



ThermoSol Concentrated

NON TOXIC ANTIFREEZE FOR HIGH TEMPERATURES INSTALLATIONS

Description and applications:

ThermoSol Conc. is a transparent red liquid. It is safe to handle as it is composed of not toxic high molecular weight glycol.

ThermoSol Conc. is a concentrated product which must be diluted before use.

ThermoSol Conc. is based on specially selected high boiling temperature glycols with:

- ✓ Superior cracking stability to high temperatures.
- ✓ Boiling point above 270°C to atmospheric pressure. Glycols do not boil in stagnation situations in solar systems maintaining dissolved the package of additives, without plugging the pipes.
- ✓ Physiologically harmless.
- ✓ Biodegradable.

ThermoSol Conc. meets with European quality specifications and standards.

Other advantages of *ThermoSol Conc.*:

- ✓ It maintains cooling circuits in perfect condition for longer periods of time than conventional products due to its 100% organic additives.
- ✓ It optimises heat transference and so enhances the performance of the installations.
- ✓ It protects from corrosion: aluminium, copper, brass, steel and cast iron.
- ✓ Its red colour helps to detect leaks.
- ✓ Silicate free product, avoid plugging issues, longer stock time.
- ✓ Nitrite, Nitrate, Amine, Phosphate and Borax free product. Better for environment and safer manipulation.



Technical Data:

Appearance	Transparent Red Liquid
pH (20°C)	9,0 – 10,0
Density (20°C)	1,12-1,13 g/ml
Viscosity (20°C)	37 mPa
Specific Heat Capacity (20°C)	2,4 KJ/KgK
Thermal Conductivity (20°C)	0,26 W/mK

Data has been gathered in specific bibliography and proprietary tests. It is not part, necessarily, of the technical specifications.

Corrosion Table:

Mixtures of high glycols and water are more corrosive than pure water so additives should be used in order to ensure the integrity of the circuit.

The following table shows the effectiveness of mixtures *ThermoSol Conc.* in inhibiting corrosion according to ASTM D 1384. For a comparative purpose results for water and propylene glycol alone are presented.

Material	<i>ThermoSol Conc. 50%</i>	Propylene Glycol (33% v/v)	Water	ASTM D 3306 Max Limit
Copper	0,50	4	2	10
Solder	0,14	1095	99	30
Brass	-0,51	5	5	10
Steel	-0,96	214	212	10
Cast Iron	-3,71	345	450	10
Aluminum	2,02	15	110	30

The results above are an average change in weight of coupons in g/m². A positive number indicates an increase in weight due to the formation of a stable protective layer on the metal's surface.



Test description:

ASTM D 1384:

In this test method, specimens of metals typical of those present in engine cooling systems are totally immersed in aerated engine coolant solutions with corrosive water for 336 h at 88°C (190°F). The corrosion inhibitive properties of the test solution are evaluated on the basis of the weight changes incurred by the specimens. Each test is run in triplicate, and the average weight change is determined for each metal.

Compatibility table:

ThermoSol Conc. is compatible with the usual materials of cooling circuits. The next table shows plastics, sealants and elastomers compatible with the product. Data has been gathered in specific bibliography and proprietary tests.

Thermosol Compatibility Chart			
Material	25°C	80°C	160°C
Adiprene™ L-100	OK	NR	NR
Black Rubber 3773	OK	NR	NR
Buna N (o 25)	OK	OK	--
Buna S	OK	Acceptable	NR
Butyl Rubber	OK	OK	--
Compressed Asbestos	OK	OK	Acceptable
EPDM	OK	OK	OK
EPR Rubber	OK	OK	OK
Hycar™ D-24	OK	Acceptable	--
Hypalon™	OK	NR	NR
Kalrez™	OK	OK	OK
Natural Rubber Gum	OK	NR	NR
Neoprene 7797	OK	Acceptable	--
Red Rubber 107	OK	NR	NR
Saraloy™ 300	OK	NR	NR
Silicone Nº 65	OK	OK	--
Thiokol™ 3060	OK	NR	NR
Viton™ A	OK	OK	NR
<i>OK: Recommended</i>		<i>NR: No Recommended</i>	<i>--: No data</i>

Phenolic resins, plasticized PVC and polyurethane elastomers are not compatible with **ThermoSol Conc.**

Zinc is not compatible with glycols or their mixtures with water, avoid zinc or galvanized reservoirs.



Filling the installation:

ThermoSol Conc. has to be diluted with at least 40% V/V to assure complete metals system corrosion protection. The recommended range of dilution is 55% V/V.

Depending on the proportion of concentrated product, the protection temperature against low temperatures is obtained, they can be consulted in the following table:

% V/V <i>ThermoSol</i>	Freezing Point (°C)	Frost Protection (°C)	Burst Point (°C) ¹
55	-24	-27	-29
50	-19	-22	-25
45	-15	-18	-21
40	-12	-15	-17

Water for dilution of the product must be potable water and with a maximum content of chlorides and sulphates of 50 ppm and hardness lower than 50 ppm expressed as CaCO₃ or demineralized water. These indications do not exempt from the compliance with applicable legislation in each place.

Before filling the systems should be flushed with water to remove traces of flux, especially when chlorine containing flux has been used.

Mixtures with other kind of antifreeze should be avoided for possible incompatibilities which would reduce the useful life of the product.

ThermoSol is stable for at least two years in regular stocks conditions in original airtight containers.

Equipment must not be fitted with galvanized heat exchangers, heat reservoirs, tanks or pipes, because glycols can corrode zinc.

Precautions:

ThermoSol is a non flammable, non corrosive product, so no special precautions are required. In any case good industrial practices are recommendable.

Avoid contact with eyes, in case of splashing flush with running water for at least 10 minutes. Do not eat or drink, keep away of children.

¹Freezing point according to ASTM D 1177 is the temperature for the first ice crystal formation. DIN 51583 normative establishes the temperature from the product does not flow and there is danger for the circuit integrity. Between both temperatures exists a mixture of ice crystals and not-frozen fluid that flows without volume increase, thus, without bursting problems.

SUC. DE CARMELO PEREZ MARTINEZ S.L.
Ctra Castellón Km 3,700, Pol. La Unión Nave 3
ES-50013 Zaragoza (Spain)
Phone: +34 976 42 18 50
Fax: +34 976 59 19 71
Mail: carpemar@carpemar.com
www.carpemar.com



Carpemar

Store in a clean and well-ventilated place. Tightly sealed containers are recommended in order to maintain the properties of the product.

The information contained in this document is based on our current knowledge and experience. This information is presented for good use of the products and it is not part, necessarily, of the technical specifications.

It is the responsibility of those to whom we supply our products to ensure that any proprietary rights and existing laws and legislation are observed.



Carpemar