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

1.1. Product identifier

Piperidine

Further trade names

Hexahydropyridine
Azacyclohexane
Pentamethyleneamine
Azinane

Substance name:	piperidine
Abbreviation:	PIP
REACH Registration Number:	01-2119962908-20-XXXX
CAS No:	110-89-4
Index No:	613-027-00-3
EC No:	203-813-0

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

Use of the substance/mixture

Manufacture of the substance. Laboratory chemical

Uses advised against

Do not use for private purposes (household).
Restrictions on use: Pharmaceutical substance

1.3. Details of the supplier of the safety data sheet

Company name:	Iris Biotech GmbH		
Street:	Adalbert-Zoellner-Straße 1		
Place:	D-95615 Marktredwitz, Germany		
Post-office box:	568 D-95605 Marktredwitz, Germany		
Telephone:	+49 9231 97121 0	Telefax:	+49 9231 97121 99
e-mail:	info@iris-biotech.de		
Contact person:	Compliance Department	Telephone:	+49 9231 97121 0
e-mail:	sds@iris-biotech.de		
Internet:	www.iris-biotech.de		
Responsible Department:	Only available during office hours.		

1.4. Emergency telephone number:

+49 (0)89 19240 (POISON CENTER Munich: 24 h)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

GB CLP Regulation

Flam. Liq. 2; H225
Acute Tox. 3; H331
Acute Tox. 3; H311
Acute Tox. 4; H302
Skin Corr. 1B; H314
Eye Dam. 1; H318

Full text of hazard statements: see SECTION 16.

2.2. Label elements

GB CLP Regulation

Signal word: Danger

Pictograms:

Hazard statements

H225	Highly flammable liquid and vapour.
H302	Harmful if swallowed.
H311+H331	Toxic in contact with skin or if inhaled.
H314	Causes severe skin burns and eye damage.

Precautionary statements

P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P260	Do not breathe dust/fume/gas/mist/vapours/spray.
P264	Wash hands thoroughly after handling.
P280	Wear protective gloves/protective clothing/eye protection/face protection/hearing protection.
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call a POISON CENTER/doctor.
P403+P235	Store in a well-ventilated place. Keep cool.

Additional advice on labelling

Warning - substance not yet tested completely.

Labelling of packages where the contents do not exceed 125 ml

Signal word: Danger

Pictograms:

Hazard statements

H311+H331-H314

Precautionary statements

P260-P264-P280-P303+P361+P353-P305+P351+P338-P310

2.3. Other hazards

No information available.

SECTION 3: Composition/information on ingredients

3.1. Substances

Chemical characterization

Piperidine

Sum formula:	C5H11N
Molecular weight:	85,15 g/mol

Hazardous components

CAS No	Chemical name			Quantity
	EC No	Index No	REACH No	
	Classification (GB CLP Regulation)			
110-89-4	piperidine			100 %
	203-813-0	613-027-00-3	01-2119962908-20-XXXX	
	Flam. Liq. 2, Acute Tox. 3, Acute Tox. 4, Skin Corr. 1B, Eye Dam. 1; H225 H331 H311 H302 H314 H318			

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

Specific Conc. Limits, M-factors and ATE

CAS No	EC No	Chemical name	Quantity
	Specific Conc. Limits, M-factors and ATE		
110-89-4	203-813-0	piperidine	100 %
	inhalation: LC50 = 4,8 mg/l (vapours); inhalation: ATE = 0,5 mg/l (dusts or mists); dermal: LD50 = 275 mg/kg; oral: LD50 = 740 mg/kg		

SECTION 4: First aid measures

4.1. Description of first aid measures

General information

First aider: Pay attention to self-protection! Remove affected person from the danger area and lay down. Take off contaminated clothing. Remove breathing apparatus only after contaminated clothing have been removed. In case of irregular breathing or respiratory arrest provide artificial respiration.

After inhalation

Provide fresh air. If breathing is irregular or stopped, administer artificial respiration. No mouth-to-mouth or mouth-to-nose resuscitation. Use Ambu bag or ventilator.
If victim is at risk of losing consciousness, position and transport on their side. Call a physician immediately.

After contact with skin

After contact with skin, wash immediately with plenty of water and soap. Take off immediately all contaminated clothing and wash it before reuse. Call a physician immediately.

After contact with eyes

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

After ingestion

Do NOT induce vomiting. Adverse human health effects and symptoms: Gastric perforation. Call a physician immediately. Do not allow a neutralisation agent to be drunk. Rinse mouth immediately and drink plenty of water. Immediately call a doctor.

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

Dyspnoea
Dizziness
Disorientation
Dilated pupils

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

Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media

Water spray jet, Carbon dioxide (CO2), Foam, Extinguishing powder. Water spray. alcohol resistant foam. Dry extinguishing powder. Carbon dioxide (CO2). Sand.

Fight larger fires with water spray or alcohol resistant foam.

Unsuitable extinguishing media

High power water jet.

5.2. Special hazards arising from the substance or mixture

Highly flammable. Vapours can form explosive mixtures with air. Thermal decomposition can lead to the escape of irritating gases and vapours.
In case of fire may be liberated: Carbon dioxide (CO2). Carbon monoxide (CO). Nitrogen oxides (NOx). anaerobic: Ammonia (NH3) (NH3).

5.3. Advice for firefighters

Wear a self-contained breathing apparatus and chemical protective clothing. Full protection suit.

Additional information

Use water spray jet to protect personnel and to cool endangered containers. Suppress gases/vapours/mists with water spray jet. Collect contaminated fire extinguishing water separately. Do not allow entering drains or surface water. Usual measures for fire prevention.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General advice

Remove all sources of ignition. Provide adequate ventilation. Do not breathe gas/fumes/vapour/spray. Avoid contact with skin, eyes and clothes. Use personal protection equipment. Wear personal protection equipment. Restrict access to stockrooms.

For non-emergency personnel

Cover drains.
Make sure spills can be contained, e.g. in sump pallets or kerbed areas.

For emergency responders

Cover drains.
Stop and contain spill/release if it can be done safely.

6.2. Environmental precautions

Do not allow uncontrolled discharge of product into the environment. Explosion risk. Do not allow to enter into soil/subsoil.
Do not allow to enter into surface water or drains. Dilute with plenty of water.

6.3. Methods and material for containment and cleaning up

For containment

Cover drains.
Stop and contain spill/release if it can be done safely.

For cleaning up

Absorb with liquid-binding material (sand, diatomaceous earth, acid- or universal binding agents). Treat the recovered material as prescribed in the section on waste disposal.

Other information

Absorb with liquid-binding material (sand, diatomaceous earth, acid- or universal binding agents). Treat the recovered material as prescribed in the section on waste disposal.
Disposal: see section 13 Provide adequate ventilation as well as local exhaustion at critical locations.

6.4. Reference to other sections

Safe handling: see section 7
Personal protection equipment: see section 8
Disposal: see section 13 SECTION 7: Handling and storage SECTION 8: Exposure controls/personal protection Disposal: see section 13

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Advice on safe handling

If handled uncovered, arrangements with local exhaust ventilation have to be used. Do not breathe gas/fumes/vapour/spray. Provide adequate ventilation.
Handle and open container with care.

Advice on protection against fire and explosion

Keep away from sources of ignition - No smoking. Take precautionary measures against static discharges. Vapours can form explosive mixtures with air.
Take action to prevent static discharges. Keep respiratory protective device available.

Advice on general occupational hygiene

Remove contaminated, saturated clothing immediately. Draw up and observe skin protection programme. Wash hands and face before breaks and after work and take a shower if necessary. When using do not eat, drink, smoke, sniff. Remove contaminated, saturated clothing immediately. Draw up and observe skin protection programme. Wash hands and face before breaks and after work and take a shower if necessary. When using do not eat or drink. Keep away from food, drink and animal feedingstuffs. Take off immediately all contaminated clothing. Wash hands before breaks and after work. Separate storage of work clothes. Avoid contact with eyes and skin.

7.2. Conditions for safe storage, including any incompatibilities

Requirements for storage rooms and vessels

Keep container tightly closed. Keep locked up. Store in a place accessible by authorized persons only. Provide adequate ventilation as well as local exhaustion at critical locations. Keep in a cool, well-ventilated place. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
storage temperature: room temperature

Hints on joint storage

Do not store together with: Oxidizing agent. Pyrophoric or self-heating substances.

Risk of explosion with:
Dicyanofurazan
N-Nitrosoacetanilid
1-Perchlorylpiperidin

Further information on storage conditions

Provide for retaining containers, e.g. floor pan without outflow.

7.3. Specific end use(s)

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

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Exposure limits (EH40)

CAS No	Substance	ppm	mg/m³	fibres/ml	Category	Origin
110-89-4	Piperidine	1	3.5		TWA (8 h)	WEL

DNEL/DMEL values

CAS No	Substance		
DNEL type	Exposure route	Effect	Value
110-89-4	piperidine		
Worker DNEL, long-term	inhalation	local	7,05 mg/m³

PNEC values

CAS No	Substance	
Environmental compartment		Value
110-89-4	piperidine	
Freshwater		0,076 mg/l
Freshwater (intermittent releases)		0,19 mg/l
Marine water		0,008 mg/l
Freshwater sediment		1,94 mg/kg
Marine sediment		0,194 mg/kg
Micro-organisms in sewage treatment plants (STP)		100 mg/l
Soil		0,342 mg/kg

Additional advice on limit values

No further relevant information available. Safe handling: see section 7

8.2. Exposure controls




Appropriate engineering controls

If handled uncovered, arrangements with local exhaust ventilation have to be used. Do not breathe gas/fumes/vapour/spray. The receiver of our product is singularly responsible for adhering to existing laws and regulations.

Individual protection measures, such as personal protective equipment

Eye/face protection

Wear eye/face protection.
Tightly fitting safety goggles. Face shield (8-inch minimum). Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Hand protection

When handling with chemical substances, protective gloves must be worn with the CE-label including the four control digits. The quality of the protective gloves resistant to chemicals must be chosen as a function of the specific working place concentration and quantity of hazardous substances. For special purposes, it is recommended to check the resistance to chemicals of the protective gloves mentioned above together with the supplier of these gloves. Wear suitable gloves.

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands. The selected protective gloves have to satisfy the specifications of Regulation (EU) 2016/425 and the standard EN 374 derived from it.

Skin protection

Flame-retardant protective clothing. Wear anti-static footwear and clothing Wear suitable protective clothing.

Respiratory protection

In case of inadequate ventilation wear respiratory protection. If technical exhaust or ventilation measures are not possible or insufficient, respiratory protection must be worn.

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN

(EU).

Thermal hazards

Flame-retardant protective clothing. Wear anti-static footwear and clothing

Environmental exposure controls

Do not empty into drains. Explosion hazard

Discharge into the environment must be avoided.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state:	liquid
Colour:	yellowish
Odour:	amin-like, disagreeable
Odour threshold:	not determined

		Test method
Melting point/freezing point:	-9 °C	
Boiling point or initial boiling point and boiling range:	106 °C	
Flammability:	Highly flammable	
Lower explosion limits:	1,3 vol. %	
Upper explosion limits:	10,3 vol. %	
Flash point:	4 °C	
Auto-ignition temperature:	320 °C	
Decomposition temperature:	> 100 °C	
pH-Value (at 20 °C):	12,6	(100 g/l)
Viscosity / kinematic: (at 20 °C)	1,52 mm²/s	
Water solubility:	completely miscible	

Solubility in other solvents

Soluble in: Ethanol, Diethyl ether, Chloroform.

Dissolution rate:	not determined
Partition coefficient n-octanol/water:	Pow: 0,67
Dispersion stability:	not determined
Vapour pressure: (at 20 °C)	33 hPa
Vapour pressure: (at 50 °C)	140 hPa
Density (at 20 °C):	0,8606 g/cm³
Relative density:	not determined
Bulk density:	not applicable
Relative vapour density:	2,94 (air = 1)
Particle characteristics:	not applicable

9.2. Other information

Information with regard to physical hazard classes

Explosive properties

Explosive. Product is not explosive. However, formation of explosive air/vapour mixtures are possible.

Explosion group: IIA

Sustaining combustion:	Sustaining combustion

Self-ignition temperature

Solid:	not applicable
Gas:	not applicable

Oxidizing properties

The product is not: oxidising.

Other safety characteristics

Evaporation rate:	not determined
Solid content:	not applicable
Sublimation point:	not determined
Softening point:	not determined
Pour point:	not determined
Viscosity / dynamic:	not determined
Flow time:	not applicable

Further Information

No further relevant information available.

SECTION 10: Stability and reactivity

10.1. Reactivity

Possibility of hazardous reactions. Highly flammable.

10.2. Chemical stability

Stable under recommended storage conditions.

10.3. Possibility of hazardous reactions

Exothermic reaction with: Acid, Peroxides, Oxidizing agent.

10.4. Conditions to avoid

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Vapours can form explosive mixtures with air.

10.5. Incompatible materials

Keep away from: Acid,
Oxidizing agent, Peroxides. Oxidizing agents, strong.
Dicyanofurazan
N-Nitrosoacetanilid
1-Perchlorylpiperidin

10.6. Hazardous decomposition products

Thermal decomposition can lead to the escape of irritating gases and vapours.
In case of fire may be liberated: Carbon dioxide (CO2). Carbon monoxide (CO). Nitrogen oxides (NOx).
anaerobic: Ammonia (NH3) (NH3).

Further information

In case of fire: See chapter 5.

SECTION 11: Toxicological information

11.1. Information on hazard classes as defined in GB CLP Regulation

Toxicocinetics, metabolism and distribution

No data available

Acute toxicity

Toxic in contact with skin.
Toxic if inhaled.
Harmful if swallowed.

CAS No	Chemical name					
	Exposure route	Dose		Species	Source	Method
110-89-4	piperidine					
	oral	LD50 mg/kg	740	Rat	Study report (1992)	EPA OTS 798.1175
	dermal	LD50 mg/kg	275	Rabbit	Am. Ind. Hyg. Assoc. J. 23, 95-107 (1962	Treatment of the rabbit skin was perform
	inhalation (4 h) vapour	LC50	4,8 mg/l	Rat	Study report (1980)	OECD Guideline 403
	inhalation dust/mist	ATE	0,5 mg/l			

Irritation and corrosivity

Causes severe skin burns and eye damage. (On basis of test data)
Causes serious eye damage. (On basis of test data)
Skin corrosion/irritation:
Skin - rabbit.
Result: Corrosive - 4 h
OECD 404
Note : Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2).

Serious eye damage/irritation:
eyes - Rabbit
Result: Causes serious eye damage.
OECD 405

Sensitising effects

Based on available data, the classification criteria are not met.
Respiratory or skin sensitisation:
Buehler Test - Guinea-pig.
Result: negative.
(US-EPA)

Carcinogenic/mutagenic/toxic effects for reproduction

Based on available data, the classification criteria are not met.
Germ cell mutagenicity:
Test system: hamster cells (lung)
Metabolic activation: with and without metabolic activation
Methode: OECD 476
Result: negative

Type of test: Micronukleus-Test
Species: Mouse. - bone marrow
Application route: oral
Methode: OECD 474
Result: negative

STOT-single exposure

Based on available data, the classification criteria are not met.

STOT-repeated exposure

Based on available data, the classification criteria are not met.

Aspiration hazard

Based on available data, the classification criteria are not met.

Specific effects in experiment on an animal

No data available

Practical experience

No data available

11.2. Information on other hazards

Endocrine disrupting properties

The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Other information

Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin., spasm, inflammation and edema of the larynx, spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary edema, burning sensation, Cough, wheezing, laryngitis, Shortness of breath, Headache, Nausea, Vomiting, Circulatory collapse, tachypnea, paralysis, Convulsions, Coma., necrosis of mouth and G.I. Tract, Jaundice, respiratory failure, cardiac arrest To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Further information

RTECS: TM3500000

Caution! To the best of our knowledge the toxicological properties of this material have not been thoroughly investigated. Other dangerous properties can not be excluded.
Handle in accordance with good industrial hygiene and safety practice.

SECTION 12: Ecological information

12.1. Toxicity

Based on available data, the classification criteria are not met.

CAS No	Chemical name						
	Aquatic toxicity	Dose		[h] | [d]	Species	Source	Method
110-89-4	piperidine						
	Acute fish toxicity	LC50	46 - 100 mg/l	96 h	Leuciscus idus	Study report (1987)	other: German Industrial Standards DIN 3
	Acute algae toxicity	ErC50	106 mg/l	72 h	Desmodesmus subspicatus	Study report (2013)	EU Method C.3
	Acute crustacea toxicity	EC50	19 mg/l	48 h	Daphnia magna	Study report (2013)	OECD Guideline 202
	Crustacea toxicity	NOEC	3,8 mg/l	21 d	Daphnia magna	Study report (2013)	OECD Guideline 211
	Acute bacteria toxicity	(EC50	> 1000 mg/l)	0,5 h	activated sludge, domestic	Study report (1991)	OECD Guideline 209

12.2. Persistence and degradability

CAS No	Chemical name			
	Method	Value	d	Source
	Evaluation			
110-89-4	piperidine			
	Biodegradability:	100 %	14	OECD 301C
	Readily biodegradable (according to OECD criteria).			

12.3. Bioaccumulative potential

No indication of bioaccumulation potential.

Partition coefficient n-octanol/water

CAS No	Chemical name	Log Pow
110-89-4	piperidine	0,64 - 0,7

BCF

CAS No	Chemical name	BCF	Species	Source
110-89-4	piperidine	>= 2,6	Cyprinus carpio	J-CHECK (2021)

12.4. Mobility in soil

No data available

12.5. Results of PBT and vPvB assessment

This substance does not meet the PBT/vPvB criteria of UK REACH.
This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6. Endocrine disrupting properties

This substance does not have endocrine disrupting properties with respect to non-target organisms.

12.7. Other adverse effects

Warning - substance not yet tested completely.

Further information

Avoid release to the environment.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Disposal recommendations

Do not allow to enter into surface water or drains. Dispose of waste according to applicable legislation.
Consult the appropriate local waste disposal expert about waste disposal.
Handle contaminated packages in the same way as the substance itself.

Contaminated packaging

Hazardous waste according to Directive 2008/98/EC (waste framework directive). Handle contaminated packages in the same way as the substance itself. Water, if necessary together with cleansing agents.

SECTION 14: Transport information

Land transport (ADR/RID)

14.1. UN number or ID number: UN 2401
14.2. UN proper shipping name: PIPERIDINE
14.3. Transport hazard class(es): 8
14.4. Packing group: I
Hazard label: 8+3

Classification code: CF1
Limited quantity: 0
Excepted quantity: E0
Transport category: 1
Hazard No: 883
Tunnel restriction code: D/E

Inland waterways transport (ADN)

14.1. UN number or ID number: UN 2401
14.2. UN proper shipping name: PIPERIDINE

14.3. Transport hazard class(es): 8
14.4. Packing group: I
Hazard label: 8+3

Classification code: CF1
Limited quantity: 0
Excepted quantity: E0

Marine transport (IMDG)

14.1. UN number or ID number: UN 2401
14.2. UN proper shipping name: PIPERIDINE
14.3. Transport hazard class(es): 8
14.4. Packing group: I
Hazard label: 8+3

Special Provisions: -
Limited quantity: 0
Excepted quantity: E0
EmS: F-E, S-C
Segregation group: alkalis

Air transport (ICAO-TI/IATA-DGR)

14.1. UN number or ID number: UN 2401
14.2. UN proper shipping name: PIPERIDINE
14.3. Transport hazard class(es): 8
14.4. Packing group: I
Hazard label: 8+3

Limited quantity Passenger: Forbidden
Passenger LQ: Forbidden
Excepted quantity: E0
IATA-packing instructions - Passenger: 850
IATA-max. quantity - Passenger: 0.5 L
IATA-packing instructions - Cargo: 854
IATA-max. quantity - Cargo: 2.5 L

14.5. Environmental hazards

ENVIRONMENTALLY HAZARDOUS: No

14.6. Special precautions for user

Warning: Combustible liquid. strongly corrosive.

14.7. Maritime transport in bulk according to IMO instruments

not applicable

SECTION 15: Regulatory information

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

EU regulatory information

Restrictions on use (REACH, annex XVII):
Entry 3, Entry 40

2010/75/EU (VOC):	100 % (860,6 g/l)
2004/42/EC (VOC):	100 % (860,6 g/l)
Information according to 2012/18/EU (SEVESO III):	38 Piperidine (110-89-4)
Additional information:	H2, P5c

Additional information

Safety Data Sheet according to Regulation (EC) No. 1907/2006 (REACH)

National regulatory information

Employment restrictions:	Observe restrictions to employment for juveniles 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 hazard class (D):	1 - slightly hazardous to water
Skin resorption/Sensitization:	Permeates easily through outer skin and causes poisoning.

Additional information

Observe restrictions to employment for juveniles 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.

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): 1,2,4,5,6,7,8,9,10,11,12,13,14,15,16.

Abbreviations and acronyms

ADR: Accord relatif au transport international des marchandises dangereuses par route
(Agreement concerning the International Carriage of Dangerous Goods by Road).
IMDG: International Maritime Code for Dangerous Goods
IATA: International Air Transport Association
GHS: Globally Harmonized System of Classification and Labelling of Chemicals
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service
LC50: Lethal concentration, 50%
LD50: Lethal dose, 50%
CLP: Classification, labelling and Packaging
REACH: Registration, Evaluation and Authorization of Chemicals
GHS: Globally Harmonised System of Classification, Labelling and Packaging of Chemicals
UN: United Nations
CAS: Chemical Abstracts Service
DNEL: Derived No Effect Level
DMEL: Derived Minimal Effect Level
PNEC: Predicted No Effect Concentration
ATE: Acute toxicity estimate
LL50: Lethal loading, 50%
EL50: Effect loading, 50%
EC50: Effective Concentration 50%

ErC50: Effective Concentration 50%, growth rate
NOEC: No Observed Effect Concentration
BCF: Bio-concentration factor
PBT: persistent, bioaccumulative, toxic
vPvB: very persistent, very bioaccumulative
RID: Regulations concerning the international carriage of dangerous goods by rail
ADN: European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (Accord européen relatif au transport international des marchandises dangereuses par voies de navigation intérieures)
EmS: Emergency Schedules
MFAG: Medical First Aid Guide
IATA: International Air Transport Association
ICAO: International Civil Aviation Organization
MARPOL: International Convention for the Prevention of Marine Pollution from Ships
IBC: Intermediate Bulk Container
SVHC: Substance of Very High Concern
For abbreviations and acronyms, see table at http://abbrev.esdscom.eu

Relevant H and EUH statements (number and full text)

H225	Highly flammable liquid and vapour.
H302	Harmful if swallowed.
H311	Toxic in contact with skin.
H311+H331	Toxic in contact with skin or if inhaled.
H314	Causes severe skin burns and eye damage.
H318	Causes serious eye damage.
H331	Toxic if inhaled.

Further Information

The information is based on the present level of our knowledge. It does not, however, give assurance of product properties and establishes no contract legal rights. The receiver of our product is singularly responsible for adhering to existing laws and regulations.