



GREENWAY® NEO SOLAR



Non-contractual photo

GREENWAY® NEO SOLAR is a **READY-TO-USE** heat transfer fluid based on **1,3 PROPANEDIOL** and corrosion inhibitors. It is particularly suitable for sanitary hot water production in solar thermal systems for medium temperatures panels and high temperature vacuum tubes.

The 1,3 Propanediol, comes from renewable plant-based materials

The formulation of **GREENWAY® NEO SOLAR** is free of Borax, a Toxic additive classified as per the 30th European ATP (Adaptation to Technical Progress).

GREENWAY® NEO SOLAR provides effective protection against freezing and against corrosion of metals in different circuits (steel, aluminium, copper, brass, solder, etc.). It prevents the formation of sludge in the circuit which can clog up solar collectors.

The low degradability of this heat transfer fluid in a circuit slows its ageing, provides protection against periods of stagnation, avoids "tarring" of collectors and systems, and gives installations a longer working life. At over 150°C for 150 hours, **GREENWAY® NEO SOLAR** degrades three times more slowly than a 50% concentrated solution of mono propylene glycol.

The corrosion inhibitor technology used in **GREENWAY® NEO SOLAR** is organic, based on neutralised carboxylic acids, without sodium borate, which is classified as toxic, phosphates, nitrites or amines. These anti-corrosion agents provide long lasting protection.

GREENWAY® NEO SOLAR is bacteriostatic and therefore prevents bacterial growth in a circuit.

GREENWAY® NEO SOLAR -25 and **-30** are **authorised by the French health administration (Direction Générale de la Santé), according to the directives of the French regulatory agency ANSES (formerly AFSSA)**, as a heat transfer fluid for thermal processing in simple exchange systems for sanitary water production.

GREENWAY® NEO SOLAR -25 and **-30** are also **approved by Belgaqua**, (the Belgian federation for the water sector), according to the standard NBN-EN 1717 as a fluid category 3.

We offer two ready-to-use solutions:

GREENWAY® SOLAR -25: Freezing point of -25°C

GREENWAY® SOLAR -30: Freezing point of -30°C

Please contact us for the concentrated product.



1. PHYSICAL AND CHEMICAL PROPERTIES OF GREENWAY® NEO SOLAR

Appearance; Green liquid

pH; (AFNOR NF T 90 008 / ASTM D 1287) 8 to 8.4

Alkaline Reserve (AFNOR NF T 78-101 / ASTM D 1121)
(ml HCl N/10 for 20 ml of GREENWAY® NEO SOLAR) ≥ 4 ml

Flash point °C (ASTM D 93) >100°C

2. PHYSICAL AND CHEMICAL PROPERTIES OF AQUEOUS SOLUTIONS OF GREENWAY® NEO SOLAR

2.1. Freezing point of aqueous solutions of GREENWAY® NEO SOLAR (in °C)

The freezing point of an aqueous solution of GREENWAY® NEO SOLAR shown below is for the formation of a crystalline mix and not a compact mass.

	GREENWAY® NEO SOLAR -25	GREENWAY® NEO SOLAR -30
Freezing point in °C ± 2	- 25	- 30

Relevant standards: AFNOR NF T 78-102 / ASTM D 1177

Freezing points are however, subject to variation due to super-cooling phenomena which may occur. When used as a transfer fluid and particularly at temperatures below 0°C, it is essential that the viscosity is taken into consideration for calculating the pressure loss.

2.2. Boiling point of an aqueous solution of GREENWAY® NEO SOLAR (in °C)

	GREENWAY® NEO SOLAR -25	GREENWAY® NEO SOLAR -30
Boiling point in °C ± 2	104	105

Relevant standards: AFNOR NF R 15-602-4 / ASTM D 1120

For uses at temperatures above boiling points and to prevent any boiling in the system, GREENWAY® NEO SOLAR must only be circulated under pressure in closed, sealed circuits.

2.3. Physiochemical properties of GREENWAY® NEO SOLAR - 25 (in kg/m³)

Temperature (°C)	Density (kg/m ³)	Kinematic Viscosity (cSt)	Specific Heat (kJ.kg ⁻¹ .K ⁻¹)	Thermal Conductivity (W.m-1.K-1)
- 20	1,058	40.2	3,39	0.393
- 10	1,052	21.2	3,42	0.402
0	1,047	11.6	3,46	0.412
+ 10	1,042	7.1	3,49	0.422
+ 20	1,037	4.5	3,53	0.431
+ 30	1,032	3.1	3,56	0.439
+ 40	1,029	2.3	3,58	0.447
+ 50	1,026	1.8	3,60	0.455
+ 60	1,023	1.5	3,62	0.461
+ 70	1,020	1.1	3,64	0.468
+ 80	1,017	0.90	3,66	0.473
+ 90	1,013	0.80	3,69	0.477
+ 100	1,010	0.70	3,71	0.481
+ 110	1,008	0.70	3,74	0.484
+ 120	1,006	0.70	3,76	0.485
+ 130	1,003	0.60	3,80	0.486
+ 140	1,001	0.60	3,84	0.486
+ 150	998	0.60	3,87	0.485
+ 160	995	0.50	3,91	0.482
+ 170	991	0.50	3,93	0.479
+ 180	987	0.50	3,96	0.474
+ 190	983	0.40	3,98	0.469
+ 200	978	0.40	4,02	0.462

Relevant standards: AFNOR NF R 15-602-1 / ASTM D 1122 (density)



2.4. Physiochemical properties of GREENWAY® NEO SOLAR -30

Temperature (°C)	Density (kg/m ³)	Kinematic Viscosity (cSt)	Specific Heat (kJ.kg ⁻¹ .K ⁻¹)	Thermal Conductivity (W.m-1.K-1)
-25	1,065	62.9	3,26	0.375
- 20	1,062	45.3	3,28	0.379
- 10	1,056	24.1	3,32	0.388
0	1,051	13.9	3,36	0.397
+ 10	1,046	9.1	3,40	0.406
+ 20	1,041	5.5	3,44	0.414
+ 30	1,036	3.9	3,47	0.422
+ 40	1,031	2.8	3,49	0.430
+ 50	1,030	2.4	3,51	0.436
+ 60	1,027	1.7	3,53	0.443
+ 70	1,024	1.4	3,55	0.448
+ 80	1,021	1.2	3,57	0.453
+ 90	1,017	1.0	3,60	0.457
+ 100	1,014	0.90	3,62	0.461
+ 110	1,012	0.90	3,65	0.463
+ 120	1,010	0.80	3,67	0.465
+ 130	1,007	0.70	3,71	0.465
+ 140	1,005	0.70	3,75	0.465
+ 150	1,002	0.60	3,78	0.464
+ 160	999	0.60	3,80	0.461
+ 170	995	0.60	3,82	0.458
+ 180	991	0.60	3,85	0.454
+ 190	987	0.50	3,87	0.449
+ 200	982	0.50	3,91	0.442

Relevant standards: AFNOR NF R 15-602-1 / ASTM D 1122 (density)



3. PROTECTION OF METALS BY GREENWAY® NEO SOLAR

As a comparison, the table below shows the corrosion of several metals in tap water and **GREENWAY® NEO SOLAR** respectively. For information, the table shows the performance requirements defined by standards AFNOR NF R 15-601 and ASTM D 3306 for coolant liquids.

Metals	Weight loss (mg / test piece)	Limits of the standard NF R 15-601	Limits of the standard ASTM D 3306
Copper	± 2	[- 5; +5]	[- 10; +10]
Solder	± 3	[- 5; +5]	[- 30; +10]
Brass	± 2	[- 5; +5]	[- 10; +10]
Steel	± 1	[- 2.5; +2.5]	[- 10; +10]
Cast iron	± 2	[- 4; +4]	[- 10; +10]
Aluminium	± 7	[- 10; +20]	[- 30; +30]

Standards governing test method: AFNOR NF R 15-602-7 / ASTM D 1384

4. PRESSURE LOSS

When using **GREENWAY® NEO SOLAR** in an installation, account must be taken of the viscosity of the aqueous solution to calculate pressure losses.

3. RECOMMENDATIONS FOR THE IMPLEMENTATION OF GREENWAY® NEO SOLAR

It is strongly recommended to conduct thorough cleaning of an installation before filling with **GREENWAY® NEO SOLAR**. If the circuit contains abundant deposits of metal oxides in particular, we recommend using Dispersant D*.

The procedure for use is as follows:

- Quickly drain the installation at the lowest point after letting the water circulate for one to two hours.
- Prepare a solution of DISPERSANT D* in water (20 g/litre) in advance,
- Add the resulting solution to the installation and let the product circulate for at least two hours,
- Carefully rinse with plenty of clean water.

Cleaning may need to be repeated, depending on the state of the circuit. It is important to drain and rinse thoroughly with water.

In the case of an old installation with significant sludge build-up, you can clean using Thermonett* Sludge Remover. *Contact your Climalife sales person.*

GREENWAY® NEO SOLAR must not be used with galvanized steel.

* Marketed by **Climalife**.

*** The data given in this document are purely indicative and do not constitute a sales specification.**

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