

Joule Heat Pump Concentrate

Heat Transfer Fluid

1. Description

Joule HP Concentrate is a Heat Transfer Fluid based on ethylene glycol with organic corrosion inhibitors to protect against freezing, corrosion, limescale, & bacteria build up within installations. The product is inhibited without the use of nitrites, amines, and phosphates. The coolant also contributes to safer environment. Suitable for use in ground & air source heat pumps.

- Freeze & Boiling Protection
- Protects against corrosion, bacteriological and lime-scale degradation
- Provides excellent efficiency and extends system life
- Protects all internal system components
- pH Stable

2. Corrosion Protection

Joule HP Concentrate contains an inhibitor package to ensure long lasting corrosion and the formation of scale at both high and low temperature. Joule HP Concentrate is based on organic 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.

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
Joule HP Concentrate	0.2	0.3	1.2	0.3	0.3	

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

3. Dilution Ratio

Joule HP Concentrate provides protection against boiling, freezing and corrosion. The dilution is determined by system requirements, mainly freezing requirements. However, to ensure good corrosion protection it is recommended to use at least 25 vol. % in the coolant solution.

Mixtures with more than 70 vol. % in water are not recommended, because the physical properties like heat transfer are no longer sufficient

Dilution Joule HP Concentrate, vol%	Freeze Point, °C	Dilution Joule HP Concentrate, vol %	Freeze Point, °C
25.0	-13	35.0	- 17
30.0	-15	40.0	- 25

4. Compatibility and Mixing

Joule HP Concentrate is compatible with most other heat transfer fluids based on ethylene glycol. Exclusive use of Joule HP Concentrate 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 CaCO₃).

5. Elastomer Compatibility

Standard qualities of the following classes of polymers are compatible with our Joule HP Concentrate: 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 MEG 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		Method	Properties		Method
Density 20°C	1.116 typ.	ASTM D5931	Freezing Point °C (25%)	-13°C typ.	DIN 51583
Colour	Blue	visual	Hard Water Stability, ml	< 0.5	BS 5117:1:5
Refractive Index 20°C	1.435 typ.	ASTM D1218	Reserve Alkalinity (pH5.5)	3.0 typ.	ASTM D1121
Nitrite, amine, phosphate	nil	IC	pH	8.3 typ.	ASTM D1287
Equilibrium Boiling point	155°C typ.	visual	Ash content. % w/w	0.4 typ.	ASTM D1119

7. Servicing and Monitoring Fluid Condition

Joule HP Concentrate 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 HP Concentrate 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 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.