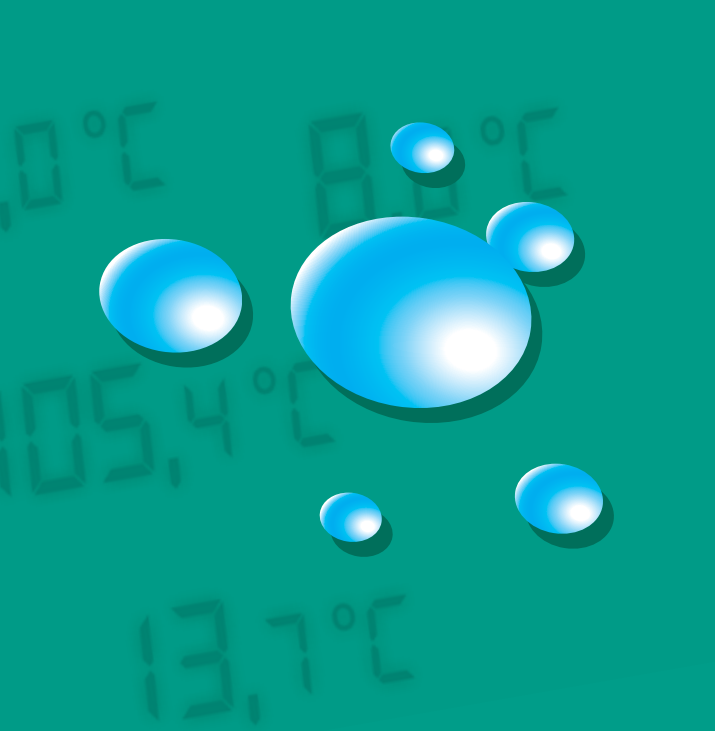




GLYKOSOL N

Heat transfer fluid
on basis of monoethylene glycol
for Technical Applications



pro KÜH SOLE GmbH

Dilution table GLYKOSOL N

Frost-proof up to °C	Vol. %	Density g/cm ³	Refractive index
-8	20	1,027	1,355
-10	23	1,032	1,358
-15	29	1,042	1,365
-20	34	1,051	1,371
-25	39	1,058	1,376
-30	44	1,065	1,381
-40	52	1,077	1,390
-50	58	1,087	1,396

Physical Parameter GLYKOSOL N - concentrate

Density (at 20°C)	1.12 to 1.13 g/cm ³
Appearance	yellowish, clear liquid
Boiling point	ca. 170°C
Solidification point	ca. -70°C
pH-Value (at 20°C)	7.5 - 9.5
Specific heat (at 20°C)	ca. 2.3 kJ/kg*K
Heat conductivity (at 20°C)	ca. 0.29 W/m*K
Viscosity (at 20°C)	ca. 22 mPa*s
Electric conductivity (at 20°C) (1:2)	ca. 3.000 µS/cm
Reserve alkalinity	> 20 ml 0.1 n HCl
Refractive index	1.433 - 1.435

Material compatibility of synthetics

The following synthetics are resistant to GLYKOSOL N

ABS	Acryl Nitrile Butadiene Styrene
PE	Polyethylene
PP	Polypropylene
PTFE	Polytetrafluoroethylene
PVC	Polyvenyl Chloride
IIR	Isobutylene-isoprene Rubber
EPDM	Ethylene Propylene Diene Monomer
CR	Chloroprene Rubber
VPE	Virgin Polyethylene
Centellen NP (WS 3860)	(trade name)
SBR	Styrene Butadiene Rubber up to 100°C
FPM (@Viton)	Fluor Rubber
NBR	Nitrile Butadiene Rubber
POM	Polyacetal
PA	Polyamide
UP	Unsaturated Polyester Resins
PB	Polybutene
NR	Natural Rubber up to 80°C
Hemp	

Product description

GLYKOSOL N is a yellow and odorless liquid on basis of monoethylene glycol for the use as heat carrier with highly effective anti-corrosion additives and hardness stabilizers.

GLYKOSOL N does not contain nitrite, amine and phosphate.

GLYKOSOL N is used as anti-freezing and anti-corrosive agent in any technical application e.g. heat pumps, geothermal probes, air conditioners, heat recovery systems, heating and cooling systems.

The inhibitor system protects all usually used metal materials against corrosion and scaling.

Even the use of galvanized parts is possible. Although the zinc coating is dissolved over a long period of time (usually, several years), this does not affect the properties of the medium since newly developed additives prevent a flocculating and fouling. The exposed material under the zinc coating is protected by the inhibitors against corrosion durable.

Application notes

GLYKOSOL N may be mixed with water in any ratio. The concentration should not be lower than 20 Vol.%, otherwise the corrosion protection cannot be warrant. **GLYKOSOL N** must only be diluted with water of a hardness up to 20°dH. Ideally DM water (demineralized) should be used.

We recommend the following concentrations for the below described applications:

Heat pumps and geothermal probes	25 – 35 Vol. %
Air conditioners and heat recovery systems	35 – 40 Vol. %
Pure frost protection	35 – 40 Vol. %

All manufactured GLYKOSOL N dilutions from pro KÜHLSOLE are exclusively manufactured with demineralised water to guarantee an optimal water quality. The operation temperatures should not be permanently over +145°C, since this may affect the product basis (ethylene glycol).

GLYKOSOL N is suitable as anti-corrosion and anti-freeze additive according to VDI guideline 2035.

Upon request we will provide you with any desired dilution in the packaging units as mentioned at next side.

Prior to the first filling, all facility parts must be duly cleaned. We recommend a 5% pro KÜHLSOLE PEX 130 solution. In facilities which uses steel, flushing is essential to remove the rust film.

Any brine system must be provided with an appropriate filter. A mesh size of 50-80 µm is recommended.

In case of a changeover from another product to **GLYKOSOL N**, adequate flushing is necessary. You may contact us by telephone at +49 24 21 / 5 91 96-0 or refer to our website www.prokuehsole.de for detailed information.

GLYKOSOL N can be mixed with most of the common anti-freezing agents on basis of ethylene glycol. Do not hesitate to contact us, if necessary.

Material compatibility

A new generation of anti-corrosive additives allows the use of any materials commonly used in plant engineering. Please refer to the respective table at this page for the wear data of the individual metals.

Sealing materials usually used in heating systems and facilities will be not affected. Please check the glycol resistance when selecting seals (e.g. in pumps).

Polyurethane elastomeres, soft PVC and phenol-formaldehyde resin are not resistant.

The suitability of the sealing materials and synthetic parts needs to be verified with the manufacturer. In particular, the thermal application limits must be observed.

GLYKOSOL N is approved and suitable for the use in press fitting systems from Geberit-Mapress and Viega.

Ecology and Toxicology

GLYKOSOL N is easily biodegradable.

GLYKOSOL N must be labeled harmful according to GHS

with , signal word „Warning“

German Water Hazard Class: 1, slightly hazardous for water (according to VwVwS; Administrative Regulation on the Classification of Substances Hazardous to Waters into Hazard Classes).

In handling **GLYKOSOL N** the usual safety measures must be observed.

Please refer to the current EU Safety Data Sheets for further advices and regulations.

Shipping, Storage and Disposal

GLYKOSOL N is shipped in the adjacent packaging units.

All packaging units are reusable. Please return completely empty. Do not fill with other products!

GLYKOSOL N and all dilutions are storage-stabile. Store dry. Avoid direct sunlight. **GLYKOSOL N** dilutions do not unmix, even after a long storage period.

Follow the respective and valid regulation for disposal. Please contact your local disposal company for duly disposal.

Calculation Software

You may use the product data calculator on our website www.prokuehlsole.de for the calculation of the thermodynamic parameters.

You may download all product brochures, data sheets, safety data sheets, general and product-related reports and documentations as well as prepared texts for invitation of tender from our website www.prokuehlsole.de Do not hesitate to contact us by telephone at +49 24 21 / 5 91 96-0.

Packaging units GLYKOSOL N

Package	Filling Weight ^{*1}
30-liter-Canister	35 kg
60-liter-Canister	70 kg
220-liter-Drum	240 kg
1000-liter-IBC	1125 kg
Tank truck	upon request

^{*1} weights are for GLYKOSOL N concentrate
The weights of the respective dilutions differ due to the different densities.

General Corrosion and Wear Data

Materials	GLYKOSOL N ^{*1} 35 Vol. %	Values in g/m ²
		Glycol-Water 35 Vol. % without inhibitors
Copper	-0.04	-2.8
Silver solder	-0.11	not measured
Brass	-0.06	-7.6
Red brass	-0.04	not measured
Stainless steel	-0.04	not measured
Steel	-0.10	-152
Grey cast iron	-0.04	-273
Aluminum	-0.25	not measured

^{*1} measured of ILK - Institut für Luft- und Kältetechnik gGmbH, Dresden

Service

Free laboratory service

Please send us a sample of 500 ml about 6 weeks after filling of the system and then once a year. We will provide you an analysis certificate with advices and recommendations free of charge.

Filling pump rental

We provide our customers a pump package incl. hoses and connection armatures. A refundable security deposit is required.

Disposal of used brine

Old liquids should be properly disposed of in accordance with legal requirements. In the process of refilling the system, we will help you utilise the used brine. Here, we provide empty containers to hold sole and help you select the right disposal company.

Personal consultation

We are pleased to arrange a personal meeting at your company or directly at the construction site to discuss the system-specific application of our products.

Measuring kit

We prepared a measuring kit with all necessary materials to test our heat carriers. This kit enables you and your staff to measure the required standard values directly at the facility.

Frost-proof in °C	Concentration Vol. %	Temperature °C	Density g/cm ³	Heat Conductivity W/m ² K	Specific Heat kJ/kg K	dynam. Viscosity mPa ² s	kinemat. Viscosity mm ² /s	Prandtl number	relative Pressure Loss	rel. heat transfer coefficient
-8	20	-5.0	1.038	0.511	3.88	4.31	4.15	33	1.39	0.460
		0.0	1.036	0.513	3.88	3.47	3.35	26	1.31	0.510
		10.0	1.032	0.518	3.90	2.38	2.31	18	1.19	0.610
		20.0	1.028	0.523	3.91	1.74	1.69	13	1.10	0.710
		40.0	1.018	0.533	3.94	1.06	1.04	8	0.96	0.900
-10	23	-10.0	1.045	0.497	3.81	6.02	5.76	46	1.52	0.380
		0.0	1.041	0.501	3.82	3.82	3.67	29	1.35	0.480
		20.0	1.033	0.509	3.85	1.91	1.85	14	1.13	0.670
		40.0	1.023	0.518	3.88	1.16	1.14	9	0.99	0.840
-15	29	-15.0	1.058	0.475	3.68	9.56	9.04	74	1.72	0.300
		-10.0	1.056	0.476	3.68	7.33	6.94	57	1.61	0.340
		0.0	1.051	0.478	3.70	4.61	4.38	36	1.43	0.420
		10.0	1.047	0.481	3.72	3.13	2.99	24	1.29	0.510
		20.0	1.042	0.483	3.74	2.28	2.18	18	1.19	0.590
-20	34	40.0	1.032	0.489	3.78	1.39	1.35	11	1.04	0.750
		-20.0	1.068	0.459	3.56	15.24	14.27	118	1.95	0.240
		-10.0	1.064	0.460	3.58	8.64	8.12	67	1.68	0.310
		0.0	1.060	0.461	3.60	5.38	5.07	42	1.49	0.380
		20.0	1.050	0.464	3.64	2.62	2.50	21	1.24	0.540
-25	39	40.0	1.040	0.466	3.69	1.60	1.54	13	1.08	0.680
		-25.0	1.079	0.446	3.44	25.39	23.53	196	2.23	0.180
		-20.0	1.077	0.446	3.45	18.23	16.93	141	2.05	0.210
		-10.0	1.073	0.446	3.48	10.19	9.50	79	1.76	0.280
		0.0	1.068	0.445	3.50	6.27	5.87	49	1.56	0.350
-30	44	20.0	1.058	0.445	3.55	3.02	2.85	24	1.29	0.490
		40.0	1.047	0.446	3.60	1.83	1.75	15	1.13	0.620
		-30.0	1.090	0.436	3.32	44.47	40.80	339	2.58	0.140
		-20.0	1.086	0.434	3.34	21.89	20.16	169	2.16	0.190
		-10.0	1.081	0.433	3.37	12.05	11.14	94	1.85	0.250
-40	52	0.0	1.076	0.431	3.40	7.32	6.80	58	1.63	0.320
		20.0	1.066	0.429	3.45	3.46	3.25	28	1.34	0.450
		40.0	1.054	0.427	3.51	2.08	1.98	17	1.17	0.560
		-40.0	1.109	0.426	3.11	148.10	133.59	1081	3.53	0.080
		-30.0	1.104	0.423	3.14	62.09	56.23	462	2.83	0.110
		-20.0	1.099	0.419	3.17	29.60	26.93	224	2.35	0.160
-50	58	-10.0	1.094	0.415	3.21	15.85	14.48	122	2.00	0.210
		0.0	1.089	0.412	3.24	9.41	8.64	74	1.75	0.270
		20.0	1.078	0.405	3.30	4.29	3.98	35	1.43	0.390
		40.0	1.066	0.399	3.37	2.54	2.38	21	1.24	0.490
		-50.0	1.124	0.426	2.94	562.86	500.91	3890	4.98	0.040
		-40.0	1.119	0.420	2.98	198.31	177.20	1404	3.83	0.060
		-30.0	1.114	0.415	3.01	80.73	72.44	585	3.05	0.100
-50	58	-20.0	1.109	0.410	3.05	37.49	33.80	278	2.51	0.140
		-10.0	1.104	0.405	3.08	19.61	17.76	149	2.12	0.190
		0.0	1.099	0.400	3.12	11.41	10.39	89	1.85	0.240
		20.0	1.087	0.390	3.19	5.05	4.64	41	1.49	0.350
		40.0	1.074	0.381	3.26	2.93	2.73	25	1.29	0.440

These data are derived from the pro KÜHLSOLE GmbH calculation program. Minor differences to values from other tables or diagrams of this data sheet may be the result of minor rounding deviations of the implemented.

Development and Production of liquid Heat Carriers and Coolants



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