

ZAC Flux Solutions (W;C;CS;F;K;K6; 40-50% Solutions)

Safety Data Sheet

SECTION 1: Identification

1.1. Product identifier

Product name : ZAC Flux Solutions (W;C;CS;F;K;K6; 40-50% Solutions)

1.2. Recommended use and restrictions on use

Manufacturing

1.3. Supplier

Zaclon LLC
2981 Independence Road
Cleveland, OH 44115
T 800-356-7327

1.4. Emergency telephone number

Emergency number : Chemtrec 1 800 424 9300

SECTION 2: Hazard identification

2.1. Classification of the substance or mixture

GHS-US/CAN classification

Acute toxicity (oral) Category 4	H302
Skin corrosion/irritation Category 1B	H314
Specific target organ toxicity (single exposure) Category 3	H335
Hazardous to the aquatic environment - Acute Hazard Category 1	H400
Hazardous to the aquatic environment - Chronic Hazard Category 1	H410

Full text of H statements : see section 16

2.2. GHS Label elements, including precautionary statements

GHS-US/CAN labelling

Hazard pictograms :



Signal word : Danger

Hazard statements : H302 - Harmful if swallowed
H314 - Causes severe skin burns and eye damage
H335 - May cause respiratory irritation
H400 - Very toxic to aquatic life
H410 - Very toxic to aquatic life with long lasting effects

Precautionary statements : P260 - Do not breathe dust/fume/gas/mist/vapors/spray
P261 - Avoid breathing dust/fume/gas/mist/vapors/spray
P264 - Wash ... 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
P301+P312 - IF SWALLOWED: Call a POISON CENTER or doctor if you feel unwell
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
P304+P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing
P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P310 - Immediately call a POISON CENTER/doctor
P312 - Call a POISON CENTER/doctor if you feel unwell
P321 - Specific treatment (see label)
P330 - Rinse mouth
P363 - Wash contaminated clothing before reuse
P391 - Collect spillage
P403+P233 - Store in a well-ventilated place. Keep container tightly closed
P405 - Store locked up
P501 - Dispose of contents/container in accordance with local/regional/national/international regulations.

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2.3. Other hazards

No additional information available

2.4. Unknown acute toxicity (GHS-CA)

No data available

SECTION 3: Composition/Information on ingredients

3.1. Substances

Not applicable

3.2. Mixtures

Name	Product identifier	%	GHS-CAN classification	GHS-US classification
Water	(CAS No) 7732-18-5	40 - 50	Not classified	Not classified
Zinc chloride	(CAS No) 7646-85-7	12 - 40	Acute Tox. 4 (Oral), H302 Skin Corr. 1B, H314 Aquatic Acute 1, H400 Aquatic Chronic 1, H410	Acute Tox. 4 (Oral), H302 Skin Corr. 1B, H314 Aquatic Acute 1, H400 Aquatic Chronic 1, H410
Ammonium chloride	(CAS No) 12125-02-9	20 - 30	Acute Tox. 4 (Oral), H302 Eye Irrit. 2, H319 Comb. Dust	Acute Tox. 4 (Oral), H302 Eye Irrit. 2, H319 Comb. Dust

SECTION 4: First-aid measures

4.1. Description of first aid measures

First-aid measures after inhalation	: If inhaled, remove to fresh air immediately. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Call a physician.
First-aid measures after skin contact	: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician. Wash contaminated clothing before reuse and discard shoes.
First-aid measures after eye contact	: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician.
First-aid measures after ingestion	: If swallowed, do not induce vomiting. Give large quantities of water. Call a physician immediately. Never give anything by mouth to an unconscious person.

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

Symptoms/injuries after inhalation	: May cause respiratory irritation.
Symptoms/injuries after skin contact	: Corrosive or irritating to the skin.
Symptoms/injuries after eye contact	: Causes eye damage
Symptoms/injuries after ingestion	: Harmful if swallowed.

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

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media	: As appropriate for combustibles in area.
Unsuitable extinguishing media	: None.

5.2. Special hazards arising from the substance or mixture

Fire hazard	: Will not burn.
Explosion hazard	: None known.

5.3. Advice for firefighters

Protection during firefighting	: Firefighters should wear full protective gear.
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SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

No additional information available

6.1.2. For emergency responders

No additional information available

6.2. Environmental precautions

Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

For containment	: Isolate area. Keep unnecessary personnel away. Stop the flow of material, if this is without risk.
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Methods for cleaning up : Confine spill and soak up with absorbent. Place in an approved container and dispose in accordance with local, state and federal regulations.

6.4. Reference to other sections

No additional information available

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Do not get in eyes, on skin, on clothing. Wash thoroughly after handling.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store in a tightly closed container in a dry place. Do not store with cyanides or sulfides.

7.3. Specific end use(s)

Manufacturing

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Ammonium chloride (12125-02-9)		
USA - ACGIH	ACGIH TWA (mg/m ³)	10 mg/m ³ (fume)
USA - ACGIH	ACGIH STEL (mg/m ³)	20 mg/m ³ (fume)
Canada (Quebec)	VECD (mg/m ³)	20 mg/m ³ (fume)
Canada (Quebec)	VEMP (mg/m ³)	10 mg/m ³ (fume)
Alberta	OEL STEL (mg/m ³)	20 mg/m ³ (fume)
Alberta	OEL TWA (mg/m ³)	10 mg/m ³ (fume)
British Columbia	OEL STEL (mg/m ³)	20 mg/m ³ (fume)
British Columbia	OEL TWA (mg/m ³)	10 mg/m ³ (fume)
Manitoba	OEL STEL (mg/m ³)	20 mg/m ³ (fume)
Manitoba	OEL TWA (mg/m ³)	10 mg/m ³ (fume)
New Brunswick	OEL STEL (mg/m ³)	20 mg/m ³ (fume)
New Brunswick	OEL TWA (mg/m ³)	10 mg/m ³ (fume)
New Foundland & Labrador	OEL STEL (mg/m ³)	20 mg/m ³ (fume)
New Foundland & Labrador	OEL TWA (mg/m ³)	10 mg/m ³ (fume)
Nova Scotia	OEL STEL (mg/m ³)	20 mg/m ³ (fume)
Nova Scotia	OEL TWA (mg/m ³)	10 mg/m ³ (fume)
Nunavut	OEL STEL (mg/m ³)	20 mg/m ³ (fume)
Nunavut	OEL TWA (mg/m ³)	10 mg/m ³ (fume)
Northwest Territories	OEL STEL (mg/m ³)	20 mg/m ³ (fume)
Northwest Territories	OEL TWA (mg/m ³)	10 mg/m ³ (fume)
Ontario	OEL STEL (mg/m ³)	20 mg/m ³ (fume)
Ontario	OEL TWA (mg/m ³)	10 mg/m ³ (fume)
Prince Edward Island	OEL STEL (mg/m ³)	20 mg/m ³ (fume)
Prince Edward Island	OEL TWA (mg/m ³)	10 mg/m ³ (fume)
Saskatchewan	OEL STEL (mg/m ³)	20 mg/m ³ (fume)
Saskatchewan	OEL TWA (mg/m ³)	10 mg/m ³ (fume)
Yukon	OEL STEL (mg/m ³)	20 mg/m ³ (fume)
Yukon	OEL TWA (mg/m ³)	10 mg/m ³ (fume)
Zinc chloride (7646-85-7)		
USA - ACGIH	ACGIH TWA (mg/m ³)	1 mg/m ³ (fume)
USA - ACGIH	ACGIH STEL (mg/m ³)	2 mg/m ³ (fume)
USA - OSHA	OSHA PEL (TWA) (mg/m ³)	1 mg/m ³ (fume)
Canada (Quebec)	VEMP (mg/m ³)	1 mg/m ³ (fume)
Alberta	OEL STEL (mg/m ³)	2 mg/m ³ (fume)
Alberta	OEL TWA (mg/m ³)	1 mg/m ³ (fume)
British Columbia	OEL STEL (mg/m ³)	2 mg/m ³ (fume)
British Columbia	OEL TWA (mg/m ³)	1 mg/m ³ (fume)

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Zinc chloride (7646-85-7)

Manitoba	OEL STEL (mg/m ³)	2 mg/m ³ (fume)
Manitoba	OEL TWA (mg/m ³)	1 mg/m ³ (fume)
New Brunswick	OEL STEL (mg/m ³)	2 mg/m ³ (fume)
New Brunswick	OEL TWA (mg/m ³)	1 mg/m ³ (fume)
New Foundland & Labrador	OEL STEL (mg/m ³)	2 mg/m ³ (fume)
New Foundland & Labrador	OEL TWA (mg/m ³)	1 mg/m ³ (fume)
Nova Scotia	OEL STEL (mg/m ³)	2 mg/m ³ (fume)
Nova Scotia	OEL TWA (mg/m ³)	1 mg/m ³ (fume)
Nunavut	OEL STEL (mg/m ³)	2 mg/m ³ (fume)
Nunavut	OEL TWA (mg/m ³)	1 mg/m ³ (fume)
Northwest Territories	OEL STEL (mg/m ³)	2 mg/m ³ (fume)
Northwest Territories	OEL TWA (mg/m ³)	1 mg/m ³ (fume)
Ontario	OEL STEL (mg/m ³)	2 mg/m ³ (fume)
Ontario	OEL TWA (mg/m ³)	1 mg/m ³ (fume)
Prince Edward Island	OEL STEL (mg/m ³)	2 mg/m ³ (fume)
Prince Edward Island	OEL TWA (mg/m ³)	1 mg/m ³ (fume)
Saskatchewan	OEL STEL (mg/m ³)	2 mg/m ³ (fume)
Saskatchewan	OEL TWA (mg/m ³)	1 mg/m ³ (fume)
Yukon	OEL STEL (mg/m ³)	2 mg/m ³ (fume)
Yukon	OEL TWA (mg/m ³)	1 mg/m ³ (fume)

8.2. Exposure controls

Appropriate engineering controls	: Provide adequate local exhaust ventilation to maintain worker exposure below exposure limits.
Hand protection	: Use neoprene or PVC rubber gloves, apron, boots; long sleeve shirt and pants. If considerable contact is likely, wear impervious neoprene or PVC rubber clothing or acid suit.
Eye protection	: Use chemical splash goggles.
Skin and body protection	: Wear suitable working clothes.
Respiratory protection	: If airborne concentrations are above the applicable exposure limits, use NIOSH approved respiratory protection.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Liquid
Colour	: Clear
Odour	: odorless.
Odour threshold	: No data available
pH	: 2.5 - 4
Relative evaporation rate (butylacetate=1)	: < 1
Melting point	: No data available
Freezing point	: No data available
Boiling point	: > 100 °C (>212 °F)
Flash point	: No data available
Self ignition temperature	: No data available
Decomposition temperature	: No data available
Flammability (solid, gas)	: No data available
Vapour pressure	: 24 mm Hg at 20°C (68°F)/49 mm Hg at 37.7 °C (100 °F)
Relative vapour density at 20 °C	: No data available
Specific gravity	: 1.2 - 1.5
Solubility	: Complete
Log Pow	: No data available
Log Kow	: No data available
Viscosity, kinematic	: No data available
Viscosity, dynamic	: No data available
Explosive properties	: No data available

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Oxidising properties : No data available
Explosive limits : No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

No additional information available

10.2. Chemical stability

The product is stable at normal handling and storage conditions.

10.3. Possibility of hazardous reactions

Will not occur.

10.4. Conditions to avoid

None

10.5. Incompatible materials

Incompatible with cyanides and sulfides (may release toxic gases).

10.6. Hazardous decomposition products

At high temperatures, (~343°C; ~650°F) as in intended use, ammonium chloride fumes, zinc oxide fumes, zinc chloride fumes, and ammonia and hydrogen chloride gases may be released.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity (oral) : Oral: Harmful if swallowed.
Acute toxicity (dermal) : Not classified
Acute toxicity (inhalation) : Not classified

ATE CA (oral)	500 mg/kg body weight
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Water (7732-18-5)

LD50 oral rat	> 90 ml/kg
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Ammonium chloride (12125-02-9)

LD50 oral rat	1650 mg/kg
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Zinc chloride (7646-85-7)

LD50 oral rat	1100 mg/kg
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Skin corrosion/irritation : Causes severe skin burns and eye damage.

pH: 2.5 - 4

Serious eye damage/irritation : Eye damage, category 1, implicit

pH: 2.5 - 4

Respiratory or skin sensitization : Not classified

Germ cell mutagenicity : Not classified

Carcinogenicity : Not classified

Reproductive toxicity : Not classified.

Tests in bacterial or mammalian cell cultures demonstrate mutagenic activity. Tests in some animals indicate that the compound may have embryotoxic activity.

Specific target organ toxicity – single exposure : May cause respiratory irritation.

The product is corrosive to the eyes and corrosive or irritating to skin. Toxic effects described in animals from short exposures include corrosion of mucosal surfaces, liver effects, and kidney effects.

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Specific target organ toxicity – repeated exposure : Not classified.

Human health effects of overexposure by inhalation, ingestion, or skin or eye contact may initially include: eye irritation with discomfort, tearing, or blurring of vision; skin irritation with discomfort or rash; or irritation of the upper respiratory passages. Higher exposures may lead to these effects: skin and eye burns or ulceration; temporary lung irritation effects with cough, discomfort, difficulty breathing, or shortness of breath; possibly modest initial symptoms, followed in hours by severe shortness of breath, requiring prompt medical attention; fatality from gross overexposure by fume inhalation or by significant ingestion. There are inconclusive or unverified reports of human sensitization. Individuals with preexisting diseases of the lungs may have increased susceptibility to the toxicity of excessive exposures.

When the Zaclon® products are heated to high temperatures as those encountered in the galvanizing process, irritating zinc chloride fumes and gaseous hydrogen chloride may be released. Severe exposures may cause pulmonary edema. Heating may also release zinc oxide fumes which may cause metal fume fever.

Aspiration hazard : Not classified

SECTION 12: Ecological information

12.1. Toxicity

Aquatic acute : Very toxic to aquatic life.
Aquatic chronic : Very toxic to aquatic life with long lasting effects.

Ammonium chloride (12125-02-9)

LC50 fish 1	209 mg/l (Exposure time: 96 h - Species: Cyprinus carpio [static])
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Zinc chloride (7646-85-7)

BCF fish 1	16000
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12.2. Persistence and degradability

No additional information available

12.3. Bioaccumulative potential

Zinc chloride (7646-85-7)

BCF fish 1	16000
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12.4. Mobility in soil

No additional information available

12.5. Other adverse effects

Ozone : Not classified

SECTION 13: Disposal considerations

13.1. Disposal methods

Product/Packaging disposal recommendations : Dispose of contents/container in accordance with local/regional/national/international regulations.

SECTION 14: Transport information

14.1. Basic shipping description

In accordance with TDG

TDG

UN-No. (TDG) : UN3264
Packing group : III - Minor Danger
TDG Primary Hazard Classes : 8 - Class 8 - Corrosives
Transport document description : UN3264 CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (Contains Zinc Chloride and Zinc Ammonium Chloride), 8, III
Proper Shipping Name (TDG) : CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.
Contains Zinc Chloride and Zinc Ammonium Chloride

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Hazard labels (TDG) : 8 - Corrosive substances



TDG Special Provisions : 16 - 1) The technical name of the most dangerous substance related to the primary class must be shown, in parentheses, on the shipping document following the shipping name in accordance with clause 3.5(1)(c)(i)(A) of Part 3, Documentation. The technical name must also be shown, in parentheses, on a small means of containment or on a tag following the shipping name in accordance with subsections 4.11(2) and (3) of Part 4, Dangerous Goods Safety Marks.

2) subsection (1), the technical name for the following dangerous goods is not required to be shown on a shipping document or on a small means of containment when Canadian law for domestic transport or an international convention for international transport prohibits the disclosure of the technical: a) UN1544, ALKALOID SALTS, SOLID, N.O.S. or ALKALOIDS, SOLID, N.O.S; b) UN1851, MEDICINE, LIQUID, TOXIC, N.O.S; c) UN3140, ALKALOID SALTS, LIQUID, N.O.S. or ALKALOIDS, LIQUID, N.O.S; d) UN3248, MEDICINE, LIQUID, FLAMMABLE, TOXIC, N.O.S; or e) UN3249, MEDICINE, SOLID, TOXIC, N.O.S. An example in Canada is the "Food and Drugs Act".

Explosive Limit and Limited Quantity Index : 5 L

Excepted quantities (TDG) : E1

Passenger Carrying Road Vehicle or Passenger Carrying Railway Vehicle Index : 5 L

Marine pollutant : Yes (IMDG only)



14.2. Transport information/DOT

DOT

DOT NA no. : UN3264

UN-No.(DOT) : 3264

Packing group (DOT) : III - Minor Danger

DOT Symbols : G - Identifies PSN requiring a technical name

Transport document description : UN3264 Corrosive liquid, acidic, inorganic, n.o.s. (Contains Zinc Chloride and Zinc Ammonium Chloride), 8, III

Proper Shipping Name (DOT) : Corrosive liquid, acidic, inorganic, n.o.s. (Contains Zinc Chloride and Zinc Ammonium Chloride)

Contains Statement Field Selection (DOT) :

Class (DOT) : 8 - Class 8 - Corrosive material 49 CFR 173.136

Division (DOT) : 8

Hazard labels (DOT) : 8 - Corrosive



Dangerous for the environment : Yes

Marine pollutant : Yes



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DOT Special Provisions (49 CFR 172.102)	: IB3 - Authorized IBCs: Metal (31A, 31B and 31N); Rigid plastics (31H1 and 31H2); Composite (31HZ1 and 31HA2, 31HB2, 31HN2, 31HD2 and 31HH2). Additional Requirement: Only liquids with a vapor pressure less than or equal to 110 kPa at 50 C (1.1 bar at 122 F), or 130 kPa at 55 C (1.3 bar at 131 F) are authorized, except for UN2672 (also see Special Provision IP8 in Table 2 for UN2672). T7 - 4 178.274(d)(2) Normal..... 178.275(d)(3) TP1 - The maximum degree of filling must not exceed the degree of filling determined by the following: Degree of filling = $97 / 1 + a (tr - tf)$ Where: tr is the maximum mean bulk temperature during transport, and tf is the temperature in degrees celsius of the liquid during filling. TP28 - A portable tank having a minimum test pressure of 2.65 bar (265 kPa) may be used provided the calculated test pressure is 2.65 bar or less based on the MAWP of the hazardous material, as defined in 178.275 of this subchapter, where the test pressure is 1.5 times the MAWP.
DOT Packaging Exceptions (49 CFR 173.xxx)	: 154
DOT Packaging Non Bulk (49 CFR 173.xxx)	: 203
DOT Packaging Bulk (49 CFR 173.xxx)	: 241
DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27)	: 5 L
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75)	: 60 L
DOT Vessel Stowage Location	: A - The material may be stowed "on deck" or "under deck" on a cargo vessel and on a passenger vessel.
DOT Vessel Stowage Other	: 40 - Stow "clear of living quarters"
Other information	: No supplementary information available.

14.3. Air and sea transport

IMDG

UN-No. (IMDG)	: 3264
Proper Shipping Name (IMDG)	: CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.
Transport document description (IMDG)	: UN 3264 CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S., 8, III, MARINE POLLUTANT/ENVIRONMENTALLY HAZARDOUS
Class (IMDG)	: 8 - Corrosive substances
Packing group (IMDG)	: III - substances presenting low danger

IATA

UN-No. (IATA)	: 3264
Proper Shipping Name (IATA)	: Corrosive liquid, acidic, inorganic, n.o.s.
Transport document description (IATA)	: UN 3264 Corrosive liquid, acidic, inorganic, n.o.s., 8, III, ENVIRONMENTALLY HAZARDOUS
Class (IATA)	: 8 - Corrosives
Packing group (IATA)	: III - Minor Danger

SECTION 15: Regulatory information

15.1. Canada National regulations

Water (7732-18-5)

Listed on the Canadian DSL (Domestic Substances List)

Ammonium chloride (12125-02-9)

Listed on the Canadian DSL (Domestic Substances List)

Zinc chloride (7646-85-7)

Listed on the Canadian DSL (Domestic Substances List)

15.2. US Federal regulations

Water (7732-18-5)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

Ammonium chloride (12125-02-9)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

Zinc chloride (7646-85-7)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

15.3. US State regulations

Ammonium chloride (12125-02-9)

U.S. - Massachusetts - Right To Know List
U.S. - Minnesota - Hazardous Substance List

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Ammonium chloride (12125-02-9)

U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) List

Zinc chloride (7646-85-7)

U.S. - Massachusetts - Right To Know List
U.S. - Minnesota - Hazardous Substance List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) List

SECTION 16: Other information

Full text of H-phrases:

H302	Harmful if swallowed
H314	Causes severe skin burns and eye damage
H319	Causes serious eye irritation
H335	May cause respiratory irritation
H400	Very toxic to aquatic life
H410	Very toxic to aquatic life with long lasting effects

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product