

SAFETY DATA SHEET

According to EC No 1907/2006 as amended as at the date of this SDS



ZF Aftermarket

Trade name: ZF Lifeguard Hybrid 2

1. Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Trade name: ZF Lifeguard Hybrid 2

Product code: 0671.090.548
0671.090.516

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

Use of the Substance/Mixture: Transmission oil.

Uses advised against: This product must not be used in applications other than those listed in Section 1 without first seeking the advice of the supplier.

1.3 Details of the supplier of the safety data sheet

ZF Friedrichshafen AG
ZF Aftermarket
Obere Weiden 12
97424 Schweinfurt
Germany
+49 9721 475 60
www.zf.com/contact

1.4 Emergency telephone number

24/7h Emergency telephone number:

+49 (0)89 19240 Information in German and English

2. Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Based on available data this substance / mixture does not meet the classification criteria.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms: No Hazard Symbol

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|---|--|
| Signal word: | No signal word |
| Hazard statements | |
| PHYSICAL HAZARDS: | Not classified as a physical hazard according to CLP criteria. |
| HEALTH HAZARDS: | Not classified as a health hazard under CLP criteria. |
| ENVIRONMENTAL HAZARDS: | Not classified as environmental hazard according to CLP criteria. |
| Precautionary statements: | |
| Prevention: | No precautionary phrases. |
| Response: | No precautionary phrases. |
| Storage: | No precautionary phrases. |
| Disposal: | No precautionary phrases. |
| Safety data sheet available on request. | |
| Sensitising components: | Contains alkyl acetamide. Contains calcium sulphonate. Contains Dialkylamine Alkylene Glycol. May produce an allergic reaction. |

2.3 Other hazards

This mixture does not contain any REACH registered substances that are assessed to be a PBT or a vPvB.

Prolonged or repeated skin contact without proper cleaning can clog the pores of the skin resulting in disorders such as oil acne/folliculitis.

Used oil may contain harmful impurities.

Not classified as flammable but will burn.

3. Composition/information on ingredients

3.2 Mixtures

| | |
|-----------------|---|
| Chemical nature | Synthetic base oil and additives. Highly refined mineral oil. The highly refined mineral oil contains <3% (w/w) DMSO-extract, according to IP346. |
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The highly refined mineral oil is only present as additive diluent.

* contains one or more of the following CAS-numbers (REACH registration numbers):

64742-53-6 (01-2119480375-34),
64742-54-7 (01-2119484627-25),
64742-55-8 (01-2119487077-29),
64742-56-9 (01-2119480132-48),
64742-65-0 (01-2119471299-27),
68037-01-4 (01-2119486452-34),
72623-86-0 (01-2119474878-16),
72623-87-1 (01-2119474889-13),
8042-47-5 (01-2119487078-27),
848301-69-9 (01-0000020163-82),
68649-12-7 (01-2119527646-33),
151006-60-9 (01-2119523580-47),
163149-28-8 (01-2119543695-30),
64741-88-4 (01-2119488706-23).

Components

| Chemical name | CAS-No. EC-No. Index-No. Registration number | Classification | Concentration [% w/w] |
|--|---|---|--------------------------|
| Alkyl acetamide | Not Assigned 471-920-1 01-0000019770-68 | Skin Sens.1; H317 | 1 - <3 |
| Dialkylamine alkylene glycol | Not Assigned 482-000-4 | Skin Sens.1B; H317 Aquatic Chronic 3; H412 | 0,1 - 0,9 |
| Calcium alkaryl sulphate | Not Assigned 947-519-7 | Skin Sens.1B; H317 | 0,1 - 0,9 |
| Interchangeable low viscosity base oil (<20,5 cSt @40°C) * | Not Assigned | Asp. Tox.1; H304 | 0 - 90 |

For explanation of abbreviations see section 16.

4. First aid measures

4.1 Description of first aid measures

Protection of first-aiders:

When administering first aid, ensure that you are wearing the appropriate personal protective equipment according to the

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| | incident, injury and surroundings. |
| If inhaled: | No treatment necessary under normal conditions of use. If symptoms persist, obtain medical advice. |
| In case of skin contact: | Remove contaminated clothing. Flush exposed area with water and follow by washing with soap if available. If persistent irritation occurs, obtain medical attention. |
| In case of eye contact: | Flush eye with copious quantities of water. Remove contact lenses, if present and easy to do. Continue rinsing. If persistent irritation occurs, obtain medical attention. |
| If swallowed: | In general no treatment is necessary unless large quantities are swallowed, however, get medical advice. |

4.2 Most important symptoms and effects, both acute and delayed

| | |
|-----------|---|
| Symptoms: | Oil acne/folliculitis signs and symptoms may include formation of black pustules and spots on the skin of exposed areas. Ingestion may result in nausea, vomiting and/or diarrhoea. |
|-----------|---|

4.3 Indication of any immediate medical attention and special treatment needed

| | |
|------------|--|
| Treatment: | Notes to doctor/physician: Treat symptomatically. |
|------------|--|

5. Firefighting measures

5.1 Extinguishing media

| | |
|---------------------------------|--|
| Suitable extinguishing media: | Foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only. |
| Unsuitable extinguishing media: | Do not use water in a jet. |

5.2 Special hazards arising from the substance or mixture

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Specific hazards during firefighting: Hazardous combustion products may include: A complex mixture of airborne solid and liquid particulates and gases (smoke). Carbon monoxide may be evolved if incomplete combustion occurs. Unidentified organic and inorganic compounds.

5.3 Advice for firefighters

Special protective equipment for firefighters: Proper protective equipment including chemical resistant gloves are to be worn; chemical resistant suit is indicated if large contact with spilled product is expected. Self-Contained Breathing Apparatus must be worn when approaching a fire in a confined space. Select fire fighter's clothing approved to relevant Standards (e.g. Europe: EN469).

Specific extinguishing methods: Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions: For non emergency personnel:
Avoid contact with skin and eyes.

Emergency responders: For emergency responders:
Avoid contact with skin and eyes.

6.2 Environmental precautions

Environmental precautions: Use appropriate containment to avoid environmental contamination. Prevent from spreading or entering drains, ditches or rivers by using sand, earth, or other appropriate barriers.
Local authorities should be advised if significant spillages cannot be contained.

6.3 Methods and materials for containment and cleaning up

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Methods for cleaning up:

Slippery when spilt. Avoid accidents, clean up immediately.
Prevent from spreading by making a barrier with sand, earth or other containment material.
Reclaim liquid directly or in an absorbent. Soak up residue with an absorbent such as clay, sand or other suitable material and dispose of properly.

6.4 Reference to other sections

For guidance on selection of personal protective equipment see Chapter 8 of this Safety Data Sheet.

For guidance on disposal of spilled material see Chapter 13 of this Safety Data Sheet.

7. Handling and storage

7.1 Precautions for safe handling

Technical measures:

Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols. Use the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate controls for safe handling, storage and disposal of this material.

Advice on safe handling:

Avoid prolonged or repeated contact with skin.
Avoid inhaling vapour and/or mists.
When handling product in drums, safety footwear should be worn and proper handling equipment should be used.
Properly dispose of any contaminated rags or cleaning materials in order to prevent fires.

Product Transfer:

Proper grounding and bonding procedures should be used during all bulk transfer operations to avoid static accumulation.

7.2 Conditions for safe storage, including any incompatibilities

Storage class (TRGS 510):

10, Combustible liquids

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Further information on storage stability: Keep container tightly closed and in a cool, well-ventilated place. Use properly labeled and closable containers. Store at ambient temperature. Refer to section 15 for any additional specific legislation covering the packaging and storage of this product.

Packaging material: Suitable material: For containers or container linings, use mild steel or high density polyethylene. Unsuitable material: PVC.

Container Advice: Polyethylene containers should not be exposed to high temperatures because of possible risk of distortion.

7.3 Specific end use(s)

Specific use(s) Not applicable

8. Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure Limits

| Components | CAS-No. | Value type (Form of exposure) | Control parameters | Basis |
|-------------------|--------------|-------------------------------|---------------------|----------------------------------|
| Oil mist, mineral | Not Assigned | TWA (inhalable fraction) | 5 mg/m ³ | US. ACGIH Threshold Limit Values |

Biological occupational exposure limits

8.2 Exposure controls

Engineering measures

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances. Appropriate measures include:
Adequate ventilation to control airborne concentrations.

Where material is heated, sprayed or mist formed, there is greater potential for airborne concentrations to be generated

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General Information:

Define procedures for safe handling and maintenance of controls.
Educate and train workers in the hazards and control measures relevant to normal activities associated with this product.
Ensure appropriate selection, testing and maintenance of equipment used to control exposure, e.g. personal protective equipment, local exhaust ventilation.
Drain down system prior to equipment break-in or maintenance.
Retain drain downs in sealed storage pending disposal or subsequent recycle.
Always observe good personal hygiene measures, such as washing hands after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping

Personal protective equipment

The provided information is made in consideration of the PPE directive (Council Directive 89/686/EEC) and the CEN European Committee for Standardisation (CEN) standards.

Personal protective equipment (PPE) should meet recommended national standards. Check with PPE suppliers.

Eye protection:

If material is handled such that it could be splashed into eyes, protective eyewear is recommended.

Approved to EU Standard EN166.

Hand protection:

Where hand contact with the product may occur the use of gloves approved to relevant standards (e.g. Europe: EN374, US: F739) made from the following materials may provide suitable chemical protection. PVC, neoprene or nitrile rubber gloves. Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced. Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended.

For continuous contact we recommend gloves with breakthrough time of more than 240 minutes with preference

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for > 480 minutes where suitable gloves can be identified. For short-term/splash protection we recommend the same, but recognize that suitable gloves offering this level of protection may not be available and in this case a lower breakthrough time maybe acceptable so long as appropriate maintenance and replacement regimes are followed. Glove thickness is not a good predictor of glove resistance to a chemical as it is dependent on the exact composition of the glove material. Glove thickness should be typically greater than 0.35 mm depending on the glove make and model.

Skin and body protection:

Skin protection is not ordinarily required beyond standard work clothes. It is good practice to wear chemical resistant gloves.

Respiratory protection:

No respiratory protection is ordinarily required under normal conditions of use. In accordance with good industrial hygiene practices, precautions should be taken to avoid breathing of material. If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, select respiratory protection equipment suitable for the specific conditions of use and meeting relevant legislation. Check with respiratory protective equipment suppliers. Where air-filtering respirators are suitable, select an appropriate combination of mask and filter. Select a filter suitable for combined particulate/organic gases and vapours [Type A/Type P boiling point > 65°C (149°F)] meeting EN14387 and EN143.

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state:

Clear, bright liquid.

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Colour: amber
 Odour: Data not available
 Odour Threshold: Data not available

| | | |
|--|----------------------|--------------------|
| Pour point | $\leq -48\text{ °C}$ | ISO 3016 |
| Melting / freezing point | Data not available | |
| Initial boiling point and boiling range | $> 280\text{ °C}$ | estimated value(s) |
| Flash point | $\geq 200\text{ °C}$ | EN ISO 2592 |
| Flammability | Data not available | |
| Upper explosion limit / upper flammability limit | Typical 10 %(V) | |
| Lower explosion limit / Lower flammability limit | Typical 1 %(V) | |
| Flash point | $\geq 200\text{ °C}$ | EN ISO 2592 |
| Auto-ignition temperature | $> 320\text{ °C}$ | |

| | | |
|---------------------------|--|-----------|
| Decomposition temperature | Data not available | |
| pH | Not applicable | |
| Viscosity | | |
| Viscosity, dynamic | Data not available | |
| Viscosity, kinematic | $\leq 26,5\text{ mm}^2/\text{s}$ (40,0 °C) $\leq 5,6\text{ mm}^2/\text{s}$ (100 °C) | DIN 51562 |
| Solubility(ies) | | |
| Water solubility | negligible | |
| | | |

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| Solubility in other solvents | Data not available | |
| Partition coefficient: n-octanol/water | log Pow: > 6 | (based on information on similar products) |
| Vapour pressure | < 0,5 Pa (20 °C) | estimated value(s) |
| Density | 0,834 g/cm ³ (15,0 °C) | DIN EN ISO 12185 |
| Relative vapour density | > 1 | estimated value(s) |

9.2 Other information

| | |
|-----------------------|---|
| Explosives: | Classification Code: Not classified |
| Oxidizing properties: | Data not available |
| Evaporation rate: | Data not available |
| Conductivity: | This material is not expected to be a static accumulator. |

10. Stability and reactivity

| | |
|---|---|
| 10.1 Reactivity: | The product does not pose any further reactivity hazards in addition to those listed in the following subparagraph. |
| 10.2 Chemical stability: | Stable. No hazardous reaction is expected when handled and stored according to provisions |
| 10.3 Possibility of hazardous reactions: | Reacts with strong oxidising agents. |
| 10.4 Conditions to avoid: | Extremes of temperature and direct sunlight |
| 10.5 Incompatible materials: | Strong oxidising agents. |

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10.6 Hazardous decomposition products: No decomposition if stored and applied as directed.

11. Toxicological information

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

Information on likely routes of exposure: Skin and eye contact are the primary routes of exposure although exposure may occur following accidental ingestion.

Acute toxicity

Product:

Acute oral toxicity:

LD50 rat: > 5.000 mg/kg

Remarks: Low toxicity:

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

Acute inhalation toxicity:

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

Acute dermal toxicity:

LD50 Rabbit: > 5.000 mg/kg

Remarks: Low toxicity:

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

Skin corrosion/irritation

Product:

Remarks: Slightly irritating to skin. Prolonged or repeated skin contact without proper cleaning can clog the pores of the skin resulting in disorders such as oil acne/folliculitis. Based on available data, the classification criteria are not met.

Serious eye damage/eye irritation

Product:

Remarks: Slightly irritating to the eye. Based on available data, the classification criteria are not met.

Respiratory or skin sensitisation

Product:

Remarks: For respiratory and skin sensitisation: Not a sensitiser. Based on available data, the classification criteria are not met.

Components:

Alkyl acetamide:

Remarks: Experimental data has shown that the concentration of potentially sensitising components present in this product does not induce skin sensitisation. May cause an allergic skin reaction in sensitive individuals.

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Dialkylamine alkylene glycol:

Remarks: May cause an allergic skin reaction in sensitive individuals.

Germ cell mutagenicity

Product:

Remarks: Non mutagenic, Based on available data, the classification criteria are not met.

Carcinogenicity

Product:

Remarks: Not a carcinogen. Based on available data, the classification criteria are not met.

Carcinogenicity - Assessment

This product does not meet the criteria for classification in categories 1A/1B.

| | |
|----------------------------|--|
| Material | GHS/CLP Carcinogenicity Classification |
| Highly refined mineral oil | No carcinogenicity classification |

Reproductive toxicity

Product:

Effects on fertility:

Remarks: Not a developmental toxicant. Does not impair fertility. Based on available data, the classification criteria are not met.

Reproductive toxicity – Assessment

This product does not meet the criteria for classification in categories 1A/1B.

STOT - single exposure

Product:

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

STOT - repeated exposure

Product:

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

Aspiration toxicity

Product:

Not considered an aspiration hazard. Based on available data, the classification criteria are not met.

11.2 Information on other hazards

Further information

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| | |
|----------|---|
| Product: | Used oils may contain harmful impurities that have accumulated during use. The concentration of such impurities will depend on use and they may present risks to health and the environment on disposal. ALL used oil should be handled with caution and skin contact avoided as far as possible. |
| Remarks | |
| Remarks | Slightly irritating to respiratory system. |
| Remarks | Classifications by other authorities under varying regulatory frameworks may exist. |

12. Ecological information

12.1 Toxicity

| | |
|--|---|
| Product: | Remarks: LL/EL/IL50 > 100 mg/l |
| Toxicity to fish: | Practically non toxic: Based on available data, the classification criteria are not met. |
| Toxicity to daphnia and other aquatic invertebrates: | Remarks: LL/EL/IL50 > 100 mg/l Practically non toxic: Based on available data, the classification criteria are not met. |
| Toxicity to algae/aquatic plants: | Remarks: LL/EL/IL50 > 100 mg/l Practically non toxic: Based on available data, the classification criteria are not met. |
| Toxicity to fish (Chronic toxicity) | Remarks: Based on available data, the classification criteria are not met. |
| Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) | Remarks: Based on available data, the classification criteria are not met. |
| Toxicity to microorganisms | Remarks: Based on available data, the classification criteria are not met. |

12.2 Persistence and degradability

| | |
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| Product: | Remarks: Not readily biodegradable., Major constituents are inherently biodegradable, but contains components that may |
| Biodegradability | |

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persist in the environment., Persistent per IMO criteria., International Oil Pollution Compensation (IOPC) Fund definition: "A non-persistent oil is oil, which, at the time of shipment, consists of hydrocarbon fractions, (a) at least 50% of which, by volume, distills at a temperature of 340°C (645°F) and (b) at least 95% of which, by volume, distils at a temperature of 370°C (700°F) when tested by the ASTM Method D-86/78 or any subsequent revision thereof."

12.3 Bioaccumulative potential

Product:
Bioakkumulation

Remarks: Contains components with the potential to bioaccumulate.

12.4 Mobility in soil

Product:
Mobility

Remarks: Liquid under most environmental conditions. If it enters soil, it will adsorb to soil particles and will not be mobile.
Remarks: Floats on water.

12.5 Results of PBT and vPvB assessment

Product:
Assessment

This mixture does not contain any REACH registered substances that are assessed to be a PBT or a vPvB.

12.6 Endocrine disrupting properties

no data available

12.7 Other adverse effects

Product:
Additional ecological information

Does not have ozone depletion potential, photochemical ozone creation potential or global warming potential., Product is a mixture of non-volatile components, which will not be released to air in any significant quantities under normal conditions of use. Poorly soluble mixture. Causes physical fouling of aquatic organisms.

13. Disposal considerations

13.1 Waste treatment methods

Product: Recover or recycle if possible.

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It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods in compliance with applicable regulations.

Do not dispose into the environment, in drains or in water courses.

Do not dispose of tank water bottoms by allowing them to drain into the ground.

This will result in soil and groundwater contamination.

Waste arising from a spillage or tank cleaning should be disposed of in accordance with prevailing regulations, preferably to a recognised collector or contractor. The competence of the collector or contractor should be established beforehand.

MARPOL - see International Convention for the Prevention of Pollution from Ships (MARPOL 73/78) which provides technical aspects at controlling pollutions from ships.

Contaminated packaging:

Dispose in accordance with prevailing regulations, preferably to a recognized collector or contractor. The competence of the collector or contractor should be established beforehand. Disposal should be in accordance with applicable regional, national, and local laws and regulations.

Local legislation Waste catalogue

EU Waste Disposal Code (EWC):

13 02 06 *

Remarks:

Disposal should be in accordance with applicable regional, national, and local laws and regulations.

Classification of waste is always the responsibility of the end user.

14 Transport information

14.1 UN number or ID number ADN

Not regulated as a dangerous good

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| | |
|------|-----------------------------------|
| ADR | Not regulated as a dangerous good |
| RID | Not regulated as a dangerous good |
| IMDG | Not regulated as a dangerous good |
| IATA | Not regulated as a dangerous good |

14.2 UN proper shipping name

| | |
|------|-----------------------------------|
| ADN | Not regulated as a dangerous good |
| ADR | Not regulated as a dangerous good |
| RID | Not regulated as a dangerous good |
| IMDG | Not regulated as a dangerous good |
| IATA | Not regulated as a dangerous good |

14.3 Transport hazard class

| | |
|------|-----------------------------------|
| ADN | Not regulated as a dangerous good |
| ADR | Not regulated as a dangerous good |
| RID | Not regulated as a dangerous good |
| IMDG | Not regulated as a dangerous good |
| IATA | Not regulated as a dangerous good |

14.4 Packing group

| | |
|-----------------------------------|-----------------------------------|
| ADN | Not regulated as a dangerous good |
| CDNI Inland Water Waste Agreement | NST 3411 Mineral Lubricating Oils |
| ADR | Not regulated as a dangerous good |
| RID | Not regulated as a dangerous good |
| IMDG | Not regulated as a dangerous good |
| IATA | Not regulated as a dangerous good |

14.5 Environmental hazards

| | |
|------|-----------------------------------|
| ADN | Not regulated as a dangerous good |
| ADR | Not regulated as a dangerous good |
| RID | Not regulated as a dangerous good |
| IMDG | Not regulated as a dangerous good |

14.6 Special precautions for user

| | |
|----------|--|
| Remarks: | Special Precautions: Refer to Chapter 7, Handling & Storage, for special precautions which a user needs to be aware of or needs to comply with in connection with transport. |
|----------|--|

14.7 Maritime transport in bulk according to IMO instruments

MARPOL Annex 1 rules apply for bulk shipments by sea.

15. Regulatory information

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

| | |
|---|---|
| REACH - List of substances subject to authorization (Annex XIV) | Product is not subject to Authorisation under REACH. |
| Water contaminating class (Germany) | WGK 2 obviously hazardous to water Remarks: Classification according to AwSV, Annex 1 (5.2) |
| Volatile organic compounds: | 0 % |
| Other regulations: | <p>The regulatory information is not intended to be comprehensive. Other regulations may apply to this material.</p> <p>Technische Anleitung Luft: Product not listed by name. Observe section 5.2.5 in connection with section 5.4.9</p> <p>Product is subject Betriebs-Sicherheits-Verordnung (BetrSichV).</p> <p>Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), annex XIV.</p> <p>Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), annex XVII.</p> <p>Directive 2004/37/EC on the protection of workers from the risks related to exposure to carcinogens or mutagens at work and its amendments.</p> <p>Directive 1994/33/EC on the protection of young people at work and its amendments.</p> <p>Council Directive 92/85/EEC on the introduction of measures to encourage improvements in the safety and health at work of pregnant workers and workers who have recently given birth or are breastfeeding and its amendments.</p> |

The components of this product are reported in the following inventories:

REACH: Notified with Restrictions.

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TSCA: All components listed.

15.2 Chemical safety assessment

No Chemical Safety Assessment has been carried out for this substance/mixture by the supplier.

16. Other information

Full text of H-Statements

H304 May be fatal if swallowed and enters airways.
H317 May cause an allergic skin reaction.
H412 Harmful to aquatic life with long lasting effects.

Full text of other abbreviations

| | |
|-----------------|------------------------------------|
| Aquatic Chronic | Long-term (chronic) aquatic hazard |
| Asp. Tox. | Aspiration hazard |
| Skin Sens. | Skin sensitisation |

Abbreviations and Acronyms:

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - Agreement concerning the International Carriage of Dangerous Goods by Road; AICC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Test-ing of Materials; bw - Body weight; CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECHA - European Chemicals Agency; EC-Number - European Community number; ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration as-sociated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of

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Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECl - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; SVHC - Substance of Very High Concern; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TRGS - Technical Rule for Hazardous Substances; TSCA - Toxic Substances Control Act (United States); UN - United Nations; vPvB - Very Persistent and Very Bioaccumulative

Further information

SAFETY DATA SHEET

According to EC No 1907/2006 as amended as at the date of this SDS



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| Training advice: | Provide adequate information, instruction and training for operators. |
| Other information: | No Exposure Scenario annex is attached to this safety data sheet. It is a non-classified mixture containing hazardous substances as detailed in Section 3; relevant information from Exposure Scenarios for the hazardous substances contained have been integrated into the core sections 1-16 of this SDS. A vertical bar () in the left margin indicates an amendment from the previous version. |
| Sources of key data used to compile the Safety Data Sheet: | The quoted data are from, but not limited to, one or more sources of information (e.g. toxicological data from Shell Health Services, material suppliers' data, CONCAWE, EU IUCLID date base, EC 1272 regulation, etc). |

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.