



Single-element Standard Solution for ICP. Zirconium (Zr) 10000mg/l in HNO3 5%, HF 2%

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

Date of issue: 18/10/2015

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

1.1. Product identifier

Product form : Mixture
Product name : Single-element Standard Solution for ICP.
Zirconium (Zr) 10000mg/l in HNO3 5%, HF 2%
Product code : S370

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

1.2.1. Relevant identified uses

Main use category : Industrial use, Professional use
Use of the substance/mixture : Certified reference material for laboratory use
Function or use category : Laboratory chemicals

1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

Spectracer UK Ltd.

Second Floor,
27 Gloucester Place,
London,
W1U 8HU,
United Kingdom.

Tel: +44 (0) 207 193 9114

Fax: +44 (0) 203 432 4686

Email: contact@spectracer.co.uk

Web: www.spectracer.com

1.4. Emergency telephone number

Emergency number : Tel: +44(0)1933 445260 Option 1. Language: English only.
For Chemical Emergencies Only
Llewellyn (Safety Advisors) Europe Ltd

Country	Organisation/Company	Address	Emergency number	Comment
Ireland	National Poisons Information Centre Beaumont Hospital	Beaumont Hospital Beaumont Road 9 Dublin	: +353 1 8379964	
United Kingdom	National Poisons Information Service (NHS Direct)	http://www.npis.org	111 (England & Wales only) or 112 (EU) or 08454 24 24 24 (Scotland)	

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

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

Corrosive to metals, H290
Category 1
Acute toxicity (oral), H301
Category 3
Acute toxicity (dermal), H311
Category 3
Skin corrosion/irritation, H314
Category 1B
Respiratory sensitisation, H334
Category 1
Skin sensitisation, Category 1 H317

Full text of hazard classes and H-statements : see section 16

Adverse physicochemical, human health and environmental effects

May be corrosive to metals. Toxic in contact with skin. Toxic if swallowed. Causes severe skin burns and eye damage. May cause an allergic skin reaction. May cause allergy or asthma symptoms or breathing difficulties if inhaled.

2.2. Label elements

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

Hazard pictograms (CLP) :



Signal word (CLP) :

Danger

Hazardous ingredients :

zirconyl nitrate,hydrate; nitric acid; hydrofluoric acid

Hazard statements (CLP) :

H290 - May be corrosive to metals
H301+H311 - Toxic if swallowed or in contact with skin
H314 - Causes severe skin burns and eye damage
H317 - May cause an allergic skin reaction
H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled

Precautionary statements (CLP) :

P234 - Keep only in original packaging
P260 - Do not breathe dust/fume/gas/mist/vapours/spray
P272 - Contaminated work clothing should not be allowed out of the workplace
P280 - Wear protective gloves/protective clothing/eye protection/face protection
P284 - In case of inadequate ventilation wear respiratory protection
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 skin with water
P304+P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing
P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P310 - Immediately call a POISON CENTER or doctor
P333+P313 - If skin irritation or rash occurs: Get medical advice/attention
P342+P311 - If experiencing respiratory symptoms: Call a POISON CENTER or doctor
P361+P364 - Take off immediately all contaminated clothing and wash it before reuse
P390 - Absorb spillage to prevent material damage
P501 - Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation

2.3. Other hazards

No additional information available

SECTION 3: Composition/information on ingredients

3.1. Substances

Not applicable

3.2. Mixtures

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
nitric acid	(CAS-No.) 7697-37-2 (EC-No.) 231-714-2 (EC Index-No.) 007-004-00-1 (REACH-no) 01-2119487297-23-XXXX	5 - 15	Ox. Liq. 2, H272 Met. Corr. 1B, H290 Skin Corr. 1A, H314
zirconyl nitrate,hydrate	(CAS-No.) 14985-18-3	1 - 5	Ox. Sol. 2, H272 Skin Corr. 1B, H314 Resp. Sens. 1, H334 Skin Sens. 1, H317
hydrofluoric acid	(CAS-No.) 7664-39-3 (EC-No.) 231-634-8 (EC Index-No.) 009-002-00-6	1 - 5	Acute Tox. 2 (Inhalation), H330 Acute Tox. 1 (Dermal), H310 Acute Tox. 2 (Oral), H300 Skin Corr. 1A, H314

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Specific concentration limits:

Name	Product identifier	Specific concentration limits
nitric acid	(CAS-No.) 7697-37-2 (EC-No.) 231-714-2 (EC Index-No.) 007-004-00-1 (REACH-no) 01-2119487297-23-XXXX	(5 =<C < 20) Skin Corr. 1B, H314 (C >= 20) Skin Corr. 1A, H314 (C >= 65) Ox. Liq. 3, H272
hydrofluoric acid	(CAS-No.) 7664-39-3 (EC-No.) 231-634-8 (EC Index-No.) 009-002-00-6	(0,1 =<C < 1) Eye Irrit. 2, H319 (1 =<C < 7) Skin Corr. 1B, H314 (7 =<C < 100) Skin Corr. 1A, H314

Full text of H-statements: see section 16

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general	: Call a physician immediately.
First-aid measures after inhalation	: Remove person to fresh air and keep comfortable for breathing. If experiencing respiratory symptoms: Call a poison center or a doctor.
First-aid measures after skin contact	: Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. Call a physician immediately.
First-aid measures after eye contact	: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a physician immediately.
First-aid measures after ingestion	: Rinse mouth. Call a physician immediately. Do not induce vomiting.

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

Symptoms/effects after inhalation	: May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Symptoms/effects after skin contact	: Burns. May cause an allergic skin reaction.
Symptoms/effects after eye contact	: Serious damage to eyes.
Symptoms/effects after ingestion	: Burns.

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

Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Water spray. Dry powder. Foam. Carbon dioxide.

5.2. Special hazards arising from the substance or mixture

Hazardous decomposition products in case of fire : Toxic fumes may be released.

5.3. Advice for firefighters

Protection during firefighting : Do not attempt to take action without suitable protective equipment. Self-contained breathing apparatus. Complete protective clothing.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Emergency procedures : Ventilate spillage area. Avoid contact with skin, eyes and clothing. Do not breathe dust/fume/gas/mist/vapours/spray.

6.1.2. For emergency responders

Protective equipment : Do not attempt to take action without suitable protective equipment. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up : Take up liquid spill into absorbent material.
Other information : Dispose of materials or solid residues at an authorized site.

6.4. Reference to other sections

For further information refer to section 13.

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SECTION 7: Handling and storage

7.1. Precautions for safe handling

- Precautions for safe handling : Ensure good ventilation of the work station. Do not get in eyes, on skin, or on clothing. Wear personal protective equipment. Do not breathe dust/fume/gas/mist/vapours/spray.
- Hygiene measures : Wash contaminated clothing before reuse. Contaminated work clothing should not be allowed out of the workplace. Do not eat, drink or smoke when using this product. Always wash hands after handling the product.

7.2. Conditions for safe storage, including any incompatibilities

- Storage conditions : Store in corrosive resistant container with a resistant inner liner. Keep only in original container. Store locked up. Store in a well-ventilated place. Keep cool.
- Incompatible materials : Metals.

7.3. Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

zirconyl nitrate,hydrate (14985-18-3)		
Austria	Local name	Zirkon
Austria	MAK (mg/m ³)	5 mg/m ³
Austria	Remark (AT)	Sah
Belgium	Local name	Zirconium (composés du) (en Zr) # Zirkonium (en verbindingen) (als Zr)
Belgium	Limit value (mg/m ³)	5 mg/m ³
Belgium	Short time value (mg/m ³)	10 mg/m ³
Denmark	Local name	Zirconiumforbindelser
Denmark	Grænseværdie (langvarig) (mg/m ³)	5 mg/m ³ beregnet som Zr
Finland	Local name	Zirkonium
Finland	HTP-arvo (8h) (mg/m ³)	1 mg/m ³
Finland	Huomautus (FI)	Zr
Germany	Local name	Zirkonium und wasserunlösliche Verbindungen
Germany	TRGS 900 Occupational exposure limit value (mg/m ³)	1 mg/m ³ E (mg/m ³)
Germany	Remark (TRGS 900)	10,DFG,Sah
Ireland	Local name	Zirconium compounds (as Zr)
Ireland	OEL (8 hours ref) (mg/m ³)	5 mg/m ³
Ireland	OEL (15 min ref) (mg/m ³)	10 mg/m ³
Lithuania	Local name	Cirkonis
Lithuania	IPRV (mg/m ³)	6 mg/m ³
Poland	Local name	Cyrkon i jego związki w przeliczeniu na Zr
Poland	NDS (mg/m ³)	5 mg/m ³
Poland	NDSCh (mg/m ³)	10 mg/m ³
Portugal	Local name	Zircónio e compostos, expressos em Zr
Portugal	OEL TWA (mg/m ³)	5 mg/m ³
Portugal	OEL STEL (mg/m ³)	10 mg/m ³
Romania	Local name	Zirconiu și compuși (exprimati în Zr)
Romania	OEL TWA (mg/m ³)	5 mg/m ³
Romania	OEL STEL (mg/m ³)	10 mg/m ³
Slovenia	Local name	cirkonij prah,legure in v vodi netopne cirkonijeve spojine
Slovenia	OEL TWA (mg/m ³)	1 mg/m ³
Spain	Local name	Circonio
Spain	VLA-ED (mg/m ³)	5 mg/m ³ elemental 5 mg/m ³ Compuestos de circonio, como Zr

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zirconyl nitrate,hydrate (14985-18-3)		
Spain	VLA-EC (mg/m ³)	10 mg/m ³ elemental 10 mg/m ³ Compuestos de circonio, como Zr
United Kingdom	Local name	Zirconium compounds (as Zr)
United Kingdom	WEL TWA (mg/m ³)	5 mg/m ³
United Kingdom	WEL STEL (mg/m ³)	10 mg/m ³
Iceland	Local name	Sirkóníumsambönd, sem Zr
Iceland	OEL (8 hours ref) (mg/m ³)	5 mg/m ³
Switzerland	Local name	Zirkonverbindungen (als Zr berechnet)
Switzerland	MAK (mg/m ³)	5 mg/m ³
Switzerland	Remark (CH)	e(mg/m ³) - NIOSH, OSHA
USA - ACGIH	Local name	Zirconium
USA - ACGIH	ACGIH TWA (mg/m ³)	5 mg/m ³
USA - ACGIH	ACGIH STEL (mg/m ³)	10 mg/m ³
USA - OSHA	Local name	Zirconium compounds (as Zr)
USA - OSHA	OSHA PEL (TWA) (mg/m ³)	5 mg/m ³
nitric acid (7697-37-2)		
EU	Local name	Nitric acid
EU	IOELV STEL (mg/m ³)	2,6 mg/m ³ (Nitric acid; EU; Short time value; Indicative occupational exposure limit value)
EU	IOELV STEL (ppm)	1 ppm (Nitric acid; EU; Short time value; Indicative occupational exposure limit value)
Austria	Local name	Salpetersäure
Austria	MAK Short time value (mg/m ³)	2,6 mg/m ³
Austria	MAK Short time value (ppm)	1 ppm
Belgium	Local name	Acide nitrique # Salpeterzuur
Belgium	Short time value (mg/m ³)	2,6 mg/m ³
Belgium	Short time value (ppm)	1 ppm
Bulgaria	Local name	Азотна киселина
Bulgaria	OEL STEL (mg/m ³)	2,6 mg/m ³
Bulgaria	OEL STEL (ppm)	1 ppm
Croatia	Local name	Dušična kiselina
Croatia	KGVI (kratkotrajna granična vrijednost izloženosti) (mg/m ³)	2,6 mg/m ³
Croatia	KGVI (kratkotrajna granična vrijednost izloženosti) (ppm)	1 ppm
Croatia	Naznake (HR)	EU** (naznaka da se radi o tvarima za koje su utvrđene indikativne granične vrijednosti izloženosti prema Direktivi 2006/15/ EC (druga lista)); O (oksidirajuće); C (nagrizajuće)
Czech Republic	Local name	Kyselina dusi ná
Czech Republic	Expoziční limity (PEL) (mg/m ³)	1 mg/m ³
Czech Republic	Expoziční limity (PEL) (ppm)	0,39 ppm
Czech Republic	Expoziční limity (NPK-P) (mg/m ³)	2,5 mg/m ³
Czech Republic	Expoziční limity (NPK-P) (ppm)	1 ppm
Denmark	Local name	Salpetersyre
Denmark	Grænseværdie (kortvarig) (mg/m ³)	2,6 mg/m ³
Denmark	Grænseværdie (kortvarig) (ppm)	1 ppm
Denmark	Anmærkninger (DK)	E (betyder, at stoffet har en EF-grænseværdi); S (betyder, at grænseværdien ikke bør overskrides. Værdien gælder for en eksponeringsperiode på 15 minutter)
Estonia	Local name	Lämmastikhape
Estonia	OEL STEL (mg/m ³)	2,6 mg/m ³



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nitric acid (7697-37-2)		
Estonia	OEL STEL (ppm)	1 ppm
Finland	Local name	Typpi happo
Finland	HTP-arvo (8h) (mg/m ³)	1,3 mg/m ³
Finland	HTP-arvo (8h) (ppm)	0,5 ppm
Finland	HTP-arvo (15 min)	2,6 mg/m ³
Finland	HTP-arvo (15 min) (ppm)	1 ppm
France	Local name	Acide nitrique
France	VLE (mg/m ³)	2,6 mg/m ³
France	VLE (ppm)	1 ppm
France	Note (FR)	Valeurs réglementaires indicatives
Germany	Local name	Salpetersäure
Germany	TRGS 900 Occupational exposure limit value (mg/m ³)	2,6 mg/m ³
Germany	TRGS 900 Occupational exposure limit value (ppm)	1 ppm
Germany	Remark (TRGS 900)	EU,13,16
Greece	OEL STEL (mg/m ³)	2,6 mg/m ³
Greece	OEL STEL (ppm)	1 ppm
Hungary	Local name	SALÉTRÓMSAV
Hungary	CK-érték	2,6 mg/m ³
Hungary	Megjegyzések (HU)	i, m; l.
Ireland	Local name	Nitric acid
Ireland	OEL (15 min ref) (mg/m ³)	2,6 mg/m ³
Ireland	OEL (15 min ref) (ppm)	1 ppm
Ireland	Notes (IE)	IOELV
Italy	Local name	Acido nitrico
Italy	OEL STEL (mg/m ³)	2,6 mg/m ³
Italy	OEL STEL (ppm)	1 ppm
Latvia	Local name	Slāpekļskābe
Latvia	OEL TWA (mg/m ³)	2 mg/m ³
Latvia	OEL TWA (ppm)	0,78 ppm
Latvia	OEL STEL (mg/m ³)	2,6 mg/m ³
Latvia	OEL STEL (ppm)	1 ppm
Lithuania	Local name	Nitrato rūgštis (azoto rūgštis)
Lithuania	TPRV (mg/m ³)	2,6 mg/m ³
Lithuania	TPRV (ppm)	1 ppm
Luxembourg	Local name	Acide nitrique
Luxembourg	OEL STEL (mg/m ³)	2,6 mg/m ³
Luxembourg	OEL STEL (ppm)	1 ppm
Malta	Local name	Nitric acid
Malta	OEL STEL (mg/m ³)	2,6 mg/m ³
Malta	OEL STEL (ppm)	1 ppm
Netherlands	Local name	Salpeterzuur
Netherlands	Grenswaarde TGG 15MIN (mg/m ³)	1,3 mg/m ³
Netherlands	Grenswaarde TGG 15MIN (ppm)	0,5 ppm (Salpeterzuur; Netherlands; Short time value; Public occupational exposure limit value)
Poland	Local name	Kwas azotowy(V)
Poland	NDS (mg/m ³)	1,4 mg/m ³
Poland	NDSch (mg/m ³)	2,6 mg/m ³
Portugal	Local name	Ácido nítrico



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nitric acid (7697-37-2)		
Portugal	OEL TWA (ppm)	2 ppm
Portugal	OEL STEL (ppm)	4 ppm
Romania	Local name	Acid nitric
Romania	OEL STEL (mg/m ³)	2,6 mg/m ³
Romania	OEL STEL (ppm)	1 ppm
Slovakia	Local name	Kyselina dusičná
Slovakia	OEL STEL (mg/m ³)	2,6 mg/m ³
Slovakia	OEL STEL (ppm)	1 ppm
Slovenia	Local name	dušikova kislina
Slovenia	OEL TWA (mg/m ³)	2,6 mg/m ³
Slovenia	OEL TWA (ppm)	1 ppm
Slovenia	OEL STEL (mg/m ³)	2,6 mg/m ³
Slovenia	OEL STEL (ppm)	1 ppm
Spain	Local name	Ácido nítrico
Spain	VLA-EC (mg/m ³)	2,6 mg/m ³
Spain	VLA-EC (ppm)	1 ppm
Spain	Notes	VLI (Agente químico para el que la U.E. estableció en su día un valor límite indicativo. Todos estos agentes químicos figuran al menos en una de las directivas de valores límite indicativos publicadas hasta ahora (ver Anexo C. Bibliografía). Los estados miembros disponen de un tiempo fijado en dichas directivas para su transposición a los valores límites de cada país miembro. Una vez adoptados, estos valores tienen la misma validez que el resto de los valores adoptados por el país).
Sweden	Local name	Salpetersyra
Sweden	nivågränsvärde (NVG) (mg/m ³)	1,3 mg/m ³
Sweden	nivågränsvärde (NVG) (ppm)	0,5 ppm
Sweden	kortidsvärde (KTV) (mg/m ³)	2,6 mg/m ³
Sweden	kortidsvärde (KTV) (ppm)	1 ppm
United Kingdom	Local name	Nitric acid
United Kingdom	WEL STEL (mg/m ³)	2,6 mg/m ³
United Kingdom	WEL STEL (ppm)	1 ppm
Iceland	Local name	Saltpéturssýra
Iceland	OEL (15 min ref) (mg/m ³)	2,6 mg/m ³
Iceland	OEL (15 min ref) (ppm)	1 ppm
Norway	Local name	Salpetersyre
Norway	Grenseverdier (AN) (mg/m ³)	5 mg/m ³
Norway	Grenseverdier (AN) (ppm)	2 ppm
Norway	Merknader (NO)	E (EU har en veiledende grenseverdi for stoffet)
Switzerland	Local name	Salpetersäure
Switzerland	MAK (mg/m ³)	5 mg/m ³
Switzerland	MAK (ppm)	2 ppm
Switzerland	KZGW (mg/m ³)	5 mg/m ³
Switzerland	KZGW (ppm)	2 ppm
Switzerland	Remark (CH)	OAW & Auge, Zahn - NIOSH, OSHA
Australia	Local name	Nitric acid
Australia	TWA (mg/m ³)	5,2 mg/m ³
Australia	TWA (ppm)	2 ppm
Australia	STEL (mg/m ³)	10 mg/m ³
Australia	STEL (ppm)	4 ppm



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nitric acid (7697-37-2)		
USA - ACGIH	Local name	Nitric acid
USA - ACGIH	ACGIH TWA (ppm)	2 ppm
USA - ACGIH	ACGIH STEL (ppm)	4 ppm
USA - ACGIH	Remark (ACGIH)	URT & eye irr; dental erosion
USA - OSHA	Local name	Nitric acid
USA - OSHA	OSHA PEL (TWA) (mg/m ³)	5 mg/m ³
USA - OSHA	OSHA PEL (TWA) (ppm)	2 ppm
hydrofluoric acid (7664-39-3)		
EU	Local name	Hydrogen fluoride
EU	IOELV TWA (mg/m ³)	1,5 mg/m ³
EU	IOELV TWA (ppm)	1,8 ppm
EU	IOELV STEL (mg/m ³)	2,5 mg/m ³
EU	IOELV STEL (ppm)	3 ppm
Austria	Local name	Fluorwasserstoff
Austria	MAK (mg/m ³)	1,5 mg/m ³
Austria	MAK (ppm)	1,8 ppm
Austria	MAK Short time value (mg/m ³)	2,5 mg/m ³
Austria	MAK Short time value (ppm)	3 ppm
Austria	Remark (AT)	H
Belgium	Local name	Hydrogène (fluorure d') # Waterstofffluoride
Belgium	Limit value (mg/m ³)	1,5 mg/m ³
Belgium	Limit value (ppm)	1,8 ppm
Belgium	Short time value (mg/m ³)	2,5 mg/m ³
Belgium	Short time value (ppm)	3 ppm
Belgium	Remark (BE)	M: La mention M indique que lors d'une exposition supérieure à la valeur limite, des irritations apparaissent ou un danger d'intoxication aiguë existe. Le procédé de travail doit être conçu de telle façon que l'exposition ne dépasse jamais la valeur limite. Lors des mesurages, la période d'échantillonnage doit être aussi courte que possible afin de pouvoir effectuer des mesurages fiables. Le résultat des mesurages est calculé en fonction de la période d'échantillonnage.# De vermelding M duidt aan dat bij de blootstelling boven de grenswaarde irritatie optreedt of er gevaar bestaat voor acute vergiftiging. Het werkproces moet zo zijn ontworpen dat de blootstelling de grenswaarde nooit overschrijdt. Bij een controle geldt dat de bemonsterde periode zo kort mogelijk moet zijn om een betrouwbare meting te kunnen verrichten. het meetresultaat wordt dan gerelateerd aan de beschouwde periode.
Bulgaria	Local name	Флуороводород
Bulgaria	OEL TWA (mg/m ³)	1,5 mg/m ³
Bulgaria	OEL TWA (ppm)	1,8 ppm
Bulgaria	OEL STEL (mg/m ³)	2,5 mg/m ³
Bulgaria	OEL STEL (ppm)	3 ppm
Croatia	Local name	Vodikov fluorid
Croatia	GVI (granična vrijednost izloženosti) (mg/m ³)	1,5 mg/m ³
Croatia	GVI (granična vrijednost izloženosti) (ppm)	1,8 ppm
Croatia	KGVI (kratkotrajna granična vrijednost izloženosti) (mg/m ³)	2,5 mg/m ³
Croatia	KGVI (kratkotrajna granična vrijednost izloženosti) (ppm)	3 ppm
Croatia	Naznake (HR)	EU* (naznaka da se radi o tvarima za koje su utvrđene indikativne granične vrijednosti izloženosti prema Direktivi 2000/39/ EC (prva lista)); T+ (vrlo otrovno); C (nagrizajuće)
Czech Republic	Local name	Fluorovodík

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hydrofluoric acid (7664-39-3)		
Czech Republic	Expoziční limity (PEL) (mg/m ³)	1,5 mg/m ³
Czech Republic	Expoziční limity (PEL) (ppm)	1835 ppm
Czech Republic	Expoziční limity (NPK-P) (mg/m ³)	2,5 mg/m ³
Czech Republic	Expoziční limity (NPK-P) (ppm)	3058 ppm
Denmark	Local name	Hydrogenfluorid (Fluorbrinte)
Denmark	Grænseværdie (langvarig) (mg/m ³)	1,5 mg/m ³
Denmark	Grænseværdie (langvarig) (ppm)	1,8 ppm
Denmark	Anmærkninger (DK)	E (betyder, at stoffet har en EF-grænseværdi)
Estonia	Local name	Vesinikfluoriid
Estonia	OEL TWA (mg/m ³)	1,5 mg/m ³
Estonia	OEL TWA (ppm)	1,8 ppm
Estonia	OEL STEL (mg/m ³)	2,5 mg/m ³
Estonia	OEL STEL (ppm)	3 ppm
Finland	Local name	Fluorivety
Finland	HTP-arvo (8h) (mg/m ³)	1,5 mg/m ³
Finland	HTP-arvo (8h) (ppm)	1,8 ppm
Finland	HTP-arvo (15 min)	2,5 mg/m ³
Finland	HTP-arvo (15 min) (ppm)	3 ppm
Finland	Huomautus (FI)	iho
France	Local name	Fluorure d'hydrogène (Acide fluorhydrique)
France	VME (mg/m ³)	1,5 mg/m ³
France	VME (ppm)	1,8 ppm
France	VLE (mg/m ³)	2,5 mg/m ³
France	VLE (ppm)	3 ppm
France	Note (FR)	Valeurs réglementaires contraignantes
Germany	Local name	Fluorwasserstoff
Germany	TRGS 900 Occupational exposure limit value (mg/m ³)	0,83 mg/m ³
Germany	TRGS 900 Occupational exposure limit value (ppm)	1 ppm
Germany	Remark (TRGS 900)	DFG,EU,Y,H
Greece	OEL TWA (mg/m ³)	2,5 mg/m ³
Greece	OEL TWA (ppm)	3 ppm
Greece	OEL STEL (mg/m ³)	2,5 mg/m ³
Greece	OEL STEL (ppm)	3 ppm
Hungary	Local name	HIDROGÉN-FLUORID
Hungary	AK-érték	1,5 mg/m ³
Hungary	CK-érték	2,5 mg/m ³
Hungary	Megjegyzések (HU)	b, m; 1.
Ireland	Local name	Hydrogen fluoride (as F)
Ireland	OEL (8 hours ref) (mg/m ³)	1,5 mg/m ³
Ireland	OEL (8 hours ref) (ppm)	1,8 ppm
Ireland	OEL (15 min ref) (mg/m ³)	2,5 mg/m ³
Ireland	OEL (15 min ref) (ppm)	3 ppm
Ireland	Notes (IE)	Sk, IOELV
Italy	Local name	Acido fluoridrico
Italy	OEL TWA (mg/m ³)	1,5 mg/m ³
Italy	OEL TWA (ppm)	1,8 ppm
Italy	OEL STEL (mg/m ³)	2,5 mg/m ³



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hydrofluoric acid (7664-39-3)		
Italy	OEL STEL (ppm)	3 ppm
Latvia	Local name	Fluorūdeņradis
Latvia	OEL TWA (mg/m ³)	1,5 mg/m ³
Latvia	OEL TWA (ppm)	1,8 ppm
Latvia	OEL STEL (mg/m ³)	2,5 mg/m ³
Latvia	OEL STEL (ppm)	3 ppm
Lithuania	Local name	Vandenilio fluoridas
Lithuania	IPRV (mg/m ³)	1,5 mg/m ³
Lithuania	IPRV (ppm)	1,8 ppm
Lithuania	TPRV (mg/m ³)	2,5 mg/m ³
Lithuania	TPRV (ppm)	3 ppm
Lithuania	Remark (LT)	Ū (ūmus poveikis)
Luxembourg	Local name	Fluorure d'hydrogène
Luxembourg	OEL TWA (mg/m ³)	1,5 mg/m ³
Luxembourg	OEL TWA (ppm)	4,8 ppm
Luxembourg	OEL STEL (mg/m ³)	2,5 mg/m ³
Luxembourg	OEL STEL (ppm)	3 ppm
Malta	Local name	Hydrogenfluoride
Malta	OEL TWA (mg/m ³)	1,5 mg/m ³
Malta	OEL TWA (ppm)	1,8 ppm
Malta	OEL STEL (mg/m ³)	2,5 mg/m ³
Malta	OEL STEL (ppm)	3 ppm
Netherlands	Local name	Fluorwaterstof
Netherlands	Grenswaarde TGG 15MIN (mg/m ³)	1 mg/m ³ (als F)
Netherlands	Grenswaarde TGG 15MIN (ppm)	1,2 ppm (Fluorwaterstof (als F); Netherlands; Short time value; Public occupational exposure limit value; als F)
Poland	Local name	Fluorowodór
Poland	NDS (mg/m ³)	0,5 mg/m ³
Poland	NDSch (mg/m ³)	2 mg/m ³
Portugal	Local name	Ácido fluorídrico , expresso em F
Portugal	OEL TWA (ppm)	0,5 ppm
Portugal	OEL - Ceilings (ppm)	2 ppm
Romania	Local name	Acid fluorhidric
Romania	OEL TWA (mg/m ³)	1,5 mg/m ³
Romania	OEL TWA (ppm)	1,8 ppm
Romania	OEL STEL (mg/m ³)	2,5 mg/m ³
Romania	OEL STEL (ppm)	3 ppm
Slovakia	Local name	Fluórovodík, kyselina fluorovodíková (ako F)
Slovakia	NPHV (priemerná) (mg/m ³)	1,5 mg/m ³
Slovakia	NPHV (priemerná) (ppm)	1,8 ppm
Slovakia	OEL STEL (mg/m ³)	2,5 mg/m ³
Slovakia	OEL STEL (ppm)	3 ppm
Slovenia	Local name	vodikov fluorid
Slovenia	OEL TWA (mg/m ³)	1,5 mg/m ³
Slovenia	OEL TWA (ppm)	1,8 ppm
Slovenia	OEL STEL (mg/m ³)	2,25 mg/m ³
Slovenia	OEL STEL (ppm)	2,7 ppm

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hydrofluoric acid (7664-39-3)		
Spain	Local name	Fluoruro de hidrógeno
Spain	VLA-ED (mg/m ³)	1,5 mg/m ³
Spain	VLA-ED (ppm)	1,8 ppm
Spain	VLA-EC (mg/m ³)	2,5 mg/m ³
Spain	VLA-EC (ppm)	3 ppm
Spain	Notes	VLB® (Agente químico que tiene Valor Límite Biológico específico en este documento), VLI (Agente químico para el que la U.E. estableció en su día un valor límite indicativo. Todos estos agentes químicos figuran al menos en una de las directivas de valores límite indicativos publicadas hasta ahora (ver Anexo C. Bibliografía). Los estados miembros disponen de un tiempo fijado en dichas directivas para su transposición a los valores límites de cada país miembro. Una vez adoptados, estos valores tienen la misma validez que el resto de los valores adoptados por el país).
Sweden	Local name	Fluorväte
Sweden	nivågränsvärde (NVG) (mg/m ³)	1,5 mg/m ³ 1,5 mg/m ³
Sweden	nivågränsvärde (NVG) (ppm)	1,8 ppm 1,8 ppm
Sweden	kortidsvärde (KTV) (mg/m ³)	1,7 mg/m ³ 1,7 mg/m ³
Sweden	kortidsvärde (KTV) (ppm)	2 ppm 2 ppm
Sweden	Anmärkning (SE)	31 (Vid exponering för blandningar av fluorider och vätefluorid ska nivågränsvärdet för fluorider tillämpas)
United Kingdom	Local name	Hydrogen fluoride
United Kingdom	WEL TWA (mg/m ³)	1,5 mg/m ³ (as F)
United Kingdom	WEL TWA (ppm)	1,8 ppm (as F)
United Kingdom	WEL STEL (mg/m ³)	2,5 mg/m ³ (as F)
United Kingdom	WEL STEL (ppm)	3 ppm (as F)
Iceland	Local name	Vetnisflúoríð (flúorvetni) I)
Iceland	OEL (8 hours ref) (mg/m ³)	0,6 mg/m ³
Iceland	OEL (8 hours ref) (ppm)	0,7 ppm
Iceland	OEL (15 min ref) (mg/m ³)	2,5 mg/m ³
Iceland	OEL (15 min ref) (ppm)	3 ppm
Norway	Local name	Hydrogenfluorid (Fluss-syre)
Norway	Grenseverdier (AN) (mg/m ³)	0,5 mg/m ³
Norway	Grenseverdier (Korttidsverdi) (mg/m ³)	1,5 mg/m ³
Norway	Grenseverdier (Korttidsverdi) (ppm)	1,8 ppm
Norway	Merknader (NO)	H (Kjemikalier som kan tas opp gjennom huden); E (EU har en veiledende grenseverdi for stoffet); S (Korttidsverdi er en verdi for gjennomsnittskonsentrasjonen av et kjemisk stoff i pustesonen til en arbeidstaker som ikke skal overskrides i en fastsatt referanseperiode. Referanseperioden er 15 minutter hvis ikke annet er oppgitt)
Switzerland	Local name	Fluorwasserstoff
Switzerland	MAK (mg/m ³)	0,83 mg/m ³
Switzerland	MAK (ppm)	1 ppm
Switzerland	KZGW (mg/m ³)	1,66 mg/m ³
Switzerland	KZGW (ppm)	2 ppm

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hydrofluoric acid (7664-39-3)		
Switzerland	Remark (CH)	B SS _c - AW & Haut & Auge, Knochen ^{KT} - HSE, NIOSH, OSHA
Australia	Local name	Hydrogen fluoride (as F)
USA - ACGIH	Local name	Hydrogen fluoride , as F
USA - ACGIH	ACGIH TWA (ppm)	0,5 ppm
USA - ACGIH	ACGIH Ceiling (ppm)	2 ppm
USA - ACGIH	Remark (ACGIH)	URT, LRT, skin, & eye irr
USA - OSHA	Local name	Hydrogen fluoride (as F)
USA - OSHA	Remark (OSHA)	(2) See Table Z-2.

8.2. Exposure controls

Appropriate engineering controls	: Provide adequate general and local exhaust ventilation. Ensure good ventilation of the work station.
Personal protective equipment	: Protective clothing. Protective goggles. Gloves.
Hand protection	: Protective gloves
Eye protection	: Safety glasses
Skin and body protection	: Wear suitable protective clothing
Respiratory protection	: Where exposure through inhalation may occur from use, respiratory protection equipment is recommended. Wear respiratory protection



Environmental exposure controls	: Avoid release to the environment.
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SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Liquid
Colour	: No data available
Odour	: No data available
Odour threshold	: No data available
pH	: < 2
Relative evaporation rate (butylacetate=1)	: No data available
Melting point	: Not applicable
Freezing point	: No data available
Boiling point	: No data available
Flash point	: No data available
Auto-ignition temperature	: No data available
Decomposition temperature	: No data available
Flammability (solid, gas)	: Not applicable
Vapour pressure	: No data available
Relative vapour density at 20 °C	: No data available
Relative density	: No data available
Solubility	: Miscible with water.
Log Pow	: No data available
Viscosity, kinematic	: No data available
Viscosity, dynamic	: No data available
Explosive properties	: No data available
Oxidising properties	: No data available

Explosive limits : No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

The product is non-reactive under normal conditions of use, storage and transport.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

No dangerous reactions known under normal conditions of use.

10.4. Conditions to avoid

None under recommended storage and handling conditions (see section 7).

10.5. Incompatible materials

metals.

10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Oral: Toxic if swallowed. Dermal: Toxic in contact with skin.

ATE CLP (oral)	250 mg/kg bodyweight
ATE CLP (dermal)	250 mg/kg bodyweight

zirconyl nitrate,hydrate (14985-18-3)	
LD50 oral rat	> 2000 mg/kg (Rat)

Skin corrosion/irritation : Causes severe skin burns and eye damage.
pH: < 2

Serious eye damage/irritation : Serious eye damage, category 1, implicit
pH: < 2

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

Germ cell mutagenicity : Not classified

Carcinogenicity : Not classified

Reproductive toxicity : Not classified

STOT-single exposure : Not classified

STOT-repeated exposure : Not classified

Aspiration hazard : Not classified

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : Before neutralisation, the product may represent a danger to aquatic organisms.

nitric acid (7697-37-2)	
LC50 fish 2	72 ppm (LC50; 96 h)
EC50 Daphnia 1	180 mg/l (EC50; 48 h)
Threshold limit algae 1	> 19 mg/l (EC0)

hydrofluoric acid (7664-39-3)	
LC50 fish 1	107,5 mg/l (LC50; 96 h)
EC50 Daphnia 1	270 mg/l (EC50; 48 h)
Threshold limit algae 1	95 mg/l (EC0; 96 h)

12.2. Persistence and degradability

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zirconyl nitrate,hydrate (14985-18-3)	
Persistence and degradability	Biodegradability in soil: Not applicable.
Biochemical oxygen demand (BOD)	Not applicable
Chemical oxygen demand (COD)	Not applicable
ThOD	Not applicable

nitric acid (7697-37-2)	
Persistence and degradability	Biodegradability: Not applicable.
Biochemical oxygen demand (BOD)	Not applicable
Chemical oxygen demand (COD)	Not applicable
ThOD	Not applicable

hydrofluoric acid (7664-39-3)	
Persistence and degradability	Biodegradability: Not applicable.
Biochemical oxygen demand (BOD)	Not applicable
Chemical oxygen demand (COD)	Not applicable
ThOD	Not applicable

12.3. Bioaccumulative potential

zirconyl nitrate,hydrate (14985-18-3)	
Bioaccumulative potential	Bioaccumulation: No data available.

nitric acid (7697-37-2)	
BCF fish 1	<= 1 (BCF)
Log Pow	-2,3 (OECD 107: Partition Coefficient (n-octanol/water): Shake Flask Method)
Bioaccumulative potential	Bioaccumulation: Not applicable.

hydrofluoric acid (7664-39-3)	
Log Pow	-1,4 (Experimental value)
Bioaccumulative potential	Bioaccumulation: Not applicable.

12.4. Mobility in soil

No additional information available

12.5. Results of PBT and vPvB assessment

No additional information available

12.6. Other adverse effects

No additional information available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste treatment methods	: Dispose of contents/container in accordance with licensed collector's sorting instructions.
Product/Packaging disposal recommendations	: Dispose in a safe manner in accordance with local/national regulations.
Ecology - waste materials	: Avoid release to the environment.
European List of Waste (LoW) code	: 16 05 06* - laboratory chemicals consisting of or containing dangerous substances including mixtures of laboratory chemicals

SECTION 14: Transport information

In accordance with ADR / RID / IMDG / IATA / ADN











ADR	IMDG	IATA	ADN	RID
14.1. UN number				
2922	2922	2922	2922	2922
14.2. UN proper shipping name				
CORROSIVE LIQUID, TOXIC, N.O.S. (nitric acid ; zirconyl nitrate,hydrate ; hydrofluoric acid)	CORROSIVE LIQUID, TOXIC, N.O.S. (nitric acid ; zirconyl nitrate,hydrate ; hydrofluoric acid)	Corrosive liquid, toxic, n.o.s. (nitric acid ; zirconyl nitrate,hydrate ; hydrofluoric acid)	CORROSIVE LIQUID, TOXIC, N.O.S. (nitric acid ; zirconyl nitrate,hydrate ; hydrofluoric acid)	CORROSIVE LIQUID, TOXIC, N.O.S. (nitric acid ; zirconyl nitrate,hydrate ; hydrofluoric acid)
Transport document description				
UN 2922 CORROSIVE	UN 2922 CORROSIVE	UN 2922 Corrosive liquid,	UN 2922 CORROSIVE	UN 2922 CORROSIVE

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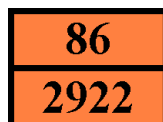
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ADR	IMDG	IATA	ADN	RID
LIQUID, TOXIC, N.O.S. (nitric acid ; zirconyl nitrate,hydrate ; hydrofluoric acid), 8 (6.1), II, (E)	LIQUID, TOXIC, N.O.S. (nitric acid ; zirconyl nitrate,hydrate ; hydrofluoric acid), 8 (6.1), II	toxic, n.o.s. (nitric acid ; zirconyl nitrate,hydrate ; hydrofluoric acid), 8 (6.1), II	LIQUID, TOXIC, N.O.S. (nitric acid ; zirconyl nitrate,hydrate ; hydrofluoric acid), 8 (6.1), II	LIQUID, TOXIC, N.O.S. (nitric acid ; zirconyl nitrate,hydrate ; hydrofluoric acid), 8 (6.1), II
14.3. Transport hazard class(es)				
8 (6.1)	8 (6.1)	8 (6.1)	8 (6.1)	8 (6.1)
 	 	 	 	 
14.4. Packing group				
II	II	II	II	II
14.5. Environmental hazards				
Dangerous for the environment : No	Dangerous for the environment : No Marine pollutant : No	Dangerous for the environment : No	Dangerous for the environment : No	Dangerous for the environment : No
No supplementary information available				

14.6. Special precautions for user

- Overland transport

Classification code (ADR) : CT1
 Special provisions (ADR) : 274
 Limited quantities (ADR) : 1I
 Excepted quantities (ADR) : E2
 Packing instructions (ADR) : P001, IBC02
 Mixed packing provisions (ADR) : MP15
 Portable tank and bulk container instructions (ADR) : T7
 Portable tank and bulk container special provisions (ADR) : TP2
 Tank code (ADR) : L4BN
 Vehicle for tank carriage : AT
 Transport category (ADR) : 2
 Special provisions for carriage - Loading, unloading and handling (ADR) : CV13, CV28
 Hazard identification number (Kemler No.) : 86
 Orange plates :



Tunnel restriction code (ADR) : E
 EAC code : 2X
 APP code : B

- Transport by sea

Special provisions (IMDG) : 274
 Limited quantities (IMDG) : 1 L
 Excepted quantities (IMDG) : E2
 Packing instructions (IMDG) : P001
 IBC packing instructions (IMDG) : IBC02
 Tank instructions (IMDG) : T7
 Tank special provisions (IMDG) : TP2
 EmS-No. (Fire) : F-A
 EmS-No. (Spillage) : S-B



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Stowage category (IMDG) : B
Stowage and handling (IMDG) : SW2
Properties and observations (IMDG) : Causes burns to skin, eyes and mucous membranes. Toxic if swallowed, by skin contact or by inhalation.

- Air transport

PCA Excepted quantities (IATA) : E2
PCA Limited quantities (IATA) : Y840
PCA limited quantity max net quantity (IATA) : 0.5L
PCA packing instructions (IATA) : 851
PCA max net quantity (IATA) : 1L
CAO packing instructions (IATA) : 855
CAO max net quantity (IATA) : 30L
Special provisions (IATA) : A3
ERG code (IATA) : 8P

- Inland waterway transport

Classification code (ADN) : CT1
Special provisions (ADN) : 274, 802
Limited quantities (ADN) : 1 L
Excepted quantities (ADN) : E2
Carriage permitted (ADN) : T
Equipment required (ADN) : PP, EP, TOX, A
Ventilation (ADN) : VE02
Number of blue cones/lights (ADN) : 2

- Rail transport

Classification code (RID) : CT1
Special provisions (RID) : 274
Limited quantities (RID) : 1L
Excepted quantities (RID) : E2
Packing instructions (RID) : P001, IBC02
Mixed packing provisions (RID) : MP15
Portable tank and bulk container instructions (RID) : T7
Portable tank and bulk container special provisions (RID) : TP2
Tank codes for RID tanks (RID) : L4BN
Transport category (RID) : 2
Special provisions for carriage - Loading, unloading and handling (RID) : CW13, CW28
Colis express (express parcels) (RID) : CE6
Hazard identification number (RID) : 86

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable

SECTION 15: Regulatory information

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

15.1.1. EU-Regulations

The following restrictions are applicable according to Annex XVII of the REACH Regulation (EC) No 1907/2006:

3. Liquid substances or mixtures which are regarded as dangerous in accordance with Directive 1999/45/EC or are fulfilling the criteria for any of the following hazard classes or categories set out in Annex I to Regulation (EC) No 1272/2008	Single-element Standard Solution for ICP. Zirconium (Zr) 10000mg/l in HNO3 5%, HF 2% - nitric acid - hydrofluoric acid
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3(a) Substances or mixtures fulfilling the criteria for any of the following hazard classes or categories set out in Annex I to Regulation (EC) No 1272/2008: Hazard classes 2.1 to 2.4, 2.6 and 2.7, 2.8 types A and B, 2.9, 2.10, 2.12, 2.13 categories 1 and 2, 2.14 categories 1 and 2, 2.15 types A to F	nitric acid
3(b) Substances or mixtures fulfilling the criteria for any of the following hazard classes or categories set out in Annex I to Regulation (EC) No 1272/2008: Hazard classes 3.1 to 3.6, 3.7 adverse effects on sexual function and fertility or on development, 3.8 effects other than narcotic effects, 3.9 and 3.10	Single-element Standard Solution for ICP. Zirconium (Zr) 10000mg/l in HNO ₃ 5%, HF 2% - nitric acid - hydrofluoric acid

Contains no substance on the REACH candidate list

Contains no REACH Annex XIV substances

15.1.2. National regulations

Germany

VwVwS Annex reference	: Water hazard class (WGK) 1, low hazard to waters (Classification according to VwVwS, Annex 4)
Storage class (LGK)	: LGK 6.1B - Non-combustible substances of acute toxicity categories 1 and 2 / very toxic substances
12th Ordinance Implementing the Federal Immission Control Act - 12.BImSchV	: Is not subject of the 12. BImSchV (Hazardous Incident Ordinance)

Netherlands

SZW-lijst van kankerverwekkende stoffen	: None of the components are listed
SZW-lijst van mutagene stoffen	: None of the components are listed
NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Borstvoeding	: None of the components are listed
NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Vruchtbaarheid	: None of the components are listed
NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Ontwikkeling	: None of the components are listed

Denmark

Recommendations Danish Regulation	: Young people below the age of 18 years are not allowed to use the product Pregnant/breastfeeding women working with the product must not be in direct contact with the product The requirements from the Danish Working Environment Authorities regarding work with carcinogens must be followed during use and disposal
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15.2. Chemical safety assessment

No chemical safety assessment has been carried out

SECTION 16: Other information

Full text of H- and EUH-statements:

Acute Tox. 1 (Dermal)	Acute toxicity (dermal), Category 1
Acute Tox. 2 (Inhalation)	Acute toxicity (inhal.), Category 2
Acute Tox. 2 (Oral)	Acute toxicity (oral), Category 2
Acute Tox. 3 (Dermal)	Acute toxicity (dermal), Category 3
Acute Tox. 3 (Oral)	Acute toxicity (oral), Category 3
Met. Corr. 1	Corrosive to metals, Category 1
Ox. Liq. 2	Oxidising Liquids, Category 2
Ox. Sol. 2	Oxidising Solids, Category 2
Resp. Sens. 1	Respiratory sensitisation, Category 1
Skin Corr. 1A	Skin corrosion/irritation, Category 1A
Skin Corr. 1B	Skin corrosion/irritation, Category 1B
Skin Sens. 1	Skin sensitisation, Category 1
H272	May intensify fire; oxidiser
H290	May be corrosive to metals
H300	Fatal if swallowed



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H301	Toxic if swallowed
H310	Fatal in contact with skin
H311	Toxic in contact with skin
H314	Causes severe skin burns and eye damage
H317	May cause an allergic skin reaction
H330	Fatal if inhaled
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled

SDS EU Mod H F (REACH ANNEX II)

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.