Glysofor ELP KI – Specification

Product properties

Glysofor ELP KI is based on high-purity propylene glycol, which has minimized electrical conductivity thanks to a special process.

A selected combination of inhibitors provides outstanding corrosion protection for a wide range of metals and alloys commonly found in water circuits.

The product is used in applications where extremely low electrical conductivity is required.

Glysofor ELP KI can be supplied as a concentrated pure product or as an aqueous solution.

The solutions are produced using high-purity water with an electrical conductivity of < 0.1 µs/cm.

Glysofor ELP KI optimally prevents frost damage, deposits, sludge formation, and biofilms in water circuits.

Compared to MEG-based products, Glysofor ELP KI is characterized by comparatively higher thermal resistance and complete labeling exemption in accordance with CLP/GHS.

Homogeneously mixed Glysofor ELP KI water mixtures do not separate, ensuring consistent

Antifreeze and heat transfer fluid with extremely low electrical conductivity

Base: 1.2 propylene glycol

Operating temperature range: -50 to +170 °C

Microbiologically stable

Biodegradable and environmentally friendly

Available as a concentrate or solution

Area of application: Induction melting furnaces,
transformer cooling, capacitors,
converter cooling, welding systems, etc.

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

The product is classified as WGK 1, the lowest water hazard class, both as a concentrate and when diluted with water.

It is resistant to the formation of biofilms, decay, and microbiological decomposition over the long term.

product properties at all times. This guarantees long-term, low-maintenance plant operation.

Glysofor ELP KI is miscible with water, ethanol, butanol, butyl acetate, and acetone in any ratio.

Electrical characteristics

Specific electrical resistance at 20 °C (M ohm cm)	min. 10
Specific electrical conductivity at 20 °C (µs/cm)	max. 0.1
Dielectric constant	approx. 28

Areas of application

Aqueous solutions of Glysofor ELP KI are used in water circuits where extremely low electrical conductivities are required.

Typical areas of application:

- Induction melting furnaces
- Transformer cooling
- X-ray tubes
- Capacitors
- Converter cooling
- Inverter cooling
- Circuit breakers and inverters
- Welding systems
- Production of electrolytes
- High-voltage architectures (400 V – 800 V)
- Battery modules with cold plate cooling

Product data

Chemical name	1.2 Propylene glycol, corrosion protection additives
Appearance	Colorless liquid
Packaging	Canisters / drums / IBCs / tank trucks
ADR	Class 0, No.
WGK	1
Label	Not applicable
Application concentration	25 to 100 vol.
Operating temperature range	-50 to +170 °C
Areas of application	Water and cooling circuits requiring particularly low electrical conductivity.
Density (20 °C)	1.03 to 1.04 g/cm³
Molar mass	76.10 g/mol
Boiling point (1013 mbar)	approx. 187 °C
Vapor 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 KI significantly lowers the freezing point of water, thus preventing freezing in water circuits and cooling systems. Water circuits can be temporarily shut down with Glysofor ELP KI even in frosty conditions, but remain operational at all times. Homogeneously mixed aqueous solutions do not separate during system shutdowns.

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

Application in high-voltage electrical environments

Glysofor ELP KI has established itself as the preferred heat transfer medium for cooling applications in power electronics, particularly in frequency converters, rectifiers, and medium- and high-voltage applications.

The product is used in direct cooling, for example in power semiconductors such as IGBT modules, cold plates, and cooling plates.

Due to its very low electrical conductivity and its complex inhibition, which deliberately avoids ionic components, Glysofor ELP KI reliably reduces the risk of creepage and leakage currents, the destruction of IGBT modules, and electrochemical corrosion on all materials used in the cooling circuit.

Thanks to its electrically insulating properties, the heat transfer fluid helps prevent galvanic corrosion in the long term, thereby supporting the insulation concept of the entire system.

At the same time, Glysofor ELP KI facilitates compliance with relevant standard requirements, for example with regard to insulation coordination, leakage current limitation, and protection against electric shock in accordance with IEC and VDE specifications, depending on the respective system design.
Due to its special formulation, Glysofor ELP KI has a conductivity of < 0.1 µS/cm, making it suitable for use in the primary circuit.

Application in electromobility

Glysofor ELP-KI is the preferred coolant with very low electrical conductivity (< 100 µS/cm) for use in electric vehicles and high-voltage systems. In modern electric vehicles, precise and safe thermal management is crucial, as batteries, power electronics, and electric motors generate considerable amounts of heat during operation and charging.

Glysofor ELP-KI offers a high level of electrical safety, especially in cold plate battery cooling systems, where the coolant circulates in close proximity to high-voltage components. Its permanently low conductivity significantly reduces the risk of short circuits, electrochemical corrosion, and gas formation, even in the event of leaks.

Compared to conventional coolants, Glysofor ELP-KI supports efficient heat dissipation, stable operating temperatures, and thus consistent performance of battery and drive systems. This contributes significantly to the extended service life of critical components, energy efficiency, and operational safety of electric vehicles.

Glysofor ELP-KI meets the requirements of relevant international standards such as ASTM D8566 and GB/T 29743.2, making it ideal for use in future-oriented vehicle concepts and electrified platforms.

Advantages:

- High electrical safety even in the event of leaks
- Permanently stable, low electrical conductivity
- Reliable corrosion protection for aluminum and copper
- High thermal and chemical stability
- Easy integration into existing cooling and thermal management systems

Result:
Greater safety, longer battery life, and reliable performance in modern electric vehicles.

Application in welding technology

Glysofor ELP KI is a liquid coolant for technical cooling systems with high thermal loads and increased requirements for media purity. It is particularly suitable for cooling liquid-cooled welding torch systems at high currents and long duty cycles, where gas-cooled systems reach their limits.

Thanks to its very low electrical conductivity, which is significantly below the recommended limits specified by equipment manufacturers, Glysofor ELP KI significantly reduces the risk of electrochemical corrosion. Copper, brass, solder, steel, iron, and aluminum components are reliably protected, while electrocorrosion, deposits, and blockages in the cooling system are significantly minimized.

Glysofor ELP KI ensures efficient heat dissipation, stable temperatures, and long-term protection of the welding torch, cooling circuit, pump, tank, cooler, and power source. It is designed for continuous operation in circulating cooling devices and liquid-cooled welding systems and is a safe, durable alternative to water.

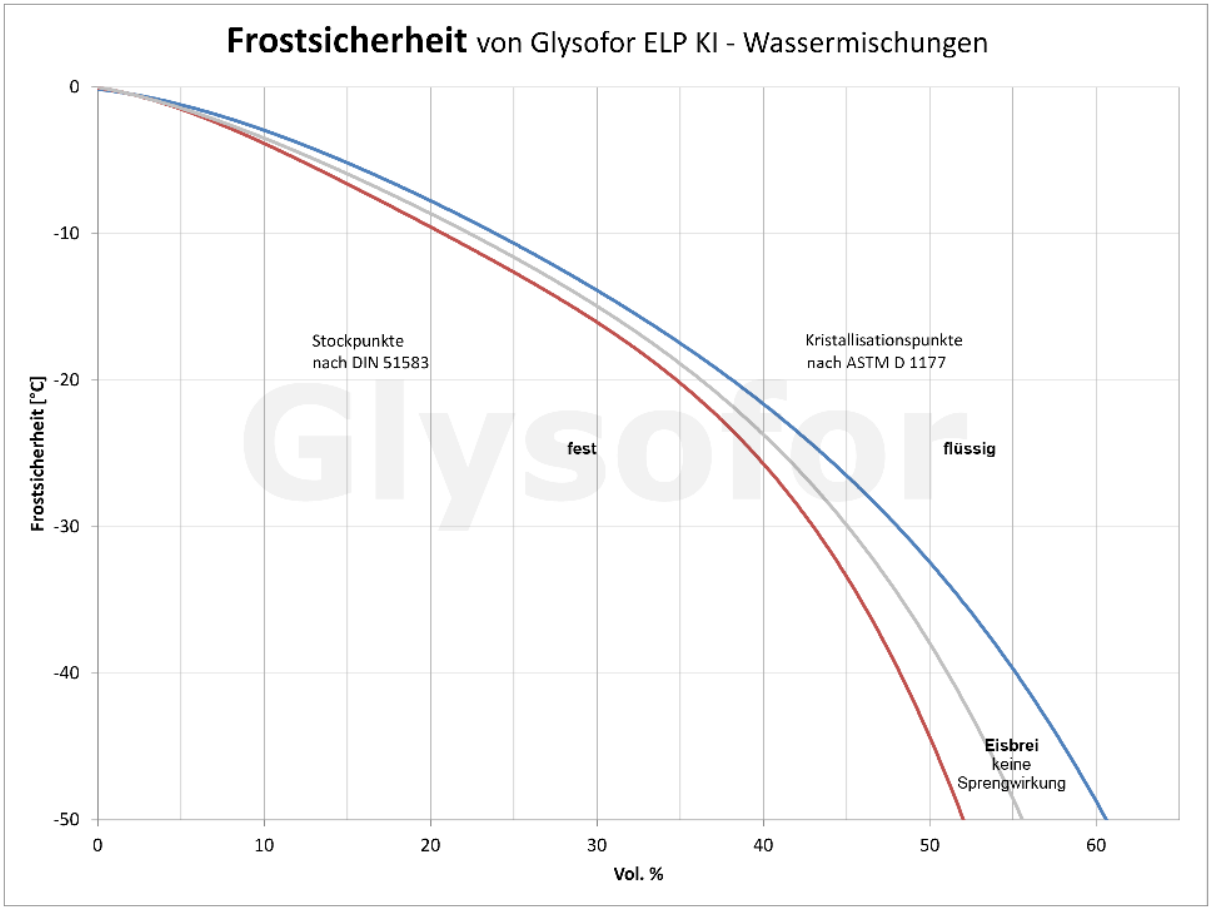
Application guidelines

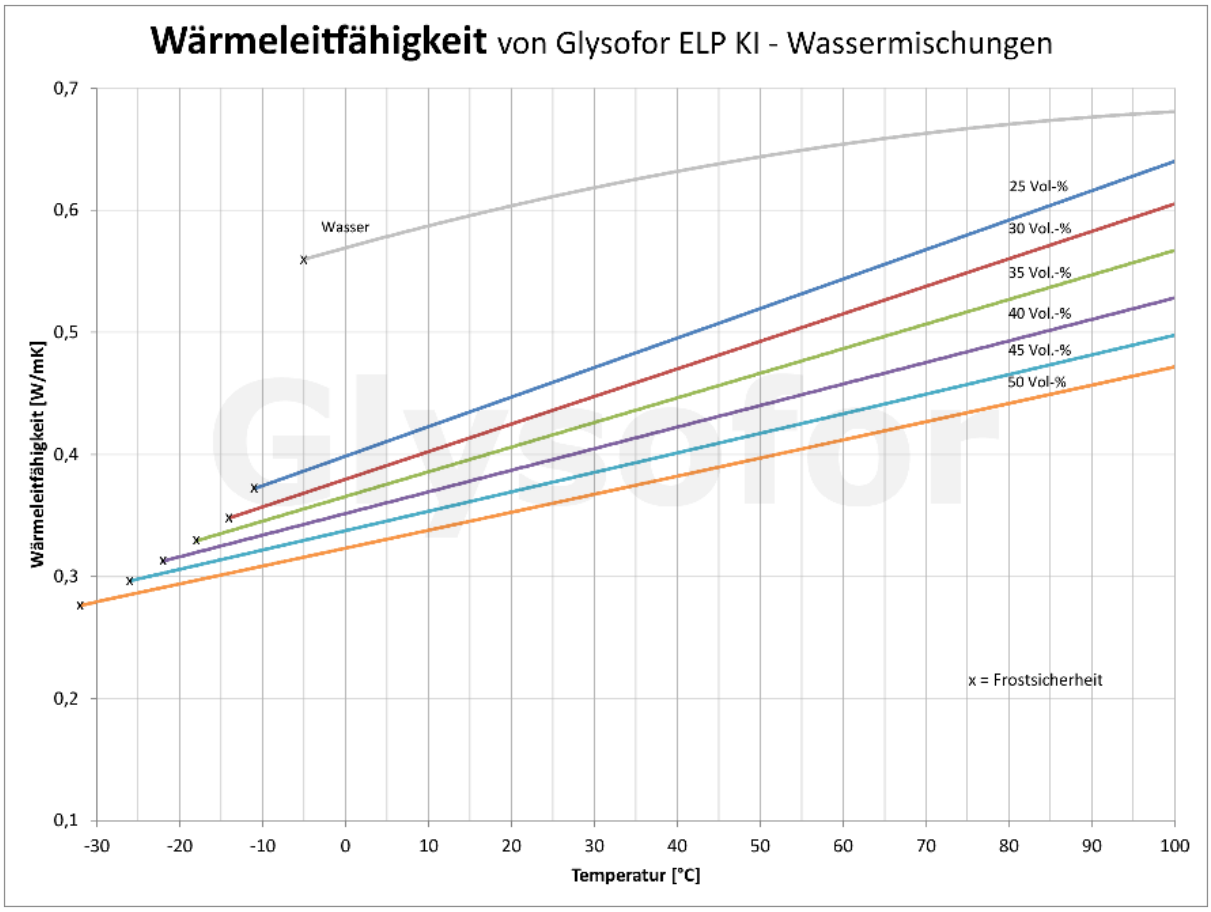
Galvanized components should be avoided, as zinc is generally incompatible with glycol and glycol-containing products
. This property therefore also affects all glycolic antifreeze agents, as there is no possibility of inhibiting zinc across all manufacturers. If galvanization is damaged during system operation, the underlying steel would in turn be protected by the inhibitor package contained in the product. If the zinc layer does peel off, this will occur in the form of very fine particles. The zinc particles are neutral in terms of the corrosion situation in the system and can be filtered out depending on the extent and requirements. Due to its extremely high purity, Glysofor ELP KI must not be contaminated with other products or substances. To maintain continuous purity during plant operation, it is possible to maintain low conductivity through ion exchange. Overheating and temperatures above the boiling point must be avoided at all costs, as this can lead to damage and premature aging.

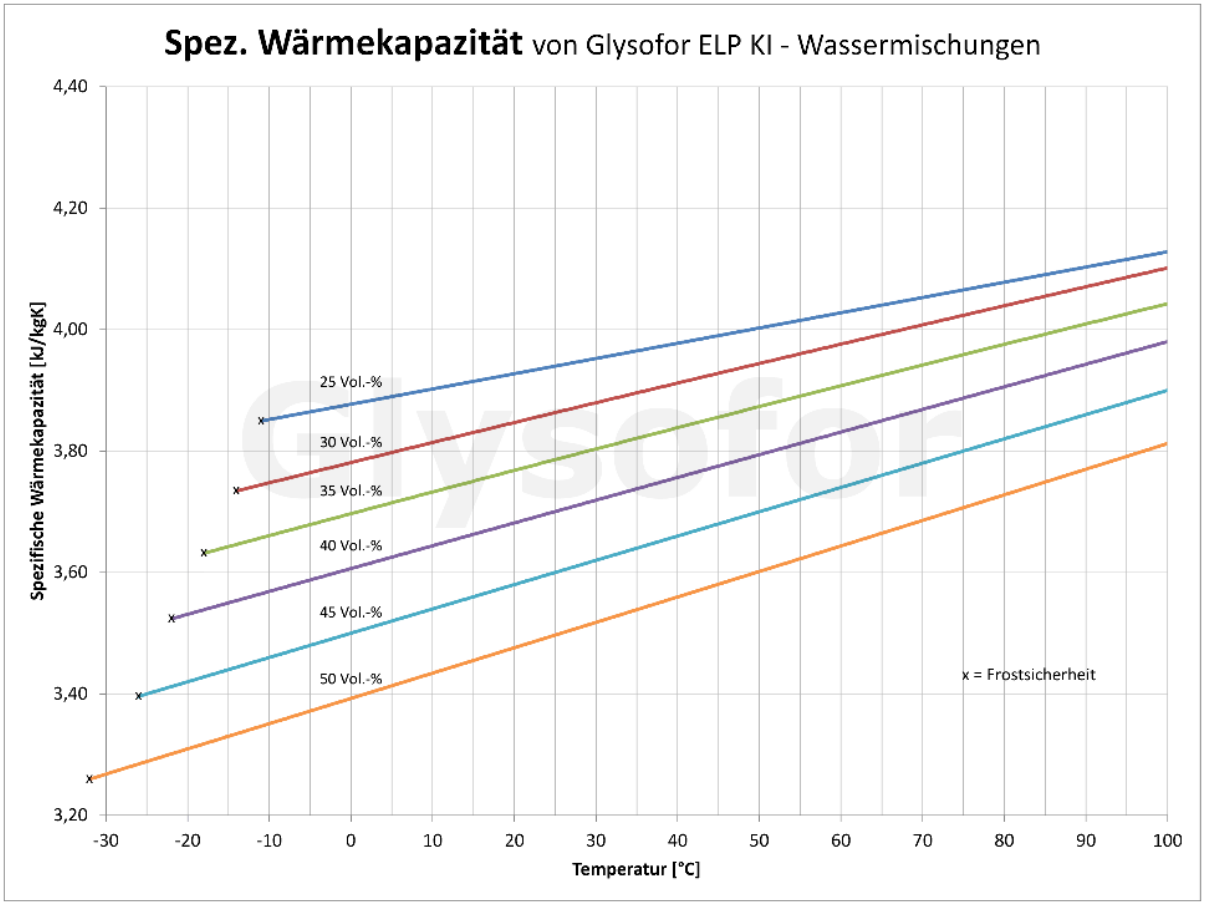
Technical data

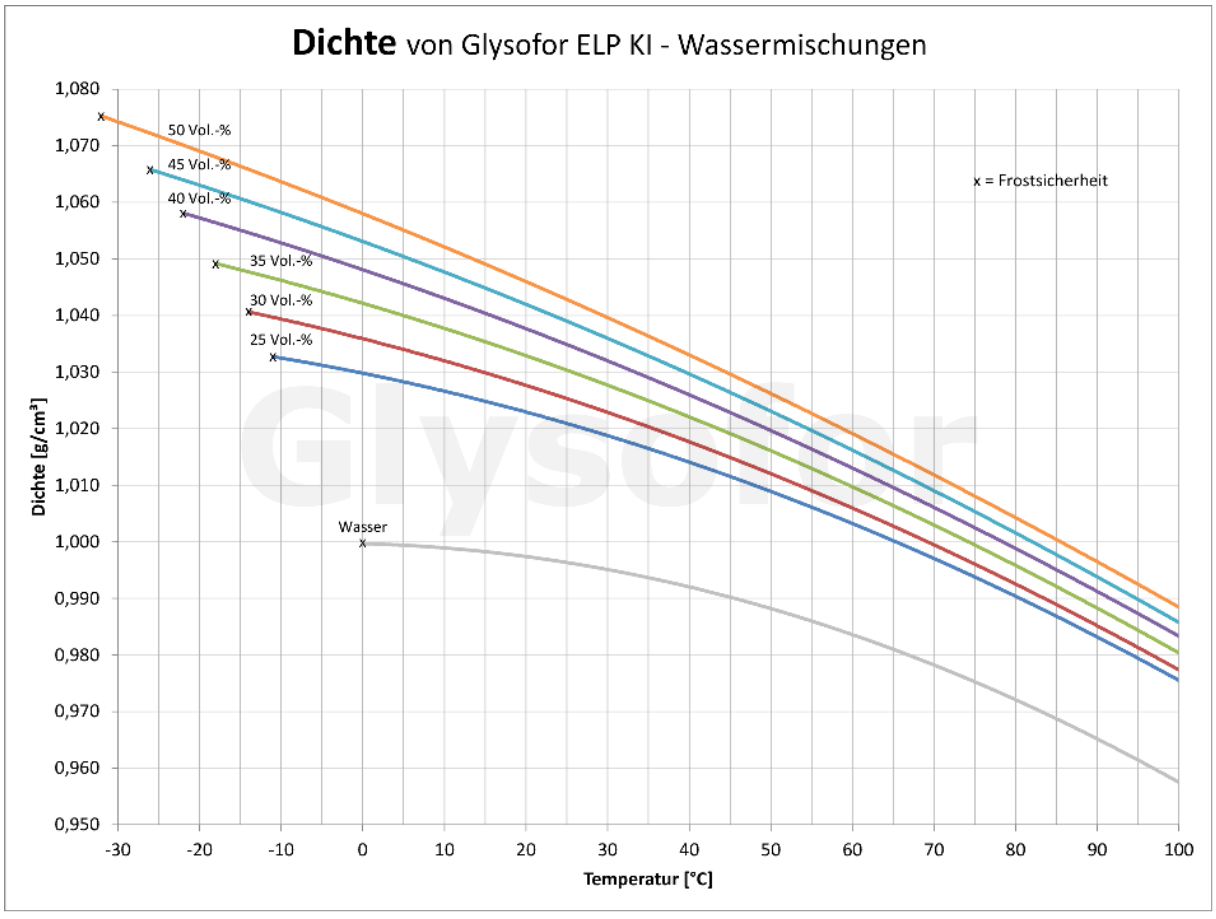
Concentration [Vol.	Frost protection	Temperature [°C]	Thermal conductivity	Specific heat	Density [g/cm^3]	Kinematic viscosity [mm^2/s]	Cubic coefficient of thermal expansion	Relative pressure loss

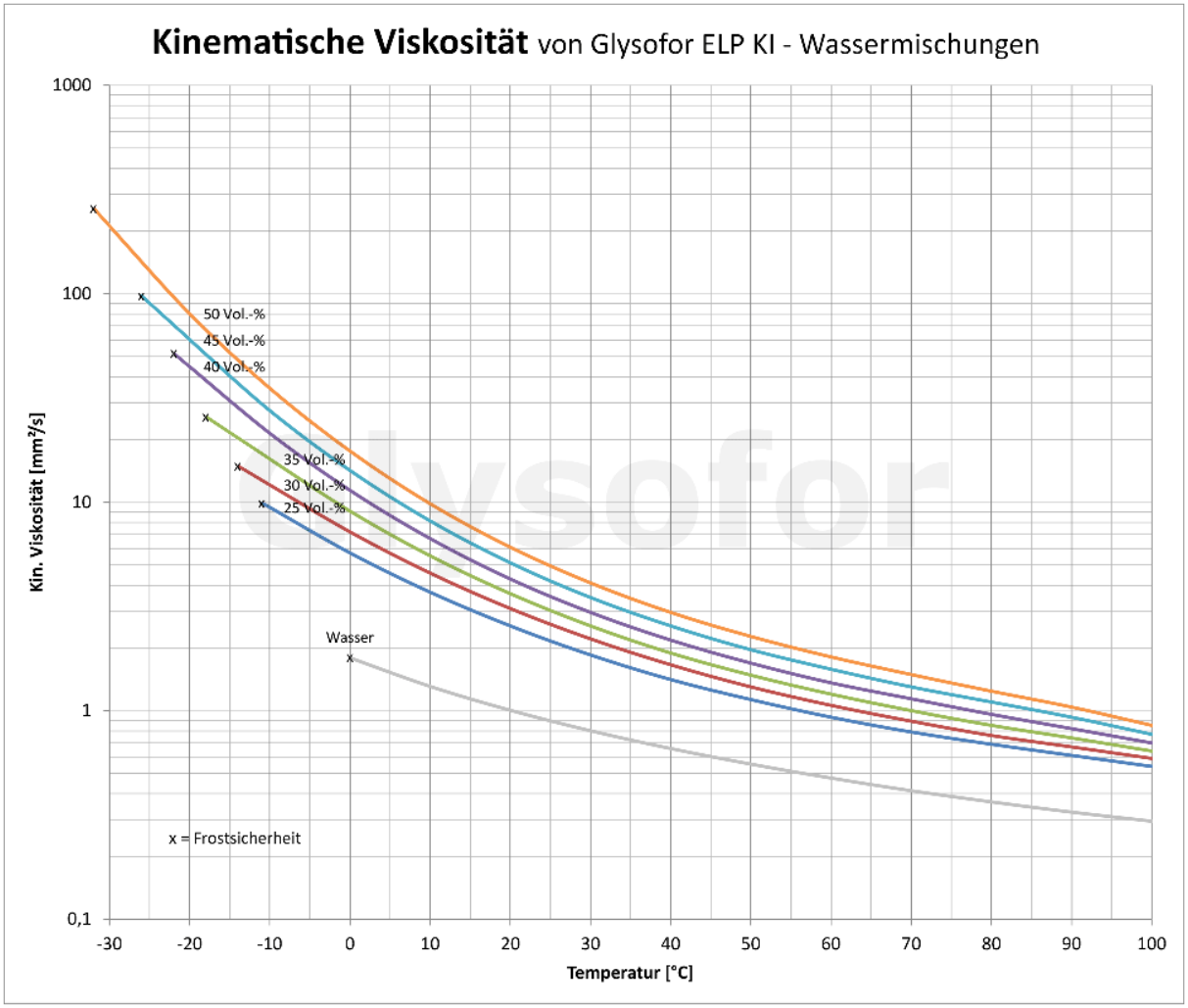
[°C]			[W/m K]	[kJ/kg K]			[K^{-1}]	[factor]
25	-11	-10	0.375	3.86	1.032	9.44	0.00014	1.70
		0	0.399	3.89	1.030	5.69	0.00023	1.48
		10	0.424	3.92	1.027	3.69	0.00031	1.31
		20	0.448	3.94	1.023	2.54	0.00038	1.20
		30	0.472	3.96	1.019	1.83	0.00045	1.10
		40	0.496	3.99	1.014	1.40	0.00051	1.04
		50	0.519	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	0.00069	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	0.00059	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

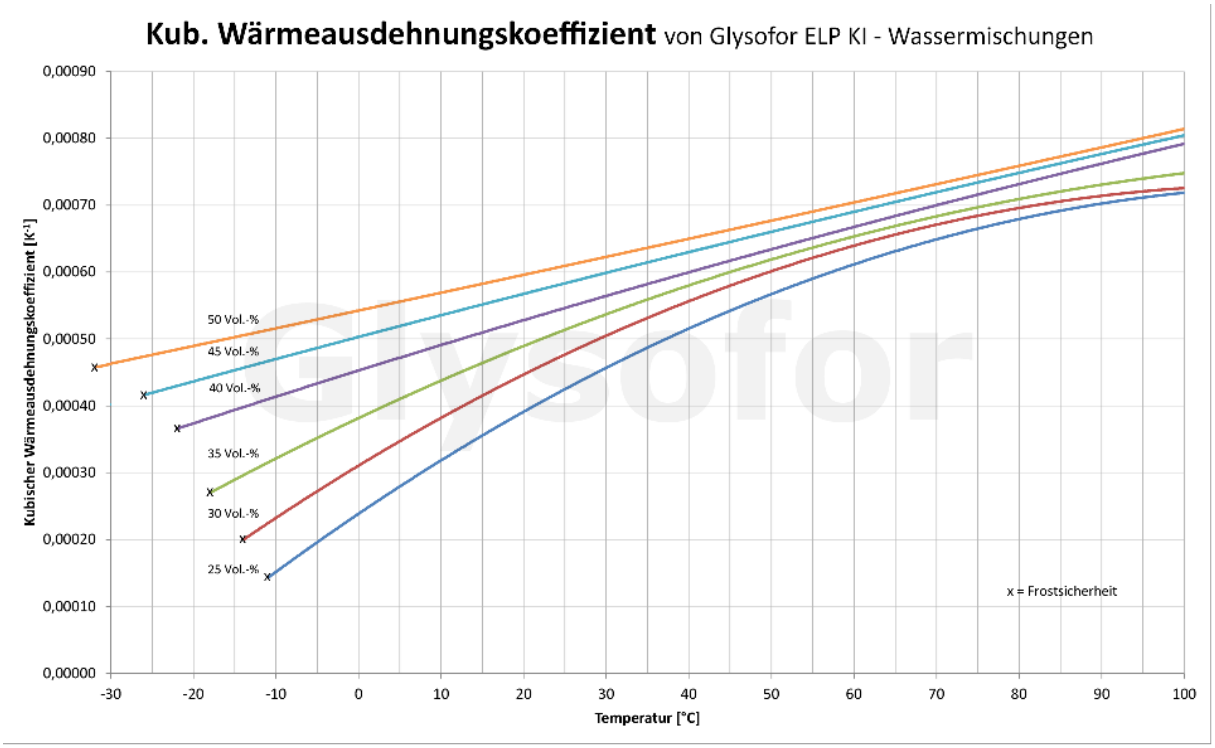

Frostsicherheit von Glysofor ELP KI - Wassermischungen
Frostsicherheit [°C]
0
-10
-20
-30
-40
-50
0
10
20
30
40
50
60
Vol. %
Stockpunkte
nach DIN 51583
Kristallisationspunkte
nach ASTM D 1177
fest
flüssig
Eisbrei
keine
Sprengwirkung

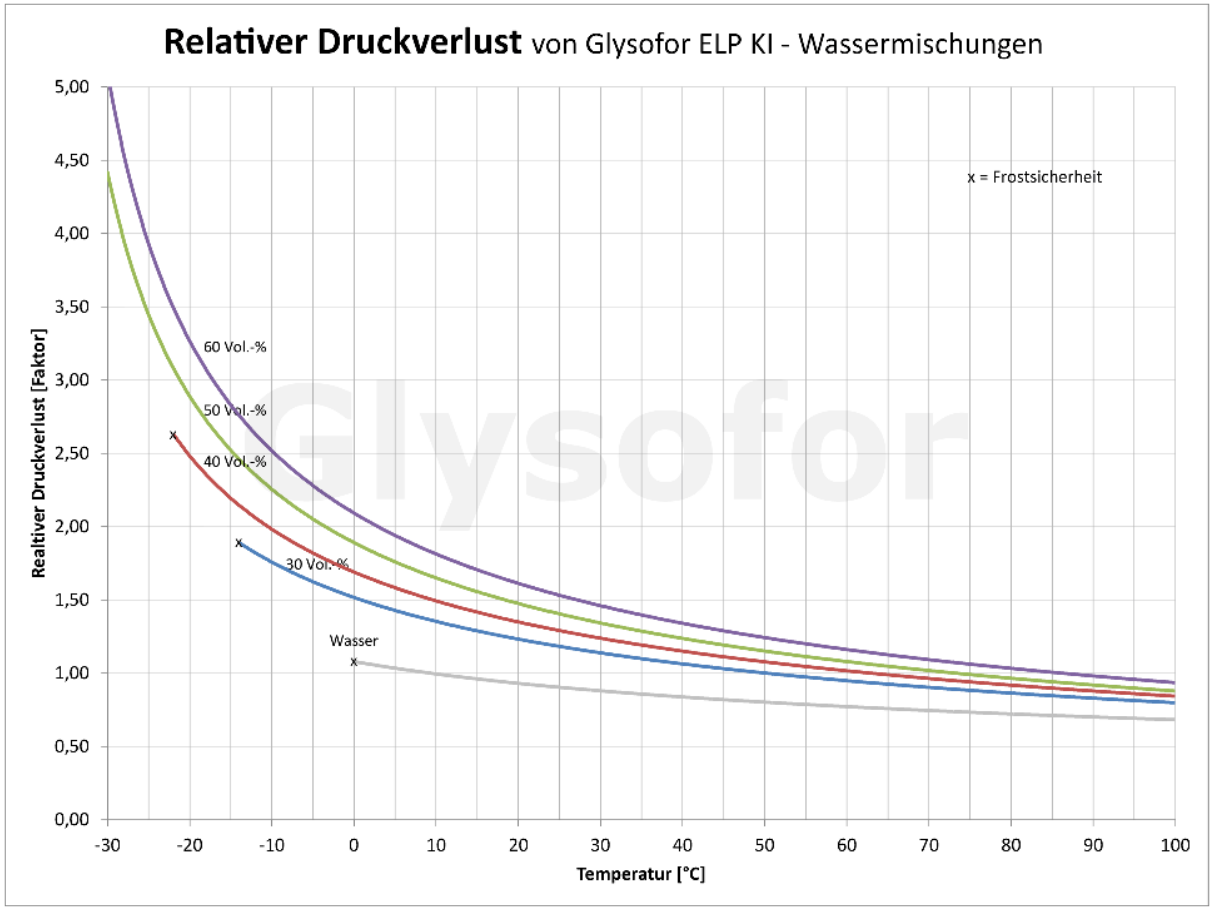

Wärmeleitfähigkeit von Glysofor ELP KI - Wassermischungen
Wärmeleitfähigkeit [W/mK]
0,7
0,6
0,5
0,4
0,3
0,2
0,1
-30
-20
-10
0
10
20
30
40
50
60
70
80
90
100
Temperatur [°C]
Wasser
25 Vol-%
30 Vol.-%
35 Vol.-%
40 Vol.-%
45 Vol.-%
50 Vol-%
x = Frostsicherheit

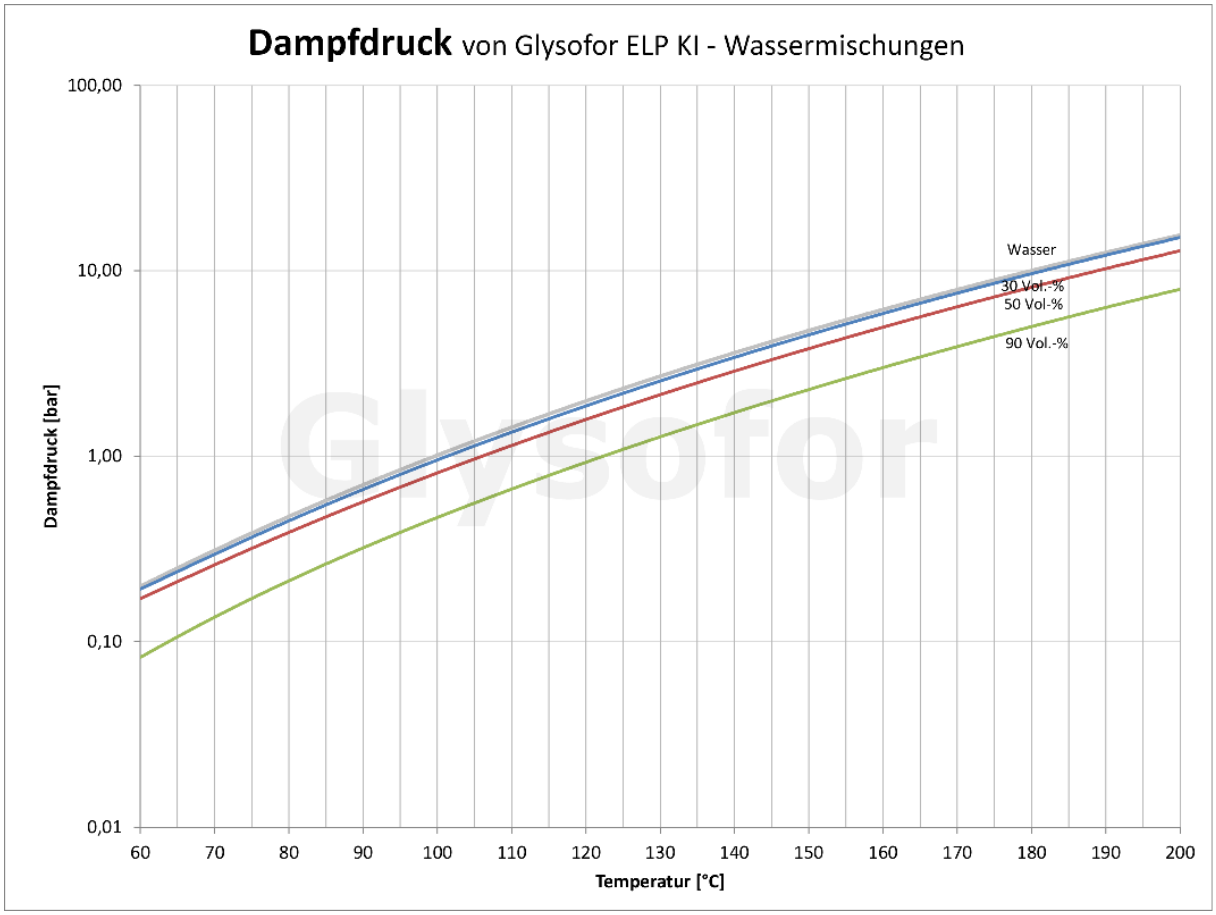

Spez. Wärmekapazität von Glysofor ELP KI - Wassermischungen
Spezifische Wärmekapazität [kJ/kgK]
4,40
4,20
4,00
3,80
3,60
3,40
3,20
-30 -20 -10 0 10 20 30 40 50 60 70 80 90 100
Temperatur [°C]
25 Vol.-%
30 Vol.-%
35 Vol.-%
40 Vol.-%
45 Vol.-%
50 Vol.-%
x = Frostsicherheit
Glysofor


Dichte von Glysofor ELP KI - Wassermischungen
Dichte [g/cm³]
1,080
1,070
1,060
1,050
1,040
1,030
1,020
1,010
1,000
0,990
0,980
0,970
0,960
0,950
-30 -20 -10 0 10 20 30 40 50 60 70 80 90 100
Temperatur [°C]
50 Vol.-%
45 Vol.-%
40 Vol.-%
35 Vol.-%
30 Vol.-%
25 Vol.-%
Wasser
x = Frostsicherheit
Glysofor


Kinematische Viskosität von Glysofor ELP KI - Wassermischungen
Kin. Viskosität [mm²/s]
1000
100
10
1
0,1
50 Vol.-%
45 Vol.-%
40 Vol.-%
35 Vol.-%
30 Vol.-%
25 Vol.-%
Wasser
x = Frostsicherheit
-30 -20 -10 0 10 20 30 40 50 60 70 80 90 100
Temperatur [°C]


Kub. Wärmeausdehnungskoeffizient von Glysofor ELP KI - Wassermischungen
Kubischer Wärmeausdehnungskoeffizient [K⁻¹]
0,00090
0,00080
0,00070
0,00060
0,00050
0,00040
0,00030
0,00020
0,00010
0,00000
50 Vol.-%
45 Vol.-%
40 Vol.-%
35 Vol.-%
30 Vol.-%
25 Vol.-%
x = Frostsicherheit
-30 -20 -10 0 10 20 30 40 50 60 70 80 90 100
Temperatur [°C]


Relativer Druckverlust von Glysofor ELP KI - Wassermischungen
x = Frostsicherheit
60 Vol.-%
50 Vol.-%
40 Vol.-%
30 Vol.-%
Wasser
Realtiver Druckverlust [Faktor]
Temperatur [°C]
5,00
4,50
4,00
3,50
3,00
2,50
2,00
1,50
1,00
0,50
0,00
-30
-20
-10
0
10
20
30
40
50
60
70
80
90
100


Dampfdruck von Glysofor ELP KI - Wassermischungen
Wasser
30 Vol.-%
50 Vol-%
90 Vol.-%
Dampfdruck [bar]
Temperatur [°C]
100,00
10,00
1,00
0,10
0,01
60
70
80
90
100
110
120
130
140
150
160
170
180
190
200

Packaging sizes

- 10 kg canister
- 25 kg canister
- 30 kg canister
- 220 kg drum
- 1,000 kg IBC
- 24,000 kg tanker truck

According to the applicable national and international classification guidelines, Glysofor ELP KI is not a
hazardous substance. Neither the concentrate nor its dilutions have any toxic effects.
The product is odorless and dermatologically safe. It does not cause irritation that could lead to inflammation of the skin or mucous membranes. Glysofor ELP KI has the highest possible degree of purity. Glysofor ELP KI is based on 1.2 propylene glycol, which is approved as an additive in accordance with the Food Additives Regulation (as of July 10, 1984) as a solvent and extraction agent (BGB1.I S897, Annex 2, List 9). In the USA, propylene glycol is categorized as a generally safe food additive (Federal Register, as of April 1, 1985, § 184.1666). Glysofor ELP KI and its dilutions are readily biodegradable. Glysofor ELP KI has the lowest water hazard class WGK 1 (slightly hazardous to water).
No workplace-related protective measures are required when handling the product. Glysofor ELP KI is non-flammable.
The product is not a dangerous good within the meaning of national/international transport regulations.
The delivery containers are made of pure PE and can be recycled after use. The product should always be stored in a closed container. Due to its extremely high purity, the product should not be decanted or contaminated with other substances.

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