



SAFETY DATA SHEET

This safety data sheet was created pursuant to the requirements of:
Regulation (EC) No. 1907/2006 and Regulation (EC) No. 1272/2008

Revision date 16-Jan-2024

Revision Number 1

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

1.1. Product identifier

Product Code(s)	VHG-SM30A-500
Product Name	Refractory Elements Standard: Al, B, Cr, Hf, Mo, Nb, Si, Ta, Ti, V, W, Zr @ 100 µg/mL in 5% HCl, tr. HF
Form	Not applicable
Unique Formula Identifier (UFI)	1RDS-80E2-S00R-6F4P
Pure substance/mixture	Mixture

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

Recommended use	Laboratory use
Uses advised against	No information available

1.3. Details of the supplier of the safety data sheet

Supplier

LGC Limited
Queens Road
Teddington
Middlesex TW11 0LY
UNITED KINGDOM
:+44 (0) 20 8943 7000
Fax :+44 (0) 20 8943 2767
eMail : gb@lgcstandards.com

Web : www.lgcstandards.com

For further information, please contact

E-mail address sds-request@lgcgroup.com

1.4. Emergency telephone number

Emergency Telephone	For Hazardous Materials or Dangerous Goods Incident Spill, Leak, Fire Exposure, or Accident Call CHEMTREC: USA & Canada 1-800-424-9300 Rest of the world +1 703-741-5970
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VHG-SM30A-500 - Refractory Elements Standard: Al, B, Cr, Hf, Mo, Nb, Si, Ta, Ti, V, W, Zr @ 100 µg/mL in 5% HCl, tr. HF

Emergency Telephone - §45 - (EC)1272/2008	
Europe	112
Austria	No information available
Bulgaria	
Croatia	
Cyprus	
Czech Republic	
Denmark	
France	
Hungary	
Ireland	
Italy	
Lithuania	
Luxembourg	
Netherlands	
Norway	
Portugal	
Romania	
Slovakia	
Slovenia	
Spain	
Sweden	
Switzerland	

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to
Regulation (EC) No. 1272/2008 [CLP]

Serious eye damage/eye irritation	Category 2 - (H319)
Corrosive to metals	Category 1 - (H290)

2.2. Label elements





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Signal word

Warning

Hazard statements

H319 - Causes serious eye irritation

H290 - May be corrosive to metals

Precautionary Statements - EU (§28, 1272/2008)

P234 - Keep only in original packaging

P264 - Wash face, hands and any exposed skin thoroughly after handling

P280 - Wear eye protection/ face protection

P337 + P313 - If eye irritation persists: Get medical advice/attention

P390 - Absorb spillage to prevent material damage

P201 - Obtain special instructions before use

P234 - Keep only in original container

P406 - Store in corrosive resistant stainless steel container with a resistant inner liner

2.3. Other hazards

Causes mild skin irritation.

This mixture contains no substance considered to be persistent, bioaccumulating or toxic (PBT). This mixture contains no substance considered to be very persistent nor very bioaccumulating (vPvB).

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

Chemical name	EU - REACH (1907/2006) - Article 59(1) - Candidate List of Substances of Very High Concern (SVHC) for Authorisation	EU - REACH (1907/2006) - Endocrine Disruptor Assessment List of Substances
Hydrochloric acid	-	-
hydrofluoric acid	-	-
vanadium pentoxide	-	-
Tantalum pentachloride	-	-
Molybdenum	-	-
Chromium	-	-
Boric acid	-	-
Aluminum	-	-

SECTION 3: Composition/information on ingredients

3.1 Substances

Not applicable



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3.2 Mixtures

Chemical nature aqueous solution.

Chemical name	Weight-%	REACH registration number	EC No (EU Index No)	Classification according to Regulation (EC) No. 1272/2008 [CLP]	Specific concentration limit (SCL)	M-Factor	M-Factor (long-term)
Hydrochloric acid 7647-01-0	1 - <3	-	231-595-7 (017-002-00-2)	Met. Corr. 1 (H290) Skin Corr. 1B (H314) STOT SE 3 (H335)	Eye Irrit. 2 :: 10%≤C<25% Skin Corr. 1B :: C≥25% Skin Irrit. 2 :: 10%≤C<25% STOT SE 3 :: C≥10%		
hydrofluoric acid 7664-39-3	0.1 - 1	-	231-634-8 (009-002-00-6)	Acute Tox. 2 (H300) Acute Tox. 1 (H310) Acute Tox. 2 (H330) Skin Corr. 1A (H314)	Eye Irrit. 2 :: 0.1%≤C<1% Skin Corr. 1A :: C≥7% Skin Corr. 1B :: 1%≤C<7%		
Zirconium tetrachloride 10026-11-6	<0.1	No data available	233-058-2	Met. Corr. 1 (H290) Acute Tox. 4 (H302) Skin Corr. 1B (H314)			
vanadium pentoxide 1314-62-1	<0.1	-	215-239-8 (023-001-00-8)	Acute Tox. 2 (H300) Acute Tox. 4 (H332) Carc. 1B (H350) Muta. 2 (H341) Repr. 2 (H361fd) Lact. (H362) STOT SE 3 (H335) STOT RE 1 (H372) Aquatic Chronic 2 (H411)			
Tungsten 7440-33-7	<0.1	-	231-143-9	-			
Titanium 7440-32-6	<0.1	-	231-142-3	Flam. Sol. 1 (H228)			
Tantalum pentachloride 7721-01-9	<0.1	-	231-755-6	Acute Tox. 4 (H302) Skin Corr. 1B (H314) Eye Dam. 1 (H318)			
Molybdenum	<0.1	-	231-107-2	-			



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7439-98-7							
Hafnium(IV) oxychloride hydrate 14456-34-9	<0.1	-	623-270-7	Skin Corr. 1C (H314) Eye Dam. 1 (H318)			
Chromium 7440-47-3	<0.1	-	231-157-5	-			
Boric acid 10043-35-3	<0.1	-	233-139-2	Repr. 1B (H360FD)			
Ammonium silicofluoride 16919-19-0	<0.1	-	240-968-3	Acute Tox. 3 (H301) Acute Tox. 3 (H311) Acute Tox. 3 (H331) Aquatic Chronic 3 (H412)			
Aluminum 7429-90-5	<0.1	-	231-072-3	Flam. Sol. 1 (H228) Water-react. 2 (H261)			

Full text of H- and EUH-phrases: see section 16

Acute Toxicity Estimate

If LD50/LC50 data is not available or does not correspond to the classification category, then the appropriate conversion value from CLP Annex I, Table 3.1.2, is used to calculate the acute toxicity estimate (ATEmix) for classifying a mixture based on its components

Chemical name	Oral LD50 mg/kg	Dermal LD50 mg/kg	Inhalation LC50 - 4 hour - dust/mist - mg/L	Inhalation LC50 - 4 hour - vapour - mg/L	Inhalation LC50 - 4 hour - gas - ppm
Hydrochloric acid 7647-01-0	238	5010	No data available	No data available	563.3022
hydrofluoric acid 7664-39-3	No data available	No data available	No data available	No data available	482.8875
Zirconium tetrachloride 10026-11-6	1688	No data available	No data available	No data available	No data available
vanadium pentoxide 1314-62-1	220 + 10	2500	2.21	No data available	No data available
Tungsten 7440-33-7	No data available	2000	No data available	No data available	No data available
Tantalum pentachloride 7721-01-9	1900	No data available	No data available	No data available	No data available
Molybdenum 7439-98-7	No data available	2000	No data available	No data available	No data available
Boric acid 10043-35-3	2660	2001	2.12	No data available	No data available



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+ This value is the harmonised acute toxicity estimate (ATE) listed in CLP Annex VI, Part 3. This harmonised ATE value must be used when calculating the acute toxicity estimate (ATE_{mix}) for classifying a mixture containing the listed substance

This product does not contain candidate substances of very high concern at a concentration $\geq 0.1\%$ (Regulation (EC) No. 1907/2006 (REACH), Article 59)

SECTION 4: First aid measures

4.1. Description of first aid measures

General advice	Show this safety data sheet to the doctor in attendance.
Inhalation	Remove to fresh air. Get medical attention immediately if symptoms occur.
Eye contact	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Keep eye wide open while rinsing. Do not rub affected area. Get medical attention if irritation develops and persists.
Skin contact	Wash off immediately with soap and plenty of water for at least 15 minutes. Get medical attention if irritation develops and persists.
Ingestion	Rinse mouth. Never give anything by mouth to an unconscious person. Do NOT induce vomiting. Call a doctor.
Self-protection of the first aider	Avoid contact with skin, eyes or clothing. Wear personal protective clothing (see section 8).

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

Symptoms	May cause redness and tearing of the eyes. Burning sensation. Prolonged contact may cause redness and irritation.
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4.3. Indication of any immediate medical attention and special treatment needed

Note to doctors	Treat symptomatically.
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SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable Extinguishing Media	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
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Large Fire

CAUTION: Use of water spray when fighting fire may be inefficient.

Unsuitable extinguishing media

Do not scatter spilled material with high pressure water streams.

5.2. Special hazards arising from the substance or mixture

Specific hazards arising from the chemical

No information available.

5.3. Advice for firefighters

Special protective equipment and precautions for fire-fighters

Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear. Use personal protection equipment.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions

Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Use personal protective equipment as required.

Other information

Refer to protective measures listed in Sections 7 and 8.

For emergency responders

Use personal protection recommended in Section 8.

6.2. Environmental precautions

Environmental precautions

Prevent further leakage or spillage if safe to do so.

6.3. Methods and material for containment and cleaning up

Methods for containment

Prevent further leakage or spillage if safe to do so.

Methods for cleaning up

Take up mechanically, placing in appropriate containers for disposal.

Prevention of secondary hazards

Clean contaminated objects and areas thoroughly observing environmental regulations.

6.4. Reference to other sections

Reference to other sections

See section 8 for more information. See section 13 for more information.

SECTION 7: Handling and storage



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7.1. Precautions for safe handling

Advice on safe handling Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes or clothing. Do not eat, drink or smoke when using this product.

General hygiene considerations Regular cleaning of equipment, work area and clothing is recommended. Avoid contact with skin, eyes or clothing. Do not eat, drink or smoke when using this product. Wash hands before breaks and after work. Wear suitable gloves and eye/face protection.

7.2. Conditions for safe storage, including any incompatibilities

Storage Conditions Keep containers tightly closed in a dry, cool and well-ventilated place. Protect from moisture. Store locked up. Keep out of the reach of children. Store away from other materials. Please refer to the manufacturer's certificate for specific storage and transport temperature conditions. Store only in the original receptacle unless other advice is given on the CoA.

7.3. Specific end use(s)

Risk Management Methods (RMM) The information required is contained in this Safety Data Sheet.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Exposure Limits

Chemical name	European Union	Austria	Belgium	Bulgaria	Croatia
Hydrochloric acid 7647-01-0	TWA: 5 ppm TWA: 8 mg/m ³ STEL: 10 ppm STEL: 15 mg/m ³	TWA: 5 ppm TWA: 8 mg/m ³ STEL 10 ppm STEL 15 mg/m ³	TWA: 5 ppm TWA: 8 mg/m ³ STEL: 10 ppm STEL: 15 mg/m ³	TWA: 5 ppm TWA: 8.0 mg/m ³ STEL: 10 ppm STEL: 15.0 mg/m ³	TWA: 5 ppm TWA: 8 mg/m ³ STEL: 10 ppm STEL: 15 mg/m ³
hydrofluoric acid 7664-39-3	TWA: 1.8 ppm TWA: 1.5 mg/m ³ STEL: 3 ppm STEL: 2.5 mg/m ³	TWA: 1.8 ppm TWA: 1.5 mg/m ³ STEL 3 ppm STEL 2.5 mg/m ³ H*	TWA: 1.8 ppm TWA: 1.5 mg/m ³ STEL: 3 ppm STEL: 2.5 mg/m ³	STEL: 3 ppm STEL: 2.5 mg/m ³ TWA: 1.8 ppm TWA: 1.5 mg/m ³	TWA: 1.8 ppm TWA: 1.5 mg/m ³ STEL: 3 ppm STEL: 2.5 mg/m ³
Zirconium tetrachloride 10026-11-6	-	TWA: 5 mg/m ³	TWA: 5 mg/m ³ STEL: 10 mg/m ³	-	TWA: 5 mg/m ³ STEL: 10 mg/m ³
vanadium pentoxide 1314-62-1	-	TWA: 0.05 mg/m ³ STEL 0.25 mg/m ³	TWA: 0.05 mg/m ³	TWA: 0.05 mg/m ³	TWA: 0.05 mg/m ³



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Tungsten 7440-33-7	-	TWA: 5 mg/m ³ STEL 10 mg/m ³	TWA: 5 mg/m ³ STEL: 10 mg/m ³	STEL: 3.0 mg/m ³ STEL: 10.0 mg/m ³ TWA: 5.0 mg/m ³ TWA: 1.0 mg/m ³	TWA: 5 mg/m ³ STEL: 3 mg/m ³
Titanium 7440-32-6	-	-	-	TWA: 1.0 mg/m ³	-
Molybdenum 7439-98-7	-	TWA: 10 mg/m ³ STEL 20 mg/m ³	TWA: 10 mg/m ³	TWA: 10.0 mg/m ³	TWA: 10 mg/m ³ STEL: 20 mg/m ³
Hafnium(IV) oxychloride hydrate 14456-34-9	-	TWA: 0.5 mg/m ³	-	-	-
Chromium 7440-47-3	TWA: 2 mg/m ³	TWA: 2 mg/m ³	TWA: 0.5 mg/m ³	TWA: 2.0 mg/m ³	TWA: 2 mg/m ³
Boric acid 10043-35-3	-	-	TWA: 2 mg/m ³ STEL: 6 mg/m ³	TWA: 5.0 mg/m ³	-
Ammonium silicofluoride 16919-19-0	TWA: 2.5 mg/m ³	-	TWA: 2.5 mg/m ³	TWA: 2.5 mg/m ³	TWA: 2.5 mg/m ³
Aluminum 7429-90-5	-	TWA: 10 mg/m ³ STEL 20 mg/m ³	TWA: 1 mg/m ³	TWA: 10.0 mg/m ³ TWA: 1.5 mg/m ³	TWA: 10 mg/m ³ TWA: 4 mg/m ³
Chemical name	Cyprus	Czech Republic	Denmark	Estonia	Finland
Hydrochloric acid 7647-01-0	TWA: 5 ppm TWA: 8 mg/m ³ STEL: 10 ppm STEL: 15 mg/m ³	TWA: 8 mg/m ³ Ceiling: 15 mg/m ³	STEL: 5 ppm STEL: 8 mg/m ³	TWA: 5 ppm TWA: 8 mg/m ³ STEL: 10 ppm STEL: 15 mg/m ³	STEL: 5 ppm STEL: 7.6 mg/m ³
hydrofluoric acid 7664-39-3	STEL: 3.0 ppm STEL: 2.5 mg/m ³ TWA: 1.8 ppm TWA: 1.5 mg/m ³	TWA: 1.5 mg/m ³ Ceiling: 2.5 mg/m ³	TWA: 1.8 ppm TWA: 1.5 mg/m ³ STEL: 2.5 mg/m ³ STEL: 3 ppm	TWA: 1.8 ppm TWA: 1.5 mg/m ³ STEL: 3 ppm STEL: 2.5 mg/m ³	TWA: 1.8 ppm TWA: 1.5 mg/m ³ STEL: 3 ppm STEL: 2.5 mg/m ³ iho*
Zirconium tetrachloride 10026-11-6	-	-	TWA: 5 mg/m ³ STEL: 10 mg/m ³	-	TWA: 1 mg/m ³
vanadium pentoxide 1314-62-1	-	TWA: 0.05 mg/m ³ Ceiling: 0.1 mg/m ³	TWA: 0.03 mg/m ³ STEL: 0.06 mg/m ³	TWA: 0.2 mg/m ³ STEL: 0.05 mg/m ³	TWA: 0.02 mg/m ³
Tungsten 7440-33-7	-	-	TWA: 5 mg/m ³ STEL: 10 mg/m ³	TWA: 5 mg/m ³	TWA: 5 mg/m ³
Tantalum pentachloride 7721-01-9	-	-	-	-	TWA: 5 mg/m ³
Molybdenum 7439-98-7	-	TWA: 5 mg/m ³ Ceiling: 25 mg/m ³	TWA: 10 mg/m ³ STEL: 20 mg/m ³	TWA: 10 mg/m ³ TWA: 5 mg/m ³	TWA: 0.5 mg/m ³
Hafnium(IV) oxychloride hydrate 14456-34-9	-	-	-	-	TWA: 0.5 mg/m ³
Chromium 7440-47-3	TWA: 2 mg/m ³	TWA: 0.5 mg/m ³ Ceiling: 1.5 mg/m ³	TWA: 0.5 mg/m ³ STEL: 1 mg/m ³	TWA: 2 mg/m ³	TWA: 0.5 mg/m ³



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Ammonium silicofluoride 16919-19-0	TWA: 2.5 mg/m ³	TWA: 2.5 mg/m ³ Ceiling: 5 mg/m ³	TWA: 2.5 mg/m ³	TWA: 2.5 mg/m ³	TWA: 2.5 mg/m ³
Aluminum 7429-90-5	-	TWA: 10.0 mg/m ³	TWA: 5 mg/m ³ TWA: 2 mg/m ³	TWA: 10 mg/m ³ TWA: 4 mg/m ³	TWA: 1.5 mg/m ³
Chemical name	France	Germany TRGS	Germany DFG	Greece	Hungary
Hydrochloric acid 7647-01-0	STEL: 5 ppm STEL: 7.6 mg/m ³	TWA: 2 ppm TWA: 3 mg/m ³	TWA: 2 ppm TWA: 3.0 mg/m ³ Peak: 4 ppm Peak: 6 mg/m ³	TWA: 5 ppm TWA: 7 mg/m ³ STEL: 5 ppm STEL: 7 mg/m ³	TWA: 8 mg/m ³ TWA: 5 ppm STEL: 165 mg/m ³ STEL: 10 ppm
hydrofluoric acid 7664-39-3	TWA: 1.8 ppm TWA: 1.5 mg/m ³ STEL: 3 ppm STEL: 2.5 mg/m ³	TWA: 1 ppm TWA: 0.83 mg/m ³ H*	TWA: 1 ppm TWA: 0.83 mg/m ³ Peak: 2 ppm Peak: 1.66 mg/m ³ *	TWA: 3 ppm TWA: 2.5 mg/m ³ STEL: 3 ppm STEL: 2.5 mg/m ³	TWA: 1.8 ppm TWA: 1.5 mg/m ³ STEL: 2.5 mg/m ³ STEL: 3 ppm b*
Zirconium tetrachloride 10026-11-6	-	-	-	TWA: 5 mg/m ³ STEL: 10 mg/m ³	TWA: 5 mg/m ³ STEL: 20 mg/m ³
vanadium pentoxide 1314-62-1	TWA: 0.05 mg/m ³	TWA: 0.005 mg/m ³ TWA: 0.03 mg/m ³	TWA: 0.005 mg/m ³ Peak: 0.01 mg/m ³	TWA: 0.5 mg/m ³ TWA: 0.05 mg/m ³	TWA: 0.05 mg/m ³ STEL: 0.2 mg/m ³ SZ+
Tungsten 7440-33-7	-	-	-	TWA: 5 mg/m ³ STEL: 10 mg/m ³	-
Molybdenum 7439-98-7	-	-	-	TWA: 15 mg/m ³	TWA: 10 mg/m ³ TWA: 5 mg/m ³
Chromium 7440-47-3	TWA: 2 mg/m ³	TWA: 2 mg/m ³	-	TWA: 1 mg/m ³	TWA: 2 mg/m ³ SZ+
Boric acid 10043-35-3	-	TWA: 0.5 mg/m ³	TWA: 10 mg/m ³ Peak: 10 mg/m ³	-	-
Ammonium silicofluoride 16919-19-0	TWA: 2.5 mg/m ³	TWA: 1 mg/m ³	TWA: 1 mg/m ³ *	TWA: 2.5 mg/m ³	TWA: 2.5 mg/m ³ *
Aluminum 7429-90-5	TWA: 10 mg/m ³ TWA: 5 mg/m ³	TWA: 1.25 mg/m ³ TWA: 10 mg/m ³	TWA: 4 mg/m ³ TWA: 1.5 mg/m ³	TWA: 10 mg/m ³ TWA: 5 mg/m ³	TWA: 1 mg/m ³
Chemical name	Ireland	Italy MDLPS	Italy AIDII	Latvia	Lithuania
Hydrochloric acid 7647-01-0	TWA: 8 mg/m ³ TWA: 5 ppm STEL: 10 ppm STEL: 15 mg/m ³	TWA: 5 ppm TWA: 8 mg/m ³ STEL: 10 ppm STEL: 15 mg/m ³	Ceiling: 2 ppm Ceiling: 2.9 mg/m ³	TWA: 5 ppm TWA: 8 mg/m ³ STEL: 10 ppm STEL: 15 mg/m ³	TWA: 5 ppm TWA: 8 mg/m ³ STEL: 10 ppm STEL: 15 mg/m ³
hydrofluoric acid 7664-39-3	TWA: 1.5 mg/m ³ TWA: 1.8 ppm STEL: 2.5 mg/m ³ STEL: 3 ppm Sk*	TWA: 1.8 ppm TWA: 1.5 mg/m ³ STEL: 3 ppm STEL: 2.5 mg/m ³	TWA: 0.5 ppm TWA: 0.4 mg/m ³ cute* Ceiling: 2 ppm Ceiling: 1.6 mg/m ³	TWA: 1.8 ppm TWA: 1.5 mg/m ³ STEL: 3 ppm STEL: 2.5 mg/m ³	TWA: 1.8 ppm TWA: 1.5 mg/m ³ STEL: 3 ppm STEL: 2.5 mg/m ³
Zirconium tetrachloride 10026-11-6	TWA: 5 mg/m ³ STEL: 10 mg/m ³	-	TWA: 5 mg/m ³ STEL: 10 mg/m ³	-	-
vanadium pentoxide	TWA: 0.05 mg/m ³	-	TWA: 0.05 mg/m ³	TWA: 0.1 mg/m ³	TWA: 0.2 mg/m ³



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1314-62-1	STEL: 0.15 mg/m ³				Ceiling: 0.05 mg/m ³
Tungsten 7440-33-7	TWA: 5 mg/m ³ STEL: 10 mg/m ³	-	TWA: 3 mg/m ³	-	-
Titanium 7440-32-6	-	-	-	TWA: 10 mg/m ³	-
Molybdenum 7439-98-7	TWA: 3 mg/m ³ STEL: 9 mg/m ³	-	TWA: 10 mg/m ³ TWA: 3 mg/m ³	-	TWA: 5 mg/m ³ TWA: 10 mg/m ³
Hafnium(IV) oxychloride hydrate 14456-34-9	-	-	TWA: 0.5 mg/m ³	-	-
Chromium 7440-47-3	TWA: 2 mg/m ³ STEL: 6 mg/m ³	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³	TWA: 2 mg/m ³	TWA: 2 mg/m ³
Boric acid 10043-35-3	TWA: 2 mg/m ³ STEL: 6 mg/m ³	-	TWA: 2 mg/m ³ STEL: 6 mg/m ³	TWA: 10 mg/m ³	TWA: 10 mg/m ³
Ammonium silicofluoride 16919-19-0	TWA: 2.5 mg/m ³ STEL: 7.5 mg/m ³	TWA: 2.5 mg/m ³	TWA: 2.5 mg/m ³	TWA: 0.2 mg/m ³	TWA: 2.5 mg/m ³
Aluminum 7429-90-5	TWA: 1 mg/m ³ STEL: 3 mg/m ³	-	TWA: 1 mg/m ³	TWA: 2 mg/m ³	TWA: 5 mg/m ³ TWA: 2 mg/m ³ TWA: 1 mg/m ³
Chemical name	Luxembourg	Malta	Netherlands	Norway	Poland
Hydrochloric acid 7647-01-0	TWA: 5 ppm TWA: 8 mg/m ³ STEL: 10 ppm STEL: 15 mg/m ³	TWA: 5 ppm TWA: 8 mg/m ³ STEL: 10 ppm STEL: 15 mg/m ³	TWA: 5 ppm TWA: 8 mg/m ³ STEL: 10 ppm STEL: 15 mg/m ³	Ceiling: 5 ppm Ceiling: 7 mg/m ³	TWA: 5 mg/m ³ STEL: 10 mg/m ³
hydrofluoric acid 7664-39-3	STEL: 3 ppm STEL: 2.5 mg/m ³ TWA: 1.8 ppm TWA: 1.5 mg/m ³	STEL: 3 ppm STEL: 2.5 mg/m ³ TWA: 1.8 ppm TWA: 1.5 mg/m ³	STEL: 1.27 ppm STEL: 1 mg/m ³	TWA: 0.6 ppm TWA: 0.5 mg/m ³ STEL: 1.5 mg/m ³ STEL: 1.8 ppm H*	STEL: 2 mg/m ³ TWA: 0.5 mg/m ³
Zirconium tetrachloride 10026-11-6	-	-	-	TWA: 5 mg/m ³ STEL: 10 mg/m ³	TWA: 5 mg/m ³ STEL: 10 mg/m ³
vanadium pentoxide 1314-62-1	-	-	TWA: 0.01 mg/m ³ STEL: 0.03 mg/m ³	-	TWA: 0.05 mg/m ³
Tungsten 7440-33-7	-	-	-	TWA: 5 mg/m ³ STEL: 10 mg/m ³	TWA: 5 mg/m ³
Titanium 7440-32-6	-	-	-	-	STEL: 30 mg/m ³ TWA: 10 mg/m ³
Molybdenum 7439-98-7	-	-	-	TWA: 10 mg/m ³ STEL: 20 mg/m ³	STEL: 10 mg/m ³ TWA: 4 mg/m ³
Hafnium(IV) oxychloride hydrate 14456-34-9	-	-	-	-	TWA: 0.5 mg/m ³
Chromium 7440-47-3	TWA: 2 mg/m ³	TWA: 2 mg/m ³	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³ STEL: 1.5 mg/m ³	TWA: 0.5 mg/m ³



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Ammonium silicofluoride 16919-19-0	TWA: 2.5 mg/m ³	-	-	TWA: 0.5 mg/m ³ STEL: 1.5 mg/m ³	TWA: 2 mg/m ³
Aluminum 7429-90-5	-	-	-	TWA: 5 mg/m ³ STEL: 10 mg/m ³	TWA: 2.5 mg/m ³ TWA: 1.2 mg/m ³
Chemical name	Portugal	Romania	Slovakia	Slovenia	Spain
Hydrochloric acid 7647-01-0	TWA: 5 ppm TWA: 8 mg/m ³ STEL: 10 ppm STEL: 15 mg/m ³ Ceiling: 2 ppm	TWA: 5 ppm TWA: 8 mg/m ³ STEL: 10 ppm STEL: 15 mg/m ³	TWA: 5 ppm TWA: 8.0 mg/m ³ Ceiling: 15 mg/m ³	TWA: 5 ppm TWA: 8 mg/m ³ STEL: 10 ppm STEL: 15 mg/m ³	TWA: 5 ppm TWA: 7.6 mg/m ³ STEL: 10 ppm STEL: 15 mg/m ³
hydrofluoric acid 7664-39-3	TWA: 1.8 ppm TWA: 1.5 mg/m ³ STEL: 3 ppm STEL: 2.5 mg/m ³ Ceiling: 2 ppm Cutănea*	TWA: 1.8 ppm TWA: 1.5 mg/m ³ STEL: 3 ppm STEL: 2.5 mg/m ³	TWA: 1.8 ppm TWA: 1.5 mg/m ³ Ceiling: 2.5 mg/m ³	TWA: 1.8 ppm TWA: 1.5 mg/m ³ STEL: 3 ppm STEL: 2.5 mg/m ³ K*	TWA: 1.8 ppm TWA: 1.5 mg/m ³ STEL: 3 ppm STEL: 2.5 mg/m ³
Zirconium tetrachloride 10026-11-6	TWA: 5 mg/m ³ STEL: 10 mg/m ³	TWA: 5 mg/m ³ STEL: 10 mg/m ³	TWA: 1 mg/m ³	TWA: 1 mg/m ³ STEL: 1 mg/m ³	TWA: 5 mg/m ³ STEL: 10 mg/m ³
vanadium pentoxide 1314-62-1	TWA: 0.05 mg/m ³	TWA: 0.05 mg/m ³ TWA: 0.1 mg/m ³ STEL: 0.1 mg/m ³	TWA: 0.2 mg/m ³ TWA: 0.05 mg/m ³	TWA: 0.005 mg/m ³ TWA: 0.030 mg/m ³ STEL: 0.005 mg/m ³ STEL: 0.030 mg/m ³	TWA: 0.05 mg/m ³ Sk*
Tungsten 7440-33-7	TWA: 5 mg/m ³ STEL: 10 mg/m ³	TWA: 2 mg/m ³ STEL: 6 mg/m ³	TWA: 5 mg/m ³	-	TWA: 5 mg/m ³ STEL: 10 mg/m ³
Titanium 7440-32-6	-	TWA: 10 mg/m ³ STEL: 15 mg/m ³	-	-	-
Molybdenum 7439-98-7	TWA: 10 mg/m ³ TWA: 3 mg/m ³	TWA: 5 mg/m ³ STEL: 10 mg/m ³	TWA: 5 mg/m ³ TWA: 10 mg/m ³	-	TWA: 10 mg/m ³ TWA: 3 mg/m ³
Hafnium(IV) oxychloride hydrate 14456-34-9	TWA: 0.5 mg/m ³	-	-	-	TWA: 0.5 mg/m ³
Chromium 7440-47-3	TWA: 0.5 mg/m ³	TWA: 2 mg/m ³	-	TWA: 2 mg/m ³ STEL: 2 mg/m ³	TWA: 2 mg/m ³
Boric acid 10043-35-3	TWA: 2 mg/m ³ STEL: 6 mg/m ³	-	-	TWA: 0.5 mg/m ³ STEL: 1.0 mg/m ³	TWA: 2 mg/m ³ STEL: 6 mg/m ³
Ammonium silicofluoride 16919-19-0	TWA: 2.5 mg/m ³	TWA: 2.5 mg/m ³	TWA: 2.5 mg/m ³	TWA: 2.5 mg/m ³ *	TWA: 2.5 mg/m ³
Aluminum 7429-90-5	TWA: 10 mg/m ³	TWA: 3 mg/m ³ TWA: 1 mg/m ³ STEL: 10 mg/m ³ STEL: 3 mg/m ³	TWA: 4 mg/m ³ TWA: 1.5 mg/m ³	-	TWA: 10 mg/m ³
Chemical name	Sweden		Switzerland		United Kingdom
Hydrochloric acid 7647-01-0	NGV: 2 ppm NGV: 3 mg/m ³		TWA: 2 ppm TWA: 3 mg/m ³		TWA: 1 ppm TWA: 2 mg/m ³



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	Bindande KGV: 4 ppm Bindande KGV: 6 mg/m ³	STEL: 4 ppm STEL: 6 mg/m ³	STEL: 5 ppm STEL: 8 mg/m ³
hydrofluoric acid 7664-39-3	NGV: 1.8 ppm NGV: 1.5 mg/m ³ Bindande KGV: 2 ppm Bindande KGV: 1.7 mg/m ³	TWA: 1 ppm TWA: 0.83 mg/m ³ STEL: 2 ppm STEL: 1.66 mg/m ³	TWA: 1.8 ppm TWA: 1.5 mg/m ³ STEL: 3 ppm STEL: 2.5 mg/m ³
Zirconium tetrachloride 10026-11-6	-	TWA: 5 mg/m ³	TWA: 5 mg/m ³ STEL: 10 mg/m ³
vanadium pentoxide 1314-62-1	NGV: 0.2 mg/m ³ Bindande KGV: 0.05 mg/m ³	TWA: 0.05 mg/m ³ STEL: 0.05 mg/m ³	TWA: 0.05 mg/m ³ STEL: 0.15 mg/m ³
Tungsten 7440-33-7	NGV: 5 mg/m ³	TWA: 1 mg/m ³ TWA: 5 mg/m ³	TWA: 5 mg/m ³ STEL: 10 mg/m ³
Molybdenum 7439-98-7	NGV: 10 mg/m ³ NGV: 5 mg/m ³	TWA: 10 mg/m ³	TWA: 10 mg/m ³ STEL: 20 mg/m ³
Chromium 7440-47-3	NGV: 0.5 mg/m ³	TWA: 0.5 mg/m ³ S+	TWA: 0.5 mg/m ³ STEL: 1.5 mg/m ³
Boric acid 10043-35-3	-	TWA: 1.8 mg/m ³ STEL: 1.8 mg/m ³	-
Ammonium silicofluoride 16919-19-0	NGV: 2 mg/m ³	-	TWA: 2.5 mg/m ³ STEL: 7.5 mg/m ³
Aluminum 7429-90-5	NGV: 5 mg/m ³ NGV: 2 mg/m ³	TWA: 3 mg/m ³	TWA: 10 mg/m ³ TWA: 4 mg/m ³ STEL: 30 mg/m ³ STEL: 12 mg/m ³

Biological occupational exposure limits

Chemical name	European Union	Austria	Bulgaria	Croatia	Czech Republic
hydrofluoric acid 7664-39-3	-	-	-	8 mg/g Creatinine - urine (Fluorides) - at the end of the work shift 4.0 mg/g Creatinine - urine (Fluorides) - before the start of the work shift in the middle of the week	-
Chromium 7440-47-3	-	-	-	5 µg/g Creatinine - urine (Chromium) - single sample at the end of the work shift	-
Ammonium silicofluoride	-	4 mg/g Creatinine	-	8 mg/g Creatinine -	-



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16919-19-0		(urine - before following shift) 7 mg/g Creatinine (urine - immediately after exposure or end of the shift)		urine (Fluorides) - at the end of the work shift 4.0 mg/g Creatinine - urine (Fluorides) - before the start of the work shift in the middle of the week	
Aluminum 7429-90-5	-	60 µg/g Creatinine (urine - Aluminum after end of work day, at the end of a work week/end of the shift) (-)	-	200 µg/L - urine (Aluminum) - at the end of the work shift	-
Chemical name	Denmark	Finland	France	Germany DFG	Germany TRGS
hydrofluoric acid 7664-39-3	-	-	3 mg/g creatinine - urine (Fluorides) - beginning of shift 10 mg/g creatinine - urine (Fluorides) - end of shift	4.0 mg/g Creatinine (urine - Fluoride end of shift) 4 mg/L - BAT (end of exposure or end of shift) urine	4.0 mg/g Creatinine (urine - Fluoride end of shift)
vanadium pentoxide 1314-62-1	-	-	- urine (Vanadium) - end of shift at end of workweek	0.15 µg/L - BAR (for long-term exposures: at the end of the shift after several shifts) urine	-
Molybdenum 7439-98-7	-	-	-	150 µg/L - BAR (not determined) urine	-
Chromium 7440-47-3	-	-	0.01 mg/g creatinine - urine (Total Chromium) - augmented during shift 0.03 mg/g creatinine - urine (Total Chromium) - end of shift at end of workweek	0.6 µg/L - BAR (end of exposure or end of shift) urine	-
Ammonium silicofluoride 16919-19-0	-	-	3 mg/g creatinine - urine (Fluorides) - beginning of shift 10 mg/g creatinine - urine (Fluorides) -	7.0 mg/g Creatinine (urine - Fluoride end of shift) 4.0 mg/g Creatinine (urine - Fluoride	7.0 mg/g Creatinine (urine - Fluoride end of shift) 4.0 mg/g Creatinine (urine - Fluoride



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			end of shift	before beginning of next shift)	before beginning of next shift)
Aluminum 7429-90-5	-	-	-	50 µg/g Creatinine (urine - Aluminum for long-term exposures: at the end of the shift after several shifts) 50 µg/g Creatinine - BAT (for long-term exposures: at the end of the shift after several shifts) urine 15 µg/g Creatinine - BAR (for long-term exposures: at the end of the shift after several shifts) urine	50 µg/g Creatinine (urine - Aluminum for long-term exposures: at the end of the shift after several shifts)
Chemical name	Hungary	Ireland		Italy MDLPS	Italy AIDII
hydrofluoric acid 7664-39-3	7 mg/g Creatinine (urine - Fluoride end of shift) 4 mg/g Creatinine (urine - Fluoride prior to next shift) 42 µmol/mmol Creatinine (urine - Fluoride end of shift) 24 µmol/mmol Creatinine (urine - Fluoride prior to next shift)	-		-	2 mg/g Creatinine - urine (Fluorides) - prior to shift 3 mg/g Creatinine - urine (Fluorides) - end of shift
Chromium 7440-47-3	0.01 mg/g Creatinine (urine - Chromium end of shift) 0.022 µmol/mmol Creatinine (urine - Chromium end of shift)	-		-	-
Ammonium silicofluoride 16919-19-0	7 mg/g Creatinine (urine - Fluoride end of shift) 4 mg/g Creatinine (urine - Fluoride prior to next shift) 42 µmol/mmol Creatinine (urine - Fluoride end of shift) 24 µmol/mmol Creatinine (urine - Fluoride prior to next shift)	2 mg/L (urine - Fluoride prior to shift) 3 mg/L (urine - Fluoride end of shift)		-	2 mg/g Creatinine - urine (Fluorides) - prior to shift 3 mg/g Creatinine - urine (Fluorides) - end of shift



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Chemical name	Latvia	Luxembourg	Romania	Slovakia
hydrofluoric acid 7664-39-3	-	-	5 mg/g Creatinine - urine (Fluorine) - end of shift	7 mg/g creatinine (urine - Fluoride end of exposure or work shift) 4 mg/g creatinine (urine - Fluoride prior to shift)
vanadium pentoxide 1314-62-1	-	-	-	50 µg/g creatinine (urine - Vanadium after all work shifts) 50 µg/g creatinine (urine - Vanadium end of exposure or work shift)
Chromium 7440-47-3	10 µg/g Creatinine - urine (Chromium) - end of shift; end of work week	-	10 µg/g Creatinine - urine (Chromium) - during working hours 30 µg/g Creatinine - urine (Chromium) - end of work week	-
Aluminum 7429-90-5	-	-	-	60 µg/g creatinine (urine - Aluminum not critical)
Chemical name	Slovenia	Spain	Switzerland	United Kingdom
hydrofluoric acid 7664-39-3	7.0 mg/g Creatinine - urine (Fluoride) - at the end of the work shift 4.0 mg/g Creatinine - urine () - before the next working day	2 mg/L (urine - Fluorides pre-shift) 3 mg/L (urine - Fluorides end of shift)	4 mg/L (urine - Fluoride end of shift) 211 µmol/L (urine - Fluoride end of shift)	-
vanadium pentoxide 1314-62-1	-	50 µg/g Creatinine (urine - Vanadium end of workweek)	70 µg/g creatinine (urine - Vanadium end of shift, and after several shifts (for long-term exposures)) 155 nmol/mmol creatinine (urine - Vanadium end of shift, and after several shifts (for long-term exposures))	-
Ammonium silicofluoride 16919-19-0	7.0 mg/g Creatinine - urine (Fluoride) - at the end of the work shift 4.0 mg/g Creatinine - urine () - before the next working day	-	-	-
Aluminum 7429-90-5	200 µg/L - urine (Aluminum) - at the end of	-	60 µg/g creatinine (urine - Aluminum no restrictions)	-



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	the work shift			
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Derived No Effect Level (DNEL) No information available.

Predicted No Effect Concentration (PNEC) No information available.

8.2. Exposure controls

Personal protective equipment

Eye/face protection Avoid contact with eyes. Wear safety glasses with side shields (or goggles).

Hand protection Wear protective Neoprene™ gloves. Wear suitable gloves. The protective gloves to be used must comply with the specifications of EC Directive 89/686/EEC and the related standard EN374.

Skin and body protection Wear suitable protective clothing.

Respiratory protection No protective equipment is needed under normal use conditions. If exposure limits are exceeded or irritation is experienced, ventilation and evacuation may be required.

General hygiene considerations Regular cleaning of equipment, work area and clothing is recommended. Avoid contact with skin, eyes or clothing. Do not eat, drink or smoke when using this product. Wash hands before breaks and after work. Wear suitable gloves and eye/face protection.

Environmental exposure controls Do not allow into any sewer, on the ground or into any body of water.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	Liquid
Appearance	Liquid
Colour	colourless
Odour	Odourless.
Odour threshold	No information available

<u>Property</u>	<u>Values</u>	<u>Remarks • Method</u>
Melting point / freezing point	No data available	None known
Initial boiling point and boiling range	No data available	None known
Flammability	No data available	None known
Flammability Limit in Air		None known



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Upper flammability or explosive limits	No data available	
Lower flammability or explosive limits	No data available	
Flash point	No data available	None known
Autoignition temperature	No data available	None known
Decomposition temperature		None known
pH	No data available	None known
pH (as aqueous solution)	No data available	No information available
Kinematic viscosity	No data available	None known
Dynamic viscosity	No data available	None known
Water solubility	No data available	None known
Solubility(ies)	No data available	None known
Partition coefficient	No data available	None known
Vapour pressure	No data available	None known
Relative density	No data available	None known
Bulk density	No data available	
Liquid Density	No data available	
Relative vapour density	No data available	None known
Particle characteristics		
Particle Size	No information available	
Particle Size Distribution	No information available	

9.2. Other information

9.2.1. Information with regards to physical hazard classes
Not applicable

9.2.2. Other safety characteristics
No information available

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity No information available.

10.2. Chemical stability

Stability Stable under normal conditions.

Explosion data

Sensitivity to mechanical impact None.

Sensitivity to static discharge None.



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10.3. Possibility of hazardous reactions

Possibility of hazardous reactions None under normal processing.

10.4. Conditions to avoid

Conditions to avoid Exposure to air or moisture over prolonged periods.

10.5. Incompatible materials

Incompatible materials Oxidising agent.

Hazardous decomposition products None known based on information supplied.

SECTION 11: Toxicological information

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

Information on likely routes of exposure

Product Information

Inhalation	Specific test data for the substance or mixture is not available.
Eye contact	Specific test data for the substance or mixture is not available. Causes serious eye irritation. (based on components). May cause redness, itching, and pain.
Skin contact	Specific test data for the substance or mixture is not available. Causes mild skin irritation.
Ingestion	Specific test data for the substance or mixture is not available. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea.

Symptoms related to the physical, chemical and toxicological characteristics

Symptoms May cause redness and tearing of the eyes. Prolonged contact may cause redness and irritation.

Numerical measures of toxicity

Acute toxicity

The following values are calculated based on chapter 3.1 of the GHS document

ATEmix (oral) 5,010.00 mg/kg



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ATEmix (dermal) 5,000.00 mg/kg
ATEmix (inhalation-gas) 99,999.00 ppm
ATEmix (inhalation-dust/mist) 50.10 mg/l
ATEmix (inhalation-vapour) 99,999.00 mg/l

Component Information

Chemical name	Oral LD50	Dermal LD50	Inhalation LC50
Hydrochloric acid	238 - 277 mg/kg (Rat)	> 5010 mg/kg (Rabbit)	= 1.68 mg/L (Rat) 1 h
hydrofluoric acid			= 0.79 mg/L (Rat) 1 h
Zirconium tetrachloride	= 1688 mg/kg (Rat)		
vanadium pentoxide	= 466.93 mg/kg (Rat) = 10 mg/kg (Rat)	> 2500 mg/kg (Rat)	= 4.4 mg/L (Rat) 4 h = 2.21 mg/L (Rat) 4 h
Tungsten		> 2000 mg/kg (Rat)	
Tantalum pentachloride	= 1900 mg/kg (Rat)		
Molybdenum		> 2000 mg/kg (Rat)	> 5.84 mg/L (Rat) 4 h
Boric acid	= 2660 mg/kg (Rat)	> 2000 mg/kg (Rabbit)	> 2.12 mg/L (Rat) 4 h

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Skin corrosion/irritation Classification based on data available for ingredients. Causes mild skin irritation.

Serious eye damage/eye irritation Classification based on data available for ingredients. Causes serious eye irritation.

Respiratory or skin sensitisation No information available.

Germ cell mutagenicity No information available.

The table below indicates ingredients above the cut-off threshold considered as relevant which are listed as mutagenic.

Chemical name	European Union
vanadium pentoxide	Muta. 2

Carcinogenicity

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



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Chemical name	European Union
vanadium pentoxide	Carc. 1B

Reproductive toxicity No information available.

The table below indicates ingredients above the cut-off threshold considered as relevant which are listed as reproductive toxins.

Chemical name	European Union
vanadium pentoxide	Repr. 2 Lact.
Boric acid	Repr. 1B

STOT - single exposure No information available.

STOT - repeated exposure No information available.

Aspiration hazard No information available.

11.2. Information on other hazards

11.2.1. Endocrine disrupting properties

Endocrine disrupting properties This product does not contain any known or suspected endocrine disruptors.

11.2.2. Other information

Other adverse effects No information available.

SECTION 12: Ecological information

12.1. Toxicity

Ecotoxicity

Unknown aquatic toxicity Contains 0 % of components with unknown hazards to the aquatic environment.

Chemical name	Algae/aquatic plants	Fish	Toxicity to microorganisms	Crustacea
hydrofluoric acid	-	-	-	EC50: =270mg/L (48h, Daphnia species)
vanadium pentoxide	-	LC50: 5.2 mg/L (96h,	-	LC50: 1.52 mg/L (48h,



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		Oncorhynchus mykiss)		Daphnia magna)
Boric acid	-	-	-	EC50: 115 - 153mg/L (48h, Daphnia magna)
Ammonium silicofluoride	-	LC50: =25.8mg/L (96h, Pimephales promelas)	-	-

12.2. Persistence and degradability

Persistence and degradability No information available.

12.3. Bioaccumulative potential

Bioaccumulation There is no data for this product.

Component Information

Chemical name	Partition coefficient
hydrofluoric acid	-1.4
Boric acid	-1.09
Ammonium silicofluoride	-6.01 @ 20 °C

12.4. Mobility in soil

Mobility in soil No information available.

12.5. Results of PBT and vPvB assessment

PBT and vPvB assessment No information available.

Chemical name	PBT and vPvB assessment
Hydrochloric acid	The substance is not PBT / vPvB
hydrofluoric acid	The substance is not PBT / vPvB
Zirconium tetrachloride	PBT assessment does not apply
vanadium pentoxide	PBT assessment does not apply
Tungsten	PBT assessment does not apply
Titanium	The substance is not PBT / vPvB
Tantalum pentachloride	PBT assessment does not apply
Molybdenum	PBT assessment does not apply
Chromium	The substance is not PBT / vPvB
Boric acid	The substance is not PBT / vPvB
Ammonium silicofluoride	PBT assessment does not apply
Aluminum	The substance is not PBT / vPvB

12.6. Endocrine disrupting properties



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Endocrine disrupting properties No information available.

12.7. Other adverse effects

No information available.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste from residues/unused products Dispose of in accordance with local regulations. Dispose of waste in accordance with environmental legislation.

Contaminated packaging Do not reuse empty containers.

SECTION 14: Transport information

IATA

14.1 UN number or ID number	UN3264
14.2 UN proper shipping name	Corrosive liquid, acidic, inorganic, n.o.s. (Hydrochloric acid, hydrofluoric acid)
14.3 Transport hazard class(es)	8
14.4 Packing group	III
Description	UN3264, Corrosive liquid, acidic, inorganic, n.o.s. (Hydrochloric acid, hydrofluoric acid), 8, III
14.5 Environmental hazards	Not applicable
14.6 Special precautions for user	
Special Provisions	A3, A803
ERG Code	8L

IMDG

14.1 UN number or ID number	UN3264
14.2 UN proper shipping name	Corrosive liquid, acidic, inorganic, n.o.s. (Hydrochloric acid, hydrofluoric acid)
14.3 Transport hazard class(es)	8
14.4 Packing group	III
Description	UN3264, Corrosive liquid, acidic, inorganic, n.o.s. (Hydrochloric acid, hydrofluoric acid), 8, III
14.5 Marine pollutant	NP
14.6 Special precautions for user	
Special Provisions	223, 274
EmS-No.	F-A, S-B No information available



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14.7 Maritime transport in bulk according to IMO instruments No information available

RID

14.1 UN number or ID number UN3264
14.2 UN proper shipping name Corrosive liquid, acidic, inorganic, n.o.s. (Hydrochloric acid, hydrofluoric acid)
14.3 Transport hazard class(es) 8
14.4 Packing group III
Description UN3264, Corrosive liquid, acidic, inorganic, n.o.s. (Hydrochloric acid, hydrofluoric acid), 8, III
14.5 Environmental hazards Not applicable
14.6 Special precautions for user
Special Provisions 274
Classification code C1

ADR

14.1 UN number or ID number UN3264
14.2 UN proper shipping name Corrosive liquid, acidic, inorganic, n.o.s. (Hydrochloric acid, hydrofluoric acid)
14.3 Transport hazard class(es) 8
14.4 Packing group III
Description UN3264, Corrosive liquid, acidic, inorganic, n.o.s. (Hydrochloric acid, hydrofluoric acid), 8, III, (E)
14.5 Environmental hazards Not applicable
14.6 Special precautions for user
Special Provisions 274
Classification code C1
Tunnel restriction code (E)

SECTION 15: Regulatory information

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

National regulations

France

Occupational Illnesses (R-463-3, France)

Chemical name	French RG number	Title
hydrofluoric acid 7664-39-3	RG 32	-
vanadium pentoxide 1314-62-1	RG 66	-
Chromium 7440-47-3	RG 10	-



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Aluminum 7429-90-5	RG 32 RG 16, RG 16bis	-
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Germany

Water hazard class (WGK) slightly hazardous to water (WGK 1)
TA Luft (German Air Pollution Control Regulation)

Netherlands

Chemical name	Netherlands - List of Carcinogens	Netherlands - List of Carcinogens	Netherlands - List of Reproductive Toxins
vanadium pentoxide	Present	-	Development Category 2 Fertility Category 2
Boric acid	-	-	Fertility Category 1B Development Category 1B

Poland

SDS created according to the following Polish regulation: Act of February 25, 2011 on chemical substances and their mixtures (Journal of Laws of 2018, item 143, as amended). Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH), establishing the European Chemicals Agency (EC) as amended. Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labeling and packaging of substances and mixtures, as amended. Regulation of the Minister of Health of 10 August 2012 on the criteria and method of classifying chemical substances and their mixtures (Journal of Laws of 2012, item 1018). Regulation of the Minister of Health of 20 April 2012 on labeling packaging of hazardous substances and mixtures and some mixtures (Journal of Laws of 2012, item 445). Regulation of the Minister of Family, Labor and Social Policy of 12 June 2018 on the maximum allowable concentrations and intensities of factors harmful to health in the work environment (Journal of Laws of 2018, item 1286). Announcement of the Minister of Economy, Labor and Social Policy of August 28, 2003 on the publication of the unified text of the Ordinance of the Minister of Labor and Social Policy on general health and safety at work regulations (Journal of Laws of 2003, No. 169, item 1650). Regulation of the Minister of Health of 30 December 2004 on occupational safety and health related to the presence of chemical agents in the workplace (Journal of Laws of 2005, No. 11, item 86). Act of December 14, 2012 on waste (Journal of Laws of 2013, item 21) Regulation of the Minister of Health of December 30, 2004 on occupational health and safety related to the presence of chemical agents in the workplace (Journal U. of 2005, No. 11, item 86). Waste Act of December 14, 2012 (Journal of Laws of 2013, item 21). Act of 13 June 2013 on the management of packaging and packaging waste, Journal of Laws 2013, item 888). Government statement of September 24, 2002 - European Agreement on the



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International Carriage of Dangerous Goods by Road (ADR) (Journal of Laws No. 194, item 1629 and Journal of Laws of 2003, No. 207, item 2013 and 2014).

European Union

Take note of Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work.

Authorisations and/or restrictions on use:

This product contains one or more substance(s) subject to restriction (Regulation (EC) No. 1907/2006 (REACH), Annex XVII)

DIRECTIVE (EU) 2021/1187 on the marketing and use of explosives precursors

Product contains: Reportable explosives precursors. Making available, introduction, possession and use according to Regulation (EU) 2019/1148, Article 9

Chemical name	RESTRICTED EXPLOSIVES PRECURSORS - ANNEX I	REPORTABLE EXPLOSIVES PRECURSORS - ANNEX II
Aluminum - 7429-90-5	-	Present

Chemical name	Restricted substance per REACH Annex XVII	Substance subject to authorisation per REACH Annex XIV
Hydrochloric acid - 7647-01-0	75.	
hydrofluoric acid - 7664-39-3	75.	
vanadium pentoxide - 1314-62-1	75. 28.	
Chromium - 7440-47-3	75.	
Boric acid - 10043-35-3	30. 75.	

Persistent Organic Pollutants

Not applicable

Named dangerous substances per Seveso Directive (2012/18/EU)

Chemical name	Lower-tier requirements (tons)	Upper-tier requirements (tons)
Hydrochloric acid - 7647-01-0	25	250

Ozone-depleting substances (ODS) regulation (EC) 1005/2009

Not applicable

Biocidal Products Regulation (EU) No 528/2012 (BPR)

Chemical name	Biocidal Products Regulation (EU) No 528/2012 (BPR)
Hydrochloric acid - 7647-01-0	Product-type 2: Disinfectants and algicides not intended for direct application to humans or animals
Boric acid - 10043-35-3	Product-type 8: Wood preservatives



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International Inventories

TSCA

Complies under research and development exemption or is regulated by a different government agency.

DSL/NDSL

Contact supplier for inventory compliance status

EINECS/ELINCS

Contact supplier for inventory compliance status

ENCS

Contact supplier for inventory compliance status

IECSC

Contact supplier for inventory compliance status

KECL

Contact supplier for inventory compliance status

PICCS

Contact supplier for inventory compliance status

AIIC

Contact supplier for inventory compliance status

Legend:

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory

DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

ENCS - Japan Existing and New Chemical Substances

IECSC - China Inventory of Existing Chemical Substances

KECL - Korean Existing and Evaluated Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances

AIIC - Australian Inventory of Chemical Substances

15.2. Chemical safety assessment

Chemical Safety Report

A Chemical Safety Assessment is not required for this substance

SECTION 16: Other information

Key or legend to abbreviations and acronyms used in the safety data sheet

Full text of H-Statements referred to under section 3

H228 - Flammable solid

H261 - In contact with water releases flammable gases

H290 - May be corrosive to metals

H300 - Fatal if swallowed

H301 - Toxic if swallowed

H302 - Harmful if swallowed

H310 - Fatal in contact with skin

H311 - Toxic in contact with skin

H314 - Causes severe skin burns and eye damage

H318 - Causes serious eye damage



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H330 - Fatal if inhaled
H331 - Toxic if inhaled
H332 - Harmful if inhaled
H335 - May cause respiratory irritation
H341 - Suspected of causing genetic defects
H350 - May cause cancer
H360FD - May damage fertility. May damage the unborn child
H361fd - Suspected of damaging fertility. Suspected of damaging the unborn child
H362 - May cause harm to breast-fed children
H372 - Causes damage to organs through prolonged or repeated exposure
H411 - Toxic to aquatic life with long lasting effects
H412 - Harmful to aquatic life with long lasting effects

Legend

SVHC: Substances of Very High Concern for Authorisation:

Legend Section 8: Exposure controls/personal protection

TWA TWA (time-weighted average) STEL STEL (Short Term Exposure Limit)
Ceiling Maximum limit value Sk* Skin designation

Classification procedure	
Classification according to Regulation (EC) No. 1272/2008 [CLP]	Method Used
Acute oral toxicity	Calculation method
Acute dermal toxicity	Calculation method
Acute inhalation toxicity - gas	Calculation method
Acute inhalation toxicity - Vapour	Calculation method
Acute inhalation toxicity - dust/mist	Calculation method
Skin corrosion/irritation	Calculation method
Serious eye damage/eye irritation	On basis of test data
Respiratory sensitisation	Calculation method
Skin sensitisation	Calculation method
Mutagenicity	Calculation method
Carcinogenicity	Calculation method
Reproductive toxicity	Calculation method
STOT - single exposure	Calculation method
STOT - repeated exposure	Calculation method
Acute aquatic toxicity	Calculation method
Chronic aquatic toxicity	Calculation method
Aspiration hazard	Calculation method
Ozone	Calculation method
Corrosive to metals	On basis of test data

Key literature references and sources for data used to compile the SDS

Agency for Toxic Substances and Disease Registry (ATSDR)



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U.S. Environmental Protection Agency ChemView Database
European Food Safety Authority (EFSA)
EPA (Environmental Protection Agency)
Acute Exposure Guideline Level(s) (AEGLS)
U.S. Environmental Protection Agency Federal Insecticide, Fungicide, and Rodenticide Act
U.S. Environmental Protection Agency High Production Volume Chemicals
Food Research Journal
Hazardous Substance Database
International Uniform Chemical Information Database (IUCLID)
Japan GHS Classification
Australian National Industrial Chemicals Notification and Assessment Scheme (NICNAS)
NIOSH (National Institute for Occupational Safety and Health)
National Library of Medicine's ChemID Plus (NLM CIP)
National Library of Medicine's PubMed database (NLM PUBMED)
National Toxicology Program (NTP)
New Zealand's Chemical Classification and Information Database (CCID)
Organisation for Economic Co-operation and Development Environment, Health, and Safety Publications
Organisation for Economic Co-operation and Development High Production Volume Chemicals Programme
Organisation for Economic Co-operation and Development Screening Information Data Set
World Health Organization

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

Disclaimer

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End of Safety Data Sheet