:

Synthetic material, stoneware/porcelain, steel, tin.

7.2.4 Non suitable packaging material:

No data available

7.3. Specific end use(s)

If applicable and available, exposure scenarios are attached in annex. See information supplied by the manufacturer.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

8.1.1 Occupational exposure

a) Occupational exposure limit values

If limit values are applicable and available these will be listed below.

EU

Arsenic acid and its salts, as well as inorganic arsenic compounds	Time-weighted average exposure limit 8 h (Binding occupational exposure limit value)	0.01 mg/m³ **(1)**
Cadmium and its inorganic compounds	Time-weighted average exposure limit 8 h (Binding occupational exposure limit value)	0.001 mg/m³ **(2)**
Inorganic lead and its compounds	Time-weighted average exposure limit 8 h (Binding occupational exposure limit value)	0.03 mg/m³
	Time-weighted average exposure limit 8 h (Binding occupational exposure limit value)	0.15 mg/m³
Nickel compounds	Time-weighted average exposure limit 8 h (Binding occupational exposure limit value)	0.01 mg/m³ **(3)**
	Time-weighted average exposure limit 8 h (Binding occupational exposure limit value)	0.05 mg/m³ **(1)**

(1) (1): Inhalable fraction

(2) (10): Inhalable fraction. Limit value 0,004 mg/m3 until 11 July 2027. Respirable fraction in those Member States that implement, on the date of the entry into force of this Directive, a biomonitoring system with a biological limit value not exceeding 0,002 mg Cd/g creatinine in urine.
(3) (2): Respirable fraction

Belgium

Antimoine et ses composés (en Sb)	Time-weighted average exposure limit 8 h	0.5 mg/m³
Arsenic, acide arsénique et ses sels, ainsi que ses composés inorganiques (en As)	Time-weighted average exposure limit 8 h	0.01 mg/m³
Cadmium et ses composés (en Cd)	Time-weighted average exposure limit 8 h	0.002 mg/m³ **(1)**
Cadmium et ses composés (en Cd) *shall apply from 2027-07-12*	Time-weighted average exposure limit 8 h	0.001 mg/m³ **(2)**
Cadmium et ses composés (en Cd) *shall apply until 2027-07-11*	Time-weighted average exposure limit 8 h	0.004 mg/m³ **(2)**
Calcium (sulfate de) (anhydrate, hemihydrate, dihydrate, gypse)	Time-weighted average exposure limit 8 h	10 mg/m³
Composés du nickel, (mesurée en tant que Ni)	Time-weighted average exposure limit 8 h	0.01 mg/m³ **(3)**
	Time-weighted average exposure limit 8 h	0.05 mg/m³ **(4)**
Cuivre (en Cu)	Time-weighted average exposure limit 8 h	0.2 mg/m³ **(5)**
	Time-weighted average exposure limit 8 h	1 mg/m³ **(6)**
Plomb inorganique et ses composés, mesurée en tant que Pb (non specifié ailleurs)	Time-weighted average exposure limit 8 h	0.15 mg/m³
Silices amorphes : précipités (gel de silice)	Time-weighted average exposure limit 8 h	10 mg/m³
Silices amorphes: fumées	Time-weighted average exposure limit 8 h	2 mg/m³ **(3)**
Silices amorphes: silice fondue SiO2	Time-weighted average exposure limit 8 h	0.1 mg/m³ **(7)**
Silices amorphes: terre de diatomées, non calcinées	Time-weighted average exposure limit 8 h	10 mg/m³ **(4)**
	Time-weighted average exposure limit 8 h	3 mg/m³ **(3)**
Zinc (oxyde de)	Time-weighted average exposure limit 8 h	2 mg/m³ **(3)**
	Short time value	10 mg/m³ **(3)**

(1) particules alvéolaires
(2) particules inhalables
(3) Fraction alvéolaire
(4) fraction inhalable
(5) fumées
(6) poussières et brouillards de
(7) poussières alvéolaires

The Netherlands

Antimoon en -verbindingen (als Sb)	Time-weighted average exposure limit 8 h (Public occupational exposure limit value)	0.099 ppm **(1)**
	Time-weighted average exposure limit 8 h (Public occupational exposure limit value)	0.5 mg/m³ **(1)**
Arseentrioxide (als As)	Time-weighted average exposure limit 8 h (Public occupational exposure limit value)	9E-5 ppm **(2)**
	Time-weighted average exposure limit 8 h (Public occupational exposure limit value)	0.28 µg/m³ **(2)**
Cadmium en anorganische cadmiumverbindingen (als Cd) *shall apply until 2027-07-10*	Time-weighted average exposure limit 8 h (Public occupational exposure limit value)	0.00086 ppm **(3)**
	Time-weighted average exposure limit 8 h (Public occupational exposure limit value)	0.004 mg/m³ **(3)**
Koper en anorganische koperverbindingen	Time-weighted average exposure limit 8 h (Public occupational exposure limit value)	0.038 ppm **(4)**
	Time-weighted average exposure limit 8 h (Public occupational exposure limit value)	0.1 mg/m³ **(4)**
Lood en anorganische loodverbindingen	Time-weighted average exposure limit 8 h (Public occupational exposure limit value)	0.017 ppm **(5)**
	Time-weighted average exposure limit 8 h (Public occupational exposure limit value)	0.15 mg/m³ **(5)**
Nikkelverbindingen	Time-weighted average exposure limit 8 h (Public occupational exposure limit value)	0.01 mg/m³ **(6)**
	Time-weighted average exposure limit 8 h (Public occupational exposure limit value)	0.05 mg/m³ **(7)**

(1) als Sb
(2) als As
(3) als Cd
(4) inhaleerbaar
(5) Als biologische grenswaarde op grond van artikel 4.16, eerste lid, van het besluit, wordt voor lood vastgesteld: 70 µg Pb/100 ml bloed.
(6) Respirabel, gemeten als nikkel. Sensibilisatie van de huid en de luchtwegen
(7) Inhaleerbaar, gemeten als nikkel. Sensibilisatie van de huid en de luchtwegen

France

Antimoine et ses composés, en Sb	Time-weighted average exposure limit 8 h (VL: Valeur non réglementaire indicative)	0.5 mg/m³
Arsenic (trioxyde de di-), en As	Time-weighted average exposure limit 8 h (VRI: Valeur réglementaire indicative)	0.01 mg/m³ **(1)**
Cadmium et ses composés inorganiques *shall apply from 2027-07-12*	Time-weighted average exposure limit 8 h (VRC: Valeur réglementaire contraignante)	0.001 mg/m³ **(2)**
Cadmium et ses composés inorganiques *shall apply until 2027-07-11*	Time-weighted average exposure limit 8 h (VRC: Valeur réglementaire contraignante)	0.004 mg/m³ **(2)**
Calcium (sulfate de)	Time-weighted average exposure limit 8 h (VL: Valeur non réglementaire indicative)	10 mg/m³
Composés du nickel exprimés en nickel	Time-weighted average exposure limit 8 h (VRC: Valeur réglementaire contraignante)	0.01 mg/m³ **(3)**
	Time-weighted average exposure limit 8 h (VRC: Valeur réglementaire contraignante)	0.05 mg/m³ **(1)**
Cuivre, en Cu	Time-weighted average exposure limit 8 h (VL: Valeur non réglementaire indicative)	1 mg/m³ **(4)**
	Short time value (VL: Valeur non réglementaire indicative)	2 mg/m³ **(4)**
Cuivre	Time-weighted average exposure limit 8 h (VL: Valeur non réglementaire indicative)	0.2 mg/m³ **(5)**
Plomb métallique et composés, en Pb	Time-weighted average exposure limit 8 h (VRC: Valeur réglementaire contraignante)	0.1 mg/m³
Zinc (oxyde de)	Time-weighted average exposure limit 8 h (VL: Valeur non réglementaire indicative)	10 mg/m³ **(4)**
	Time-weighted average exposure limit 8 h (VL: Valeur non réglementaire indicative)	5 mg/m³ **(5)**

(1) La valeur limite concerne la fraction inhalable
(2) Fraction inhalable. Fraction alvéolaire si une surveillance biologique organisée par le médecin du travail permet de s'assurer du respect d'une valeur biologique maximale de 2 µg Cd/g de créatinine dans les urines.
(3) La valeur limite concerne la fraction alvéolaire
(4) poussières
(5) fumées

Germany

Blei und anorganischen Bleiverbindungen	Time-weighted average exposure limit 8 h (TRGS 505)	150 µg/m³ **(1)**
Cadmium und anorganische Cadmium Verbindungen	Time-weighted average exposure limit 8 h (TRGS 900)	0.002 mg/m³ **(2)**
	Der AGW gilt nur für den E-Staub und deckt die nicht-krebserzeugende Wirkung (Nierentoxizität) ab. Die krebserzeugende Wirkung und der entsprechende Eintrag für den AStaub in der TRGS 910 sind zu berücksichtigen	
	Der Arbeitsplatzgrenzwert bezieht sich auf den Elementgehalt des entsprechenden Metalls.	
Calciumsulfat: Dihydrat (alveolengängige Fraktion)	*vgl. Abschn. IIb*	
Calciumsulfat: Dihydrat	Time-weighted average exposure limit 8 h (MAK)	4 mg/m³ **(3)**
	vgl. Abschn. V f) und g)	
Diantimontrioxid	Time-weighted average exposure limit 8 h (TRGS 900)	0.006 mg/m³ **(4)**
	Der Arbeitsplatzgrenzwert bezieht sich auf den Elementgehalt des entsprechenden Metalls.	
Kieselsäuren, amorphe	Time-weighted average exposure limit 8 h (TRGS 900)	1 mg/m³ **(5)**
	Kolloidale amorphe Kieselsäure (7631-86-9) einschließlich pyrogener Kieselsäure und im Nassverfahren hergestellter Kieselsäure (Fällungskieselsäure, Kieselgel).	
Kupfer und seine anorganischen Verbindungen	Time-weighted average exposure limit 8 h (MAK)	0.01 mg/m³ **(6)**
Nickel und Nickelverbindungen	Time-weighted average exposure limit 8 h (TRGS 900)	0.030 mg/m³ **(5)**
	Der Arbeitsplatzgrenzwert bezieht sich auf den Elementgehalt des entsprechenden Metalls.	
	Die arbeitsmedizinisch-toxikologische Ableitung des Wertesbasiert auf einer Plausibilitätsbetrachtung. Auf die Werte für den A-Staub für Nickelmetall in dieser TRGS und für Nickelverbindungen in der TRGS 910 wird hingewiesen.	
	Für als Carc 1A oder 1B eingestufte Nickelverbindungen siehe TRGS 910 und TRGS 561. Eine Beurteilung anhand des AGW für Nickelmetall kann dann erfolgen, wenn ausschließlich Nickelmetall vorliegt. Sofern bei Tätigkeiten nickelhaltige Stäube entstehen, bei denen nur eine Oberflächenoxidation zu unterstellen ist,sind diese wie nickelmetallhaltige Gemische zu behandeln. Bei Anwendung von thermischen Verfahren in Gegenwart von Luftsauerstoff ist grundsätzlich eine Bildung von oxidischen Nickelverbindungen anzunehmen. Dies ist beispielsweise beim Schweißen (Elektroden oder Draht) und thermischen Schneiden mit bzw. von Legierungen, beim Metallspritzen von Legierungen, beim Schmelzen und Gießen von Legierungen und beim Schleifen und Trennen von Legierungen mit „Funkenbildung" der Fall. Weitere Empfehlungen sowie Beispiele für Arbeitsverfahren, bei denen der AGW bzw. die ERB zur Beurteilung herangezogen werden können, enthält die IFA-Arbeitsmappe (Kennzahl 0537).	
Zink und seine anorganischen Verbindungen	Time-weighted average exposure limit 8 h (MAK)	0.1 mg/m³ **(7)**
	Time-weighted average exposure limit 8 h (MAK)	2 mg/m³ **(8)**

(1) Die RL 98/24/EG legt einen bindenden Luftgrenzwert von 150 µg Blei/m³ fest, der somit als maximale Obergrenze in der Luft am Arbeitsplatz zu betrachten ist. Dieser Wert ist nicht gesundheitsbasiert und entspricht zudem nicht dem Stand von Wissenschaft und Technik. Es besteht keine Korrelation zwischen Luftmesswerten und Wirkungsdaten.
(2) Einatembare Fraktion; UF: 8(II)
(3) Einatembare Fraktion

(4) Alveolengängige Fraktion; UF: 8 (I)
(5) Einatembare Fraktion; UF: 8 (II)
(6) Alveolengängige Fraktion; UF: II(2)
(7) Alveolengängige Fraktion; UF: I(4)
(8) Einatembare Fraktion; UF: I(2); Zinkchlorid: Kurzzeitkategorie I(1)

Austria

Antimontrioxid – Herstellung von Antimontrioxid, Herstellung von Antimontrioxid-Masterbatches und -pasten (Wiegen und Mischen von Antimontrioxid-Pulver)	Kurzzeitwert 15(Miw) 4x (TRK)	1.2 mg/m³ **(1)**
	Tagesmittelwert (TRK)	0.3 mg/m³ **(1)**
Antimontrioxid – im übrigen	Kurzzeitwert 15(Miw) 4x (TRK)	0.4 mg/m³ **(1)**
	Tagesmittelwert (TRK)	0.1 mg/m³ **(1)**
Blei und seine Verbindungen außer Bleiarsenat, Bleichromat, Bleichromatoxid und Alkylbleiverbindungen	Tagesmittelwert (MAK)	0.1 mg/m³ **(2)**
	Kurzzeitwert 15(Miw) 4x (MAK)	0.4 mg/m³ **(2)**
Cadmium und seine Verbindungen *shall apply from 2027-07-12*	Kurzzeitwert 15(Miw) 4x (TRK)	0.004 mg/m³ **(3)**
	Tagesmittelwert (TRK)	0.001 mg/m³ **(3)**
Cadmium und seine Verbindungen *shall apply until 2027-07-11*	Kurzzeitwert 15(Miw) 4x (TRK)	0.016 mg/m³ **(3)**
	Tagesmittelwert (TRK)	0.004 mg/m³ **(3)**
Kieselsäuren, amorphe a) kolloidale amorphe Kieselsäure einschl. pyrogener Kieselsäure und im Nassverfahren hergestellter Kieselsäure (Fällungskieselsäure, Kieselgel) und ungebrannter Kieselgur	Tagesmittelwert (MAK)	4 mg/m³ **(4)**
Kupfer und seine Verbindungen(als Rauch)	Tagesmittelwert (MAK)	0.1 mg/m³ **(5)**
	Kurzzeitwert 15(Miw) 4x (MAK)	0.4 mg/m³ **(5)**
Kupfer und seine Verbindungen	Tagesmittelwert (MAK)	1 mg/m³ **(6)**
	Kurzzeitwert 15(Miw) 4x (MAK)	4 mg/m³ **(6)**
Nickel (Nickelmetall, Nickellegierungen und –verbindungen)	Kurzzeitwert 15(Miw) 4x (TRK)	0.04 mg/m³ **(7)**
	Kurzzeitwert 15(Miw) 4x (TRK)	0.2 mg/m³ **(8)**
	Tagesmittelwert (TRK)	0.01 mg/m³ **(7)**
	Tagesmittelwert (TRK)	0.05 mg/m³ **(8)**
Zinkoxid-Rauch	Tagesmittelwert (MAK)	5 mg/m³ **(9)**

(1) Einatembare Fraktion; als Sb berechnet
(2) Einatembare Fraktion; als Pb berechnet
(3) Einatembare Fraktion; als Cd berechnet
(4) Einatembare Fraktion
(5) Alveolengängige Fraktion; als Cu berechnet
(6) Einatembare Fraktion; als Cu berechnet
(7) Alveolengängige Fraktion; als Ni berechnet
(8) Einatembare Fraktion; als Ni berechnet
(9) Alveolengängige Fraktion

UK

Antimony and compounds except stibine (as Sb)	Time-weighted average exposure limit 8 h (Workplace exposure limit (EH40/2005))	0.5 mg/m³
Arsenic and compounds except arsine (as As)	Time-weighted average exposure limit 8 h (Workplace exposure limit (EH40/2005))	0.1 mg/m³
Cadmium compounds except cadmium oxide fume, cadmium sulphide and cadmium sulphide pigments (as Cd)	Time-weighted average exposure limit 8 h (Workplace exposure limit (EH40/2005))	0.025 mg/m³
Cobalt compounds (as Co)	Time-weighted average exposure limit 8 h (Workplace exposure limit (EH40/2005))	0.1 mg/m³
Copper and compounds: dusts and mists (as Cu)	Time-weighted average exposure limit 8 h (Workplace exposure limit (EH40/2005))	1 mg/m³
	Short time value (Workplace exposure limit (EH40/2005))	2 mg/m³
Copper fume	Time-weighted average exposure limit 8 h (Workplace exposure limit (EH40/2005))	0.2 mg/m³
Gypsum	Time-weighted average exposure limit 8 h (Workplace exposure limit (EH40/2005))	10 mg/m³ **(1)**
	Time-weighted average exposure limit 8 h (Workplace exposure limit (EH40/2005))	4 mg/m³ **(2)**
Lead other than lead alkyls	Time-weighted average exposure limit 8 h (Occupational exposure limit (Control of lead at work))	0.15 mg/m³
Nickel, insoluble inorganic compounds (as Ni)(except nickel tetracarbonyl)	Time-weighted average exposure limit 8 h (Workplace exposure limit (EH40/2005))	0.5 mg/m³
Silica, amorphous	Time-weighted average exposure limit 8 h (Workplace exposure limit (EH40/2005))	2.4 mg/m³ **(2)**
	Time-weighted average exposure limit 8 h (Workplace exposure limit (EH40/2005))	6 mg/m³ **(1)**

(1) Inhalable dust
(2) Respirable dust

USA (TLV-ACGIH)

Antimony trioxide	Time-weighted average exposure limit 8 h (TLV - Adopted Value)	0.02 mg/m³ **(1)**
Arsenic and inorganic compounds, as As	Time-weighted average exposure limit 8 h (TLV - Adopted Value)	0.01 mg/m³
Cadmium and compounds, as Cd	Time-weighted average exposure limit 8 h (TLV - Adopted Value)	0.002 mg/m³ **(2)**
	Time-weighted average exposure limit 8 h (TLV - Adopted Value)	0.01 mg/m³
Calcium sulfate	Time-weighted average exposure limit 8 h (TLV - Adopted Value)	10 mg/m³ **(1)**
Cobalt and inorganic compounds, as Co	Time-weighted average exposure limit 8 h (TLV - Adopted Value)	0.02 mg/m³ **(1)**
Copper dusts and mists, as Cu	Time-weighted average exposure limit 8 h (TLV - Adopted Value)	1 mg/m³
Copper fume, as Cu	Time-weighted average exposure limit 8 h (TLV - Adopted Value)	0.2 mg/m³
Lead and inorganic compounds, as Pb	Time-weighted average exposure limit 8 h (TLV - Adopted Value)	0.05 mg/m³
Nickel and inorganic compounds including Nickel subsulfide, as Ni: Insoluble inorganic compounds (NOS)	Time-weighted average exposure limit 8 h (TLV - Adopted Value)	0.2 mg/m³ **(1)**
Zinc oxide	Time-weighted average exposure limit 8 h (TLV - Adopted Value)	2 mg/m³ **(2)**
	Short time value (TLV - Adopted Value)	10 mg/m³ **(2)**

(1) (I): Inhalable fraction
(2) (R): Respirable fraction

b) National biological limit values

If limit values are applicable and available these will be listed below.

Belgium

Plomb et ses composés ioniques (Lood)	sang	70 µg/100ml	

Germany

Blei, anorganischen Bleiverbindungen und bleihaltigen Gemischen (Blei)	Vollblut: keine beschränkung im fließgleichgewicht	150 µg/l	Dieser Wert gilt nicht für Beschäftigte im gebärfähigen Alter. Die Regelungen des Mutterschutzgesetzes bleiben unberührt. Beschäftigungsbeschränkungen sind in Abschnitt 7, Verwendungsverbote in Abschnitt 6 aufgeführt.
Blei (Blei)	Vollblut: keine beschränkung im fließgleichgewicht	150 µg/l	Dieser Wert gilt nicht für Beschäftigte im gebärfähigen Alter. Die Regelungen des Mutterschutzgesetzes bleiben unberührt. Beschäftigungsbeschränkungen sind in Abschnitt 7, Verwendungsverbote in Abschnitt 6 aufgeführt.

USA (BEI-ACGIH)

Arsenic (and soluble inorganic compounds) (Inorganic arsenic plus methylated metabolites)	Urine: end of shift, end of workweek	15 µg/g creatinine	Population based
Cadmium and inorganic compounds (Cadmium)	Blood: not critical	5 µg/L	Background
Cadmium and inorganic compounds (Cadmium)	Urine: not critical	5 µg/g creatinine	Background
Cobalt and inorganic compounds; including Cobalt oxides but not combined with Tungsten carbide (Cobalt)	Urine: end of shift at end of workweek	15 µg/L	Nonspecific
Lead and inorganic compounds (Lead)	Blood: not critical	200 µg/L	Persons applying this BEI® are encouraged to counsel female workers of child-bearing age about the risk of delivering a child with a PbB over the current CDC reference value.
Nickel and inorganic compounds; after exposure to elemental Nickel and poorly soluble compounds (Nickel)	Urine: post-shift at end of workweek	5 µg/L	Background

c) National acceptable and tolerable concentrations

Germany

Arsenverbindungen, als Carc. 1A, Carc. 1B eingestuft	Akzeptanzkonzentration (TRGS 910)	0.83 µg/m³	
	Toleranzkonzentration (Risiko 4:1.000) (TRGS 910)	8.3 µg/m³	
	Die Konzentrationen beziehen sich auf den Elementgehalt des entsprechenden Metalls		
Cadmium und CdVerbindungen, als Carc.1A, Carc.1B eingestuft	*0.9 µg/m³*		
	2 µg/m³		
	Die Konzentrationen beziehen sich auf den Elementgehalt des entsprechenden Metalls		
	Die Toleranzkonzentration wurde gemäß Nummer 3.2.1 aufgrund einer nicht krebserzeugenden Wirkung festgelegt. Bei Überschreitung gelten die glechen Maßnahmen wie bei Überschreitung des AGW.		
	Für Cadmium und Cadmium-Verbindungen ist ein AGW in der E-Staubfraktion fest-gelegt, siehe hierzu TRGS 900.		
Nickelverbindungen, als Carc. 1A, Carc. 1B eingestuft	*6 µg/m³*		
	6 µg/m³		
	Die Konzentrationen beziehen sich auf den Elementgehalt des entsprechenden Metalls		
	Die Toleranzkonzentration wurde gemäß Nummer 3.2.1 aufgrund einer nicht krebserzeugenden Wirkung festgelegt. Bei Überschreitung gelten die glechen Maßnahmen wie bei Überschreitung des AGW.		
	Für Nickelmetall ist ein AGW in der E- und A-Staubfraktion und für Nickelverbindungen ist ein AGW in der E-Staubfraktion festgelegt, siehe hierzu TRGS 900.		
Arsenverbindungen als Carc. 1A, Carc. 1B eingestuft	Akzeptanzkonzentration (TRGS 910)	14 µg/L Parameter: S Arsen(III), Arsen(V), Monomethylarsonsäure und Dimethylarsinsäure Untersuchungsmaterial: Urin	Expositionsende bzw. Schichtende, bei Langzeitexposition: am Schichtende nach mehreren vorangegangenen Schichten
	Toleranzkonzentration (Risiko 4:1.000) (TRGS 910)	40 µg/L Parameter: S Arsen(III), Arsen(V), Monomethylarsonsäure und Dimethylarsinsäure Untersuchungsmaterial: Urin	Expositionsende bzw. Schichtende, bei Langzeitexposition: am Schichtende nach mehreren vorangegangenen Schichten

8.1.2 Sampling methods

If applicable and available it will be listed below.

8.1.3 Applicable limit values when using the substance or mixture as intended

If limit values are applicable and available these will be listed below.

8.1.4 Threshold values

If applicable and available it will be listed below.

8.1.5 Control banding

If applicable and available it will be listed below.

8.2. Exposure controls

The information in this section is a general description. If applicable and available, exposure scenarios are attached in annex. Always use the relevant exposure scenarios that correspond to your identified use.

8.2.1 Appropriate engineering controls

Avoid raising dust. Keep away from naked flames/heat. Measure the concentration in the air regularly. Carry operations in the open/under local exhaust/ventilation or with respiratory protection.

8.2.2 Individual protection measures, such as personal protective equipment

Observe very strict hygiene - avoid contact. Do not eat, drink or smoke during work.

a) Respiratory protection:

Dust production: dust mask with filter type P3. High dust production: self-contained breathing apparatus (EN 136 + EN 137).

b) Hand protection:

Protective gloves against chemicals (EN 374).

Materials	Remark
butyl rubber	Good resistance
PVC	Good resistance
nitrile rubber	Good resistance
neoprene (chloroprene rubber)	Good resistance

c) Eye protection:

Face shield (EN 166). In case of dust production: protective goggles (EN 166).

d) Skin protection:

Protective clothing (EN 14605 or EN 13034). In case of dust production: head/neck protection. In case of dust production: dustproof clothing (EN 13982).

8.2.3 Environmental exposure controls:

See sections 6.2, 6.3 and 13

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical form	Solid
	Powder
Colour	Grey
Odour	Odourless
Odour threshold	Not applicable
Melting point	71 °C ; Decomposition ; 1013 hPa ; EU Method A.1
Boiling point	Not applicable (decomposes)
Flammability	Not classified as flammable
Explosion limits	Not applicable
Flash point	Not applicable (solid)
Auto-ignition temperature	Not applicable
Decomposition temperature	71 °C ; EU Method A.1 ; 1013 hPa
pH	No data available in the literature
Kinematic viscosity	Not applicable (solid)
Dynamic viscosity	Not applicable (solid)
Solubility	Water ; 0.086 g/100 ml ; OECD 105
Log Kow	Not applicable (inorganic)
Vapour pressure	Not applicable (solid)
Absolute density	3390 kg/m³ ; 20 °C ; EU Method A.3
Relative density	3.39 ; 20 °C ; EU Method A.3
Relative vapour density	Not applicable (solid)
Particle size	D50 ; ASTM E323-09 ; 1226 mm

9.2. Other information

No data available

SECTION 10: Stability and reactivity

10.1. Reactivity

No data available.

10.2. Chemical stability

No data available.

10.3. Possibility of hazardous reactions

No data available.

10.4. Conditions to avoid

Precautionary measures

Avoid raising dust. Keep away from naked flames/heat.

10.5. Incompatible materials

Oxidizing agents, (strong) acids.

10.6. Hazardous decomposition products

On burning: release of toxic and corrosive gases/vapours (sulphur oxides) and formation of metal oxides.

SECTION 11: Toxicological information

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

11.1.1 Test results

Acute toxicity

leach residues, zinc ore-calcine, zinc cobalt

Route of exposure	Parameter	Method	Value	Exposure time	Species	Value determination	Remark
Oral	ATE		50 mg/kg bw - 300 mg/kg bw			Calculated value	
Oral	LD50		63 mg/kg bw - 259 mg/kg bw		Rat	Read-across	
Inhalation (dust)	ATE		1 mg/l - 5 mg/l	4 h		Calculated value	
Inhalation (aerosol)	LC50		> 0.0086 mg/l	30 minutes	Rat (male)	Read-across	

Conclusion

Toxic if swallowed.
Harmful if inhaled.
Not classified as acute toxic in contact with skin

Corrosion/irritation

leach residues, zinc ore-calcine, zinc cobalt

Route of exposure	Result	Method	Exposure time	Time point	Species	Value determination	Remark
Eye	Serious eye damage					Calculated value	
In vitro - Eye	Not relevant, expert judgement	OECD 438	10 seconds		Isolated chicken eye	Experimental value	Cadmium ion
Skin	Irritating					Calculated value	
In vitro	Not irritating	OECD 431	4 h		In vitro: SkinEthic Reconstituted epithelium model	Experimental value	Cadmium ion

Conclusion

Causes skin irritation.
Causes serious eye damage.
Not classified as irritating to the respiratory system

Respiratory or skin sensitisation

leach residues, zinc ore-calcine, zinc cobalt

Route of exposure	Result	Method	Exposure time	Observation time point	Species	Value determination	Remark
Skin	Sensitizing					Calculated value	
Skin	Not sensitizing	OECD 406			Guinea pig (male / female)	Experimental value	Cadmium ion
Inhalation (dust)	Sensitizing					Calculated value	

Conclusion

May cause an allergic skin reaction.
May cause allergy or asthma symptoms or breathing difficulties if inhaled.

Specific target organ toxicity

leach residues, zinc ore-calcine, zinc cobalt

Route of exposure	Parameter	Method	Value	Organ/Effect	Exposure time	Species	Value determination	Remark
Oral (diet)	NOAEL	Subchronic toxicity test	3 mg/kg bw/day	No effect	91 day(s)	Rat (male / female)	Experimental value	Cadmium ion
Inhalation (dust)			STOT RE cat.1				Calculated value	
Inhalation (aerosol)	NOAEL	Equivalent to OECD 413	0.025 mg/m³ air	No effect	13 weeks (6h / day, 5 days / week)	Rat (male / female)	Experimental value	Cadmium ion
Inhalation (aerosol)	LOAEL	Equivalent to OECD 413	0.05 mg/m³ air	Respiratory tract (lung tissue affection/degeneration)	13 weeks (6h / day, 5 days / week)	Rat (male / female)	Experimental value	Cadmium ion

Conclusion

Causes damage to organs (respiratory system) through prolonged or repeated exposure if inhaled.
Not classified as sub-chronically toxic in contact with skin
Not classified as sub-chronically toxic if swallowed

Mutagenicity (in vitro)

leach residues, zinc ore-calcine, zinc cobalt

Result	Method	Test substrate	Effect	Value determination	Remark
Negative with metabolic activation, negative without metabolic activation	Equivalent to OECD 471	Bacteria (S.typhimurium)	No effect	Read-across	
Positive	Equivalent to OECD 476	Chinese hamster lung fibroblasts (V79)		Experimental value	Cadmium ion

Mutagenicity (in vivo)

leach residues, zinc ore-calcine, zinc cobalt

Result	Method	Exposure time	Test substrate	Organ/Effect	Value determination	Remark
Negative (Inhalation (aerosol))	Equivalent to OECD 474	13 weeks (6h / day, 5 days / week)	Mouse (male / female)	No effect	Experimental value	Cadmium ion

Conclusion

Suspected of causing genetic defects.

Carcinogenicity

leach residues, zinc ore-calcine, zinc cobalt

Route of exposure	Parameter	Method	Value	Organ/Effect	Exposure time	Species	Value determination	Remark
Unknown			category 1A				Calculated value	
Inhalation (dust)	LOAEC	Carcinogenic toxicity study	0.03 mg/m³	Lungs (carcinogenicity)		Rat	Experimental value	Cadmium ion
Oral	LOAEL		3.5 mg/kg bw/day				Experimental value	

Conclusion

May cause cancer.

Reproductive toxicity

leach residues, zinc ore-calcine, zinc cobalt

Category	Parameter	Method	Value	Exposure time	Species	Effect/Organ	Value determination	Remark
Developmental toxicity			category 1A				Calculated value	
Developmental toxicity (Inhalation (dust))	NOAEL	OECD 414	0.5 mg/m³ air	16 days (6h / day)	Rat	No effect	Read-across	
	LOAEL	OECD 414	2 mg/m³ air	16 days (6h / day)	Rat	Skeleton (anomalies)	Read-across	
Maternal toxicity (Inhalation (dust))	NOAEL	OECD 414	0.5 mg/m³ air	16 days (6h / day)	Rat	No effect	Read-across	
Effects on fertility (Oral)			category 1A				Calculated value	
Effects on fertility (Inhalation (aerosol))	NOAEL	Equivalent to OECD 413	1 mg/m³ air	13 weeks (6h / day, 5 days / week)	Mouse (male / female)	No effect	Read-across	

Conclusion

May damage fertility if swallowed.
May damage the unborn child if swallowed.

Aspiration hazard

leach residues, zinc ore-calcine, zinc cobalt

Not classified for aspiration toxicity

Toxicity other effects

leach residues, zinc ore-calcine, zinc cobalt

No (test)data available

Chronic effects from short and long-term exposure

leach residues, zinc ore-calcine, zinc cobalt

Skin rash/inflammation. Possible inflammation of the respiratory tract. Respiratory difficulties. Risk of pneumonia. Affection of the renal tissue. Change in urine composition. Change in the haemogramme/blood composition. Affection/discolouration of the teeth. Slowing ossification.

11.2. Information on other hazards

No evidence of endocrine disrupting properties

SECTION 12: Ecological information

12.1. Toxicity

leach residues, zinc ore-calcine, zinc cobalt

	Parameter	Method	Value	Duration	Species	Test design	Fresh/salt water	Value determination
Acute toxicity fishes	LC50		0.041 mg/l	96 h	Pimephales promelas			Literature study; Lead ion
Acute toxicity crustacea	LC50		0.026 mg/l	48 h	Ceriodaphnia dubia		Fresh water	Literature study
Toxicity algae and other aquatic plants	EC50		0.021 mg/l	72 h	Pseudokirchneriella subcapitata		Fresh water	Literature study; Lead ion
	NOEC		0.0061 mg/l		Pseudokirchneriella subcapitata		Fresh water	Literature study; Lead ion
Long-term toxicity fish	NOEC		0.018 mg/l		Cyprinus carpio		Fresh water	Literature study; Lead ion
Long-term toxicity aquatic crustacea	NOEC		0.48 µg/l		Lymnaea sp.		Fresh water	Literature study; Lead ion

Conclusion

Very toxic to aquatic life.
Very toxic to aquatic life with long lasting effects.

12.2. Persistence and degradability

Water

Biodegradability: not applicable

12.3. Bioaccumulative potential

leach residues, zinc ore-calcine, zinc cobalt

Log Kow

Method	Remark	Value	Temperature	Value determination
	Not applicable (inorganic)			

Conclusion

Not bioaccumulative

12.4. Mobility in soil

No (test)data on mobility of the substance available

12.5. Results of PBT and vPvB assessment

The criteria of PBT and vPvB as listed in Annex XIII of Regulation (EC) No 1907/2006 do not apply to inorganic substances.

12.6. Endocrine disrupting properties

No evidence of endocrine disrupting properties

12.7. Other adverse effects

leach residues, zinc ore-calcine, zinc cobalt

Greenhouse gases

Not included in the list of fluorinated greenhouse gases (Regulation (EU) No 2024/573)

Ozone-depleting potential (ODP)

Not classified as dangerous for the ozone layer (Regulation (EC) No 2024/590)

Groundwater

Groundwater pollutant

lead(II)sulphate

Greenhouse gases

Not included in the list of fluorinated greenhouse gases (Regulation (EU) No 2024/573)

copper sulphate

Groundwater

Groundwater pollutant

Water ecotoxicity pH

pH shift

copper dihydroxide
Greenhouse gases
Not included in the list of fluorinated greenhouse gases (Regulation (EU) No 2024/573)
Groundwater
Groundwater pollutant

zinc hydroxide
Greenhouse gases
Not included in the list of fluorinated greenhouse gases (Regulation (EU) No 2024/573)
Ozone-depleting potential (ODP)
Not classified as dangerous for the ozone layer (Regulation (EC) No 2024/590)
Groundwater
Groundwater pollutant

zinc sulphate (anhydrous)
Greenhouse gases
Not included in the list of fluorinated greenhouse gases (Regulation (EU) No 2024/573)
Water ecotoxicity pH
pH shift

zinc
Greenhouse gases
Not included in the list of fluorinated greenhouse gases (Regulation (EU) No 2024/573)

copper
Greenhouse gases
Not included in the list of fluorinated greenhouse gases (Regulation (EU) No 2024/573)

cadmium sulphate
Greenhouse gases
Not included in the list of fluorinated greenhouse gases (Regulation (EU) No 2024/573)
Groundwater
Groundwater pollutant
Water ecotoxicity pH
pH shift

cobalt oxide
Greenhouse gases
Not included in the list of fluorinated greenhouse gases (Regulation (EU) No 2024/573)

nickel monoxide
Greenhouse gases
Not included in the list of fluorinated greenhouse gases (Regulation (EU) No 2024/573)

Iron hydroxide
Greenhouse gases
Not included in the list of fluorinated greenhouse gases (Regulation (EU) No 2024/573)

lead powder; [particle diameter <1mm]
Greenhouse gases
Not included in the list of fluorinated greenhouse gases (Regulation (EU) No 2024/573)

silicon dioxide
Greenhouse gases
Not included in the list of fluorinated greenhouse gases (Regulation (EU) No 2024/573)
Ozone-depleting potential (ODP)
Not classified as dangerous for the ozone layer (Regulation (EC) No 2024/590)

diarsenic trioxide
Greenhouse gases
Not included in the list of fluorinated greenhouse gases (Regulation (EU) No 2024/573)
Groundwater
Groundwater pollutant
Water ecotoxicity pH
pH shift

antimony trioxide
Greenhouse gases
Not included in the list of fluorinated greenhouse gases (Regulation (EU) No 2024/573)

calcium sulfate, dihydrate
Greenhouse gases
Not included in the list of fluorinated greenhouse gases (Regulation (EU) No 2024/573)

SECTION 13: Disposal considerations

The information in this section is a general description. If applicable and available, exposure scenarios are attached in annex. Always use the relevant exposure scenarios that correspond to your identified use.

13.1. Waste treatment methods

13.1.1 Provisions relating to waste

European Union

Hazardous waste according to Directive 2008/98/EC, as amended by Regulation (EU) No 1357/2014 and Regulation (EU) No 2017/997.
Waste material code (Directive 2008/98/EC, Decision 2000/0532/EC).
06 03 13* (wastes from the MFSU of salts and their solutions and metallic oxides: solid salts and solutions containing heavy metals).
Depending on branch of industry and production process, also other waste codes may be applicable.

13.1.2 Disposal methods

Remove waste in accordance with local and/or national regulations. Hazardous waste shall not be mixed together with other waste. Different types of hazardous waste shall not be mixed together if this may entail a risk of pollution or create problems for the further management of the waste. Hazardous waste shall be managed responsibly. All entities that store, transport or handle hazardous waste shall take the necessary measures to prevent risks of pollution or damage to people or animals. Do not discharge into surface water (Directive 2000/60/EC, Council Decision 2455/2001/EC). Do not discharge into drains or the environment. Dispose of at authorized waste collection point.

13.1.3 Packaging/Container

European Union

Waste material code packaging (Directive 2008/98/EC).
15 01 10* (packaging containing residues of or contaminated by dangerous substances).

SECTION 14: Transport information

Road (ADR)

14.1. UN number or ID number

UN number	3288

14.2. UN proper shipping name

Proper shipping name	toxic solid, inorganic, n.o.s. (leach residues, zinc ore-calcine, zinc cobalt)

14.3. Transport hazard class(es)

Hazard identification number	60
Class	6.1
Classification code	T5

14.4. Packing group

Packing group	III
Labels	 6.1

14.5. Environmental hazards

Environmentally hazardous substance mark	 yes

14.6. Special precautions for user

Special provisions	274
Limited quantities	Combination packagings: not more than 5 kg per inner packaging for solids. A package shall not weigh more than 30 kg (gross mass).

Rail (RID)

14.1. UN number or ID number

UN number	3288

14.2. UN proper shipping name

Proper shipping name	toxic solid, inorganic, n.o.s. (leach residues, zinc ore-calcine, zinc cobalt)

14.3. Transport hazard class(es)

Hazard identification number	60
Class	6.1
Classification code	T5

14.4. Packing group

Packing group	III

Labels	 6 6.1

14.5. Environmental hazards

Environmentally hazardous substance mark	 yes

14.6. Special precautions for user

Special provisions	274
Limited quantities	Combination packagings: not more than 5 kg per inner packaging for solids. A package shall not weigh more than 30 kg (gross mass).

Inland waterways (ADN)

14.1. UN number or ID number

UN number/ID number	3288

14.2. UN proper shipping name

Proper shipping name	toxic solid, inorganic, n.o.s. (leach residues, zinc ore-calcine, zinc cobalt)

14.3. Transport hazard class(es)

Class	6.1
Classification code	T5

14.4. Packing group

Packing group	III
Labels	 6 6.1

14.5. Environmental hazards

Environmentally hazardous substance mark	 yes

14.6. Special precautions for user

Special provisions	274
Special provisions	802
Limited quantities	Combination packagings: not more than 5 kg per inner packaging for solids. A package shall not weigh more than 30 kg (gross mass).

Sea (IMDG/IMSBC)

14.1. UN number or ID number

UN number	3288

14.2. UN proper shipping name

Proper shipping name	toxic solid, inorganic, n.o.s. (leach residues, zinc ore-calcine, zinc cobalt)

14.3. Transport hazard class(es)

Class	6.1

14.4. Packing group

Packing group	III
Labels	 6 6.1

14.5. Environmental hazards

Marine pollutant	P
Environmentally hazardous substance mark	 yes

14.6. Special precautions for user

Special provisions	223
Special provisions	274
Limited quantities	Combination packagings: not more than 5 kg per inner packaging for solids. A package shall not weigh more than 30 kg (gross mass).

14.7. Maritime transport in bulk according to IMO instruments

Annex II of MARPOL 73/78	Not applicable

Air (ICAO-TI/IATA-DGR)

14.1. UN number or ID number

UN number/ID number	3288

14.2. UN proper shipping name

Proper shipping name	toxic solid, inorganic, n.o.s. (leach residues, zinc ore-calcine, zinc cobalt)

14.3. Transport hazard class(es)

Class	6.1

14.4. Packing group

Packing group	III
Labels	 6.1

14.5. Environmental hazards

Environmentally hazardous substance mark	 yes

14.6. Special precautions for user

Special provisions	A3
Special provisions	A5

Passenger and cargo transport

Limited quantities: maximum net quantity per packaging	10 kg

SECTION 15: Regulatory information

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

European legislation:

VOC content Directive 2010/75/EU

VOC content	Remark
	Not applicable (inorganic)

Directive 2012/18/EU (Seveso III)

Threshold values under normal circumstances

Substance or category	Low tier (tonnes)	Top tier (tonnes)	Group	For this substance or mixture the summation rule has to be applied for:
E1 Hazardous to the Aquatic Environment in Category Acute 1 or Chronic 1	100	200	None	Eco-toxicity

Prior informed consent (PIC)

Contains component(s) listed in Annex I of Regulation (EU) No 649/2012: Part 1 - List of chemicals subject to export notification procedure

Information exposure scenarios

This safety data sheet does not contain an exposure scenario; exempted as (isolated) intermediate

REACH Candidate list

Not enumerated in candidate list of substances of very high concern (SVHC) for authorisation (Article 59 of Regulation (EC) No 1907/2006)

REACH Candidate list

Contains component(s) included in candidate list of substances of very high concern (SVHC) for authorisation (Article 59 of Regulation (EC) No 1907/2006)

REACH Annex XIV - Authorisation

Not enumerated in Annex XIV of Regulation (EC) No 1907/2006: list of substances subject to authorisation

REACH Annex XIV - Authorisation

Contains component(s) included in Annex XIV of Regulation (EC) No 1907/2006: List of substances subject to authorisation

REACH Annex XVII - Restriction

Not subject to restrictions of Annex XVII of Regulation (EC) No. 1907/2006: restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles.

REACH Annex XVII - Restriction

Contains component(s) subject to restrictions of Annex XVII of Regulation (EC) No 1907/2006: restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles.

National legislation Belgium

Agents cancérigènes, mutagènes et reprotoxiques et aux agents possédant des propriétés perturbant le système endocrinien (Code du bien-être au travail, Livre VI, titre 2)	cancérigène catégorie 1A ou 1B selon CLP, n.s.a.
	reprotoxique catégorie 1A ou 1B selon CLP, n.s.a.

National legislation The Netherlands

Waterbezwaarlijkheid	Z (1); Algemene Beoordelingsmethodiek (ABM)
SZW - Lijst van kankerverwekkende stoffen	Als kankerverwekkende stof ingedeeld in categorie 1A of 1B als bedoeld in bijlage I van de Verordening (EG) nr. 1272/2008 van het Europees parlement en de Raad van 16 december 2008; Opgenomen in SZW-lijst van kankerverwekkende stoffen

National legislation France

No data available

National legislation Germany

Lagerklasse (TRGS510)	6.1 D: Nichtbrennbare, akut toxische Kat. 3 / giftige oder chronisch wirkende Gefahrstoffe
WGK	3; Verordnung über Anlagen zum Umgang mit wassergefährdenden Stoffen (AwSV) - 18. April 2017
TA-Luft	5.2.7.1.1/I

National legislation Austria

No data available

National legislation United Kingdom

No data available

Other relevant data

No data available

15.2. Chemical safety assessment

A chemical safety assessment has been performed.
zinc

A chemical safety assessment has been performed.

SECTION 16: Other information

Full text of any H- and EUH-statements referred to under section 3:

H300 Fatal if swallowed.
H301 Toxic if swallowed.
H302 Harmful if swallowed.
H314 Causes severe skin burns and eye damage.
H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H318 Causes serious eye damage.
H330 Fatal if inhaled.
H332 Harmful if inhaled.
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H340 May cause genetic defects.
H341 Suspected of causing genetic defects.
H350 May cause cancer.
H350i May cause cancer by inhalation.
H351 Suspected of causing cancer if inhaled.
H360Df May damage the unborn child. Suspected of damaging fertility.
H360FD May damage fertility. May damage the unborn child.
H360FD May damage fertility if swallowed. May damage the unborn child if swallowed.
H362 May cause harm to breast-fed children.
H372 Causes damage to organs (blood, central nervous system, kidneys) through prolonged or repeated exposure if inhaled.
H372 Causes damage to organs (respiratory system) through prolonged or repeated exposure if inhaled.

H372 Causes damage to organs through prolonged or repeated exposure.
H372 Causes damage to organs (lungs) through prolonged or repeated exposure if inhaled.
H372 Causes damage to organs (blood, central nervous system, kidneys) through prolonged or repeated exposure if swallowed.
H373 May cause damage to organs through prolonged or repeated exposure.
H400 Very toxic to aquatic life.
H410 Very toxic to aquatic life with long lasting effects.
H411 Toxic to aquatic life with long lasting effects.
H413 May cause long lasting harmful effects to aquatic life.

(*)	INTERNAL CLASSIFICATION BY BIG
ADI	Acceptable daily intake
AOEL	Acceptable operator exposure level
ATE	Acute Toxicity Estimate
BCF	Bioconcentration Factor
BEI	Biological Exposure Indices
CLP (EU-GHS)	Classification, labelling and packaging (Globally Harmonised System in Europe)
DMEL	Derived Minimal Effect Level
DNEL	Derived No Effect Level
EC10	Effect Concentration 10 %
EC50	Effect Concentration 50 %
ErC50	EC50 in terms of reduction of growth rate
GLP	Good Laboratory Practice
LC0	Lethal Concentration 0 %
LC50	Lethal Concentration 50 %
LD50	Lethal Dose 50 %
LOAEC/LOAEL	Lowest Observed Adverse Effect Concentration/Lowest Observed Adverse Effect Level
NOAEC/NOAEL	No Observed Adverse Effect Concentration/No Observed Adverse Effect Level
NOEC/NOEL	No Observed Effect Concentration/No Observed Effect Level
OECD	Organisation for Economic Co-operation and Development
PBT	Persistent, Bioaccumulative & Toxic
PNEC	Predicted No Effect Concentration
STP	Sludge Treatment Process
vPvB	very Persistent & very Bioaccumulative