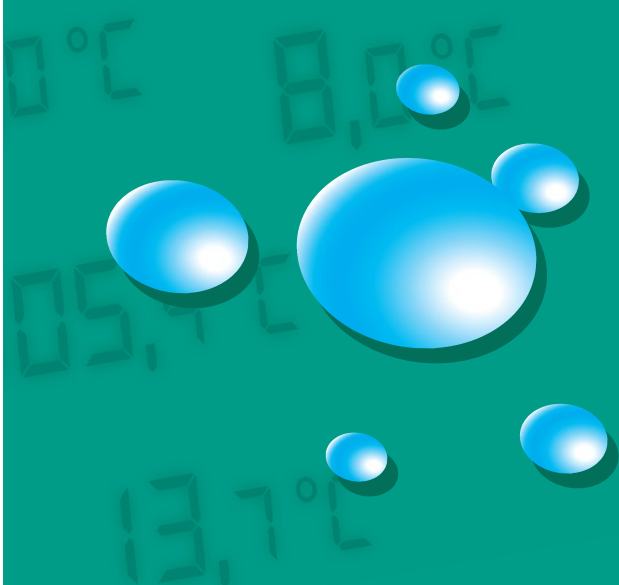




® PEKASOLL

Heat transfer fluid
on basis of 1,2 propylene glycol



Dilution table [®]PEKASOL L

Frost proof down to °C	% by vol.	Density g/cm ³	Refractive index
-6	20	1,017	1.356
-10	27	1,025	1.363
-15	33	1,031	1.372
-20	39	1,036	1.379
-25	43	1,040	1.383
-30	47	1,043	1.387
-40	54	1,049	1.395
-50	60	1,053	1.400

Physical Parameters [®]PEKASOL L concentrate

Density (at 20°C)	1,046 to 1,052 g/cm ³
Appearance	clear, colorless liquid
Boiling point (concentrate)	approx. 185 °C
pure point (concentrate)	< - 40 °C
pH-Value (at 20°C)	7,5 - 9,5
Specific heat (at 20°C)	approx. 2,5 kJ/kg*K
thermal conductivity (at 20°C)	approx. 0,22 W/m*K
Viscosity (at 20°C)	approx. 56 mPa*s
Electric conductivity (at 20°C)	
Dilution 1:2	approx. 2.400 µS/cm
Refractive index	1,431 - 1,432

Material compatibility of plastics

The following plastics are resistant to [®]PEKASOL L

ABS	Acryl Nitrile butadiene styrene
PE	Polyethylene
PP	Polypropylene
PTFE	Polytetrafluoroethylene
PVC	Polyvenyl Chloride
IIR	Isobutylene-isoprene Rubber
CR	Chloroprene Rubber
NBR	Nitrile Butadiene Rubber
UP	Unsaturated Polyester Resins
Centellen NP (WS 3860)	(trade name)
Hemp	
POM	Polyacetal
PB	Polybutene
FPM ([®] Viton)	Fluor Rubber
EPDM	ethylene propylene diene monomer (up to 150 °C)

Product description

[®]PEKASOL L is a colorless and odorless liquid on basis of propylene glycol for the use as heat transfer fluid with highly effective anti-corrosive agents and hardness stabilizers.

[®]PEKASOL L does not contain nitrite, amine, phosphate, borate, silicate and nitrate.

Product characteristics

[®]PEKASOL L is used as anti-freeze and anti-corrosion medium in food processing and technical applications, e.g. heating and cooling systems, heat pumps, sprinkler systems and food cooling.

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

Even the use of galvanized components is possible. Although the zinc coating is dissolved over a long period of time, this does not affect the properties of the medium since newly developed additives prevent a flocculating and fouling and keeps the zinc in solution.

Application notes

[®]PEKASOL L may be mixed with water in any ratio. The concentration should not be lower than 20% by vol., otherwise the corrosion protection cannot be warrant. [®]PEKASOL L must only be diluted with water of a hardness up to 20°dH. Ideally DM water (demineralized) should be used. Please refer to our website www.prokuehlsole.de for a detailed report on the topic „Quality characteristics of waters and heat transfer fluid“.

We recommend the following concentrations for the below described applications:

Air conditioner and Heating and cooling systems	35 – 45 % by vol.
Pure frost protection	35 – 45 % by vol.
Heat pumps and geothermal probes	30 – 40 % by vol.

[®]PEKASOL L is suitable as anti-corrosion and antifreeze additive according to VDI guideline 2035.

Upon request we will provide you with any desired dilution in the packaging units as mentioned at page 3. All manufactured [®]PEKASOL L dilutions from pro KÜHLSOLE are exclusively manufactured with demineralised water to guarantee an optimal water quality. Prior to the first filling, all plant parts must be duly cleaned. We recommend a 5 % pro KÜHLSOLE PEX 130 solution. In facilities which use 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 [®]PEKASOL L adequate flushing is necessary. You may

contact us by telephone at **+49 24 21 / 5 91 96-0** or refer to our website www.prokuehlsole.de for detailed information. **®PEKASOL L** can be mixed with most of the common anti-freezing agents on basis of propylene 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 down right table for the wear data of 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 elastomers, 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.

®PEKASOL L is approved and suitable for the use in press fitting systems from Geberit-Mapress and Viega.

Safety Notes

In handling **®PEKASOL L** the usual safety measures in handling chemicals must be observed.

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

Ecology and Toxicology

®PEKASOL L is non-toxic and easily biodegradable.

®PEKASOL L does not need to be labeled according to GHS.

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)

Shipping, Storage and Disposal

®PEKASOL L is shipped in the adjacent packaging units. All packaging units are reusable. Please return completely empty. Do not fill with other products!

®PEKASOL L and all dilutions are storage-stabile. Store dry. Avoid direct sunlight. **®PEKASOL L** dilutions do not unmix, even after a long storage period. The respective and valid regulations for disposal must be observed.

Calculation Software

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

Packaging units **®PEKASOL L**

Package	Filling Weight
30-liter-can	30 kg
60-liter-can	60 kg
220-liter-drum	220 kg
1000-liter-IBC	1000 kg
Tank truck	upon request

General Corrosion and Wear Data

Materials	Testing method according to ASTM D 1384			
	®PEKASOL L *1 40 % by vol.	Water at 14°dH	Calcium Chloride 21% by vol. Solution	Glycol-Water 35 % by vol. without inhibitors
Stainless steel	-0,1	-0,5	pitting	not tested
Copper	-1,0	-1	-11	-2,8
Brass	-1,2	-1	-36	-7,6
Steel	-1,1	-76	-95	-152
Red brass	+0,8	unknown	unknown	unknown
Hard solder	+0,6	unknown	unknown	unknown
Soft solder	-0,5	-11	-443	-135
Grey cast iron	-1,2	-192	-310	-273
Cast aluminum	+2,0	-32	-135	-16
Aluminium	-1,7	-5	-660	not tested

*1 The wear date of **®PEKASOL L** 40% solution were measured by ILK (Institute of Air Handling and Refrigeration, Dresden). The values for water, calcium chloride solution and glycol without inhibitors were taken from available technical literature.

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 °C	Concentration % by vol.	Temperature °C	Density g/cm ³	Thermal Conductivity W/m*K	Specific Heat kJ/kg K	dynam. Viscosity mPa*s	kinemat. Viscosity mm ² /s	Prandtl number	relative Pressure Loss	rel. heat transfer coefficient
-10	27	-10.0	1.038	0.464	3.91	11.69	11.26	98	1.78	0.270
		0.0	1.034	0.470	3.93	6.74	6.53	56	1.55	0.350
		20.0	1.025	0.482	3.99	2.94	2.86	24	1.25	0.530
		40.0	1.015	0.494	4.05	1.66	1.63	14	1.08	0.700
		60.0	1.005	0.505	4.12	1.09	1.08	9	0.96	0.870
		80.0	0.991	0.565	4.27	0.57	0.58	4	0.81	1.260
		100.0	0.981	0.580	4.32	0.35	0.35	3	0.71	1.610
-15	33	-10.0	1.046	0.439	3.80	15.54	14.86	135	1.92	0.230
		0.0	1.041	0.443	3.83	8.71	8.37	75	1.66	0.300
		20.0	1.031	0.452	3.90	3.62	3.51	31	1.32	0.460
		40.0	1.020	0.461	3.96	1.99	1.95	17	1.13	0.620
		60.0	1.009	0.469	4.03	1.28	1.27	11	1.00	0.760
		80.0	0.995	0.517	4.18	0.74	0.74	6	0.86	1.050
		100.0	0.984	0.528	4.24	0.46	0.47	4	0.76	1.320
-20	39	-20.0	1.058	0.413	3.66	42.28	39.95	374	2.49	0.140
		-10.0	1.053	0.416	3.69	20.44	19.41	181	2.07	0.190
		0.0	1.048	0.419	3.73	11.10	10.59	99	1.77	0.260
		20.0	1.036	0.424	3.79	4.38	4.23	39	1.39	0.400
		40.0	1.025	0.430	3.86	2.32	2.27	21	1.18	0.550
		60.0	1.013	0.435	3.93	1.47	1.45	13	1.04	0.680
		80.0	1.000	0.441	4.00	1.00	1.00	9	0.94	0.820
		100.0	0.987	0.446	4.08	0.64	0.65	6	0.83	1.010
-25	43	-20.0	1.063	0.400	3.58	52.05	48.95	466	2.63	0.120
		-10.0	1.058	0.402	3.61	24.53	23.20	221	2.17	0.170
		0.0	1.052	0.404	3.65	13.03	12.38	118	1.85	0.230
		20.0	1.040	0.407	3.72	4.96	4.77	45	1.44	0.370
		40.0	1.028	0.411	3.79	2.56	2.49	24	1.21	0.500
		60.0	1.015	0.414	3.87	1.60	1.58	15	1.07	0.630
		80.0	1.001	0.417	3.94	1.08	1.08	10	0.96	0.760
		100.0	0.987	0.420	4.01	0.70	0.71	7	0.85	0.930
-30	47	-30.0	1.074	0.387	3.46	160.78	149.73	1438	3.52	0.070
		-20.0	1.068	0.388	3.50	64.42	60.32	581	2.79	0.110
		-10.0	1.062	0.388	3.53	29.57	27.85	269	2.29	0.150
		0.0	1.056	0.389	3.57	15.34	14.52	141	1.93	0.210
		20.0	1.043	0.391	3.64	5.61	5.38	52	1.49	0.340
		40.0	1.030	0.392	3.72	2.82	2.74	27	1.24	0.470
		60.0	1.017	0.393	3.80	1.73	1.70	17	1.09	0.590
		80.0	1.002	0.395	3.87	1.16	1.16	11	0.97	0.710
100.0	0.987	0.396	3.95	0.76	0.77	8	0.87	0.860		

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 calculation formula.

Development and Production of Heat transfer fluid and Coolants



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