

## Joule Sol-Fluid-20

### Ready To Use Heat Transfer Fluid for Solar Heating Installations

#### 1. Description

Non Toxic Premixed 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. Joule Sol-Fluid-20 is formulated to withstand extreme temperature above 180°C during period stagnation within solar collectors. The fluid is produced to provide freeze protection to -20°C. The product is suitable for both evacuated tube and flat plate solar heating systems.

- Provides excellent efficiency and extends system life
- Non-Toxic, environmentally friendly
- Stable at extreme temperatures

#### 2. Corrosion Protection

Joule Sol-Fluid-20 contains an optimized inhibitor package to ensure maximum and long-lasting corrosion and the formation of boiler scale at both high and low temperature. Joule Sol-Fluid-20 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 <sup>1</sup>					
	Brass	Copper	Solder	Steel	Cast Iron	Aluminium
'Industry' limit (max)	10	10	30	10	10	30
Joule Sol-Fluid-20	1.1	1.2	0.9	0.3	-0.5	-0.9

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

2: Reference product is a mono propylene glycol based product with a traditional inhibitor package.

#### 3. Dilution Ratio

Joule Sol-Fluid-20 is a ready to use solution so no further dilution is recommended.

#### 4. Compatibility and Mixing

Joule Sol-Fluid-20 is compatible with most other heat transfer fluids based on propylene glycol. Exclusive use of Joule Sol-Fluid-20 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<sub>3</sub>).

#### 5. Elastomer Compatibility

Standard qualities of the following classes of polymers are compatible with our Joule Sol-Fluid-20: 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.

### 6. Chemical and Physical Properties

Properties	Joule Sol-Fluid-20	Method	Properties	Joule Sol-Fluid-20	Method
Freezing Point	-20°C	ASTM D1177	Specific Heat	3.73kJ/Kg-K	Internal
Kinematic Viscosity	5.0cSt @ 20°C 1.00cSt @ 80°C	DIN 51562 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	Blue/Green	visual	Refractive Index, 20°C	1.445 typ.	ASTM D1218

### 7. Servicing and Monitoring Fluid Condition

Joule Sol-Fluid-20 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.

### 8. 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. Joule Sol-Fluid-20 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.

### 9. Toxicity and Safety

For detailed Toxicity and Safety Data we refer to the Safety Data Sheet. The transport is not regulated and not subject to labelling according to directive 1999/45/EC. Material Safety data sheet has been drafted in accordance with EEC Directive 1907/2006/EC (REACH)

*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.*

### 10. Packaging

Joule Sol-Fluid-20 is supplied in 10ltr, 20ltr, 25ltr, 210ltr, 1000ltrs & Bulk Tanker lots

### 11. Notes for Solar Heating Installations

Joule Sol-Fluid-20 is suitable for use in all high temperature 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