



Trade name: ZF-LIFEGUARDFLUID 8

1. IDENTIFICATION

Trade name: ZF-LIFEGUARDFLUID 8

Product code: S671.090.310
S671.090.311
S671.090.312
S671.090.313

Recommended use of the chemical and restrictions on use

Recommended use Transmission oil.

Manufacturer or supplier's details

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

Emergency telephone number

24/7h Emergency telephone number:

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

2. HAZARDS IDENTIFICATION

GHS Classification

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

GHS label elements

Hazard pictograms: No Hazard Symbol required

Signal word: No signal word

Hazard statements

PHYSICAL HAZARDS: Not classified as a physical hazard under GHS criteria



Trade name: ZF-LIFEGUARDFLUID 8

HEALTH HAZARDS:	Not classified as a health hazard under GHS criteria.
ENVIRONMENTAL HAZARDS:	Not classified as an environmental hazard under GHS criteria.
Precautionary statements:	
Prevention:	No precautionary phrases.
Response:	No precautionary phrases.
Storage:	No precautionary phrases.
Disposal:	No precautionary phrases.

Other hazards which do not result in classification

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.

The classification of this material is based on OSHA HCS 2012 criteria.

Under normal conditions of use or in a foreseeable emergency, this product does not meet the definition of a hazardous chemical when evaluated according to the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

3. Composition/information on ingredients

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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* contains one or more of the following CAS-numbers:

64742-53-6, 64742-54-7, 64742-55-8,
64742-56-9, 64742-65-0, 68037-01-4,
72623-86-0, 72623-87-1, 8042-47-5,
848301-69-9.

Hazardous components



Trade name: ZF-LIFEGUARDFLUID 8

ZF Aftermarket

Chemical name	Synonyms	CAS-No.	Concentration [%]
Alkyl acetamid	--	Not Assigned	1 - 3
Calcium sulphonate	--	Not Assigned	0.1 – 0.9
Interchangeable low viscosity base oil (<20,5 cSt @40°C) *	--	Not Assigned	0 - 90

4. FIRST-AID MEASURES

General advice:	Not expected to be a health hazard when used under normal conditions.
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. If persistent irritation occurs, obtain medical attention.
If swallowed:	In general no treatment is necessary unless large quantities are swallowed, however, get medical advice.
Most important symptoms and effects, both acute and delayed:	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.
Protection of first-aiders	When administering first aid, ensure that you are wearing the appropriate personal protective equipment according to the incident, injury and surroundings.
Immediate medical attention, special treatment	Treat symptomatically



Trade name: ZF-LIFEGUARDFLUID 8

5. FIRE-FIGHTING MEASURES

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.
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.
Specific extinguishing methods	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Special protective equipment for fire-fighters:	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).

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	Avoid contact with skin and eyes.
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.
Methods and materials for containment and cleaning up	Slippery when spilt. Avoid accidents, clean up immediately.



Trade name: ZF-LIFEGUARDFLUID 8

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.

Additional advice

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

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.

Precautions for 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:

This material has the potential to be a static accumulator. Proper grounding and bonding procedures should be used during all bulk transfer operations.

Avoidance of contact:

Strong oxidising agents.

Storage

Other data:

Keep container tightly closed and in a cool, well-ventilated place.



Trade name: ZF-LIFEGUARDFLUID 8

ZF Aftermarket

Use properly labeled and closable containers.

Store at ambient temperature.

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.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Oil mist, mineral	Not Assigned	TWA ((inhalable fraction))	5 mg/m ³	US. ACGIH Threshold Limit Values
		(Mist)	5 mg/m ³	OSHA_TRANS
		TWA (Mist)	5 mg/m ³	OSHA Z-1
		TWA (Inhalable fraction)	5 mg/m ³	ACGIH

Biological occupational exposure limits

No biological limit allocated.

Monitoring Methods

Monitoring of the concentration of substances in the breathing zone of workers or in the general workplace may be required to confirm compliance with an OEL and adequacy of exposure controls.

For some substances biological monitoring may also be appropriate.

Validated exposure measurement methods should be applied by a competent person and samples analysed by an accredited laboratory.

Examples of sources of recommended exposure measurement methods are given below or contact the supplier. Further national methods may be available.

National Institute of Occupational Safety and Health (NIOSH), USA: Manual of Analytical Methods

SAFETY DATA SHEET

According to OSHA Hazard Communication Standard, 29 CFR 1910.1200



Trade name: ZF-LIFEGUARDFLUID 8

ZF Aftermarket

<http://www.cdc.gov/niosh/>

Occupational Safety and Health Administration (OSHA), USA: Sampling and Analytical Methods

<http://www.osha.gov/>

Health and Safety Executive (HSE), UK: Methods for the Determination of Hazardous Substances

<http://www.hse.gov.uk/>

Institut für Arbeitsschutz Deutschen Gesetzlichen Unfallversicherung (IFA), Germany

<http://www.dguv.de/inhalt/index.jsp>

L'Institut National de Recherche et de Sécurité, (INRS), France

<http://www.inrs.fr/accueil>

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

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

Eye protection:

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

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

SAFETY DATA SHEET

According to OSHA Hazard Communication Standard, 29 CFR 1910.1200



Trade name: ZF-LIFEGUARDFLUID 8

ZF Aftermarket

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 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



Trade name: ZF-LIFEGUARDFLUID 8

ZF Aftermarket

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.

Thermal hazards:

Not applicable

Protective measures:

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

Environmental exposure controls

General advice:

Take appropriate measures to fulfill the requirements of relevant environmental protection legislation. Avoid contamination of the environment by following advice given in Chapter 6. If necessary, prevent undissolved material from being discharged to waste water. Waste water should be treated in a municipal or industrial waste water treatment plant before discharge to surface water. Local guidelines on emission limits for volatile substances must be observed for the discharge of exhaust air containing vapour.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Liquid at room temperatur
Colour:	green
Odour:	Slight hydrocarbon
Odour Threshold:	Data not available
pH:	Not applicable

Pour point	-42 °C / -44 °F	ASTM D97
Initial boiling point and boiling range	> 280 °C / 536 °F	Cestimated value(s)

SAFETY DATA SHEET

According to OSHA Hazard Communication Standard, 29 CFR 1910.1200

**Trade name: ZF-LIFEGUARDFLUID 8**

ZF Aftermarket

Flash point	206 °C / 403 °F	ASTM D92 (COC)
Evaporation rate	Data not available	
Flammability (solid, gas)	Data not available	
Upper explosion limit	Typical 10 %(V)	
Lower explosion limit	Typical 1 %(V)	
Vapour pressure	< 0,5 Pa (20 °C / 68 °F)	estimated value(s)
Relative vapour density	> 1	estimated value(s)

Relative density	0,846 (15°C / 59 °F)	
Density	846 kg/m ³ (15°C / 59 °F)	ISO 12185
Solubility(ies)		
Water solubility	negligible	
Solubility in other solvents	Data not available	
Partition coefficient: n-octanol/water	Pow: > 6	(based on information on similar products)
Auto-ignition temperature	> 320°C / 608 °F	
Viscosity, dynamic	Data not available	
Viscosity, kinematic	26 mm ² /s (40°C / 104 °F) 5,6 mm ² /s (100°C / 212 °F)	ASTM D445
Explosive properties	Not classified	
Oxidizing properties	Data not available	



Trade name: ZF-LIFEGUARDFLUID 8

Conductivity:	This material is not expected to be a static accumulator.
Decomposition temperature:	Data not available

10. STABILITY AND REACTIVITY

Reactivity	The product does not pose any further reactivity hazards in addition to those listed in the following subparagraph.
Chemical stability:	Stable.
Possibility of hazardous reactions:	Reacts with strong oxidising agents.
Conditions to avoid:	Extremes of temperature and direct sunlight
Incompatible materials:	Strong oxidising agents.
Hazardous decomposition products:	Hazardous decomposition products are not expected to form during normal storage.

11. TOXICOLOGICAL INFORMATION

Information on toxicological effects

Basis for assessment:	Information given is based on data on the components and the toxicology of similar products. Unless indicated otherwise, the data presented is representative of the product as a whole, rather than for individual component(s).
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Information on likely routes of exposure	Skin and eye contact are the primary routes of exposure although exposure may occur following accidental ingestion.
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Acute toxicity

Product:	
Acute oral toxicity:	LD50 rat: > 5,000 mg/kg Remarks: Expected to be of low toxicity



Trade name: ZF-LIFEGUARDFLUID 8

ZF Aftermarket

Acute inhalation toxicity:	Remarks: Not considered to be an inhalation hazard under normal conditions of use.
Acute dermal toxicity:	LD50 Rabbit: > 5,000 mg/kg Remarks: Expected to be of low toxicity

Skin corrosion/irritation

Product:

Remarks: Expected to be slightly irritating. Prolonged or repeated skin contact without proper cleaning can clog the pores of the skin resulting in disorders such as oil acne/folliculitis.

Serious eye damage/eye irritation

Product:

Remarks: Expected to be slightly irritating.

Respiratory or skin sensitisation

Product:

Remarks: Not expected to be a sensitiser.

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.

Calcium sulphonate:

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

Remarks: Classified Skin Sensitiser Category 1B.

Germ cell mutagenicity

Product:

Remarks: Not considered a mutagenic hazard.

Carcinogenicity

Product:

Remarks: Not expected to be carcinogenic.

IARC No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

ACGIH No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.



ZF Aftermarket

Trade name: ZF-LIFEGUARDFLUID 8

- OSHA No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.
- NTP No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Reproductive toxicity

Product:

Remarks: Not expected to impair fertility.

Not expected to be a developmental toxicant.

STOT - single exposure

Product:

Remarks: Not expected to be a hazard.

STOT - repeated exposure

Product:

Remarks: Not expected to be a hazard.

Aspiration toxicity

Product:

Not considered an aspiration hazard.

Further information

Product:

Remarks: 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: Slightly irritating to respiratory system.

12. ECOLOGICAL INFORMATION

Basis for assessment:

Ecotoxicological data have not been determined specifically for this product. Information given is based on a knowledge of the components and the ecotoxicology of similar products. Unless indicated otherwise, the data presented is representative of the product as a whole, rather than for individual component(s). (LL/EL/IL50 expressed as the

SAFETY DATA SHEET

According to OSHA Hazard Communication Standard, 29 CFR 1910.1200



Trade name: ZF-LIFEGUARDFLUID 8

ZF Aftermarket

nominal amount of product required to prepare aqueous test extract).

Ecotoxicity

Product: Remarks: Expected to be practically non toxic: LL/EL/IL50 > 100 mg/l
Toxicity to fish (Acute toxicity):

Toxicity to daphnia and other aquatic invertebrates (Acute toxicity) Remarks: Expected to be practically non toxic: LL/EL/IL50 > 100 mg/l

Toxicity to algae (Acute toxicity) Remarks: Expected to be practically non toxic: LL/EL/IL50 > 100 mg/l

Toxicity to fish (Chronic toxicity) Remarks: Data not available

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) Remarks: Data not available

Toxicity to bacteria (Acute toxicity) Remarks: Data not available

Persistence and degradability

Product: Remarks: Expected to be not readily biodegradable. Major constituents are expected to be inherently biodegradable, but contains components that may persist in the environment.
Biodegradability

Bioaccumulative potential

Product: Remarks: Contains components with the potential to bioaccumulate.
Bioakkumulation

Mobility in soil

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

Other adverse effects

no data available

Product: Product is a mixture of non-volatile components, which are not expected to be released to air in any significant quantities.
Additional ecological information



ZF Aftermarket

Trade name: ZF-LIFEGUARDFLUID 8

Not expected to have ozone depletion potential, photochemical ozone creation potential or global warming potential.

Poorly soluble mixture.
May cause physical fouling of aquatic organisms.

13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues.

Recover or recycle if possible.
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.
Waste product should not be allowed to contaminate soil or ground water, or be disposed of into the environment.
Waste, spills or used product is dangerous waste.

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
Remarks

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

14. TRANSPORT INFORMATION

National Regulations

US Department of Transportation
Classification (49 CFR Parts 171-180)

Not regulated as a dangerous good



Trade name: ZF-LIFEGUARDFLUID 8

International Regulations

IATA-DGR Not regulated as a dangerous good
 IMDG-Code Not regulated as a dangerous good

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Pollution category Not applicable
 Ship type Not applicable
 Product name Not applicable
 Special precautions Not applicable

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.

Additional Information: MARPOL Annex 1 rules apply for bulk shipments by sea.

15. REGULATORY INFORMATION

OSHA Hazards No OSHA Hazards

EPCRA - Emergency Planning and Community Right-to-Know Act

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
Phosphoric acid	7664-38-2	5000	*
Benzene	71-43-2	10	*
Isobutyl alcohol	78-83-1	5000	*
Isobutyl alcohol	78-83-1	100	*

*: Calculated RQ exceeds reasonably attainable upper limit.

CERCLA Reportable Quantity Calculated RQ exceeds reasonably attainable upper limit.

CERCLA Reportable Quantity

SAFETY DATA SHEET

According to OSHA Hazard Communication Standard, 29 CFR 1910.1200



Trade name: ZF-LIFEGUARDFLUID 8

ZF Aftermarket

Calculated RQ exceeds reasonably attainable upper limit., Shell classifies this material as an "oil" under the CERCLA Petroleum Exclusion, therefore releases to the environment are not reportable under CERCLA., The components with RQs are given for information.

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards No SARA Hazards

SARA 302 No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Clean Water Act

The following Hazardous Chemicals are listed under the U.S. CleanWater Act, Section 311, Table 117.3:

Phosphoric acid	7664-38-2	0.0837 %
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Pennsylvania Right To Know

Distillates (petroleum), hydrotreated heavy paraffinic:	64742-54-7
Phosphoric acid:	7664-38-2
Diphenylamine:	122-39-4

California Prop 65

WARNING! This product contains a chemical known to the State of California to cause cancer.

WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

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

EINECS:	All components listed or polymer exempt.
TSCA:	All components listed.
DSL:	All components listed.

16. OTHER INFORMATION

Further information

SAFETY DATA SHEET

According to OSHA Hazard Communication Standard, 29 CFR 1910.1200



Trade name: ZF-LIFEGUARDFLUID 8

ZF Aftermarket

NFPA Rating (Health, Fire, Reactivity) 0, 1, 0

|| A vertical bar (|) in the left margin indicates an amendment from the previous version.

Abbreviations and Acronyms: The standard abbreviations and acronyms used in this document can be looked up in reference literature (e.g. scientific dictionaries) and/or websites.

ACGIH = American Conference of Governmental Industrial Hygienists
ADR = European Agreement concerning the International Carriage of Dangerous Goods by Road
AICS = Australian Inventory of Chemical Substances
ASTM = American Society for Testing and Materials
BEL = Biological exposure limits
BTEX = Benzene, Toluene, Ethylbenzene, Xylenes
CAS = Chemical Abstracts Service
CEFIC = European Chemical Industry Council
CLP = Classification Packaging and Labelling
COC = Cleveland Open-Cup
DIN = Deutsches Institut für Normung
DMEL = Derived Minimal Effect Level
DNEL = Derived No Effect Level
DSL = Canada Domestic Substance List
EC = European Commission
EC50 = Effective Concentration fifty
ECETOC = European Center on Ecotoxicology and Toxicology Of Chemicals
ECHA = European Chemicals Agency
EINECS = The European Inventory of Existing Commercial Chemical Substances
EL50 = Effective Loading fifty
ENCS = Japanese Existing and New Chemical Substances Inventory
EWC = European Waste Code
GHS = Globally Harmonised System of Classification and Labelling of Chemicals
IARC = International Agency for Research on Cancer
IATA = International Air Transport Association
IC50 = Inhibitory Concentration fifty

SAFETY DATA SHEET

According to OSHA Hazard Communication Standard, 29 CFR 1910.1200



Trade name: ZF-LIFEGUARDFLUID 8

ZF Aftermarket

IL50 = Inhibitory Level fifty
IMDG = International Maritime Dangerous Goods
INV = Chinese Chemicals Inventory
IP346 = Institute of Petroleum test method N° 346 for the determination of polycyclic aromatics DMSO-extractables
KECI = Korea Existing Chemicals Inventory
LC50 = Lethal Concentration fifty
LD50 = Lethal Dose fifty per cent.
LL/EL/IL = Lethal Loading/Effective Loading/Inhibitory loading
LL50 = Lethal Loading fifty
MARPOL = International Convention for the Prevention of Pollution From Ships
NOEC/NOEL = No Observed Effect Concentration / No Observed Effect Level
OE_HP V = Occupational Exposure - High Production Volume
PBT = Persistent, Bioaccumulative and Toxic
PICCS = Philippine Inventory of Chemicals and Chemical Substances
PNEC = Predicted No Effect Concentration
REACH = Registration Evaluation And Authorisation Of Chemicals
RID = Regulations Relating to International Carriage of Dangerous Goods by Rail
SKIN_DES = Skin Designation
STEL = Short term exposure limit
TRA = Targeted Risk Assessment
TSCA = US Toxic Substances Control Act
TWA = Time-Weighted Average
vPvB = very Persistent and very Bioaccumulative

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).

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.