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

1.1. Product identifier: **TYFO**COR® **L**

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

Relevant identified uses: Antifreeze and anti-corrosion fluid for thermotechnical systems

1.3. Details of the supplier of the safety data sheet

Company: **TYFO**ROP Chemie GmbH, Ausschläger Billdeich 77, D-20539 Hamburg
Telephone/Telefax: Tel.: +49 (0)40 20 94 97 0, Fax: +49 (0)40 20 94 97 20
E-Mail: msds@tyfo.de (E-Mail address of person responsible for SDS)

1.4. Emergency telephone number: Tel.: +49 (0)551-19240 GIZ-Nord Poison Center

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

The product is not subject to classification.

2.2. Label elements

Labelling according to Regulation (EC) No. 1272/2008 [CLP]

The product is not subject to labelling.

2.3. Other hazards: None known.

SECTION 3: Composition/information on ingredients

3.2. Mixtures

Chemical nature: Propane-1,2-diol (propylene glycol). Inhibitors.

Hazardous components

Substance / REACH registration number	Content	CAS number	EC number	INDEX number	Classification acc. CLP
Sodium benzoate	≥ 1 % - < 3 %	532-32-1	208-534-8	-	Eye Irrit. 2, H319
Borax decahydrate 01-2119490790-32	≥ 1 % - < 3 %	1303-96-4	215-540-4	005-011-01-1	Eye Irrit. 2, H319. Repr. 1B, H360FD. Specific concentration limit Repr. 1B: ≥ 8.5 %.

The full text of the abbreviations is listed in section 16.

SECTION 4: First aid measures

4.1. Description of first aid measures

Protection of first-aiders: No special precautions are necessary for first aid responders.

If inhaled: If inhaled, remove to fresh air. Get medical attention if symptoms occur.

On skin contact: Wash thoroughly with soap and water. Get medical attention if symptoms occur.

On contact with eyes: Wash affected eyes for at least 15 minutes under running water with eyelids held open. Get medical attention if irritation develops and persists.

On ingestion: Rinse mouth thoroughly with water. DO NOT induce vomiting. Get medical attention if symptoms occur.

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

None known.

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

Treatment: Symptomatic treatment (decontamination, vital functions), no known specific antidote.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media: Water spray. Alcohol-resistant foam. Dry powder. Carbon dioxide (CO_2).

Unsuitable extinguishing media: None known.

5.2. Special hazards arising from the substance or mixture

Specific hazards during firefighting: Exposure to combustion products may be a hazard to health.

Hazardous combustion products: Carbon oxides.

5.3. Advice for fire-fighters

Special protective equipment: In the event of fire, wear self-contained breathing apparatus. Use personal protective equipment.

Specific extinguishing methods: Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Use water spray to cool unopened containers. Remove undamaged containers from fire area if it is safe to do so.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions: Use personal protective equipment. Follow safe handling advice and personal protective equipment recommendations.

6.2. Environmental precautions

Discharge into the environment must be avoided. Prevent further leakage or spillage if safe to do so. Prevent spreading over a wide area (e.g. by containment or oil barriers). Retain and dispose of contaminated wash water. Local authorities should be advised if significant spillages cannot be contained.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up: Soak up with inert absorbent material. For large spills, provide dyking or other appropriate containment to keep material from spreading. If dyked material can be pumped, store recovered material in appropriate container. Clean up remaining materials from spill with suitable absorbent. Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases. You will need to determine which regulations are applicable. Sections 13 and 15 provide information regarding certain local or national requirements.

6.4. Reference to other sections: See sections 7, 8, 11, 12 and 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Technical measures: See Engineering measures in section 8.

Local/total ventilation: Use only with adequate ventilation.

Advice on safe handling: Handle in accordance with good industrial hygiene and safety practice. Take care to prevent spills, waste and minimize release to the environmt.

Advice on protection against fire and explosion: Observe the general rules of industrial fire protection.

Hygiene measures: When using do not eat, drink or smoke. Wash contaminated clothing before re-use.

7.2. Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers: Store containers tightly sealed in a cool, dry and well ventilated place. Store in accordance with the particular national regulations.

Advice on common storage: Do not store with strong oxidizing agents. Keep away from food, beverages and animal feedstuffs.

SECTION 7: Handling and storage - Continuation

7.3. Specific end uses

For the relevant identified uses listed in section 1 the advice mentioned in this section 7 is to be observed.

SECTION 8: Exposure control/personal protection

8.1. Control parameters

Components with occupational exposure limits

Information on component Propane-1,2-diol

Legal basis	Value type	Control parameters	Further information
GB EH40	TWA (Particles) TWA (Total vapour and particles)	10 mg/m^3 10 mg/m^3 474 mg/m^3, 150 ppm	Where no specific short-term exposure limit is listed, a figure three times the long-term exposure should be used.

Information on component Borax decahydrate

Legal basis	Value type	Control parameters	Further information
GB EH40	TWA	5 mg/m^3	Where no specific short-term exposure limit is listed, a figure three times the long-term exposure should be used

DNEL values - information on component Propane-1,2-diol

End use	Exposure routes	Potential health effects	Value
Workers	Inhalation	Long-term local effects	10 mg/m^3
Workers	Inhalation	Long-term systemic effects	168 mg/m^3
Consumers	Inhalation	Long-term local effects	10 mg/m^3
Consumers	Inhalation	Long-term systemic effects	50 mg/m^3

DNEL values - information on component Sodium benzoate

End use	Exposure routes	Potential health effects	Value
Workers	Inhalation	Long-term local effects	6.3 mg/m^3
Workers	Skin contact	Long-term local effects	4.5 mg/cm^2
Workers	Inhalation	Long-term systemic effects	10.4 mg/m^3
Workers	Skin contact	Long-term systemic effects	34.7 mg/kg body weight/day
Consumers	Inhalation	Long-term local effects	1.3 mg/m^3
Consumers	Skin contact	Long-term local effects	2.7 mg/cm^2
Consumers	Ingestion	Long-term systemic effects	25 mg/kg body weight/day
Consumers	Inhalation	Long-term systemic effects	2.1 mg/m^3
Consumers	Skin contact	Long-term systemic effects	20.8 mg/kg body weight/day

DNEL values - information on component Borax decahydrate

End use	Exposure routes	Potential health effects	Value
Workers	Inhalation	Acute - local effects	11.7 mg/m^3
Workers	Inhalation	Long-term local effects	11.7 mg/m^3
Workers	Inhalation	Long-term systemic effects	6.7 mg/m^3
Workers	Skin contact	Long-term systemic effects	316.4 mg/kg body weight/day
Consumers	Inhalation	Acute - local effects	11.7 mg/m^3
Consumers	Inhalation	Long-term local effects	11.7 mg/m^3
Consumers	Inhalation	Long-term systemic effects	3.4 mg/m^3
Consumers	Skin contact	Long-term systemic effects	159.5 mg/kg body weight/day
Consumers	Ingestion	Acute - local effects	0.79 mg/kg body weight/day
Consumers	Ingestion	Long-term systemic effects	0.79 mg/kg body weight/day

SECTION 8: Exposure control/personal protection - Continuation

PNEC values - information on component Propane-1,2-diol

Fresh water	Marine water	Water (intermittent release)	Fresh water sediment	Marine water sediment	Soil	Sewage treatment plant
260 mg/l	26 mg/l	183 mg/l	572 mg/kg	57.2 mg/kg	50 mg/kg	20000 mg/l

PNEC values - information on component Borax decahydrate

Fresh water	Marine water	Water (intermittent release)	Fresh water sediment	Marine water sediment	Soil	Sewage treatment plant
2.02 mg/l	2.02 mg/l	13.7 mg/l	-	-	5.4 mg/kg	10 mg/l

8.2. Exposure controls

Engineering measures: Ensure adequate ventilation, especially in confined areas. Minimize workplace exposure concentrations.

Personal protective equipment

Eye protection: Safety glasses with side-shields (frame goggles, e.g. EN 166).

Hand protection: Chemical resistant protective gloves (EN 374). Material: butyl rubber. Protective index 2. Break through time: >30 minutes. Glove thickness: 0.7 mm. Material: nitrile rubber. Protective index 2. Break through time: >30 minutes. Glove thickness: 0.4 mm. Remarks: Choose gloves to protect hands against chemicals depending on the concentration and quantity of the hazardous substance and specific to place of work. For special applications, we recommend clarifying the resistance to chemicals of the aforementioned protective gloves with the manufacturer. Wash hands before breaks and at the end of workday.

Skin and body protection: Wash skin thoroughly after contact.

Respiratory protection: Use respiratory protection unless adequate local exhaust ventilation is provided or exposure assessment demonstrates that exposures are within recommended exposure guidelines. Filter type: Particulate type (P).

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance:	liquid.	
Colour:	colourless.	
Odour:	almost odourless.	
Odour threshold:	No data available.	
pH value (20 °C):	7.5 - 8.5.	(ASTM D 1287)
Solidification temperature:	<-50 °C.	(DIN ISO 3016)
Initial boiling point/boiling range:	>150 °C.	(ASTM D 1120)
Flash point:	>100 °C.	(DIN EN 22719, ISO 2719)
Evaporation rate:	No data available.	
Flammability (solid, gas):	not applicable.	
Upper explosion limit:	12.6 % vol.	(Inform. on Propylene glycol)
Lower explosion limit:	2.6 % vol.	(Inform. on Propylene glycol)
Vapour pressure (20 °C):	ca. 0.2 hPa.	(calculated)
Vapour density:	No data available.	
Density (20 °C):	ca. 1.055 g/cm^3.	(DIN 51757)
Solubility:	Water solubility: soluble.	
Partition coefficient n-octanol/H_2O:	log P_{ow} (20.5 °C): -1.07.	(Inform. on Propylene glycol)
Auto-ignition temperature:	No data available.	
Decomposition temperature:	No data available.	
Viscosity (kinematic, 20 °C):	ca. 70 mm^2/s.	(DIN 51562)
Explosive properties:	not explosive.	
Oxidizing properties:	not oxidizing.	

9.2. Other Information: No other information.

SECTION 10: Stability and reactivity

10.1. Reactivity: No hazardous reactions if stored and handled as prescribed/indicated.

SECTION 10: Stability and reactivity - Continuation

	Corrosion to metals: No corrosive effect on metals.
10.2. Chemical stability:	The product is stable if stored and handled as prescribed/indicated.
10.3. Possibility of hazardous reactions:	No hazardous reactions if stored and handled as prescribed/indicated.
10.4. Conditions to avoid:	No conditions to avoid anticipated.
10.5. Incompatible materials:	Substances to avoid: strong oxidising agents.
10.6. Hazardous decomposition products:	No hazardous decomposition products if stored and handled as prescribed/indicated.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Information on likely routes of exposure:	Inhalation. Skin contact. Ingestion. Eye contact.
Acute toxicity:	Not classified based on available information. Information on component Sodium benzoate: Acute oral toxicity: LD50 (Rat): >2000 mg/kg. Assessmt.: The substance has no acute oral toxicity. Information on component Borax decahydrate: Acute oral toxicity: LD50 (Rat): 3450 - 4080 mg/kg. Acute inhalation toxicity: LC50 (Rat): >2.03 mg/l, exposure time: 4 hours, test atmosphere: dust, mist, method: OECD test guideline 403. Acute dermal toxicity: LD50 (Rat): >2000 mg/kg. Assessment: The substance has no acute dermal toxicity.
Skin corrosion/ irritation:	Not classified based on available information. Information on component Sodium benzoate: No skin irritation (Rabbit), method: OECD test guideline 404. Information on component Borax decahydrate: No skin irritation (Rabbit).
Serious eye damage/ eye irritation:	Not classified based on available information. Information on component Sodium benzoate: Irritation to eyes, reversing within 7 days (Rabbit), method: OECD test guideline 405. Information on component Borax decahydrate: Irritation to eyes, reversing within 21 days (Rabbit).
Respiratory or skin sensitisation:	Skin sensitisation: Not classified based on available information. Respiratory sensitisation: Not classified based on available information. Information on component Sodium benzoate: Skin contact: not sensitising (Mouse, local lymph node assay (LLNA)). Remark: Based on data from similar materials. Information on component Borax decahydrate: Skin contact: not sensitising (Guinea pig, Buehler Test), method: OECD test guideline 406.
Germ cell mutagenicity:	Not classified based on available information. Information on component Sodium benzoate: Genotoxicity in vitro: not mutagenic (Bacteria, AMES Test), method: OECD test guideline 471. Genotoxicity in vivo: not mutagenic (Rat, in vivo mammalian bone-marrow cytogenetic test, chromosomal analysis), applicat. route: ingestion. Information on component Borax decahydrate: Genotoxicity in vitro: not mutagenic (in vitro sister chromatid exchange assay in mammalian cells). Remark: Based on data from similar materials. Genotoxicity in vivo: not mutagenic (Mouse, mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)), application route: ingestion. Remark: Based on data from similar materials.
Carcinogenicity:	Not classified based on available information. Information on component Borax decahydrate: not carcinogenic (Mouse), application route: ingestion, exposure time: 2 years. Remark: Based on data from similar materials.
Reproductive toxicity:	Not classified based on available information. Information on comp. Sodium benzoate: Effects on foetal development:

SECTION 11: Toxicological information - Continuation

negative (Mouse, embryo-foetal development), applicat. route: ingestion. Information on component Borax decahydrate: Effects on fertility: positive (Rat, Three-generation reproduction toxicity study), application route: ingestion. Effects on foetal development: positive (Rat, embryo-foetal development), application route: ingestion. Reproductive toxicity - assessment: Clear evidence of adverse effects on development, based on animal experiments. Clear evidence of adverse effects on sexual function and fertility, based on animal experiments.

Specific target organ toxicity (single exposure): Not classified based on available information.

Specific target organ toxicity (repeated exposure): Not classified based on available information.

Repeated dose toxicity: Information on component Sodium benzoate: NOAEL (Rat): 905 mg/kg, application route: ingestion, exposure time: 28 days.
Information on component Borax decahydrate: NOAEL (Rat): 100 mg/kg, LOAEL (Rat): 334 mg/kg, application route: ingestion, expos. time: 28 d.

Aspiration toxicity: Not classified based on available information.

SECTION 12: Ecological information

12.1. Toxicity

Information on component Sodium benzoate

Toxicity to	Value / exposure time	Species
fish	LC50: >100 mg/l / 96 h	Pimephales promelas (Fathead minnow)
daphnia and other aquatic invertebrates	EC50: >100 mg/l / 96 h	Daphnia magna (Water flea)
algae	EC50: >100 mg/l / 72 h	Pseudokirchneriella subcapitata (Green algae) Method: OECD test guideline 201

Information on component Borax decahydrate

Toxicity to	Value / exposure time	Species
fish	LC50: 447 mg/l / 96 h NOEC: 13 mg/l / 96 d	Oncorhynchus kisutch (Coho salmon) Danio rerio (Zebra fish)
daphnia and other aquatic invertebrates	EC50: 133 mg/l / 48 h NOEC: 18 mg/l / 14 d	Daphnia magna (Water flea)
algae	NOEC: 50 mg/l / 10 d	Dunaliella tertiolecta
bacteria	EC50: >175 mg/l / 3 h	Method: OECD test guideline 209

12.2. Persistence and degradability: Information on component Sodium benzoate: Biodegradability: Biodegradation: 85 % (28 d), method: OECD test guideline 301 A. Result: readily biodegradable.

12.3. Bioaccumulative potential: Information on component Sodium benzoate: Partition coefficient n-octanol/H_20: log P_{ow}: -2.27.
Information on component Borax decahydrate: Partition coefficient n-octanol/H_20: log P_{ow}: -1.53.

12.4. Mobility in soil: No data available.

12.5. Results of PBT and vPvB assessment: The product does not contain a substance fulfilling the PBT criteria (persistent/bioaccumulative/toxic) or the vPvB criteria (very persistent/very bioaccumulative).

12.6. Other adverse effects: No data available.

12.7. Further information: No further information.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Product: Dispose of in accordance with local regulations.
According to the European Waste Catalogue (EWC), waste codes are not product specific, but application specific. Waste codes should be assigned by the user, preferably in discussion with the waste disposal authorities.

Contaminated packaging: Dispose of as the product. Empty containers should be taken to an approved waste handling site for recycling or disposal.

SECTION 14: Transport information

	ADR/ RID	ADN	IMDG	IATA/ ICAO
	Not classified as a dangerous good under transport regulations			
14.1. UN number	-	-	-	-
14.2. UN proper shipping name	-	-	-	-
14.3. Transport hazard classes	-	-	-	-
14.4. Packing group	-	-	-	-
14.5. Environmental hazards	-	-	-	-
14.6. Special precautions for user	-	-	-	-

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

Not evaluated.

SECTION 15: Regulatory information

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

Legal basis	Remark / Evaluation
Regulation (EC) No. 649/2012 of the European Parliament and the Council concerning the export and import	Not applicable
REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59)	Borax decahydrate
Regulation (EC) No. 1005/2009 on substances that deplete the ozone layer	Not applicable
Regulation (EC) No. 850/2004 on persistent organic pollutants	Not applicable
Seveso III - Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances	Not applicable

Other regulations

No further information.

15.2. Chemical Safety Assessment

A Chemical Safety Assessment was not carried out for the product.

SECTION 16: Other information

Full text of the abbreviations of classifications and H-Statements used in sections 2 and 3

Eye Irrit. 2	Eye irritation, Category 2
Repr. 1B	Reproductive toxicity, Category 1B
H319	Causes serious eye irritation
H360FD	May damage fertility. May damage the unborn child

Other abbreviations used in this safety data sheet in alphabetical order

ADN	European agreement concerning the international carriage of dangerous goods by inland waterways

SECTION 16: Other information - Continuation

ADR	European agreement concerning the international carriage of dangerous goods by road
ASTM	American Society for Testing and Materials
CAS number	Chemical Abstracts Service number
CLP	Regulation (EC) No. 1272/2008 on classification, labeling and packaging of chemical substances and mixtures
DIN	German Institute for Standardisation/German Industrial Standard
DNEL	Derived No Effect Level
EC50	Median Effective Concentration
EC number	EINECS number (European Inventory of Existing Substances) or ELINCS number (European List of Notified Chemical Substances)
GB EH40	UK EH40 WEL - Workplace Exposure Limits
GB EH40 TWA	Long-term exposure limit (8-hour TWA reference period)
IATA	International Air Transport Association
IBC	International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk
ICAO	International Civil Aviation Organization
IMDG	International Maritime Dangerous Goods Code
INDEX number	Identification code for hazardous substances, Annex VI of Regulation (EC) No. 1272/2008
ISO	International Organisation for Standardisation/International Standard
LC50	Median Lethal Concentration
LD50	Median Lethal Dose
LOAEL	Lowest Observed Adverse Effect Level
MARPOL	International Convention for the Prevention of Marine Pollution from Ships
NOAEL	No Observed Adverse Effect Level
NOEC	No Observed Effect Concentration
OECD	Organisation for Economic Cooperation and Development
PNEC	Predicted No Effect Concentration
REACH	Regulation (EC) No. 1907/2006 on Registration, Evaluation, Authorisation and Restriction of Chemicals
RID	Regulation concerning the international carriage of dangerous goods by rail

Further information

Sources of key data used to compile the safety data sheet: Internal technical data, data from component SDS, OECD eChem Portal search results and European Chemicals Agency [ECHA].

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Vertical lines in the left hand margin indicate an amendment from the previous version.

The information provided in this safety data sheet (SDS) is correct to the best of our knowledge, information and belief at the date of its publication. The information is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and shall not be considered a warranty or quality specification of any type. The information provided relates only to the specific product identified at the top of this SDS and may not be valid when the SDS product is used in combination with any other materials or in any process, unless specified in the text. Product users should review the information and recommendations in the specific context of their intended manner of handling, use, processing and storage, including an assessment of the appropriateness of the SDS product in the user's end product, if applicable.