

# according to Regulation (EC) No 1907/2006 Vanadium Standard 1.000gV/L V2O5 in nitric acid 1 mol/l for ICP - traceable to NIST

Revision date: 07.02.2025

Product code: 03784

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

#### 1.1. Product identifier

Vanadium Standard 1.000gV/L V2O5 in nitric acid 1 mol/l for ICP - traceable to NIST

UFI:

## NVFA-D0K6-A00N-WWJA

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

## Use of the substance/mixture

Laboratory chemicals

Industrial uses: Uses of substances as such or in preparations at industrial sites

Professional uses: Public domain (administration, education, entertainment, services, craftsmen)

## Uses advised against

Do not use for private purposes (household).

#### 1.3. Details of the supplier of the safety data sheet

Company name:	AnalytiChem GmbH	
	ACD	
Street:	Stempelstraße 6	
Place:	D-47167 Duisburg	
Telephone:	0203/5194-0	Telefax: 0203/5194-290
E-mail:	info@analytichem.de	
Contact person:	Abteilung Produktsicherheit	Telephone:0203/5194-107/117
E-mail:	produktsicherheit@analytichem.de	
Internet:	www.analytichem.de	
Responsible Department:	Abteilung Produktsicherheit	
<u>1.4. Emergency telephone</u> number:	Exposure, or Accident Call CHEMTF	ous Goods] Incidents Spill, Leak, Fire, REC Day or Night Within USA and Canada: Canada: +1 703-741-5970 (collect calls

#### **Further Information**

This product is a mixture. REACH Registration Number see section 3.

## **SECTION 2: Hazards identification**

#### 2.1. Classification of the substance or mixture

#### Regulation (EC) No 1272/2008

Met. Corr. 1; H290 Skin Corr. 1B; H314 Eye Dam. 1; H318 Carc. 1B; H350

Full text of hazard statements: see SECTION 16.

## 2.2. Label elements

## Regulation (EC) No 1272/2008

## Hazard components for labelling

nitric acid

vanadium pentoxide

Signal word:

**Pictograms:** 





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according to Regulation (EC) No 1907/2006

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Hazard statements			
H290	May be corrosive to metals		

H290	May be corrosive to metals.
H314	Causes severe skin burns and eye damage.
H350	May cause cancer.
Precautionary statemer	nts
P260	Do not breathe dust/fume/gas/mist/vapours/spray.
P280	Wear protective gloves/protective clothing and eye protection/face protection.
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin 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.
P310	Immediately call a POISON CENTER/doctor.

## Special labelling of certain mixtures

EUH071	Corrosive to the respiratory tract.
	Restricted to professional users.

#### 2.3. Other hazards

No data available

## **SECTION 3: Composition/information on ingredients**

## 3.2. Mixtures

## **Chemical characterization**

Mixtures in aqueous solution

## **Relevant ingredients**

CAS No	Chemical name			Quantity
	EC No	Index No	REACH No	
	Classification (Regulation	on (EC) No 1272/2008)		
7697-37-2	nitric acid			5 - < 10 %
	231-714-2	007-030-00-3	01-2119487297-23	
	Ox. Liq. 3, Met. Corr. 1, EUH071	Acute Tox. 3, Skin Corr. 1A, Eye Da	m. 1; H272 H290 H331 H314 H318	
1314-62-1	vanadium pentoxide			< 1 %
	215-239-8	023-001-00-8		
		. 2, Lact., Acute Tox. 2, Acute Tox. 3 I361fd H362 H330 H301 H335 H372		

Full text of H and EUH statements: see section 16.

## Specific Conc. Limits, M-factors and ATE

CAS No	EC No	Chemical name	Quantity
	Specific Conc. L	imits, M-factors and ATE	
7697-37-2	231-714-2	nitric acid	5 - < 10 %
		: 2,65 mg/l (vapours) Ox. Liq. 3; H272: >= 65 - 100 Skin Corr. 1A; H314: >= 20 rr. 1B; H314: >= 5 - < 20	
1314-62-1	215-239-8	vanadium pentoxide	< 1 %
	inhalation: ATE	0,05 mg/l (dusts or mists); oral: ATE 220 mg/kg	

## **Further Information**

This product does not contain substances of very high concern according to Regulation (EC) No 1907/2006 (REACH), Article 57 above the respective regulatory concentration limit of = 0.1 % (w/w).

## SECTION 4: First aid measures



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## 4.1. Description of first aid measures

## General information

First aider: Pay attention to self-protection!

## After inhalation

Provide fresh air. If breathing is irregular or stopped, administer artificial respiration. Call a physician immediately.

## After contact with skin

Wash immediately with: Water Take off immediately all contaminated clothing and wash it before reuse. Call a physician immediately.

#### After contact with eyes

In case of contact with eyes flush immediately with plenty of flowing water for 10 to 15 minutes holding eyelids apart and consult an ophthalmologist.

Remove contact lenses, if present and easy to do. Continue rinsing.

#### After ingestion

Rinse mouth immediately and drink plenty of water. Do NOT induce vomiting. Adverse human health effects and symptoms: Gastric perforation. Call a physician immediately. Do not allow a neutralisation agent to be drunk.

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

Irritant — skin irritation and eye damage Causes burns. Cough Dyspnoea Risk of serious damage to eyes. Vomiting Methaemoglobinaemia

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

No data available

## **SECTION 5: Firefighting measures**

## 5.1. Extinguishing media

## Suitable extinguishing media

Co-ordinate fire-fighting measures to the fire surroundings.

## Unsuitable extinguishing media

no restriction

#### 5.2. Special hazards arising from the substance or mixture

Non-combustible liquids Hazardous combustion products In case of fire may be liberated: Nitrogen oxides (NOx) Metal oxide smoke, toxic

## 5.3. Advice for firefighters

Wear a self-contained breathing apparatus and chemical protective clothing. Full protection suit. Do not inhale explosion and combustion gases. Avoid contact with skin, eyes and clothes.

## Additional information

Collect contaminated fire extinguishing water separately. Do not allow entering drains or surface water. Move undamaged containers from immediate hazard area if it can be done safely. Use water spray jet to protect personnel and to cool endangered containers.



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## SECTION 6: Accidental release measures

## 6.1. Personal precautions, protective equipment and emergency procedures

#### General advice

Corrosive to metals. Do not breathe vapour/aerosol.

#### For non-emergency personnel

Provide adequate ventilation.

Use personal protection equipment.

Avoid contact with skin, eyes and clothes.

Remove persons to safety.

Emergency procedures

Consult an expert

Do not breathe dust/fume/gas/mist/vapours/spray.

#### For emergency responders

Precautionary statements For emergency responders : Personal protection equipment: see section 8

6.2. Environmental precautions

Do not allow to enter into surface water or drains.

## 6.3. Methods and material for containment and cleaning up

#### For containment

Cover drains. Prevent spread over a wide area (e.g. by containment or oil barriers). Collect in closed and suitable containers for disposal. Absorb with liquid-binding material (sand, diatomaceous earth, acid- or universal binding agents).

#### For cleaning up

Clean contaminated articles and floor according to the environmental legislation.

## Other information

Provide adequate ventilation. Do not breathe dust/fume/gas/mist/vapours/spray. Wear breathing apparatus if exposed to vapours/dusts/aerosols.

## 6.4. Reference to other sections

Safe handling: see section 7 Personal protection equipment: see section 8 Disposal: see section 13

#### **SECTION 7: Handling and storage**

#### 7.1. Precautions for safe handling

#### Advice on safe handling

If handled uncovered, arrangements with local exhaust ventilation have to be used. Read label before use. Handle and open container with care. When using do not eat, drink, smoke, sniff. Keep container tightly closed. Use personal protection equipment. Use extractor hood (laboratory). Provide adequate ventilation. Avoid contact with skin, eyes and clothes.

## Advice on protection against fire and explosion

Material, oxygen-rich, Oxidising

### Advice on general occupational hygiene

Remove contaminated, saturated clothing immediately. Draw up and observe skin protection programme. Wash hands and face before breaks and after work and take a shower if necessary. When using do not eat or drink. The choice of body protection depends on the concentration and quantity of hazardous substances. The chemical resistance of protective agents must be clarified with their suppliers.



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## Further information on handling

Draw up and observe skin protection programme. Wash hands and face before breaks and after work and take a shower if necessary. Take off immediately all contaminated clothing and wash it before reuse.

#### 7.2. Conditions for safe storage, including any incompatibilities

## Requirements for storage rooms and vessels

Keep container tightly closed.

Provide adequate ventilation as well as local exhaustion at critical locations. Keep in a cool place.

#### Hints on joint storage

national regulations

#### Further information on storage conditions

Unsuitable container/equipment material: Metal, Light metal Store in a place accessible by authorized persons only.

### 7.3. Specific end use(s)

Laboratory chemicals

## **SECTION 8: Exposure controls/personal protection**

#### 8.1. Control parameters

#### Occupational exposure limits

CAS No	Substance	ppm	mg/m³	fib/cm³	Category	Origin
1314-62-1	Divanadium pentaoxide (as V), total inhalable fraction	-	0.05		TWA (8 h)	
7697-37-2	Nitric acid	1	2.6		STEL (15 min)	

## 8.2. Exposure controls

#### Appropriate engineering controls

Technical measures and the application of suitable work processes have priority over personal protection equipment.

If handled uncovered, arrangements with local exhaust ventilation have to be used. Do not breathe gas/fumes/vapour/spray.

#### Individual protection measures, such as personal protective equipment

#### Eye/face protection

Face protection shield goggles.

#### Hand protection

Protective gloves are recommended Company KCL GmbH, D-36124 Eichenzell, email: vertrieb@kcl.de With specification (test according to EN374):

By long-term hand contact Recommended glove articles: KCL 741 Dermatril® L Recommended material: NBR (Nitrile rubber) 0,11mm Wearing time with permanent contact: >480min

By short-term hand contact Recommended glove articles: KCL 741 Dermatril® L Recommended material: NBR (Nitrile rubber) 0,11mm Wearing time with occasional contact (splashes): >480min

The breakthrough times stated above were determined by KCL in laboratory tests acc. to EN374 with samples



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of the recommended glove types. This recommendation applies only to the product stated in the safety data sheet<(>,<)> supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).

#### Skin protection

Wear suitable protective clothing.

## **Respiratory protection**

Respiratory protection necessary at: aerosol or mist formation

The entrepeneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.

## Thermal hazards

No data available

#### **Environmental exposure controls**

Do not allow to enter into surface water or drains.

## **SECTION 9: Physical and chemical properties**

#### 9.1. Information on basic physical and chemical properties

Physical state:	Liquid	
Colour:	colourless	
Odour:	stinging	
Odour threshold:	No data available	
Melting point/freezing point:		No data available
Boiling point or initial boiling point and		No data available
boiling range:		
Flammability:		No data available
Lower explosion limits:		No data available
Upper explosion limits:		No data available
Flash point:		Х
Auto-ignition temperature:		No data available
Decomposition temperature:		No data available
pH-Value:		acidic
Viscosity / kinematic:		No data available
Water solubility:		No data available
Solubility in other solvents		
not determined		
Dissolution rate:		No data available
Partition coefficient n-octanol/water:		No data available
Dispersion stability:		No data available
Vapour pressure:		No data available
Vapour pressure:		No data available
Density:		No data available
Relative density:		No data available
Bulk density:		No data available
Relative vapour density:		No data available
Particle characteristics:		No data available
9.2. Other information		
Information with regard to physical haza	ard classes	

No data available

Self-ignition temperature

Explosive properties No data available Sustaining combustion:



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## **SECTION 10: Stability and reactivity**

## 10.1. Reactivity

Corrosive to metals. Oxidising agent, strong

## 10.2. Chemical stability

The product is stable under storage at normal ambient temperatures.

#### 10.3. Possibility of hazardous reactions

Danger of explosion:

Acetone, Alcohol, Aniline, Substance, organic, Benzene, Aniline, Amines, Hydrocarbons, halogenated, Diethyl ether, Hydrazine, Dioxane, Acetic acid, Acetic anhydride, Ethanol, Fluorine, Formaldehyde, Rubber articles, Hydrocarbons, Copper, Powdered metals, Methanol, Phosphorus trichloride, Hydrogen phosphides, Gasoline, Reducing agent, titanium, Toluene, Hydrogen peroxide, tin, Xylene, Dichloromethane, carbon black, Potassium chlorate, permanganates, e.g. potassium permanganate

Ignition hazard:

Amines, Ammonia (NH3), Combustible substance, aldehydes, Hydrogen iodide (HI), White/yellow phosphor, Hydrogen sulphide (H2S), Alkali metals, Alkaline earth metal

Violent reaction with:

Nitriles, antimony, arsenic, boron, Alkali (lye), sodium hypochlorite, Formic acid, sulphuric acid, sulphuric acid, sulphuric acid, sulphuric acid, selenium

## 10.4. Conditions to avoid

Heat

## 10.5. Incompatible materials

Cellulose, Metal

Keep away from: Metal.

Keep away from combustible material.

The product develops hydrogen in an aqueous solution in contact with metals. / Nitrogen oxides (NOx)

## 10.6. Hazardous decomposition products

In case of fire may be liberated:

SECTION 5: Firefighting measures

## Further information

No data available



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## **SECTION 11: Toxicological information**

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

#### Toxicocinetics, metabolism and distribution

There are no data available on the mixture itself.

#### Acute toxicity

Based on available data, the classification criteria are not met.

If swallowed danger of perforation of the esophagus and the stomach (strong corrosive effects).

Pulmonary oedema

Mucous membrane irritation in the mouth, throat, esophagus and gastrointestinal tract.

#### ATEmix calculated

ATE (oral) > 5000 mg/kg; ATE (dermal) > 2000 mg/kg; ATE (inhalation vapour) > 20 mg/l; ATE (inhalation dust/mist) > 12,5 mg/l

CAS No	Chemical name				
	Exposure route	Dose	Species	Source	Method
7697-37-2	nitric acid				
	inhalation vapour	ATE 2,65 mg/l			
1314-62-1	vanadium pentoxide				_
	oral	ATE 220 mg/kg			
	inhalation dust/mist	ATE 0,05 mg/l			

#### Irritation and corrosivity

Skin corrosion/irritation: Causes severe skin burns and eye damage. Serious eye damage/eye irritation: Causes serious eye damage. Corrosive to the respiratory tract. Risk of serious damage to eyes.

#### Sensitising effects

Based on available data, the classification criteria are not met.

#### Carcinogenic/mutagenic/toxic effects for reproduction

May cause cancer. (vanadium pentoxide) Germ cell mutagenicity: Based on available data, the classification criteria are not met. Reproductive toxicity: Based on available data, the classification criteria are not met.

## STOT-single exposure

Based on available data, the classification criteria are not met.

#### STOT-repeated exposure

Based on available data, the classification criteria are not met.

## Aspiration hazard

Based on available data, the classification criteria are not met.

#### Information on likely routes of exposure

There are no data available on the mixture itself.

## Specific effects in experiment on an animal

There are no data available on the mixture itself.

#### Additional information on tests

There are no data available on the mixture itself.

## **Practical experience**

There are no data available on the mixture itself.

## 11.2. Information on other hazards

Endocrine disrupting properties

There are no data available on the mixture itself.



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## Other information

There are no data available on the mixture itself.

## Further information

Irritant — skin irritation and eye damage Causes burns. Cough Dyspnoea Risk of serious damage to eyes. Vomiting Methaemoglobinaemia

## **SECTION 12: Ecological information**

## 12.1. Toxicity

Based on available data, the classification criteria are not met.

CAS No	Chemical name						
	Aquatic toxicity	Dose		[h]   [d]	Species	Source	Method
7697-37-2	nitric acid						
	Acute fish toxicity	LC50 mg/l	1559	96 h	Topeka shiner	Environmental Toxicology and Chemistry,	other: ASTM E729-26
	Fish toxicity	NOEC	268 mg/l		juvenile Topeka shiner and with juvenile Fathead m	Study report (2009)	Growth tests estimated the test chemical
	Algae toxicity	NOEC mg/l	> 419	-	several benthic diatoms; see results	Marine Biology 43:307-315 (1977)	Ten cultures of benthic diatoms were iso
	Acute bacteria toxicity	EC50 mg/l()	> 1000	3 h	Activated sludge	Study report (2008)	OECD Guideline 209

#### 12.2. Persistence and degradability

The methods for determining the biological degradability are not applicable to inorganic substances.

#### 12.3. Bioaccumulative potential

There are no data available on the mixture itself.

## 12.4. Mobility in soil

There are no data available on the mixture itself.

## 12.5. Results of PBT and vPvB assessment

The substances in the mixture do not meet the PBT/vPvB criteria according to REACH, annex XIII.

## 12.6. Endocrine disrupting properties

This product does not contain a substance that has endocrine disrupting properties with respect to non-target organisms as no components meets the criteria.

## 12.7. Other adverse effects

Discharge into the environment must be avoided.

Harmful effect due to pH shift.

Forms corrosive mixtures with water even if diluted.

## Further information

Do not empty into drains.

## **SECTION 13: Disposal considerations**

## 13.1. Waste treatment methods



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#### **Disposal recommendations**

Waste disposal according to directive 2008/98/EC, covering waste and dangerous waste. Send to a physico-chemical treatment facility under observation of official regulations. Do not empty into drains.

## Contaminated packaging

Handle contaminated packages in the same way as the substance itself.

The allocation of waste identity numbers/waste descriptions must be carried out according to the EEC, specific to the industry and process.

## **SECTION 14: Transport information**

#### Land transport (ADR/RID)

Land transport (ADR/RID)		
<u>14.1. UN number or ID number:</u>	UN 2031	
14.2. UN proper shipping name:	NITRIC ACID	
14.3. Transport hazard class(es):	8	
14.4. Packing group:	II	
Hazard label:	8	
Classification code:	C1	
Limited quantity:	1 L	
Excepted quantity:	E2	
Transport category:	2	
Hazard No:	80	
Tunnel restriction code:	E	
Inland waterways transport (ADN)		
14.1. UN number or ID number:	UN 2031	
14.2. UN proper shipping name:	NITRIC ACID	
14.3. Transport hazard class(es):	8	
14.4. Packing group:	Ш	
Hazard label:	8	
Classification code:	C1	
Limited quantity:	1 L	
Excepted quantity:	E2	
Marine transport (IMDG)		
<u>14.1. UN number or ID number:</u>	UN 2031	
14.2. UN proper shipping name:	NITRIC ACID	
14.3. Transport hazard class(es):	8	
14.4. Packing group:	8	
Hazard label:	8	
Special Provisions:	o -	
Limited quantity:	- 1 L	
Excepted quantity:	F2	
Excepted quantity. EmS:	F-A, S-B	
	г- <b>А</b> , <b>3-</b> D	
Air transport (ICAO-TI/IATA-DGR)	UN 2031	
14.1. UN number or ID number:		
14.2. UN proper shipping name:		
14.3. Transport hazard class(es):	8	
14.4. Packing group:		
Hazard label:	8	
Special Provisions:	A212	
Limited quantity Passenger:	Forbidden	
Passenger LQ:	Forbidden	
Excepted quantity:	E0	<b>-</b>
IATA-packing instructions - Passenger:		Forbidden



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IATA-max. quantity - Passenger:	Forbidden
IATA-packing instructions - Cargo:	855
IATA-max. quantity - Cargo:	30 L
14.5. Environmental hazards	
ENVIRONMENTALLY HAZARDOUS:	No
14.6. Special precautions for user	
Warning: Oxidising substances. strong	gly corrosive.
14.7. Maritime transport in bulk according t	to IMO instruments
not applicable	
SECTION 15: Regulatory information	
15.1. Safety, health and environmental requ	Ilations/legislation specific for the substance or mixture
EU regulatory information	
EU regulatory information	
<b>EU regulatory information</b> Restrictions on use (REACH, annex XVII)	
<b>EU regulatory information</b> Restrictions on use (REACH, annex XVII) Entry 3, Entry 75 Information according to Directive	: Not subject to 2012/18/EU (SEVESO III)
EU regulatory information Restrictions on use (REACH, annex XVII) Entry 3, Entry 75 Information according to Directive 2012/18/EU (SEVESO III): Marketing and use of explosives precurso Acquisition, introduction, possession of	: Not subject to 2012/18/EU (SEVESO III) rs (Regulation (EU) 2019/1148): or use of this product by the general public is restricted by Regulation
EU regulatory information Restrictions on use (REACH, annex XVII) Entry 3, Entry 75 Information according to Directive 2012/18/EU (SEVESO III): Marketing and use of explosives precurso Acquisition, introduction, possession of	: Not subject to 2012/18/EU (SEVESO III) rs (Regulation (EU) 2019/1148):
EU regulatory information Restrictions on use (REACH, annex XVII) Entry 3, Entry 75 Information according to Directive 2012/18/EU (SEVESO III): Marketing and use of explosives precurso Acquisition, introduction, possession of (EU) 2019/1148. All suspicious transa	: Not subject to 2012/18/EU (SEVESO III) rs (Regulation (EU) 2019/1148): or use of this product by the general public is restricted by Regulation
EU regulatory information Restrictions on use (REACH, annex XVII) Entry 3, Entry 75 Information according to Directive 2012/18/EU (SEVESO III): Marketing and use of explosives precurso Acquisition, introduction, possession of (EU) 2019/1148. All suspicious transa the relevant national contact point.	: Not subject to 2012/18/EU (SEVESO III) rs (Regulation (EU) 2019/1148): or use of this product by the general public is restricted by Regulation

## Changes

This data sheet contains changes from the previous version in section(s): 2,5,6,7,8,9,11,12,13,15.



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## Abbreviations and acronyms

Ox. Liq: Oxidising liquid Met. Corr: Substance or mixture corrosive to metals Acute Tox: Acute toxicity Skin Corr: Skin corrosion Eye Dam: Eye damage Muta: Germ cell mutagenicity Carc: Carcinogenicity Repr: Reproductive toxicity Lact: Lactation effects STOT SE: Specific target organ toxicity - single exposure STOT RE: Specific target organ toxicity - repeated exposure Aquatic Chronic: Chronic aquatic hazard ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road) IMDG: International Maritime Code for Dangerous Goods IATA: International Air Transport Association GHS: Globally Harmonized System of Classification and Labelling of Chemicals EINECS: European Inventory of Existing Commercial Chemical Substances ELINCS: European List of Notified Chemical Substances CAS: Chemical Abstracts Service LC50: Lethal concentration, 50% LD50: Lethal dose, 50%

#### Classification for mixtures and used evaluation method according to Regulation (EC) No 1272/2008 [CLP]

Classification	Classification procedure
Met. Corr. 1; H290	On basis of test data
Skin Corr. 1B; H314	Calculation method
Eye Dam. 1; H318	Calculation method
Carc. 1B; H350	Calculation method

## Relevant H and EUH statements (number and full text)

H272	May intensify fire; oxidiser.
H290	May be corrosive to metals.
H301	Toxic if swallowed.
H314	Causes severe skin burns and eye damage.
H318	Causes serious eye damage.
H330	Fatal if inhaled.
H331	Toxic if inhaled.
H335	May cause respiratory irritation.
H341	Suspected of causing genetic defects.
H350	May cause cancer.
H361fd	Suspected of damaging fertility. Suspected of damaging the unborn child.
H362	May cause harm to breast-fed children.
H372	Causes damage to organs (Respiratory tract) through prolonged or repeated exposure if inhaled.
H411	Toxic to aquatic life with long lasting effects.
EUH071	Corrosive to the respiratory tract.

#### **Further Information**

The above information describes exclusively the safety requirements of the product and is based on our present-day knowledge. The information is intended to give you advice about the safe handling of the product named in this safety data sheet, for storage, processing, transport and disposal. The information cannot be transferred to other products. In the case of mixing the product with other products or in the case of processing, the information on this safety data sheet is not necessarily valid for the new made-up material. Provide appropriate information, instructions and training to users



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(The data for the relevant ingredients were taken respectively from the last version of the sub-contractor's safety data sheet.)