# SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006 Revision date 01.07.2019

Version: 3.2, ID-No.: 2600-01_GB-GB 

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

**1.1. Product identifier:** **TYFO**COR® **LS**®
**ready mixed, frost protection -28 °C**

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

**Relevant identified uses:** Heat transfer fluid for solar thermal 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 adress 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:** Aqueous solution of Propane-1,2-diol (propylene glycol) with inhibitors.

**Hazardous components**

| Substance / REACH registration number | Content | CAS number | EC number | INDEX number | Classification acc. CLP |
|---|---|---|---|---|---|
| 1,1'-Iminobis-2-propanol 01-2119475444-34 | > 1 % - < 3 % | 110-97-4 | 203-820-9 | 603-083-00-7 | Eye Irrit. 2, H319 |

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. Get medical attention. 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. Nitrogen oxides (NOx).

### 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.

### 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)<br>TWA (Total vapour and particles) | 10 mg/m$^3$<br>10 mg/m$^3$<br>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. |

**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 1,1'-Iminobis-2-propanol**

| End use | Exposure routes | Potential health effects | Value |
|---|---|---|---|
| Workers | Inhalation | Long-term systemic effects | 16 mg/m$^3$ |
| Workers | Skin contact | Long-term systemic effects | 12.5 mg/kg body weight/day |
| Consumers | Inhalation | Long-term systemic effects | 3.9 mg/m$^3$ |
| Consumers | Skin contact | Long-term systemic effects | 6.3 mg/kg body weight/day |
| Consumers | Ingestion | Long-term systemic effects | 1.3 mg/kg body weight/day |

**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 1,1'-Iminobis-2-propanol**

| Fresh water | Marine water | Water (intermittent release) | Fresh water sediment | Marine water sediment | Soil | Sewage treatment plant |
|---|---|---|---|---|---|---|
| 0.2777 mg/l | 0.02777 mg/l | 2.777 mg/l | 2.19 mg/kg | 0.219 mg/kg | 0.275 mg/kg | 15000 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:** | red fluorescent. | |
| **Odour:** | faint. | |
| **Odour threshold:** | No data available. | |
| **pH value (20 °C):** | 9.0 - 10.5. | (ASTM D 1287) |
| **Freezing point:** | ca. -25 °C. | (ASTM D 1177) |
| **Frost protection:** | ca. -28 °C. | (calculated) |
| **Solidification temperature:** | ca. -31 °C. | (DIN ISO 3016) |
| **Initial boiling point/boiling range:** | >100 °C. | (ASTM D 1120) |
| **Flash point:** | not applicable. | (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. 20 hPa. | (calculated) |
| **Vapour density:** | No data available. | |
| **Density (20 °C):** | ca. 1.034 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. 5.0 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. 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 1,1'-Iminobis-2-propanol: Acute oral toxicity: LD50 (Rat): >2000 mg/kg, method: OECD test guideline 401. Acute inhalation toxicity LC0 (Mouse): >2069 mg/m$^3$, exposure time: 3 hours, test atmosphere: dust, mist. Acute dermal toxicity: LD50 (Rabbit): 8000 mg/kg.

**Skin corrosion/ irritation:** Not classified based on available information.
Information on component 1,1'-Iminobis-2-propanol: No skin irritation (Rabbit), method: OECD test guideline 404.

**Serious eye damage/ eye irritation:** Not classified based on available information.
Information on component 1,1'-Iminobis-2-propanol: Irritation to eyes, reversing within 21 days (Rabbit), method: OECD test guideline 405.

**Respiratory or skin sensitisation:** Skin sensitisation: Not classified based on available information. Respiratory sensitisation: Not classified based on available information.

## SECTION 11: Toxicological information - Continuation

Information on component 1,1'-Iminobis-2-propanol: 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 1,1'-Iminobis-2-propanol: Genotoxicity in vitro: not mutagenic: Tests: 1. Bacteria, AMES Test, mehod: OECD test guideline 471, 2. Chromosome aberration test in vitro, method: OECD test guideline 473, 3. In vitro mammalian cell gene mutation test, method: OECD test guideline 476.

**Carcinogenicity:** Not classified based on available information.
Information on component 1,1'-Iminobis-2-propanol: Not carcinogenic (Rat), application route: ingestion, exposure time: 94 weeks.

**Reproductive toxicity:** Not classified based on available information.
Information on component 1,1'-Iminobis-2-propanol: Effects on fertility: negative (Rat, One-generation reproduction study, application route: ingestion. Effects on foetal development: negative (Rat, embryo-foetal development), appl. route: ingestion, method: OECD test guideline 414.

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

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

**Aspiration toxicity:** Not classified based on available information.

## SECTION 12: Ecological information

**12.1. Toxicity**

**Information on component 1,1'-Iminobis-2-propanol**

| Toxicity to | Value / exposure time | Species |
|---|---|---|
| fish | LC50: 1466 mg/l / 96 h | Brachydanio rerio (Zebra fish)<br>Method: OECD test guideline 203 |
| daphnia and other aquatic invertebrates | EC50: 277.7 mg/l / 48 h | Daphnia magna (Water flea) |
| algae | EC50: 339 mg/l / 72 h<br>NOEC: 125 mg/l / 72 h | Desmodesmus subspicatus (Green algae) |

**12.2. Persistence and degradability:** Information on component 1,1'-Iminobis-2-propanol: Biodegradability: Biodegradation: 94 % (28 d), method: OECD test guideline 301. Result: readiliy biodegradable.

**12.3. Bioaccumulative potential:** Information on component 1,1'-Iminobis-2-propanol: Partition coefficient n-octanol/$H_20$: log $P_{ow}$: -0.88.

**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.

## SECTION 13: Disposal considerations - Continuation

**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) | Not applicable |
| 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 |
| H319 | Causes serious eye irritation |

**Other abbreviations used in this safety data sheet in alphabetical order**

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

## SECTION 16: Other information - Continuation

| | |
|---|---|
| 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 |
| I 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 |
| LC0 | Threshold concentration without harmful effect |
| LC50 | Median Lethal Concentration |
| LD50 | Median Lethal Dose |
| MARPOL | International Convention for the Prevention of Marine Pollution from Ships |
| 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].

Revision date: 01.07.2019
Date of previous version: 01.05.2017

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.