



SAFETY DATA SHEET

acc. to Regulation (EC) No. 1907/2006 (REACH), amended by Regulation (EU) 2020/878

TYFOCOR® G-LS

Version: 3.3, ID-No.: 2630-01_EN-EN

Revision date 01.04.2022

Page 1/9

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

- 1.1. Product identifier:** **TYFOCOR® G-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: TYFOROP 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 mixture is not subject to classification.
- 2.2. Label elements**
Labelling according to Regulation (EC) No. 1272/2008 [CLP]
The mixture is not subject to labelling.
- 2.3. Other hazards**
- I This 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% by weight or higher.
 - I This mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% by weight or higher.

SECTION 3: Composition/information on ingredients

3.2. Mixtures

Chemical nature: Aqueous solution of Propane-1,2-diol (propylene glycol) with inhibitors.

Components

Substance / REACH registration number	Content [% w/w]	CAS number	EC number	INDEX number	Classification acc. to CLP
I Propane-1,2-diol 01-2119456809-23	40 - 45	57-55-6	200-338-0	-	-
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.



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TYFOCOR® G-LS

Version: 3.3, ID-No.: 2630-01_EN-EN

Revision date 01.04.2022

Page 2/9

SECTION 4: First aid measures

On ingestion: eyelids held open. Get medical attention if irritation develops and persists.
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

I **Treatment:** Symptomatic treatment (decontamination, vital functions)

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media: Water spray. Alcohol-resistant foam. Dry powder. Carbon dioxide (CO₂).

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 (NO_x).

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.



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TYFOCOR® G-LS

Version: 3.3, ID-No.: 2630-01_EN-EN

Revision date 01.04.2022

Page 3/9

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 environment.
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) 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.

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

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

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



SAFETY DATA SHEET

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TYFOCOR® G-LS

Version: 3.3, ID-No.: 2630-01_EN-EN

Revision date 01.04.2022

Page 4/9

SECTION 8: Exposure control/personal protection

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:	violet.	
Odour:	faint.	
Odour threshold:	No data available.	
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)
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)
Flash point:	not applicable.	(DIN EN 22719, ISO 2719)
Ignition temperature:	No data available.	
Decomposition temperature:	No data available.	
pH value (20 °C):	9.0 - 10.5.	(ASTM D 1287)
Viscosity (kinematic, 20 °C):	ca. 5.0 mm ² /s.	(DIN 51562)
Solubility:	Water solubility: soluble.	
Partition coefficient n-octanol/H ₂ O:	log P _{ow} (20.5 °C): -1.07.	(Inform. on propylene glycol)
Vapour pressure (20 °C):	ca. 20 hPa.	(calculated)
Density (20 °C):	ca. 1.034 g/cm ³ .	(DIN 51757)
Vapour density:	No data available.	
Particle properties:	not applicable.	



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TYFOCOR® G-LS

Version: 3.3, ID-No.: 2630-01_EN-EN

Revision date 01.04.2022

Page 5/9

SECTION 9: Physical and chemical properties

9.2. Other information

9.2.1. Information with regard to physical hazard classes

Oxidizing properties: not oxidizing.
Explosive properties: not explosive.

9.2.2. Other safety characteristics

No further 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 hazard classes as defined in Regulation (EC) No. 1272/2008

Information on likely routes of exposure: Inhalation. Skin contact. Ingestion. Eye contact.

Acute toxicity: Not classified based on available information.
Information on component Propane-1,2-diol: Acute oral toxicity: LD50 (Rat): 19400-36000 mg/kg. Assessment: The substance has no acute oral toxicity. Acute inhalation toxicity: No data available. Acute dermal toxicity: LD50 (Rabbit): 20800 mg/kg. Assessment: The substance has no acute dermal toxicity.
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/m³, 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 Propane-1,2-diol: no skin irritation (Rabbit), method: OECD test guideline 404.
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 Propane-1,2-diol: slight eye irritation (Rabbit), method: OECD test guideline 405.
Information on compon. 1,1'-Iminobis-2-propanol: Irritation to eyes, reversing within 21 days (Rabbit), meth.: OECD test guideline 405.

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

Information on component 1,1'-Iminobis-2-propanol: Skin contact: not sensitising (Guinea pig, Buehler Test), method: OECD test guideline 406.



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TYFOCOR® G-LS

Version: 3.3, ID-No.: 2630-01_EN-EN

Revision date 01.04.2022

Page 6/9

SECTION 11: Toxicological information

- I Germ cell mutagenicity:** Not classified based on available information.
Information on component Propane-1,2-diol: Genotoxicity in vitro: not mutagenic (Bacteria, AMES Test), m.: OECD test guideline 471. Information on component 1,1'-Iminobis-2-propanol: Genotoxicity in vitro: not mutagenic: Tests: 1. Bacteria, AMES Test, method: 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.
- I Carcinogenicity:** Not classified based on available information.
Information on component Propane-1,2-diol: NOAEL (Rat): 1700-2100 mg/kg, application route: ingestion, exposure time: 2 years. 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), application 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.
- I Repeated dose toxicity:** Not classified based on available information.
- Aspiration toxicity:** Not classified based on available information.
- I 11.2. Information on other hazards**
- I Endocrine disrupting properties**
This mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% by weight or higher.

SECTION 12: Ecological information

12.1. Toxicity

I Information on component Propane-1,2-diol

Toxicity to	Value / exposure time	Species
fish	LC50: 51600 mg/l / 96 h	Oncorhynchus mykiss (Rainbow trout) Method: OECD test guideline 203
daphnia and other aquatic invertebrates	EC50: 34400 mg/l / 48 h	Daphnia magna (Water flea)
algae	EC50: 19000 mg/l / 72 h	Pseudokirchneriella subcapitata (Green algae) Method: OECD test guideline 201
bacteria	EC50: 26800 mg/l / 30 min EC50: >1000 mg/l / 3 h	Photobacterium phosphoreum Activated sludge



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TYFOCOR® G-LS

Version: 3.3, ID-No.: 2630-01_EN-EN

Revision date 01.04.2022

Page 7/9

SECTION 12: Ecological information

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) 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 NOEC: 125 mg/l / 72 h	Desmodesmus subspicatus (Green algae)

- 12.2. Persistence and degradability:** Information on component Propane-1,2-diol: Biodegradability: Biodegradation: 87-92 % (28 d), method: OECD test guideline 301 D. Result: readily biodegradable.
Information on component 1,1'-Iminobis-2-propanol: Biodegradability: Biodegradation: 94 % (28 d), method: OECD test guideline 301 F. Result: readily biodegradable.
- 12.3. Bioaccumulative potential:** Information on component Propane-1,2-diol: Partition coefficient n-octanol/H₂O: log P_{ow} (20.5 °C): -1.07.
Information on component 1,1'-Iminobis-2-propanol: Partition coefficient n-octanol/H₂O: log P_{ow}: -0.88.
- 12.4. Mobility in soil:** No data available.
- 12.5. Results of PBT and vPvB assessment:** This 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% by weight or higher.
- 12.6. Endocrine disrupting properties:** This mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% by weight or higher.
- 12.7. Other adverse effects:** No data available.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

- Product:** Do not allow to enter ground water, surface water or sewage system. Dispose of in accordance with local regulations.
According to the European Waste Catalogue (EWC), waste code numbers are not product specific, but application specific. Waste code numbers are to be assigned by the user in discussion with the manufacturer / the disposer / the competent authority.
Recommended EWC No.: 16 01 14* - antifreeze fluids containing hazardous substances.
- Contaminated packaging:** Dispose of as the product. Empty containers should be taken to an approved waste handling site for recycling or disposal.



SAFETY DATA SHEET

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TYFOCOR® G-LS

Version: 3.3, ID-No.: 2630-01_EN-EN

Revision date 01.04.2022

Page 8/9

SECTION 14: Transport information

	ADR/ RID	ADN	IMDG	IATA/ ICAO
	Not classified as a dangerous good under transport regulations			
14.1. UN number or ID 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

See sections 6, 7, and 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/mixture

EU Regulations	Remark
Regulation (EC) No. 649/2012 of the European Parliament and the Council concerning the export and import	Not applicable
REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, preparations and articles (Annex XVII)	Not applicable
REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59)	Not applicable
REACH - List of substances subject to authorisation (Annex XIV)	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



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TYFOCOR® G-LS

Version: 3.3, ID-No.: 2630-01_EN-EN

Revision date 01.04.2022

Page 9/9

SECTION 16: Other information

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
ICAO	International Civil Aviation Organization
IMDG	International Maritime Dangerous Goods Code
I	IMO
INDEX number	International Maritime Organization
	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
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 this product in the user's end product, if applicable.