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

1.1. Product identifier

MITANOL Brake Fluid DOT 4

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

Use of the substance/mixture

brake fluids

Uses advised against

No information available.

1.3. Details of the supplier of the safety data sheet

Company name:	MITANOL GmbH	
Street:	Industriestraße 8	
Place:	D-49577 Ankum	
Telephone:	+49 (0)5462/7470-50	Telefax: +49 (0)5462/7470-33
e-mail:	info@mitanol.de	
Internet:	www.mitanol.de	
Responsible Department:	Produktsicherheit / Product Safety sicherheitsdatenblatt@mitanol.de	

1.4. Emergency telephone number:

Giftinformationszentrum Nord (Göttingen)
+49 (0)551/19240

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

GB CLP Regulation

Repr. 2; H361fd

Full text of hazard statements: see SECTION 16.

2.2. Label elements

GB CLP Regulation

Hazard components for labelling

Tris[2-[2-(2-methoxyethoxy)ethoxy]ethyl] orthoborate

Signal word: Warning

Pictograms:

Hazard statements

H361fd	Suspected of damaging fertility. Suspected of damaging the unborn child.

Precautionary statements

P101	If medical advice is needed, have product container or label at hand.
P102	Keep out of reach of children.
P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P280	Wear protective gloves/protective clothing/eye protection/face protection/hearing protection.
P308+P313	IF exposed or concerned: Get medical advice/attention.
P405	Store locked up.
P501	Dispose of contents / container in accordance with official regulations.

2.3. Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher. According to the present state of knowledge provided this product is handled correctly,there is no danger to humans or the environment

SECTION 3: Composition/information on ingredients

3.2. Mixtures

Hazardous components

CAS No	Chemical name			Quantity
	EC No	Index No	REACH No	
	GHS Classification			
30989-05-0	Tris[2-[2-(2-methoxyethoxy)ethoxy]ethyl] orthoborate			>= 3 - < 10 %
	250-418-4		01-2119462824-33	
	Repr. 2; H361fd			
111-46-6	2,2'-oxybisethanol; diethylene glycol			>= 1 - < 10 %
	203-872-2	603-140-00-6	01-2119457857-21	
	Acute Tox. 4; H302			
	Reaction mass of 2-(2-(2-butoxyethoxy)ethoxy)ethanol and 3,6,9,12-tetraoxahexadecan-1-ol			>= 3 - < 10 %
	907-996-4			
	Eye Dam. 1; H318			
110-97-4	1,1'-iminodipropan-2-ol; di-isopropanolamine			>= 1 - <= 5 %
	203-820-9	603-083-00-7		
	Eye Irrit. 2; H319			

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

Specific Conc. Limits, M-factors and ATE

CAS No	EC No	Chemical name	Quantity
	Specific Conc. Limits, M-factors and ATE		
30989-05-0	250-418-4	Tris[2-[2-(2-methoxyethoxy)ethoxy]ethyl] orthoborate	>= 3 - < 10 %
	dermal: LD50 = > 2000 mg/kg; oral: LD50 = > 2000 mg/kg		
111-46-6	203-872-2	2,2'-oxybisethanol; diethylene glycol	>= 1 - < 10 %
	dermal: LD50 = 11890 mg/kg; oral: LD50 = 16500 mg/kg		
	907-996-4	Reaction mass of 2-(2-(2-butoxyethoxy)ethoxy)ethanol and 3,6,9,12-tetraoxahexadecan-1-ol	>= 3 - < 10 %
	Eye Dam. 1; H318: >= 30 - 100 Eye Irrit. 2; H319: >= 20 - < 30		
110-97-4	203-820-9	1,1'-iminodipropan-2-ol; di-isopropanolamine	>= 1 - <= 5 %
	dermal: LD50 = 8000 mg/kg; oral: LD50 = >2000 mg/kg		

SECTION 4: First aid measures

4.1. Description of first aid measures

General information

Personal protection equipment: see section 8

Never give anything by mouth to an unconscious person or a person with cramps.

In all cases of doubt, or when symptoms persist, seek medical advice.

After inhalation

Remove person to fresh air and keep comfortable for breathing.

When in doubt or if symptoms are observed, get medical advice.

After contact with skin

Take off immediately all contaminated clothing and wash it before reuse.
After contact with skin, wash immediately with plenty of water and soap.
If skin irritation occurs: Get medical advice/attention.

After contact with eyes

After contact with the eyes, rinse with water with the eyelids open for a sufficient length of time, then consult an ophthalmologist immediately.
Remove contact lenses, if present and easy to do. Continue rinsing.

After ingestion

Rinse mouth thoroughly with water.
Let water be drunken in little sips (dilution effect).
Do NOT induce vomiting.
Seek medical advice immediately.

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

No information available.

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

Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media

Use water spray jet to protect personnel and to cool endangered containers.
Co-ordinate fire-fighting measures to the fire surroundings.

- alcohol resistant foam
- Extinguishing powder
- Carbon dioxide (CO2)
- Water mist

Unsuitable extinguishing media

Full water jet

5.2. Special hazards arising from the substance or mixture

Non-flammable. Formation of toxic gases is possible during heating or in case of fire.
In case of fire may be liberated:

- Carbon monoxide (CO)
- Carbon dioxide (CO2).
- Nitrogen oxides (NOx)
- Pyrolysis products, toxic

5.3. Advice for firefighters

In case of fire: Wear self-contained breathing apparatus.
Suppress gases/vapours/mists with water spray jet.

Additional information

Collect contaminated fire extinguishing water separately. Do not allow entering drains or surface water.
Dispose of waste according to applicable legislation.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General advice

Keep people at a distance and stay on the windward side.
Provide adequate ventilation.
Use personal protection equipment.
Avoid contact with skin, eyes and clothes.

6.2. Environmental precautions

Do not allow to enter into surface water or drains.
In case of gas escape or of entry into waterways, soil or drains, inform the responsible authorities.

6.3. Methods and material for containment and cleaning up

For containment

Stop leak if safe to do so.
Absorb with liquid-binding material (sand, diatomaceous earth, acid- or universal binding agents).

For cleaning up

Collect in closed and suitable containers for disposal.
Treat the recovered material as prescribed in the section on waste disposal.
Clean contaminated articles and floor according to the environmental legislation.

6.4. Reference to other sections

Safe handling: see section 7
Personal protection equipment: see section 8
Disposal: see section 13

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Advice on safe handling

If handled uncovered, arrangements with local exhaust ventilation have to be used.
Do not breathe gas/fumes/vapour/spray.
Avoid contact with skin, eyes and clothes.
Use personal protective equipment as required.

Advice on protection against fire and explosion

No special fire protection measures are necessary.

7.2. Conditions for safe storage, including any incompatibilities

Requirements for storage rooms and vessels

Keep locked up.
Keep container tightly closed in a cool, well-ventilated place.
Keep only in the original container.

Hints on joint storage

Do not store together with:
- Materials capable of ignition under almost all normal temperature conditions
- Explosives

7.3. Specific end use(s)

brake fluids

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Exposure limits (EH40)

CAS No	Substance	ppm	mg/m³	fibres/ml	Category	Origin
111-46-6	2,2'-Oxydiethanol	23	101		TWA (8 h)	WEL

DNEL/DMEL values

CAS No	Substance			
DNEL type		Exposure route	Effect	Value
30989-05-0	Tris[2-[2-(2-methoxyethoxy)ethoxy]ethyl] orthoborate			
Worker DNEL, long-term		inhalation	systemic	14,8 mg/m³
Worker DNEL, long-term		dermal	systemic	4,2 mg/kg bw/day
Consumer DNEL, long-term		inhalation	systemic	2,6 mg/m³
Consumer DNEL, long-term		dermal	systemic	1,5 mg/kg bw/day
Consumer DNEL, long-term		oral	systemic	1,5 mg/kg bw/day
111-46-6	2,2'-oxybisethanol; diethylene glycol			
Worker DNEL, long-term		inhalation	systemic	44 mg/m³
Worker DNEL, long-term		inhalation	local	60 mg/m³
Worker DNEL, long-term		dermal	systemic	43 mg/kg bw/day
Consumer DNEL, long-term		inhalation	systemic	12 mg/m³
Consumer DNEL, long-term		inhalation	local	12 mg/m³
Consumer DNEL, long-term		dermal	systemic	21 mg/kg bw/day
110-97-4	1,1'-iminodipropan-2-ol; di-isopropanolamine			
Worker DNEL, long-term		dermal	systemic	12,5 mg/kg bw/day
Worker DNEL, long-term		inhalation	systemic	16 mg/m³
Consumer DNEL, long-term		dermal	systemic	6,3 mg/kg bw/day
Consumer DNEL, acute		inhalation	systemic	3,9 mg/m³
Consumer DNEL, long-term		oral	systemic	1,3 mg/kg bw/day

PNEC values

CAS No	Substance	
Environmental compartment		Value
30989-05-0	Tris[2-[2-(2-methoxyethoxy)ethoxy]ethyl] orthoborate	
Freshwater		0,211 mg/l
Freshwater (intermittent releases)		2,112 mg/l
Marine water		0,021 mg/l
Freshwater sediment		0,76 mg/kg
Marine sediment		0,076 mg/kg
Micro-organisms in sewage treatment plants (STP)		100 mg/l
Soil		0,028 mg/kg
111-46-6	2,2'-oxybisethanol; diethylene glycol	
Freshwater		10 mg/l
Freshwater (intermittent releases)		10 mg/l
Marine water		1 mg/l
Freshwater sediment		20,9 mg/kg
Marine sediment		2,09 mg/kg
Micro-organisms in sewage treatment plants (STP)		199,5 mg/l
Soil		1,53 mg/kg
110-97-4	1,1'-iminodipropan-2-ol; di-isopropanolamine	
Freshwater		0,2777 mg/l
Freshwater sediment		2,33 mg/kg
Marine sediment		0,233 mg/kg
Soil		0,303 mg/kg

8.2. Exposure controls

Appropriate engineering controls

Provide adequate ventilation as well as local exhaustion at critical locations. Do not breathe gas/fumes/vapour/spray.

Protective and hygiene measures

Remove contaminated, saturated clothing immediately.
Wash hands and face before breaks and after work and take a shower if necessary.
When using do not eat, drink, smoke, sniff.

Eye/face protection

Wear eye/face protection. (EN166)

Hand protection

When handling with chemical substances, protective gloves must be worn with the CE-label including the four control digits. The quality of the protective gloves resistant to chemicals must be chosen as a function of the specific working place concentration and quantity of hazardous substances. For special purposes, it is recommended to check the resistance to chemicals of the protective gloves mentioned above together with the supplier of these gloves. (EN ISO 374)
Suitable material: NBR (Nitrile rubber)
Thickness of the glove material: > 0,3 mm

Breakthrough time: > 8h

Skin protection

Wear suitable protective clothing.

Respiratory protection

In case of inadequate ventilation wear respiratory protection.
Half-face mask (EN 140)
Filter type: A (EN 141)
The filter class must be suitable for the maximum contaminant concentration (gas/vapour/aerosol/particulates) that may arise when handling the product. If the concentration is exceeded, self-contained breathing apparatus must be used. (EN 137)

Environmental exposure controls

Avoid release to the environment.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state:	Liquid
Colour:	yellow
Odour:	characteristic
Odour threshold:	not determined
pH-Value:	9 - 10

Changes in the physical state

Melting point/freezing point:	< -50 °C
Boiling point or initial boiling point and boiling range:	> 230 °C
Flash point:	143 °C
Sustaining combustion:	No data available

Flammability

Solid/liquid:	not applicable
Gas:	not applicable

Explosive properties

The product is not: Explosive.

Lower explosion limits:	not determined
Upper explosion limits:	not determined

Self-ignition temperature

Solid:	not applicable
Gas:	not applicable

Oxidizing properties

The product is not: oxidising.

Vapour pressure:	not determined
Density (at 20 °C):	1,07 g/cm³
Bulk density:	not applicable
Water solubility:	easily soluble

Solubility in other solvents

not determined

Partition coefficient n-octanol/water:	not determined
Viscosity / dynamic:	not determined

Viscosity / kinematic: (at 20 °C)	not determined
Relative vapour density:	not determined
Evaporation rate:	not determined

9.2. Other information

Solid content:	not determined

SECTION 10: Stability and reactivity

10.1. Reactivity

No hazardous reaction when handled and stored according to provisions.

10.2. Chemical stability

The product is stable under storage at normal ambient temperatures.

10.3. Possibility of hazardous reactions

No known hazardous reactions.

10.4. Conditions to avoid

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

10.5. Incompatible materials

Incompatible materials:

- Oxidizing agent
- Strong acid

10.6. Hazardous decomposition products

Hazardous decomposition products:

- Carbon monoxide (CO)
- Carbon dioxide (CO2).
- Nitrogen oxides (NOx)
- Pyrolysis products, toxic

SECTION 11: Toxicological information

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

Acute toxicity

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

CAS No	Chemical name					
	Exposure route	Dose		Species	Source	Method
30989-05-0	Tris[2-[2-(2-methoxyethoxy)ethoxy]ethyl] orthoborate					
	oral	LD50 mg/kg	> 2000	Rat	Study report (1995)	OECD Guideline 401
	dermal	LD50 mg/kg	> 2000	Rat	Study report (2010)	OECD Guideline 402
111-46-6	2,2'-oxybisethanol; diethylene glycol					
	oral	LD50 mg/kg	16500	Rat	Journal of Industrial Hygiene and Toxico	
	dermal	LD50 mg/kg	11890	Rabbit		
110-97-4	1,1'-iminodipropan-2-ol; di-isopropanolamine					
	oral	LD50 mg/kg	>2000	Rat	OECD 401	
	dermal	LD50 mg/kg	8000	Rabbit		

Irritation and corrosivity

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

Sensitising effects

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

Carcinogenic/mutagenic/toxic effects for reproduction

Suspected of damaging fertility. Suspected of damaging the unborn child. (Tris[2-[2-(2-methoxyethoxy)ethoxy]ethyl] orthoborate)

Germ cell mutagenicity: Based on available data, the classification criteria are not met.

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

STOT-single exposure

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

STOT-repeated exposure

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

Aspiration hazard

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

Additional information on tests

The mixture is classified as hazardous according to regulation (EC) No 1272/2008 [CLP]. Special hazards arising from the substance or mixture!

11.2. Information on other hazards

Endocrine disrupting properties

See section: 12.6

SECTION 12: Ecological information

12.1. Toxicity

The product has not been tested.

CAS No	Chemical name						
	Aquatic toxicity	Dose		[h] | [d]	Species	Source	Method
30989-05-0	Tris[2-[2-(2-methoxyethoxy)ethoxy]ethyl] orthoborate						
	Acute fish toxicity	LC50	100,3 mg/l	96 h	Oncorhynchus mykiss	Study report (1987)	OECD Guideline 203
	Acute algae toxicity	ErC50	> 224,4 mg/l	72 h	Raphidocelis subcapitata	Study report (1999)	EU Method C.3
	Acute bacteria toxicity	(EC50	> 1000 mg/l)	0,5 h	The inoculum of the activated sludge originated fr	Study report (1999)	OECD Guideline 209
111-46-6	2,2'-oxybisethanol; diethylene glycol						
	Acute fish toxicity	LC50	75200 mg/l	96 h	Pimephales promelas	Center for Lake Superior Environmental S	Method: special acute fish toxicity test
	Acute algae toxicity	ErC50	6500 - 13000 mg/l	96 h	Pseudokirchneriella subcapitata	Study report (1982)	other: EPA 600/9-78-018, 1978
	Acute crustacea toxicity	EC50	62630 mg/l	48 h	Daphnia magna	Secondary source (2006)	other: Acute Lethality Test Using Daphni
	Fish toxicity	NOEC	15380 mg/l	7 d	Pimephales promelas	Environ. Toxicology and Chemistry, Vol.	other: EPA 600/4-89/001. U.S. Environmen
	Crustacea toxicity	NOEC	8590 mg/l	7 d	Ceriodaphnia dubia	Environ. Toxicology and Chemistry, Vol.	other: EPA 600/4-89/001. U.S. Environmen
110-97-4	1,1'-iminodipropan-2-ol; di-isopropanolamine						
	Acute fish toxicity	LC50	1466 mg/l	96 h	Danio rerio (zebrafish)	OECD 203	
	Acute crustacea toxicity	EC50	277,7 mg/l	48 h	Daphnia magna (Big water flea)		

12.2. Persistence and degradability

The product has not been tested.

12.3. Bioaccumulative potential

The product has not been tested.

Partition coefficient n-octanol/water

CAS No	Chemical name	Log Pow
30989-05-0	Tris[2-[2-(2-methoxyethoxy)ethoxy]ethyl] orthoborate	-0,62
111-46-6	2,2'-oxybisethanol; diethylene glycol	-1,98
110-97-4	1,1'-iminodipropan-2-ol; di-isopropanolamine	-0,82

BCF

CAS No	Chemical name	BCF	Species	Source
111-46-6	2,2'-oxybisethanol; diethylene glycol	100	Leuciscus idus melanotus	Chemosphere 14(10):

12.4. Mobility in soil

No data available

12.5. Results of PBT and vPvB assessment

The substances in the mixture do not meet the PBT/vPvB criteria according to UK REACH.

12.6. Endocrine disrupting properties

This product does not contain a substance that has endocrine disrupting properties with respect to non-target organisms as no components meets the criteria.

12.7. Other adverse effects

No information available.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Disposal recommendations

Do not allow to enter into surface water or drains. Dispose of waste according to applicable legislation.

Contaminated packaging

This material and its container must be disposed of as hazardous waste. Handle contaminated packages in the same way as the substance itself.

SECTION 14: Transport information

Land transport (ADR/RID)

14.1. UN number:	No dangerous good in sense of this transport regulation.
14.2. UN proper shipping name:	No dangerous good in sense of this transport regulation.
14.3. Transport hazard class(es):	No dangerous good in sense of this transport regulation.
14.4. Packing group:	No dangerous good in sense of this transport regulation.

Inland waterways transport (ADN)

14.1. UN number:	No dangerous good in sense of this transport regulation.
14.2. UN proper shipping name:	No dangerous good in sense of this transport regulation.
14.3. Transport hazard class(es):	No dangerous good in sense of this transport regulation.
14.4. Packing group:	No dangerous good in sense of this transport regulation.

Marine transport (IMDG)

14.1. UN number:	No dangerous good in sense of this transport regulation.
14.2. UN proper shipping name:	No dangerous good in sense of this transport regulation.
14.3. Transport hazard class(es):	No dangerous good in sense of this transport regulation.
14.4. Packing group:	No dangerous good in sense of this transport regulation.

Air transport (ICAO-TI/IATA-DGR)

14.1. UN number:	No dangerous good in sense of this transport regulation.
14.2. UN proper shipping name:	No dangerous good in sense of this transport regulation.
14.3. Transport hazard class(es):	No dangerous good in sense of this transport regulation.
14.4. Packing group:	No dangerous good in sense of this transport regulation.

14.5. Environmental hazards

ENVIRONMENTALLY HAZARDOUS: No

14.6. Special precautions for user

No dangerous good in sense of this transport regulation.

14.7. Maritime transport in bulk according to IMO instruments

No dangerous good in sense of this transport regulation.

SECTION 15: Regulatory information

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

EU regulatory information

Restrictions on use (REACH, annex XVII):

Entry 3, Entry 75

2010/75/EU (VOC): 9,99 % (106,893 g/l)

2004/42/EC (VOC):	14,98 % (160,286 g/l)
Information according to 2012/18/EU (SEVESO III):	Not subject to 2012/18/EU (SEVESO III)

National regulatory information

Employment restrictions:	Observe restrictions to employment for juveniles according to the 'juvenile work protection guideline' (94/33/EC). Observe employment restrictions under the Maternity Protection Directive (92/85/EEC) for expectant or nursing mothers.
Water hazard class (D):	1 - slightly hazardous to water

15.2. Chemical safety assessment

Chemical safety assessments for substances in this mixture were not carried out.

SECTION 16: Other information

Changes

This data sheet contains changes from the previous version in section(s): 2,4,5,6,7,8,9,10,11,12,13,15,16.

Abbreviations and acronyms

ADR: Accord européen sur le transport des marchandises dangereuses par Route
(European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
IATA: International Air Transport Association
GHS: Globally Harmonized System of Classification and Labelling of Chemicals
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service
LC50: Lethal concentration, 50%
LD50: Lethal dose, 50%
CLP: Classification, labelling and Packaging
REACH: Registration, Evaluation and Authorization of Chemicals
GHS: Globally Harmonised System of Classification, Labelling and Packaging of Chemicals
UN: United Nations
DNEL: Derived No Effect Level
DMEL: Derived Minimal Effect Level
PNEC: Predicted No Effect Concentration
ATE: Acute toxicity estimate
LL50: Lethal loading, 50%
EL50: Effect loading, 50%
EC50: Effective Concentration 50%
ErC50: Effective Concentration 50%, growth rate
NOEC: No Observed Effect Concentration
BCF: Bio-concentration factor
PBT: persistent, bioaccumulative, toxic
vPvB: very persistent, very bioaccumulative
RID: Regulations concerning the international carriage of dangerous goods by rail
ADN: European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
(Accord européen relatif au transport international des marchandises dangereuses par voies de navigation intérieures)
EmS: Emergency Schedules
MFAG: Medical First Aid Guide
ICAO: International Civil Aviation Organization
MARPOL: International Convention for the Prevention of Marine Pollution from Ships
IBC: Intermediate Bulk Container
VOC: Volatile Organic Compounds
SVHC: Substance of Very High Concern

For abbreviations and acronyms, see table at http://abbrev.esdscom.eu

Classification for mixtures and used evaluation method according to GB CLP Regulation

Classification	Classification procedure
Repr. 2; H361fd	Calculation method

Relevant H and EUH statements (number and full text)

H302	Harmful if swallowed.
H318	Causes serious eye damage.
H319	Causes serious eye irritation.
H361fd	Suspected of damaging fertility. Suspected of damaging the unborn child.

Further Information

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

(The data for the hazardous ingredients were taken respectively from the last version of the sub-contractor's safety data sheet.)