



Glysofor

Glysofor ELP - Specification

Product features

Glysofor ELM is a high-purity monoethylene glycol, which is available in any concentration.

The product is used for applications which require extremely low electrical conductivity.

Glysofor ELM can be delivered as a concentrated high-purity product or as an aqueous solution.

The solutions are manufactured using high-purity water with an electrical conductivity $< 0.1 \mu\text{s}/\text{cm}$.

Glysofor ELM optimally prevents frost damage, deposits, sludge accumulation, and biofilms in water circuits.

Due to its safety Glysofor ELP can be used in environmentally sensitive applications. It is biodegradable and environmentally friendly.

Both as a concentrate and diluted with water, the product is classed in the lowest water hazard class WHC 1.

It exhibits longterm resistance to the formation of biofilms, rot, and microbiological decomposition.

Antifreeze concentrate and heat transfer medium with extremely low electrical conductivity

Basis: 1.2 Propylene glycol

Operating temperature: -50 bis +150 °C

Microbiologically stable

Biodegradable and environmentally friendly

Available as a concentrate or solution

Areas of application: Induction melting furnaces, transformer cooling systems, capacitors, inverter cooling, welding systems

Glysofor ELM can be mixed in any ratio with water, ethanol, butanol, butyl acetate, and acetone. We supply high-purity water with an electrical conductivity $< 0.1 \mu\text{s}/\text{cm}$ for you to make subsequent adjustments.

Homogeneous Glysofor ELPN/water mixtures do not separate, which ensures consistent product characteristics. This guarantees longterm and low-maintenance operation of the system.

Specific electrical resistance at 20 °C (M ohm cm)	min. 10
Specific electrical conductivity at 20 °C (µs/cm)	max. 0,1
Permittivity	approx. 28

Typical application areas

Aqueous solutions of Glysofor ELP are used in water circuits which require extremely low electrical conductivity.

- Induction melting furnaces
- Transformer cooling systems
- X-ray tubes
- Capacitors
- Converter cooling systems
- Inverter cooling systems
- Circuit breakers
- Welding systems
- Producing electrolytes

Product data

Chemical name	1.2 Propylene glycol
Appearance	Colorless liquid
Packaging	Canisters / barrels / IBCs / tank vehicles
ADR	KI 0 number
WHC	1
Labelling	-
Applied concentration:	25 to 100 Vol.%
Operating temperature range:	-50 to +150 °C
Areas of application:	Colling systems and water circuits which require extremely low electrical conductivity.
Density (20 °C)	1,03 - 1,04 g/cm ³
Molar mass	76,10 g/mol
Boiling point (1013 mbar). Conc.	approx. 187 °C
Vapour pressure (20 °C)	0,11 mbar
Specific heat (20 °C)	2,49 kJ/kg K
Thermal conductivity (20 °C)	0,20 W/m K
Dynamic viscosity (20 °C)	55 mPa s (100%)

Antifreeze

Glysofor ELP significantly reduces the freezing point of water, thereby preventing freezing in water circuits and cooling systems. With Glysofor ELP, water circuits can be temporarily switched off, even during frost conditions, while however remaining ready for operation at any time. Homogeneous mixed aqueous solutions do not separate when the system is shut down.

Glysofor ELP – active content (volume)	Frost protection up to °C
25 %	-11
30 %	-14
35 %	-18
40 %	-22
45 %	-26
50 %	-32

Application guidelines

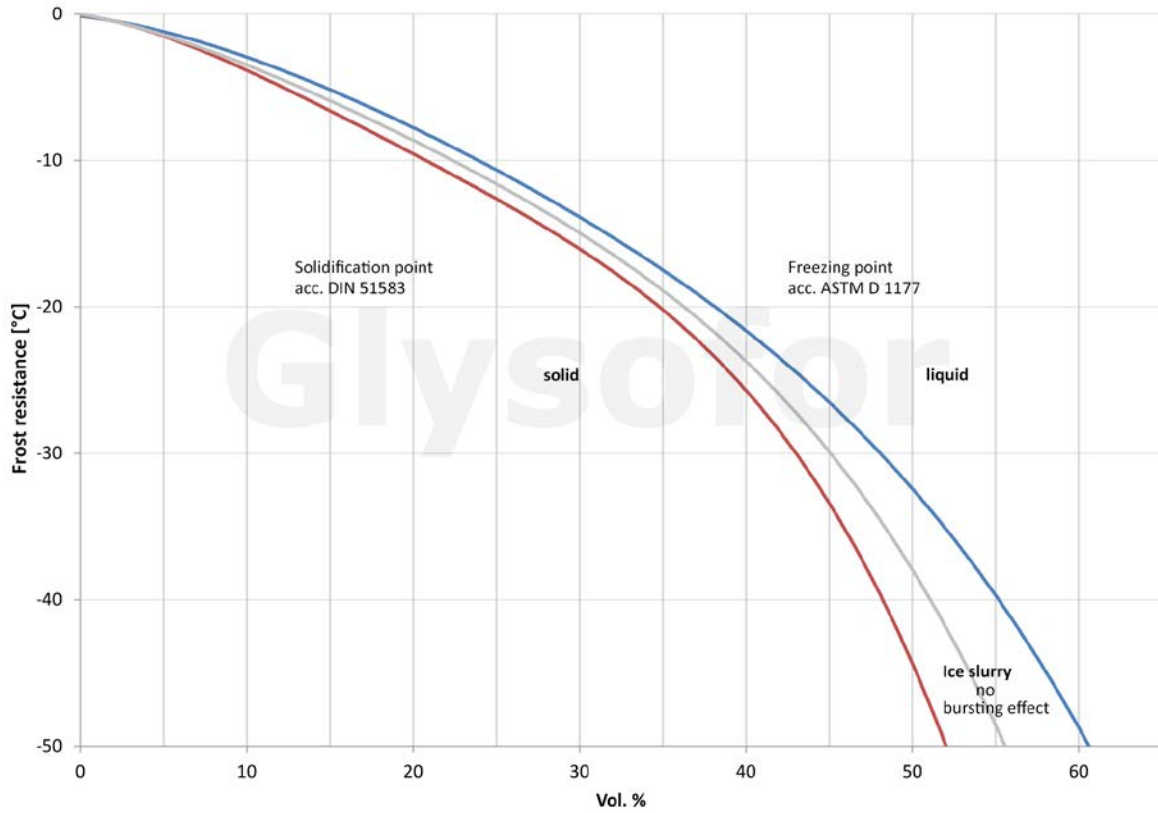
Galvanised components are to be avoided, as zinc is generally volatile with Glysofor ELP and products which contain glycol. With regard to the extremely high purity Glysofor ELP should not be contaminated with other products or materials. The low conductivity can be obtained by ion exchange. Overheating must be strictly avoided, as this can lead to damage and the premature ageing of Glysofor EVO ELP.



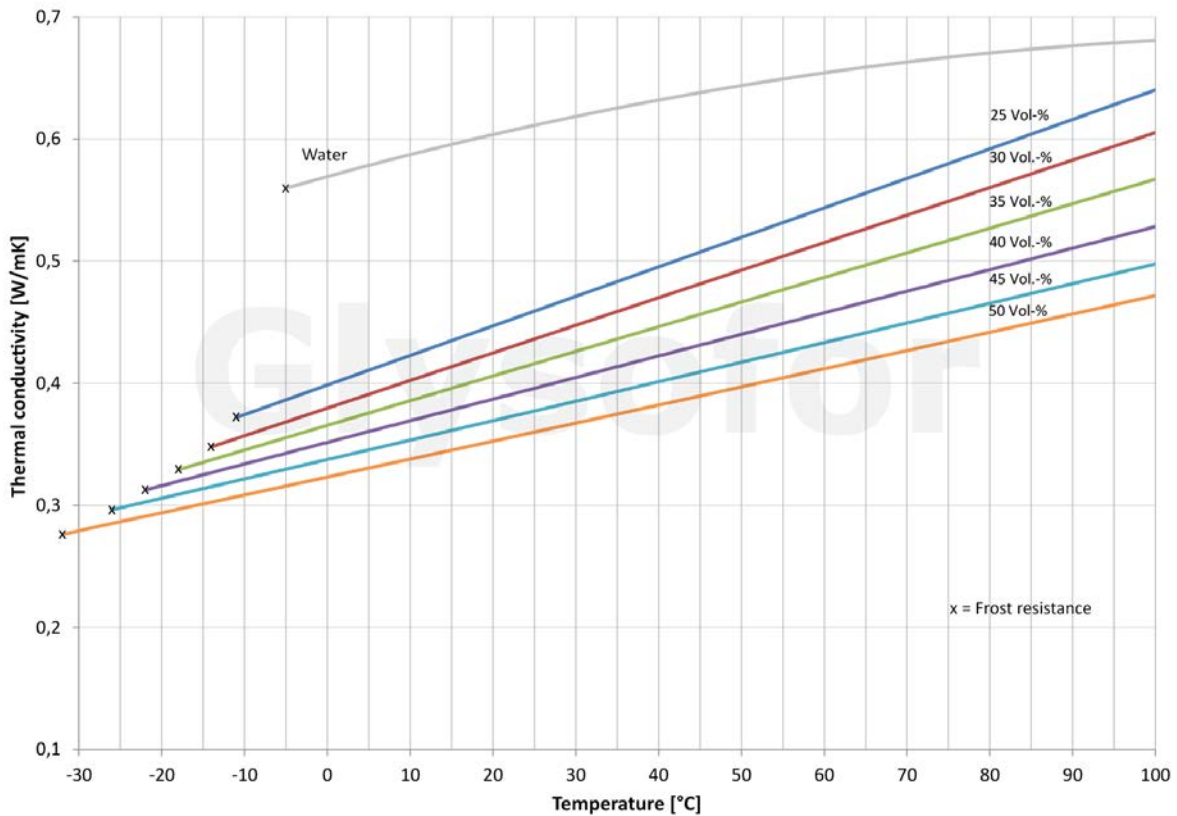
Technical data

Concentrate [Vol.%]	Frost resistance [°C]	Temp. [°C]	Thermal conductivity [W/m K]	Spec. heat capacity [kJ/kg K]	Density [g/cm ³]	Kinemat. viscosity [mm ² /s]	Cub. Expansion coefficient [K ⁻¹]	Rel. Pressure drop factor [Factor]
25	-11	-10	0,375	3,86	1,032	9,44	0,00014	1,70
		0	0,399	3,89	1,030	5,69	0,00023	1,48
		10	0,424	3,92	1,027	3,69	0,00031	1,31
		20	0,448	3,94	1,023	2,54	0,00038	1,20
		30	0,472	3,96	1,019	1,83	0,00045	1,10
		40	0,496	3,99	1,014	1,40	0,00051	1,04
		50	0,519	4,02	1,009	1,11	0,00056	0,97
		60	0,545	4,04	1,003	0,92	0,00061	0,92
		70	0,569	4,06	0,997	0,78	0,00064	0,88
		80	0,594	4,09	0,990	0,67	0,00067	0,84
		90	0,617	4,12	0,983	0,59	0,00066	0,81
100	0,641	4,14	0,976	0,53	0,00070	0,80		
30	-14	-10	0,358	3,76	1,039	12,09	0,00022	1,74
		0	0,381	3,79	1,036	7,18	0,00030	1,52
		10	0,403	3,82	1,032	4,56	0,00037	1,34
		20	0,425	3,86	1,028	3,08	0,00044	1,23
		30	0,448	3,89	1,023	2,19	0,00051	1,13
		40	0,471	3,92	1,018	1,65	0,00054	1,06
		50	0,494	3,95	1,012	1,29	0,00055	1,00
		60	0,516	3,99	1,006	1,05	0,00063	0,93
		70	0,539	4,02	0,999	0,87	0,00066	0,89
		80	0,562	4,05	0,992	0,75	0,00068	0,85
		90	0,584	4,08	0,985	0,66	0,00060	0,82
100	0,606	4,10	0,978	0,57	0,00073	0,80		
35	-18	-10	0,346	3,67	1,046	16,08	0,00031	1,97
		0	0,367	3,71	1,042	9,05	0,00037	1,66
		10	0,386	3,74	1,038	5,52	0,00043	1,44
		20	0,407	3,77	1,033	3,63	0,00048	1,29
		30	0,427	3,81	1,028	2,53	0,00053	1,18
		40	0,447	3,85	1,022	1,87	0,00056	1,09
		50	0,467	3,88	1,016	1,47	0,00061	1,03
		60	0,488	3,92	1,010	1,19	0,00064	0,97
		70	0,508	3,95	1,003	1,00	0,00067	0,91
		80	0,528	3,99	0,995	0,84	0,00071	0,88
		90	0,548	4,02	0,988	0,73	0,00072	0,85
100	0,568	4,05	0,981	0,62	0,00074	0,83		
40	-22	-20	0,317	3,54	1,057	44,69	0,00037	2,43
		-10	0,335	3,58	1,053	21,38	0,00041	2,01
		0	0,353	3,62	1,048	11,39	0,00044	1,71
		10	0,369	3,65	1,043	6,68	0,00048	1,49
		20	0,388	3,69	1,038	4,26	0,00052	1,33
		30	0,406	3,73	1,032	2,95	0,00055	1,22
		40	0,423	3,77	1,026	2,17	0,00060	1,13
		50	0,441	3,79	1,020	1,68	0,00062	1,06
		60	0,459	3,84	1,013	1,35	0,00065	1,01
		70	0,476	3,88	1,006	1,13	0,00068	0,94
		80	0,493	3,92	0,998	0,94	0,00073	0,91
90	0,512	3,95	0,991	0,81	0,00076	0,88		
100	0,529	3,98	0,984	0,68	0,00077	0,85		
45	-26	-20	0,306	3,43	1,063	60,19	0,00043	2,75
		-10	0,323	3,47	1,058	27,48	0,00046	2,26
		0	0,339	3,51	1,053	14,19	0,00049	1,88
		10	0,355	3,55	1,048	8,12	0,00052	1,67
		20	0,372	3,58	1,042	5,11	0,00056	1,46
		30	0,386	3,63	1,036	3,47	0,00059	1,29
		40	0,402	3,67	1,030	2,54	0,00062	1,20
		50	0,418	3,71	1,023	1,95	0,00065	1,12
		60	0,434	3,75	1,016	1,57	0,00068	1,05
		70	0,449	3,79	1,009	1,28	0,00071	0,98
		80	0,466	3,83	1,001	1,09	0,00074	0,91
90	0,483	3,87	0,994	0,92	0,00077	0,89		
100	0,499	3,91	0,986	0,75	0,00079	0,87		
50	-32	-30	0,278	3,28	1,074	210,98	0,00045	
		-20	0,295	3,32	1,069	80,19	0,00048	2,79
		-10	0,309	3,36	1,064	35,19	0,00051	2,29
		0	0,325	3,39	1,058	17,58	0,00053	1,91
		10	0,339	3,44	1,052	9,82	0,00056	1,70
		20	0,354	3,49	1,046	6,07	0,00058	1,48
		30	0,369	3,53	1,040	4,08	0,00061	1,31
		40	0,384	3,57	1,033	2,95	0,00064	1,22
		50	0,397	3,61	1,026	2,26	0,00067	1,14
		60	0,412	3,65	1,019	1,79	0,00070	1,07
		70	0,427	3,69	1,012	1,48	0,00072	1,01
80	0,442	3,74	1,004	1,23	0,00075	0,93		
90	0,458	3,78	0,996	1,03	0,00077	0,91		
100	0,474	3,82	0,989	0,82	0,00081	0,89		

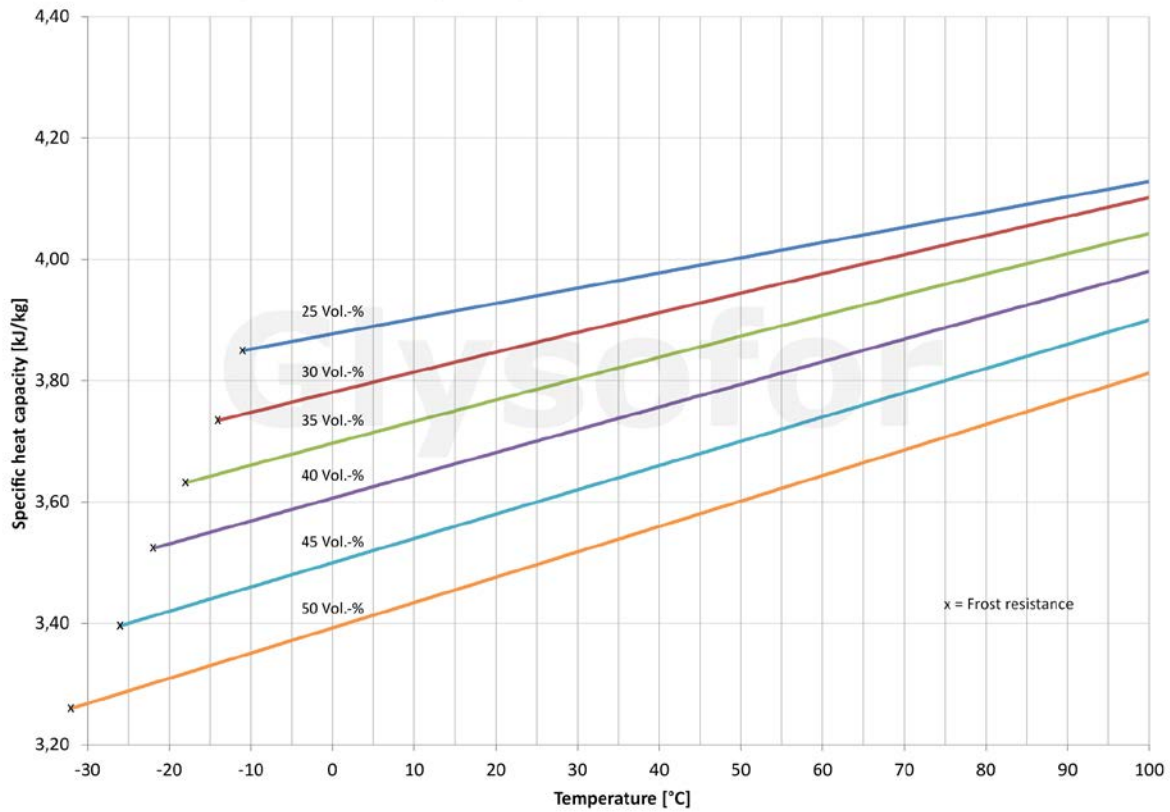
Frost resistance of Glysofor ELP - water mixtures



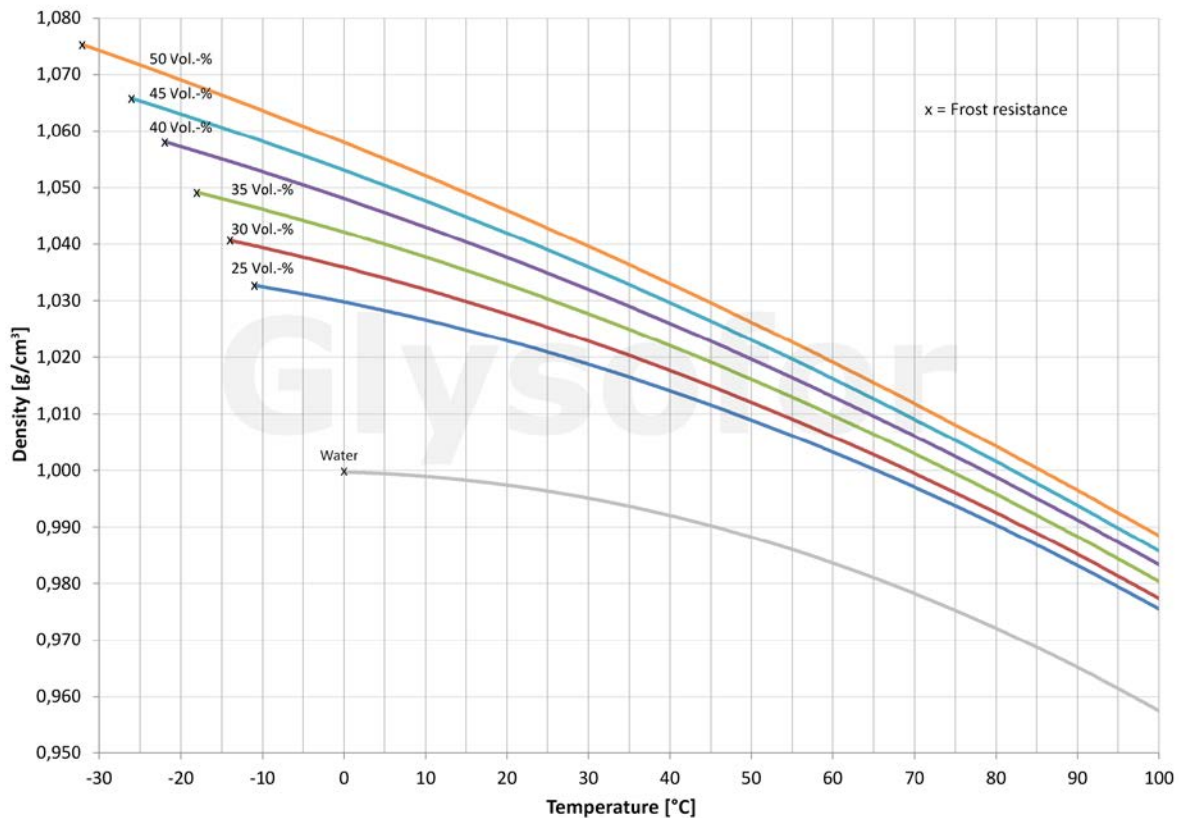
Thermal conductivity of Glysofor ELP - water mixtures



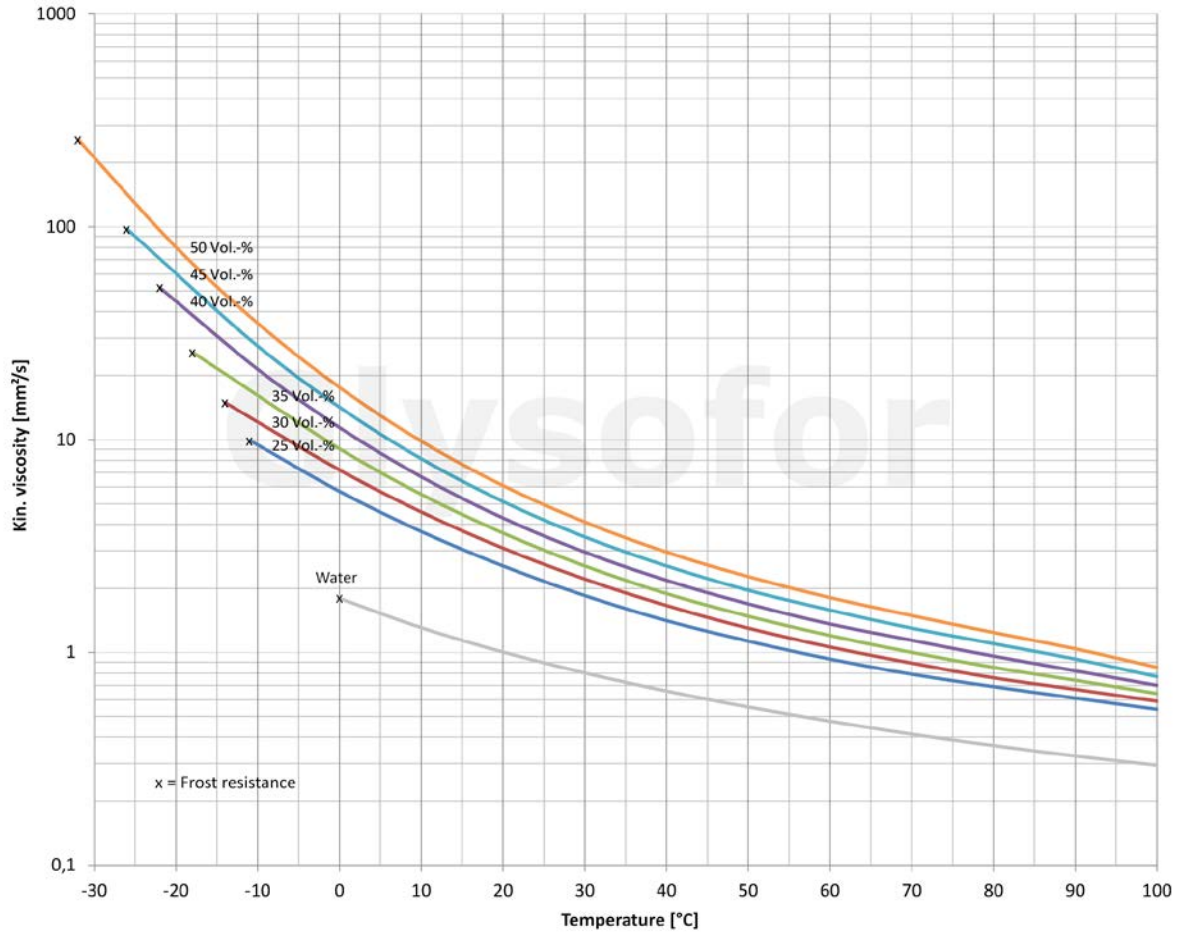
Spec. heat capacity of Glysofor ELP - water mixtures



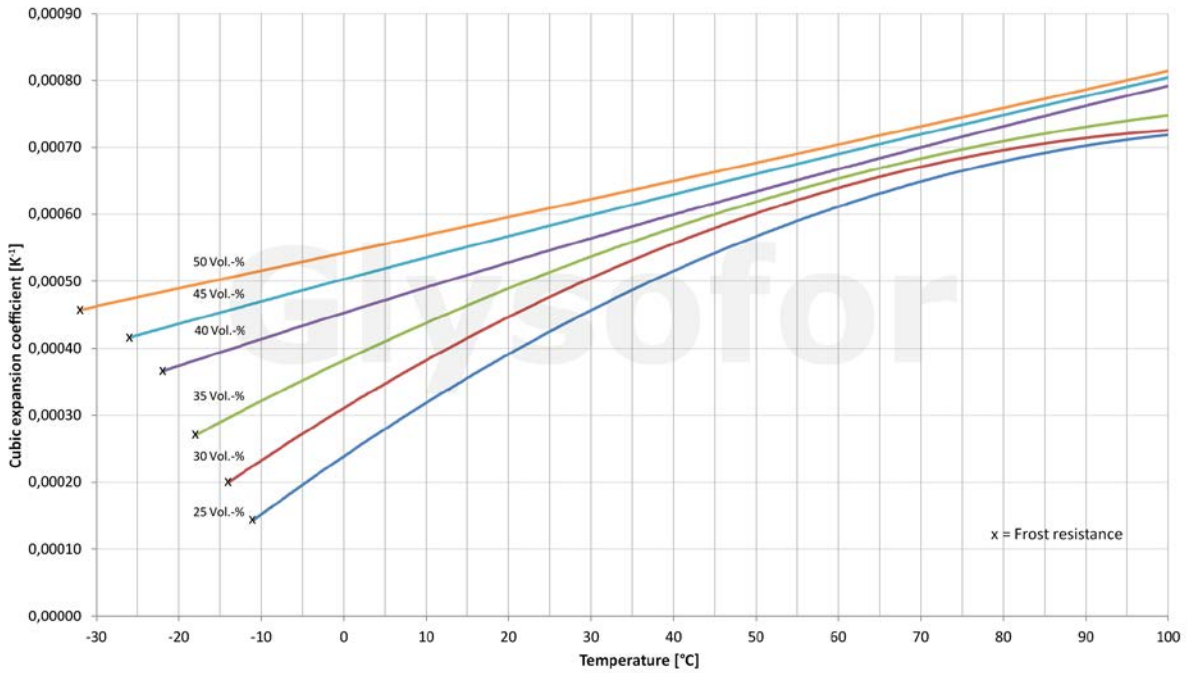
Density of Glysofor ELP - water mixtures



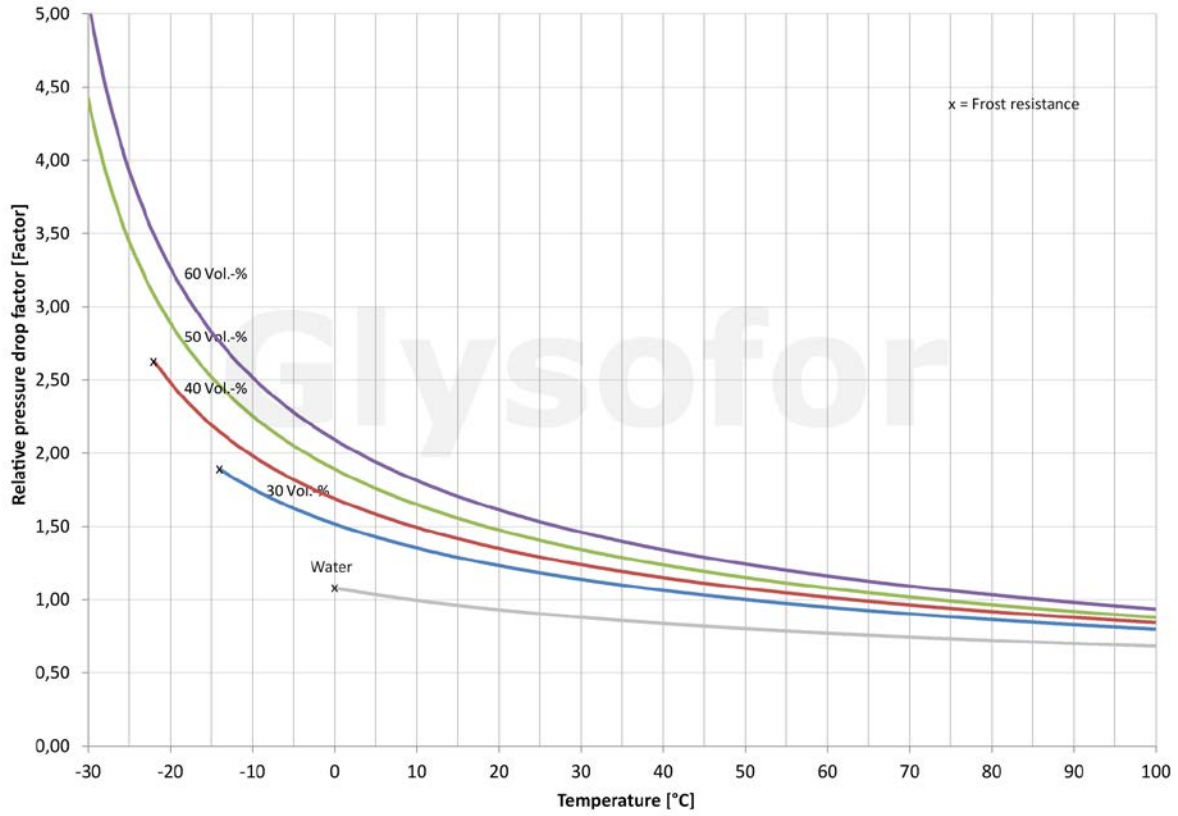
Kinematic viscosity of Glysofor ELP - water mixtures



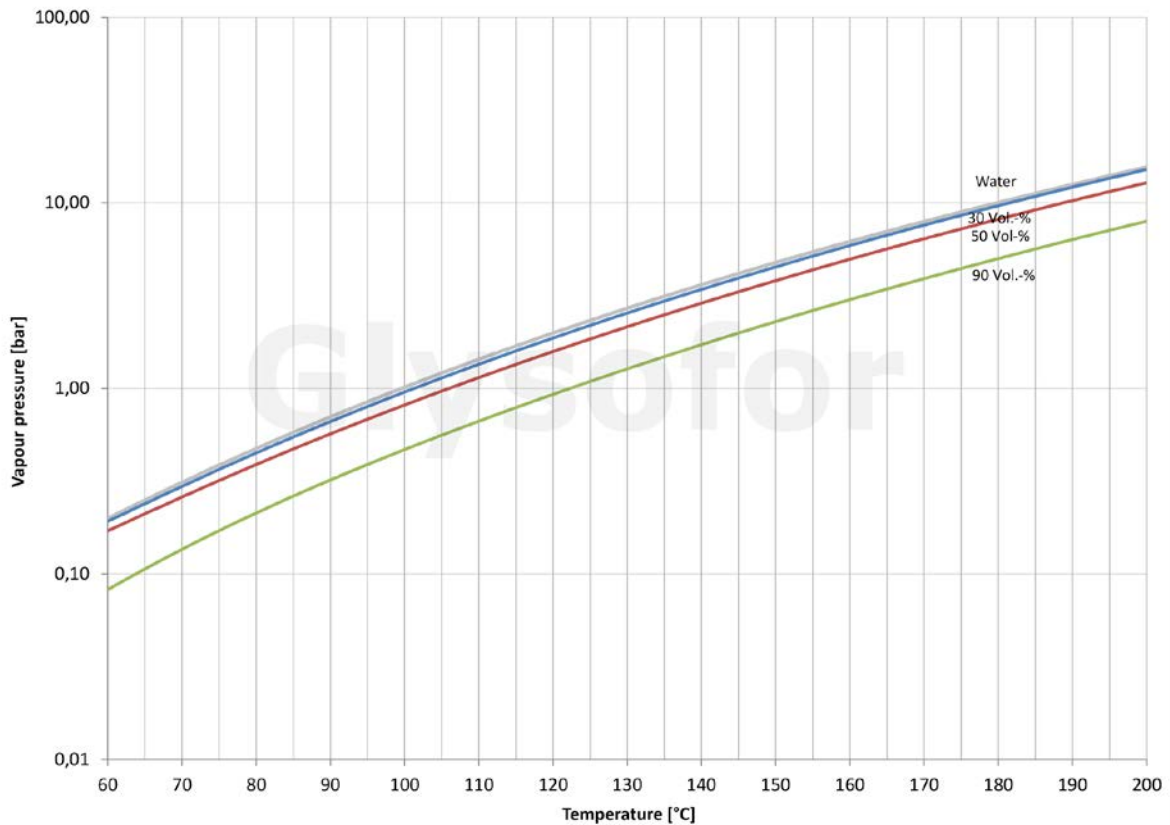
Cub. expansion coefficient of Glysofor ELP - water mixtures



Relative pressure drop factor of Glysofor ELP - water mixtures



Vapour pressure of Glysofor ELP - water mixtures





Packaging sizes

- 10 kg canister
- 25 kg canister
- 30 kg canister
- 220 kg barrel
- 1.000 kg IBC
- 24.000 kg tank vehicle

Pursuant to the national and international classification criteria, Glysofor ELP is not a hazardous material. A toxic effect results neither from when it is in concentrated form nor from when it is diluted. The product is odourless and harmless to the skin. Product has no irritant effect which can lead to the irritation of the skin or to mucosa.

The raw materials which the product contains possess the highest possible levels of purity. Glysofor ELP is formulated on the basis of 1.2 propylene glycol which fulfils the requirements of both the DAB as well as the European and the US pharmacopeia. 1.2 propylene glycol is permitted as an additive pursuant to the foods and additives regulations (status 10.07.1984) and as a solution and extraction agent (BGB (German civil code) 1.I p.897, appendix 2, list 9). In the USA, propylene glycol is categorized as a generally harmless food additive (Federal Register, as at 1.4.1985, § 184.1666). Glysofor ELP and its dilutions are easily biodegradable. Glysofor ELP is in the lowest water hazard class, WGK 1 (very limited hazard to water). In borehole heat exchangers with a volume of up to 200 litres, Glysofor ELP can be used harmlessly pursuant to § 7 of the VAWS (Law on materials hazardous to water, Germany) and VDI (Association of German Engineers) guideline no. 4640. Workplace related protection measures when using this product are not required. Glysofor ELP is not flammable; classification in one of the hazard classes for flammable liquids is omitted. Glysofor ELP is not subject to a labelling requirement, and is not a dangerous good according to the national / international transport regulations. The supply containers consist of mono-fraction PE and can also be recycled subsequent to use. The product should be kept sealed at all times. Due to its extremely high level of purity, the product should not be decanted into other containers or contaminated with other products.

This data relates to the correct and appropriate application of our products, with due consideration of the professional standards and regulations of the area of application. It is for informational purposes only and does not absolve the obligation to carry out the due materials testing upon arrival. The data is based on our current state of knowledge and is not meant to guarantee specific properties. No general or legally binding statement on certain features, in a concrete application, can be derived from the above data. It is meant to describe our products with regard to their composition and offer application advice. Any industrial property rights of third parties and the suitability for a special application purpose are to be observed and verified by the user.



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