

Safety Data Sheet

9 Mix elements standard solution

Version : V2.0.0.1

Report No. : BWB2580-2016-MSDS-EP

Creation Date : 2026/01/09

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	9 Mix elements standard solution
Cat No.	BWB2580-2016
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

Acute Toxicity - Oral	Category 4
Acute Toxicity - Dermal	Category 3
Skin corrosion/irritation	Category 1B
Serious eye damage/irritation	Category 2
Specific target organ toxicity - single exposure; respiratory	Category 3

tract irritation	
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2.2 Label elements

Hazard pictograms	
Signal word	Danger

Hazard statements

H302	Harmful if swallowed
H311	Toxic in contact with skin
H314	Causes severe skin burns and eye damage
H319	Causes serious eye irritation
H335	May cause respiratory irritation

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.
P270	Do not eat, drink or smoke when using this product.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/protective clothing/eye protection/face protection.

◆ Response

P310	Immediately call a POISON CENTER/doctor.
P321	Specific treatment (see related instructions on the label).
P330	Rinse mouth.
P363	Wash contaminated clothing before reuse.
P301+P312	IF SWALLOWED: Call a POISON CENTRE/doctor if you feel unwell.
P302+P352	IF ON SKIN: Wash with plenty of water.
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P337+P313	If eye irritation persists: Get medical advice/attention.
P361+P364	Take off immediately all contaminated clothing and wash it before reuse.
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.
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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
Hydrogen chloride	Not PBT/vPvB
Hydrogen fluoride	Not PBT/vPvB
Boron	Not applicable
Germanium	Not PBT/vPvB
Molybdenum	Not applicable
Niobium	Not applicable
Phosphorus	Not applicable
Rhenium	Not PBT/vPvB
Thallium	Insufficient information, temporarily unable to evaluate
Tungsten	Not applicable
Zirconium	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
Hydrogen chloride	Insufficient information, temporarily unable to evaluate
Hydrogen fluoride	Insufficient information, temporarily unable to evaluate
Boron	Insufficient information, temporarily unable to evaluate
Germanium	Insufficient information, temporarily unable to evaluate
Molybdenum	Insufficient information, temporarily unable to evaluate
Niobium	Insufficient information, temporarily unable to evaluate
Phosphorus	Insufficient information, temporarily unable to evaluate
Rhenium	Insufficient information, temporarily unable to evaluate
Thallium	Insufficient information, temporarily unable to evaluate
Tungsten	Insufficient information, temporarily unable to evaluate
Zirconium	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	Classification according to Regulation (EC) No. 1272/2008 with amendment	Specific Conc. Limits, M-factors
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	range)	2023/707 [CLP]	
Water CAS : 7732-18-5 EC : 231-791-2 Index No. : -	88.7	Not Classified	-
Hydrogen chloride CAS : 7647-01-0 EC : 231-595-7 Index No. : 017-002-00-2	10	Skin corrosion/irritation, Category 1B, H314; Specific target organ toxicity - single exposure; respiratory tract irritation, Category 3, H335	H314B:C≥25% H315:10%≤C<25% H319:10%≤C<25% H335:C≥10%
Hydrogen fluoride CAS : 7664-39-3 EC : 231-634-8 Index No. : 009-002-00-6	1.2	Acute Toxicity - Oral, Category 2, H300; Acute Toxicity - Dermal, Category 1, H310; Skin corrosion/irritation, Category 1A, H314; Acute Toxicity - Inhalation, Category 2, H330	H314A:C≥7% H314B:1%≤C<7% H319:0.1%≤C<1%
Boron CAS : 7440-42-8 EC : 231-151-2 Index No. : -	0.0095	Not Classified	-
Germanium CAS : 7440-56-4 EC : 231-164-3 Index No. : -	0.0095	Reproductive toxicity, Category 2, H361; Specific target organ toxicity - repeated exposure, Category 2, H373; Hazardous to the aquatic environment - long-term (chronic) hazard, Category 3, H412	-
Molybdenum CAS : 7439-98-7 EC : 231-107-2 Index No. : -	0.0095	Not Classified	-
Niobium CAS : 7440-03-1 EC : 231-113-5 Index No. : -	0.0095	Not Classified	-
Phosphorus CAS : 7723-14-0 EC : 231-768-7 Index No. : 015-002-00-7	0.0095	Flammable solids, Category 1, H228; Hazardous to the aquatic environment - long-term (chronic) hazard, Category 3, H412	-
Rhenium CAS : 7440-15-5 EC : 231-124-5 Index No. : -	0.0095	Not Classified	-
Thallium CAS : 7440-28-0 EC : 231-138-1 Index No. : 081-001-00-3	0.0095	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	-
Tungsten CAS : 7440-33-7 EC : 231-143-9 Index No. : -	0.0095	Flammable solids, Category 1, H228; Self-heating substances and mixtures, Category 2, H252	-
Zirconium CAS : 7440-67-7 EC : 231-176-9 Index No. : 040-001-00-3	0.0095	Pyrophoric solids, Category 1, H250; Substances and mixtures which, in contact with water, emit flammable gases, Category 1, H260	-

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.
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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.
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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	Use extinguishing media suitable for surrounding area.
Unsuitable extinguishing media	There is no restriction on the type of extinguisher which may be used.

5.2 Specific hazards arising from the substance or mixture

1	Development of hazardous combustion gases or vapor possible in the event of fire.
2	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	Use personal protective equipment, do not breathe gas/mist/vapour/spray.
2	Ensure adequate ventilation. Remove all sources of ignition. Take precautionary measures against static discharges.
3	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	Cut off the source of the leak as much as possible.
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2	Keep leaks in a ventilated place.
3	Absorb spilled material in dry sand or inert absorbent. In case of large amount of spillage, contain a spill by bunding.
4	Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment.
5	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.
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◆ Measures to prevent aerosol and dust generation

1	Not applicable.
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◆ 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.
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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/m ³	ppm	mg/m ³
Hydrogen chloride	Japan - JSOH(2024-2025)	-	-	-	-
	Permissible exposure standards for workers in the	-	-	-	-

	workplace				
	European Union	5	8	10	15
	France	-	-	5	7.6
	Germany (AGS)	2	3	4	6
	Germany (DFG)	2	3	4	6
Hydrogen fluoride	Japan - JSOH(2024–2025)	-	-	-	-
	Permissible exposure standards for workers in the workplace	3	2.6	6	5.2
	European Union	1.8	1.5	3	2.5
	France	1.8	1.5	3	2.5
	Germany (AGS)	1	0.83	2	1.66
	Germany (DFG)	1	0.83	2	1.66
	Boron	Germany (DFG)	-	0.75	-
Germanium	Germany (AGS)	-	0.85	-	1.7
	Romania	-	2	-	5
Molybdenum	France	-	5	-	10
	Austria	-	15(inhalable aerosol)	-	30(inhalable aerosol)
	Denmark	-	10	-	20
	Finland	-	0.5	-	-
	Hungary	-	10	-	-
	Ireland	-	10	-	-
Niobium	Austria	-	5(inhalable aerosol)	-	10(inhalable aerosol)
Phosphorus	Japan - JSOH(2024–2025)	-	0.1	-	-
	Permissible exposure standards for workers in the workplace	-	0.1	-	0.3
	Germany (AGS)	-	0.01(inhalable aerosol)	-	0.02(inhalable aerosol)
	Germany (DFG)	-	0.01	-	0.02
	United Kingdom	-	0.1	-	0.3
	Belgium	0.02	0.1	-	-
	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	-	-
Tungsten	Permissible exposure standards for workers in the workplace	-	5	-	10
	United Kingdom	-	5	-	10
	Austria	-	5(inhalable aerosol)	-	10(inhalable aerosol)
	Belgium	-	5	-	10
	Denmark	-	5	-	10
	Finland	-	5	-	-
	Zirconium	Germany (DFG)	-	1(inhalable aerosol)	-
United Kingdom		-	5	-	10
Austria		-	5(inhalable aerosol)	-	-
Belgium		-	5	-	10
Denmark		-	5	-	10
Finland		-	1	-	-

◆ Biological limit values

Component	Standard	Biological monitoring index	Biological limits value	Sampling time	Remark
Hydrogen fluoride	SCOEL(EU)	Fluorine/urine	8mg/L	end of shift	
		Fluoride(Urine)	2mg/L	Prior to shift	
		Fluoride(Urine)	3mg/L	End of shift	

◆ 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
Hydrogen chloride	Inhalation	No data available	No data available	8 mg/m ³	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
Hydrogen fluoride	Inhalation	No data available	No data available	1.5 mg/m ³	1.5 mg/m ³
	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
Germanium	Inhalation	No data available	No data available	No data available	0.335 mg/m ³
	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/m ³
	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
Niobium	Inhalation	No data available	No data available	No data available	23.5 mg/m ³
	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
Phosphorus	Inhalation	No data available	No data available	No data available	4 mg/m ³
	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
Rhenium	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
Tungsten	Inhalation	No data available	No data available	No data available	5.8 mg/m ³
	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
Zirconium	Inhalation	No data available	No data available	No data available	5 mg/m ³
	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
Hydrogen chloride	No hazard identified	No hazard identified	No hazard identified	No hazard identified	No hazard identified	No hazard identified	No data available	No potential for bioaccumulation
Hydrogen fluoride	890 µg/L	89 µg/L	51 mg/L	3.38 mg/kg sediment dw	338 µg/kg sediment dw	No hazard identified	10.6 mg/kg soil dw	No potential for bioaccumulation
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
Germanium	43.4 µg/L	43.4 µg/L	7 mg/L	599.4 mg/kg sediment dw	19.6 mg/kg sediment dw	No hazard identified	43.4 mg/kg soil dw	No 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
Niobium	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
Phosphorus	2.5 ng/L	0.25 ng/L	No data available	No data available	No data available	No hazard identified	No hazard identified	No potential for bioaccumulation
Tungsten	338 µg/L	33.8 µg/L	5.86 mg/L	960 mg/kg sediment dw	96 mg/kg sediment dw	No hazard identified	2.17 mg/kg soil dw	11 mg/kg food
Zirconium	74 µg/L	7.4 µg/L	No data available	74.6 mg/kg sediment dw	7.5 mg/kg sediment dw	No data available	7 mg/kg soil dw	No potential for bioaccumulation

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
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9 Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	Clear, colorless liquid
Colour	Clear, colorless liquid
Odor	No information available
Odor threshold	No information available
pH	No information available
Melting point/freezing point(°C)	2 075 (Boron)
Initial boiling point and boiling range(°C)	4000 (101.325 kPa,Boron)
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	No information available
Vapor density(Air = 1)	No information available
Relative density(Water=1)	2.35 (20 °C,Boron)
Solubility	Insoluble in water (Boron)
n-octanol/water partition coefficient	No information available
Auto-ignition temperature(°C)	700 (Boron)
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
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9.2.2 Other safety characteristics

Other safety characteristics	No information available
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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. In contact with magnesium, sodium, potassium, copper and other metals or metal acetylense may cause a fire or explosion. Mixtures with

	metallic acetylene, when heated, cause a fire or incandescence.
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. Magnesium, sodium, potassium, copper, oxidants, acetylene metal compounds, alcohols, alkanes, hydrogen and water. Metal acetylide, halogen, interhalogen, halogen oxides, nitric acid, nitrous oxide, nitrates, nitrites, halogen oxyacid salts, chromates, permanganates, inorganic peroxides, metal oxides and peroxyformic acid.
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

9 Mix elements standard solution	
Skin corrosion/irritation	Causes severe skin burns and eye damage(Category 1B)
Serious eye damage/irritation	Causes serious eye irritation(Category 2)
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	May cause respiratory irritation(Category 3)
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)
Phosphorus	3.03mg/kg(Rat)	No information available	No information available
Hydrogen chloride	900mg/kg(Rabbit)	No information available	1405ppmV(Rat)
Hydrogen fluoride	No information available	No information available	653.5ppmV(Rat)
Boron	650mg/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
Hydrogen chloride	Category 3	Not Listed
Hydrogen fluoride	Not Listed	Not Listed
Boron	Not Listed	Not Listed
Germanium	Not Listed	Not Listed
Molybdenum	Not Listed	Not Listed
Niobium	Not Listed	Not Listed
Phosphorus	Not Listed	Not Listed

Rhenium	Not Listed	Not Listed
Thallium	Not Listed	Not Listed
Tungsten	Not Listed	Not Listed
Zirconium	Not Listed	Not Listed

11.2 Information on other hazards

11.2.1 Endocrine disrupting properties

Component	Endocrine disrupting properties
Water	No information available
Hydrogen chloride	No information available
Hydrogen fluoride	No information available
Boron	No information available
Germanium	No information available
Molybdenum	No information available
Niobium	No information available
Phosphorus	No information available
Rhenium	No information available
Thallium	No information available
Tungsten	No information available
Zirconium	No information available

11.2.2 Other Information

Other Information	See Section 11.1
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12 Ecological information

12.1 Toxicity

Acute aquatic toxicity

Component	Fish	Crustaceans	Algae or other aquatic plants
Phosphorus	LC ₅₀ : 0.006mg/L (96h)(Fish)	EC ₅₀ : 0.14mg/L (48h)(Crustaceans)	No information available
Hydrogen chloride	LC ₅₀ : 20.5mg/L (96h)(Fish)	No information available	No information available
Zirconium	LC ₅₀ : 74mg/L (96h)(Fish)	No information available	No information available
Tungsten	LC ₅₀ : > 106mg/L (96h)(Fish)	EC ₅₀ : > 96mg/L (48h)(Crustaceans)	ErC ₅₀ : 31mg/L (72h)(Algae)
Germanium	LC ₅₀ : 72mg/L (96h)(Fish)	No information available	No information available
Molybdenum	LC ₅₀ : 609.1mg/L (96h)(Fish)	No information available	No information available
Hydrogen fluoride	LC ₅₀ : 51mg/L (96h)(Fish)	No information available	No information available
Thallium	LC ₅₀ : 21mg/L (96h)(Fish)	No information available	ErC ₅₀ : 0.13mg/L (96h)(Algae)

Chronic aquatic toxicity

Component	Fish	Crustaceans	Algae or other aquatic plants
Tungsten	NOEC : ≥ 10 mg/L(Fish)	No information available	No information available

12.2 Persistence and degradability

Component	Persistence (water/soil)	Persistence (air)
Hydrogen fluoride	Low	Low

12.3 Bioaccumulative potential

Component	Bioaccumulative potential	Comments
Hydrogen fluoride	Low	Log Kow=-1.38
Phosphorus	High	BCF=2310000

12.4 Mobility in soil

Component	log Koc	Remark
Hydrogen fluoride	0.29	20 °C
Zirconium	4.61	20 °C

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
Hydrogen chloride	Not PBT/vPvB
Hydrogen fluoride	Not PBT/vPvB
Boron	Not applicable
Germanium	Not PBT/vPvB
Molybdenum	Not applicable
Niobium	Not applicable
Phosphorus	Not applicable
Rhenium	Not PBT/vPvB
Thallium	Insufficient information, temporarily unable to evaluate
Tungsten	Not applicable
Zirconium	Not applicable

12.6 Endocrine disrupting properties

Component	Endocrine disrupting properties
Water	No information available
Hydrogen chloride	No information available
Hydrogen fluoride	No information available

Boron	No information available
Germanium	No information available
Molybdenum	No information available
Niobium	No information available
Phosphorus	No information available
Rhenium	No information available
Thallium	No information available
Tungsten	No information available
Zirconium	No information available

12.7 Other adverse effects

	No information available
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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	Not applicable
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IMDG-CODE

IMDG-CODE	NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS
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IATA-DGR

IATA-DGR	NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS
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UN-ADR

UN-ADR	NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS
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Special precautions for user

	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.
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Maritime transport in bulk according to IMO instruments

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

	Not Available
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- ◆ Transport in bulk in accordance with MARPOL Annex V and the IMSBC Code

	Not Available
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◆ 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	√	√	√	√	√	√	√	√	√	√	√	√	√
Hydrogen chloride	√	√	√	√	√	√	√	√	√	√	√	√	√
Hydrogen fluoride	√	√	√	√	√	√	√	√	√	√	√	√	√
Boron	√	√	√	√	√	√	√	√	×	√	√	√	√
Germanium	√	√	√	×	√	×	√	√	×	×	×	√	√
Molybdenum	√	√	√	√	√	√	√	√	×	√	√	√	√
Niobium	√	√	√	√	√	√	√	√	×	×	×	√	√
Phosphorus	√	√	√	√	√	√	√	√	×	√	√	√	√
Rhenium	√	√	√	√	√	√	√	√	×	×	×	√	√
Thallium	√	√	√	√	√	√	√	√	×	×	√	√	√
Tungsten	√	√	√	√	√	√	√	√	×	√	√	√	√
Zirconium	√	√	√	√	√	√	√	√	×	√	√	√	√

- [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	×	×	×
Hydrogen chloride	×	×	×
Hydrogen fluoride	×	×	×
Boron	×	×	×
Germanium	×	×	×
Molybdenum	×	×	×
Niobium	×	×	×

Phosphorus	x	x	x
Rhenium	x	x	x
Thallium	x	x	x
Tungsten	x	x	x
Zirconium	x	x	x

[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	x	x	x	√	x	x	x	x	x
Hydrogen chloride	x	x	x	√	√	x	x	x	x
Hydrogen fluoride	x	x	x	√	√	x	x	x	x
Boron	x	x	x	√	√	x	x	x	x
Germanium	x	x	x	√	√	x	x	x	x
Molybdenum	x	x	x	√	√	x	x	x	x
Niobium	x	x	x	√	√	x	x	x	x
Phosphorus	x	x	x	√	√	x	x	x	x
Rhenium	x	x	x	√	√	x	x	x	x
Thallium	x	x	x	√	x	x	x	x	x
Tungsten	x	x	x	√	√	x	x	x	x
Zirconium	x	x	x	√	√	x	x	x	x

[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.

“x” No data or not included in the regulations.

German water hazard class(WGK)

Component	WGK	Remark
Hydrogen chloride	WGK 1	The regular and professional use of this substance for drinking water treatment, surface water remediation or waste water treatment is not restricted by this classification.
Hydrogen fluoride	WGK 2	
Boron	nwg	

Molybdenum	nwg	
Niobium	nwg	
Phosphorus	WGK 1	
Rhenium	nwg	
Tungsten	nwg	
Zirconium	WGK 1	

- 【WGK 1】 slightly hazardous to water
 【WGK 2】 obviously hazardous 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
Hydrogen chloride	Chapter 5.2.4 Gaseous inorganic substances. Class III. Following values are not allowed to be exceeded in the exhaust gas Mass flow:0,15 kg/hr or Mass conc.:30 mg/m ³ . Specified as hydrogen chlorid.	
Hydrogen fluoride	Chapter 5.2.4 Gaseous inorganic substances. Class II. Following values are not allowed to be exceeded in the exhaust gas Mass flow:15 g/hr or Mass conc.:3 mg/m ³ . Specified as hydrogen fluoride.	
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/m ³ The mass per unit volume of 0,15 g/m ³ 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/m ³ .	
Germanium	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/m ³ The mass per unit volume of 0,15 g/m ³ 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/m ³ .	
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/m ³ The mass per unit volume of 0,15 g/m ³ 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/m ³ .	
Niobium	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/m ³ The mass per unit volume of 0,15 g/m ³ 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/m ³ .	
Phosphorus	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/m ³ The mass per unit volume of 0,15 g/m ³ 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/m ³ .	
Rhenium	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/m ³ The mass per unit volume of 0,15 g/m ³ 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/m ³ .	

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/m ³ . Specified as Tl.	
Tungsten	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/m ³ The mass per unit volume of 0,15 g/m ³ 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/m ³ .	
Zirconium	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/m ³ The mass per unit volume of 0.15 g/m ³ 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/m ³ .	

German technical rules for hazardous substances(TRGS)

Component	TRGS	Remark
Water	TRGS 500 TRGS 509 TRGS 510	
Hydrogen chloride	TRGS 201 TRGS 400 TRGS 555 TRGS 600 TRGS 402 TRGS 401 TRGS 407 TRGS 745 TRBS 3145 TRGS 746 TRBS 3146 TRGS 510 TRGS 500	
Hydrogen fluoride	TRGS 201 TRGS 400 TRGS 555 TRGS 600 TRGS 402 TRGS 401 TRGS 407 TRGS 745 TRBS 3145 TRGS 746 TRBS 3146 TRGS 510 TRGS 500	
Boron	TRGS 500 TRGS 509 TRGS 510 TRGS 800 TRGS 720 TRGS 721 TRGS 722 TRGS 723 TRGS 724	
Germanium	TRGS 201 TRGS 400 TRGS 555 TRGS 600 TRGS 402 TRGS 401 TRGS 500 TRGS 509 TRGS 510 TRGS 800	

Molybdenum	TRGS 500 TRGS 509 TRGS 510	
Niobium	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	
Phosphorus	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	Red phosphorus
Rhenium	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	
Tungsten	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	
Zirconium	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.
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16 Other information

Information on revision

Creation Date	2026/01/09
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.