# Grant Solar Fluid

**Grant Solar Fluid** is a ready to use heat transfer fluid for flat plate solar heating systems.

**Product Description**

Ready to use mono propylene glycol based heat transfer medium for solar heating applications with organic corrosion inhibitors to protect against high temperature degradation and low temperature conditions within solar panel installations. The product is inhibited without the use of borates, nitrites, amines, silicates and phosphates. Grant Solar Fluid is formulated to withstand extreme temperatures during period stagnation within solar collectors. The fluid is produced to provide freeze protection to -23°C. The product is suitable for flat plate solar heating systems.

- Protects against corrosion and limescale
- Provides excellent efficiency and extends system life
- Non-Toxic, environmentally friendly

**Corrosion Protection**

Grant Solar Fluid contains an optimized inhibitor package to ensure maximum and long lasting corrosion and the formation of boiler scale at both high and low temperature. Grant Solar Fluid is based on organic inhibitor technology which is completely different from traditional inhibitor technology. The corrosion inhibitor of traditional technology forms an isolating film on the interior of the installation. This means they are consumed over time, and require repeated renewal to maintain corrosion protection. Organic inhibitors on the other hand, protect metals against corrosion by acting selectively by forming a mono-molecular protection layer on the location where corrosion has a tendency to start. This means that the inhibitor is used only where needed and therefore the rest of the inhibitor remains in reserve which gives a much longer corrosion protection life than traditional inhibitor technologies.
The effectiveness of the inhibitor is proven via the corrosion test method ASTM D1384 (American Society for Testing and Materials)
As for most heat transfer fluids, the use of zinc or materials using zinc is not recommended for pipes or any other part of the installation.

| ASTM D1384 glassware corrosion tests | Weight loss in mg/coupon[1] | | | | | |
|---|---|---|---|---|---|---|
| | Brass | Copper | Solder | Steel | Cast Iron | ASTM D1384 |
| 'Industry' limit (max) | 10 | 10 | 30 | 10 | 10 | Industry Limit |
| Grant Solar Fluid | 1.1 | 1.2 | 0.9 | 0.3 | -0.5 | |

1 : Weight loss AFTER chemical cleaning. Weight gain is indicated by a - sign.

**Compatibility and Mixing**

Grant Solar Fluid is compatible with most other heat transfer fluids based on propylene glycol.
Exclusive use of Grant Solar Fluid is recommended for optimal corrosion protection. This heat transfer fluid is compatible with European hard tap waters, up to a water hardness of 30° dH (German hardness degrees equivalent to 535 mg/l $CaCO_3$).

**Approved Elastomer Compatibility**

Standard qualities of the following classes of polymers are compatible with our Grant Solar Fluid: Nitrile rubber (NBR), Hydrogenated nitrile rubber (H-NBR), Acrylate rubber (ACM), Silicone rubber (MVQ), Fluorocarbon rubber, commonly referred to as Viton (FPM), Ethylene Propylene Diene rubber (EPDM), Butyl rubber (IIR), Natural rubber (NR), Styrene Butadiene rubber (SBR), Polychloroprene rubber, often referred to as Neoprene (CR), Polytetrafluorethylene, commonly known as Teflon (PTFE), Polyethylene, low density and high density (LDPE and HDPE), Polypropylene (PP) Polyvinylchloride (PVC), Polyamide (PA), Polyester resins (UP)
Maximum and minimum usage temperatures in MPG and water based dilutions depend on the quality of the elastomer and should be requested of the manufacturer. Inform the manufacturer of the pH of the product and the sustained maximal pressures in the system when submitting your request.

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## CHEMICAL AND PHYSICAL PROPERTIES

| Properties | Grant Solar Fluid | Method | Properties | Grant Solar Fluid | Method |
|---|---|---|---|---|---|
| Freezing Point | -23°C | ASTM D1177 | Specific Heat | 3.73kJ/Kg-K | Internal |
| Kinematic Viscosity | 4.5cSt @ 20°C<br>0.93cSt @ 80°C | DIN 51562<br>DIN 51562 | Specific gravity, 20°C | 1.037 typ g/cm3 | ASTM D1122 |
| Equilibrium Boiling Point | 108°C typ. | ASTM D1120 | Thermal Conductivity 20°C | 0.49W/mK | Internal |
| Nitrite, amine, phosphate | Nil | IC | pH | 8.8 typ. | ASTM D1287 |
| Colour | Pink | visual | Refractive Index, 20°C | 1.445 typ. | ASTM D1218 |

### Servicing and Monitoring Fluid Condition

Grant Solar Fluid can be used effectively in systems for many years. It is recommended that the fluid is checked annually with a refractometer to test for freeze protection.

### Storage Requirements

The product should be stored at ambient temperatures and periods of exposure to temperatures above 35°C should be minimized. As with any antifreeze coolant, the use of galvanized steel is not recommended for pipes or any other part of the storage/mixing installation
**Grant Solar Fluid** can be stored for minimum 8 years in unopened containers without any effect on the product quality or performance. It is strongly recommended to use new containers and not recycled ones.

### Toxicity and Safety

For detailed Toxicity and Safety Data we refer to the Material Safety Data Sheet. The transport is not regulated.
*All information contained in this Product Information Leaflet is accurate to the best of our knowledge and belief as at the date of issue specified. However, the Company makes no warranty or representation, express or implied, as to the accuracy or completeness of such information.*

## NOTES FOR SOLAR HEATING INSTALLATIONS

Grant Solar Fluid is suitable for use in flat plate solar installations.

- Systems should meet the DIN 4757 requirements, designed as closed loop circuits due to the effects of air within systems leads to consuming the fluid at an increased rate.
- Membrane pressure systems must conform to DIN4807
- The use of galvanized steel is not recommended for pipes or any other part of the storage/mixing installation
- Systems should be pressure tested for leaks, flushed and cleaned prior to filling ensuring to remove all residues and fluxes present.
- Gas and air should be removed using a method of venting
- Avoid sustained stagnation as this effects the life span of the heat transfer medium
- Avoid mixing with other products and top up with water
- Refractometers or Hydrometers can be used to test the freeze protection levels

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