



Product name: ZF Lifeguard eFluid 2

ZF Aftermarket

1. Product and company identification

1.1 Product identifier

Product name: ZF Lifeguard eFluid 2

Product number: 0671.090.534

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

Identified uses: Hydraulic/transmission fluid

Uses advised against: No uses advised against identified.

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](http://www.zf.com/contact)
msds.zf-aftermarket@zf.com

1.4 Emergency number

24/7h Emergency information/ emergency number:

(+49) 89 19 240 (Poison emergency call – Information in German and English)

2. Hazards identification

2.1 Classification of the substance or mixture

The product has been classified and labelled as hazardous according to the legislation in force.

Health Hazards

Carcinogenicity Category 2

Toxic to reproduction Category 2

Environmental Hazards

Chronic hazards to the aquatic environment Category 3

Hazard summary

Physical Hazards: No data available.



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2.2 Label Elements



Signal Words:
Hazard Statement(s):

Warning
H351: Suspected of causing cancer.
H361f: Suspected of damaging fertility.
H412: Harmful to aquatic life with long lasting effects.

Precautionary Statements

Prevention:

P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P273: Avoid release to the environment.
P281: Use personal protective equipment as required.
P308+P313: IF exposed or concerned: Get medical advice/attention.
P405: Store locked up.

Response:

Storage:

Disposal:

P501: Dispose of contents/ container to an approved facility in accordance with local, regional, national and international regulations.

2.3 Other hazards

By handling of mineral oil products and chemical products no particular hazard is known when normal precautions (item 7) and personal protective equipment (item 8) are kept. The product may not be released into the environment without control.

Unknown toxicity: Due to information available product does not contain any ingredients of unknown toxicity.

3. Composition/ Information on ingredients

3.2 Mixtures

General information: mixture of synthetic base oils and severely refined base oil.



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Chemical name	Identifier	Concentration *
Hydrocarbons, low viscous	68037-01-4	20.00 - <50.00%
base oil, low viscous	72623-87-1	20.00 - <50.00%
Base oil paraffinic	64742-54-7	1.00 - <10.00%
Amine aromatic, alkylated	68411-46-1	0.10 - <1.00%
Alkyl amine	61791-44-4	0.10 - <0.25%
hydrocarbons, low viscous	64742-94-5	0.10 - <1.00%
prim. alkanolamine ether	218141-16-3	0.00 - <0.10%
hydroxyethyl-alkylamine	71786-60-2	0.01 - <0.10%

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

PBT: persistent, bioaccumulative and toxic substance.

vPvB: very persistent and very bioaccumulative substance.

Classification

Chemical name	Identifier	Classification
Hydrocarbons, low viscous	68037-01-4	Asp. Tox. 1;H304
base oil, low viscous	72623-87-1	Asp. Tox. 1;H304
Base oil paraffinic	64742-54-7	Asp. Tox. 1;H304
Amine aromatic , alkylated	68411-46-1	Repr. 2;H361f, Aquatic Chronic 3;H412
Alkyl amine	61791-44-4	Skin Corr. 1C;H314, Eye Dam. 1;H318, Aquatic Acute 1;H400, Aquatic Chronic 1;H410, Acute Tox. 4;H302; M-Factor (aquatic acute): 10; M-Factor (aquatic chronic): 1
hydrocarbons, low viscous	64742-94-5	Carc. 2;H351, Asp. Tox. 1;H304, STOT SE 3;H336, Aquatic Chronic 2;H411
prim. alkanolamine ether	218141-16-3	Acute Tox. 4;H302, Skin Corr. 1B;H314, Eye Dam. 1;H318, Aquatic Acute 1;H400, Aquatic Chronic 1;H410; M-Factor (aquatic acute): 100; M-Factor (aquatic chronic): 1
hydroxyethyl-alkylamine	71786-60-2	Acute Tox. 4;H302, Skin Corr. 1C;H314, Eye Dam. 1;H318, Repr. 2;H361d, Aquatic Acute 1;H400,



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		Aquatic Chronic 1;H410; M-Factor (aquatic acute): 10; M-Factor (aquatic chronic): 10
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Please note that the mineral oils and petroleum distillates used in our products are severely refined and have a DMSO extract < 3% as measured by method IP 346 and are not classified as carcinogenic according to Nota L/ Nota N of Annex VI of Regulation EC 1272/2008."

4. First aid measures

General:

Instantly remove any clothing soiled by the product.

4.1 Description of first aid measures

Inhalation:

Supply fresh air; consult doctor in case of symptoms.

Eye contact:

Promptly wash eyes with plenty of water while lifting the eye lids.

Skin Contact:

Wash with soap and water.

Ingestion:

Rinse mouth thoroughly.

4.2 Most important symptoms and effects, both acute and delayed

May cause skin and eye irritation.

4.3 Indication of any immediate medical attention and special treatment needed

Get medical attention if symptoms occur.

5. Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media:

CO₂, fire extinguishing powder or fog like water spraying. Extinguish larger fires with alcohol resistant foam or spray water with suitable surfactant added

Unsuitable extinguishing media:

Water with a full water jet.

5.2 Special hazards arising from the substance or mixture

During fire, gases hazardous to health may be formed.



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5.3 Advice for firefighters

Special fire fighting procedures:

Move container from fire area if it can be done without risk. Dispose of fire debris and contaminated fire fighting water in accordance with official regulations. Collect contaminated fire fighting water separately. It must not enter drains.

Special protective equipment for firefighters:

Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

In case of spills, beware of slippery floors and surfaces.

6.2 Environmental Precautions

Avoid release to the environment. Prevent further leakage or spillage if safe to do so. Prevent from spreading (e.g. by binding or oil barriers). Environmental manager must be informed of all major spillages. Do not allow to enter drainage system, surface or ground water.

6.3 Methods and material for containment and cleaning up

Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust). Dispose of the material collected according to regulations. Stop the flow of material if this is without risk.

6.4 Reference to other sections

See Section 8 of the SDS for Personal Protective Equipment. See Section 7 for information on safe handling See Section 13 for information on disposal.

7. Handling and storage

7.1 Precautions for safe handling

Prevent formation of aerosols. Do not eat, drink or smoke when working with the product. Take usual precautions when handling mineral oil products or chemical products. Observe good industrial hygiene practices. Provide adequate ventilation.

7.2 Conditions for safe storage, including any incompatibilities



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Local regulations concerning handling and storage of waterpolluting products have to be followed. Do not heat up to temperatures close to the flash point.

7.3 Specific end use(s)

Not applicable

8. Exposure controls/ personal protection

8.1 Exposure Limits

Chemical name	Type	Exposure Limit Values	Source
base oil, low viscous - Inhalable fraction.	TWA	5 mg/m ³	US. ACGIH Threshold Limit Values, as amended (03 2014)
base oil, low viscous	PEL	500 ppm 2,000 mg/m ³	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000), as amended (02 2006)
base oil, low viscous - Mist.	PEL	5 mg/m ³	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000), as amended (02 2006)
base oil, low viscous	TWA	400 ppm 1,600 mg/m ³	US. OSHA Table Z-1-A (29 CFR 1910.1000), as amended (1989)
base oil, low viscous - Mist.	TWA	5 mg/m ³	US. OSHA Table Z-1-A (29 CFR 1910.1000), as amended (1989)
Base oil paraffinic	PEL	500 ppm 2,000 mg/m ³	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000), as amended (02 2006)
Base oil paraffinic - Mist.	PEL	5 mg/m ³	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000), as amended (02 2006)
Base oil paraffinic	TWA	400 ppm 1,600 mg/m ³	US. OSHA Table Z-1-A (29 CFR 1910.1000), as amended (1989)
Base oil paraffinic - Mist.	TWA	5 mg/m ³	US. OSHA Table Z-1-A (29 CFR 1910.1000), as amended (1989)
Base oil paraffinic - Mist.	PEL	5 mg/m ³	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000), as amended (01 2017)
Base oil paraffinic - Mist.	TWA	5 mg/m ³	US. OSHA Table Z-1-A (29 CFR 1910.1000), as amended (1989)
hydrocarbons, low viscous	PEL	500 ppm 2,000 mg/m ³	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000), as amended (02 2006)
hydrocarbons, low viscous - Mist.	PEL	5 mg/m ³	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000), as amended (02 2006)
hydrocarbons, low viscous	TWA	400 ppm 1,600 mg/m ³	US. OSHA Table Z-1-A (29 CFR 1910.1000), as amended (1989)
hydrocarbons, low viscous - Mist.	TWA	5 mg/m ³	US. OSHA Table Z-1-A (29 CFR 1910.1000), as amended (1989)



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hydrocarbons, low viscous - Inhalable fraction.	TWA	5 mg/m ³	US. ACGIH Threshold Limit Values, as amended (03 2014)
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8.2 Exposure controls

Appropriate engineering controls

Provide adequate ventilation. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Individual protection measures, such as personal protective equipment

General information:

Wash hands before breaks and after work. Use personal protective equipment as required. Personal protection equipment should be chosen according to the CEN standards and in discussion with the supplier of the personal protective equipment. The usual precautionary measures should be adhered to in handling the chemicals or the mineral oil products.

Eye/face protection:

Avoid contact with skin and eyes. Goggles/face shield are recommended. If risk of splashing, wear safety goggles or face shield.

**Skin protection
Hand Protection:**

Material: Nitrile butyl rubber (NBR).
Min. Breakthrough time: ≥ 480 min
Recommended thickness of the material: ≥ 0.38 mm
Avoid long-term and repeated skin contact. Suitable gloves can be recommended by the glove supplier. Use skin protection cream for preventive skin protection. Protective gloves, where permitted in acc. to safety directions. The exact breakthrough time has to be found out by the manufacturer of the protective gloves and has to be observed.



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Other:

Do not carry cleaning cloths impregnated with the product in trouser pockets. Wear suitable protective clothing.

Respiratory Protection:

Ensure good ventilation/exhaustion at the workplace. Avoid breathing vapour/ aerosol.

Thermal hazards:

No data available.

Hygiene measures:

Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing to remove contaminants. Discard contaminated footwear that cannot be cleaned.

Environmental Controls:

No data available.

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance	
Physical state:	liquid
Form:	liquid
Color:	Amber
Odor:	Characteristic
Odor Threshold:	Not applicable for mixtures
pH:	substance/mixture is non-soluble (in water)
Freezing point:	Not applicable for mixtures
Boiling Point:	Value not relevant for classification
Flash Point:	220°C, 428°F
Evaporation Rate:	Not applicable for mixtures
Flammability (solid, gas):	Value not relevant for classification
Explosion Limit - Upper (%):	Not applicable for mixtures
Explosion Limit - Lower (%):	Not applicable for mixtures
Vapor pressure:	Not applicable for mixtures
Relative vapor density:	Not applicable for mixtures
Density:	0.84 g/cm ³ (20°C, 68°F)
Solubility(ies)	



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Solubility in Water:	Insoluble in water
Solubility (other):	No data available.
Partition coefficient (n-octanol/water):	Not applicable for mixtures
Autoignition Temperature:	Value not relevant for classification
Decomposition Temperature:	Value not relevant for classification
Kinematic viscosity:	35 mm ² /s (40°C, 104°F)
Explosive properties:	Value not relevant for classification
Oxidizing properties:	Value not relevant for classification

9.2 Other information

No data available.

10. Stability and reactivity

10.1 Reactivity	Stable under normal use conditions.
10.2 Chemical Stability	Stable under normal use conditions.
10.3 Possibility of hazardous reactions	Stable under normal use conditions.
10.4 Conditions to avoid	Stable under normal use conditions.
10.5 Incompatible Materials	Strong oxidizing substances. Strong acids. Strong bases.
10.6 Hazardous Decomposition Products	Thermal decomposition or combustion may liberate carbon oxides and other toxic gases or vapors.

11. Toxicological information

Information on likely routes of exposure

Inhalation:	No data available.
Ingestion:	No data available.
Skin Contact:	No data available.
Eye contact:	No data available.

Acute toxicity

Oral Product:	Not classified for acute toxicity based on available data.
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Specified substance(s) Hydrocarbons, low viscous	LD 50 (Rat): > 5.000 mg/kg
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base oil, low viscous	LD 50 (Rat): > 5.000 mg/kg (OECD 401)
Base oil paraffinic	LD 50 (Rat): > 5,000 mg/kg
Amine aromatic, alkylated	LD 50 (Rat): > 5,000 mg/kg (OECD 401)
Alkyl amine	LD 50 (Rat): 1,350 mg/kg (OECD 401)
hydrocarbons, low viscous	LD 50 (Rat): 6,318 mg/kg (OECD 423)
Dermal Product:	Not classified for acute toxicity based on available data.

Specified substance(s)	
Base oil paraffinic	LD 50 (Rabbit): > 5,000 mg/kg
Inhalation Product:	Not classified for acute toxicity based on available data.

Specified substance(s)	
Hydrocarbons, low viscous	LC 50 (Rat, 4 h): > 5 mg/l
	Dusts and mist

Skin Corrosion/Irritation Product:	Based on available data, the classification criteria are not met.
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Specified substance(s)	
Base oil paraffinic	OECD 404 Not irritant.
Alkyl amine	OECD 404 (Rabbit, 14 d): Causes severe skin burns.

Serious Eye Damage/Eye Irritation Product:	Based on available data, the classification criteria are not met.
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Specified substance(s)	
Base oil paraffinic	OECD 405 Not irritant.
Amine aromatic, alkylated	OECD 405 (Rabbit): Not irritant.

Respiratory or Skin Sensitization Product:	
Skin sensitizer:	Based on available data, the classification criteria are not met.
Respiratory sensitizer:	Based on available data, the classification criteria are not met.

Specified substance(s)	
Amine aromatic, alkylated	No sensitizing effect (guinea pig); OECD 406
Alkyl amine	No sensitizing effect (guinea pig); OECD 406



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hydroxyethyl-alkylamine

No sensitizing effect (guinea pig);
OECD 406

Germ Cell Mutagenicity

Product:

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

Carcinogenicity

Product:

Based on available data, the classification criteria are met.

IARC: IARC Monographs on the Evaluation of Carcinogenic Risks to Humans:

No carcinogenic components identified

NTP: US. National Toxicology Program (NTP) Report on Carcinogens:

No carcinogenic components identified

OSHAS: US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050):

No carcinogenic components identified

Reproductive toxicity

Product:

Based on available data, the classification criteria are met.

Specific Target Organ Toxicity - Single Exposure

Product:

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

Specific Target Organ Toxicity - Repeated Exposure

Product:

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

Aspiration Hazard

Product:

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

Specified substance(s)

Base oil paraffinic: May be fatal if swallowed and enters airways.

12. Ecological information

General information: Not applicable

12.1 Toxicity

Acute toxicity

Product:

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

Fish

Specified substance(s)

Hydrocarbons, low viscous

LC 50 (Fish, 96 h): > 750 mg/l



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Base oil paraffinic Amine aromatic, alkylated	LC 50 (Fish, 96 h): > 100 mg/l LC 50 (Fish, 96 h): > 100 mg/l (OECD 203)
Alkyl amine	LC 50 (Fish, 96 h): 0,1 mg/l (OECD 203)
hydrocarbons, low viscous hydroxyethyl-alkylamine	LC 50 (Fish, 96 h): 2 - 5 mg/l LC 50 (Fish, 96 h): 0.1 mg/l (OECD 203)
Aquatic Invertebrates Specified substance(s) Hydrocarbons, low viscous	EC 50 (Water Flea, 48 h): 190 mg/l
base oil, low viscous	EL50 (Water Flea, 48 h): > 10,000 mg/l (OECD 202)
Base oil paraffinic Amine aromatic, alkylated	EC 50 (Water Flea, 48 h): > 100 mg/l EC 50 (Daphnia magna): 51 mg/l (OECD 202)
Alkyl amine	EC 50 (Water Flea, 48 h): 0.043 mg/l (OECD 202)
hydroxyethyl-alkylamine	EC 50 (Water Flea, 48 h): 0,48 mg/l (OECD 202)
Chronic Toxicity Product:	Based on available data, the classification criteria are met.
Fish Specified substance(s) base oil, low viscous	NOEC (Fish, 14 d): > 1,000 mg/l
Aquatic Invertebrates Specified substance(s) base oil, low viscous	NOEC (Water Flea, 21 d): 10 mg/l (OECD 211)
Base oil paraffinic	NOEC (Daphnia magna, 21 d): 10 mg/l (OECD 211)
Alkyl amine	EC 10 (Water Flea, 21 d): 0.0107 mg/l (OECD 211)
hydroxyethyl-alkylamine	EC 10 (Water Flea, 21 d): 0.279 mg/l (OECD 211)
Toxicity to Aquatic Plants Specified substance(s)	



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Hydrocarbons, low viscous	EC 50 (Alga, 72 h): > 1.000 mg/l
base oil, low viscous	NOEC (Alga, 72 h): > 100 mg/l (OECD 201)
Base oil paraffinic	EC 50 (Algae, 72 h): > 100 mg/l (OECD 201)
Amine aromatic, alkylated	EC 50 (72 h): > 100 mg/l (OECD 201)
Alkyl amine	EC 50 (Alga, 72 h): 0.0538 mg/l (OECD 201)
hydrocarbons, low viscous	NOEC (Alga, 72 h): 0.0156 mg/l EC 50 (Alga, 72 h): 1 - 3 mg/l (OECD 201)
hydroxyethyl-alkylamine	EC 50 (Alga, 72 h): 0.107 mg/l (OECD 201) EC 10 (Alga, 72 h): 0.0092 mg/l (OECD 201)

12.2 Persistence and Degradability

Biodegradation

Product: Not applicable for mixtures

Specified substance(s)

Base oil paraffinic Not readily degradable.

Amine aromatic, alkylated Not readily degradable.
Alkyl amine 63 % (28 d, OECD 301D) Readily biodegradable
hydrocarbons, low viscous 58 % (28 d)

hydroxyethyl-alkylamine > 60 % (28 d, OECD 301B) Readily biodegradable

12.3 Bioaccumulative potential

Product: Not applicable for mixtures

12.4 Mobility in soil

Product: Not applicable for mixtures

12.5 Results of PBT and vPvB assessment

The product does not contain any substances fulfilling the PBT/vPvB criteria.

12.6 Other adverse effects

Harmful to aquatic life with long lasting effects.



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13. Disposal considerations

13.1 Waste treatment methods

General information: Dispose in accordance with all applicable regulations.

Disposal methods: Discharge, treatment, or disposal may be subject to national, state, or local laws.

14. Transport information

DOT
Not Regulated.
TDG
Not Regulated.

IMDG - International Maritime Dangerous Goods Code
Not Regulated.

IATA
Not Regulated.

15. Regulatory information

US Federal Regulations

US State Regulations
US. California Proposition 65

WARNING! This product can expose you to chemicals including NAPHTHALENE which is [are] known to the State of California to cause cancer.

For more information go to www.P65Warnings.ca.gov.

Inventory Status

DSL On or in compliance with the inventory

TSCA On or in compliance with the inventory

16. Other information



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Revision Information:

Vertical lines in the margin indicate an amendment.

Wording of the H-statements in section 2 and 3

- H302 Harmful if swallowed.
- H304 May be fatal if swallowed and enters airways.
- H314 Causes severe skin burns and eye damage.
- H318 Causes serious eye damage.
- H336 May cause drowsiness or dizziness.
- H351 Suspected of causing cancer.
- H361d Suspected of damaging the unborn child.
- H361f Suspected of damaging fertility.
- H400 Very toxic to aquatic life.
- H410 Very toxic to aquatic life with long lasting effects.
- H411 Toxic to aquatic life with long lasting effects.
- H412 Harmful to aquatic life with long lasting effects.

Disclaimer:

The data contained in this safety data sheet are based on our current knowledge and experience and are given to the best of our knowledge and belief. It characterizes the product only with regard to safety requirements for handling, transport and disposal. The data do not describe the product's properties (tech. product specification). Neither should any agreed property nor the suitability of the product for any specific technical application be deduced from the data contained in this safety data sheet. Modifications on this document are not allowed. The data are not transferable to other products. In the case of mixing the product with other products or in the case of processing, the data in this safety data sheet are not necessarily valid for the new-made material. It is the responsibility of the recipient of the product to observe federal, state and local law. Please contact us to obtain up-to-date safety data sheets. This document was issued electronically and has no signature.