



# Glysofor

## Glysofor Solar AF – Specification

### Product features

Glysofor Solar is an environmentally friendly solar fluid based on propylene glycol in combination with corrosion inhibitors and stabilisers.

Glysofor Solar AF fulfils the requirements of DIN 4757 Part 3 or DIN EN 12975 for solarthermal plants.

Glysofor Solar AF is used in both vacuum tube solar plants and plate collector solar plants.

Due to its physiological and ecological harmlessness, it can be used both in the food and beverage sector as well as in pharmaceutically and ecologically sensitive areas of application.

Glysofor Solar AF can be used as a frost protection agent, an anticorrosive agent and a heat transfer medium.

Glysofor AF optimally prevents frost damage, corrosion, debris, accumulation of mud or biofilms.

With a glycol base - in this case monopropylene glycol - the freezing point of Glysofor Solar AF is significantly lowered, thus ensuring that solar systems can be safely operated even at minus temperatures.

Environmentally friendly heat carrier medium, frost protection and anticorrosive agent in solar plants with high thermal loads

Basis: 1.2 Propylene glycol

Ready-to-use

Operating temperature: -28 to +180 °C

Complies with DIN 4757 Part 3 and DIN EN 12975 for solar thermal systems

Free of nitrites, phosphates, amines, borates and silicates

Universally useable for Solar plants / Vacuum tubes

Installations made of copper, brass, solder, grey iron, aluminium, steel and iron are optimally protected, even if they are used in multi-metal installations.

Glysofor Solar AF is completely free of nitrites, amines, phosphates, silicates and borates.

It is biodegradable and environmentally friendly.

If any damage occurs to the system, a simultaneous frost-related explosive effect can be reliably prevented using Glysofor Solar AF.

Thanks to a complex combination of anticorrosion additives, metals are optimally protected against corrosive attacks.

This anticorrosive protection can be used for all important metals that are usually used in solar installations.

Glysofor Solar AF is resistant in the long-term against the formation of biofilms, putrescence and microbiological degradation, thus preventing precipitations and the accumulation of mud.

Glysofor Solar AF does not separate, even during prolonged plant shutdowns. This guarantees a year-round, long-term and low-maintenance operation of plants that have been filled with Glysofor Solar

Glysofor Solar AF is delivered ready to be filled in, with a frost protection value of -28 °C.

## Product data

|                              |  |
|------------------------------|--|
| Chemical name                | 1.2 propylene glycol and higher glycols, anticorrosion additives |
| Appearance                   | Yellow liquid  |
| Packaging                    | Canisters / barrels / IBCs / tank vehicles                       |
| ADR                          | KI 0 number  |
| WHC                          | 1  |
| Labelling                    | -  |
| Applied concentration:       | Undiluted (Frost protection up to approx. -28 °C)                |
| Operating temperature range: | -28 bis +180 °C  |
| Areas of application:        | Solar plants / Vacuum tubes and plate collector                  |
| Density (20 °C)              | 1,01 - 1,02 g/cm <sup>3</sup>                                    |
| pH-value                     | 7,5 - 8,5  |
| Boiling point (1013 mbar)    | approx. 105 °C   |
| Specific heat (20 °C)        | approx. 3,55 kJ/kg K   |
| Thermal conductivity (20 °C) | 0,37 W/m K   |
| Solidification point         | -28 °C   |

**Glysofor Solar AF is delivered ready to be filled in, with a frost protection value of -28 degrees Celsius. The product can, depending on the desired frost protection value, be further diluted with water. As far as possible, the dilution should be done with AQUA DEST. or AQUA DEM. which possesses a minimum purity in accordance with VDE 0510.**

**Preparation:** Before the plant is filled for the first time, it should be tested for leaks. For this purpose, the plant should initially be filled with chloride-free water in the amount specified by the plant manufacturer, so that if any leakage occurs, no frost protection agent will be released accidentally. If it is not possible to test the plant using water (e.g. due to low temperatures), the plant should be observed during the filling process as much as is possible.

**Filling:** When used in undiluted form and for a desired frost protection value of up to – 28 degrees Celsius, Glysofor Solar AF is filled directly into the plant as delivered.

**If Glysofor Solar AF is being used in diluted form, proceed as follows**

**Filling:** If the capacity of the plant is not known, the required quantity of Glysofor Solar AF can be calculated using the table below. In order to ensure an ideal distribution, the system should first be filled with approx. 50% of the required quantity of water, followed by the entire required quantity of Glysofor Solar AF and finally the remaining quantity of water.

**Refilling:** If the system needs to be refilled, and the required refilling quantity is not known, an estimated quantity of Glysofor Solar AF is premixed, proportional to the desired level of frost protection. The premixed Glysofor Solar AF/water mixture is then filled into the system.

**Other:** After the system has been filled, a several hours long circulation should take place (overnight, if possible). The frost protection value setting is determined based on the temperatures that can be expected in that region. In order to ensure reliable frost protection at all times, we recommend a 5 to 10 % higher setting for this value.

| Glysofor Solar AF – active content (volume) |               | Frost protection up to °C |
|---|---------------|---------------------------|
| 100   | % - undiluted | -28                       |
| 90%   |               | -22                       |
| 80%   |               | -17                       |
| 70%   |               | -15                       |

## Application guidelines

Galvanised components are to be avoided, as zinc is generally volatile with glycol and products which contain glycol. Pipe connections are to be made of hard solder and chloride-containing flux materials are to be avoided or are to be removed completely by flushing after usage. Scalings on copper components, metal swarf and contaminations are to be removed completely before the plant is filled. Plants that are to be operated with Glysofor must not be in contact with any external electrical potential. When installing the plant, it must be ensured that the future operation is not interrupted by circulatory disturbances caused by air cushions or debris. Plants that are operated with Glycogard must be installed as closed systems and are to be filled completely and vented directly after the pressure test is carried out. Gas and air cushions are to be removed immediately. Breathers are to be applied in such a way that they keep the system free from air and oxygen at all times and that, in the case of low pressure, no air can be sucked in. If an existing plant is to be filled with Glysofor, the corrosion status should be checked beforehand. Before a system that is damaged by corrosion is filled, it must be completely reconstructed. In order to ensure a sufficient level of functionality and frost protection at all times, the condition and concentration of Glysofor Solar AF should be tested at least once per year. This is particularly advisable if work has been carried out on the operated system or the liquid has been refilled. Overheating must be avoided, as this can lead to damage and the premature ageing of Glysofor Solar AF.

## Other


Pure water/glycol mixtures have very distinctive corrosive properties. You must therefore never use pure water/glycol mixtures without inhibitor equipment. Glysofor Solar AF is delivered ready for use and offers a reliable antifreeze protection up to -28 degrees Celsius. As an alternative to a product that is pre-ready to be filled in, Glysofor Solar is also available as a concentrate. Our products Glysofor N and Glysofor L are available for other areas of application.

## Packaging sizes

- 10 kg canister
- 25 kg canister
- 30 kg canister
- 220 kg barrel
- 1.000 kg IBC
- 24.000 kg tank vehicle

As per the valid national and international classification guidelines, Glysofor Solar AF is not a hazardous substance. There is no toxic effect from the concentrate, nor from its dilution. The product is odourless and dermatologically safe. No irritation occurs that can lead to inflammation of the skin or mucous membrane. Glysofor Solar AF is free of nitrites, phosphates and amines. The raw materials contained in this product possess the highest possible degree of purity. Glysofor Solar AF is formulated on a 1.2 propylene glycol base, which fulfils the requirements of the DAB as well as the European Pharmacopoeia and the US Pharmacopeia. As an additive, 1.2 propylene glycol has been approved as per the Ordinance on Additives in Foodstuffs (effective 10/07/1984) as a solvent and extraction agent (BGB1.I S897, Enc. 2, List 9). In the USA, propylene glycol is categorised as a generally harmless food additive (Federal Register, Effective 01/04/1985, § 184.1666). Glysofor Solar AF, and its dilutions, are readily biodegradable. Glysofor Solar AF is classified in the lowest water pollution class WPC 1 (slightly hazardous to water). No workplace-related safety measures are necessary when handling this product. Glysofor Solar AF is non-flammable; it has not been classified in one of the hazard classes for flammable liquids. Glysofor Solar AF is not subject to labelling and not considered a hazardous substance in the national / international transport regulations. The delivery container consists of homogeneous PE and can be recycled after use. The product should be stored in a sealed state at all times. Due to the existing, extremely high level of purity, the product should not be decanted or contaminated with other substances.

*This data relates to the correct and appropriate application of our products, with due consideration of the professional standards and regulations of the area of application. It is for informational purposes only and does not absolve the obligation to carry out the due materials testing upon arrival. The data is based on our current state of knowledge and is not meant to guarantee specific properties. No general or legally binding statement on certain features, in a concrete application, can be derived from the above data. It is meant to describe our products with regard to their composition and offer application advice. Any industrial property rights of third parties and the suitability for a special application purpose are to be observed and verified by the user.*

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