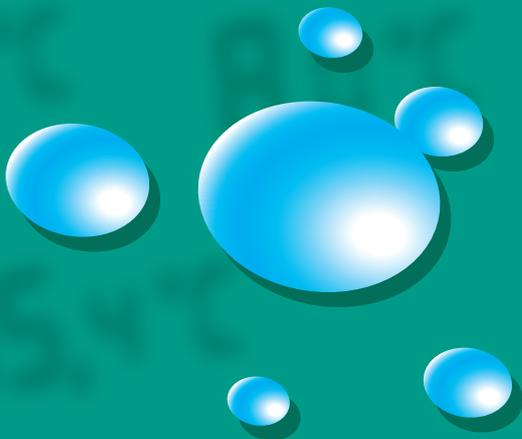


® PEKASOLar 50 and ® PEKASOLar 100

Liquid Heat Carrier on Basis of Propylene Glycol
for all Solar Collector Types
and their Combination with Heating Systems,
Heat Pumps etc.



pro KÜH SOLE GmbH

Dilution table ®PEKASOLar 100

Frost-proof up to °C	Vol. %	Density g/cm ³	Refractive index at 20 °C
-2	10	1,008	1,344
-6	20	1,018	1,356
-8	25	1,024	1,362
-12	30	1,028	1,367
-17	35	1,032	1,373
-22	40	1,036	1,379
-28	45	1,040	1,384 ®PEKASOLar 50
-34	50	1,043	1,389
-41	55	1,046	1,394
-50	60	1,048	1,399
---	65	1,049	1,403
---	70	1,050	1,407
---	80	1,050	1,416
---	90	1,048	1,424
---	100	1,046	1,431

When determining the concentration and frost resistance with a refractometer, please always read the refractive index and compare it with the table. The scale of the propylene glycol frost resistance is frequently false.

Physical Parameter ®PEKASOLar 100

Density (at 20°C)	1,046 g/cm ³
Appearance:	clear colorless liquid
Melting point (Concentrate):	ca. 185 °C
Solidification point (concentrate):	< - 40 °C
pH-Value (at 20°C)	7.5 - 8.5
Specific heat (at 20°C)	ca. 2.5 kJ/kg*K
Heat conductivity (at 20°C)	ca. 0.22 W/m*K
Viscosity (at 20°C)	ca. 56 mPa*s
Electric conductivity (at 20°C)	2,400 µS/cm
Refractive index	1.431

Material compatibility of synthetics

The following synthetics are resistant to ®PEKASOL 50 und 100

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

Product description

®PEKASOLar 100 and its dilutions are colorless and odorless liquids on basis of propylene glycol with newly developed additives, especially for the use in flat plate AND vacuum tube collectors and their combinations with heating systems, geothermal probe systems and heat pumps. ®PEKASOLar 100 does not contain von borates, phosphates, silicates, amines, nitrites and nitrates.

Product characteristics

A newly developed combination of additives and inhibitors effectively prevents fouling and corrosion.

®PEKASOLar 100 protects all usually used metallic materials. Please refer to the table at the next page for the tested wear data.

Application notes

®PEKASOLar 50 is a ready-to-use, 45 % dilution of ®PEKASOLar 100 that is frost-proof up to - 28°C. The combination of additives allows the mixing and concentration of our existing solar liquids ®PEKASOL L, ®PEKASOLar F and ®PEKASOLar V with ®PEKASOLar 100 and its dilutions in any ratio. The concentration should not be lower than 30 Vol.%. If you want to mix ®PEKASOLar 100 with other heat carriers, our service laboratory will analyze if this is possible or if this may cause problems.

We highly recommend to dilute ®PEKASOLar 100 with VE- water (distilled water) to prevent a contamination of the system with harmful substances like chloride, sulfate or hardness components.

The operation temperatures should not be permanently 200°C and should reach 250°C only for a short time, since this may affect the product basis (propylene glycol) and may cause thermal decomposition. The durability of the heat carrier decreases, the higher the thermal impact. New facilities must be cleaned sufficiently prior to filling. We recommend the use of a 5% pro KÜHLSOLE PEX 130.

Especially scaling on copper parts must be removed.

A complete deairing must be conducted.

Air pockets and gas cushion in the system must be prevented.

Solder joints should preferably be completed by means of hard solder (silver or copper solder).

Facilities, which will be filled with diluted ®PEKASOLar 100, must be designed as closed systems and prevent the entry of air or oxygen respectively.

If flexible pipes or connections are used, preferably, metal hoses should be chosen.

It is to ensure that the entire system is completely filled with solar fluid at anytime.

Recommended Usage concentrations:

For solar heating systems:	45 Vol. %
For heat pumps:	33 Vol. %

Material compatibility

A new generation of additives allows the use of any metal 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 are not affected.

SBR (styrene butadiene rubber) and PA (polyamide) are suitable up to 100°C.

EPDM (ethylene propylene diene monomer) can be used up to 150°C.

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

We recommend to directly contact the manufacturer of sealing materials for high temperature application (>150°C).

The suitability of the sealing materials needs to be verified with the manufacturer.

In particular, the thermal application limits of the individual sealing materials must be observed.

Ecology and Toxicology

®PEKASOLar 100 is non-toxic and easily biodegradable.

®PEKASOLar 100 does not need to be labeled. 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

®PEKASOLar 100 will be delivered in abovementioned package units. Drums and containers are reusable. Please return completely empty.

®PEKASOLar 100 is storage-stable. Store dry. Avoid direct sunlight.

Please refer to the safety data sheet for further information.

Measuring Kit

We prepared a measuring kit with all necessary measuring instruments. You may order it directly from us or your distributor.

Should you have any questions on the product or its application, you may also contact us by telephone. Phone +49 2421 59196 0

Packaging units ®PEKASOLar 100

Package:	Weight:	Filling Volume:
Canister	10 kg	9,5 liters
Canister	20 kg	19 liters
Canister	30 kg	28,5 liters
Drum	220 kg	210 liters
Container	1,000 kg	950 liters
Tank truck	from 10,000 kg	
Tank container	from 10,000 kg	

Corrosion and Wear Data

Testing method according to ASTM D 1384

Weight losses in g/m²

Materials	®PEKASOLar 50
Copper	0.1
Brass	0.0
Steel	0.0
Grey cast iron	- 0.1
Cast aluminum (ALSi12)	- 0.3
Aluminum	0.5

Thermodynamic Data for ®PEKASOLar 100 Dilutions

Product concentration	Frost protection °C	Temperature °C	Density g/cm ³	Heat conductivity W/m ² K	Specific Heat kJ/kg K	Viscosity mPa*s	Relative pressure verlust	Vapor pressure bar
PEKASOLAR 50 (45 Vol. %)	-28	-20	1,057	0,40	3,51	64,4	2,86	0
		0	1,051	0,40	3,57	16,5	1,99	0
		20	1,040	0,40	3,63	6,0	1,52	0
		40	1,028	0,40	3,70	2,9	1,24	0
		60	1,014	0,40	3,76	1,6	1,06	0,2
		80	0,999	0,40	3,83	1,1	0,93	0,4
		100	0,983	0,40	3,89	0,8	0,85	0,8
		120	0,966	0,41	3,96	0,6	0,79	1,6
PEKASOLAR 35 (33 Vol. %)	-15	0	1,040	0,44	3,82	8,7	1,68	0
		20	1,030	0,45	3,86	3,7	1,32	0
		40	1,021	0,46	3,90	2,9	1,10	0
		60	1,008	0,47	3,94	1,2	0,95	0,2
		80	0,993	0,47	3,98	0,8	0,85	0,4
		100	0,977	0,48	4,03	0,6	0,78	0,8
		120	0,960	0,49	4,07	0,5	0,73	1,7
		160						
200							14,0	

„The market
asks for the product

– we provide it.“

Development and
Production of liquid Heat
Carriers and Coolants



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