Safety Data Sheet

according to Regulation (EC) No 1907/2006

Renovirin

Product code: 4649.50

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

1.1. Product identifier

Renovirin

1.2. 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

1.3. Details of the supplier of the safety data sheet

Company name:	Bullnheimer & Co. GmbH & Co. KG	
Street:	Im Tal 12	
Place:	D-86179 Augsburg	
Telephone:	+49 (0)821 80850 0	Telefax: +49 (0)821 80850 90
e-mail:	info@bullheimer.de	
Contact person:		
Internet:	www.bullnheimer.de	
Responsible Department:	Poison Information Center of the University of Freiburg.	

1.4. Emergency telephone number:

0049 (0)761 19240 - 24 h German and English

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Hazard categories:
Acute toxicity: Acute Tox. 2
Acute toxicity: Acute Tox. 2
Acute toxicity: Acute Tox. 3
Skin corrosion/irritation: Skin Corr. 1A
Serious eye damage/eye irritation: Eye Dam. 1
Hazardous to the aquatic environment: Aquatic Chronic 2
Hazard Statements:
Fatal in contact with skin.
Fatal if inhaled.
Toxic if swallowed.
Causes severe skin burns and eye damage.
Causes serious eye damage.
Toxic to aquatic life with long lasting effects.

2.2. Label elements

Hazard components for labelling

Sodium cyanide

Signal word: Danger

Pictograms:

Hazard statements

H301	Toxic if swallowed.
H310+H330	Fatal in contact with skin or if inhaled.
H314	Causes severe skin burns and eye damage.

H411	Toxic to aquatic life with long lasting effects.

Precautionary statements

P260	Do not breathe dust/fume/gas/mist/vapours/spray.
P262	Do not get in eyes, on skin, or on clothing.
P264	Wash hands 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+P330+P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P310	Immediately call a POISON CENTER/doctor.
P321	Specific treatment (see 4.1 on this label).
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P310	Immediately call a POISON CENTER/doctor.
P321	Specific treatment (see ... on this label).
P352	Wash with plenty of water.
P361+P364	Take off immediately all contaminated clothing and wash it before reuse.
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P310	Immediately call a POISON CENTER/doctor.
P320	Specific treatment is urgent (see 4.1 on this label).
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call a POISON CENTER/doctor.
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.

SECTION 3: Composition/information on ingredients

3.2. Mixtures

Hazardous components

CAS No	Chemical name			Quantity
	EC No	Index No	REACH No	
	Classification according to Regulation (EC) No. 1272/2008 [CLP]			
143-33-9	Sodium cyanide			7 %
	205-599-4			
	Acute Tox. 1, Acute Tox. 1, Aquatic Acute 1 (M-Factor = 1), Aquatic Chronic 1; H300 H310 H400 H410 EUH032			

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

SECTION 4: First aid measures

4.1. Description of first aid measures

General information

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

Self protection of first aider: By occurance of indications consult immediatley 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 immediatley the doctor below the keyword suspicion of prussic acid contamination. Ideal storage, protection against heat and cold, observe the casulty at least one hour.
2. Medium heavy up to heavy contamination: Unconscious, breath intact or apnoea, if appcliable convulsion affection call immeditaley the emergency doctor (tel.112) under the keyword suspicion of prussic acid. Bring about absolute body calm and protect against loss of heat.
Contamination through swallowing: Call immediately the emergency doctor (tel.112) under the keyword prussic acid contamination. Let immediatley swallow three spoons of activated carbon with water, provided the consciousness is conserved.

After inhalation

After inhalation of aerosols or exhalation out of 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 immediatley 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.

4.3. 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 immediatley. In these cases muscous 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, arrythmia, hypotension, peripheric vascular collapse, apnoea,

cardiac arrest.
By at first unkown 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 accorgingly.
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 registrated topic effects on eyes and skin should be treated occasionally symptomatic (possibly enlistment of a ophthalmologist). The intensity of the theraphy should comply after the severity of the intoxikation:
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 (FiO2, 1,0), if necessary needed partly blank buffering (prähospital) with 1-molar sodium bicarbonate solution, mayby here DMAP/thiosulphate (see level 3). Level 3: Unconsciousness, metabolic acidosis and/or convulsions, arryhtmia, shock ? intubation, oxygen (FiO2 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 a 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

5.1. Extinguishing media

Suitable extinguishing media

Dry extinguishing powder.

Unsuitable extinguishing media

Water spray. Carbon dioxide (CO_2).

5.2. 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.

5.3. 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

6.1. 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).
Take up mechanically.
Subsequent ventilate the room and clean contaminated subjects and floor.

6.2. 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.

6.3. **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

7.1. **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.

7.2. **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 togehter with these substances is forbidden:
- Medicine, food, forages including additives. - Dangerous contagiosity, 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

8.1. **Control parameters**

Additional advice on limit values

The instructions are academic references and no effective authorization.
3,8mg/m3 measured as respirable aerosole rate. Restriction of exposition cusp: Exeeding 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.

8.2. **Exposure controls**

Protective and hygiene measures

When using do not eat, drink, smoke, sniff. Wash hands before breaks and after work.
General Precautions for safe handling of chemicals.

Eye/face protection

Tightly sealed safety glasses.

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 the case of wanting to use the gloves

again, clean them before taking off and air them well. Consider skin care.
Totally not suitable are cloth- or leather gloves.
Following data is valid for liquid, sated solutions of salt.
Suitable are gloves out of the following materials (breakthrough time >=8 hours) :
Nature latex-NR (0,5mm)(use non powdered and non allergic products) Polychloropene- 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.

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

9.1. Information on basic physical and chemical properties

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

		Test method
pH-Value (at 20 °C):	> 11	
Changes in the physical state		
Initial boiling point and boiling range:	not determined	
Sublimation point:	not determined	
Explosive properties		
not explosive.		
Lower explosion limits:	not applicable	
Ignition temperature:	not applicable	
Oxidizing properties		
Not oxidising.		
Vapour pressure:	not determined	
Density (at 20 °C):	1,04 g/cm³	
Water solubility:	unlimited	
Solubility in other solvents		
not determined		
Partition coefficient:	not determined	
Viscosity / dynamic: (at 20 °C)	10 mPa·s	
Solvent separation test:	not applicable	

SECTION 10: Stability and reactivity

10.2. **Chemical stability**

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

10.3.**Possibility of hazardous reactions**

The substance may react dangerously with:
nitric acid, urea (heat), alkali carbonates->hydrogen cyanide, acids->hydrogen cyanide, moist carbon dioxide->hydrogen cyanide

10.4.**Conditions to avoid**

Avoid contact with acids !

10.6. Hazardous decomposition products

Sodium acetylated; nitrogen, hydrogen cyanide.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Toxicocinetics, metabolism and distribution

Resorbiertes NaCN is attached reversible, in particular at Methämoglobin (0,5 – 1% of haemoglobin) 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 diffrent). In the quantitative important step of metabolize thiocyanade (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 theraphy uses the high affinity of cyanide to Fe3+, by a part of the Fe2+haemoglobin oxidizes to Fe3+-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

Giftig bei Verschlucken.
Lebensgefahr bei Hautkontakt oder Einatmen.

ATEmix calculated

ATE (oral) 92,0 mg/kg; ATE (dermal) 148,6 mg/kg; ATE (inhalative vapour) 1,14 mg/l

CAS No	Chemical name				
	Exposure route	Method	Dose	Species	Source
143-33-9	Sodium cyanide				
	oral	LD50	6,44 mg/kg	Rat	
	dermal	LD50	10,4 mg/kg	Rabbit	
	inhalative (1 h) vapour	LC50	0,16 mg/l	Rat	

Sensitising effects

An allgernization by acitvity-schedulded 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.

STOT-single exposure

not determined

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 parentaloxische concentration. Mutagenicity: Alkaline cyanide provided in Genotoxizitätstests on microorganisms and cell cultures negative results. Carzinoma: There exist no sufficient indications.

SECTION 12: Ecological information

12.1.**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] | [d]	Species	Source
143-33-9	Sodium cyanide					
	Acute fish toxicity	LC50	0,125 mg/l	96 h		

12.2.**Persistence and degradability**

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

12.3.**Bioaccumulative potential**

not determined

12.4.**Mobility in soil**

not determined

Further information

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

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Advice on disposal

Removal only after neutralization with EXNOVIRIN possible- consider dirctions 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 hazardous substances; hazardous waste

Contaminated packaging

Packaging is to 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)

14.1.**UN number:**	UN 3414
14.2.**UN proper shipping name:**	SODIUM CYANIDE SOLUTION (ca. 7%)
14.3. Transport hazard class(es):	6.1
14.4. Packing group:	II

Hazard label: 6.1

Classification code: T4
Limited quantity: 100 mL
Excepted quantity: E4
Transport category: 2
Hazard No: 60
Tunnel restriction code: D/E

Inland waterways transport (ADN)

14.1.**UN number:** UN 3414
14.2.**UN proper shipping name:** SODIUM CYANIDE SOLUTION (ca. 7%)
14.3. Transport hazard class(es): 6.1

14.4.**Packing group:** II
Hazard label: 6.1

Classification code: T4
Special Provisions: 802

Limited quantity: 100 mL
Excepted quantity: E4

Marine transport (IMDG)

14.1.**UN number:** UN 3414
14.2.**UN proper shipping name:** SODIUM CYANIDE SOLUTION 7%
14.3. Transport hazard class(es): 6.1
14.4. Packing group: II
Hazard label: 6.1

Marine pollutant: P
Special Provisions: -

Limited quantity: 100 mL
Excepted quantity: E4
EmS: F-A, S-A

Air transport (ICAO-TI/IATA-DGR)

14.1.**UN number:** UN 3414
14.2.**UN proper shipping name:** SODIUM CYANIDE SOLUTION 7%
14.3. Transport hazard class(es): 6.1
14.4. Packing group: II
Hazard label: 6.1

Special Provisions:	A3
Limited quantity Passenger:	1 L
Passenger LQ:	Y641
Excepted quantity:	E4
IATA-packing instructions - Passenger:	654
IATA-max. quantity - Passenger:	5 L
IATA-packing instructions - Cargo:	662
IATA-max. quantity - Cargo:	60 L

14.5. **Environmental hazards**

ENVIRONMENTALLY HAZARDOUS: yes

SECTION 15: Regulatory information

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

National regulatory information

Employment restrictions:	Observe restrictions to employment for juvenils according to the 'juvenile work protection guideline' (94/33/EC). Observe employment restrictions under the Maternity Protection Directive (92/85/EEC) for expectant or nursing mothers.
Water contaminating class (D):	3 - highly water contaminating

15.2. **Chemical safety assessment**

For this substance a chemical safety assessment has not been carried out.

SECTION 16: Other information

Changes

This data sheet contains changes from the previous version in section(s): 2,4,9,11,14,15.

Relevant H and EUH statements (number and full text)

H300	Fatal if swallowed.
H301	Toxic if swallowed.
H310	Fatal in contact with skin.
H310+H330	Fatal in contact with skin or if inhaled.
H314	Causes severe skin burns and eye damage.
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.
EUH032	Contact with acids liberates very toxic gas.

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.)

Safety Data Sheet

according to Regulation (EC) No 1907/2006

Exnovirin

Product code: 4649.50

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

1.1. Product identifier

Exnovirin

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

Use of the substance/mixture

Renovirin - Cyanide detoxification

1.3. Details of the supplier of the safety data sheet

Company name:	Bullnheimer & Co. GmbH & Co. KG	
Street:	Im Tal 12	
Place:	D86179 Augsburg	
Telephone:	+49 (0)821 80850 0	Telefax: +49 (0)821 80850 90
e-mail:	info@bullnheimer.de	
Contact person:		
Internet:	www.bullnheimer.de	
Responsible Department:	Poison Information Center of the University of Freiburg.	

1.4. Emergency telephone number:

0049 (0)761 19240 - 24 h German and English

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Hazard categories:
Skin corrosion/irritation: Skin Corr. 1A
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.
Causes serious eye damage.
Very toxic to aquatic life.

2.2. Label elements

Hazard components for labelling

Sodium hypochlorite, solution 13-16 % Cl active

Signal word: Danger

Pictograms:

Hazard statements

H314	Causes severe skin burns and eye damage.
H400	Very toxic to aquatic life.

Precautionary statements

P260	Do not breathe dust/fume/gas/mist/vapours/spray.
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): Take off immediately all contaminated clothing. Rinse skin with water/shower.

P363	Wash contaminated clothing before reuse.
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P310	Immediately call a POISON CENTER/doctor.
P321	Specific treatment (see 4.1 on this label).
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call a POISON CENTER/doctor.
P391	Collect spillage.
P405	Store locked up.
P501	Dispose of contents/container to an officially registered waste disposal company.

Special labelling of certain mixtures

EUH031	Contact with acids liberates toxic gas.

SECTION 3: Composition/information on ingredients

3.2. Mixtures

Hazardous components

CAS No	Chemical name			Quantity
	EC No	Index No	REACH No	
	Classification according to Regulation (EC) No. 1272/2008 [CLP]			
7681-52-9	Sodium hypochlorite, solution 13-16 % Cl active			42 %
	231-668-3	017-011-00-1		
	Skin Corr. 1B, Aquatic Acute 1; H314 H400 EUH031			

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

SECTION 4: First aid measures

4.1. 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 unwellness, seek medical advice immediately (show directions for use or 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.
Call a physician immediately.

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.

After ingestion

Rinse mouth immediately and drink plenty of water.
If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label.

4.3. 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, Tracheoband ronchitis, pulmonary edema, Pneumonie, (nach Latenz), possibly sudden cardiac death.
Ingestion: Burn/pain in the mouth, throat, oesuphagus, 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 following 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 glucocordicoides 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/treat-ment. 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 glucocordicoid administration may be required to prevent the formation of a glottisödema 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

5.1. Extinguishing media

Suitable extinguishing media

Water spray. Foam. Carbon dioxide. Extinguishing powder.

5.2. 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.

5.3. Advice for firefighters

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

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

6.1. **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).

6.2. **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.

6.3. **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 coasted liquid with acid. Pump down bigger amounts.
Subsequent ventilate the room and clean contaminated subjects and floor.

SECTION 7: Handling and storage

7.1. **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 adequate ventilation as well as local exhaustion at critical locations.

7.2. **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 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

8.1. Control parameters

8.2. 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 after work.

Eye/face protection

Adequate eye protection must be wearied.
Wear protective glasses.

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 >= 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)

Skin protection

The protection clothing should be alkali-resistant.

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).

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state:	liquid
Colour:	light yellow
Odour:	to chlorine

		Test method
pH-Value (at 20 °C):	10 g/l < 11	

Changes in the physical state

Initial boiling point and boiling range:	ca. 90 °C
Zersetzungstemperatur::	ca. 35 °C
Flash point:	not applicable

Explosive properties

not explosive.

Oxidizing properties

Not oxidising.

Vapour pressure:	not determined
Density (at 20 °C):	1,06 g/cm³
Water solubility:	unendlich

Solubility in other solvents
not determined

Partition coefficient:	not determined
Viscosity / dynamic: (at 20 °C)	<10 mPa·s
Vapour density:	not determined
Solvent separation test:	not applicable

SECTION 10: Stability and reactivity

10.2. **Chemical stability**

Stable under normal temperature and compression conditions. Light sensitive.

10.3. **Possibility of hazardous reactions**

By reaction of acids occurs chlorine.

10.4. **Conditions to avoid**

Sunlight, heat temperature below 40°C.

10.5. **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.

10.6. **Hazardous decomposition products**

Hydrogen chloride, chlorine, sodium oxide.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Toxicocinetics, metabolism and distribution

In individual cases allergic reactions are described by human beings towards NaOCI-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% NaOCI-solution was in a animal experiment very low (LD50 > 2g/kg KG). By inhalation the aerosol of a NaOCI-solution can irritate the airways. In a test on mouses 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 NaOCI 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% NaOCI solution increased level of sodium and Hyperchlorämische acidosis is to be proved.

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

STOT-single exposure

not determined

Severe effects after repeated or prolonged exposure

not determined

Carcinogenic/mutagenic/toxic effects for reproduction

The are no data available for classification of this substance concerning his carcinogenic out of EPA, IAR, NTP, OSHA or ACGIH.

Specific effects in experiment on an animal

LD50 (orale, mouse): 5800mg/kg

SECTION 12: Ecological information

12.1.**Toxicity**

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

12.2.**Persistence and degradability**

not determined

12.3.**Bioaccumulative potential**

not determined

12.4.**Mobility in soil**

If product enters soil, it will be mobile and may contaminate groundwater.

12.6. Other adverse effects

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

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Advice on disposal

Dispose of waste according to "Kreislaufwirtschafts- und Abfallgesetz (KrW-/AbfG)".

Waste disposal number of waste from residues/unused products

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 hazardous substances; hazardous waste

Contaminated packaging

Contaminated packages must be completely emptied and can be re-used following proper cleaning.

SECTION 14: Transport information

Land transport (ADR/RID)

14.1.**UN number:**	UN 1791
14.2.**UN proper shipping name:**	HYPOCHLORITE SOLUTION ca. 8%ig
14.3. Transport hazard class(es):	8
14.4. Packing group:	III
Hazard label:	8

Classification code:	C9
Special Provisions:	521
Limited quantity:	5 L
Excepted quantity:	E1

Transport category:	3
Hazard No:	80
Tunnel restriction code:	E

Inland waterways transport (ADN)

14.1.**UN number:**	UN 1791
14.2.**UN proper shipping name:**	HYPOCHLORITE SOLUTION ca. 8%ig
14.3. Transport hazard class(es):	8
14.4.**Packing group:**	III
Hazard label:	8

Classification code:	C9
Special Provisions:	521
Limited quantity:	5 L
Excepted quantity:	E1

Marine transport (IMDG)

14.1.**UN number:**	UN 1791
14.2.**UN proper shipping name:**	HYPOCHLORITE SOLUTION
14.3. Transport hazard class(es):	8
14.4. Packing group:	III
Hazard label:	8

Marine pollutant:	P
Special Provisions:	223
Limited quantity:	5 L
Excepted quantity:	E1
EmS:	F-A, S-B

Air transport (ICAO-TI/IATA-DGR)

14.1.**UN number:**	UN 1791
14.2.**UN proper shipping name:**	HYPOCHLORITE SOLUTION
14.3. Transport hazard class(es):	8
14.4. Packing group:	III
Hazard label:	8

Special Provisions:	A3 A803

Limited quantity Passenger:	1 L	
Passenger LQ:	Y841	
Excepted quantity:	E1	
IATA-packing instructions - Passenger:		852
IATA-max. quantity - Passenger:		5 L
IATA-packing instructions - Cargo:		856
IATA-max. quantity - Cargo:		60 L
ENVIRONMENTALLY HAZARDOUS:	yes	

14.5. **Environmental hazards**

SECTION 15: Regulatory information

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

National regulatory information

Employment restrictions:	Observe restrictions to employment for juvenils according to the 'juvenile work protection guideline' (94/33/EC). Observe employment restrictions under the Maternity Protection Directive (92/85/EEC) for expectant or nursing mothers. Observe employment restrictions for women of child-bearing age.
Water contaminating class (D):	2 - water contaminating

15.2. **Chemical safety assessment**

For this substance a chemical safety assessment has not been carried out.

SECTION 16: Other information

Changes

This data sheet contains changes from the previous version in section(s): 2,9,12,14.

Relevant H and EUH statements (number and full text)

H314	Causes severe skin burns and eye damage.
H400	Very toxic to aquatic life.
EUH031	Contact with acids liberates toxic gas.

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.)