

BRINE FLUID

DESCRIPTION AND APPLICATIONS

The secret behind *Brine Fluid*'s excellent fluid- and environmental properties lies in the optimal mix of organic salts giving it its very low viscosity. This in turn reduces the overall energy consumption and makes it ideal for industrial refrigeration and food industry.

Brine Fluid contains an advanced organic adsorption inhibitor package to ensure an optimal corrosion protection.

Brine Fluid is colorless to yellowish and is free from nitrites, borates, phosphates, molybdates and silicates. To ensure the high quality of the product, *Brine Fluid* is always supplied ready-to-use and is available in six different versions with freezing points from -10 °C to -60 °C.

Brine Fluid's excellent fluid properties in terms of viscosity, specific heat and thermal conductivity make it the ideal choice of Heat Transfer Fluid (HTF) at very low temperatures. The great fluid properties not only enable you to use smaller pumps and heat exchangers but also significantly reduce the total energy consumption. This applies especially at very low temperatures.

Brine Fluid can be used wherever a liquid HTF is required in indirect cooling, stationary or mobile installations. *Brine Fluid* offers great advantages in comparison to glycol mixtures in applications such as:

- Food industry.
- Logistic centers.
- Defrosting of CO₂ air coolers.
- Pharmaceutical industry.
- Ice rinks/artificial ski slopes.
- Power plants.

ADVANTAGES

- ✓ Low viscosity.
- ✓ High thermal conductivity.
- ✓ Reduced energy cost.
- ✓ Readily biodegradable, non toxic and non-flammable.
- ✓ Adapted for the food industry.
- ✓ Advanced inhibitor technology.
- ✓ Personalized technical support.



PROPERTIES

Technical Data:

Appearance	Colorless – Pale Yellowish
Boiling Point	Approx. 109°C
Density (20°C)	1086 - 1240
pH (20°C)	8,0 - 9,0

Material Compatibility:

Most of the common materials can be used such as copper, bronze, brass (dezincification resistant), steel, stainless steel, cast iron, as well as plastic pipes (ABS, PE). Plastic materials must be suitable for the system's minimum and maximum temperatures.

High temperatures involve an increased risk of corrosion. Selection of materials must therefore take into account the operational temperature within the system. The higher the temperature, the better the quality of the materials is recommended. Galvanized steel is not recommended to use together with *Brine Fluid*.

Corrosion Protection:

Brine Fluid is a high quality product based on potassium salts with an optimal concentration of corrosion inhibitors. The optimal corrosion package creates, and only when necessary, a local temporary and very thin protective layer with a minimal (mono-molecular) thickness at the metal surface. This allows very good heat transfer. To quantify the corrosion protection efficiency, different corrosion tests is used.

The following table shows the effectiveness of mixtures *Brine Fluid*– Water in inhibiting corrosion according to ASTM D 1384. For a comparative purpose, results for water without additives are presented.

Material	<i>Brine Fluid</i> -20	Water	ASTM D 1384 Max. Limit
Copper	+4	2	10
Solder	98	99	30
Brass	+5	5	10
Mild Steel	0	212	10
Cast Iron	5	450	10
Cast Aluminum	13	110	30

The changes are weight losses of coupons in mg/coupon, except plus sign shows weight gain.

ANALYSIS & TECHNICAL SUPPORT

It is recommended to regularly check the fluid in respect of parameters such as pH, freezing point (density), metal ions and corrosion inhibitor level. With a test kit you may easily check freezing point (density) and pH value. More advanced analysis can be performed, such as metal ions concentration and corrosion inhibitor level to secure the well functioning of the system. Along with the test result, a complete report with conclusion and recommended actions is always provided.

PRECAUTIONS

Store in tightly closed original containers not below its freezing point. Avoid contact with eyes and skin. When transporting *Brine Fluid*, there are no restriction since the product is not classified.

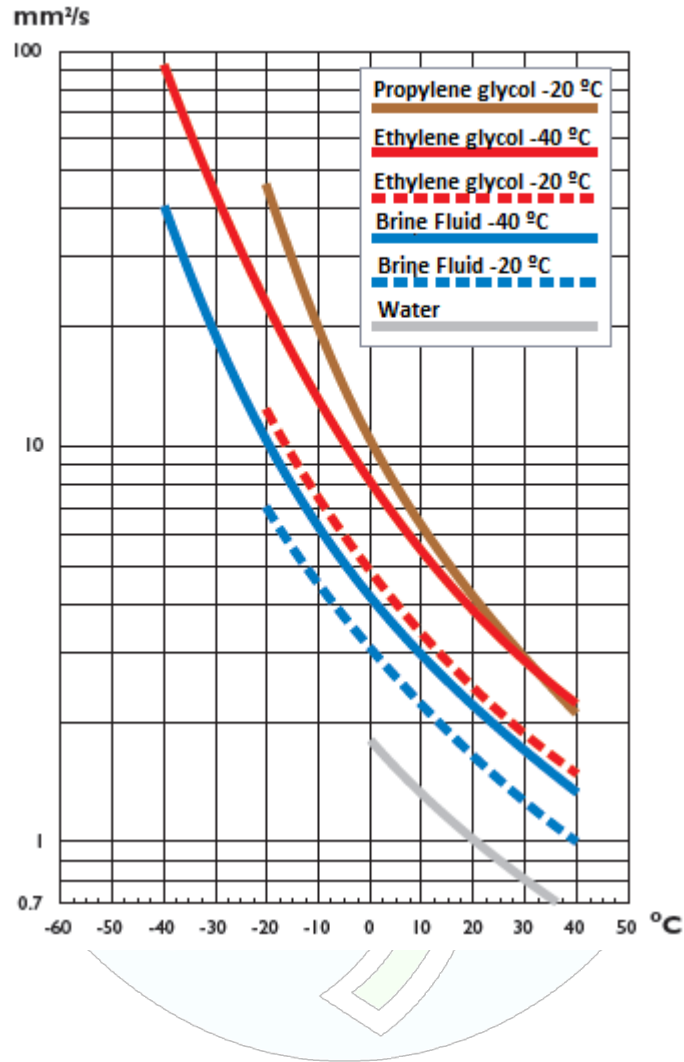
PRESENTATION

The product is supplied in 1000 liter IBC containers, 210 liter non-returnable plastic canisters and in 25 and 10 liter non-returnable plastic canisters. Other volumes are available upon request.



Carpemar

Kinematic Viscosity of *Brine Fluid* and Glycol



Carpemar



	Brine Fluid -10	Brine Fluid -15	Brine Fluid -20	Brine Fluid -30	Brine Fluid -40	Brine Fluid -55	Brine Fluid -60
Density (Kg./m³)	1086	1114	1142	1177	1207	1240	1260
Specific Heat (KJ/Kg.K)	3,577	3,446	3,315	3,124	3,008	2,817	2,820
Thermal Conductivity (W/mK)	0,544	0,526	0,508	0,486	0,465	0,441	0,440
Dynamic Viscosity (mPa.s)	1,45	1,63	1,80	2,10	2,71	24,06	4,28
Kinematic Viscosity (mm²/s)	1,33	1,46	1,58	1,78	2,25	3,27	3,40

Measurements are performed @ +20 °C