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

1.1 Product identifier

febi 23930 brake fluid DOT 4 PLUS
Article number: 26748, 23932, 23930
UFI: EH84-02UQ-800M-8RWQ

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

1.2.1 Relevant uses

brake fluid

1.2.2 Uses advised against

For all uses not specified in SECTION 1.2.1

1.3 Details of the supplier of the safety data sheet

Company

Ferdinand Bilstein GmbH + Co. KG
Wilhelmstr. 47
58256 Ennepetal / GERMANY
Phone +49 2333 911-0
Fax +49 2333 911-444
Homepage www.febi.com
E-mail info@febi.com

Address enquiries to

Technical information info@febi.com

Safety Data Sheet info@febi.com

1.4 Emergency telephone number

Advisory body +49 (0)89-19240 (24h) (English)

Company +49 2333 911-0

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture [REGULATION (GB) CLP]

Repr. 2: H361d Suspected of damaging the unborn child.

2.2 Label elements

The product is required to be labelled in accordance with regulation CLP.

Hazard pictograms

Signal word WARNING

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

Hazard statements H361d 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.
P308+P313 IF exposed or concerned: Get medical advice / attention.
P405 Store locked up.
P501 Dispose of contents/container in accordance with local/national regulation.

2.3 Other hazards

Human health dangers	If swallowed or in the event of vomiting, risk of product entering the lungs. Frequent persistent contact with the skin can cause skin irritation.
Environmental hazards	Does not contain any PBT or vPvB substances.
Other hazards	none

SECTION 3: Composition / Information on ingredients

3.1 Substances

not applicable

3.2 Mixtures

The product is a mixture.

Range [%]	Substance
50 - < 70	Tris[2-(2-(2-methoxyethoxy)ethoxy)ethyl]orthoborate
	CAS: 30989-05-0, EINECS/ELINCS: 250-418-4, Reg-No.: 01-2119462824-33-XXXX
	GHS/CLP: Repr. 2: H361
1 - < 10	1,1'-Iminodipropan-2-ol
	CAS: 110-97-4, EINECS/ELINCS: 203-820-9, EU-INDEX: 603-083-00-7, Reg-No.: 01-2117475444-34-XXXX
	GHS/CLP: Eye Irrit. 2: H319
1 - < 10	2-2'-oxybisethanol
	CAS: 111-46-6, EINECS/ELINCS: 203-872-2, EU-INDEX: 603-140-00-6, Reg-No.: 01-2119457857-21-XXXX
	GHS/CLP: Acute Tox. 4: H302

Comment on component parts	Substances of Very High Concern - SVHC: substances are not contained or are below 0.1%. For full text of H-statements and R-phrases: see SECTION 16.

SECTION 4: First aid measures

4.1 Description of first aid measures

General information	Take off contaminated clothing and wash before reuse.
Inhalation	Ensure supply of fresh air. In the event of symptoms seek medical treatment.
Skin contact	When in contact with the skin, clean with soap and water. Consult a doctor if skin irritation persists.
Eye contact	Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.
Ingestion	Seek medical advice immediately. Do not induce vomiting. Rinse out mouth and give plenty of water to drink.

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.
Forward this sheet to your doctor.

SECTION 5: Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media	foam, dry powder, water spray jet, carbon dioxide
Extinguishing media that must not be used	Full water jet

5.2 Special hazards arising from the substance or mixture

Not combusted hydrocarbons.
Risk of formation of toxic pyrolysis products.
Carbon monoxide (CO)
Nitrogen oxides (NOx).

5.3 Advice for firefighters

Use self-contained breathing apparatus.

Collect contaminated firefighting water separately, must not be discharged into the drains.
Fire residues and contaminated firefighting water must be disposed of in accordance within the local regulations.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Ensure adequate ventilation.
High risk of slipping due to leakage/spillage of product.
Forms slippery surfaces with water.

6.2 Environmental precautions

Prevent spread over a wide area (e.g. by containment or oil barriers).
Do not discharge into the drains/surface waters/groundwater.

6.3 Methods and material for containment and cleaning up

Take up with absorbent material (e.g. general-purpose binder).
Dispose of absorbed material in accordance within the regulations.

6.4 Reference to other sections

See SECTION 8+13

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Use only in well-ventilated areas.
Avoid formation of oil dust.

The product is combustible.

Do not eat, drink or smoke when using this product.
Use barrier skin cream.
Wash hands before breaks and after work.
Contaminated work clothing should not be allowed out of the workplace.
Take off contaminated clothing and wash before reuse.

7.2 Conditions for safe storage, including any incompatibilities

Keep only in original container.
Prevent penetration into the ground.

Do not store together with oxidizing agents.
Do not store together with food and animal food/diet.

The product is hygroscopic.
Keep in a cool place. Store in a dry place.
Keep container tightly closed.
Protect from heat/overheating.
Keep container in a well-ventilated place.

7.3 Specific end use(s)

See product use, SECTION 1.2

SECTION 8: Exposure controls / personal protection

8.1 Control parameters

Ingredients with occupational exposure limits to be monitored (GB)

Substance
2-2'-oxybisethanol
CAS: 111-46-6, EINECS/ELINCS: 203-872-2, EU-INDEX: 603-140-00-6, Reg-No.: 01-2119457857-21-XXXX
Long-term exposure: 23 ppm, 101 mg/m³

DNEL

Substance
Tris[2-(2-(2-methoxyethoxy)ethoxy)ethyl]orthoborate, CAS: 30989-05-0
Industrial, dermal, Long-term - systemic effects, 8,3 mg/kg bw/day
Industrial, inhalative, Long-term - systemic effects, 29,1 mg/m³
general population, oral, Long-term - systemic effects, 4,1 mg/kg bw/day
general population, dermal, Long-term - systemic effects, 4,1 mg/kg bw/day
general population, inhalative, Long-term - systemic effects, 7,2 mg/m³
2-2'-oxybisethanol, CAS: 111-46-6
Industrial, dermal, Long-term - systemic effects, 43 mg/kg bw/d (AF= 105)
Industrial, inhalative, Long-term - local effects, 60 mg/m³ (AF= 2)
Industrial, inhalative, Long-term - systemic effects, 44 mg/m³
general population, inhalative, Long-term - local effects, 12 mg/m³ (AF0 10)
general population, inhalative, Long-term - systemic effects, 12 mg/m³
general population, dermal, Long-term - systemic effects, 21 mg/kg bw/d (AF= 210)

PNEC

Substance
Tris[2-(2-(2-methoxyethoxy)ethoxy)ethyl]orthoborate, CAS: 30989-05-0
soil, 28,3 µg/kg soil dw
sediment (seawater), 76 µg/kg sediment dw
sediment (freshwater), 760 µg/kg sediment dw
sewage treatment plants (STP), 100 mg/L
seawater, 21,12 µg/L
freshwater, 211,2 µg/L
2-2'-oxybisethanol, CAS: 111-46-6
sediment (freshwater), 20.9 mg/kg dw
sewage treatment plants (STP), 199.5 mg/L (AF= 10)
seawater, 1 mg/L (AF= 100)
freshwater, 10 mg/L (AF= 10)
soil, 1.53 mg/kg dw
sediment (seawater), 2.09 mg/kg dw

8.2 Exposure controls

Additional advice on system design	Ensure adequate ventilation on workstation. Measurement methods for taking workplace measurements must meet the performance requirements of DIN EN 482. For example, recommendations are given in the IFA's list of hazardous substances.
Eye protection	safety glasses
Hand protection	The details concerned are recommendations. Please contact the glove supplier for further information. > 0,4 mm; Nitrile rubber, >480 min (EN 374-1/-2/-3). > 0,4 mm; Butyl rubber, >480 min (EN 374-1/-2/-3).
Skin protection	Oil-resistant protective clothing.
Other	Personal protective equipment should be selected specifically for the working place, depending on concentration and quantity handled. The resistance of this equipment to chemicals should be ascertained with the respective supplier. Avoid contact with eyes and skin. Do not inhale vapours.
Respiratory protection	In the event of occupational exposure limits being exceeded or of inadequate ventilation: wear appropriate respiratory protection. Short term: filter apparatus, filter A. (DIN EN 14387)
Thermal hazards	none
Delimitation and monitoring of the environmental exposition	Comply with applicable environmental regulations limiting discharge to air, water and soil.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	liquid
Color	yellowish
Odor	characteristic
Odour threshold	not applicable
pH-value	ca. 8,5 (20° C) (FMVSS 116)
pH-value [1%]	No information available.
Boiling point [°C]	> 260 (FMVSS 116)
Flash point [°C]	> 134 (DIN ISO 2719)
Flammability (solid, gas) [°C]	> 200 (DIN 51794)
Lower explosion limit	1,5 Vol%
Upper explosion limit	No information available.
Oxidising properties	no
Vapour pressure/gas pressure [kPa]	< 0,1 kPa (20° C)
Density [g/cm³]	ca. 1,06 (DIN 51 757) (20 °C / 68,0 °F)
Relative density	not determined
Bulk density [kg/m³]	not applicable
Solubility in water	miscible
Solubility other solvents	No information available.
Partition coefficient [n-octanol/water]	No information available.
Kinematic viscosity	ca. 15 - 17 mm²/s (20° C) (FMVSS 116)
Relative vapour density	No information available.
Evaporation speed	No information available.
Melting point [°C]	ca. -70 (DIN 51583)
Auto-ignition temperature	No information available.
Decomposition temperature [°C]	360°C
Particle characteristics	No information available.

9.2 Other information

No information available.

SECTION 10: Stability and reactivity

10.1 Reactivity

No dangerous reactions known if used as directed.

10.2 Chemical stability

Stable under normal ambient conditions (ambient temperature).
Decomposes begins at ca. 360 °C.

10.3 Possibility of hazardous reactions

Reactions with oxidizing agents.
The product is hygroscopic.

10.4 Conditions to avoid

See SECTION 7.2.

10.5 Incompatible materials

Oxidizing agent

10.6 Hazardous decomposition products

No hazardous decomposition products known.

SECTION 11: Toxicological information

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

Acute oral toxicity

Product
ATE-mix, oral, > 2000 mg/kg bw

Substance
Tris[2-(2-(2-methoxyethoxy)ethoxy)ethyl]orthoborate, CAS: 30989-05-0
LD50, oral, Rat, >2000 mg/kg bw
NOAEL, oral, Rat, >1000 mg/kg bw/day
1,1'-Iminodipropan-2-ol, CAS: 110-97-4
LD50, oral, Rat, 6720 mg/kg bw
2-2'-oxybisethanol, CAS: 111-46-6
Oral lethal dose for humans: 0,014 mg/kg (ECHA)
LD50, oral, Rat, > 16500 mg/kg
ATE, oral, 500 mg/kg (Cat. 4), for ATEmix calculation

Acute dermal toxicity

Product
dermal, Based on the available information, the classification criteria are not fulfilled.

Substance
Tris[2-(2-(2-methoxyethoxy)ethoxy)ethyl]orthoborate, CAS: 30989-05-0
LD50, dermal, Rat, >2000 mg/kg bw
2-2'-oxybisethanol, CAS: 111-46-6
LD50, dermal, Rabbit, 13300 mg/kg

Acute inhalational toxicity

Product
inhalative, Based on the available information, the classification criteria are not fulfilled.

Substance
2-2'-oxybisethanol, CAS: 111-46-6
LC50, inhalative, Rat, > 4,6 mg/l/4h

Serious eye damage/irritation Toxicological data of complete product are not available.
No classification.
Calculation method

Substance
2-2'-oxybisethanol, CAS: 111-46-6
Rabbit, in vivo, non-irritating

Skin corrosion/irritation Based on the available information, the classification criteria are not fulfilled.

Substance
2-2'-oxybisethanol, CAS: 111-46-6
Reconstituted human epidermis model, OECD 439, non-irritating

Respiratory or skin sensitisation Based on the available information, the classification criteria are not fulfilled.

Substance
2-2'-oxybisethanol, CAS: 111-46-6
Guinea pig, EU Method B.6; in vivo (non-LLNA), non-sensitizing

Specific target organ toxicity — single exposure Based on the available information, the classification criteria are not fulfilled.

Specific target organ toxicity — repeated exposure Based on the available information, the classification criteria are not fulfilled.

Mutagenicity Based on the available information, the classification criteria are not fulfilled.

Substance
2-2'-oxybisethanol, CAS: 111-46-6
no adverse effect observed

Reproduction toxicity Suspected of damaging the unborn child.
Calculation method

Substance
2-2'-oxybisethanol, CAS: 111-46-6
NOAEL, oral, mouse, 3060 mg/kg bw/d (Effect on fertility), no adverse effect observed

Carcinogenicity Based on the available information, the classification criteria are not fulfilled.

Aspiration hazard Based on the available information, the classification criteria are not fulfilled.

General remarks

Toxicological data of complete product are not available.
The toxicity data listed pertaining to the ingredients are intended for those working in the medicinal professions, experts for occupational health and safety and toxicologists.

11.2 Information on other hazards

Endocrine disrupting properties No information available.

Other information none

SECTION 12: Ecological information

12.1 Toxicity

Product
Based on the available information, the classification criteria are not fulfilled.

Substance
Tris[2-(2-(2-methoxyethoxy)ethoxy)ethyl]orthoborate, CAS: 30989-05-0
LC50, (96h), fish, 222,2 mg/L
EC50, (48h), Crustacea, 211,2 mg/L
EC50, (72h), Algae, 224,4 mg/L
2-2'-oxybisethanol, CAS: 111-46-6
LC50, (96h), Pimephales promelas, 752 mg/l
EC50, (24h), Daphnia magna, > 100 mg/l
EC10, (0,5h), Activated sewage sludge, > 1995 mg/l
EC5, (8d), Scenedesmus quadricauda (algea), 2700 mg/l

12.2 Persistence and degradability

Behaviour in environment compartments	not determined
Behaviour in sewage plant	not determined
Biological degradability	96%, 4d - The product is biodegradable.

12.3 Bioaccumulative potential

CAS 110-97-4: Log Pow = -0,82

12.4 Mobility in soil

No information available.

12.5 Results of PBT and vPvB assessment

Based on all available information not to be classified as PBT or vPvB respectively.

12.6 Endocrine disrupting properties

No information available.

12.7 Other adverse effects

Ecological data of complete product are not available.
Do not discharge product unmonitored into the environment or into the drainage.
The toxicity data pertaining to the ingredients were supplied by the manufacturers of raw materials.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Waste material must be disposed of in accordance with the Directive on waste 2008/98/EC as well as other national and local regulations. It is not possible to determine a waste code for this product in accordance with the European Waste Catalogue (EWC) since it is only possible to classify it according to how it is used by the customer. The waste code is to be determined within the EU in liaison with the waste-disposal operator.

Product

In according to RoHS!
Coordinate disposal with the disposal contractor/authorities if necessary.

Waste no. (recommended) 160113*

Contaminated packaging

Packaging that cannot be cleaned should be disposed of as for product.
Uncontaminated packaging may be taken for recycling.

Waste no. (recommended)

150102
150104
150110* packaging containing residues of or contaminated by hazardous substances

SECTION 14: Transport information

14.1 UN number or ID number

Transport by land according to ADR/RID	not applicable
Inland navigation (ADN)	not applicable
Marine transport in accordance with IMDG	not applicable
Air transport in accordance with IATA	not applicable

14.2 UN proper shipping name

Transport by land according to ADR/RID	NO DANGEROUS GOODS
Inland navigation (ADN)	NO DANGEROUS GOODS
Marine transport in accordance with IMDG	NOT CLASSIFIED AS "DANGEROUS GOODS"
Air transport in accordance with IATA	NOT CLASSIFIED AS "DANGEROUS GOODS"

14.3 Transport hazard class(es)

Transport by land according to ADR/RID	not applicable
Inland navigation (ADN)	not applicable
Marine transport in accordance with IMDG	not applicable
Air transport in accordance with IATA	not applicable

14.4 Packing group

Transport by land according to ADR/RID	not applicable
Inland navigation (ADN)	not applicable
Marine transport in accordance with IMDG	not applicable
Air transport in accordance with IATA	not applicable

14.5 Environmental hazards

Transport by land according to ADR/RID	no
Inland navigation (ADN)	no
Marine transport in accordance with IMDG	no
Air transport in accordance with IATA	no

14.6 Special precautions for user

Relevant information under SECTION 6 to 8.

14.7 Maritime transport in bulk according to IMO instruments

not applicable

SECTION 15: Regulatory information

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

EEC-REGULATIONS	2008/98/EC 2000/532/EC); 2010/75/EU; 2004/42/EC; (EC) 648/2004; (EC) 1907/2006 (REACH); (EU) 1272/2008; 75/324/EEC ((EC) 2016/2037); (EU) 2020/878; (EU) 2016/131; (EU) 517/2014
TRANSPORT-REGULATIONS	ADR (2021); IMDG-Code (2021, 40. Amdt.); IATA-DGR (2021)
NATIONAL REGULATIONS (GB):	EH40/2005 Workplace exposure limits (Second edition, published December 2011); UK REACH; GB CLP.
- Observe employment restrictions for people	Observe employment restrictions for young people. Observe employment restrictions for mothers-to-be and nursing mothers.
- VOC (2010/75/CE)	0 %

15.2 Chemical safety assessment

not applicable

SECTION 16: Other information

16.1 Hazard statements (SECTION 3)

H319 Causes serious eye irritation.
H302 Harmful if swallowed.
H361 Suspected of damaging fertility or the unborn child.

16.2 Abbreviations and acronyms:

ADR = Accord européen relatif au transport international des marchandises Dangereuses par Route
RID = Règlement concernant le transport international ferroviaire de marchandises dangereuses
ADN = Accord européen relatif au transport international des marchandises dangereuses par voie de navigation intérieure
ATE = acute toxicity estimate
CAS = Chemical Abstracts Service
CLP = Classification, Labelling and Packaging
DMEL = Derived Minimum Effect Level
DNEL = Derived No Effect Level
EC50 = Median effective concentration
ECB = European Chemicals Bureau
EEC = European Economic Community
EINECS = European Inventory of Existing Commercial Chemical Substances
EL50 = Median effective loading
ELINCS = European List of Notified Chemical Substances
EmS = Emergency Schedules
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC-Code = International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk
IC50 = Inhibition concentration, 50%
IMDG = International Maritime Code for Dangerous Goods
IUCLID = International Uniform ChemicaL Information Database
IVIS = In vitro irritation score
LC50 = Lethal concentration, 50%
LD50 = Median lethal dose
LC0 = lethal concentration, 0%
LOAEL = lowest-observed-adverse-effect level
LL50 = Median lethal loading
LQ = Limited Quantities
MARPOL = International Convention for the Prevention of Marine Pollution from Ships
NOAEL = No Observed Adverse Effect Level
NOEC = No Observed Effect Concentration
PBT = Persistent, Bioaccumulative and Toxic substance
PNEC = Predicted No-Effect Concentration
REACH = Registration, Evaluation, Authorisation and Restriction of Chemicals
STP = Sewage Treatment Plant
TLV®/TWA = Threshold limit value – time-weighted average
TLV®STEL = Threshold limit value – short-time exposure limit
VOC = Volatile Organic Compounds
vPvB = very Persistent and very Bioaccumulative

16.3 Other information

Classification procedure Repr. 2: H361d Suspected of damaging the unborn child. (Calculation method)

Modified position SECTION 3 deleted: Benzenamine, N-phenyl-, styrenated