Safety Data Sheet

20 Mix Metal Standard Solution

Version：V2.0.0.1
Report No.：BWB2627-2016-MSDS-EP
Creation Date：2025/12/23
Revision Date：-

*Prepared in accordance with EU REACH Regulation (REACH 1907/2006 with amendment 2020/878)

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

1.1 Product identifier

Product Name	20 Mix Metal Standard Solution
Cat No.	BWB2627-2016
CAS No.	Not applicable
EC No.	Not applicable
Molecular Formula	Not applicable
REACH Registration Number	-
UFI	No information available

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

Relevant identified uses	Please consult manufacturer.
Uses advised against	Please consult manufacturer.

1.3 Details of the supplier of the Safety Data Sheet

Name of the company	Weiyel Inc
Address of the company	Hedian Light Industrial Park, Chengguan Town, Shangcheng County, Xinyang City, Henan Province, China
Post code	465350
Telephone number	010-58103678
Fax number	010-84840368
E-mail address	info@weiyel.com

1.4 Emergency telephone number

Emergency telephone number	010-58103678
Opening hours	24h

2 Hazards identification

2.1 CLP classification according to Regulation (EC) No. 1272/2008 with amendment 2023/707

Skin corrosion/irritation	Category 1
Serious eye damage/irritation	Category 1
Acute Toxicity - Inhalation	Category 2

2.2 Label elements

Hazard pictograms	
Signal word	**Danger**

Hazard statements

H314	Causes severe skin burns and eye damage
H318	Causes serious eye damage
H330	Fatal if inhaled
EUH071	Corrosive to the respiratory tract

Precautionary statements

- Prevention

P260	Do not breathe gas/mist/vapour/spray.
P264	Wash hands and other parts of the body (if related) thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P284	[In case of inadequate ventilation] wear respiratory protection.

- Response

P310	Immediately call a POISON CENTER/doctor.
P320	Specific treatment is urgent (see related instructions on the label).
P321	Specific treatment (see related instructions on the label).
P363	Wash contaminated clothing before reuse.
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P301+P330+P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse affected areas with water [or shower].
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

- Storage

P405	Store locked up.
P403+P233	Store in a well-ventilated place. Keep container tightly closed.

- Disposal

P501	Dispose of contents/container in accordance with local/regional/national/ international regulations.

2.3 Other hazards

- Results of PBT and vPvB assessment

Component	Results of PBT and vPvB assessment [according to (EC) No 1907/2006]
Water	Insufficient information, temporarily unable to evaluate
Nitric acid	Not PBT/vPvB
Arsenic	Not applicable
Beryllium	Not applicable

Cadmium	Not applicable
Cobalt	Not applicable
Copper	Not applicable
Manganese	Not applicable
Molybdenum	Not applicable
Nickel	Not applicable
Lead	Not applicable
Antimony	Not PBT/vPvB
Selenium	Not applicable
Titanium	Not applicable
Thallium	Insufficient information, temporarily unable to evaluate
Vanadium	Not applicable
Zinc	Not applicable
Aluminium	Not applicable
Boron	Not applicable
Barium	Not applicable
Chromium	Not applicable
Iron	Not applicable

◆ Results of endocrine disrupting properties assessment

Component	Results of endocrine disrupting properties assessment [according to (EU) No 2017/2100 or (EU) No 2018/605]
Water	Insufficient information, temporarily unable to evaluate
Nitric acid	Insufficient information, temporarily unable to evaluate
Arsenic	Insufficient information, temporarily unable to evaluate
Beryllium	Insufficient information, temporarily unable to evaluate
Cadmium	Insufficient information, temporarily unable to evaluate
Cobalt	Insufficient information, temporarily unable to evaluate
Copper	Insufficient information, temporarily unable to evaluate
Manganese	Insufficient information, temporarily unable to evaluate
Molybdenum	Insufficient information, temporarily unable to evaluate
Nickel	Insufficient information, temporarily unable to evaluate
Lead	Insufficient information, temporarily unable to evaluate
Antimony	Insufficient information, temporarily unable to evaluate
Selenium	Insufficient information, temporarily unable to evaluate
Titanium	Insufficient information, temporarily unable to evaluate
Thallium	Insufficient information, temporarily unable to evaluate
Vanadium	Insufficient information, temporarily unable to evaluate

Zinc	Insufficient information, temporarily unable to evaluate
Aluminium	Insufficient information, temporarily unable to evaluate
Boron	Insufficient information, temporarily unable to evaluate
Barium	Insufficient information, temporarily unable to evaluate
Chromium	Insufficient information, temporarily unable to evaluate
Iron	Insufficient information, temporarily unable to evaluate

◆ Other

	Not applicable.

3 Composition/information on ingredients

3.1 Substance

	Not applicable

3.2 Mixture

Component	Weight % content(or range)	Classification according to Regulation (EC) No. 1272/2008 with amendment 2023/707 [CLP]	Specific Conc. Limits, M-factors
Water CAS : 7732-18-5 EC : 231-791-2 Index No. : -	94.984	Not Classified	-
Nitric acid CAS : 7697-37-2 EC : 231-714-2 Index No. : 007-004-00-1	5	Oxidizing liquids, Category 2, H272; Skin corrosion/irritation, Category 1A, H314; Acute Toxicity - Inhalation, Category 1, H330; Corrosive to the respiratory tract, EUH071	H272Y2:C ≥ 99%|H272Y3:70% ≤ C < 99%
Arsenic CAS : 7440-38-2 EC : 231-148-6 Index No. : 033-001-00-X	0.0008	Acute Toxicity - Oral, Category 3, H301; Acute Toxicity - Inhalation, Category 3, H331; Hazardous to the aquatic environment - short-term (acute) hazard, Category 1, H400; Hazardous to the aquatic environment - long-term (chronic) hazard, Category 1, H410	-
Beryllium CAS : 7440-41-7 EC : 231-150-7 Index No. : 004-001-00-7	0.0008	Acute Toxicity - Oral, Category 3, H301; Skin Corrosion/Irritation, Category 2, H315; Sensitization - skin, Category 1, H317; Serious eye damage/irritation, Category 2, H319; Acute Toxicity - Inhalation, Category 2, H330; Specific target organ toxicity - single exposure; respiratory tract irritation, Category 3, H335; Carcinogenicity, Category 1B, H350; Specific target organ toxicity - repeated exposure, Category 1, H372	-
Cadmium CAS : 7440-43-9 EC : 231-152-8 Index No. : 048-002-00-0	0.0008	Acute Toxicity - Inhalation, Category 2, H330; Germ cell mutagenicity, Category 2, H341; Carcinogenicity, Category 1B, H350; Reproductive toxicity, Category 2, H361; Specific target organ toxicity - repeated exposure, Category 1, H372; Hazardous to the aquatic environment - short-term (acute) hazard, Category 1, H400; Hazardous to the aquatic environment - long-term (chronic) hazard, Category 1, H410	-

Cobalt CAS : 7440-48-4 EC : 231-158-0 Index No. : 027-001-00-9	0.0008	Sensitization - skin, Category 1, H317; Sensitization - respiratory, Category 1, H334; Germ cell mutagenicity, Category 2, H341; Carcinogenicity, Category 1B, H350; Reproductive toxicity, Category 1B, H360; Hazardous to the aquatic environment - long-term (chronic) hazard, Category 4, H413	-
Copper CAS : 7440-50-8 EC : 231-159-6 Index No. : 029-026-00-0	0.0008	Hazardous to the aquatic environment - short-term (acute) hazard, Category 1, H400; Hazardous to the aquatic environment - long-term (chronic) hazard, Category 1, H410	M=10;M(Chronic)=1
Manganese CAS : 7439-96-5 EC : 231-105-1 Index No. : -	0.0008	Not Classified	-
Molybdenum CAS : 7439-98-7 EC : 231-107-2 Index No. : -	0.0008	Not Classified	-
Nickel CAS : 7440-02-0 EC : 231-111-4 Index No. : 028-002-00-7	0.0008	Sensitization - skin, Category 1, H317; Carcinogenicity, Category 2, H351; Specific target organ toxicity - repeated exposure, Category 1, H372	-
Lead CAS : 7439-92-1 EC : 231-100-4 Index No. : 082-013-00-1	0.0008	Reproductive toxicity, Category 1A, H360; Reproductive Toxicity - effects on or via lactation, Additional, H362; Hazardous to the aquatic environment - short-term (acute) hazard, Category 1, H400; Hazardous to the aquatic environment - long-term (chronic) hazard, Category 1, H410	H360A:C ≥ 0.03%;M=10;M(Chronic)= 100
Antimony CAS : 7440-36-0 EC : 231-146-5 Index No. : -	0.0008	Not Classified	-
Selenium CAS : 7782-49-2 EC : 231-957-4 Index No. : 034-001-00-2	0.0008	Acute Toxicity - Oral, Category 3, H301; Acute Toxicity - Inhalation, Category 3, H331; Specific target organ toxicity - repeated exposure, Category 2, H373; Hazardous to the aquatic environment - long-term (chronic) hazard, Category 4, H413	-
Titanium CAS : 7440-32-6 EC : 231-142-3 Index No. : -	0.0008	Not Classified	-
Thallium CAS : 7440-28-0 EC : 231-138-1 Index No. : 081-001-00-3	0.0008	Acute Toxicity - Oral, Category 2, H300; Acute Toxicity - Inhalation, Category 2, H330; Specific target organ toxicity - repeated exposure, Category 2, H373; Hazardous to the aquatic environment - long-term (chronic) hazard, Category 4, H413	-
Vanadium CAS : 7440-62-2 EC : 231-171-1 Index No. : -	0.0008	Not Classified	-
Zinc CAS : 7440-66-6 EC : 231-175-3	0.0008	Pyrophoric solids, Category 1, H250; Substances and mixtures which, in contact with water, emit flammable gases,	-

Index No. : 030-001-00-1		Category 1, H260; Hazardous to the aquatic environment - short-term (acute) hazard, Category 1, H400; Hazardous to the aquatic environment - long-term (chronic) hazard, Category 1, H410	
Aluminium CAS : 7429-90-5 EC : 231-072-3 Index No. : 013-001-00-6	0.0008	Pyrophoric solids, Category 1, H250; Substances and mixtures which, in contact with water, emit flammable gases, Category 2, H261	-
Boron CAS : 7440-42-8 EC : 231-151-2 Index No. : -	0.0008	Not Classified	-
Barium CAS : 7440-39-3 EC : 231-149-1 Index No. : -	0.0008	Flammable solids, Category 1, H228; Substances and mixtures which, in contact with water, emit flammable gases, Category 1, H260; Acute Toxicity - Oral, Category 3, H301; Skin corrosion/irritation, Category 1, H314; Serious eye damage/irritation, Category 1, H318	-
Chromium CAS : 7440-47-3 EC : 231-157-5 Index No. : -	0.0008	Not Classified	-
Iron CAS : 7439-89-6 EC : 231-096-4 Index No. : -	0.0008	Not Classified	-

4 First-aid measures

4.1 Description of first aid measures

General advice	Immediate medical attention is required. Show this safety data sheet (SDS) to the doctor in attendance.
Eye contact	Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician if feel uncomfortable.
Skin contact	Take off contaminated clothing and shoes immediately. Wash off with plenty of soap and water for at least 15 minutes and consult a physician if feel uncomfortable.
Ingestion	Never give anything by mouth to an unconscious person. Call a physician or Poison Control Center immediately.
Inhalation	Move victim into fresh air. If breathing is difficult, give oxygen. Do not use mouth to mouth resuscitation if victim ingested or inhaled the substance. If not breathing, give artificial respiration and consult a physician immediately.
Protecting of first-aiders	Ensure that medical personnel are aware of the substance involved. Take precautions to protect themselves and prevent spread of contamination.

4.2 Most important symptoms/effects, acute and delayed

1	Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure.

4.3 Indication of any immediate medical attention and special treatment needed

1	Treat symptomatically.
2	Symptoms may be delayed.

5 Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media	Small fire: dry chemical, CO_2 or water spray; Large fire: dry chemical, CO_2 , alcohol-resistant foam or water spray; Fire involving tanks, rail tank cars or highway tanks: Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles. Cool containers with flooding quantities of water until well after fire is out. Do not get water inside containers.
Unsuitable extinguishing media	No information available.

5.2 Specific hazards arising from the substance or mixture

1	May emit poisonous fumes on fire.
2	Fire may produce irritating, poisonous or corrosive gases.
3	Development of hazardous combustion gases or vapor possible in the event of fire.
4	May expansion or decompose explosively when heated or involved in fire.

5.3 Advice for firefighters

1	As in any fire, wear self-contained breathing apparatus (MSHA/NIOSH approved or equivalent) and full protective gear.
2	Fight fire from a safe distance, with adequate cover.
3	Prevent fire extinguishing water from contaminating surface water or the ground water system.

6 Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

1	Fully encapsulating, vapor protective clothing should be worn for spills and leaks with no fire.
2	Do not touch or walk through spilled material.
3	Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
4	Use personal protective equipment,do not breathe gas/mist/vapour/spray.
5	Ensure adequate ventilation. Remove all sources of ignition. Take precautionary measures against static discharges.
6	Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak.

6.2 Environmental precautions

1	Prevent further leakage or spillage if safe to do so.
2	Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up

1	Do not touch or cross spills.
2	Cover with anti-solvent foam to reduce evaporation.
3	It is recommended that emergency personnel wear positive pressure self-contained breathing apparatus and wear anti-virus suits.
4	Spray water disperses the vapor and dilutes the liquid spill.
5	Do not touch broken containers and spills before putting on appropriate protective clothing.
6	It is recommended that emergency personnel wear a self-contained breathing apparatus with positive pressure and wear anti-corrosion clothing.
7	Transfer to a tank truck or special collector with a corrosion-resistant pump.
8	Cut off the source of the leak as much as possible.
9	Keep leaks in a ventilated place.
10	Absorb spilled material in dry sand or inert absorbent. In case of large amount of spillage, contain a spill by

	bunding.
11	Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment.
12	Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container.

6.4 Reference to other sections

1	Personal Protective Equipment advice is contained in Section 8 of the SDS.
2	Disposal considerations advice is contained in Section 13 of the SDS.

7 Handling and storage

7.1 Precautions for safe handling

◆ Protective measures

1	Handling is performed in a well ventilated place.
2	Wear suitable protective equipment.
3	Avoid contact with skin and eyes.

◆ Measures to prevent fire

1	Keep away from heat/sparks/open flames/ hot surfaces.

◆ Measures to prevent aerosol and dust generation

1	Not applicable.

◆ Advice on general occupational hygiene

1	Wash hands and face after using the substances.
2	Replace the contaminated clothing immediately.

7.2 Conditions for safe storage, including any incompatibilities

1	Keep containers tightly closed.
2	Keep containers in a dry, cool and well-ventilated place.
3	Keep away from heat/sparks/open flames/hot surfaces.
4	Store away from incompatible materials and foodstuff containers.

7.3 Specific end use(s)

1	In addition to use mentioned in the Section 1.2, unforeseen other specific end uses.

8 Exposure controls/personal protection

8.1 Control parameters

◆ Occupational exposure limit values

Component	Country/Region	Limit value - Eight hours		Limit value - Short term	
		ppm	mg/m³	ppm	mg/m³
Nitric acid	Japan - JSOH(2024–2025)	2	5.2	-	-
	Permissible exposure standards for workers in the workplace	2	5.2	4	10.4
	European Union	-	-	1	2.6

	France	-	-	1	2.6
	Germany (AGS)	-	-	1	2.6
	Italy	-	-	1	2.6
Arsenic	Japan - JSOH(2024–2025)	-	0.003(individual excess lifetime risk of cancer 10^-3)	-	-
	Permissible exposure standards for workers in the workplace	-	0.01(as As)	-	0.03(as As)
	Germany (AGS)	-	0.0083	-	0.066
	United Kingdom	-	0.1	-	-
	Austria	-	0.1(inhalable aerosol)	-	0.4(inhalable aerosol)
	Belgium	-	0.01	-	-
Beryllium	Japan - JSOH(2024–2025)	-	0.002	-	-
	Permissible exposure standards for workers in the workplace	-	0.002(as Be)	-	0.006(as Be)
	European Union	-	0.0002	-	-
	France	-	0.0006	-	-
	Germany (AGS)	-	0.00006	-	0.00006
	Italy	-	0.0002	-	-
Cadmium	Japan - JSOH(2024–2025)	-	0.05	-	-
	Permissible exposure standards for workers in the workplace	-	0.05(as Cd)	-	0.15(as Cd)
	European Union	-	0.001	-	-
	France	-	0.05	-	-
	Germany (AGS)	-	0.002	-	0.016
	Italy	-	0.001	-	-
Cobalt	Japan - JSOH(2024–2025)	-	0.05	-	-
	Permissible exposure standards for workers in the workplace	-	0.05(dust and fume)	-	0.15(dust and fume)
	Germany (AGS)	-	0.005	-	0.04
	United Kingdom	-	0.1	-	-

	Austria	-	0.1	-	0.4
	Belgium	-	0.02	-	-
Copper	Permissible exposure standards for workers in the workplace	-	1(dust and mist)	-	2(dust and mist)
	Permissible exposure standards for workers in the workplace	-	0.2(fume)	-	0.6(fume)
	France	-	0.2(fume, respirable fraction)	-	-
	Germany (DFG)	-	0.01	-	0.02
	United Kingdom	-	1(dusts and mists)	-	2
	Austria	-	1(inhalable aerosol)	-	-
Manganese	Japan - JSOH(2024–2025)	-	0.02(respirable particles, as Mn)	-	-
	Japan - JSOH(2024–2025)	-	0.1(total particulate, as Mn)	-	-
	Permissible exposure standards for workers in the workplace	-	1(fume)	-	2(fume)
	European Union	-	0.2	-	-
	France	-	0.2	-	-
	Germany (AGS)	-	0.02	-	0.16
Molybdenum	France	-	5	-	10
	Austria	-	15(inhalable aerosol)	-	30(inhalable aerosol)
	Denmark	-	10	-	20
	Finland	-	0.5	-	-
	Hungary	-	10	-	-
	Ireland	-	10	-	-
Nickel	Japan - JSOH(2024–2025)	-	1	-	-
	Permissible exposure standards for workers in the workplace	-	1	-	2
	France	-	1	-	-
	Germany (AGS)	-	0.006	-	0.048
	United Kingdom	-	-	-	3

	Austria	-	0.5	-	2
Lead	Japan - JSOH(2024–2025)	-	0.03(as Pb)	-	-
	Permissible exposure standards for workers in the workplace	-	0.05	-	0.15
	European Union	-	0.15	-	-
	France	-	0.1(inhalable aerosol)	-	-
	Germany (AGS)	-	0.15	-	-
	Germany (DFG)	-	0.004	-	0.032
Antimony	Japan - JSOH(2024–2025)	-	0.1	-	-
	Permissible exposure standards for workers in the workplace	-	0.5	-	1.5
	France	-	0.5	-	-
	United Kingdom	-	0.5	-	-
	Austria	-	0.5	-	1.5
	Belgium	-	0.5	-	-
Selenium	Japan - JSOH(2024–2025)	-	0.1	-	-
	Permissible exposure standards for workers in the workplace	-	0.2(as Se)	-	0.6(as Se)
	Germany (AGS)	-	0.05(inhalable aerosol)	-	0.05(inhalable aerosol)
	Germany (DFG)	-	0.02	-	0.16
	United Kingdom	-	0.1	-	-
	Austria	-	0.1(inhalable aerosol)	-	0.3(inhalable aerosol)
Titanium	Latvia	-	10	-	-
	Poland	-	10	-	15
	Romania	-	10	-	15
Thallium	France	-	0.1	-	-
	United Kingdom	-	0.1	-	-
	Austria	-	0.1(inhalable aerosol)	-	1(inhalable aerosol)
	Belgium	-	0.02	-	-
	Denmark	-	0.1	-	0.2
	Finland	-	0.1	-	-

Vanadium	Germany (DFG)	-	0.005	-	0.01
	Austria	-	0.5(inhalable aerosol)	-	1(inhalable aerosol)
	Latvia	-	1	-	-
	New Zealand	-	0.05	-	-
	Norway	-	0.2	-	0.05
	Romania	-	0.05	-	0.1
Zinc	Germany (DFG)	-	2	-	4
	Switzerland	-	0.1(respirable aerosol)	-	0.4(respirable aerosol)
Aluminium	Japan - JSOH(2024–2025)	-	0.5(respirable dust)	-	-
	Japan - JSOH(2024–2025)	-	2(total dust)	-	-
	Permissible exposure standards for workers in the workplace	-	5(respirable dust)	-	10(respirable dust)
	France	-	10(inhalable aerosol)	-	-
	Germany (DFG)	-	4	-	-
	United Kingdom	-	10(inhalable fraction);4(respirable fraction)	-	-
Boron	Germany (DFG)	-	0.75	-	0.75
Barium	Permissible exposure standards for workers in the workplace	-	0.5	-	1.5
	European Union	-	0.5	-	-
	France	-	0.5	-	-
	Germany (AGS)	-	0.5(inhalable aerosol)	-	0.5(inhalable aerosol)
	Germany (DFG)	-	0.5	-	4
	Italy	-	0.5	-	-
Chromium	Japan - JSOH(2024–2025)	-	0.5	-	-
	Permissible exposure standards for workers in the workplace	-	1	-	2
	European Union	-	2	-	-
	France	-	2	-	-
	Germany (AGS)	-	2	-	2

	Italy	-	0.5	-	-

◆ Biological limit values

Component	Standard	Biological monitoring index	Biological limits value	Sampling time	Remark
Arsenic	USA -ACGIH	Inorganic arsenic, plus methylated metabolites, as As(Creatinine in urine)	15µg/g	End of work week	
		Inorganic arsenic, plus methylated metabolites, as As(Creatinine in urine)	15µg/g	End of shift	
Cadmium	SCOEL(EU)	Cd	2 µg/g creatinine	Not strictly regulated	
		Cadmium(Creatinine in urine)	5µg/g	Not critical	
		Cadmium(Blood)	5µg/L	Not critical	
Cobalt	USA -ACGIH	Cobalt(Urine)	15µg/L	End of shift at end of work week	
Nickel	USA -ACGIH	Nickel(Urine)	5µg/L	End of shift at end of work week	
Lead	SCOEL(EU)	Not strictly regulated	0.3mg/L	Not strictly regulated	
		Lead(Blood)	200µg/L	Not critical	
Chromium	USA -ACGIH	Total chromium(Urine)	0.7µg/L	End of shift at end of work week	

◆ Monitoring methods

1	EN 14042 Workplace atmospheres. Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents.
2	GBZ/T 300 and GBZ/T 160 series standard Determination of toxic substances in workplace air.

◆ Derived No effect level (DNEL)

Component	Route of exposure	DNEL for Workers			
		Acute effects (local)	Acute effects (systemic)	Chronic effects (local)	Chronic effects (systemic)
Water	Inhalation	No data available	No data available	No data available	No data available
	Oral	No data available	No data available	No data available	No data available
	Dermal	No data available	No data available	No data available	No data available
Nitric acid	Inhalation	No data available	No data available	No data available	No data available
	Oral	No data available	No data available	No data available	No data available
	Dermal	No data available	No data available	No data available	No data available
Arsenic	Inhalation	No data available	No data available	No data available	0.004 mg/m3
	Oral	No data available	No data available	No data available	No data available

	Dermal	No data available	No data available	No data available	No data available
Beryllium	Inhalation	No data available	No data available	No data available	No data available
	Oral	No data available	No data available	No data available	No data available
	Dermal	No data available	No data available	No data available	No data available
Cadmium	Inhalation	No data available	No data available	0.004 mg/m3	No data available
	Oral	No data available	No data available	No data available	No data available
	Dermal	No data available	No data available	No data available	No data available
Cobalt	Inhalation	No data available	No data available	0.04 mg/m3	0.0541 mg/m3
	Oral	No data available	No data available	No data available	No data available
	Dermal	No data available	No data available	No data available	No data available
Copper	Inhalation	No data available	No data available	No data available	No data available
	Oral	No data available	No data available	No data available	No data available
	Dermal	No data available	No data available	No data available	No data available
Manganese	Inhalation	No data available	No data available	No data available	0.0101 mg/m3
	Oral	No data available	No data available	No data available	No data available
	Dermal	No data available	No data available	No data available	No data available
Molybdenum	Inhalation	No data available	No data available	No data available	11.17 mg/m3
	Oral	No data available	No data available	No data available	No data available
	Dermal	No data available	No data available	No data available	No data available
Nickel	Inhalation	No data available	No data available	No data available	No data available
	Oral	No data available	No data available	No data available	No data available
	Dermal	No data available	No data available	No data available	No data available
Lead	Inhalation	No data available	No data available	No data available	No data available
	Oral	No data available	No data available	No data available	No data available
	Dermal	No data available	No data available	No data available	No data available
Antimony	Inhalation	No data available	No data available	0.263 mg/m3	No data available
	Oral	No data available	No data available	No data available	No data available
	Dermal	No data available	No data available	No data available	No data available
Selenium	Inhalation	No data available	No data available	No data available	0.05 mg/m3
	Oral	No data available	No data available	No data available	No data available
	Dermal	No data available	No data available	No data available	No data available
Titanium	Inhalation	No data available	No data available	No data available	No data available
	Oral	No data available	No data available	No data available	No data available
	Dermal	No data available	No data available	No data available	No data available
Thallium	Inhalation	No data available	No data available	No data available	No data available
	Oral	No data available	No data available	No data available	No data available
	Dermal	No data available	No data available	No data available	No data available

Vanadium	Inhalation	No data available	No data available	No data available	No data available
	Oral	No data available	No data available	No data available	No data available
	Dermal	No data available	No data available	No data available	No data available
Zinc	Inhalation	No data available	No data available	No data available	No data available
	Oral	No data available	No data available	No data available	No data available
	Dermal	No data available	No data available	No data available	No data available
Aluminium	Inhalation	No data available	No data available	3.72 mg/m3	3.72 mg/m3
	Oral	No data available	No data available	No data available	No data available
	Dermal	No data available	No data available	No data available	No data available
Boron	Inhalation	No data available	No data available	No data available	No data available
	Oral	No data available	No data available	No data available	No data available
	Dermal	No data available	No data available	No data available	No data available
Barium	Inhalation	No data available	No data available	No data available	5.8 mg/m3
	Oral	No data available	No data available	No data available	No data available
	Dermal	No data available	No data available	No data available	No data available
Chromium	Inhalation	No data available	No data available	0.5 mg/m3	No data available
	Oral	No data available	No data available	No data available	No data available
	Dermal	No data available	No data available	No data available	No data available
Iron	Inhalation	No data available	No data available	3 mg/m3	No data available
	Oral	No data available	No data available	No data available	No data available
	Dermal	No data available	No data available	No data available	No data available

◆ Predicted No Effect Concentration (PNEC)

Component	A	B	C	D	E	F	G	H
Nitric acid	No hazard identified	No hazard identified	No hazard identified	No hazard identified	No hazard identified	No hazard identified	No hazard identified	No potential for bioaccumulation
Arsenic	5.6 µg/L	4.7 µg/L	61 µg/L	70.5 mg/kg sediment dw	35.7 mg/kg sediment dw	No hazard identified	2.9 mg/kg soil dw	1 mg/kg food
Cadmium	190 ng/L	1.14 µg/L	20 µg/L	1.8 mg/kg sediment dw	640 µg/kg sediment dw	No hazard identified	900 µg/kg soil dw	160 µg/kg food
Cobalt	1.06 µg/L	2.36 µg/L	370 µg/L	53.8 mg/kg sediment dw	69.8 mg/kg sediment dw	No hazard identified	10.9 mg/kg soil dw	No potential for bioaccumulation
Copper	6.3 µg/L	5.2 µg/L	230 µg/L	87 mg/kg sediment dw	676 mg/kg sediment dw	No hazard identified	65 mg/kg soil dw	No potential for bioaccumulation
Manganese	22 - 34	2.2 - 3.4	100	108 -	10.8 -	No	8.74 -	No

	µg/L	µg/L	mg/L	3300 µg/kg sediment dw	340 µg/kg sediment dw	hazard identified	3400 µg/kg soil dw	potential for bioaccumulation
Molybdenum	11.9 mg/L	2.28 mg/L	21.7 mg/L	21200 mg/kg sediment dw	2370 mg/kg sediment dw	No hazard identified	9.9 mg/kg soil dw	No potential for bioaccumulation
Lead	2.4 µg/L	3.3 µg/L	100 µg/L	186 mg/kg sediment dw	168 mg/kg sediment dw	No hazard identified	212 mg/kg soil dw	10.9 mg/kg food
Antimony	113 µg/L	11.3 µg/L	2.55 mg/L	11.2 mg/kg sediment dw	2.24 mg/kg sediment dw	No hazard identified	37 mg/kg soil dw	No potential for bioaccumulation
Selenium	2.67 µg/L	2 µg/L	1.5 mg/L	8.2 mg/kg sediment dw	6.2 mg/kg sediment dw	No hazard identified	44 - 100 µg/kg soil dw	1 mg/kg food
Titanium	76 µg/L	600 µg/L	60 mg/L	600 mg/kg sediment dw	60 mg/kg sediment dw	No data available	60 mg/kg soil dw	No potential for bioaccumulation
Vanadium	17.8 µg/L	2.5 µg/L	450 µg/L	563 mg/kg sediment dw	79 mg/kg sediment dw	No hazard identified	7.2 mg/kg soil dw	167 µg/kg food
Zinc	14.4 µg/L	7.2 µg/L	100 µg/L	146.9 mg/kg sediment dw	162.2 mg/kg sediment dw	No hazard identified	83.1 mg/kg soil dw	No potential for bioaccumulation
Aluminium	No data available	No data available	20 mg/L	No data available	No data available	No hazard identified	No data available	No data available
Boron	2.9 mg/L	2.9 mg/L	10 mg/L	No data available	No data available	No hazard identified	5.7 mg/kg soil dw	No potential for bioaccumulation
Barium	114.7 µg/L	No data available	62.2 mg/L	598.9 mg/kg sediment dw	No hazard identified	No hazard identified	207.7 mg/kg soil dw	No potential for bioaccumulation
Chromium	6.5 µg/L	No data available	No data available	205.7 mg/kg sediment dw	No data available	No hazard identified	21.1 mg/kg soil dw	No potential for bioaccumulation
Iron	No data available	No data available	No data available	No data available	No data available	No hazard identified	No data available	No data available

Note 1:

A: Freshwater; B: Seawater; C: Sewage treatment plant; D: Sediment (freshwater); E: Sediment (seawater); F: Air; G: Soil; H: Secondary poisoning(Hazard for Predators).

Note 2:

The PNEC values of the remaining components not shown in the product are not available yet.

8.2 Exposure controls

8.2.1 Engineering controls

1	Ensure adequate ventilation, especially in confined areas.
2	Ensure that eyewash stations and safety showers are close to the workstation location.
3	Use explosion-proof electrical/ventilating/lighting/equipment.
4	Set up emergency exit and necessary risk-elimination area.

8.2.2 Personal protection equipment

General requirement	
Eye protection	Must wear appropriate anti-corrosion goggles.
Hand protection	Must wear acid and alkali resistant chemical protective gloves.
Respiratory protection	Must wear appropriate personal dust proof gas mask.
Skin and body protection	Must wear acid and alkali resistant chemical protective clothing.

8.2.3 Environmental exposure controls

Environmental exposure controls	No information available

9 Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	colorless to pale yellow transparent liquid
Colour	colorless to pale yellow transparent liquid
Odor	No information available
Odor threshold	No information available
pH	< 1 (Nitric acid)
Melting point/freezing point(°C)	-41.6 (Nitric acid)
Initial boiling point and boiling range(°C)	121 (Nitric acid)
Flash point(Closed cup,°C)	No information available
Evaporation rate	No information available
Flammability	No information available
Upper/lower explosive limits[%(v/v)]	Upper limit : No information available ; Lower limit : No information available
Vapor pressure	6.4kPa (20°C ,Nitric acid)
Vapor density(Air = 1)	2.2 (Nitric acid)

Relative density(Water=1)	1.4 (Nitric acid)
Solubility	500000mg/L (20 °C,Nitric acid)
n-octanol/water partition coefficient	-0.21 (Nitric acid)
Auto-ignition temperature(°C)	No information available
Decomposition temperature(°C)	No information available
Kinematic viscosity	No information available
Explosive properties	No information available
Oxidizing properties	No information available
Particle characteristics	Not applicable

9.2 Other information

9.2.1 Information with regard to physical hazard classes

Information with regard to physical hazard classes	No information available

9.2.2 Other safety characteristics

Other safety characteristics	No information available

10 Stability and reactivity

Stability and reactivity

10.1 Reactivity	Contact with incompatible substances can cause decomposition or other chemical reactions.
10.2 Chemical stability	Stable under proper operation and storage conditions.
10.3 Possibility of hazardous reactions	In contact with active metals (alkali metals, Na, Ca etc.) causes a reaction and release hydrogen. Mixtures with metallic acetylene, when heated, cause a fire or incandescence. Reacts severely with halogens, interhalogens or other strong oxidants, or causes a fire. Ultrafine powder will self-ignite in the air at room temperature. May burn continuously in carbon dioxide.
10.4 Conditions to avoid	Incompatible materials, heat, flame and spark.
10.5 Incompatible materials	Alkali, sodium, calcium, and other active metal, halogen, metal oxide, nonmetal oxide, acyl halide and metal phosphide. Metal acetylide, halogen, interhalogen, halogen oxides, nitric acid, nitrous oxide, nitrates, nitrites, halogen oxyacid salts, chromates, permanganates, inorganic peroxides, metal oxides and peroxyformic acid. Halogen, interhalogen, strong oxidant, water and acids. Oxidants, halogen, interhalogen and mercury. Water, carbon dioxide, oxidants, halogen, interhalogen and mercury.
10.6 Hazardous decomposition products	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

11 Toxicological information

11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008 with amendment 2023/707

20 Mix Metal Standard Solution	
Skin corrosion/irritation	Causes severe skin burns and eye damage(Category 1)
Serious eye damage/irritation	Causes serious eye damage(Category 1)
Skin sensitization	Based on available data, the classification criteria are not met
Respiratory sensitization	Based on available data, the classification criteria are not met

Reproductive toxicity	Based on available data, the classification criteria are not met
STOT-single exposure	Based on available data, the classification criteria are not met
STOT-repeated exposure	Based on available data, the classification criteria are not met
Aspiration hazard	Based on available data, the classification criteria are not met
Germ cell mutagenicity	Based on available data, the classification criteria are not met

Acute toxicity

Component	LD_{50}(oral)	LD_{50}(dermal)	LC_{50}(inhalation,4h)
Selenium	6700mg/kg(Rat)	No information available	5.67mg/L(Rat)
Manganese	9000mg/kg(Rat)	No information available	No information available
Arsenic	763mg/kg(Rat)	No information available	No information available
Boron	650mg/kg(Rat)	No information available	No information available
Antimony	7000mg/kg(Rat)	No information available	No information available
Iron	30000mg/kg(Rat)	No information available	No information available
Cobalt	6171mg/kg(Rat)	No information available	No information available
Cadmium	2330mg/kg(Rat)	No information available	No information available

Carcinogenicity

Component	List of carcinogens by the IARC Monographs	Report on Carcinogens by NTP
Water	Not Listed	Not Listed
Nitric acid	Not Listed	Not Listed
Arsenic	Category 1	Category K
Beryllium	Category 1	Category K
Cadmium	Category 1	Category K
Cobalt	Category 2A	Category R
Copper	Not Listed	Not Listed
Manganese	Not Listed	Not Listed
Molybdenum	Not Listed	Not Listed
Nickel	Category 2B	Category R
Lead	Category 2B	Category R
Antimony	Not Listed	Not Listed
Selenium	Category 3	Not Listed
Titanium	Not Listed	Not Listed
Thallium	Not Listed	Not Listed
Vanadium	Not Listed	Not Listed
Zinc	Not Listed	Not Listed
Aluminium	Not Listed	Not Listed
Boron	Not Listed	Not Listed
Barium	Not Listed	Not Listed

Chromium	Category 3	Not Listed
Iron	Not Listed	Not Listed

11.2 Information on other hazards

11.2.1 Endocrine disrupting properties

Component	Endocrine disrupting properties
Water	No information available
Nitric acid	No information available
Arsenic	No information available
Beryllium	No information available
Cadmium	No information available
Cobalt	No information available
Copper	No information available
Manganese	No information available
Molybdenum	No information available
Nickel	No information available
Lead	No information available
Antimony	No information available
Selenium	No information available
Titanium	No information available
Thallium	No information available
Vanadium	No information available
Zinc	No information available
Aluminium	No information available
Boron	No information available
Barium	No information available
Chromium	No information available
Iron	No information available

11.2.2 Other Information

Other Information	See Section 11.1

12 Ecological information

12.1 Toxicity

Acute aquatic toxicity

Component	Fish	Crustaceans	Algae or other aquatic plants
Nickel	LC_{50} : 40mg/L (96h)(Fish)	EC_{50} : 1mg/L (48h)(Crustaceans)	No information available

Selenium	LC_{50} : 2.06mg/L (96h)(Fish)	No information available	ErC_{50} : 96mg/L (96h)(Algae)
Manganese	LC_{50} : 1800mg/L (96h)(Fish)	EC_{50} : 40mg/L (48h)(Crustaceans)	No information available
Thallium	LC_{50} : 21mg/L (96h)(Fish)	No information available	ErC_{50} : 0.13mg/L (96h)(Algae)
Copper	LC_{50} : 0.665mg/L (96h)(Fish)	EC_{50} : 0.02mg/L (48h)(Crustaceans)	ErC_{50} : 7.9mg/L (96h)(Algae)
Lead	LC_{50} : 2.8mg/L (96h)(Fish)	No information available	No information available
Zinc	LC_{50} : 2.01mg/L (96h)(Fish)	EC_{50} : 1.33mg/L (48h)(Crustaceans)	No information available
Chromium	LC_{50} : 40.5mg/L (96h)(Fish)	EC_{50} : 0.07mg/L (48h)(Crustaceans)	No information available
Aluminium	LC_{50} : 1.55mg/L (96h)(Fish)	No information available	No information available
Arsenic	LC_{50} : 12.6mg/L (96h)(Fish)	No information available	ErC_{50} : 25.2mg/L (72h)(Algae)
Molybdenum	LC_{50} : 609.1mg/L (96h)(Fish)	No information available	No information available
Iron	LC_{50} : 1.29mg/L (96h)(Fish)	No information available	No information available
Cobalt	LC_{50} : 1.5mg/L (96h)(Fish)	No information available	No information available
Cadmium	LC_{50} : 7.8mg/L (96h)(Fish)	EC_{50} : 0.58mg/L (48h)(Crustaceans)	No information available
Vanadium	LC_{50} : 0.693mg/L (96h)(Fish)	No information available	No information available

| Chronic aquatic toxicity

Component	Fish	Crustaceans	Algae or other aquatic plants
Selenium	NOEC : 0.025mg/L(Fish)	No information available	No information available

| 12.2 Persistence and degradability

Component	Persistence (water/soil)	Persistence (air)
Nickel	Low	Low

| 12.3 Bioaccumulative potential

Component	Bioaccumulative potential	Comments
Nickel	Low	Log Kow=-1.38

| 12.4 Mobility in soil

Component	log Koc	Remark
Nickel	1.155	

| 12.5 Results of PBT and vPvB assessment

Component	Results of PBT and vPvB assessment [according to (EC) No 1907/2006]

Water	Insufficient information, temporarily unable to evaluate
Nitric acid	Not PBT/vPvB
Arsenic	Not applicable
Beryllium	Not applicable
Cadmium	Not applicable
Cobalt	Not applicable
Copper	Not applicable
Manganese	Not applicable
Molybdenum	Not applicable
Nickel	Not applicable
Lead	Not applicable
Antimony	Not PBT/vPvB
Selenium	Not applicable
Titanium	Not applicable
Thallium	Insufficient information, temporarily unable to evaluate
Vanadium	Not applicable
Zinc	Not applicable
Aluminium	Not applicable
Boron	Not applicable
Barium	Not applicable
Chromium	Not applicable
Iron	Not applicable

12.6 Endocrine disrupting properties

Component	Endocrine disrupting properties
Water	No information available
Nitric acid	No information available
Arsenic	No information available
Beryllium	No information available
Cadmium	No information available
Cobalt	No information available
Copper	No information available
Manganese	No information available
Molybdenum	No information available
Nickel	No information available
Lead	No information available
Antimony	No information available
Selenium	No information available

Titanium	No information available
Thallium	No information available
Vanadium	No information available
Zinc	No information available
Aluminium	No information available
Boron	No information available
Barium	No information available
Chromium	No information available
Iron	No information available

12.7 Other adverse effects

	No information available

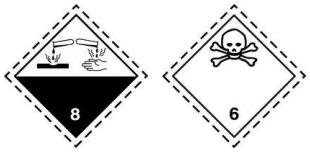
13 Disposal considerations

13.1 Waste treatment methods

Waste chemicals	Before disposal should refer to the relevant national and local laws and regulation. Recommend the use of incineration disposal.
Contaminated packaging	Containers may still present chemical hazard when empty. Keep away from hot and ignition source of fire. Return to supplier for recycling if possible.
Disposal recommendations	Refer to section waste chemicals and contaminated packaging.

14 Transport information

Label and Mark

Transporting Label	

IMDG-CODE

14.1 UN number	2922
14.2 UN proper shipping name	CORROSIVE LIQUID, TOXIC, N.O.S.
14.3 Transport hazard class	8+6.1
14.4 Packing group	I
14.5 Environmental hazards (Yes or no)	No

IATA-DGR

14.1 UN number	2922
14.2 UN proper shipping name	CORROSIVE LIQUID, TOXIC, N.O.S.
14.3 Transport hazard class	8+6.1
14.4 Packing group	I
14.5 Environmental hazards (Yes or no)	No

UN-ADR

14.1 UN number	2922
14.2 UN proper shipping name	CORROSIVE LIQUID, TOXIC, N.O.S.
14.3 Transport hazard class	8+6.1
14.4 Packing group	I
14.5 Environmental hazards (Yes or no)	No

Special precautions for user

	Transit should be anti-exposure, rain, high temperature. Strictly prohibited shipping or transportation with acids, alkalis, oxidants, food and food additives etc. Transport vehicles should be equipped with the appropriate variety and quantity of fire equipment and emergency equipment leakage during transport. Before transport, should be preceded by checking whether container integrity, sealing. The transport unit must be placarded and marked in accordance with relevant transporting requirements.

Maritime transport in bulk according to IMO instruments

◆Transport in bulk according to Annex II of MARPOL and the IBC code

	Not Available

◆Transport in bulk in accordance with MARPOL Annex V and the IMSBC Code

	Not Available

◆Transport in bulk in accordance with the IGC Code

	Not Available

15 Regulatory information

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

International chemical inventory

Component	A	B	C	D	E	F	G	H	I	J	K	L	M
Water	√	√	√	√	√	√	√	√	√	√	√	√	√
Nitric acid	√	√	√	√	√	√	√	√	√	√	√	√	√
Arsenic	√	√	√	√	√	√	√	√	√	√	√	√	√
Beryllium	√	√	√	√	√	√	√	√	√	√	√	√	√
Cadmium	√	√	√	√	√	√	√	√	√	√	√	√	√
Cobalt	√	√	√	√	√	√	√	√	×	√	√	√	√
Copper	√	√	√	√	√	√	√	√	√	√	√	√	√
Manganese	√	√	√	√	√	√	√	√	√	√	√	√	√
Molybdenum	√	√	√	√	√	√	√	√	√	√	√	√	√
Nickel	√	√	√	√	√	√	√	√	√	√	√	√	√
Lead	√	√	√	√	√	√	√	√	×	√	√	√	√
Antimony	√	√	√	√	√	√	√	√	√	√	√	√	√
Selenium	√	√	√	√	√	√	√	√	×	√	√	√	√
Titanium	√	√	√	√	√	√	√	√	√	√	√	√	√

Thallium	√	√	√	√	√	√	√	√	√	×	√	√	√
Vanadium	√	√	√	√	√	√	√	√	√	√	√	√	√
Zinc	√	√	√	√	√	√	√	√	×	√	√	√	√
Aluminium	√	√	√	√	√	√	√	√	√	√	√	√	√
Boron	√	√	√	√	√	√	√	√	√	√	√	√	√
Barium	√	√	√	√	√	√	√	√	√	√	√	√	√
Chromium	√	√	√	√	√	√	√	√	√	√	√	√	√
Iron	√	√	√	√	√	√	√	√	√	√	√	√	√

【A】 China Inventory of Existing Chemical Substances(IECSC)
【B】 European Inventory of Existing Commercial Chemical Substances(EC inventory)
【C】 United States Toxic Substances Control Act Inventory(TSCA)
【D】 Canadian Domestic Substances List(DSL)
【E】 New Zealand Inventory of Chemicals(NZIoC)
【F】 Philippines Inventory of Chemicals and Chemical Substances(PICCS)
【G】 Korea Existing Chemicals Inventory(KECL)
【H】 Australian. Inventory of Industrial Chemical (AIICS)
【I】 Japan Inventory of Existing & New Chemical Substances(ENCS)
【J】 Thailand Existing Chemicals Inventory(TECI)
【K】 Mexico National Inventory of Chemical Substances (INSQ)
【L】 Russia Inventory of Existing Substances (DRAFT)
【M】 Inventory of Existing Chemical Substances in Taiwan, China (TCSI)

List of Chemical Substances under International Conventions

Component	A	B	C
Water	×	×	×
Nitric acid	×	×	×
Arsenic	×	×	×
Beryllium	×	×	×
Cadmium	×	×	×
Cobalt	×	×	×
Copper	×	×	×
Manganese	×	×	×
Molybdenum	×	×	×
Nickel	×	×	×
Lead	×	×	×
Antimony	×	×	×
Selenium	×	×	×
Titanium	×	×	×
Thallium	×	×	×
Vanadium	×	×	×
Zinc	×	×	×
Aluminium	×	×	×

Boron	×	×	×
Barium	×	×	×
Chromium	×	×	×
Iron	×	×	×

【A】 The Montreal Protocol on Substances that Deplete the Ozone Layer
【B】 Stockholm Convention on Persistent Organic Pollutants (POPs)
【C】 Rotterdam Convention on the prior informed consent procedure for certain hazardous chemicals and pesticides in international trade

European chemical inventory

Component	A	B	C	D	E	F	G	H	I
Water	×	×	×	√	×	×	×	×	×
Nitric acid	×	×	×	√	√	×	×	×	×
Arsenic	×	×	√	√	√	×	×	×	×
Beryllium	×	×	√	√	√	√	×	×	×
Cadmium	√	×	√	√	√	×	√	×	×
Cobalt	×	×	√	√	√	×	×	×	×
Copper	×	×	×	√	√	×	×	×	×
Manganese	×	×	×	√	√	×	×	×	×
Molybdenum	×	×	×	√	√	×	×	×	×
Nickel	×	×	√	√	√	×	√	×	×
Lead	√	×	√	√	√	×	√	×	×
Antimony	×	×	×	√	√	√	×	×	×
Selenium	×	×	×	√	√	×	×	×	×
Titanium	×	×	×	√	√	×	×	×	×
Thallium	×	×	×	√	×	×	×	×	×
Vanadium	×	×	×	√	√	×	×	×	×
Zinc	×	×	×	√	√	×	×	×	×
Aluminium	×	×	×	√	√	×	×	×	×
Boron	×	×	×	√	√	×	×	×	×
Barium	×	×	×	√	√	×	×	×	×
Chromium	×	×	×	√	√	×	×	×	×
Iron	×	×	×	√	√	×	×	×	×

[A] Candidate list of Substances of Very High Concern for authorization under EU REACH regulation
[B] Substances requiring authorisation under EU REACH regulation
[C] Substances restricted under EU REACH
[D] Pre-registered substances under EU REACH
[E] Registered substances under EU REACH
[F] Substance Evaluation – CoRAP under EU REACH
[G] List of priority substances under EU water policy （Directive 2455/2001/EC）
[H] Substances subject to POPs Regulation
[I] Substances proposed as POPs

Note:

"√" Indicates that the substance included in the regulations.

"×" No data or not included in the regulations.

German water hazard class(WGK)

Component	WGK	Remark
Nitric acid	WGK 1	
Arsenic	WGK 3	
Cadmium	WGK 3	
Cobalt	WGK 1	
Copper	WGK 2	
Manganese	WGK 2	
Molybdenum	nwg	
Nickel	WGK 1	
Selenium	WGK 2	
Titanium	nwg	
Vanadium	WGK 3	
Zinc	nwg	
Aluminium	nwg	
Boron	nwg	
Barium	WGK 1	
Chromium	nwg	
Iron	nwg	

【WGK 1】 slightlyhazardous to water
【WGK 2】 obviouslyhazardous to water
【WGK 3】 highly hazardous to water
【nwg】 non-hazardous to water
【awg】 hazardous to water in general

German technical instructions on air quality control(TA LUFT)

Component	TA LUFT	Remark
Arsenic	Chapter 5.2.7.1.1 Carcinogenic substances. Class I. As minimum requirement, the following values are in all not allowed to be exceeded in the exhaust gas:Mass flow:0,15 g/hr or Mass conc.:0,05 mg/m³. Specified as As.	
Beryllium	Chapter 5.2.7.1.1 Carcinogenic substances. Class I. As minimum requirement, the following values are in all not allowed to be exceeded in the exhaust gas:Mass flow: 0,15 g/hr or Mass conc.: 0,05 mg/m³	
Cadmium	Chapter 5.2.7.1.1 Carcinogenic substances. Class I. As minimum requirement, the following values are in all not allowed to be exceeded in	

	the exhaust gas:Mass flow:0.15 g/hr or Mass conc.:0.05 mg/m³. Specified as Cd.	
Cobalt	Chapter 5.2.2 Inorganic dusts. Class II. Also with the presence of several substances of the same class, the following values are in all not allowed to be exceeded in the exhaust gas:Mass flow:2,5 g/hr or Mass conc.:0,5 mg/m³. Specified as Co.	
Copper	Chapter 5.2.2 Inorganic dusts. Class III. Also with the presence of several substances of the same class, the following values are in all not allowed to be exceeded in the exhaust gas:Mass flow:5 g/hr or Mass conc.:1 mg/m³. Specified as Cu.	
Manganese	Chapter 5.2.2 Inorganic dusts. Class III. Also with the presence of several substances of the same class, the following values are in all not allowed to be exceeded in the exhaust gas:Mass flow:5 g/hr or Mass conc.:1 mg/m³. Specified as Mn.	
Molybdenum	Chapter 5.2.1 Overall Dust, including fine dust. The emissions of dust in the exhaust gas are not allowed to exceed the following values:Mass flow:0,20 kg/hr or Mass conc.:20 mg/m³ The mass per unit volume of 0,15 g/m3 in exhaust gas is not allowed to be exceeded also on observance or lower deviation of a mass flow of 0,20 kg/h.For emission sources that exceed the mass flow rate of 0.40 kg/h, the mass concentration in waste gas the mass concentration must not exceed 10 mg/m³.	
Nickel	Chapter 5.2.2 Inorganic dusts. Class II. Also with the presence of several substances of the same class, the following values are in all not allowed to be exceeded in the exhaust gas:Mass flow:2,5 g/hr or Mass conc.:0,5 mg/m³. Specified as Ni.	
Lead	Chapter 5.2.2 Inorganic dusts. Class II. Also with the presence of several substances of the same class, the following values are in all not allowed to be exceeded in the exhaust gas:Mass flow:2,5 g/hr or Mass conc.:0,5 mg/m³. Specified as Pb.	
Antimony	Chapter 5.2.2 Inorganic dusts. Class III. Also with the presence of several substances of the same class, the following values are in all not	

	allowed to be exceeded in the exhaust gas:Mass flow:5 g/hr or Mass conc.:1 mg/m³. Specified as Sb.	
Selenium	Chapter 5.2.2 Inorganic dusts. Class II. Also with the presence of several substances of the same class, the following values are in all not allowed to be exceeded in the exhaust gas:Mass flow:2,5 g/hr or Mass conc.:0,5 mg/m³. Specified as Se.	
Titanium	Chapter 5.2.1 Overall Dust, including fine dust. The emissions of dust in the exhaust gas are not allowed to exceed the following values:Mass flow:0,20 kg/hr or Mass conc.:20 mg/m³ The mass per unit volume of 0,15 g/m3 in exhaust gas is not allowed to be exceeded also on observance or lower deviation of a mass flow of 0,20 kg/h.For emission sources that exceed the mass flow rate of 0.40 kg/h, the mass concentration in waste gas the mass concentration must not exceed 10 mg/m³.	
Thallium	Chapter 5.2.2 Inorganic dusts. Class I. Also with the presence of several substances of the same class, the following values are in all not allowed to be exceeded in the exhaust gas:Mass flow: 0,05 g/hr or Mass conc.:0,01 mg/m³. Specified as Tl.	
Vanadium	Chapter 5.2.2 Inorganic dusts. Class III. Also with the presence of several substances of the same class, the following values are in all not allowed to be exceeded in the exhaust gas:Mass flow:5 g/hr or Mass conc.:1 mg/m³. Specified as V.	
Zinc	Chapter 5.2.1 Overall Dust, including fine dust. The emissions of dust in the exhaust gas are not allowed to exceed the following values:Mass flow:0.20 kg/hr or Mass conc.:20 mg/m³ The mass per unit volume of 0.15 g/m3 in exhaust gas is not allowed to be exceeded also on observance or lower deviation of a mass flow of 0.20 kg/h.For emission sources that exceed the mass flow rate of 0.40 kg/h, the mass concentration in waste gas the mass concentration must not exceed 10 mg/m³.	
Aluminium	Chapter 5.2.1 Overall Dust, including fine dust. The emissions of dust in the exhaust gas are not allowed to exceed the following values:Mass flow:0.20 kg/hr or	

	Mass conc.:20 mg/m³ The mass per unit volume of 0.15 g/m3 in exhaust gas is not allowed to be exceeded also on observance or lower deviation of a mass flow of 0.20 kg/h.For emission sources that exceed the mass flow rate of 0.40 kg/h, the mass concentration in waste gas the mass concentration must not exceed 10 mg/m³.	
Boron	Chapter 5.2.1 Overall Dust, including fine dust. The emissions of dust in the exhaust gas are not allowed to exceed the following values:Mass flow:0,20 kg/hr or Mass conc.:20 mg/m³ The mass per unit volume of 0,15 g/m3 in exhaust gas is not allowed to be exceeded also on observance or lower deviation of a mass flow of 0,20 kg/h.For emission sources that exceed the mass flow rate of 0.40 kg/h, the mass concentration in waste gas the mass concentration must not exceed 10 mg/m³.	
Barium	Chapter 5.2.1 Overall Dust, including fine dust. The emissions of dust in the exhaust gas are not allowed to exceed the following values:Mass flow:0,20 kg/hr or Mass conc.:20 mg/m³ The mass per unit volume of 0,15 g/m3 in exhaust gas is not allowed to be exceeded also on observance or lower deviation of a mass flow of 0,20 kg/h.For emission sources that exceed the mass flow rate of 0.40 kg/h, the mass concentration in waste gas the mass concentration must not exceed 10 mg/m³.	
Chromium	Chapter 5.2.2 Inorganic dusts. Class III. Also with the presence of several substances of the same class, the following values are in all not allowed to be exceeded in the exhaust gas:Mass flow:5 g/hr or Mass conc.:1 mg/m³. Specified as Cr.	
Iron	Chapter 5.2.1 Overall Dust, including fine dust. The emissions of dust in the exhaust gas are not allowed to exceed the following values:Mass flow:0,20 kg/hr or Mass conc.:20 mg/m³ The mass per unit volume of 0,15 g/m3 in exhaust gas is not allowed to be exceeded also on observance or lower deviation of a mass flow of 0,20 kg/h.For emission sources that exceed the mass flow rate of 0.40 kg/h, the mass concentration in waste gas the mass concentration	

	must not exceed 10 mg/m³.	

German technical rules for hazardous substances(TRGS)

Component	TRGS	Remark
Water	TRGS 500|TRGS 509|TRGS 510	
Nitric acid	TRGS 201|TRGS 400|TRGS 555|TRGS 600|TRGS 401|TRGS 500|TRGS 509|TRGS 510|TRGS 800	
Arsenic	TRGS 201|TRGS 400|TRGS 555|TRGS 600|TRGS 401|TRGS 410|TRGS 500|TRGS 509|TRGS 510|TRGS 800	
Beryllium	TRGS 201|TRGS 400|TRGS 555|TRGS 600|TRGS 402|TRGS 401|TRGS 410|TRGS 500|TRGS 509|TRGS 510|TRGS 800|TRGS 720|TRGS 721|TRGS 722|TRGS 723|TRGS 724|TRGS 560	
Cadmium	TRGS 201|TRGS 400|TRGS 555|TRGS 600|TRGS 402|TRGS 401|TRGS 410|TRGS 500|TRGS 509|TRGS 510|TRGS 800|TRGS 720|TRGS 721|TRGS 722|TRGS 723|TRGS 724|TRGS 560	pyrophoric
Cobalt	TRGS 201|TRGS 400|TRGS 555|TRGS 600|TRGS 401|TRGS 406|TRGS 410|TRGS 500|TRGS 509|TRGS 510|TRGS 800|TRGS 720|TRGS 721|TRGS 722|TRGS 723|TRGS 724|TRGS 560	
Copper	TRGS 201|TRGS 400|TRGS 555|TRGS 600|TRGS 500|TRGS 509|TRGS 510|TRGS 800|TRGS 720|TRGS 721|TRGS 722|TRGS 723|TRGS 724	
Manganese	TRGS 201|TRGS 400|TRGS 555|TRGS 600|TRGS 402|TRGS 500|TRGS 509|TRGS 510|TRGS 800|TRGS 720|TRGS 721|TRGS 722|TRGS 723|TRGS 724	
Molybdenum	TRGS 500|TRGS 509|TRGS 510	
Nickel	TRGS 201|TRGS 400|TRGS 555|TRGS 600|TRGS 402|TRGS 401|TRGS 500|TRGS 509|TRGS 510|TRGS 800|TRGS 720|TRGS 721|TRGS 722|TRGS 723|TRGS 724	
Lead	TRGS 201|TRGS 400|TRGS 555|TRGS 600|TRGS 402|TRGS 401|TRGS 500|TRGS 509|TRGS 510|TRGS 560|TRGS 505	
Antimony	TRGS 201|TRGS 400|TRGS 555|TRGS 600|TRGS 401|TRGS 500|TRGS 509|TRGS 510|TRGS 800	
Selenium	TRGS 201|TRGS 400|TRGS 555|TRGS 600|TRGS 402|TRGS 401|TRGS 500|TRGS 509|TRGS	

	510|TRGS 720|TRGS 721|TRGS 722|TRGS 723|TRGS 724	
Titanium	TRGS 201|TRGS 400|TRGS 555|TRGS 600|TRGS 500|TRGS 509|TRGS 510|TRGS 800|TRGS 720|TRGS 721|TRGS 722|TRGS 723|TRGS 724	
Thallium	TRGS 201|TRGS 400|TRGS 555|TRGS 600|TRGS 500|TRGS 509|TRGS 510	
Vanadium	TRGS 500|TRGS 509|TRGS 510|TRGS 800	
Zinc	TRGS 201|TRGS 400|TRGS 555|TRGS 600|TRGS 500|TRGS 509|TRGS 510|TRGS 800|TRGS 720|TRGS 721|TRGS 722|TRGS 723|TRGS 724	
Aluminium	TRGS 500|TRGS 509|TRGS 510|TRGS 800	
Boron	TRGS 500|TRGS 509|TRGS 510|TRGS 800|TRGS 720|TRGS 721|TRGS 722|TRGS 723|TRGS 724	
Barium	TRGS 201|TRGS 400|TRGS 555|TRGS 600|TRGS 401|TRGS 500|TRGS 509|TRGS 510|TRGS 800|TRGS 720|TRGS 721|TRGS 722|TRGS 723|TRGS 724	
Chromium	TRGS 402|TRGS 500|TRGS 509|TRGS 510|TRGS 800|TRGS 720|TRGS 721|TRGS 722|TRGS 723|TRGS 724	
Iron	TRGS 201|TRGS 400|TRGS 555|TRGS 600|TRGS 500|TRGS 509|TRGS 510|TRGS 800|TRGS 720|TRGS 721|TRGS 722|TRGS 723|TRGS 724	

15.2 Chemical safety assessment

	No Chemical Safety Assessment has been carried out for this substance/mixture by the supplier.

16 Other information

Information on revision

Creation Date	2025/12/23
Revision Date	-
Reason for revision	-

Reference

[1] IPCS: The International Chemical Safety Cards (ICSC), website: http://www.ilo.org/dyn/icsc/showcard.home.
[2] IARC, website: http://www.iarc.fr/.
[3] OECD: The Global Portal to Information on Chemical Substances, website: https://www.echemportal.org/echemportal/.
[4] CAMEO Chemicals, website: http://cameochemicals.noaa.gov/search/simple.
[5] NLM: ChemIDplus, website: http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp.
[6] EPA: Integrated Risk Information System, website: http://cfpub.epa.gov/iris/.
[7] U.S. Department of Transportation: ERG, website: http://www.phmsa.dot.gov/hazmat/library/erg.
[8] Germany GESTIS-database on hazard substance, website: http://gestis-en.itrust.de/.

Abbreviations and acronyms

CAS	Chemical Abstracts Service	UN	The United Nations
PC-STEL	Short term exposure limit	OECD	Organization for Economic Co-operation and Development
PC-TWA	Time Weighted Average	IMDG-CODE	International Maritime Dangerous Goods CODE
MAC	Maximum Allowable Concentration	IARC	International Agency for Research on Cancer
DNEL	Derived No Effect Level	ICAO	International Civil Aviation Organization
PNEC	Predicted No Effect Concentration	IATA	International Air Transportation Association
NOEC	No Observed Effect Concentration	ACGIH	American Conference of Governmental Industrial Hygienists
LC_{50}	Lethal Concentration 50%	NFPA	National Fire Protection Association
LD_{50}	Lethal Dose 50%	NTP	National Toxicology Program
EC_{50}	Effective Concentration 50%	PBT	Persistent, Bioaccumulative, Toxic
EC_X	Effective Concentration X%	vPvB	very Persistent, very Bioaccumulative
P_{OW}	Partition coefficient Octanol: Water	CMR	Carcinogens, mutagens or substances toxic to reproduction
BCF	Bioconcentration factor	RPE	Respiratory Protective Equipment
ED	Endocrine disruptor		

Disclaimer

This Safety Data Sheet (SDS) was prepared according to REACH Regulation The data included was derived from international authoritative database and provided by the enterprise. Other information was based on the present state of our knowledge. We try to ensure the correctness of all information. However, due to the diversity of information sources and the limitations of our knowledge, this document is only for user's reference. Users should make their independent judgment of suitability of this information for their particular purposes. We do not assume responsibility for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product.