

# Safety Data Sheet

according to Regulation (EC) No 1907/2006

**Renovirin**

Print date: 12.04.2012

Product code: 53

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

### Product identifier

Renovirin

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

#### Use of the substance/mixture

Metal surface treatment products, including galvanic and electroplating products

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

Company name:

Street:

Place:

Telephone:

e-mail:

Internet: E-Mail: [info@bullnheimer.de](mailto:info@bullnheimer.de)

Internet: <http://www.bullnheimer.de>

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### Emergency telephone:

0049 6131 19240 Counseling center for poisoning

## SECTION 2: Hazards identification

### Classification of the substance or mixture

Indications of danger : Very toxic, Dangerous for the environment

R-phrases:

Very toxic by inhalation, in contact with skin and if swallowed.

Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

### GHS classification

Hazard categories:

Acute toxicity: Acute Tox. 3

Acute toxicity: Acute Tox. 2

Acute toxicity: Acute Tox. 2

Hazardous to the aquatic environment: Aquatic Chronic 2

Hazard Statements:

Fatal in contact with skin.

Fatal if inhaled.

Toxic if swallowed.

Toxic to aquatic life with long lasting effects.

### Label elements

Signal word:

Danger

Pictograms:

GHS06-GHS09



Hazardous components which must be listed on the label

Sodium cyanide

### Hazard statements

H310

Fatal in contact with skin.

H330

Fatal if inhaled.

H301

Toxic if swallowed.

H411

Toxic to aquatic life with long lasting effects.

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### Precautionary statements

- P101 If medical advice is needed, have product container or label at hand.  
P102 Keep out of reach of children.  
P260 Do not breathe dust/fume/gas/mist/vapours/spray.  
P262 Do not get in eyes, on skin, or on clothing.  
P264 Wash hands and face thoroughly after handling.  
P270 Do not eat, drink or smoke when using this product.  
P271 Use only outdoors or in a well-ventilated area.  
P273 Avoid release to the environment.  
P280 Wear protective gloves/protective clothing/eye protection/face protection.  
P284 Wear respiratory protection.  
P301+P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.  
P330 Rinse mouth.  
P302+P352 IF ON SKIN: Wash with plenty of soap and water.  
P312 Call a POISON CENTER or doctor/physician if you feel unwell.  
P361 Remove/Take off immediately all contaminated clothing.  
P363 Wash contaminated clothing before reuse.  
P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.  
P310 Immediately call a POISON CENTER or doctor/physician.  
P391 Collect spillage.  
P403+P233 Store in a well-ventilated place. Keep container tightly closed.  
P405 Store locked up.  
P501 Dispose of contents/container to an officially registered waste disposal company.

### Special labelling of certain mixtures

- EUH032 Contact with acids liberates very toxic gas.  
Read attached instructions before use.

## SECTION 3: Composition/information on ingredients

### Mixtures

#### Hazardous components

EC No	Chemical name	Quantity
CAS No	Classification	
Index No	GHS classification	
REACH No		
205-559-4	Sodium cyanide	7 %
143-33-9	T+, N R26/27/28-32-50-53	
	Acute Tox. 1, Aquatic Acute 1, Aquatic Chronic 1; H300 H400 H410	

Full text of R- and H-phrases: see section 16.

## SECTION 4: First aid measures

### Description of first aid measures

#### General information

By each accident with Renovirin call immediately the doctor:  
"Suspicion of cyanide-contamination !"

Self protection of first aider: By occurrence of indications consult immediately a doctor.  
The here listed first aid methods as well as the data sheet M-002 of BG-Chemistry (government safety organization) should be allocated to all possible first aiders, which accomplish first aid in case of contamination.

1. Light cyanide-contamination: Conserve consciousness, respiration intact Consult immediately the

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doctor below the keyword suspicion of prussic acid contamination. Ideal storage, protection against heat and cold, observe the casualty at least one hour.

2. Medium heavy up to heavy contamination: Unconscious, breath intact or apnoea, if applicable convulsion affection call immediately the emergency doctor (tel.112) under the keyword suspicion of prussic acid. Bring about absolute body calm and protect against loss of heat.

3. Contamination through swallowing: Call immediately the emergency doctor (tel.112) under the keyword prussic acid contamination. Let immediately swallow three spoons of activated carbon with water, provided the consciousness is conserved.

### After inhalation

After inhalation of NaCN-containing aerosols or exhalation out of NaCN-solutions: Transport the injured below self protection out of the danger zone into fresh air. Keep injured calm, protect against hypothermia. Call the doctor immediately to the accident location. Bring the patient into a half seated position. By unconsciousness and existing breath recovery position. No mouth-to-mouth resuscitation by apnoea. Instead of this ventilate through respiratory mask with oxygen. By unconscious person concerned with (still) self-contained breath is immediately a through breaking off opened Isoamylnitrit-smell ampoule 30 seconds in two minutes interval close to the nare, so that the alexipharmic nitrite can be inhaled; bluish discolouration of lips and skin can be visible after a few minutes.

### After contact with skin

Remove wetted clothing, consider self protection. Flush the concerned parts of skin under floating water. Call in any case the doctor to the accident location, in order to treat possibly occurring resorptive effects optimal. Keep injured calm, protect ahead hypothermia.

### After contact with eyes

Flush eye under protection of the non injured eye 10 minutes by wide opened eyelid. Call doctor to accident location. Eye contact with sodium cyanide (NaCN)-powder or splash of a aqueous solution is dangerous to life!

### After ingestion

Flush mouth, spit again liquid. Immediately - by maintained consciousness- let drink plenty of liquid (water). Cause as soon as possible regurgitation, in case the injured is by consciousness. All manipulations at the injured are to be executed only with protection gloves. By apnoea no breath-to-breath resuscitation, but breath over a respiratory mask with dioxygen contained air or clear dioxygen. Call doctor to accident location. By spontaneous or secondary regurgitation hold head of the injured deep, in order to avoid aspiration.

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

By oral ingestion the period up to the occurrence of the contamination symptom is affected and their intensity of the NaCN dose and their acid capacity of the stomach. By small acid concentration can change from a originally acid reaction into a alkaline, whereby the absorption is considerable decelerated and even a high concentration must not be deadly immediately. In these cases mucous membran corrosion appears.

Eyes: Moderate up to heavy irritation through powders, resorptiv-toxic effect up to fatal outcome possible. Skin: Irritation up to chemical burn of wet skin through powders or concentrated solutions; systemic effects are to be expected at least after a prolonged contact .

Inhalation: Mucous membrane irritation, burning on the tongue, metallic raspy taste in mouth and throat, (in extreme cases) pulmonary oedema possible, depending on concentration gradual up to abrupt ingress systemic effects ingestion: heavy irritation, possible also chemical burn of the contacted mucous membrane, in particular of the stomach, with a high probability a very fast ingres resorptiv-toxic effects resorption: dyspnoea, air hunger, anxiety, clouding of consciousness, headache, deception, tonic clonic and tetanic convulsions, coma; by high concentrations/dose rates additional at first tachycardia, then bradycardia, arrhythmia, hypotension, peripheric vascular collapse, apnoea, cardiac arrest.

By at first unknown genesis it was recommended of a heavy contamination, the combination of tachypnoe, light red venous blood, metabolic acidosis and central nervous symptoms (as well as if necessary noticeable bitter almond smell) is to be seen as a typical symptomatology of contamination with HCN/cyanides and is to be acted accordingly.

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Advices for medical first aid: The treatment of the resorptive toxic effect through methods for protection of vital functions is in any case superficial. If applicable registered toxic effects on eyes and skin should be treated occasionally symptomatic (possibly enlistment of an ophthalmologist). The intensity of the therapy should comply after the severity of the intoxication:

Level 0: anxiety, agitation, deception, obnubilation, (possibly light dyspnoea)? oxygen, repose, sedate, surveillance. Level 1: Change in outlook, psychomotor slowdown ? oxygen, 100ml sodium thiosulphate 10%, intravenous. Level 2: Coma, and/or metabolic acidosis ? intubation, oxygen (FiO<sub>2</sub> 1,0), if necessary needed partly blank buffering (prähospital) with 1-molar sodium bicarbonate solution, maybe here DMAP/thiosulphate (see level 3). Level 3: Unconsciousness, metabolic acidosis and/or convulsions, arrhythmia, shock ? intubation, oxygen (FiO<sub>2</sub> 1,0), acidosis balance, antikonvulsia, methämoglobin formation through 3,25 mg 4-Dimethylaminophenol (4-DMAP)/kg KG intravenous and subsequent give thiosulphate (100ml, 10% intravenous) through the same cannula.

Level 4: Cardiovascular stagnation ? cardiopulmonary resuscitation, otherwise indicate like level 3. For the case of an oral ingestion of NaCN-solutions a prompt release of regurgitation is recommended, in case a loss of consciousness has still not occurred. A gastric lavage is to be executed first after stabilization of the vital functions- despite of the very fast resorption. The actual priorities are to be composed by the emergency doctor.

## SECTION 5: Firefighting measures

### Extinguishing media

#### **Suitable extinguishing media**

Dry extinguishing powder.

#### **Extinguishing media which must not be used for safety reasons**

Water spray. Carbon dioxide (CO<sub>2</sub>).

### Special hazards arising from the substance or mixture

By comprehension in a fire dangerous vapours or products of decomposition can occur. -Nitrous fumes (nitrogen oxides) -Prussic acid vapours Wear an independent ambient atmosphere protective respirator. Wear a chemical protective suit.

### Advice for firefighters

Substance itself does not burn, cleanup method are adapted on surrounding area. By comprehension of surrounding fire: Cool surrounding barrels and containers with spray. Carry containers if possible out of the danger zone. Pressure increase and bursting danger when heated. Stay on wind facing side. Let not reach the fire water into the canalization.

## SECTION 6: Accidental release measures

### Personal precautions, protective equipment and emergency procedures

Clear endangered area, warn concerned area.

For cleaning up of the endangered situation may the danger zone only be entered with adequate protection methods.

Wear breath-, eye-, hand- and body protection (see chapter personal protection methods).

Collect mechanically.

Subsequent ventilate the room and clean contaminated subjects and floor.

### Environmental precautions

Tap water and environmental hazard: Avoid invasion in waters, canalization, ground earth. Tap water hazard already by invasion few amounts in underground and waters possible. Advise authorities.

Environmental hazard by occurrence of bigger amounts of the substance in the area of atmosphere possible. Advise authorities.

### Methods and material for containment and cleaning up

Neutralization (after instructions sheet) with Exnovirin (sodium hypochlorite). Accept alternative with chemical binding agent and dispose accordingly (mark with very toxic (skull)!)!

## SECTION 7: Handling and storage

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### Precautions for safe handling

#### **Advice on safe handling**

Use Renovirin wide mouth bottle as working container – do not decant in other containers. Open Renovirin wide mouth bottle only under fume hood or open by enough ventilation.

#### **Advice on protection against fire and explosion**

No special measures are necessary.

### Conditions for safe storage, including any incompatibilities

#### **Requirements for storage rooms and vessels**

Store closed in a toxic room!  
Store in a dry, good ventilated, cool place!  
Request to stock and container: No metal container.  
Do not store in aluminium container.

#### **Advice on storage compatibility**

The storage together with these substances is forbidden:  
- Medicine, food, forages including additives. - Dangerous contagiousity, radioactive and explosive substances. - Flammable liquid substances of storage class 3 - Other explosive substances of storage class 4.1 A. - Flammable compact substances or desensitized substances of storage class 4.1B - Self-flammable substances - Substances, which develop in contact with water flammable gases. - Heavy oxidizing effective substances of storage class 5.1A - Ammonium nitrate and ammonium nitrate containing preparation. - Organic peroxides and self decomposing substances.  
Do not store together with acids.  
Do not store together with food.

#### **Further information on storage conditions**

Protect ahead unauthorized persons and children!

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

### Control parameters

#### **Exposure limits (EH40)**

CAS No	Chemical name	ml/m <sup>3</sup>	mg/m <sup>3</sup>	F/ml	Category	Origin
143-33-9	Sodium cyanide		1		TWA (8 h) STEL (15 min)	

#### **Additional advice on limit values**

The instructions are academic references and no effective authorization.  
3,8mg/m<sup>3</sup> measured as respirable aerosole rate. Restriction of exposition cusp: Exceeding factor 1  
Duration 15min, mean value; 4 times per deposit; separation 1 h Danger of cutenous absorption  
Pregnancy: Group C  
A risk of embryo damage is not to be expected when observation of the MAK-value and of the BAT-value.

### Exposure controls

#### **Protective and hygiene measures**

Do not eat, drink, smoke or sneeze at the workplace. Wash hands before breaks and at the end of work.  
General Precautions for safe handling of chemicals.

#### **Hand protection**

Use protective gloves. The material of the gloves should be enough tight and firm against the used substance. Before using check leak tightness / impermeability. In case of reutilization, clean gloves before taking off and store in well-aired place. Consider skin care.  
Totally not suitable are cloth- or leather gloves.

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Following data is valid for liquid, sated solutions of salt.

Suitable are gloves out of the following materials (breakthrough time  $\geq 8$  hours) :

Nature latex-NR (0,5mm)(use non powdered and non allergic products) Polychloroprene- CR (0,5mm)  
Nitrile rubber- NBR (0,35mm) Butyl rubber – butyl (0,5mm) Fluor rubber- FKM (0,4mm) Polyvinyl  
chloride- PVC (0,5mm) The time specifications are reference values out of measures at 22°C and  
lasting contact. Increased temperature through heated substances, body heat etc. and a reduction of  
the effective lamination strength through expansion can lead to a heavy decline of the breakthrough  
time. In case of doubt contact manufacturer. By a ca. 1,5 - point bigger/smaller coat thickness  
double/halve the particular breakthrough time. The data are only valid for pure substance. By transfer  
to substance mixtures they may be regarded only as guideline. The exact breakthrough time are to be  
found out and to be regarded at the manufacturer of protection gloves. For the product are protection  
gloves out of nitrile rubber suitable of category III coat thickness  $> 0,35$  mm breckthrough time  $> 480$   
min.

### Eye protection

Tightly sealed safety glasses.

### Skin protection

According to danger wear tight, adequate long apron and boots or suitable chemical protection suit. The  
protection clothing should be alkali-resistant.

## SECTION 9: Physical and chemical properties

### Information on basic physical and chemical properties

Physical state:	liquid
Colour:	colourless
Odour:	bitter almonds.

### Test method

pH-Value (at 20 °C):	$> 11$
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### Changes in the physical state

Density (at 20 °C):	1,04 g/cm <sup>3</sup>
Water solubility:	unlimited
Viscosity / dynamic: (at 20 °C)	10 mPa·s

## SECTION 10: Stability and reactivity

### Chemical stability

The decomposition and hydrogen cyanide formation begins already in moist air.

### Possibility of hazardous reactions

The substance may react dangerously with:

nitric acid, urea (heat), alkali carbonates  $\rightarrow$  hydrogen cyanide, acids  $\rightarrow$  hydrogen cyanide, moist carbon  
dioxide  $\rightarrow$  hydrogen cyanide

### Conditions to avoid

Avoid contact with acids !

### Hazardous decomposition products

Sodium acetylated; nitrogen, hydrogen cyanide.

## SECTION 11: Toxicological Information

### Information on toxicological effects

#### Toxicokinetics, metabolism and distribution

Resorbiertes NaCN is attached reversible, in particular at Methämoglobin (0,5 – 1% of haemoglobin)

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and at plasma protein and distributed in all organs (in particular in the liver, lung, milt and brain). Unchanged cyanide is only rejected in a extremely light percentage through respiratory system and kidney (but concerning this matter conclusions are different). In the quantitative important step of metabolize thiocyanate (rhodanide) is developed. This reaction is catalyzed through the enough available and in common very active enzyme Rhodanese and is only limited through availability of the reaction ready Sulfan brimstone. This can be substituted through thiosulphate respectively or to be recharged. Main contact point of the cyanides in acid organism ist the Cytochromoxidase-complex, whereby the recovery of oxygen is avoided in the booths (reversible). Furthermore are to be blocked a lot of other enzyme systems, for example those used for detoxication reactive oxygen species catalase, peroxidase and superoxide dismutase. The repression of the oxidative phosphorylation is made remarkable in the brain. The thereby qualified change of the ADP/ATP-quotient causes the Glykogenolyse, which leads to the anaerobic ATP formation. The effect is a fast inciepent lactazidose. The classic antidot therapy uses the high affinity of cyanide to Fe<sup>3+</sup>, by a part of the Fe<sup>2+</sup>-haemoglobin oxidizes to Fe<sup>3+</sup>-Hb, which resists the oxygen. The out of this complex slowly laid off cyanide is to be binded through additional administration of thiosulphate and as thiocyanate is deposit over the renals.

### Acute toxicity

CAS No	Chemical name				
	Exposure routes	Method	Dose	Species	Source
143-33-9	Sodium cyanide				
	oral	LD50	6,44 mg/kg	Rat.	
	dermal	LD50	10,4 mg/kg	Rabbit	

### Carcinogenic/mutagenic/toxic effects for reproduction

A risk of embryo damage is not be suspected when observance of the MAK-value/BAT-value is regarded. An influence on the function of the male and female reproduction organs as well as a embryo damage potential is realized by parentaloische concentration. Mutagenicity: Alkaline cyanide provided in Genotoxizitätstests on microorganisms and cell cultures negative results. Carzinoma: There exist no sufficient indications.

### Additional information on tests

An allergization by acitvity-scheduled persons is possible. For cyanide compound/nitrile obtains in common: Maximum caution! Disposal of prussic acid possible! Blockade of cell respiration. Cardiovasculadisorder, dyspnoea, unconsciousness. Further indications: The substance is to handle with particular caution.

## SECTION 12: Ecological information

### Toxicity

Biologic effects: Very toxic for water organisms. It is possible that in inshore water long term damaging effect occur. Caution for tab water. Generates despite of dilution still toxic and caustic mixture with water.

CAS No	Chemical name					
	Aquatic toxicity	Method	Dose	h	Species	Source
143-33-9	Sodium cyanide					
	Acute fish toxicity	LC50	0,125 mg/l	96		

### Persistence and degradability

Biologic decomposability: 99% (IUCLID).  
Abiotic degradation: Slow degradation (oxygen).

### Further information

May not get in inshore waters, in sewage water or ground earth!

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## SECTION 13: Disposal considerations

### Waste treatment methods

#### Advice on disposal

Removal only after neutralization with EXNOVIRIN possible- consider directions for use.

#### Waste disposal number of waste from residues/unused products

110198 WASTES FROM CHEMICAL SURFACE TREATMENT AND COATING OF METALS AND OTHER MATERIALS; NON-FERROUS HYDRO-METALLURGY; wastes from chemical surface treatment and coating of metals and other materials (for example galvanic processes, zinc coating processes, pickling processes, etching, phosphating, alkaline degreasing, anodising); other wastes containing dangerous substances  
Classified as hazardous waste.

#### Contaminated packaging

Packaging is to be neutralized in accordance with instruction for use with EXNOVIRIN.  
Not cleaning capable packaging are to be disposed like the substance.

## SECTION 14: Transport information

### Land transport (ADR/RID)

**UN number:** UN3414  
**UN proper shipping name:** SODIUM CYANIDE SOLUTION (ca. 7%)  
**Transport hazard class(es):** 6.1  
**Packing group:** II  
**Hazard label:** 6.1



**Classification code:** T4  
**Limited quantity:** 100 mL  
**Transport category:** 2  
**Hazard No:** 60  
**Tunnel restriction code:** D/E

**Other applicable information (land transport)**  
E4

### Inland waterways transport

**UN number:** UN3414  
**UN proper shipping name:** SODIUM CYANIDE SOLUTION (ca.7%)  
**Transport hazard class(es):** 6.1  
**Packing group:** II  
**Hazard label:** 6.1



**Classification code:** T4  
**Special Provisions:** 802  
**Limited quantity:** 100 mL

**Other applicable information (inland waterways transport)**  
E4



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### Marine transport

**UN number:** UN3414  
**UN proper shipping name:** SODIUM CYANIDE SOLUTION (ca. 7%)  
**Transport hazard class(es):** 6.1  
**Packing group:** II  
**Hazard label:** 6.1



**Marine pollutant:** P  
**Special Provisions:** -  
**Limited quantity:** 100 mL  
**EmS:** F-A, S-A

**Other applicable information (marine transport)**  
E4

### Air transport

**UN/ID number:** UN3414  
**UN proper shipping name:** SODIUM CYANIDE SOLUTION (ca. 7%)  
**Transport hazard class(es):** 6.1  
**Packing group:** II  
**Hazard label:** 6.1



**Special Provisions:** A3  
**Limited quantity Passenger:** 1 L  
**IATA-packing instructions - Passenger:** 654  
**IATA-max. quantity - Passenger:** 5 L  
**IATA-packing instructions - Cargo:** 662  
**IATA-max. quantity - Cargo:** 60 L

**Other applicable information (air transport)**  
E4  
: Y641

### Environmental hazards

**Dangerous for the environment:** yes



## SECTION 15: Regulatory information

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

#### National regulatory information

**Employment restrictions:** Observe employment restrictions for young people. Observe employment restrictions for child bearing mothers and nursing.  
**Water contaminating class (D):** 3 - highly water contaminating

## SECTION 16: Other information

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### Full text of R-phrases referred to under sections 2 and 3

- 26/27/28 Very toxic by inhalation, in contact with skin and if swallowed.
- 32 Contact with acids liberates very toxic gas.
- 50 Very toxic to aquatic organisms.
- 51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
- 53 May cause long-term adverse effects in the aquatic environment.

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

- H300 Fatal if swallowed.
- H301 Toxic if swallowed.
- H310 Fatal in contact with skin.
- H330 Fatal if inhaled.
- 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.

### Further Information

This information is based on the present state of knowledge, but they do not constitute a guarantee of product properties and establishes no contract legal rights. Existing laws and regulations are followed by the recipient of our products on their own responsibility. This MSDS contains only safety-related information and does not replace any information or product specifications.

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



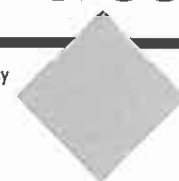
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# Safety Data Sheet

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## Exnovirin

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

#### Product Identifier

Exnovirin

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

##### Use of the substance/mixture

Renovirin - Cyanide detoxification

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

Company name:

Street:

Place:

Telephone:

e-mail: E-Mail: [info@bullnheimer.de](mailto:info@bullnheimer.de)

Internet: <http://www.bullnheimer.de>

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#### Emergency telephone:

0049 6131 19240 Counseling center for poisoning

### SECTION 2: Hazards Identification

#### Classification of the substance or mixture

Indications of danger : Corrosive, Dangerous for the environment

R-phrases:

Causes burns.

Very toxic to aquatic organisms.

#### GHS classification

Hazard categories:

Skin corrosion/irritation: Skin Corr. 1B

Serious eye damage/eye irritation: Eye Dam. 1

Hazardous to the aquatic environment: Aquatic Acute 1

Hazard Statements:

Causes severe skin burns and eye damage.

Very toxic to aquatic life.

#### Label elements

Signal word:

Danger

Pictograms:

GHS05-GHS09



Hazardous components which must be listed on the label  
sodium hypochlorite, solution 13-16 % Cl active

#### Hazard statements

H314

Causes severe skin burns and eye damage.

H400

Very toxic to aquatic life.

#### Precautionary statements

P101

If medical advice is needed, have product container or label at hand.

P102

Keep out of reach of children.

P260

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

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- P264 Wash hands thoroughly after handling.  
P273 Avoid release to the environment.  
P280 Wear protective gloves/protective clothing/eye protection/face protection.  
P301+P330+P331 IF SWALLOWED: rinse mouth. Do NOT induce vomiting.  
P303+P361+P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.  
P363 Wash contaminated clothing before reuse.  
P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.  
P310 Immediately call a POISON CENTER or doctor/physician.  
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/physician.  
P391 Collect spillage.  
P405 Store locked up.

### Special labelling of certain mixtures

- EUH031 Contact with acids liberates toxic gas.  
EUH206 Warning! Do not use together with other products. May release dangerous gases (chlorine).

## SECTION 3: Composition/information on ingredients

### Mixtures

#### Hazardous components

EC No	Chemical name	Quantity
CAS No	Classification	
Index No	GHS classification	
REACH No		
231-668-3	sodium hypochlorite, solution 13-16 % Cl active	42 %
7681-52-9	C, N R34-31-50	
017-011-00-1	Skin Corr. 1B, Aquatic Acute 1; H314 H400	

Full text of R- and H-phrases: see section 16.

## SECTION 4: First aid measures

### Description of first aid measures

#### General information

Immediately remove any wetted clothing, shoes or stockings. Self-protection of the first aider.  
Wash contaminated clothing prior to re-use.  
In case of accident or if you feel unwell, seek medical advice immediately (show safety data sheet if possible).

#### After inhalation

If victim is at risk of losing consciousness, position and transport on their side.  
Move victim to fresh air. Put victim at rest and keep warm.  
Provide fresh air.  
Get immediate medical advice/attention.

#### After contact with skin

After contact with skin, wash immediately with plenty of water and soap.  
Immediately get medical attention.

#### After contact with eyes

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

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### After ingestion

Rinse mouth immediately and drink large quantities of water.

If swallowed, do not induce vomiting: seek medical advice immediately and show this container label.

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

Focus of attention is the local effect of the solution, these acts from 5 % irritating, from ca. 10 % corrosive to the dermal tissue. By adding acid, chlorine gas can be released. -Symptoms of acute poisoning: Eyes: Burn, pain, depending on the concentration superficial epithelial damage to the cornea up to serious corrosion. Degree of damage and reversibility highly dependent on the reaction time to the onset of rinsing! Skin: Superficial irritation up to corrosive damage.

Inhalation: Preferred by aerosol irritation/injury in the nasal-throat-area. After massive inhalation and always after the release of chlorine gas: Risk of Laryngospasmus, glottisödem, bronchospasm, Tracheobronchitis, pulmonary edema, Pneumonie, (nach Latenz), possibly sudden cardiac death. Ingestion: Burn/pain in the mouth, throat, oesophagus, stomach, nausea, vomiting, (aspiration hazard!), risk of corrosive damage of the contacted mucous membranes. (Ulceration, perforation, stricture in oesophagus /stomach); when aspiration serious lung damage as a result of massive corrosion also acute cardiovascular reaction (collapse, shock); after very large doses maybe systemic effect.

Absorption: Possibly hypernatraemia, hyperchloraemia acidose, probably less as a result of absorption as a result of massive tissue damage; disorder of the central nervous system (lethargy, loss of consciousness up to coma), cardiovascular reaction, maybe renal dysfunctions. -Instruction on the first medical aid: After impact on the eye the first aid (thorough rinsing preferably with physiological sodium chloride solution, possibly pain relief) must follow as soon as possible a further ophthalmological treatment. Thoroughly rinse contaminated skin with water. Irritated areas can be treated with a corticoid containing dermatic agent. In the case of large-area skin damage, the injured should be transported for further treatment to a hospital. After inhalation of fine aerosol solution or released chlorine gas the application of glucocorticoids and an oxygen administration is indexed. If necessary any other measures in prevention against pulmonary edema.

If bronchospasm additional an administration of Broncholytika. In severe cases intubation and artificial respiration may be necessary, cardiovascular support, always as fast as possible transportation of the injured to the hospital for further diagnosis/treatment. In the case of oral intake only the situation and clinical diagnostic findings can decide on the required measures. If signs of perforation certainly are missing an immediate gastric lavage (in intubation) is considered. But it seems only be useful if large amounts of solution have been incorporated. As well as after inhalation a glucocorticoid administration may be required to prevent the formation of a glottisödem or/and lung damage (compare measures after inhalation). Further treatment is symptomatically. In any suspicion of intoxication clarification under stationary conditions must be done.

In the foreground are control of cardiovascular, central nervous system and respiratory function, diagnosis (endoscopy) and treatment of etching damage and control of the acid-bases balance, of blood count (in particular of the leucocytes) and renal function.

## SECTION 5: Firefighting measures

### Extinguishing media

#### **Suitable extinguishing media**

Water spray. Foam. Carbon dioxide. Extinguishing powder.

### Special hazards arising from the substance or mixture

In concentrated form the solution can release oxygen and act as oxidizing. During thermal decomposition different, aggressive acting gases were free, such as chlorine gas, chlorine oxide and hydrogen chloride. In case of fire drill is to be regarded on the alkaline reacting Hypochlorite solution as well as on the acid solidified product. The product is in a dry condition oxidizing. Vapour and/or decomposition product are irritating and/or toxic. The product can react as oxidizer.

### Advice for firefighters

Protective respiration apparatus not using surrounding air (breathing apparatus) (DIN EN 133).  
Wear chemical resistant suit.

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### Additional information

Cool endangered containers with water spray jet.  
Collect contaminated fire extinguishing water separately. Do not allow entering drains or surface water.

## SECTION 6: Accidental release measures

### Personal precautions, protective equipment and emergency procedures

Clear endangered area, warn concerned area.  
For cleaning up of the endangered situation may the danger zone only be entered with adequate protection methods.  
Wear breath-, eye-, hand- and body protection (see chapter personal protection methods).

### Environmental precautions

Avoid invasion into inshore waters, canalization, ground earth. Drinking water danger when invasion of a bigger amount into the underground and inshore waters. Environmental hazard possible by release of bigger amounts of the substance in the surrounding atmosphere. Inform authorities. Polluted textiles/cleaning rag made of natural fibre can be flammable (for example out of clean wool or clean cotton) and should not be used respectively should be disposed safely.

### Methods and material for containment and cleaning up

Absorb buried liquids with universal binding agent (for example diatomaceous earth, vermiculite, grit) and dispose specified. Do not attempt to neutralize in no case the coated liquid with acid. Pump down bigger amounts.  
Subsequent ventilate the room and clean contaminated subjects and floor.

## SECTION 7: Handling and storage

### Precautions for safe handling

#### **Advice on safe handling**

In area of operation may no food and luxury food be absorbed. For this function are adequate areas to be constructed. Avoid contact with skin. Avoid absolutely dry of the substances or his solutions on the skin. After contact with skin cleaning of skin is necessary. Avoid contact with eyes. After contact with eyes conduct a eyes flushing. Avoid breathing of vapours or mist. Avoid contact with clothing. Change polluted working clothing and clean efficiently. Rinse clothing before cleaning. Separated storage possibilities for clothing and working clothing should be available, if danger of pollution is to be expected.

#### **Advice on protection against fire and explosion**

Substance is not flammable. Balance fire and explosion protection methods on the flammable substances in the area. Aqueous solution can yet in concentrated form by contact with substances like hydro chloride acid and hydrogen peroxide separate oxygen and assist the burning of flammable substances.

Fire fighting-equipments are to be provided.

Check electric installation regularly because of increased corrosion danger.

#### **Further information on handling**

General Precautions for safe handling of chemicals.

Provide for sufficient ventilation and punctiform suction at critical points.

### Conditions for safe storage, including any incompatibilities

#### **Requirements for storage rooms and vessels**

Keep container tightly closed in a cool, well-ventilated place.

Protect against sunlight.

#### **Advice on storage compatibility**

The clustering with the following substances is forbidden: -Medicine, food and forage including additives. -Contagious dangerous, radioactive and explosive substances -Heavy oxidizing effective substance of storage class 5.1 A. -Organic peroxides and self decomposable substances The clustering with the following substances is only allowed under certain conditions (details see TRGS

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510): -Other explosive dangerous substances of storage class 4.1A. -Self flammable substances  
-Substances, which develop with contact of water flammable gases. -Ammonium nitrate and  
ammonium nitrate containing preparations. The substance should not be stored with substances, with  
which dangerous chemical reactions are possible.

## SECTION 8: Exposure controls/personal protection

### Control parameters

#### Exposure controls

##### Protective and hygiene measures

General Precautions for safe handling of chemicals. When using do not eat, drink or smoke. Wash hands before breaks and at the end of work.

##### Respiratory protection

In exceptional circumstances wearing of respiratory equipment is needed. Details to the adoption conditions and maximum adoption concentrations take from the rules for the adoption of respiratory equipments (BGR 190).

##### Hand protection

Use protective gloves. The material of the gloves should be enough tight and firm against the used substance. Check tightness before use. Preclean gloves before extraction, afterwards store good cooled. Consider skin care.

Suitable are gloves out of following materials (breakthrough time  $\geq 8$  hours): Natural rubber-NR (0,5mm) (use non powdered and allergy free products) Polychloropren – CR (0,5mm) Nitrile rubber – NR (0,35mm) Butyl rubber – butyl (0,5mm) Fluor rubber – FKM (0,4mm) Polyvinyl chloride – PVC (0,5mm)

##### Eye protection

Adequate eye protection must be wearied.  
Wear protective glasses.

##### Skin protection

The protection clothing should be alkali-resistant.

## SECTION 9: Physical and chemical properties

### Information on basic physical and chemical properties

Physical state:	flüssig
Colour:	gelblich
Odour:	nach Chlor

pH-Value (at 20 °C):	10 g/l < 11
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#### Changes in the physical state

Boiling point:	ca. 90 °C
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Zersetzungstemperatur::	ca. 35 °C
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Flash point:	n.a.
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Density (at 20 °C):	1,06 g/cm <sup>3</sup>
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Water solubility:	unendlich
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Viscosity / dynamic: (at 20 °C)	<10 mPa·s
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#### Test method

## SECTION 10: Stability and reactivity

### Chemical stability

Stable under normal temperature and compression conditions. Light sensitive.

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### Possibility of hazardous reactions

By reaction of acids occurs chlorine.

### Conditions to avoid

Sunlight, heat temperature below 40°C.

### Incompatible materials

Metals, reducing agent, heavy acids, amines, ammoniac, acids (organic-, for example acetic acid, benzoic acid, formic acid, methanoic acid, oxalic acid), methanole, ammonium salts.

### Hazardous decomposition products

Hydrogen chloride, chlorine, sodium oxide.

## SECTION 11: Toxicological information

### Information on toxicological effects

#### **Toxicokinetics, metabolism and distribution**

In individual cases allergic reactions are described by human beings towards NaOCl-solutions (see chronic toxicity). In a standardized test on probands and in 3 from each other independent testing on guinea pigs a skin sensitizing effect was not yet verifiable. The dermal toxicity of a 5,25% NaOCl-solution was in a animal experiment very low (LD50 > 2g/kg KG). By inhalation the aerosol of a NaOCl-solution can irritate the airways. In a test on mice with aerosolised 10% solution a RD50-value of 4,11ppm (50% reduction of the breath frequency) was determined as measure for the irritation effect.

The oral toxicity is affected due to the local effect of the hypochlorite less than the dose of the concentration of the solution. In an animal experiment the toxicity was low (LD50 for 5,25% NaClO2 about 682mg Cl/kg KG). Despite this the danger exists that in case of aspiration also smaller amounts of life threatening lung damages can be caused. Through higher concentrated NaOCl solutions or solutions with high caustic soda additive life threatening corrosivity are to be feared in the range of oesophagus and stomach. As systemic effects are in two cases after ingestion of 1 litre 5% NaOCl solution increased level of sodium and Hyperchlorämische acidosis is to be proved.

#### **Specific effects in experiment on an animal**

LD50 (orale, mouse): 5800mg/kg

#### **Irritation and corrosivity**

After inhalation: Irritation of the mucous membrane  
After eye contact: Irritation effect; no sensitizing effect known  
After skin contact: Irritation effect  
After swallowing: Irritation effect

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

There are no data available for classification of this substance concerning its Carcinogenicity out of EPA, IAR, NTP, OSHA or ACGIH.

## SECTION 12: Ecological information

### Toxicity

Fisch: Rainbow trout: 0.07 mg/l; 48h;  
Fisch: Fathead Minnow: 5.9 mg/l; 96h;

### Mobility in soil

Let not get undiluted into inshore waters or canalization. In inshore waters also toxic for fish and water organisms. Toxicity through pH value shift and release of chlorine.

## SECTION 13: Disposal considerations

### Waste treatment methods

Waste disposal number of waste from residues/unused products



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110113 WASTES FROM CHEMICAL SURFACE TREATMENT AND COATING OF METALS AND OTHER MATERIALS; NON-FERROUS HYDRO-METALLURGY; wastes from chemical surface treatment and coating of metals and other materials (for example galvanic processes, zinc coating processes, pickling processes, etching, phosphating, alkaline degreasing, anodising); degreasing wastes containing dangerous substances  
Classified as hazardous waste.

### Contaminated packaging

Contaminated packing must be completely emptied and can be re-used following appropriate cleaning.

## SECTION 14: Transport information

### Land transport (ADR/RID)

**UN number:** UN1791  
**UN proper shipping name:** HYPOCHLORITE SOLUTION ca. 8%ig  
**Transport hazard class(es):** 8  
**Packing group:** III  
**Hazard label:** 8



**Classification code:** C9  
**Special Provisions:** 521  
**Limited quantity:** 5 L  
**Transport category:** 3  
**Hazard No:** 80  
**Tunnel restriction code:** E

### Other applicable information (land transport)

E1

### Inland waterways transport

**UN number:** UN1791  
**UN proper shipping name:** HYPOCHLORITE SOLUTION ca. 8%  
**Transport hazard class(es):** 8  
**Packing group:** III  
**Hazard label:** 8



**Classification code:** C9  
**Special Provisions:** 521  
**Limited quantity:** 5 L

### Other applicable information (inland waterways transport)

E1

### Marine transport

**UN number:** UN1791  
**UN proper shipping name:** HYPOCHLORITE SOLUTION ca. 8%  
**Transport hazard class(es):** 8  
**Packing group:** III

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Hazard label: 8



Special Provisions: 223  
Limited quantity: 5 L  
EmS: F-A, S-B

Other applicable information (marine transport)  
E1

### Air transport

UN/ID number: UN1791  
UN proper shipping name: HYPOCHLORITE SOLUTION  
Transport hazard class(es): 8  
Packing group: III  
Hazard label: 8



Special Provisions: A3 A803  
Limited quantity Passenger: 1 L  
IATA-packing instructions - Passenger: 852  
IATA-max. quantity - Passenger: 5 L  
IATA-packing instructions - Cargo: 856  
IATA-max. quantity - Cargo: 60 L

Other applicable information (air transport)  
E1  
: Y841

### Environmental hazards

Dangerous for the environment: yes



## SECTION 15: Regulatory information

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

#### National regulatory information

Employment restrictions: Observe employment restrictions for young people. Observe employment restrictions for child bearing mothers and nursing. Observe employment restrictions for women of child-bearing age.

Water contaminating class (D): 2 - water contaminating

## SECTION 16: Other information

### Full text of R-phrases referred to under sections 2 and 3

- 31 Contact with acids liberates toxic gas.
- 34 Causes burns.
- 50 Very toxic to aquatic organisms.

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

- H314 Causes severe skin burns and eye damage.

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H400 Very toxic to aquatic life.

### Further Information

This information is based on the present state of knowledge, but they do not constitute a guarantee of product properties and establishes no contract legal rights. Existing laws and regulations are followed by the recipient of our products on their own responsibility. This MSDS contains only safety-related information and does not replace any information or product specifications.

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



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