Temper®

The Intelligent Solution

Temper, the ideal Heat Transfer Fluid

The secret behind Temper'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. The fluid contains an advanced organic adsorption inhibitor package to ensure an optimal corrosion protection.

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

Advantages when using Temper

- Low viscosity
- High thermal conductivity
- Reduced energy cost
- Readily biodegradable
- Adapted for the food industry
- Advanced inhibitor technology
- Personalized technical support

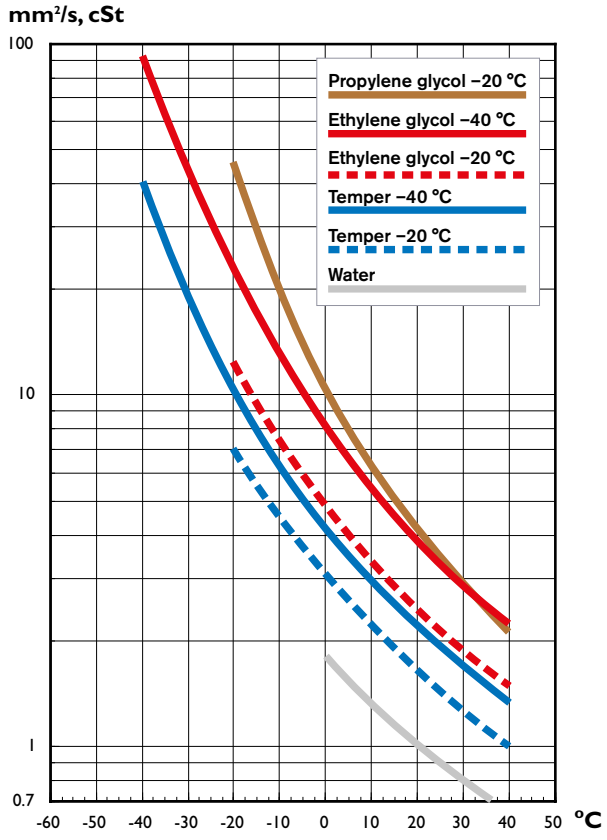
General Properties

Appearance	Colourless to pale yellowish
Boiling point	Approx. 109°C
Density	1086-1260
pH	8-9

Performance

Temper'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.

Kinematic Viscosity of Temper and Glycol



Thermophysical Properties

	Unit	T-10	T-15	T-20	T-30	T-40	T-55	T-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/m • K**	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	4,06	4,28
Kinematic viscosity	**mm²/s**	1,33	1,46	1,58	1,79	2,25	3,27	3,40

Measurements are performed @ +20 °C

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Areas of Use

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

- Food industry
- Logistic centres
- Defrosting of CO_2 air coolers
- Pharmaceutical industry
- Ice rinks/artificial ski slopes
- Power plants

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 be used together with Temper.

Corrosion Protection

Temper 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 (monomolecular) thickness at the metal surface. This allows very good heat transfer. To quantify the corrosion protection efficiency, different corrosion tests is used.

Temper Technology has chosen to ASTM D 1384 test (see below), which is the most frequent, used among heat transfer fluids. Figures in the table represent the change in weight before and after the test.

ASTM D1384 standard test

Specimen	Industry Limit	Water	Temper -20
Copper	10	2	+4
Solder	30	99	98
Brass	10	5	+5
Mild Steel	10	212	0
Cast Iron	10	450	5
Cast Aluminium	30	110	13

The changes are weight losses 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.

For technical support contact **techsupport@temper.se**

Environment

Temper has very good environmental properties: it is readily biodegradable, non toxic and non-flammable. Temper does not contain nitrites borates, phosphates, molybdates or silicates.

Health and Ecotoxical information
Non toxic to mammals
LD50 (oral, rat) > 5000 mg/kg

Non toxic to aquatic animals
OECD TG 203: LC50/96 = 13 900mg/l

Microtox
Not acute toxic

Readily biodegradable
OECD 301A: 99 % after 28 days

Bioaccumulation
Do not bio-accumulate

The freezing point depression substances in Temper contains mainly of potassium acetate which is used as food preservative.

Packaging

Temper is supplied in the following packaging, as well as bulk deliveries:

25L blue canister made of PE with sealed cap, the canister's weight is 1,2 kg.

208L blue barrel made of PE, with a sealed cap, the barrel's weight is 9,0 kg.

1000L black IBC, the IBC weight is 70,0 kg. Outlet valve NW 50

Bulk deliveries for larger volumes

Storing, Handling & Transport

Store in tightly closed original containers not below its freezing point. Avoid contact with eyes and skin. When transporting Temper, there are no restriction since the product is not classified. Further information can be found in the safety data sheet.

Further Information

For more information contact Temper Technology AB, visit our website or consult your local distributor.

ISO
Temper Technology is
Certified according to
9001:2015

temper technology

www.temper.se **info@temper.se**