



Agilent Technologies

Kit Name: [ICH/USP 232 Parenteral Kit_v2](#)

Kit PN: [5191-4556](#)

This product is a kit, composed of the following individual chemical components:

Kit Components

Component Part Number	Component Name	Volume or mass/ container and unit	No. of component containers/ kit
5190-9770	Pharma Internal Standard 1	100 mL	1
5191-4533	ICH/USP 232 Class1&2 Parenteral Elements	100 mL	1
5191-4557	ICH/USP 232 Parenteral Combined 1_v2	100 mL	1
5191-4558	ICH/USP 232 Parenteral Combined 2_v2	100 mL	1

SDSs for each component follow this cover sheet.

Transportation Information for the Kit:

Proper Shipping Names:

DOT	IATA/ICAO	China
UN3316, Chemical Kit, 9, II	UN3316, Chemical Kit, 9, II	UN3316, Chemical Kit, 9, II



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 29-Nov-2023

Revision Number 2

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

1.1. Product identifier

Product Code(s) 5190-9770
Product Name Pharma Internal Standard 1
Form Not applicable
Pure substance/mixture Mixture

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

Recommended use Reagents and Standards for Analytical Chemical Laboratory Use
Uses advised against No information available

1.3. Details of the supplier of the safety data sheet

Supplier

Agilent Technologies LDA UK Ltd.
5500 Lakeside Cheadle Royal Business Park,
Cheadle, Cheshire, SK8 3GR
United Kingdom

+44 (0) 345 712 5292

For further information, please contact

E-mail address pdl-msds_author@agilent.com

1.4. Emergency telephone number

Emergency Telephone CHEMTREC®: +(44)-870-8200418

Emergency Telephone - §45 - (EC)1272/2008	
Europe	112
Austria	No information available
Bulgaria	
Croatia	
Cyprus	
Czech Republic	
Denmark	
France	
Hungary	

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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]

Skin corrosion/irritation	Category 2 - (H315)
Serious eye damage/eye irritation	Category 2 - (H319)
Corrosive to metals	Category 1 - (H290)

2.2. Label elements



Signal word
Warning

Hazard statements

H315 - Causes skin irritation
H319 - Causes serious eye irritation
H290 - May be corrosive to metals
EUH071 - Corrosive to the respiratory tract

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

P264 - Wash face, hands and any exposed skin thoroughly after handling
P280 - Wear protective gloves and eye/face protection

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P332 + P313 - If skin irritation occurs: Get medical advice/attention
P337 + P313 - If eye irritation persists: Get medical advice/attention
P390 - Absorb spillage to prevent material damage
P406 - Store in corrosion resistant stainless steel container with a resistant inner liner

2.3. Other hazards

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
Nitric Acid	-	-
hydrofluoric acid	-	-
Tellurium	-	-
Indium	-	-

SECTION 3: Composition/information on ingredients

3.1 Substances

Not applicable

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)
Nitric Acid 7697-37-2	1 - <3	-	231-714-2	Met. Corr. 1 (H290) Ox. Liq. 2 (H272) Acute Tox. 3 (H331) Skin Corr. 1A (H314) (EUH071)	Ox. Liq. 2 :: C>=99% Ox. Liq. 3 :: C≥65% Skin Corr. 1A :: C>=20% Skin Corr. 1B :: 5%<=C<20%		
hydrofluoric acid	0.1 - 1	-	231-634-8	Acute Tox. 2 (H300)	Eye Irrit. 2 ::		

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7664-39-3			(009-002-00-6)	Acute Tox. 1 (H310) Acute Tox. 2 (H330) Skin Corr. 1A (H314)	0.1%≤C<1% Skin Corr. 1A :: C≥7% Skin Corr. 1B :: 1%≤C<7%		
Tellurium 13494-80-9	<0.1	-	(052-001-00-0) 236-813-4	Acute Tox. 3 (H301) Acute Tox. 4 (H332) Skin Sens. 1B (H317) Repr. 1B (H360Df) Lact. (H362) Aquatic Chronic 4 (H413)			
Indium 7440-74-6	<0.1	-	231-180-0	STOT RE 1 (H372)			

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 (ATE_{mix}) 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
Nitric Acid 7697-37-2	No data available	No data available	No data available	2.65	No data available
hydrofluoric acid 7664-39-3	No data available	No data available	No data available	No data available	482.8875
Tellurium 13494-80-9	83	No data available	No data available	No data available	No data available
Indium 7440-74-6	4200	No data available	No data available	No data available	No data available

Additional information

The concentration of the acid stated in this SDS is calculated as an absolute mass concentration (%w/v). This is less than the acid concentration stated on the product label and COA, which reflects a percent value of the commercially available concentrated aqueous form of the acid.

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

SECTION 4: First aid measures



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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.
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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.

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 Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear.

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precautions for fire-fighters 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

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. Take off contaminated clothing and wash it before reuse.

General hygiene considerations 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. Regular cleaning of equipment, work area and clothing is recommended.

7.2. Conditions for safe storage, including any incompatibilities

Storage Conditions Please refer to the manufacturer's certificate for specific storage and transport temperature

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conditions. Store only in the original receptacle unless other advice is given on the CoA. 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.

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
Nitric Acid 7697-37-2	-	STEL 1 ppm STEL 2.6 mg/m ³	STEL: 1 ppm STEL: 2.6 mg/m ³	STEL: 1 ppm STEL: 2.6 mg/m ³	STEL: 1 ppm STEL: 2.6 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
Tellurium 13494-80-9	-	TWA: 0.1 mg/m ³ STEL 0.5 mg/m ³	TWA: 0.1 mg/m ³	TWA: 0.1 mg/m ³	TWA: 0.1 mg/m ³
Indium 7440-74-6	-	TWA: 0.1 mg/m ³ STEL 0.2 mg/m ³	TWA: 0.1 mg/m ³	-	TWA: 0.1 mg/m ³ STEL: 0.3 mg/m ³
Chemical name	Cyprus	Czech Republic	Denmark	Estonia	Finland
Nitric Acid 7697-37-2	STEL: 1 ppm STEL: 2.6 mg/m ³	TWA: 1 mg/m ³ Ceiling: 2.5 mg/m ³	STEL: 1 ppm STEL: 2.6 mg/m ³	STEL: 1 ppm STEL: 2.6 mg/m ³	TWA: 0.5 ppm TWA: 1.3 mg/m ³ STEL: 1 ppm STEL: 2.6 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*
Tellurium 13494-80-9	-	TWA: 0.1 mg/m ³ Ceiling: 0.5 mg/m ³	TWA: 0.1 mg/m ³ STEL: 0.2 mg/m ³	TWA: 0.1 mg/m ³	TWA: 0.1 mg/m ³ STEL: 0.3 mg/m ³
Indium 7440-74-6	-	-	TWA: 0.1 mg/m ³ STEL: 0.2 mg/m ³	-	TWA: 0.1 mg/m ³
Chemical name	France	Germany TRGS	Germany DFG	Greece	Hungary

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Nitric Acid 7697-37-2	STEL: 1 ppm STEL: 2.6 mg/m ³	TWA: 1 ppm TWA: 2.6 mg/m ³	-	STEL: 1 ppm STEL: 2.6 mg/m ³	STEL: 2.6 mg/m ³ STEL: 1 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*
Tellurium 13494-80-9	TWA: 0.1 mg/m ³	-	-	TWA: 0.1 mg/m ³	-
Indium 7440-74-6	-	TWA: 0.0001 mg/m ³	-	TWA: 1 mg/m ³ STEL: 1 mg/m ³	-
Chemical name	Ireland	Italy MDLPS	Italy AIDII	Latvia	Lithuania
Nitric Acid 7697-37-2	STEL: 1 ppm STEL: 2.6 mg/m ³	STEL: 1 ppm STEL: 2.6 mg/m ³	TWA: 2 ppm TWA: 5.2 mg/m ³ STEL: 4 ppm STEL: 10.3 mg/m ³	TWA: 0.78 ppm TWA: 2 mg/m ³ STEL: 1 ppm STEL: 2.6 mg/m ³	STEL: 1 ppm STEL: 2.6 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
Tellurium 13494-80-9	TWA: 0.1 mg/m ³ STEL: 0.3 mg/m ³	-	TWA: 0.1 mg/m ³	TWA: 0.01 mg/m ³	TWA: 0.1 mg/m ³
Indium 7440-74-6	TWA: 0.1 mg/m ³ STEL: 0.3 mg/m ³	-	TWA: 0.1 mg/m ³	-	TWA: 0.1 mg/m ³
Chemical name	Luxembourg	Malta	Netherlands	Norway	Poland
Nitric Acid 7697-37-2	STEL: 1 ppm STEL: 2.6 mg/m ³	STEL: 1 ppm STEL: 2.6 mg/m ³	STEL: 0.5 ppm STEL: 1.3 mg/m ³	TWA: 2 ppm TWA: 5 mg/m ³ STEL: 4 ppm STEL: 10 mg/m ³	TWA: 1.4 mg/m ³ STEL: 2.6 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
Tellurium 13494-80-9	-	-	-	TWA: 0.1 mg/m ³ STEL: 0.3 mg/m ³	STEL: 0.03 mg/m ³ TWA: 0.01 mg/m ³
Indium 7440-74-6	-	-	-	TWA: 0.1 mg/m ³ STEL: 0.3 mg/m ³	-
Chemical name	Portugal	Romania	Slovakia	Slovenia	Spain
Nitric Acid 7697-37-2	TWA: 2 ppm STEL: 1 ppm STEL: 2.6 mg/m ³	STEL: 1 ppm STEL: 2.6 mg/m ³	Ceiling: 2.6 mg/m ³	TWA: 1 ppm TWA: 2.6 mg/m ³ STEL: 1 ppm STEL: 2.6 mg/m ³	STEL: 1 ppm STEL: 2.6 mg/m ³
hydrofluoric acid	TWA: 1.8 ppm	TWA: 1.8 ppm	TWA: 1.8 ppm	TWA: 1.8 ppm	TWA: 1.8 ppm

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Tellurium 13494-80-9	TWA: 0.1 mg/m ³	TWA: 0.05 mg/m ³ STEL: 0.15 mg/m ³	TWA: 0.1 mg/m ³	-	TWA: 0.1 mg/m ³
Indium 7440-74-6	TWA: 0.1 mg/m ³	-	-	TWA: 0.0001 mg/m ³ STEL: 0.0008 mg/m ³	TWA: 0.1 mg/m ³
Chemical name	Sweden		Switzerland		United Kingdom
Nitric Acid 7697-37-2	NGV: 0.5 ppm NGV: 1.3 mg/m ³ Bindande KGV: 1 ppm Bindande KGV: 2.6 mg/m ³		TWA: 2 ppm TWA: 5 mg/m ³ STEL: 2 ppm STEL: 5 mg/m ³		STEL: 1 ppm STEL: 2.6 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
Tellurium 13494-80-9	NGV: 0.1 mg/m ³		TWA: 0.1 mg/m ³ STEL: 0.2 mg/m ³		TWA: 0.1 mg/m ³ STEL: 0.3 mg/m ³
Indium 7440-74-6	NGV: 0.1 mg/m ³		TWA: 0.1 mg/m ³		TWA: 0.1 mg/m ³ STEL: 0.3 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	-
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)
Chemical name	Hungary	Ireland	Italy MDLPS		Italy AIDII

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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
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)
Tellurium 13494-80-9	-	-	20 µg/L - urine (Tellurium) - end of shift	-
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)	-

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). If splashes are likely to occur, wear safety glasses with side-shields.

Hand protection

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

Skin and body protection

Wear suitable protective clothing. Long sleeved clothing.

Respiratory protection

No protective equipment is needed under normal use conditions. If exposure limits are



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exceeded or irritation is experienced, ventilation and evacuation may be required.

General hygiene considerations 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. Regular cleaning of equipment, work area and clothing is recommended.

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
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	



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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.

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. Strong acids. Strong bases.

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

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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 skin irritation. (based on components).
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 Redness. May cause redness and tearing of the eyes.

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
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)	139.50 mg/l

Component Information

Chemical name	Oral LD50	Dermal LD50	Inhalation LC50
Nitric Acid			= 2500 ppm (Rat) 1 h ATE (vapours) = 2.65 mg/L
hydrofluoric acid			= 0.79 mg/L (Rat) 1 h
Tellurium	> 5 g/kg (Rat)		> 2.42 mg/L (Rat) 4 h
Indium	= 4200 mg/kg (Rat)		

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 skin irritation.

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



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Respiratory or skin sensitisation No information available.

Germ cell mutagenicity No information available.

Carcinogenicity No information available.

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
Tellurium	Repr. 1B Lact.

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 No information available.

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.

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

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
Nitric Acid	-2.3
hydrofluoric acid	-1.4

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
Nitric Acid	The substance is not PBT / vPvB
hydrofluoric acid	The substance is not PBT / vPvB
Tellurium	PBT assessment does not apply
Indium	The substance is not PBT / vPvB

12.6. Endocrine disrupting properties

Endocrine disrupting properties No information available.

12.7. Other adverse effects

No information available.

SECTION 13: Disposal considerations

13.1. Waste treatment methods



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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. (Nitric Acid, hydrofluoric acid)
14.3 Transport hazard class(es) 8
14.4 Packing group III
Description UN3264, Corrosive liquid, acidic, inorganic, n.o.s. (Nitric 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. (Nitric Acid, hydrofluoric acid)
14.3 Transport hazard class(es) 8
14.4 Packing group III
Description UN3264, Corrosive liquid, acidic, inorganic, n.o.s. (Nitric 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
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. (Nitric Acid, hydrofluoric acid)
14.3 Transport hazard class(es) 8
14.4 Packing group III
Description UN3264, Corrosive liquid, acidic, inorganic, n.o.s. (Nitric 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. (Nitric Acid, hydrofluoric acid)



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14.3 Transport hazard class(es)	8
14.4 Packing group	III
Description	UN3264, Corrosive liquid, acidic, inorganic, n.o.s. (Nitric 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	-

Germany

Water hazard class (WGK) non-hazardous to water (nwg)

Netherlands

Chemical name	Netherlands - List of Carcinogens	Netherlands - List of Carcinogens	Netherlands - List of Reproductive Toxins
Tellurium	-	-	Development Category 1B Fertility Category 2 Can be harmful via breastfeeding

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

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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 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

Not applicable

Chemical name	RESTRICTED EXPLOSIVES PRECURSORS - ANNEX I	REPORTABLE EXPLOSIVES PRECURSORS - ANNEX II
Nitric Acid - 7697-37-2	3 %w/w	-

Chemical name	Restricted substance per REACH Annex XVII	Substance subject to authorisation per REACH Annex XIV
Nitric Acid - 7697-37-2	75.	
hydrofluoric acid - 7664-39-3	75.	
Tellurium - 13494-80-9	75.	

Persistent Organic Pollutants

Not applicable

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

Not applicable



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International Inventories

TSCA	Complies
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
- AICS** - 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

- EUH071 - Corrosive to the respiratory tract
- H272 - May intensify fire; oxidiser
- H290 - May be corrosive to metals
- H300 - Fatal if swallowed
- H301 - Toxic if swallowed
- H310 - Fatal in contact with skin
- H314 - Causes severe skin burns and eye damage
- H317 - May cause an allergic skin reaction
- H330 - Fatal if inhaled
- H331 - Toxic if inhaled



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H332 - Harmful if inhaled
H360Df - May damage the unborn child. Suspected of damaging fertility
H362 - May cause harm to breast-fed children
H372 - Causes damage to organs through prolonged or repeated exposure
H413 - May cause long lasting harmful effects to aquatic life

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	On basis of test data
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)
U.S. Environmental Protection Agency ChemView Database
European Food Safety Authority (EFSA)
EPA (Environmental Protection Agency)
Acute Exposure Guideline Level(s) (AEGl(s))
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



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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

The information contained in this document is based on Agilent's state of knowledge at the time of preparation. No warranty as to its accurateness, completeness or suitability for a particular purpose is expressed or implied.

End of Safety Data Sheet



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

1.1. Product identifier

Product Code(s) 5191-4533
Product Name ICH/USP 232 Class1&2 Parenteral Elements
Form Not applicable
Pure substance/mixture Mixture

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

Recommended use Reagents and Standards for Analytical Chemical Laboratory Use
Uses advised against

1.3. Details of the supplier of the safety data sheet

Supplier

Agilent Technologies LDA UK Ltd.
5500 Lakeside Cheadle Royal Business Park,
Cheadle, Cheshire, SK8 3GR
United Kingdom

+44 (0) 345 712 5292

For further information, please contact

E-mail address pdl-msds_author@agilent.com

1.4. Emergency telephone number

Emergency Telephone CHEMTREC®: +(44)-870-8200418

Emergency Telephone - §45 - (EC)1272/2008	
Europe	112
Austria	No information available
Bulgaria	
Croatia	
Cyprus	
Czech Republic	
Denmark	
France	
Hungary	

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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]

Skin corrosion/irritation	Category 2 - (H315)
Serious eye damage/eye irritation	Category 2 - (H319)
Corrosive to metals	Category 1 - (H290)

2.2. Label elements



Signal word
Warning

Hazard statements

H315 - Causes skin irritation
H319 - Causes serious eye irritation
H290 - May be corrosive to metals
EUH071 - Corrosive to the respiratory tract

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

P264 - Wash face, hands and any exposed skin thoroughly after handling
P280 - Wear protective gloves and eye/face protection



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P332 + P313 - If skin irritation occurs: Get medical advice/attention
P337 + P313 - If eye irritation persists: Get medical advice/attention
P390 - Absorb spillage to prevent material damage
P406 - Store in corrosion resistant stainless steel container with a resistant inner liner

2.3. Other hazards

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
Nitric Acid	-	-
Nickel	-	-
Arsenic	-	-
vanadium pentoxide	-	-
Lead	-	-
Cobalt	-	-
Mercury	-	-
Cadmium	-	-

SECTION 3: Composition/information on ingredients

3.1 Substances

Not applicable

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)
Nitric Acid 7697-37-2	1 - <3	-	231-714-2	Met. Corr. 1 (H290) Ox. Liq. 2 (H272) Acute Tox. 3 (H331) Skin Corr. 1A (H314) (EUH071)	Ox. Liq. 2 :: C>=99% Ox. Liq. 3 :: C≥65% Skin Corr. 1A ::		



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					C>=20% Skin Corr. 1B :: 5%<=C<20%		
Nickel 7440-02-0	<0.1	-	(028-002-00 -7) 231-111-4	Skin Sens. 1 (H317) Carc. 2 (H351) STOT RE 1 (H372) Aquatic Chronic 3 (H412)			
Arsenic 7440-38-2	<0.1	-	(033-001-00 -X) 231-148-6	Acute Tox. 3 (H301) Acute Tox. 3 (H331) Carc. 1A (H350) Repr. 1A (H360) STOT RE 1 (H372) Aquatic Acute 1 (H400) Aquatic Chronic 1 (H410)			
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)			
Lead 7439-92-1	<0.1	-	(082-014-00 -7) 231-100-4	Carc. 2 (H351) Repr. 1A (H360FD) Lact. (H362) STOT RE 1 (H372) Aquatic Acute 1 (H400) Aquatic Chronic 1 (H410)	Repr. 1A :: C>=0.03%	1	10
Cobalt 7440-48-4	<0.1	-	(027-001-00 -9) 231-158-0	Acute Tox. 4 (H302) Eye Irrit. 2 (H319) Resp. Sens. 1 (H334) Skin Sens. 1 (H317) Muta. 2 (H341) Carc. 1B (H350) Repr. 1B (H360F) Aquatic Chronic 2 (H411)			
Mercury 7439-97-6	<0.1	-	(080-001-00 -0)	Acute Tox. 2 (H330) Repr. 1B (H360D)	STOT RE 2 :: C>=0.1%		

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			231-106-7	STOT RE 1 (H372) Aquatic Acute 1 (H400) Aquatic Chronic 1 (H410)			
Cadmium 7440-43-9	<0.1	-	(048-002-00-0) 231-152-8	Acute Tox. 2 (H330) Muta. 2 (H341) Carc. 1B (H350) Repr. 2 (H361fd) STOT RE 1 (H372) Aquatic Acute 1 (H400) Aquatic Chronic 1 (H410)			

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 (ATE_{mix}) 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
Nitric Acid 7697-37-2	No data available	No data available	No data available	2.65	No data available
Nickel 7440-02-0	9000	No data available	No data available	No data available	No data available
Arsenic 7440-38-2	15	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
Cobalt 7440-48-4	6171	No data available	No data available	No data available	No data available
Cadmium 7440-43-9	1140	No data available	No data available	No data available	No data available

+ 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

Additional information

The concentration of the acid stated in this SDS is calculated as an absolute mass concentration (%w/v). This is less than the acid concentration stated on the product label and COA, which reflects a percent value of the commercially available concentrated aqueous form of the acid..

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)



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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.
-----------------	---

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

Note to doctors	Treat symptomatically.
------------------------	------------------------

SECTION 5: Firefighting measures

5.1. Extinguishing media

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

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. Take off contaminated clothing and wash it before reuse.

General hygiene considerations 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. Regular cleaning of equipment, work area and clothing is recommended.



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7.2. Conditions for safe storage, including any incompatibilities

Storage Conditions

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. 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.

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
Nitric Acid 7697-37-2	-	STEL 1 ppm STEL 2.6 mg/m ³	STEL: 1 ppm STEL: 2.6 mg/m ³	STEL: 1 ppm STEL: 2.6 mg/m ³	STEL: 1 ppm STEL: 2.6 mg/m ³
Nickel 7440-02-0	-	Respiratory sensitizer Skin sensitizer	TWA: 1 mg/m ³	TWA: 0.05 mg/m ³	TWA: 0.5 mg/m ³ Skin Sensitisation
Arsenic 7440-38-2	-	-	TWA: 0.01 mg/m ³	-	TWA: 0.1 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
Lead 7439-92-1	TWA: 0.15 mg/m ³	TWA: 0.1 mg/m ³ STEL 0.4 mg/m ³	-	TWA: 0.05 mg/m ³	TWA: 0.15 mg/m ³
Cobalt 7440-48-4	-	H* Respiratory sensitizer Skin sensitizer	TWA: 0.02 mg/m ³	TWA: 0.1 mg/m ³	TWA: 0.1 mg/m ³ Skin Sensitisation Respiratory Sensitisation
Mercury 7439-97-6	TWA: 0.02 mg/m ³	TWA: 0.02 mg/m ³ STEL 0.08 mg/m ³ H* Skin sensitizer	TWA: 0.02 mg/m ³ *	TWA: 0.05 mg/m ³ TWA: 0.02 mg/m ³	TWA: 0.02 mg/m ³
Cadmium 7440-43-9	TWA: 0.001 mg/m ³	-	TWA: 0.01 mg/m ³ TWA: 0.004 mg/m ³	TWA: 0.004 mg/m ³	TWA: 0.004 mg/m ³
Chemical name	Cyprus	Czech Republic	Denmark	Estonia	Finland
Nitric Acid	STEL: 1 ppm	TWA: 1 mg/m ³	STEL: 1 ppm	STEL: 1 ppm	TWA: 0.5 ppm

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7697-37-2	STEL: 2.6 mg/m ³	Ceiling: 2.5 mg/m ³	STEL: 2.6 mg/m ³	STEL: 2.6 mg/m ³	TWA: 1.3 mg/m ³ STEL: 1 ppm STEL: 2.6 mg/m ³
Nickel 7440-02-0	-	TWA: 0.5 mg/m ³ Ceiling: 1 mg/m ³ Sensitizer	TWA: 0.05 mg/m ³ STEL: 0.1 mg/m ³	TWA: 0.5 mg/m ³	TWA: 0.01 mg/m ³
Arsenic 7440-38-2	-	TWA: 0.1 mg/m ³ Ceiling: 0.4 mg/m ³	TWA: 0.0028 mg/m ³ STEL: 0.0056 mg/m ³	TWA: 0.03 mg/m ³ TWA: 0.01 mg/m ³	TWA: 0.01 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
Lead 7439-92-1	TWA: 0.15 mg/m ³	TWA: 0.05 mg/m ³ Ceiling: 0.2 mg/m ³	TWA: 0.05 mg/m ³ STEL: 0.1 mg/m ³	TWA: 0.1 mg/m ³ TWA: 0.05 mg/m ³	TWA: 0.1 mg/m ³
Cobalt 7440-48-4	-	TWA: 0.05 mg/m ³ Ceiling: 0.1 mg/m ³ Sensitizer	TWA: 0.01 mg/m ³ STEL: 0.02 mg/m ³	TWA: 0.05 mg/m ³	TWA: 0.02 mg/m ³
Mercury 7439-97-6	TWA: 0.02 mg/m ³	TWA: 0.02 mg/m ³ Ceiling: 0.15 mg/m ³ *	TWA: 0.02 mg/m ³ H* STEL: 0.04 mg/m ³	TWA: 0.02 mg/m ³	TWA: 0.02 mg/m ³ iho*
Cadmium 7440-43-9	TWA: 0.001 mg/m ³	TWA: 0.004 mg/m ³ Ceiling: 0.008 mg/m ³ *	TWA: 0.001 mg/m ³ STEL: 0.002 mg/m ³	TWA: 0.004 mg/m ³	TWA: 0.004 mg/m ³
Chemical name	France	Germany TRGS	Germany DFG	Greece	Hungary
Nitric Acid 7697-37-2	STEL: 1 ppm STEL: 2.6 mg/m ³	TWA: 1 ppm TWA: 2.6 mg/m ³	-	STEL: 1 ppm STEL: 2.6 mg/m ³	STEL: 2.6 mg/m ³ STEL: 1 ppm
Nickel 7440-02-0	TWA: 1 mg/m ³	TWA: 0.03 mg/m ³ TWA: 0.006 mg/m ³	respiratory and skin sensitizer inhalable fraction, respiratory sensitization confirmed for water soluble Nickel compounds only	TWA: 1 mg/m ³	TWA: 0.01 mg/m ³
Arsenic 7440-38-2	-	-	-	TWA: 0.1 mg/m ³	TWA: 0.01 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+
Lead 7439-92-1	TWA: 0.1 mg/m ³	-	TWA: 0.004 mg/m ³ Peak: 0.032 mg/m ³	TWA: 0.15 mg/m ³	TWA: 0.1 mg/m ³ TWA: 0.05 mg/m ³
Cobalt 7440-48-4	-	-	* respiratory and skin sensitizer	TWA: 0.1 mg/m ³	TWA: 0.02 mg/m ³
Mercury 7439-97-6	TWA: 0.02 mg/m ³	TWA: 0.02 mg/m ³ H*	TWA: 0.02 mg/m ³ Peak: 0.16 mg/m ³ * skin sensitizer	TWA: 0.02 mg/m ³	TWA: 0.02 mg/m ³ *

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Cadmium 7440-43-9	TWA: 0.004 mg/m ³	TWA: 0.002 mg/m ³	*	TWA: 0.001 mg/m ³	TWA: 0.004 mg/m ³
Chemical name	Ireland	Italy MDLPS	Italy AIDII	Latvia	Lithuania
Nitric Acid 7697-37-2	STEL: 1 ppm STEL: 2.6 mg/m ³	STEL: 1 ppm STEL: 2.6 mg/m ³	TWA: 2 ppm TWA: 5.2 mg/m ³ STEL: 4 ppm STEL: 10.3 mg/m ³	TWA: 0.78 ppm TWA: 2 mg/m ³ STEL: 1 ppm STEL: 2.6 mg/m ³	STEL: 1 ppm STEL: 2.6 mg/m ³
Nickel 7440-02-0	TWA: 0.5 mg/m ³ STEL: 1.5 mg/m ³ Sensitizer	-	TWA: 1.5 mg/m ³	TWA: 0.05 mg/m ³	Sensitizer TWA: 0.5 mg/m ³
Arsenic 7440-38-2	TWA: 0.01 mg/m ³ STEL: 0.03 mg/m ³	-	TWA: 0.01 mg/m ³	-	-
vanadium pentoxide 1314-62-1	TWA: 0.05 mg/m ³ STEL: 0.15 mg/m ³	-	TWA: 0.05 mg/m ³	TWA: 0.1 mg/m ³	TWA: 0.2 mg/m ³ Ceiling: 0.05 mg/m ³
Lead 7439-92-1	TWA: 0.15 mg/m ³ STEL: 0.45 mg/m ³	TWA: 0.15 mg/m ³	TWA: 0.05 mg/m ³	TWA: 0.05 mg/m ³ STEL: 0.1 mg/m ³	TWA: 0.15 mg/m ³ TWA: 0.07 mg/m ³
Cobalt 7440-48-4	TWA: 0.02 mg/m ³ STEL: 0.3 mg/m ³ Sensitizer	-	TWA: 0.02 mg/m ³	TWA: 0.5 mg/m ³	Sensitizer TWA: 0.05 mg/m ³
Mercury 7439-97-6	TWA: 0.02 mg/m ³ STEL: 0.06 mg/m ³	TWA: 0.02 mg/m ³ pelle*	TWA: 0.025 mg/m ³ *	TWA: 0.02 mg/m ³	TWA: 0.02 mg/m ³
Cadmium 7440-43-9	TWA: 0.001 mg/m ³ TWA: 0.004 mg/m ³ STEL: 0.003 mg/m ³ STEL: 0.012 mg/m ³	TWA: 0.001 mg/m ³ TWA: 0.004 mg/m ³	TWA: 0.01 mg/m ³	TWA: 0.001 mg/m ³	TWA: 0.004 mg/m ³
Chemical name	Luxembourg	Malta	Netherlands	Norway	Poland
Nitric Acid 7697-37-2	STEL: 1 ppm STEL: 2.6 mg/m ³	STEL: 1 ppm STEL: 2.6 mg/m ³	STEL: 0.5 ppm STEL: 1.3 mg/m ³	TWA: 2 ppm TWA: 5 mg/m ³ STEL: 4 ppm STEL: 10 mg/m ³	TWA: 1.4 mg/m ³ STEL: 2.6 mg/m ³
Nickel 7440-02-0	-	-	-	TWA: 0.05 mg/m ³ STEL: 0.15 mg/m ³	TWA: 0.25 mg/m ³
Arsenic 7440-38-2	-	-	TWA: 0.28 µg/m ³	TWA: 0.005 mg/m ³ STEL: 0.015 mg/m ³ H*	TWA: 0.01 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
Lead 7439-92-1	TWA: 0.15 mg/m ³	-	TWA: 0.15 mg/m ³	TWA: 0.05 mg/m ³ STEL: 0.15 mg/m ³	TWA: 0.05 mg/m ³
Cobalt 7440-48-4	-	-	TWA: 0.02 mg/m ³	TWA: 0.02 mg/m ³ STEL: 0.06 mg/m ³	TWA: 0.02 mg/m ³
Mercury 7439-97-6	TWA: 0.02 mg/m ³	TWA: 0.02 mg/m ³	TWA: 0.02 mg/m ³	TWA: 0.02 mg/m ³ STEL: 0.06 mg/m ³	TWA: 0.02 mg/m ³ *
Cadmium 7440-43-9	-	-	TWA: 0.004 mg/m ³	TWA: 0.001 mg/m ³ STEL: 0.003 mg/m ³	TWA: 0.004 mg/m ³

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Chemical name	Portugal	Romania	Slovakia	Slovenia	Spain
Nitric Acid 7697-37-2	TWA: 2 ppm STEL: 1 ppm STEL: 2.6 mg/m ³	STEL: 1 ppm STEL: 2.6 mg/m ³	Ceiling: 2.6 mg/m ³	TWA: 1 ppm TWA: 2.6 mg/m ³ STEL: 1 ppm STEL: 2.6 mg/m ³	STEL: 1 ppm STEL: 2.6 mg/m ³
Nickel 7440-02-0	TWA: 1.5 mg/m ³	TWA: 0.1 mg/m ³ STEL: 0.5 mg/m ³	TWA: 0.5 mg/m ³ STEL: 0.05 mg/m ³ Sensitizer	TWA: 0.006 mg/m ³ STEL: 0.048 mg/m ³	TWA: 1 mg/m ³ sensitizer
Arsenic 7440-38-2	TWA: 0.01 mg/m ³	TWA: 0.01 mg/m ³ STEL: 0.1 mg/m ³	-	-	TWA: 0.01 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*
Lead 7439-92-1	TWA: 0.05 mg/m ³	TWA: 0.15 mg/m ³	TWA: 0.15 mg/m ³ TWA: 0.5 mg/m ³	TWA: 0.1 mg/m ³ STEL: 0.4 mg/m ³	TWA: 0.15 mg/m ³
Cobalt 7440-48-4	TWA: 0.02 mg/m ³	TWA: 0.05 mg/m ³ STEL: 0.1 mg/m ³	TWA: 0.05 mg/m ³ Sensitizer	-	TWA: 0.02 mg/m ³ sensitizer
Mercury 7439-97-6	TWA: 0.02 mg/m ³ P*	TWA: 0.02 mg/m ³	TWA: 0.1 mg/m ³ * Sensitizer	TWA: 0.02 mg/m ³ STEL: 0.16 mg/m ³ *	TWA: 0.02 mg/m ³
Cadmium 7440-43-9	TWA: 0.001 mg/m ³ TWA: 0.004 mg/m ³	TWA: 0.05 mg/m ³	TWA: 0.03 mg/m ³ TWA: 0.15 mg/m ³ STEL: 0.15 mg/m ³ STEL: 0.75 mg/m ³	TWA: 0.004 mg/m ³	TWA: 0.01 mg/m ³ TWA: 0.002 mg/m ³
Chemical name	Sweden	Switzerland	United Kingdom		
Nitric Acid 7697-37-2	NGV: 0.5 ppm NGV: 1.3 mg/m ³ Bindande KGV: 1 ppm Bindande KGV: 2.6 mg/m ³	TWA: 2 ppm TWA: 5 mg/m ³ STEL: 2 ppm STEL: 5 mg/m ³	STEL: 1 ppm STEL: 2.6 mg/m ³		
Nickel 7440-02-0	NGV: 0.5 mg/m ³ Sensitizer	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³ STEL: 1.5 mg/m ³ Sk*		
Arsenic 7440-38-2	NGV: 0.01 mg/m ³	TWA: 0.01 mg/m ³ H*	TWA: 0.1 mg/m ³ STEL: 0.3 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		
Lead 7439-92-1	NGV: 0.1 mg/m ³ NGV: 0.05 mg/m ³	TWA: 0.1 mg/m ³ STEL: 0.8 mg/m ³	TWA: 0.15 mg/m ³ STEL: 0.45 mg/m ³		
Cobalt 7440-48-4	NGV: 0.02 mg/m ³ * Sensitizer	TWA: 0.05 mg/m ³ H*	TWA: 0.1 mg/m ³ STEL: 0.3 mg/m ³ Sen+		
Mercury 7439-97-6	NGV: 0.02 mg/m ³	TWA: 0.005 ppm TWA: 0.05 mg/m ³ STEL: 0.04 ppm	TWA: 0.02 mg/m ³ STEL: 0.06 mg/m ³		



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		STEL: 0.4 mg/m ³ H*	
Cadmium 7440-43-9	NGV: 0.001 mg/m ³ NGV: 0.004 mg/m ³	TWA: 0.001 mg/m ³ H*	TWA: 0.025 mg/m ³ STEL: 0.075 mg/m ³

Biological occupational exposure limits

Chemical name	European Union	Austria	Bulgaria	Croatia	Czech Republic
Nickel 7440-02-0	-	7 µg/L (urine - spontaneous urine after end of work day, at the end of a work week/end of the shift) (-)	45 µg/L - urine (Nickel) - after several work shifts	10 µg/L - plasma (Nickel) - at the end of the work shift 8 µg/g Creatinine - urine (Nickel) - at the end of the work shift	0.077 µmol/mmol Creatinine (urine - Nickel discretionary) 0.04 mg/g Creatinine (urine - Nickel discretionary)
Arsenic 7440-38-2	-	3.2 million/µL Erythrocytes (red and white blood count - not provided) 3.8 million/µL Erythrocytes (red and white blood count - not provided) 4000 Leukocytes/µL (red and white blood count - not provided) 13000 Leukocytes/µL (red and white blood count - not provided) 10 g/dL Hemoglobin (red and white blood count - not provided) 12 g/dL Hemoglobin (red and white blood count - not provided) 30 % Hematocrit (red and white blood	-	70 µg/L - urine (Arsenic) - at the end of the work shift or urine collected over 24 hours	0.05 mg/g Creatinine (urine - Arsenic end of workweek) 0.075 µmol/mmol Creatinine (urine - Arsenic end of workweek)



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		count - not provided) 35 % Hematocrit (red and white blood count - not provided) 50 µg/L (urine - after end of work day, at the end of a work week/end of the shift)			
Lead 7439-92-1	70 µg/100 mL - blood (Lead) - no restriction 0.075 mg/m ³ - air (Lead) - 40 hours per week 40 µg/100 mL - blood (Lead) - no restriction	120 µg/100 mL RBC Erythrocyte protoporphyrin (blood - Ethylenediaminetetracetic acid not provided) 30 µg/100 mL blood Lead (blood - Ethylenediaminetetracetic acid not provided) 3.8 million/µL Erythrocytes (blood - Ethylenediaminetetracetic acid not provided) 12 g/dL Hemoglobin (blood - Ethylenediaminetetracetic acid not provided) 35 % Hematocrit (blood - Ethylenediaminetetracetic acid not provided) 10 mg/L (urine - .delta.-Aminolevulinic acid not provided) 3.2 million/µL Erythrocytes (blood - Ethylenediaminetetracetic acid not provided)	300 µg/L - blood (Lead) - not fixed 400 µg/L - blood (Lead) - not fixed	400 µg Pb/L - blood (Lead) - not critical 300 µg Pb/L - blood (Lead) - not critical 15 U/LE - blood (.delta.-Aminolevulinic acid dehydratase) - not critical 1.50 mg/LE - blood (Protoporphyrin in erythrocytes) - after exposure during 2-3 months (sample protected from light)	13 µmol/mmol Creatinine (urine - 5-Aminolevulinic acid discretionary) 0.035 µmol/mmol Creatinine (urine - Coproporphyrin discretionary) 15 mg/g Creatinine (urine - 5-Aminolevulinic acid discretionary) 0.2 mg/g Creatinine (urine - Coproporphyrin discretionary) 0.4 mg/L (blood - Lead discretionary)

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		10 g/dL Hemoglobin (blood - Ethylenediaminetetracetic acid not provided) 30 % Hematocrit (blood - Ethylenediaminetetracetic acid not provided) 6 mg/L (urine - .delta.-Aminolevulinic acid not provided)			
Cobalt 7440-48-4	-	10 µg/L (urine - spontaneous urine after end of work day, at the end of a work week/end of the shift) (-)	-	-	-
Mercury 7439-97-6	-	25 µg/g Creatinine (urine - after end of work day, at the end of a work week/end of the shift)	100 µg/L - urine (Mercury) - not fixed	10 µg/L - blood (Mercury) - not critical 30 µg/g Creatinine - urine (Mercury) - single sample or urine collected over 24 hours	0.056 µmol/mmol Creatinine (urine - Mercury discretionary) 0.1 mg/g Creatinine (urine - Mercury discretionary)
Cadmium 7440-43-9	-	2.5 µg/g Creatinine (urine - N-Acetylglucosaminidase not provided) (-)	-	5 µg/L - blood (Cadmium) - not critical 5 µg/g Creatinine - urine (Cadmium) - single sample or urine collected over 24 hours	0.005 µmol/mmol Creatinine (urine - Cadmium discretionary) 0.005 mg/g Creatinine (urine - Cadmium discretionary) 0.045 µmol/L (blood - Cadmium discretionary) 0.005 mg/L (blood - Cadmium discretionary)
Chemical name	Denmark	Finland	France	Germany DFG	Germany TRGS
Nickel 7440-02-0	-	0.1 µmol/L (urine - Nickel after the shift after a working week	-	3 µg/L - BAR (for long-term exposures: at the	-



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		or exposure period)		end of the shift after several shifts) urine 15 µg/L - (long-term exposure: at the end of the shift after several shifts) - urine 30 µg/L - (long-term exposure: at the end of the shift after several shifts) - urine 45 µg/L - (long-term exposure: at the end of the shift after several shifts) - urine	
Arsenic 7440-38-2	-	70 nmol/L (urine - Arsenic, inorganic after the work phase or shift after a working week or exposure period)	0.05 mg/g creatinine - urine (Metabolites of inorganic Arsenic) - end of workweek	10 µg/L - BLW (end of exposure or end of shift) urine 10 µg/L - BLW (for long-term exposures: at the end of the shift after several shifts) urine 0.5 µg/L - BAR (end of exposure or end of shift) urine 0.5 µg/L - BAR (for long-term exposures: at the end of the shift after several shifts) urine 2 µg/L - BAR (end of exposure or end of shift) urine 2 µg/L - BAR (for long-term exposures: at the end of the shift after several shifts) urine 10 µg/L - BAR (end of exposure or end of shift) urine 10 µg/L - BAR (for long-term exposures: at the end of the shift after several shifts) urine	-



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				2 µg/L - (long-term exposure: at the end of the shift after several shifts) - urine 2.5 µg/L - (long-term exposure: at the end of the shift after several shifts) - urine 3 µg/L - (long-term exposure: at the end of the shift after several shifts) - urine 8 µg/L - (long-term exposure: at the end of the shift after several shifts) - urine 11 µg/L - (long-term exposure: at the end of the shift after several shifts) - urine 13 µg/L - (long-term exposure: at the end of the shift after several shifts) - urine 36 µg/L - (long-term exposure: at the end of the shift after several shifts) - urine 57 µg/L - (long-term exposure: at the end of the shift after several shifts) - urine 2 µg/L - (end of exposure or end of shift) - urine 2.5 µg/L - (end of exposure or end of shift) - urine 3 µg/L - (end of exposure or end of shift) - urine 8 µg/L - (end of exposure or end of shift) - urine 11 µg/L - (end of	
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				exposure or end of shift) - urine 13 µg/L - (end of exposure or end of shift) - urine 36 µg/L - (end of exposure or end of shift) - urine 57 µg/L - (end of exposure or end of shift) - urine	
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	-
Lead 7439-92-1	20 µg/100 mL (blood - Lead)	1.4 µmol/L (blood - Lead time of day does not matter)	400 µg/L - blood (Lead) - 180 µg/L - blood (Lead) - indifferent sampling time 300 µg/L - blood (Lead) - 200 µg/L - blood (Lead) - 100 µg/L - blood (Lead) -	150 µg/L (whole blood - Lead no restriction) 150 µg/L - BAT (not fixed) blood 30 µg/L - BAR (not fixed) blood 40 µg/L - BAR (not fixed) blood	150 µg/L (whole blood - Lead no restriction)
Cobalt 7440-48-4	-	130 nmol/L (urine - Cobalt after the work phase or shift after a working week or exposure period)	0.001 mg/L - blood (Cobalt) - end of shift at end of workweek 0.015 mg/L - urine (Cobalt) - end of shift at end of workweek	35 µg/L - BLW (for long-term exposures: at the end of the shift after several shifts) urine 1.5 µg/L - BAR (for long-term exposures: at the end of the shift after several shifts) urine 6 µg/L - (long-term exposure: at the end of the shift after several shifts) - urine 15 µg/L - (long-term exposure: at the end of the shift after several shifts) - urine 30 µg/L - (long-term	-

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				exposure: at the end of the shift after several shifts) - urine 60 µg/L - (long-term exposure: at the end of the shift after several shifts) - urine 300 µg/L - (long-term exposure: at the end of the shift after several shifts) - urine 3 µg/L - (long-term exposure: at the end of the shift after several shifts) - urine	
Mercury 7439-97-6	-	140 nmol/L (urine - Mercury in the morning after a working day at the end of a working week or exposure period) 50 nmol/L (blood - Mercury, inorganic at the end of a working week; time of day does not matter)	0.015 mg/L - blood (Total inorganic Mercury) - end of shift at end of workweek 0.050 mg/g creatinine - urine (Total inorganic Mercury) - prior to shift	25 µg/g Creatinine (urine - Mercury no restriction) 25 µg/g Creatinine - BAT (not fixed) urine	25 µg/g Creatinine (urine - Mercury no restriction)
Cadmium 7440-43-9	-	20 nmol/L (urine - Cadmium at the end of a working week; time of day does not matter)	0.005 mg/g creatinine - urine (Cadmium) - not critical 0.004 mg/L - blood (Cadmium) - not critical	1 µg/L - BAR (not fixed) blood 0.8 µg/L - BAR (not fixed) urine	-
Chemical name	Hungary	Ireland	Italy MDLPS	Italy AIDII	
Nickel 7440-02-0	0.003 mg/L (urine - Nickel at end of workweek, end of shift) 0.051 µmol/L (urine - Nickel at end of workweek, end of shift)	3 µg/L (urine - Nickel after several consecutive working shifts)	-	-	
Arsenic 7440-38-2	0.05 mg/L (urine - Arsenic end of shift) 0.67 µmol/L (urine - Arsenic end of shift)	35 µg/L (urine - inorganic Arsenic plus methylated metabolites end of workweek)	-	35 µg As/L - urine (Inorganic arsenic plus methylated metabolites) - end of workweek	

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Lead 7439-92-1	-	70 µg/100 mL (blood - Lead not critical) 40 µg/100 mL (blood - Lead not critical) 30 µg/100 mL (blood - Lead not critical)	60 Pb µg/100 mL (blood - end of workweek)	30 µg/100 mL - blood (Lead) - not critical
Cobalt 7440-48-4	0.01 mg/g Creatinine (urine - Cobalt end of shift) 0.019 µmol/mmol Creatinine (urine - Cobalt end of shift)	15 µg/L (urine - Cobalt end of shift at end of workweek) 1 µg/L (blood - Cobalt end of shift at end of workweek)	-	15 µg/L - urine (Cobalt) - end of shift at end of workweek
Mercury 7439-97-6	0.030 mg/g Creatinine (urine - Mercury not critical) 0.017 µmol/mmol Creatinine (urine - Mercury not critical)	10 µg/L (blood - Mercury) 30 µg/g Creatinine (urine - Mercury)	-	20 µg/g Creatinine - urine (Total inorganic mercury) - prior to shift
Cadmium 7440-43-9	0.02 mg/g Creatinine (urine - Cadmium not critical) 0.02 µmol/mmol Creatinine (urine - Cadmium not critical)	2 µg/g Creatinine (urine - not critical)	-	5 µg/g Creatinine - urine (Cadmium) - not critical 5 µg/L - blood (Cadmium) - not critical
Chemical name	Latvia	Luxembourg	Romania	Slovakia
Nickel 7440-02-0	3 µg/L - urine (Nickel) -	-	3 µg/L - urine (Nickel) - end of shift	0.03 mg/L (blood - Nickel end of exposure or work shift)
Arsenic 7440-38-2	-	-	50 µg/g Creatinine - urine (Arsenic) - end of work week 0.5 mg/100g - hair (Arsenic) - end of work week	-
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)
Lead 7439-92-1	30 µg/100 mL - blood (Lead) - 100 µg/g Creatinine - urine (Coprotophyrin) - 5 mg/g Creatinine - urine (Aminolevulinic acid) -	70 µg/100 mL - blood (Lead) - 0.072 mg/m ³ - blood (Lead) - 40 µg/100 mL - blood (Lead) -	150 µg/L - urine (Lead) - end of shift 70 µg/100 mL - blood (Lead) - end of shift 3 mg/cm - hair (Lead) - end of shift	400 µg/L (blood - Lead not critical) 100 µg/L (blood - Lead not critical) 15 mg/L (urine - .delta.-Aminolevulinic acid)

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			10 mg/L - urine (.delta.-Aminolevulinic acid) - end of shift 300 µg/L - urine (Coproporphyrin) - end of shift 100 µg/100 mL erythrocyte - blood (free erythrocytes protoporphyrin) - end of shift	not critical) 6 mg/L (urine - .delta.-Aminolevulinic acid not critical) 0.30 mg/L (urine - Coproporphyrins not critical)
Cobalt 7440-48-4	-	-	15 µg/L - urine (Cobalt) - end of work week 1 µg/L - blood (Cobalt) - end of work week	30 µg/L (urine - Cobalt not critical)
Mercury 7439-97-6	10 µg/L - blood (Mercury) - 30 µg/g Creatinine - urine (Mercury) -	-	10 µg/L - blood (Mercury) - end of shift 30 µg/g Creatinine - urine (Mercury) - beginning of next shift	37.5 µg/L (urine - Mercury not critical) 15 mg/L (blood - Mercury after all work shifts)
Cadmium 7440-43-9	2 µg/L - urine (Cadmium) -	-	2 µg/g Creatinine - urine (Cadmium) - end of shift 5 µg/L - blood (Cadmium) - end of shift 2 mg/L - urine (Protein) - end of shift	3.1 µg/L (urine - Cadmium not critical)
Chemical name	Slovenia	Spain	Switzerland	United Kingdom
Nickel 7440-02-0	-	-	45 µg/L (urine - Nickel end of shift, and after several shifts (for long-term exposures)) 766.6 nmol/L (urine - Nickel end of shift, and after several shifts (for long-term exposures))	-
Arsenic 7440-38-2	-	35 µg As/L (urine - Inorganic arsenic plus Methylated metabolites end of workweek)	50 µg/L (urine - inorganic Arsenic and Methylated metabolite end of shift, and after several shifts (for long-term exposures)) 667 nmol/L (urine - inorganic Arsenic and Methylated metabolite end of shift, and after several shifts (for long-term exposures))	-

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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))	-
Lead 7439-92-1	400 µg/L - blood (Lead) - not relevant 300 µg/L - blood (Lead) - not relevant	70 µg/dL (blood - Lead not critical)	400 µg/L (whole blood - Lead no restrictions) 1.93 µmol/L (whole blood - Lead no restrictions) 100 µg/L (whole blood - Lead no restrictions) 0.48 µmol/L (whole blood - Lead no restrictions)	-
Cobalt 7440-48-4	-	15 µg/L (urine - Cobalt end of workweek) 1 µg/L (blood - Cobalt end of workweek)	30 µg/L (urine - Cobalt end of shift) 509 nmol/L (urine - Cobalt end of shift)	-
Mercury 7439-97-6	0.25 µg/g Creatinine - urine (Mercury) - not relevant 30 µg/L urine - urine (Mercury) - not relevant	30 µg/g Creatinine (urine - total inorganic mercury pre-shift) 10 µg/L (blood - total inorganic mercury end of workweek)	25 µg/g creatinine (urine - Mercury inorganic before subsequent shift) 14.3 nmol/mmol creatinine (urine - Mercury inorganic before subsequent shift) 15 µg/L (whole blood - Mercury inorganic end of shift, and after several shifts (for long-term exposures)) 75 nmol/L (whole blood - Mercury inorganic end of shift, and after several shifts (for long-term exposures))	20 µmol/mol creatinine - urine (Mercury) - random
Cadmium 7440-43-9	-	2 µg/g Creatinine (urine - Cadmium not critical) 5 µg/L (blood - Cadmium not critical)	2 µg/g creatinine (urine - Cadmium no restrictions) 2.01 nmol/mmol creatinine (urine - Cadmium no restrictions)	-

Derived No Effect Level (DNEL) No information available.

Predicted No Effect Concentration No information available.



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(PNEC)

8.2. Exposure controls

Personal protective equipment

Eye/face protection

Avoid contact with eyes. Wear safety glasses with side shields (or goggles). If splashes are likely to occur, wear safety glasses with side-shields.

Hand protection

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

Skin and body protection

Wear suitable protective clothing. Long sleeved 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

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. Regular cleaning of equipment, work area and clothing is recommended.

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	0 °C	None known
Initial boiling point and boiling range	100 °C	None known
Flammability	No data available	None known
Flammability Limit in Air		None known
Upper flammability or explosive limits	No data available	
Lower flammability or explosive limits	No data available	



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Flash point	No data available	None known
Autoignition temperature	No data available	None known
Decomposition temperature	100 °C	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	23 hPa	@ 20°C
Relative density	0.99821 g/cm ³ at 20 °C	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 100 °C 100 °C

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.

10.3. Possibility of hazardous reactions

Possibility of hazardous reactions None under normal processing.

10.4. Conditions to avoid



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

10.5. Incompatible materials

Incompatible materials Oxidising agent. Strong acids. Strong bases.

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 skin irritation. (based on components).
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 Redness. May cause redness and tearing of the eyes.

Numerical measures of toxicity

Acute toxicity

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

ATEmix (oral)	99,999.00 mg/kg
ATEmix (dermal)	99,999.00 mg/kg
ATEmix (inhalation-gas)	99,999.00 ppm
ATEmix (inhalation-dust/mist)	99,999.00 mg/l
ATEmix (inhalation-vapour)	139.50 mg/l

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Component Information

Chemical name	Oral LD50	Dermal LD50	Inhalation LC50
Nitric Acid			= 2500 ppm (Rat) 1 h ATE (vapours) = 2.65 mg/L
Nickel	> 9000 mg/kg (Rat)		> 10.2 mg/L (Rat) 1 h
Arsenic	= 15 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
Cobalt	= 6171 mg/kg (Rat)		< 0.05 mg/L (Rat) 4 h
Mercury			< 27 mg/m ³ (Rat) 2 h
Cadmium	= 1140 mg/kg (Rat)		= 25 mg/m ³ (Rat) 30 min

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 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
Cobalt	Muta. 2
Cadmium	Muta. 2

Carcinogenicity

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

Chemical name	European Union
Nickel	Carc. 2
vanadium pentoxide	Carc. 1B
Cobalt	Carc. 1B

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Cadmium	Carc. 1B
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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.
Lead	Repr. 1A Lact.
Cobalt	Repr. 1B
Mercury	Repr. 1B
Cadmium	Repr. 2

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 No information available.

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
Nickel	EC50: =0.18mg/L (72h, Pseudokirchneriella)	LC50: >100mg/L (96h, Brachydanio rerio)	-	EC50: >100mg/L (48h, Daphnia magna)

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	subcapitata) EC50: 0.174 - 0.311mg/L (96h, Pseudokirchneriella subcapitata)	LC50: =1.3mg/L (96h, Cyprinus carpio) LC50: =10.4mg/L (96h, Cyprinus carpio)		EC50: =1mg/L (48h, Daphnia magna)
vanadium pentoxide	-	LC50: 5.2 mg/L (96h, Oncorhynchus mykiss)	-	LC50: 1.52 mg/L (48h, Daphnia magna)
Lead	-	LC50: =0.44mg/L (96h, Cyprinus carpio) LC50: =1.17mg/L (96h, Oncorhynchus mykiss) LC50: =1.32mg/L (96h, Oncorhynchus mykiss)	-	EC50: =600µg/L (48h, water flea)
Cobalt	-	LC50: >100mg/L (96h, Brachydanio rerio)	-	-
Mercury	-	LC50: =0.5mg/L (96h, Cyprinus carpio) LC50: =0.16mg/L (96h, Cyprinus carpio) LC50: =0.18mg/L (96h, Cyprinus carpio) LC50: =0.9mg/L (96h, Oryzias latipes)	-	-
Cadmium	-	LC50: =0.003mg/L (96h, Oncorhynchus mykiss) LC50: =0.006mg/L (96h, Oncorhynchus mykiss) LC50: =0.002mg/L (96h, Cyprinus carpio) LC50: =4.26mg/L (96h, Cyprinus carpio) LC50: =0.24mg/L (96h, Cyprinus carpio) LC50: =21.1mg/L (96h, Lepomis macrochirus) LC50: =0.016mg/L (96h, Oryzias latipes) LC50: 0.0004 - 0.003mg/L (96h, Pimephales promelas)	-	EC50: =0.0244mg/L (48h, Daphnia magna)

12.2. Persistence and degradability

Persistence and degradability No information available.

12.3. Bioaccumulative potential



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Bioaccumulation There is no data for this product.

Component Information

Chemical name	Partition coefficient
Nitric Acid	-2.3

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
Nitric Acid	The substance is not PBT / vPvB
Nickel	The substance is not PBT / vPvB
Arsenic	PBT assessment does not apply
vanadium pentoxide	PBT assessment does not apply
Lead	PBT assessment does not apply
Cobalt	The substance is not PBT / vPvB
Cadmium	PBT assessment does not apply

12.6. Endocrine disrupting properties

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



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IATA

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

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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
Arsenic 7440-38-2	RG 20, RG 20bis	-
vanadium pentoxide 1314-62-1	RG 66	-
Lead 7439-92-1	RG 1	-
Cobalt 7440-48-4	RG 65, RG 70, RG 70bis, RG 70ter	-
Mercury 7439-97-6	RG 2	-
Cadmium 7440-43-9	RG 61, RG 61bis	-

Germany

Water hazard class (WGK) slightly hazardous to water (WGK 1)

Netherlands

Chemical name	Netherlands - List of Carcinogens	Netherlands - List of Carcinogens	Netherlands - List of Reproductive Toxins
Arsenic	Present	-	Can be harmful via breastfeeding Development Category 1B Fertility Category 1B
vanadium pentoxide	Present	-	Development Category 2 Fertility Category 2
Lead	-	-	Fertility Category 1A Development Category 1A Can be harmful via breastfeeding
Cobalt	Present	-	Fertility Category 1B
Mercury	-	-	Development Category 1B



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Chemical name	Netherlands - List of Carcinogens	Netherlands - List of Carcinogens	Netherlands - List of Reproductive Toxins
Cadmium	Present	-	Fertility Category 1B;including stabilized, pyrophoric Development Category 1B;including stabilized, pyrophoric Can be harmful via breastfeeding including stabilized, pyrophoric

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 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)

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

Not applicable

Chemical name	RESTRICTED EXPLOSIVES PRECURSORS - ANNEX I	REPORTABLE EXPLOSIVES PRECURSORS - ANNEX II
Nitric Acid - 7697-37-2	3 %w/w	-

Chemical name	Restricted substance per REACH Annex XVII	Substance subject to authorisation per REACH Annex XIV
Nitric Acid - 7697-37-2	75.	
Nickel - 7440-02-0	27. 75.	
Arsenic - 7440-38-2	75.	
vanadium pentoxide - 1314-62-1	75. 28.	
Lead - 7439-92-1	72. 30. 63. 75.	
Cobalt - 7440-48-4	30. 28. 75.	
Mercury - 7439-97-6	18[a]. 30. 75.	
Cadmium - 7440-43-9	72. 23. 28. 75.	

Persistent Organic Pollutants

Not applicable

Export Notification requirements

This product contains substances which are regulated pursuant to Regulation (EC) No. 649/2012 of the European parliament and of the council concerning the export and import of dangerous chemicals

Chemical name	European Export/Import Restrictions per (EC) 649/2012 - Annex Number
Lead - 7439-92-1	I.1
Mercury - 7439-97-6	I.1 I.2 V
Cadmium - 7440-43-9	I.1 I.2



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

Not applicable

EU - Water Framework Directive (2000/60/EC)

Chemical name	EU - Water Framework Directive (2000/60/EC)
Nickel - 7440-02-0	Priority substance
Lead - 7439-92-1	Priority substance
Mercury - 7439-97-6	Priority hazardous substance
Cadmium - 7440-43-9	Priority hazardous substance

EU - Environmental Quality Standards (2008/105/EC)

Chemical name	EU - Environmental Quality Standards (2008/105/EC)
Nickel - 7440-02-0	Priority substance
Lead - 7439-92-1	Priority substance
Mercury - 7439-97-6	Priority hazardous substance
Cadmium - 7440-43-9	Priority hazardous substance

International Inventories

TSCA	Complies
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



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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

- EUH071 - Corrosive to the respiratory tract
- H272 - May intensify fire; oxidiser
- H290 - May be corrosive to metals
- H300 - Fatal if swallowed
- H301 - Toxic if swallowed
- H302 - Harmful if swallowed
- H314 - Causes severe skin burns and eye damage
- H317 - May cause an allergic skin reaction
- H319 - Causes serious eye irritation
- H330 - Fatal if inhaled
- H331 - Toxic if inhaled
- H332 - Harmful if inhaled
- H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled
- H335 - May cause respiratory irritation
- H341 - Suspected of causing genetic defects
- H350 - May cause cancer
- H351 - Suspected of causing cancer
- H360 - May damage fertility or the unborn child
- H360D - May damage the unborn child
- H360F - May damage fertility
- 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
- H400 - Very toxic to aquatic life
- H410 - Very toxic to aquatic life with long lasting effects
- 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



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Acute inhalation toxicity - gas	Calculation method
Acute inhalation toxicity - Vapour	Calculation method
Acute inhalation toxicity - dust/mist	Calculation method
Skin corrosion/irritation	On basis of test data
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)
U.S. Environmental Protection Agency ChemView Database
European Food Safety Authority (EFSA)
EPA (Environmental Protection Agency)
Acute Exposure Guideline Level(s) (AEGL(s))
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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The information contained in this document is based on Agilent's state of knowledge at the time of preparation. No warranty as to its accurateness, completeness or suitability for a particular purpose is expressed or implied.

End of Safety Data Sheet



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

1.1. Product identifier

Product Code(s) 5191-4557
Product Name ICH/USP 232 Parenteral Combined 1_v2
Form Not applicable
Pure substance/mixture Mixture

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

Recommended use Reagents and Standards for Analytical Chemical Laboratory Use
Uses advised against No information available

1.3. Details of the supplier of the safety data sheet

Supplier

Agilent Technologies LDA UK Ltd.
5500 Lakeside Cheadle Royal Business Park,
Cheadle, Cheshire, SK8 3GR
United Kingdom

+44 (0) 345 712 5292

For further information, please contact

E-mail address pdl-msds_author@agilent.com

1.4. Emergency telephone number

Emergency Telephone CHEMTREC®: +(44)-870-8200418

Emergency Telephone - §45 - (EC)1272/2008	
Europe	112
Austria	No information available
Bulgaria	
Croatia	
Cyprus	
Czech Republic	
Denmark	
France	
Hungary	

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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]

Skin corrosion/irritation	Category 1 Sub-category B - (H314)
Serious eye damage/eye irritation	Category 1 - (H318)
Chronic aquatic toxicity	Category 2 - (H411)
Corrosive to metals	Category 1 - (H290)

2.2. Label elements



Signal word
Danger

Hazard statements

H314 - Causes severe skin burns and eye damage
H411 - Toxic to aquatic life with long lasting effects
H290 - May be corrosive to metals
EUH071 - Corrosive to the respiratory tract

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

P260 - Do not breathe dust/fume/gas/mist/vapours/spray



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P280 - Wear protective gloves/protective clothing and eye/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 or doctor

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

2.3. Other hazards

Toxic to aquatic life.

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
Nitric Acid	-	-
hydrofluoric acid	-	-
Molybdenum	-	-
Chromium (III) nitrate nonahydrate	-	-
Barium nitrate	-	-
Tin	-	-
Copper	-	-
Lithium carbonate	-	-
Antimony	-	-
Selenium	-	-
Silver	-	-
Thallium	-	-

SECTION 3: Composition/information on ingredients

3.1 Substances

Not applicable

3.2 Mixtures

Chemical nature aqueous solution.

Chemical name	Weight-%	REACH registration number	EC No (EU Index No)	Classification according to Regulation (EC) No.	Specific concentration	M-Factor	M-Factor (long-term)

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				1272/2008 [CLP]	limit (SCL)		
Nitric Acid 7697-37-2	3 - <5	-	231-714-2	Met. Corr. 1 (H290) Ox. Liq. 2 (H272) Acute Tox. 3 (H331) Skin Corr. 1A (H314) (EUH071)	Ox. Liq. 2 :: C>=99% Ox. Liq. 3 :: C>=65% Skin Corr. 1A :: C>=20% Skin Corr. 1B :: 5%<=C<20%		
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%		
Molybdenum 7439-98-7	0.1 - 1	-	231-107-2	-			
Chromium (III) nitrate nonahydrate 7789-02-8	0.1 - 1	-	616-540-0	Ox. Sol. 2 (H272) Skin Irrit. 2 (H315) Eye Irrit. 2 (H319)			
Barium nitrate 10022-31-8	<0.1	-	(056-002-00 -7) 233-020-5	Ox. Sol. 2 (H272) Acute Tox. 4 (H302) Acute Tox. 4 (H332) Eye Irrit. 2 (H319)			
Tin 7440-31-5	<0.1	-	231-141-8	-			
Copper 7440-50-8	<0.1	-	231-159-6	Aquatic Acute 1 (H400) Aquatic Chronic 1 (H410)			
Lithium carbonate 554-13-2	<0.1	-	209-062-5	Acute Tox. 4 (H302) STOT RE 2 (H373) Aquatic Chronic 3 (H412)			
Antimony 7440-36-0	<0.1	-	231-146-5	Carc. 2 (H351) STOT RE 2 (H373)			
Selenium 7782-49-2	<0.1	-	231-957-4	Acute Tox. 3 (H301) Acute Tox. 3 (H331) STOT RE 2 (H373) Aquatic Chronic 4 (H413)			

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Silver 7440-22-4	<0.1	-	231-131-3	Aquatic Acute 1 (H400) Aquatic Chronic 1 (H410)			
Thallium 7440-28-0	<0.1	-	(081-001-00-3) 231-138-1	Acute Tox. 2 (H300) Acute Tox. 2 (H330) STOT RE 2 (H373) Aquatic Chronic 4 (H413)			

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
Nitric Acid 7697-37-2	No data available	No data available	No data available	2.65	No data available
hydrofluoric acid 7664-39-3	No data available	No data available	No data available	No data available	482.8875
Molybdenum 7439-98-7	No data available	2000	No data available	No data available	No data available
Chromium (III) nitrate nonahydrate 7789-02-8	3250	No data available	No data available	No data available	No data available
Barium nitrate 10022-31-8	355	No data available	1.1138	No data available	No data available
Tin 7440-31-5	700	2000	No data available	No data available	No data available
Lithium carbonate 554-13-2	525	3000	2.17	No data available	No data available
Antimony 7440-36-0	100	No data available	No data available	No data available	No data available
Selenium 7782-49-2	6700	No data available	No data available	No data available	No data available
Silver 7440-22-4	5000	2000	5.16	No data available	No data available

Additional information

The concentration of the acid stated in this SDS is calculated as an absolute mass concentration (%w/v). This is less than the acid concentration stated on the product label and COA, which reflects a percent value of the commercially available concentrated

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aqueous form of the acid..

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. Immediate medical attention is required.
Inhalation	Remove to fresh air. If breathing has stopped, give artificial respiration. Get medical attention immediately. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. If breathing is difficult, (trained personnel should) give oxygen. Delayed pulmonary edema may occur. Get immediate medical attention.
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 immediate medical attention.
Skin contact	Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Get immediate medical attention.
Ingestion	Rinse mouth. Never give anything by mouth to an unconscious person. Do NOT induce vomiting. Get immediate medical attention.
Self-protection of the first aider	Avoid contact with skin, eyes or clothing. Wear personal protective clothing (see section 8). Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination. Avoid direct contact with skin. Use barrier to give mouth-to-mouth resuscitation.

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

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

Note to doctors	Product is a corrosive material. Use of gastric lavage or emesis is contra-indicated. Possible perforation of stomach or esophagus should be investigated. Do not give chemical antidotes. Asphyxia from glottal edema may occur. Marked decrease in blood pressure may occur with moist rales, frothy sputum, and high pulse pressure.
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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.

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 The product causes burns of eyes, skin and mucous membranes. Thermal decomposition can lead to release of irritating gases and vapours.

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. Attention! Corrosive material. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak.

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. Should not be released into the environment. Do not allow to enter into soil/subsoil. Prevent product from entering drains.

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.



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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

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. In case of insufficient ventilation, wear suitable respiratory equipment. Handle product only in closed system or provide appropriate exhaust ventilation. Do not eat, drink or smoke when using this product. Take off contaminated clothing and wash it before reuse.

General hygiene considerations 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. Regular cleaning of equipment, work area and clothing is recommended. Remove and wash contaminated clothing and gloves, including the inside, before re-use. Contaminated work clothing should not be allowed out of the workplace. Wash hands before breaks and immediately after handling the product.

7.2. Conditions for safe storage, including any incompatibilities

Storage Conditions 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. 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.

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
Nitric Acid 7697-37-2	-	STEL 1 ppm STEL 2.6 mg/m ³	STEL: 1 ppm STEL: 2.6 mg/m ³	STEL: 1 ppm STEL: 2.6 mg/m ³	STEL: 1 ppm STEL: 2.6 mg/m ³

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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
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
Chromium (III) nitrate nonahydrate 7789-02-8	-	-	TWA: 0.5 mg/m ³	-	-
Barium nitrate 10022-31-8	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³ STEL 2 mg/m ³	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³
Tin 7440-31-5	TWA: 2 mg/m ³	TWA: 2 mg/m ³ STEL 4 mg/m ³	TWA: 2 mg/m ³ D*	TWA: 0.1 mg/m ³ TWA: 2.0 mg/m ³	TWA: 2 mg/m ³
Copper 7440-50-8	-	TWA: 1 mg/m ³ TWA: 0.1 mg/m ³ STEL 4 mg/m ³ STEL 0.4 mg/m ³	TWA: 0.2 mg/m ³ TWA: 1 mg/m ³	TWA: 0.1 mg/m ³	TWA: 0.2 mg/m ³ TWA: 1 mg/m ³ STEL: 2 mg/m ³
Antimony 7440-36-0	-	TWA: 0.5 mg/m ³ STEL 5 mg/m ³	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³
Selenium 7782-49-2	-	TWA: 0.1 mg/m ³ STEL 0.3 mg/m ³	TWA: 0.2 mg/m ³	TWA: 0.2 mg/m ³	TWA: 0.1 mg/m ³
Silver 7440-22-4	TWA: 0.1 mg/m ³	TWA: 0.1 mg/m ³ STEL 0.1 mg/m ³ Ceiling: 0.1 mg/m ³	TWA: 0.1 mg/m ³	TWA: 0.1 mg/m ³	TWA: 0.1 mg/m ³
Thallium 7440-28-0	-	STEL 1 mg/m ³	TWA: 0.02 mg/m ³ *	TWA: 0.05 mg/m ³	-
Chemical name	Cyprus	Czech Republic	Denmark	Estonia	Finland
Nitric Acid 7697-37-2	STEL: 1 ppm STEL: 2.6 mg/m ³	TWA: 1 mg/m ³ Ceiling: 2.5 mg/m ³	STEL: 1 ppm STEL: 2.6 mg/m ³	STEL: 1 ppm STEL: 2.6 mg/m ³	TWA: 0.5 ppm TWA: 1.3 mg/m ³ STEL: 1 ppm STEL: 2.6 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*
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
Chromium (III) nitrate nonahydrate 7789-02-8	-	TWA: 0.5 mg/m ³ Ceiling: 1.5 mg/m ³	-	TWA: 2 mg/m ³	TWA: 0.5 mg/m ³
Barium nitrate 10022-31-8	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³ Ceiling: 2.5 mg/m ³	TWA: 0.5 mg/m ³ STEL: 1 mg/m ³	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³
Tin	TWA: 2 mg/m ³	TWA: 2 mg/m ³	TWA: 2 mg/m ³	TWA: 2 mg/m ³	TWA: 2 mg/m ³

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7440-31-5		Ceiling: 4 mg/m ³	STEL: 4 mg/m ³		
Copper 7440-50-8	-	TWA: 1 mg/m ³ TWA: 0.1 mg/m ³ Ceiling: 2 mg/m ³ Ceiling: 0.2 mg/m ³	TWA: 1.0 mg/m ³ TWA: 0.1 mg/m ³ STEL: 2 mg/m ³ STEL: 0.2 mg/m ³	TWA: 1 mg/m ³ TWA: 0.2 mg/m ³	TWA: 0.02 mg/m ³
Antimony 7440-36-0	-	TWA: 0.5 mg/m ³ Ceiling: 1.5 mg/m ³	TWA: 0.5 mg/m ³ STEL: 1 mg/m ³	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³
Selenium 7782-49-2	-	TWA: 0.1 mg/m ³ Ceiling: 0.2 mg/m ³	TWA: 0.1 mg/m ³ STEL: 0.2 mg/m ³	TWA: 0.1 mg/m ³	TWA: 0.1 mg/m ³ STEL: 0.3 mg/m ³
Silver 7440-22-4	TWA: 0.1 mg/m ³	TWA: 0.1 mg/m ³ Ceiling: 0.3 mg/m ³	TWA: 0.01 mg/m ³ STEL: 0.02 mg/m ³	TWA: 0.1 mg/m ³	TWA: 0.1 mg/m ³
Thallium 7440-28-0	-	TWA: 0.1 mg/m ³ Ceiling: 0.5 mg/m ³ *	H*	-	TWA: 0.1 mg/m ³ iho*
Chemical name	France	Germany TRGS	Germany DFG	Greece	Hungary
Nitric Acid 7697-37-2	STEL: 1 ppm STEL: 2.6 mg/m ³	TWA: 1 ppm TWA: 2.6 mg/m ³	-	STEL: 1 ppm STEL: 2.6 mg/m ³	STEL: 2.6 mg/m ³ STEL: 1 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*
Molybdenum 7439-98-7	-	-	-	TWA: 15 mg/m ³	TWA: 10 mg/m ³ TWA: 5 mg/m ³
Chromium (III) nitrate nonahydrate 7789-02-8	-	TWA: 2 mg/m ³	-	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³ TWA: 2 mg/m ³ STEL: 2 mg/m ³
Barium nitrate 10022-31-8	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³ Peak: 4 mg/m ³	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³
Tin 7440-31-5	-	-	-	TWA: 2 mg/m ³	TWA: 2 mg/m ³ STEL: 8 mg/m ³ b*
Copper 7440-50-8	TWA: 0.2 mg/m ³ TWA: 1 mg/m ³ STEL: 2 mg/m ³	-	TWA: 0.01 mg/m ³ Peak: 0.02 mg/m ³	TWA: 0.2 mg/m ³ TWA: 1 mg/m ³ STEL: 2 mg/m ³	TWA: 0.1 mg/m ³ TWA: 0.01 mg/m ³ STEL: 0.2 mg/m ³
Lithium carbonate 554-13-2	-	-	TWA: 0.2 mg/m ³	-	-
Antimony 7440-36-0	TWA: 0.5 mg/m ³	-	-	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³
Selenium 7782-49-2	-	TWA: 0.05 mg/m ³	TWA: 0.02 mg/m ³ Peak: 0.16 mg/m ³ *	TWA: 0.2 mg/m ³	-
Silver 7440-22-4	TWA: 0.1 mg/m ³	TWA: 0.1 mg/m ³	TWA: 0.1 mg/m ³ Peak: 0.8 mg/m ³	TWA: 0.1 mg/m ³	TWA: 0.1 mg/m ³
Thallium	TWA: 0.1 mg/m ³	-	-	TWA: 0.1 mg/m ³	-

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7440-28-0				skin - potential for cutaneous absorption	
Chemical name	Ireland	Italy MDLPS	Italy AIDII	Latvia	Lithuania
Nitric Acid 7697-37-2	STEL: 1 ppm STEL: 2.6 mg/m ³	STEL: 1 ppm STEL: 2.6 mg/m ³	TWA: 2 ppm TWA: 5.2 mg/m ³ STEL: 4 ppm STEL: 10.3 mg/m ³	TWA: 0.78 ppm TWA: 2 mg/m ³ STEL: 1 ppm STEL: 2.6 mg/m ³	STEL: 1 ppm STEL: 2.6 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
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
Chromium (III) nitrate nonahydrate 7789-02-8	TWA: 2 mg/m ³ STEL: 6 mg/m ³	-	TWA: 0.003 mg/m ³	TWA: 2 mg/m ³	-
Barium nitrate 10022-31-8	TWA: 0.5 mg/m ³ STEL: 1.5 mg/m ³	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³ *	TWA: 0.5 mg/m ³
Tin 7440-31-5	TWA: 2 mg/m ³ STEL: 6 mg/m ³	-	TWA: 2 mg/m ³	TWA: 2 mg/m ³	TWA: 2 mg/m ³
Copper 7440-50-8	TWA: 0.2 mg/m ³ TWA: 1 mg/m ³ STEL: 2 mg/m ³ STEL: 0.6 mg/m ³	-	TWA: 0.2 mg/m ³	TWA: 0.5 mg/m ³ STEL: 1 mg/m ³	TWA: 1 mg/m ³ TWA: 0.2 mg/m ³
Antimony 7440-36-0	TWA: 0.5 mg/m ³ STEL: 1.5 mg/m ³	-	TWA: 0.5 mg/m ³	TWA: 0.2 mg/m ³ STEL: 0.5 mg/m ³	TWA: 0.5 mg/m ³
Selenium 7782-49-2	TWA: 0.1 mg/m ³ STEL: 0.3 mg/m ³	-	TWA: 0.2 mg/m ³	-	TWA: 0.1 mg/m ³
Silver 7440-22-4	TWA: 0.1 mg/m ³ STEL: 0.3 mg/m ³	TWA: 0.1 mg/m ³	TWA: 0.1 mg/m ³	TWA: 0.1 mg/m ³	TWA: 0.1 mg/m ³
Thallium 7440-28-0	TWA: 0.02 mg/m ³ STEL: 0.06 mg/m ³ Sk*	-	TWA: 0.02 mg/m ³ *	-	-
Chemical name	Luxembourg	Malta	Netherlands	Norway	Poland
Nitric Acid 7697-37-2	STEL: 1 ppm STEL: 2.6 mg/m ³	STEL: 1 ppm STEL: 2.6 mg/m ³	STEL: 0.5 ppm STEL: 1.3 mg/m ³	TWA: 2 ppm TWA: 5 mg/m ³ STEL: 4 ppm STEL: 10 mg/m ³	TWA: 1.4 mg/m ³ STEL: 2.6 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

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Molybdenum 7439-98-7	-	-	-	TWA: 10 mg/m ³ STEL: 20 mg/m ³	STEL: 10 mg/m ³ TWA: 4 mg/m ³
Chromium (III) nitrate nonahydrate 7789-02-8	-	-	TWA: 0.06 mg/m ³	TWA: 0.5 mg/m ³ STEL: 1.5 mg/m ³	TWA: 0.5 mg/m ³
Barium nitrate 10022-31-8	TWA: 0.5 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
Tin 7440-31-5	TWA: 2 mg/m ³	TWA: 2 mg/m ³	TWA: 2 mg/m ³	TWA: 2 mg/m ³ STEL: 4 mg/m ³	TWA: 2 mg/m ³
Copper 7440-50-8	-	-	TWA: 0.1 mg/m ³	TWA: 0.1 mg/m ³ TWA: 1 mg/m ³ STEL: 3 mg/m ³ STEL: 0.3 mg/m ³	TWA: 0.2 mg/m ³
Antimony 7440-36-0	-	-	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³ STEL: 1.5 mg/m ³	TWA: 0.5 mg/m ³
Selenium 7782-49-2	-	-	-	TWA: 0.05 mg/m ³ STEL: 0.15 mg/m ³	STEL: 0.3 mg/m ³ TWA: 0.1 mg/m ³
Silver 7440-22-4	TWA: 0.1 mg/m ³	TWA: 0.1 mg/m ³	TWA: 0.1 mg/m ³	TWA: 0.1 mg/m ³ STEL: 0.3 mg/m ³	TWA: 0.05 mg/m ³
Thallium 7440-28-0	-	-	-	TWA: 0.1 mg/m ³ STEL: 0.3 mg/m ³ H*	STEL: 0.3 mg/m ³ TWA: 0.1 mg/m ³
Chemical name	Portugal	Romania	Slovakia	Slovenia	Spain
Nitric Acid 7697-37-2	TWA: 2 ppm STEL: 1 ppm STEL: 2.6 mg/m ³	STEL: 1 ppm STEL: 2.6 mg/m ³	Ceiling: 2.6 mg/m ³	TWA: 1 ppm TWA: 2.6 mg/m ³ STEL: 1 ppm STEL: 2.6 mg/m ³	STEL: 1 ppm STEL: 2.6 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 Cutânea*	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
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
Chromium (III) nitrate nonahydrate 7789-02-8	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³	-	-	-
Barium nitrate 10022-31-8	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³ STEL: 0.5 mg/m ³	TWA: 0.5 mg/m ³
Tin 7440-31-5	TWA: 2 mg/m ³	TWA: 2 mg/m ³	TWA: 2 mg/m ³ K* Ceiling: 4 mg/m ³	TWA: 2 mg/m ³ TWA: 8 mg/m ³	TWA: 2 mg/m ³
Copper 7440-50-8	TWA: 0.2 mg/m ³ TWA: 1 mg/m ³	TWA: 0.5 mg/m ³ STEL: 0.2 mg/m ³	TWA: 1 mg/m ³ TWA: 0.2 mg/m ³	-	TWA: 0.01 mg/m ³

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Antimony 7440-36-0	TWA: 0.5 mg/m ³	STEL: 1.5 mg/m ³ TWA: 0.2 mg/m ³ STEL: 0.5 mg/m ³	TWA: 0.5 mg/m ³	-	TWA: 0.5 mg/m ³
Selenium 7782-49-2	TWA: 0.2 mg/m ³	TWA: 0.1 mg/m ³ STEL: 0.2 mg/m ³	TWA: 0.05 mg/m ³	TWA: 0.05 mg/m ³ STEL: 0.05 mg/m ³	TWA: 0.1 mg/m ³
Silver 7440-22-4	TWA: 0.01 mg/m ³	TWA: 0.1 mg/m ³	TWA: 0.1 mg/m ³	TWA: 0.01 mg/m ³ STEL: 0.02 mg/m ³	TWA: 0.1 mg/m ³
Thallium 7440-28-0	TWA: 0.02 mg/m ³ P*	-	TWA: 0.1 mg/m ³	-	TWA: 0.1 mg/m ³ vía dérmica*
Chemical name	Sweden		Switzerland	United Kingdom	
Nitric Acid 7697-37-2	NGV: 0.5 ppm NGV: 1.3 mg/m ³ Bindande KGV: 1 ppm Bindande KGV: 2.6 mg/m ³		TWA: 2 ppm TWA: 5 mg/m ³ STEL: 2 ppm STEL: 5 mg/m ³	STEL: 1 ppm STEL: 2.6 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	
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 (III) nitrate nonahydrate 7789-02-8	NGV: 0.5 mg/m ³		TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³ STEL: 1.5 mg/m ³	
Barium nitrate 10022-31-8	NGV: 0.5 mg/m ³		TWA: 0.5 mg/m ³ STEL: 4 mg/m ³	TWA: 0.5 mg/m ³ STEL: 1.5 mg/m ³	
Tin 7440-31-5	NGV: 2 mg/m ³		TWA: 0.004 ppm TWA: 0.02 mg/m ³ TWA: 0.003 ppm TWA: 0.015 mg/m ³ STEL: 0.004 ppm STEL: 0.02 mg/m ³ H*	TWA: 2 mg/m ³ STEL: 4 mg/m ³	
Copper 7440-50-8	NGV: 0.01 mg/m ³		TWA: 0.1 mg/m ³ STEL: 0.2 mg/m ³	TWA: 1 mg/m ³ TWA: 0.2 mg/m ³ STEL: 0.6 mg/m ³ STEL: 2 mg/m ³	
Antimony 7440-36-0	NGV: 0.25 mg/m ³		TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³ STEL: 1.5 mg/m ³	
Selenium 7782-49-2	NGV: 0.1 mg/m ³		TWA: 0.02 mg/m ³ STEL: 0.16 mg/m ³ H*	TWA: 0.1 mg/m ³ STEL: 0.3 mg/m ³	
Silver 7440-22-4	NGV: 0.1 mg/m ³		TWA: 0.1 mg/m ³ STEL: 0.8 mg/m ³	TWA: 0.1 mg/m ³ STEL: 0.3 mg/m ³	
Thallium 7440-28-0	-		TWA: 0.1 mg/m ³ H*	-	

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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	-
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)
Molybdenum 7439-98-7	-	-	-	150 µg/L - BAR (not determined) urine	-
Chromium (III) nitrate nonahydrate 7789-02-8	-	-	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	-
Barium nitrate 10022-31-8	-	-	-	10 µg/L - BAR (end of exposure or end of shift) urine 10 µg/L - BAR (for long-term exposures: at the end of the shift after several shifts) urine	-
Antimony 7440-36-0	-	-	-	0.2 µg/L - BAR (end of exposure or end of shift) urine 0.2 µg/L - BAR (for	-

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				long-term exposures: at the end of the shift after several shifts) urine	
Selenium 7782-49-2	-	-	-	150 µg/L (serum - Selenium no restriction) 150 µg/L - BAT (not fixed) serum 100 µg/L - BAR (not fixed) plasma/serum 30 µg/g Creatinine - BAR (for long-term exposures: at the end of the shift after several shifts) urine	150 µg/L (serum - Selenium no restriction)
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	
Selenium 7782-49-2	0.075 mg/g Creatinine (urine - Selenium not critical) 0.110 µmol/mmol Creatinine (urine - Selenium not critical)	-	-	-	-
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)	
Antimony 7440-36-0	-	-	1 mg/L - urine (Antimony) - end of shift	-	
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 -	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)	-	

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	urine () - before the next working day			
Selenium 7782-49-2	-	-	150 µg/L (serum - Selenium no restrictions) 2 µmol/L (serum - Selenium no restrictions)	-

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). Tight sealing safety goggles. Face protection shield.

Hand protection

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

Skin and body protection

Wear suitable protective clothing. Long sleeved clothing. Chemical resistant apron.

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

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. Regular cleaning of equipment, work area and clothing is recommended. Remove and wash contaminated clothing and gloves, including the inside, before re-use. Contaminated work clothing should not be allowed out of the workplace. Wash hands before breaks and immediately after handling the product.

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



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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
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



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Stability Stable under normal conditions.

Explosion data

Sensitivity to mechanical impact None.

Sensitivity to static discharge None.

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. Acids. Bases.

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. Corrosive by inhalation. (based on components). Inhalation of corrosive fumes/gases may cause coughing, choking, headache, dizziness, and weakness for several hours. Pulmonary edema may occur with tightness in the chest, shortness of breath, bluish skin, decreased blood pressure, and increased heart rate. Inhaled corrosive substances can lead to a toxic edema of the lungs. Pulmonary edema can be fatal.

Eye contact Specific test data for the substance or mixture is not available. Causes serious eye damage. (based on components). Corrosive to the eyes and may cause severe damage including blindness. May cause irreversible damage to eyes.

Skin contact Specific test data for the substance or mixture is not available. Corrosive. (based on components). Causes burns.

Ingestion Specific test data for the substance or mixture is not available. Causes burns. (based on components). Ingestion causes burns of the upper digestive and respiratory tracts. May

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cause severe burning pain in the mouth and stomach with vomiting and diarrhea of dark blood. Blood pressure may decrease. Brownish or yellowish stains may be seen around the mouth. Swelling of the throat may cause shortness of breath and choking. May cause lung damage if swallowed. May be fatal if swallowed and enters airways.

Symptoms related to the physical, chemical and toxicological characteristics

Symptoms Redness. Burning. May cause blindness. Coughing and/ or wheezing.

Numerical measures of toxicity

Acute toxicity

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

ATEmix (oral)	2,505.00 mg/kg
ATEmix (dermal)	2,500.00 mg/kg
ATEmix (inhalation-gas)	99,999.00 ppm
ATEmix (inhalation-dust/mist)	25.0500 mg/l
ATEmix (inhalation-vapour)	58.90 mg/l

Component Information

Chemical name	Oral LD50	Dermal LD50	Inhalation LC50
Nitric Acid			= 2500 ppm (Rat) 1 h ATE (vapours) = 2.65 mg/L
hydrofluoric acid			= 0.79 mg/L (Rat) 1 h
Molybdenum		> 2000 mg/kg (Rat)	> 5.84 mg/L (Rat) 4 h
Chromium (III) nitrate nonahydrate	= 3250 mg/kg (Rat)		
Barium nitrate	= 355 mg/kg (Rat)		> 1.1 mg/L (Rat) 243 min
Tin	= 700 mg/kg (Rat)	> 2000 mg/kg (Rat)	> 4.75 mg/L (Rat) 4 h
Copper			> 5.11 mg/L (Rat) 4 h
Lithium carbonate	= 525 mg/kg (Rat)	> 3000 mg/kg (Rabbit)	> 2.17 mg/L (Rat) 4 h
Antimony	= 7000 mg/kg (Rat)		
Selenium	= 6700 mg/kg (Rat)		
Silver	> 5000 mg/kg (Rat)	> 2000 mg/kg (rat)	> 5.16 mg/L (Rat) 4 h



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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 severe skin burns and eye damage.
Serious eye damage/eye irritation	Classification based on data available for ingredients. Causes serious eye damage. Causes burns.
Respiratory or skin sensitisation	No information available.
Germ cell mutagenicity	No information available.
Carcinogenicity	No information available.
Reproductive toxicity	No information available.
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 No information available.

11.2.2. Other information

Other adverse effects No information available.

SECTION 12: Ecological information

12.1. Toxicity

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Ecotoxicity Toxic to aquatic life with long lasting effects.

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)
Copper	EC50: 0.031 - 0.054mg/L (96h, Pseudokirchneriella subcapitata) EC50: 0.0426 - 0.0535mg/L (72h, Pseudokirchneriella subcapitata)	LC50: 0.0068 - 0.0156mg/L (96h, Pimephales promelas) LC50: <0.3mg/L (96h, Pimephales promelas) LC50: =0.2mg/L (96h, Pimephales promelas) LC50: =0.052mg/L (96h, Oncorhynchus mykiss) LC50: =1.25mg/L (96h, Lepomis macrochirus) LC50: =0.3mg/L (96h, Cyprinus carpio) LC50: =0.8mg/L (96h, Cyprinus carpio) LC50: =0.112mg/L (96h, Poecilia reticulata)	-	EC50: =0.03mg/L (48h, Daphnia magna)
Lithium carbonate	-	LC50: =30.3mg/L (96h, Oncorhynchus mykiss)	-	-
Antimony	-	LC50: >6.2 - 8.3mg/L (96h, Cyprinodon variegatus)	-	-
Selenium	-	LC50: >100mg/L (96h, Oncorhynchus mykiss)	-	-
Silver	-	LC50: 0.00155 - 0.00293mg/L (96h, Pimephales promelas) LC50: =0.0062mg/L (96h, Oncorhynchus mykiss) LC50: =0.064mg/L (96h, Lepomis macrochirus)	-	EC50: =0.00024mg/L (48h, Daphnia magna)

12.2. Persistence and degradability

Persistence and degradability No information available.

12.3. Bioaccumulative potential



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Bioaccumulation There is no data for this product.

Component Information

Chemical name	Partition coefficient
Nitric Acid	-2.3
hydrofluoric acid	-1.4

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
Nitric Acid	The substance is not PBT / vPvB
hydrofluoric acid	The substance is not PBT / vPvB
Molybdenum	PBT assessment does not apply
Chromium (III) nitrate nonahydrate	The substance is not PBT / vPvB
Barium nitrate	The substance is not PBT / vPvB
Tin	The substance is not PBT / vPvB
Copper	The substance is not PBT / vPvB
Lithium carbonate	The substance is not PBT / vPvB
Antimony	The substance is not PBT / vPvB
Selenium	PBT assessment does not apply
Silver	PBT assessment does not apply

12.6. Endocrine disrupting properties

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.



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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. (Nitric Acid, hydrofluoric acid)
14.3 Transport hazard class(es)	8
14.4 Packing group	III
Description	UN3264, Corrosive liquid, acidic, inorganic, n.o.s. (Nitric Acid, hydrofluoric acid), 8, III
14.5 Environmental hazards	Yes
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. (Nitric Acid, hydrofluoric acid)
14.3 Transport hazard class(es)	8
14.4 Packing group	III
Description	UN3264, Corrosive liquid, acidic, inorganic, n.o.s. (Nitric Acid, hydrofluoric acid), 8, III, Marine pollutant
14.5 Marine pollutant	P
Environmental hazards	Yes
14.6 Special precautions for user	
Special Provisions	223, 274
EmS-No.	F-A, S-B No information available
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. (Nitric Acid, hydrofluoric acid)
14.3 Transport hazard class(es)	8
14.4 Packing group	III
Description	UN3264, Corrosive liquid, acidic, inorganic, n.o.s. (Nitric Acid, hydrofluoric acid), 8, III, Environmentally Hazardous
14.5 Environmental hazards	Yes
14.6 Special precautions for user	
Special Provisions	274
Classification code	C1

ADR

14.1 UN number or ID number	UN3264
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14.2 UN proper shipping name	Corrosive liquid, acidic, inorganic, n.o.s. (Nitric Acid, hydrofluoric acid)
14.3 Transport hazard class(es)	8
14.4 Packing group	III
Description	UN3264, Corrosive liquid, acidic, inorganic, n.o.s. (Nitric Acid, hydrofluoric acid), 8, III, (E), Environmentally Hazardous
14.5 Environmental hazards	Yes
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	-
Antimony 7440-36-0	RG 73	-
Selenium 7782-49-2	RG 75	-

Germany

Water hazard class (WGK) slightly hazardous to water (WGK 1)

Netherlands

Chemical name	Netherlands - List of Carcinogens	Netherlands - List of Carcinogens	Netherlands - List of Reproductive Toxins
Lithium carbonate	-	-	Fertility Category 2 Development Category 1A Can be harmful via breastfeeding
Selenium	-	-	Can be harmful via breastfeeding

Poland

SDS created according to the following Polish regulation: Act of February 25, 2011 on

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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 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: Restricted explosives precursors. Making available, introduction, possession and use according to Regulation (EU) 2019/1148, Article 5 (1) and (3)

Chemical name	RESTRICTED EXPLOSIVES PRECURSORS - ANNEX I	REPORTABLE EXPLOSIVES PRECURSORS - ANNEX II
Nitric Acid - 7697-37-2	3 %w/w	-

Chemical name	Restricted substance per REACH Annex XVII	Substance subject to authorisation per REACH Annex XIV
Nitric Acid - 7697-37-2	75.	
hydrofluoric acid - 7664-39-3	75.	



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Tin - 7440-31-5	75.	
Copper - 7440-50-8	75.	
Antimony - 7440-36-0	75.	
Selenium - 7782-49-2	75.	
Silver - 7440-22-4	75.	
Thallium - 7440-28-0	75.	

Persistent Organic Pollutants

Not applicable

Dangerous substance category per Seveso Directive (2012/18/EU)

E2 - Hazardous to the Aquatic Environment in Category Chronic 2

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)
Copper - 7440-50-8	Product-type 21: Antifouling products

International Inventories

TSCA	Complies
DSL/NDL	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/NDL - 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

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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

EUH071 - Corrosive to the respiratory tract
H272 - May intensify fire; oxidiser
H290 - May be corrosive to metals
H300 - Fatal if swallowed
H301 - Toxic if swallowed
H302 - Harmful if swallowed
H310 - Fatal in contact with skin
H314 - Causes severe skin burns and eye damage
H315 - Causes skin irritation
H319 - Causes serious eye irritation
H330 - Fatal if inhaled
H331 - Toxic if inhaled
H332 - Harmful if inhaled
H351 - Suspected of causing cancer
H373 - May cause damage to organs through prolonged or repeated exposure
H400 - Very toxic to aquatic life
H410 - Very toxic to aquatic life with long lasting effects
H412 - Harmful to aquatic life with long lasting effects
H413 - May cause long lasting harmful effects to aquatic life

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	On basis of test data
Serious eye damage/eye irritation	On basis of test data
Respiratory sensitisation	Calculation method



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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)
U.S. Environmental Protection Agency ChemView Database
European Food Safety Authority (EFSA)
EPA (Environmental Protection Agency)
Acute Exposure Guideline Level(s) (AEGLe(s))
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

The information contained in this document is based on Agilent's state of knowledge at the time of preparation. No warranty as to its accurateness, completeness or suitability for a particular purpose is expressed or implied.

End of Safety Data Sheet



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Revision Number 1.04

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

1.1. Product identifier

Product Code(s) 5191-4558
Product Name ICH/USP 232 Parenteral Combined 2_v2
Form Not applicable
Pure substance/mixture Mixture

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

Recommended use Reagents and Standards for Analytical Chemical Laboratory Use

Uses advised against

1.3. Details of the supplier of the safety data sheet

Supplier

Agilent Technologies LDA UK Ltd.
5500 Lakeside Cheadle Royal Business Park,
Cheadle, Cheshire, SK8 3GR
United Kingdom

+44 (0) 345 712 5292

For further information, please contact

E-mail address pdl-msds_author@agilent.com

1.4. Emergency telephone number

Emergency Telephone CHEMTREC®: +(44)-870-8200418

Emergency Telephone - §45 - (EC)1272/2008	
Europe	112
Austria	No information available
Bulgaria	
Croatia	
Cyprus	
Czech Republic	
Denmark	
France	

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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]

Corrosive to metals	Category 1 - (H290)
----------------------------	---------------------

2.2. Label elements



Signal word

Warning

Hazard statements

H290 - May be corrosive to metals

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

P234 - Keep only in original packaging

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



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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	-	-
Rhodium(III) chloride hydrate	-	-
Platinum	-	-
Palladium	-	-

SECTION 3: Composition/information on ingredients

3.1 Substances

Not applicable

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	5 - <10	-	(017-002-00-2) 231-595-7	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%		
Rhodium(III) chloride hydrate 20765-98-4	<0.1	-	606-630-8	Met. Corr. 1 (H290) Acute Tox. 4 (H302) Eye Dam. 1 (H318) Muta. 2 (H341) Aquatic Acute 1 (H400) Aquatic Chronic 1 (H410)			
Platinum 7440-06-4	<0.1	-	231-116-1	Flam. Sol. 2 (H228)			
Palladium	<0.1	-	231-115-6	Flam. Sol. 2 (H228)			



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7440-05-3							
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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
Rhodium(III) chloride hydrate 20765-98-4	No data available	2000	No data available	No data available	No data available

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 Prolonged contact may cause redness and irritation.

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



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Note to doctors Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

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

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



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Reference to other sections See section 8 for more information. See section 13 for more information.

SECTION 7: Handling and storage

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.

General hygiene considerations 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. Regular cleaning of equipment, work area and clothing is recommended.

7.2. Conditions for safe storage, including any incompatibilities

Storage Conditions 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. 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.

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	STEL: 10 ppm STEL: 15.0 mg/m ³ TWA: 5 ppm TWA: 8.0 mg/m ³	TWA: 5 ppm TWA: 8 mg/m ³ STEL: 10 ppm STEL: 15 mg/m ³
Rhodium(III) chloride hydrate 20765-98-4	-	-	TWA: 0.01 mg/m ³	-	TWA: 0.001 mg/m ³ STEL: 0.003 mg/m ³
Platinum 7440-06-4	TWA: 1 mg/m ³	TWA: 1 mg/m ³	TWA: 1 mg/m ³	TWA: 1.0 mg/m ³	TWA: 1 mg/m ³
Chemical name	Cyprus	Czech Republic	Denmark	Estonia	Finland
Hydrochloric acid 7647-01-0	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: 5 ppm STEL: 7.6 mg/m ³



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	TWA: 5 ppm TWA: 8 mg/m ³			STEL: 10 ppm STEL: 15 mg/m ³	
Rhodium(III) chloride hydrate 20765-98-4	-	-	TWA: 0.001 mg/m ³ STEL: 0.002 mg/m ³	-	TWA: 0.001 mg/m ³
Platinum 7440-06-4	TWA: 1 mg/m ³	TWA: 0.5 mg/m ³ Ceiling: 1 mg/m ³	TWA: 1 mg/m ³ STEL: 2 mg/m ³	TWA: 1 mg/m ³	TWA: 1 mg/m ³
Palladium 7440-05-3	-	-	-	-	TWA: 0.5 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
Rhodium(III) chloride hydrate 20765-98-4	-	-	-	TWA: 0.001 mg/m ³ STEL: 0.003 mg/m ³	-
Platinum 7440-06-4	TWA: 1 mg/m ³	TWA: 1 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
Rhodium(III) chloride hydrate 20765-98-4	TWA: 0.001 mg/m ³ STEL: 0.003 mg/m ³	-	TWA: 0.01 mg/m ³	-	-
Platinum 7440-06-4	TWA: 1 mg/m ³ STEL: 3 mg/m ³	-	TWA: 1 mg/m ³	TWA: 1 mg/m ³	TWA: 1 mg/m ³
Chemical name	Luxembourg	Malta	Netherlands	Norway	Poland
Hydrochloric acid 7647-01-0	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	TWA: 5 ppm TWA: 8 mg/m ³ STEL: 10 ppm STEL: 15 mg/m ³	Ceiling: 5 ppm Ceiling: 7 mg/m ³	STEL: 10 mg/m ³ TWA: 5 mg/m ³
Rhodium(III) chloride hydrate 20765-98-4	-	-	-	TWA: 0.001 mg/m ³ STEL: 0.003 mg/m ³	-
Platinum 7440-06-4	TWA: 1 mg/m ³	TWA: 1 mg/m ³	TWA: 1 mg/m ³	:	TWA: 1 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
Rhodium(III) chloride hydrate 20765-98-4	TWA: 0.01 mg/m ³	-	-	-	TWA: 0.01 mg/m ³



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Platinum 7440-06-4	TWA: 1 mg/m ³	TWA: 1 mg/m ³	TWA: 1 mg/m ³	TWA: 1 mg/m ³	TWA: 1 mg/m ³
Chemical name	Sweden		Switzerland		United Kingdom
Hydrochloric acid 7647-01-0	NGV: 2 ppm NGV: 3 mg/m ³ Bindande KGV: 4 ppm Bindande KGV: 6 mg/m ³		TWA: 2 ppm TWA: 3 mg/m ³ STEL: 4 ppm STEL: 6 mg/m ³		TWA: 1 ppm TWA: 2 mg/m ³ STEL: 5 ppm STEL: 8 mg/m ³
Rhodium(III) chloride hydrate 20765-98-4	-		TWA: 0.001 mg/m ³		TWA: 0.001 mg/m ³ STEL: 0.003 mg/m ³
Platinum 7440-06-4	NGV: 1 mg/m ³		TWA: 1 mg/m ³		TWA: 5 mg/m ³ STEL: 15 mg/m ³

Biological occupational exposure limits

This product, as supplied, does not contain any hazardous materials with biological limits established by the region specific regulatory bodies

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

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 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. Regular cleaning of equipment, work area and clothing is recommended.

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

SECTION 9: Physical and chemical properties



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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
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.



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10.2. Chemical stability

Stability Stable under normal conditions.

Explosion data

Sensitivity to mechanical impact None.

Sensitivity to static discharge None.

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.

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.

Symptoms related to the physical, chemical and toxicological characteristics

Symptoms 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



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ATEmix (oral)	99,999.00 mg/kg
ATEmix (dermal)	99,999.00 mg/kg
ATEmix (inhalation-gas)	99,999.00 ppm
ATEmix (inhalation-dust/mist)	99,999.00 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
Rhodium(III) chloride hydrate		> 2000 mg/kg (Rabbit)	

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	No information available.
Respiratory or skin sensitisation	No information available.
Germ cell mutagenicity	No information available.
Carcinogenicity	No information available.
Reproductive toxicity	No information available.
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



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Endocrine disrupting properties No information available.

11.2.2. Other information

Other adverse effects No information available.

SECTION 12: Ecological information

12.1. Toxicity

Ecotoxicity The environmental impact of this product has not been fully investigated.

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

12.2. Persistence and degradability

Persistence and degradability No information available.

12.3. Bioaccumulative potential

Bioaccumulation No information available.

12.4. Mobility in soil

Mobility in soil No information available.

12.5. Results of PBT and vPvB assessment

PBT and vPvB assessment

Chemical name	PBT and vPvB assessment
Hydrochloric acid	The substance is not PBT / vPvB
Platinum	PBT assessment does not apply
Palladium	PBT assessment does not apply

12.6. Endocrine disrupting properties

Endocrine disrupting properties No information available.

12.7. Other adverse effects

No information available.

SECTION 13: Disposal considerations



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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	UN1789
14.2 UN proper shipping name	Hydrochloric acid mixture
14.3 Transport hazard class(es)	8
14.4 Packing group	II
Description	UN1789, Hydrochloric acid mixture, 8, II
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	UN1789
14.2 UN proper shipping name	Hydrochloric acid mixture
14.3 Transport hazard class(es)	8
14.4 Packing group	II
Description	UN1789, Hydrochloric acid mixture, 8, II
14.5 Marine pollutant	NP
14.6 Special precautions for user	
Special Provisions	None
EmS-No.	F-A, S-B No information available
14.7 Maritime transport in bulk according to IMO instruments	No information available

RID

14.1 UN number or ID number	UN1789
14.2 UN proper shipping name	Hydrochloric acid mixture
14.3 Transport hazard class(es)	8
14.4 Packing group	II
Description	UN1789, Hydrochloric acid mixture, 8, II
14.5 Environmental hazards	Not applicable
14.6 Special precautions for user	
Special Provisions	520
Classification code	C1

ADR

14.1 UN number or ID number	UN1789
14.2 UN proper shipping name	Hydrochloric acid mixture



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14.3 Transport hazard class(es)	8
14.4 Packing group	II
Description	UN1789, Hydrochloric acid mixture, 8, II, (E)
14.5 Environmental hazards	Not applicable
14.6 Special precautions for user	
Special Provisions	520
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

Germany

Water hazard class (WGK) slightly hazardous to water (WGK 1)

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 International Carriage of Dangerous Goods by Road (ADR) (Journal of Laws No. 194,



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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

Not applicable

Chemical name	Restricted substance per REACH Annex XVII	Substance subject to authorisation per REACH Annex XIV
Hydrochloric acid - 7647-01-0	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

International Inventories

TSCA

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

DSL/NDL

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/NDL - Canadian Domestic Substances List/Non-Domestic Substances List



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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
AICS - 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
H290 - May be corrosive to metals
H302 - Harmful if swallowed
H314 - Causes severe skin burns and eye damage
H318 - Causes serious eye damage
H335 - May cause respiratory irritation
H341 - Suspected of causing genetic defects
H400 - Very toxic to aquatic life
H410 - Very toxic 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	*	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	Calculation method
Respiratory sensitisation	Calculation method
Skin sensitisation	Calculation method
Mutagenicity	Calculation method
Carcinogenicity	Calculation method



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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)
U.S. Environmental Protection Agency ChemView Database
European Food Safety Authority (EFSA)
EPA (Environmental Protection Agency)
Acute Exposure Guideline Level(s) (AEGL(s))
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

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End of Safety Data Sheet