

Fuel Oil

Material safety data sheet according to (EC) No 1907/2006



Section 1: Identification of the substance/mixture and of the company

1.1 Product identifier

Product name: Fuel Oil, Fuel Oil SA, Fuel Oil 0.3 – 3.5 % sulphur, Heavy Fuel Oil (HFO) and its components with up to 3.5 % sulphur

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

Relevant identified uses: Fuel oil for heating and for combustion engines.
Uses advised against: Other uses are not supported.

1.3 Details of the supplier of the safety data sheet

Supplier: Mabanaft Deutschland Gmb
Am Strandkai 1
20457 Hamburg
GERMANY
Tel.: +49 (0)40 37004 0
Fax: +49 (0)40 37004 7173
Information provided to technical issues by: Kevin Tatzki
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1.4 Emergency telephone number

Giftinformationszentrum-Nord: +49 (0)551 192 40

Section 2: Hazards identification

2.1 Classification of the substance or mixture

2.1.1 Classification according to (EC) No 1272/2008

This mixture is classified as hazardous according to (EC) No 1272/2008.

Acute toxicity (inhalation), Category 4; H332

Carcinogenicity, Category 1B; H350

Reproductive toxicity, Category 2; H361

Specific target organ systematic toxicity (repeated exposure), Category 2; H373

Aquatic toxicity, Category 1; H400

Aquatic chronic, Category 1; H410 (EUH066)

For the full text of hazard statement mentioned in this section, see section 16.

2.2 Label elements

2.2.1 Labelling according to regulation (EC) No 1272/2008

Hazard pictogram



GHS07

GHS08

GHS09

Signal Word: DANGER

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Hazard statements

- H332 – Harmful if inhaled.
- H350 – May cause cancer.
- H361 – Suspected of damaging fertility or the unborn child.
- H373 – May cause damage to organs through prolonged or repeated exposure.
- H400 – Very toxic to aquatic life.
- H410 – Very toxic to aquatic life with long lasting effects.
- EUH066 – Repeated exposure may cause skin dryness or cracking.

Precautionary statements

- P201 – Obtain special instruction before use.
- 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.
- P308 + P313 – If exposed or concerned: Get medical advice/attention.

2.3 Other hazards

Does not meet the criteria for persistent, bioaccumulative and toxic (PBT) or very persistent and very bioaccumulative (vPvB) substances according to Annex XIII of the REACH Regulation. Product may release hydrogen sulphide (H₂S), a very toxic gas.

Heated material can cause burns to eyes and skin.

Section 3: Composition/information on ingredients

3.1 Substances

Component	Product identifier	% ¹⁾	Classification according to Regulation (EC) No 1272/2008
Fuel oil, residual	(EC No) 270-675-6 (CAS No) 68476-33-5 (REACH registration no) 01-2119474894-22-0148	< 100	Acute Tox., Cat. 4; H332 Carc., Cat. 1B; H350 Repr., Cat. 2; H361 STOT RE, Cat. 2; H373 Aquatic Toxicity, Cat. 1; H400 Aquatic Chronic, Cat. 1; H410

¹⁾ Concentration is indicated in vol.-%.

Additional information: Contains benzo[a]pyrene and hydrogen sulphide (H₂S) < 0.1 Mass.-% and up to 3.5 Mass.-% sulphur.

For the full text of the hazard statements see section 16.

3.2 Mixtures

Not applicable.

Section 4: First-aid measures

4.1 Description of first aid measures

Inhalation: If breathing problems or other symptoms of exposure occur, remove affected person from source of exposure and put into a comfortable position in the fresh air. If symptoms persist, seek medical attention immediately. If person is not breathing, initiate artificial respiration immediately. If person has respiratory problems oxygen should be supplied by qualified personnel. Seek medical help immediately.

Skin contact: Remove contaminated shoes and clothing and rinse affected area with water. If the skin surface is damaged, apply sterile cover and seek medical help. If the skin surface is not damaged,

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clean affected area thoroughly by washing with mild soap and water or a waterless hand cleanser. If irritation or redness develops, seek medical help. Clean contaminated clothing before reuse. If the product is injected into or under the skin or any body part, the person should be immediately examined by a physician, regardless of appearance and size of the wound.

Eye contact: Flush eyes with clean water if irritation occurs. If symptoms persist, consult a doctor.

Chocking: Do not induce vomiting or give anything by mouth because this material can enter the lungs and cause lung damage. If victim is drowsy or unconscious put person in safety position. If possible, do not leave the person unattended and continuously monitor breathing. Seek medical help.

Protection of first-aiders: No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

4.2 Most important symptoms and effects, both acute and delayed

Inhalation: Inhalation of larger quantities causes coordination disorders, intoxication, headache, breaching. In case of prolonged exposure: dizziness, unconsciousness and apnea are possible.

Skin contact: Repeated exposure may cause skin dryness or cracking. When using high pressure equipment, product can get under the skin.

Ingestion: Gastrointestinal discomfort.

4.3 Indication of any immediate medical attention and special treatment needed

If swallowed or in case of vomiting, danger of penetration into the lungs. After inhalation, dizziness, unconsciousness and apnea are possible. Symptomatic treatment. Monitor breathing and pulse rate.

Section 5: Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing agents: Dry chemical, carbon dioxide or foam is recommended. Spray is recommended to cool exposed materials or structures or to protect them. Carbon dioxide can displace oxygen. Caution in the use of carbon dioxide in confined spaces.

Inappropriate extinguishing agents: Do not use water jet in order to prevent scatter and the spread of the fire. Do not use water and foam on the same surface, as water destroys the foam.

5.2 Special hazards arising from the substance or mixture

Combustion may form smoke, carbon monoxide and other products of incomplete combustion. The formation of nitrogen oxides and sulfur oxides is also possible. If container is not properly cooled, it can explode due to the heat of the fire.

5.3 Advice for firefighters

Special protective equipment for fire-fighting: Ambient air-independent breathing apparatus with full face mask in compressed air operation, eye protection as well as fire-resistant protective clothing are required.

Additional information: Cool endangered containers with water spray. Do not inhale explosion gases or fumes. Collect contaminated water separately. Contaminated water must be disposed of in accordance with official regulations.

Section 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Avoid direct contact with the product. Do not breathe fumes. Do not operate electrical equipment. Additionally, wear other appropriate protective equipment, as required (refer to section 8). See Sections 2 and 7 for further information on hazards and precautions. In case of accidental release notify the authority responsible in accordance with all applicable regulations. When the hot product is used in a confined space use self contained breathe protection.

6.2 Environmental precautions

Stop overflow / release, if this can be done safely. Prevent spilled material from entering into drains, other unofficial drainage systems and natural waterways. Use water sparingly to avoid contamination, especially of the environment. If spilled product contaminates water, notify the authorities responsible and inform them of the hazardous materials.

6.3 Methods and material for containment and cleaning up

Inform authorities responsible in accordance with applicable regulations. Immediate purification of spillages is recommended. Absorb spilled material with inert material (e. g. sand), then place in an appropriate waste container. If spilled product contaminates water use appropriate methods for decontamination (e. g. skimming, barrier, absorbent). In case of soil contamination refer to local regulations for remediation or disposal.

6.4 Reference to other sections

Protection measures in section 7, 8 and 13.

Section 7: Handling and storage

7.1 Precautions for safe handling

Keep away from ignition sources such as heat / sparks / open flames. No smoking. Take precautionary measures against static discharges. Do not use any sparking tools. Do not handle until all safety precautions have been read and understood. Do not breathe vapors and mists. Use only outside or in well ventilated areas. Wear protective gloves / protective clothing and eye / face protection. Wash hands after handling this product thoroughly. Wear appropriate personal protective equipment. Open container slowly to release pressure. Electrostatic charge may accumulate and create a hazardous situation when handling or processing this product. To prevent fire or explosion, the static electricity must be grounded before the transfer of the product. The use of explosion-proof electrical equipment is recommended and may be required (see appropriate fire codes for specific requirements regarding potential equalization / ground). Do not enter confined spaces such as tanks or pits, without having made appropriate arrangements. Do not wear contaminated clothing or shoes. Keep contaminated clothing away from ignition sources such as sparks or open flames. Due to its flammability and its potentially toxic properties do not use as solvent. Siphoning by mouth can cause a dangerous or fatal pulmonary aspiration. The use of hydrocarbon fuel in an area without adequate ventilation may result in hazardous levels of combustion products (e. g., carbon monoxide, sulfur and nitrogen oxides, benzene and other hydrocarbons) and / or dangerously low oxygen concentrations. Emissions from Residual Marine Fuel Oil combustion containing hazardous combustion products and are classified as potentially carcinogenic to humans.

High pressure injection of hydrocarbon fuels, hydraulic oils or greases under the skin may have serious consequences even though no symptoms and no visible injury is present.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed and properly labelled. Use this material in cool, dry, well-ventilated area away from heat, direct sunlight, hot metal surfaces, and all ignition sources. Keep only in suitable containers. Mark area with "smoking and open flames not permitted". Keep away from incompatible materials (see section 10). Protect containers against physical damage. "Empty" containers retain residue and can be dangerous. Do not pressurize, cut, weld, drill, grind, or heat, these containers.

They may explode and cause injury. "Empty" drums should be completely drained, properly closed, and should be sent immediately to the supplier or other appropriate recyclers. All containers should be disposed of in an environmentally safe manner and in accordance with state regulations. Before working on or in tanks which contain or have contained this material, consult regarding cleaning repair, welding, or other scheduled work in the corresponding instructions. Separate storage or outside storage is recommended. Storage in buildings has to meet the standards of the countries or commission and the relevant fire safety codes.

7.3 Specific end use(s)

See section 1.2. For further information consult the attached supplementary exposure scenarios.

Section 8: Exposure controls/personal protection

8.1 Control parameters

8.1.1 Workplace exposure limit

Benzo[a]pyrene (CAS No. 50-32-8)

Technische Richtkonzentration (TRK-Wert): 0.002 mg/m³ (DFG 2002)

Hydrogen sulfide (CAS No. 7783-06-4)

Germany (TRGS 900) AGW Long Term (8 h): 7.1 mg/m³; 5 ppm

Germany (TRGS 900) AGW Short Term (15 min): 14.2 mg/m³; 10 ppm

Europe (Directive 2009/161/EC) TWA: 7 mg/m³; 5 ppm

Europe (Directive 2009/161/EC) STEL: 14 mg/m³; 10 ppm

8.1.2 DNEL for employees

Fuel oil, residual (CAS No. 68476-33-5)

Acute exposure, systemic impact, by inhalation: 4700 mg/m³/15 min

Long term exposure, dermal: 0.065 mg/kg KG/8h

Long term exposure, by inhalation: 0.12 mg/m³/8h

8.1.3 DNEL for the general public

Fuel oil, residual (CAS No. 68476-33-5)

Acute exposure, systemic impact, oral: 0.015 mg/kg/24h

8.1.4 PNEC

Fuel oil, residual (CAS No. 68476-33-5)

PNEC oral 66.7 kg/kg

8.2 Exposure controls

Respiratory protection: If the exposure to air exceeds the exposure limit wear an approved air-purifying respirator with Type ABEK-P filter for organic gases and vapors according to EN 141.

Skin protection: Wearing impervious gloves according to EN 374, which are insensitive to the particular product, is recommended to avoid skin contact. Users should check with the manufacturer to verify the tightness of their products. Depending on the exposure and use, an additional protection is required in order to avoid contact with the skin, including chemical resistant boots, aprons, hoods, overalls, or full body suits. Proposed protective materials: nitrile rubber with the protection index 6 and a penetration time > 480 min according to EN 374. The maximum wearing time is 8 hours.

Eye/face protection: Eye protection that meets or exceeds EN 166 is recommended to protect against potential eye contact, irritation or injury. Depending on the operating conditions, a tight-fitting eye and face protection is necessary.

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Technical measures: If current ventilation practices are not sufficient to keep concentrations below the established exposure limits, additional engineering controls may be required.

Other protective equipment: A safety shower and an eye shower should be located in the work area. Clean contaminated clothing and shoes before reuse.

Exposure controls: see section 6, 7, 12 and 13.

The proposals outlined in this section in terms of exposure control and specific types of protective equipment are based on readily available information. Users should confirm the performance of their protective equipment by contacting the specific manufacturer. Special circumstances may make it necessary to contact a specialist for good hygiene and safety.

Section 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Data represents typical values and is not intended for specification purposes.

Physical state:	Liquid
Colour:	Black
Odour:	Typical petroleum
Melting point/freezing point:	< 30 °C
Boiling point and boiling range:	150 °C to > 750 °C
Flammability:	Yes
Lower and upper explosion limit:	N/D
Flash point:	≥ 100 °C at 101.325 kPa (DIN EN ISO 2719)
Auto-ignition temperature:	> 220 °C (ASTM E 659)
Decomposition temperature:	N/D
pH:	N/A
Kinematic viscosity:	≤ 50 mm ² /s at 100 °C
Solubility:	N/A
Partition coefficient n-octanol/water (log value):	N/A
Vapour pressure:	< 1 kPa at 120 °C (ASTM D 2878)
Relative density:	840 – 1100 kg/m ³ at 15 °C
Relative vapour density:	> 1 (Air = 1)
Particle characteristics:	N/A

9.2 Other information

N/A

Section 10: Stability and reactivity

10.1 Reactivity

Chemically unreactive.

10.2 Chemical stability

Stable under normal temperature and intended use.

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10.3 Possibility of hazardous reactions

No dangerous reactions are expected.

10.4 Conditions to avoid

Avoid overheating. Keep away from sources of ignition. Avoid open flames. In case of strong heating: formation of explosive mixtures is possible. Take precautionary measures against electrostatic charging.

10.5 Incompatible materials

Prevent contact with strong oxidizing agents and strong reducing agents.

10.6 Hazardous decomposition products

Attention! Hydrogen sulfide (H₂S) can be released.

In thermal or oxidative decomposition, a complex mixture of air polluting solids, liquids and gases such as carbon monoxide (CO), carbon dioxide (CO₂), sulfur dioxide (SO₂) and other organic compounds are formed.

Section 11: Toxicological information

11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008

The information about toxicological effects of the mixture is based on product data, knowledge about the components and the toxicology of similar products. Unless otherwise stated, the following specifications apply to the product as a whole.

11.1.1 Information on relevant hazard classes

Acute toxicity:	The mixture is classified as acute toxic (Category 4). LC ₅₀ > 4100 mg/m ³ , 4 h, rat, intake by inhalation. Based on test data from structurally similar materials (test equivalent or similar to OECD guidelines 403). The classification as acute toxic (Category 4) is based on an inhalation study on acute toxicity. LD ₅₀ > 2000 mg/kg, rabbit, dermal absorption. Based on test data from structurally similar materials (test equivalent or similar to OECD guidelines 434). Test results or other study results do not meet the criteria for classification. LD ₅₀ > 4320 mg/kg, rat, ingestion. Based on test data for structurally similar materials (test equivalent or similar to OECD guidelines 401). Test results or other study results do not meet the criteria for classification.
Skin corrosion/irritation:	Samples of this product were tested for skin irritation. There has been no evidence of skin corrosion. Repeated exposure may cause skin dryness or cracking.
Serious eye damage/irritation:	May cause mild, short-lasting discomfort to eyes. Will cause burns if hot material contacts eyes.
Respiratory or skin sensitization:	There are no test results or other study results showing that the substance potentially causes sensitization to skin or respiratory tract.
Germ cell mutagenicity:	Test results or other study results do not meet the criteria for classification as a germ cell mutagen. Based on test data from structurally similar materials (test equivalent or similar to OECD guidelines 471 and 475).
Carcinogenicity:	The mixture is classified as carcinogenic (Category 1B).

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	Repeated application of heavy oil components with a high content of polycyclic aromatic hydrocarbons (PAHs) in mouse skin showed an increased incidence of skin tumors. Residual oils were identified by the IARC as a carcinogen.
Reproductive toxicity:	The mixture is classified as toxic for reproduction (Category 2). Repeated dermal application of various heavy oils with a high content of polycyclic aromatic hydrocarbons (PAH) in the skin of pregnant rats showed maternal toxicity, reduced body weight of fetuses and reduced survival of fetuses. Foetal abnormalities and reduced sperm count were observed in some studies.
STOT-single exposure:	No adverse effects on organs are expected for single exposure.
STOT-repeated exposure:	Can cause damage to organs through prolonged or repeated exposure. Application of heavy oil components on the skin of mice or rats, five times a week, over a period 10-13 weeks or via gavage at 1000 mg / kg / day for 10 weeks resulted in treatment-related effects on the liver (necrosis), bone marrow (erythroid hyperplasia and anaemia) and the thymus (atrophy). In the lymph nodes (reactive hyperplasia) and kidney (degeneration of the urethra) was found an indication of toxicity.
Aspiration hazard:	Not considered an aspiration hazard.

11.1.2 Symptoms

After inhalation:	Inhalation of larger quantities causes coordination disorders, intoxication, headache, nausea.
After prolonged exposure:	Dizziness, unconsciousness and apnea.
After swallowing:	Gastrointestinal discomfort.
After skin contact:	Repeated exposure may cause skin dryness or cracking.

11.1.3 General remarks

Indication to hydrogen sulfide (H ₂ S):	Highly toxic on inhalation.
Odour threshold:	0.01 ppm
50 – 100 ppm (1 h):	Irritation of the respiratory tract, eye irritation.
200 – 300 ppm (1 h):	Severe irritation of the respiratory tract.
500 – 700 (15 min.):	Dizziness, headache, nausea. Unconsciousness and apnea after 30 - 60 min.

11.1.4 Information on likely routes of exposure

Skin and eye contact are the primary routes of exposure. The exposure can also take place by inhalation or accidental ingestion.

11.2 Information on other hazards

11.2.1 Endocrine disrupting properties

Contains no substances with known endocrine-disrupting properties for human health.

Section 12: Ecological information

12.1. Toxicity

Studies on the acute aquatic toxicity of samples of heavy oil components show acute toxicity values at less than 1 mg/l. Residual Marine Fuel Oil must be regarded as very toxic to aquatic life with long lasting effects. Classification: H410; Chronic cat. 1.

Fish toxicity (<i>Oncorhynchus mykiss</i> – OECD 203)::	LL ₅₀ ≥ 79 mg/l (96 h)
Daphnia toxicity (<i>Daphnia magna</i> – OECD 202):	EL ₅₀ ≥ 2 mg/l (48 h)
Toxicity to algae (<i>Pseudokirchnerella subcapitata</i> – QSAR Petrotox):	E _r L ₅₀ ≥ 0.75 mg/l (72 h)

12.2 Persistence and degradability

Product is considered inherently biodegradable. Some hydrocarbon components of the mixture may meet the criteria for persistence. Other ingredients can be easily degraded by microorganisms under aerobic conditions.

12.3 Bioaccumulative potential

The majority of the components have a high potential for bioaccumulation. Compounds having lower molecular weights can be degraded easily. The bioaccumulation potential of compounds of higher molecular weight is due to the low water solubility and the size of molecules not of high importance.

12.4 Mobility in soil

The mobility in the soil is limited by the solidification of the product at ambient temperature. It is possible that some components are heavier than water.

12.5 Results of PBT and vPvB assessment

The mixture is neither a PBT nor a vPvB substance, according to the result of the review.

12.6 Endocrine disrupting properties

This substance has no relevant endocrine disrupting properties for non-target organisms because it does not meet the criteria set out in Section B of Regulation (EU) No 2017/2100.

12.7 Other adverse effects

General information: Do not allow to enter groundwater, waters or sewage system.

Section 13: Disposal considerations

13.1 Waste treatment methods

This material - if discarded as produced - is in accordance with directive 2008/98/EEC hazardous waste.

Product disposal: Send to a licensed waste contractor. If possible the product should be recycled. The contact of spilled material with soil, waterways, drains and sewers must be avoided. Empty containers represent a fire hazard as they may contain flammable product residues and vapor. Never weld or braze empty containers.

EWC Waste Disposal No.: 13 07 01 "fuel oil and diesel". The listed waste code represents only a recommendation. The waste producer is responsible for the concrete specification of the waste. However, deviation from the intended use and / or contaminants may require an alternative waste disposal key number by the end user.

Legislation for waste treatment

Disposal:	Directive 2006/12/EC
Incineration:	Directive 2000/76/EC
Landfilling:	Directive 1999/31/EC

In addition, other national and regional rules apply.

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Section 14: Transport information

14.1 UN number or ID-number

UN number: UN 3082

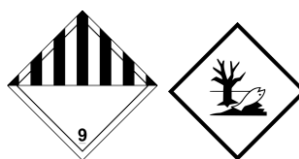
14.2 UN proper shipping name

ADR/RID/AND/IMDG-Code: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Heavy fuel oil)

14.3 Transport hazard class(es)

14.3.1 Land transport (ADR/RID) / Inland water transport (ADN) / Sea transport (IMDG-Code)

Transport hazard class: 9



14.4 Packing group

Packing Group: III

14.5 Environmental hazards

Environmental hazard: Environmentally hazardous substance.

14.6 Special precautions for user

If this material is transported on ships in international waters, MARPOL Annex 1 must be fulfilled.

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

15.1.1 EU rules

Regulation (EC) No. 1907/2006:	Annex XVII, No. 3
Directive 96/82/EC (Seveso II):	The product is subject to the Seveso directive.
Directive 2000/76/EC:	Regarding waste incineration.
Directive 1999/31/EC:	Regarding disposal of waste.
Directive 89/686/EC:	Regarding PPE.
Directive 2004/37/EC:	The product is covered by Guideline 2004/37/EC.
European standard for PPE:	EN 166:2002 Eye protection EN 529:2005 Respirators EN 374-1:2016 Protective gloves against chemicals and microorganisms RL 89/686/EEC PPE
Risks related to exposure to carcinogens or mutagens at work Directive 2004/37/EC:	The product is subject to the Directive 2004/37/EC.
Measures to encourage improvements in the safety and health at work of pregnant workers	The product is subject to the Directive 92/85/EEC.

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and workers who have recently given birth or are breastfeeding RL 92/85/EEC:

15.2 Chemical safety assessment

For this substance a chemical safety assessment has been carried out.

Section 16: Other information

Date of issue: 10.07.2024

Revision of sheet dated: 22.12.2022

Revised sections: Flash Point changed.

Full text of hazard statements

H332	Harmful if inhaled.
H350	May cause cancer by inhalation.
H361	Suspected of damaging fertility or the unborn child.
H373	May cause damage to organs through prolonged or repeated exposure through prolonged or repeated exposure.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
EUH066	Repeated exposure may cause skin dryness or cracking.

Important literature and data sources that was used to compile the safety data sheet

The data comes from several sources (manufacturer, CONCAWE EU IUCLID database, BAuA, ECHA, etc.)

Abbreviations and Acronyms

ACGIH	= American Conference of Industrial Hygienists
N/A	= Not applicable
N/D	= Not determined
STEL	= Short Term Exposure Limit
L ₅₀	= effective loading rate lethal to 50 % of the test population
E _r L ₅₀	= effective loading rate that causes 50 % reduction in algal growth rate
LL ₅₀	= Lethal loading rate required to kill 50 % of test population
PBT	= Persistent, bioaccumulative, toxic
vPvB	= very persistent, very bioaccumulative
IARC	= International agency for research on cancer
PPE	= Personal protective equipment

Note: The information in this MSDS is based on our current knowledge and experience. These data is not a guarantee of the properties of the product. The use of the product for other use than intended can be dangerous. Data contained in this MSDS does not release the user from the obligation to inform themselves about current regulations and apply them to his work. He has to bear the sole responsibility for the precautions required when using this product.