

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Revision Date 28.11.2018

Version 9.3

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

1.1 Product identifier

Catalogue No. 804604

Product name Hydrazin hydrate (80% solution in water) for synthesis

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

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

Identified uses Chemical for synthesis
For additional information on uses please refer to the Merck Chemicals portal (www.merckgroup.com).

1.3 Details of the supplier of the safety data sheet

Company Merck KGaA * 64271 Darmstadt * Germany * Phone:+49 6151 72-0

Responsible Department LS-QHC * e-mail: prodsafe@merckgroup.com

1.4 Emergency telephone number Please contact the regional company representation in your country.

SECTION 2. Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

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according to Regulation (EC) No. 1907/2006

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Product name Hydrazin hydrate (80% solution in water) for synthesis

Acute toxicity, Category 3, Oral, H301

Acute toxicity, Category 3, Inhalation, H331

Acute toxicity, Category 3, Dermal, H311

Skin corrosion, Category 1B, H314

Skin sensitisation, Category 1, H317

Carcinogenicity, Category 1B, H350

Acute aquatic toxicity, Category 1, H400

Chronic aquatic toxicity, Category 1, H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms



Signal word

Danger

Hazard statements

H350 May cause cancer.

H301 + H311 + H331 Toxic if swallowed, in contact with skin or if inhaled.

H314 Causes severe skin burns and eye damage.

H317 May cause an allergic skin reaction.

H410 Very toxic to aquatic life with long lasting effects.

Precautionary statements

Prevention

P201 Obtain special instructions before use.

P273 Avoid release to the environment.

P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response

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Product name Hydrazin hydrate (80% solution in water) for synthesis

P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

P302 + P352 IF ON SKIN: Wash with plenty of soap and water.

P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P308 + P310 IF exposed or concerned: immediately call a POISON CENTER or doctor/ physician.

Restricted to professional users.

Reduced labelling (≤125 ml)

Hazard pictograms



Signal word

Danger

Hazard statements

H350 May cause cancer.

H301 + H311 + H331 Toxic if swallowed, in contact with skin or if inhaled.

H314 Causes severe skin burns and eye damage.

H317 May cause an allergic skin reaction.

Precautionary statements

P201 Obtain special instructions before use.

P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

P302 + P352 IF ON SKIN: Wash with plenty of soap and water.

P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P308 + P310 IF exposed or concerned: immediately call a POISON CENTER or doctor/ physician.

2.3 Other hazards

None known.

SECTION 3. Composition/information on ingredients

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Product name Hydrazin hydrate (80% solution in water) for synthesis

Chemical nature Aqueous solution

3.1 Substance

Not applicable

3.2 Mixture

Hazardous components (REGULATION (EC) No 1272/2008)

Chemical name (Concentration)

CAS-No. Registration number Classification

hydrazine monohydrate ($\geq 50\%$ - $\leq 100\%$)

Substance does not meet the criteria for PBT or vPvB according to Regulation (EC) No 1907/2006, Annex XIII.

7803-57-8 01-2119492624-31-

XXXX

Acute toxicity, Category 3, H301

Acute toxicity, Category 3, H331

Acute toxicity, Category 3, H311

Skin corrosion, Category 1B, H314

Skin sensitisation, Category 1, H317

Carcinogenicity, Category 1B, H350

Acute aquatic toxicity, Category 1, H400

Chronic aquatic toxicity, Category 1, H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4. First aid measures

4.1 Description of first aid measures

General advice

First aider needs to protect himself.

After inhalation: fresh air. Immediately call in physician. If breathing stops: immediately apply artificial respiration, if necessary also oxygen.

In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/shower. Call a physician immediately.

After eye contact: rinse out with plenty of water. Immediately call in ophthalmologist. Remove contact lenses.

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If swallowed: give water to drink (two glasses at most). Seek medical advice immediately. In exceptional cases only, if medical care is not available within one hour, induce vomiting (only in persons who are wide awake and fully conscious), administer activated charcoal (20 - 40 g in a 10% slurry) and consult a doctor as quickly as possible. Do not attempt to neutralise.

4.2 Most important symptoms and effects, both acute and delayed

Diarrhoea, Nausea, Vomiting, Headache, Spasm, CNS disorders, Irregular cardiac activity, Lung oedema, Dizziness

Risk of methaemoglobin formation with headache, cardiac dysrhythmia, drop in blood pressure, dyspnoea and spasms, principal symptom: cyanosis (blue discolouration of the blood).

Irritation and corrosion, Allergic reactions, Cough, Shortness of breath

Risk of blindness!

4.3 Indication of any immediate medical attention and special treatment needed

No information available.

SECTION 5. Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media

Water, Foam, Carbon dioxide (CO₂), Dry powder

Unsuitable extinguishing media

For this substance/mixture no limitations of extinguishing agents are given.

5.2 Special hazards arising from the substance or mixture

Combustible.

In the event of decomposition: danger of explosion!

Vapours are heavier than air and may spread along floors.

Forms explosive mixtures with air on intense heating.

Development of hazardous combustion gases or vapours possible in the event of fire.

Fire may cause evolution of:

nitrous gases, nitrogen oxides

5.3 Advice for firefighters

Special protective equipment for firefighters

Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

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Further information

Suppress (knock down) gases/vapours/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel: Do not breathe vapours, aerosols. Avoid substance contact. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert.

Advice for emergency responders:

Protective equipment see section 8.

6.2 Environmental precautions

Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up

Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up carefully with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

6.4 Reference to other sections

Indications about waste treatment see section 13.

SECTION 7. Handling and storage

7.1 Precautions for safe handling

Advice on safe handling

Observe label precautions.

Work under hood. Do not inhale substance/mixture. Avoid generation of vapours/aerosols.

Hygiene measures

Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.

7.2 Conditions for safe storage, including any incompatibilities

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Product name Hydrazin hydrate (80% solution in water) for synthesis

Storage conditions

Tightly closed. Keep in a well-ventilated place. Keep locked up or in an area accessible only to qualified or authorised persons.

Recommended storage temperature see product label.

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.

SECTION 8. Exposure controls/personal protection

8.1 Control parameters

Derived No Effect Level (DNEL)

hydrazine monohydrate (7803-57-8)

Worker DNEL, acute	Local and systemic effects	inhalation	0,1332 mg/m ³
Worker DNEL, longterm	Systemic effects	inhalation	0,01 ppm
Worker DNEL, longterm	Systemic effects	dermal	0,0064 mg/kg Body weight

Predicted No Effect Concentration (PNEC)

hydrazine monohydrate (7803-57-8)

PNEC Fresh water	0,0006 mg/l
PNEC Marine water	0,00006 mg/l
PNEC Sewage treatment plant	0,055 mg/l

8.2 Exposure controls

Engineering measures

Technical measures and appropriate working operations should be given priority over the use of personal protective equipment.

See section 7.1.

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Individual protection measures

Protective clothing needs to be selected specifically for the workplace, depending on concentrations and quantities of the hazardous substances handled. The chemical resistance of the protective equipment should be enquired at the respective supplier.

Eye/face protection

Tightly fitting safety goggles

Hand protection

full contact:

Glove material:	natural latex
Glove thickness:	0,6 mm
Break through time:	> 480 min

splash contact:

Glove material:	Nitrile rubber
Glove thickness:	0,11 mm
Break through time:	> 30 min

The protective gloves to be used must comply with the specifications of EC Directive 89/686/EEC and the related standard EN374, for example KCL 706 Lapren® (full contact), KCL 741 Dermatrill® L (splash contact).

The breakthrough times stated above were determined by KCL in laboratory tests acc. to EN374 with samples of the recommended glove types.

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

Other protective equipment

protective clothing

Respiratory protection

required when vapours/aerosols are generated.

Recommended Filter type: Filter K (acc. to DIN 3181) for NH₃

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

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Product name	Hydrazin hydrate (80% solution in water) for synthesis

Environmental exposure controls

Do not let product enter drains.

SECTION 9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Form	liquid
Colour	colourless
Odour	ammoniacal
Odour Threshold	No information available.
pH	10,6 - 10,7 at 10 g/l 20 °C
Melting point	-60 °C
Boiling point/boiling range	117 - 119 °C at 1.013 hPa
Flash point	No information available.
Evaporation rate	No information available.
Flammability (solid, gas)	No information available.
Lower explosion limit	4,7 %(V) (refers to pure substance)

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Upper explosion limit	> 99 %(V) (refers to pure substance)
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Vapour pressure	13 hPa at 20 °C
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Relative vapour density	No information available.
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Density	1,02 g/cm ³ at 20 °C
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Relative density	No information available.
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Water solubility	at 20 °C soluble
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Partition coefficient: n-octanol/water	No information available.
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Auto-ignition temperature	No information available.
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Decomposition temperature	> 250 °C
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Viscosity, dynamic	1,33 mPa.s at 20 °C
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Explosive properties	Not classified as explosive.
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Oxidizing properties	none
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9.2 Other data

Ignition temperature	310 °C
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SECTION 10. Stability and reactivity

10.1 Reactivity

The Safety Data Sheets for catalogue items are available at www.merckgroup.com

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Product name Hydrazin hydrate (80% solution in water) for synthesis

strong reducing agent

has a corrosive effect

highly reactive

10.2 Chemical stability

The product is chemically stable under standard ambient conditions (room temperature) .

10.3 Possibility of hazardous reactions

Exothermic reaction with:

Oxidizing agents, Heavy metals, Light metals, metallic oxides, halogens, Metals, acids, Organic Substances, Nitro compounds, strong alkalis

Risk of explosion with:

Alkali metals, sodium, mercury compounds, tin (II) chloride

10.4 Conditions to avoid

Strong heating (decomposition).

10.5 Incompatible materials

glass, rubber, various metals

10.6 Hazardous decomposition products

in the event of fire: See section 5.

SECTION 11. Toxicological information

11.1 Information on toxicological effects

Mixture

Acute oral toxicity

Symptoms: Nausea, Vomiting, Diarrhoea, If ingested, severe burns of the mouth and throat, as well as a danger of perforation of the oesophagus and the stomach.

Acute toxicity estimate: 211,25 mg/kg

Calculation method

Acute inhalation toxicity

Acute toxicity estimate: 3,75 mg/l; 4 h ; vapour

Calculation method

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Product name Hydrazin hydrate (80% solution in water) for synthesis

Symptoms: mucosal irritations, Cough, Shortness of breath, Possible damages: damage of respiratory tract, Lung oedema, Symptoms may be delayed.

Acute dermal toxicity

Acute toxicity estimate : 375 mg/kg

Calculation method

Skin irritation

Mixture causes burns.

Eye irritation

Mixture causes serious eye damage. Risk of blindness!

Sensitisation

Mixture may cause an allergic skin reaction.

Germ cell mutagenicity

This information is not available.

Carcinogenicity

This information is not available.

Reproductive toxicity

This information is not available.

Teratogenicity

This information is not available.

CMR effects

Carcinogenicity:

Possible carcinogen.

Specific target organ toxicity - single exposure

This information is not available.

Specific target organ toxicity - repeated exposure

This information is not available.

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Product name Hydrazin hydrate (80% solution in water) for synthesis

Aspiration hazard

This information is not available.

11.2 Further information

After absorption:

Systemic effects:

Headache, Convulsions, Cardiac irregularities, CNS disorders, Dizziness, respiratory arrest

Risk of methaemoglobin formation with headache, cardiac dysrhythmia, drop in blood pressure, dyspnoea and spasms, principal symptom: cyanosis (blue discolouration of the blood).

The substance has delayed effects.

Damage to:

Liver, Kidney, Cardiac, Central nervous system

Other dangerous properties can not be excluded.

This substance should be handled with particular care.

Components

hydrazine monohydrate

Acute oral toxicity

LD50 Rat: 108 - 173 mg/kg

OECD Test Guideline 401

Acute inhalation toxicity

LC50 Rat: 0,76 mg/l; 4 h ; dust/mist

(ECHA)

Skin irritation

Rabbit

Result: Corrosive

(55% solution)

Sensitisation

Patch test: human

Result: positive

(IUCLID)

Germ cell mutagenicity

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Product name Hydrazin hydrate (80% solution in water) for synthesis

Genotoxicity in vitro

In vitro mammalian cell gene mutation test

Mouse lymphoma test

Result: positive

Method: OECD Test Guideline 476

(anhydrous substance)

Ames test

Escherichia coli/Salmonella typhimurium

Result: positive

Method: OECD Test Guideline 471

(anhydrous substance)

Mutagenicity (mammal cell test): chromosome aberration.

Chinese hamster lung cells

Result: positive

Method: OECD Test Guideline 473

(anhydrous substance)

SECTION 12. Ecological information

Mixture

12.1 Toxicity

No information available.

12.2 Persistence and degradability

No information available.

12.3 Bioaccumulative potential

No information available.

12.4 Mobility in soil

No information available.

12.5 Results of PBT and vPvB assessment

Substance(s) in the mixture do(es) not meet the criteria for PBT or vPvB according to Regulation (EC) No 1907/2006, Annex XIII, or a PBT/vPvB assessment was not conducted.

12.6 Other adverse effects

Discharge into the environment must be avoided.

Components

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Product name Hydrazin hydrate (80% solution in water) for synthesis

hydrazine monohydrate

Toxicity to fish

static test LC50 *Poecilia reticulata* (guppy): 0,61 mg/l; 96 h
(ECHA)

Toxicity to daphnia and other aquatic invertebrates

semi-static test EC50 *Daphnia pulex* (Water flea): 0,16 mg/l; 48 h
Analytical monitoring: yes
US-EPA
(anhydrous substance)

Toxicity to algae

static test ErC50 *Desmodesmus subspicatus* (green algae): 0,017 mg/l; 72 h
Analytical monitoring: yes
OECD Test Guideline 201
(anhydrous substance)

static test NOEC *Desmodesmus subspicatus* (green algae): 0,006 mg/l; 72 h
Analytical monitoring: yes
OECD Test Guideline 201
(anhydrous substance)

Toxicity to bacteria

EC5 *Pseudomonas putida*: 0,019 mg/l; 16 h
(calculated on the free base) (IUCLID)

static test activated sludge: 5,5 mg/l; 3 h
OECD Test Guideline 209
(anhydrous substance)

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)

semi-static test NOEC *Daphnia magna* (Water flea): 0,01 mg/l; 21 d

OECD Test Guideline 211
(anhydrous substance)

Biodegradability

99 %; 24 h; aerobic
OECD Test Guideline 302B
(anhydrous substance)
Inherently biodegradable.

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Product name	Hydrazin hydrate (80% solution in water) for synthesis

Partition coefficient: n-octanol/water

log Pow: -3,8

(External MSDS) Bioaccumulation is not expected.

Substance does not meet the criteria for PBT or vPvB according to Regulation (EC) No 1907/2006, Annex XIII.

SECTION 13. Disposal considerations

Waste treatment methods

See www.retrologistik.com for processes regarding the return of chemicals and containers, or contact us there if you have further questions.

SECTION 14. Transport information

Land transport (ADR/RID)

14.1 UN number	UN 2030
14.2 Proper shipping name	HYDRAZINE, AQUEOUS SOLUTION
14.3 Class	8 (6.1)
14.4 Packing group	II
14.5 Environmentally hazardous	yes
14.6 Special precautions for user	yes
Tunnel restriction code	E

Inland waterway transport (ADN)

Not relevant

Air transport (IATA)

14.1 UN number	UN 2030
14.2 Proper shipping name	HYDRAZINE, AQUEOUS SOLUTION
14.3 Class	8 (6.1)
14.4 Packing group	II
14.5 Environmentally hazardous	yes

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14.6 Special precautions for user yes

IATA (Passenger) Not permitted for transport

Sea transport (IMDG)

14.1 UN number UN 2030

14.2 Proper shipping name HYDRAZINE, AQUEOUS SOLUTION

14.3 Class 8 (6.1)

14.4 Packing group II

14.5 Environmentally hazardous yes

14.6 Special precautions for user yes

EmS F-A S-B

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

Not relevant

SECTION 15. Regulatory information

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

EU regulations

Major Accident Hazard SEVESO III

Legislation ACUTE TOXIC

H2

Quantity 1: 50 t

Quantity 2: 200 t

SEVESO III

ENVIRONMENTAL HAZARDS

E1

Quantity 1: 100 t

Quantity 2: 200 t

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Product name Hydrazin hydrate (80% solution in water) for synthesis

SEVESO III

Carcinogenic substances

33

Quantity 1: 0,5 t

Quantity 2: 2 t

Occupational restrictions Take note of Dir 94/33/EC on the protection of young people at work. Observe work restrictions regarding maternity protection in accordance to Dir 92/85/EEC or stricter national regulations where applicable.

Regulation (EC) No 1005/2009 on substances that deplete the ozone layer not regulated

Regulation (EC) No 850/2004 of the European Parliament and of the Council of 29 April 2004 on persistent organic pollutants and amending Directive 79/117/EEC not regulated

Substances of very high concern (SVHC) This product does contain substances of very high concern according to Regulation (EC) No 1907/2006 (REACH), Article 59 above the respective regulatory concentration limit of > 0.1 % (w/w).

Contains: hydrazine monohydrate

National legislation

Storage class 6.1A

15.2 Chemical safety assessment

For this product a chemical safety assessment was not carried out.

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Product name Hydrazin hydrate (80% solution in water) for synthesis

SECTION 16. Other information

Full text of H-Statements referred to under sections 2 and 3.

H301	Toxic if swallowed.
H311	Toxic in contact with skin.
H314	Causes severe skin burns and eye damage.
H317	May cause an allergic skin reaction.
H331	Toxic if inhaled.
H350	May cause cancer.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.

Training advice

Provide adequate information, instruction and training for operators.

Labelling

Hazard pictograms



Signal word

Danger

Hazard statements

H301 + H311 + H331 Toxic if swallowed, in contact with skin or if inhaled.

H314 Causes severe skin burns and eye damage.

H317 May cause an allergic skin reaction.

H350 May cause cancer.

H410 Very toxic to aquatic life with long lasting effects.

Precautionary statements

Prevention

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Catalogue No. 804604

Product name Hydrazin hydrate (80% solution in water) for synthesis

P201 Obtain special instructions before use.

P273 Avoid release to the environment.

P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response

P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

P302 + P352 IF ON SKIN: Wash with plenty of soap and water.

P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P308 + P310 IF exposed or concerned: immediately call a POISON CENTER or doctor/ physician.

Further information

Restricted to professional users.

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

Used abbreviations and acronyms can be looked up at www.wikipedia.org.

Regional representation

This information is given on the authorised Safety Data Sheet for your country.

The information contained herein is based on the present state of our knowledge. It characterises the product with regard to the appropriate safety precautions. It does not represent a guarantee of any properties of the product.