Heat Transfer Fluids

GREENWAY® NEO HEAT PUMP N

Non contractual photo.

Greenway® Neo Heat Pump N is a **ready-to-use, plant-based heat transfer fluid** (1,3-propanediol and corrosion inhibitors), specially formulated for geothermal ground source (underground collector circuits) and aerothermal air/water heat pumps.

Greenway® Neo Heat Pump N protects against freezing and the formation of deposits in the system.

The anti-corrosive H- OAT (neutralised carboxylic acids) formulation is nitrate and amine free.

In the event of a leak, the raw material of renewable plant origin and 1,3-propanediol, greatly reduces the risk of soil and air pollution.

The formula contains a bittering agent, in accordance with the French Order of 14 January 2019 relating to the conditions for placing products on the market in facilities used for the thermal treatment of water intended for human consumption.

Greenway® Neo Heat Pump N is bacteriostatic according to ISO 11930: its formula prevents the growth of bacteria and avoids mould, fungus or algae that alter the flow and heat exchange in the systems.

Greenway® Neo Heat Pump N is biodegradable: it demonstrates "ultimate intrinsic biodegradability without pre-adaptation" and "primary intrinsic biodegradability" according to OECD criteria extrapolated to a finished product. In this analysis, Greenway® Neo Heat Pump N is found to biodegrade between 90% and 100% in 28 days.

Freezing point of the solutions :

Greenway® Neo Heat Pump N -18 : -18°C
Greenway® Neo Heat Pump N -20 : -20°C
Greenway® Neo Heat Pump N -25 : -25°C

1. USE :

The compatibility of the joints with a heat transfer medium with a higher wetting power than water must be checked. It will sometimes be necessary to tighten the joints and connections with a higher torque to prevent seepage.

In case of doubt, given the diversity of materials available, it is advisable to check the compatibility of **Greenway® Neo Heat Pump N** or 1,3-propanediol bio-sourced from the manufacturers of the components (exchangers, pumps, pipes, joints, etc).

Galvanised steel should never be used with **Greenway® Neo Heat Pump N**.

It is recommended that an installation be thoroughly cleaned before filling with a heat transfer fluid.
If the installation is scaled or strongly oxidised with deposits, circulate **Desoxyclean*** (100 g/l of water), for 2 hours at 50°C, then clean with **Dispersant D***.

If the installation has a lot of deposits of non-incrusted metal oxides, clean with Dispersant D* to remove all particles. After cleaning, drain and rinse thoroughly with water.

** Marketed by the Climalife. (www.climalife.dehon.com)*

2. Properties of Greenway® Neo Heat Pump N

Appearance ..... Green liquid

Density (AFNOR NF R 15-602-1 / ASTM D 1122)

Greenway® Neo Heat Pump N -18 ..... 1.030 ± 0.002 kg/dm³
Greenway® Neo Heat Pump N -20 ..... 1.032 ± 0.002 kg/dm³
Greenway® Neo Heat Pump N -25 ..... 1.037 ± 0.002 kg/dm³

pH (AFNOR NF T 90-008 / ASTM D 1287)

Greenway® Neo Heat Pump N -18 ..... 8 to 9
Greenway® Neo Heat Pump N -20 ..... 8.5 to 9.5
Greenway® Neo Heat Pump N -25 ..... 8.5 to 9.5

Alkaline Reserve on 20 ml of product (AFNOR NF T 78-101 / ASTM D 1121)

Greenway® Neo Heat Pump N -18 ..... > 5 ml
Greenway® Neo Heat Pump N -20 ..... > 5 ml
Greenway® Neo Heat Pump N -25 ..... > 6 ml

Freezing point °C (AFNOR NF T 78-102 / ASTM D 1177)

Greenway® Neo Heat Pump N -18 ..... - 18 ± 2°C
Greenway® Neo Heat Pump N -20 ..... - 20 ± 2°C
Greenway® Neo Heat Pump N -25 ..... - 25 ± 2°C
(Formation of a crystalline mix and not a compact mass)

Freezing points are however subject to variation due to overcooling phenomena that may occur. For use as a transfer medium below 0°C, the viscosity must be taken into account when calculating pressure loss.

Boiling point °C (AFNOR NF R 15-602-4 / ASTM D 1120) at atmospheric pressure

Greenway® Neo Heat Pump N -18 ..... 104 ± 2°C
Greenway® Neo Heat Pump N -20 ..... 104 ± 2°C
Greenway® Neo Heat Pump N -25 ..... 105 ± 2°C

When using at temperatures above their boiling points and to prevent any evaporation from the system, **Greenway® Neo Heat Pump N** must only be circulated under pressure in closed sealed circuits and kept in circulation during that time.

2.1. Properties of Greenway® Neo Heat Pump N -18

Temperature (°C)	Density (kg/m³)	Kinematic Viscosity (cSt)	Specific Heat (kJ.kg⁻¹.K⁻¹)	Thermal Conductivity (W.m-1.K-1)
- 15	1047	18.58	3.59	0.386
- 10	1044	13.51	3.63	0.392
0	1039	8.96	3.7	0.403
+ 10	1034	5.57	3.77	0.413
+ 20	1031	3.53	3.84	0.422
+ 30	1027	2.64	3.91	0.429
+ 40	1024	2.01	3.98	0.436
+ 50	1021	1.57	4.05	0.442
+ 60	1018	1.26	4.12	0.447
+ 70	1015	1.08	4.19	0.452
+ 80	1012	0.84	4.25	0.455
+ 90	1008	0.74	4.32	0.457
+ 100	1005	0.61	4.39	0.459
+ 110	1003	0.52	4.46	0.46
+ 120	1001	0.45	4.53	0.46
+ 130	998	0.39	4.6	0.46
+ 140	996	0.34	4.67	0.459
+ 150	993	0.3	4.74	0.457
+ 160	990	0.27	4.81	0.454
+ 170	986	0.24	4.88	0.451
+ 180	982	0.21	4.95	0.447
+ 190	978	0.19	5.02	0.443
+ 200	973	0.17	5.09	0.438

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

2.2. Properties of Greenway® Neo Heat Pump N -20

Temperature (°C)	Density (kg/m³)	Kinematic Viscosity (cSt)	Specific Heat (kJ.kg⁻¹.K⁻¹)	Thermal Conductivity (W.m-1.K-1)
- 15	1049	20.3	3.51	0.378
- 10	1047	14.77	3.55	0.384
0	1042	9.77	3.62	0.394
+ 10	1037	6.07	3.69	0.403
+ 20	1033	3.88	3.77	0.411
+ 30	1029	2.88	3.84	0.419
+ 40	1026	2.17	3.91	0.425
+ 50	1023	1.69	3.99	0.43
+ 60	1020	1.35	4.06	0.435
+ 70	1017	1.15	4.13	0.439
+ 80	1014	0.9	4.2	0.442
+ 90	1010	0.78	4.28	0.444
+ 100	1007	0.64	4.35	0.445
+ 110	1005	0.55	4.42	0.446
+ 120	1003	0.47	4.5	0.446
+ 130	1000	0.41	4.57	0.445
+ 140	998	0.36	4.64	0.443
+ 150	995	0.32	4.71	0.441
+ 160	992	0.28	4.79	0.438
+ 170	988	0.25	4.86	0.435
+ 180	984	0.22	4.93	0.431
+ 190	980	0.2	5.01	0.427
+ 200	975	0.18	5.08	0.422

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

2.3. Properties of Greenway® Neo Heat Pump N -25

Temperature (°C)	Density (kg/m³)	Kinematic Viscosity (cSt)	Specific Heat (kJ.kg⁻¹.K⁻¹)	Thermal Conductivity (W.m-1.K-1)
- 20	1058	34.22	3.28	0.356
- 10	1052	18.23	3.36	0.366
0	1046	11.74	3.44	0.375
+ 10	1041	7.24	3.52	0.383
+ 20	1038	4.78	3.6	0.39
+ 30	1033	3.47	3.68	0.396
+ 40	1030	2.58	3.76	0.402
+ 50	1027	1.98	3.84	0.406
+ 60	1024	1.58	3.92	0.41
+ 70	1021	1.33	4	0.412
+ 80	1018	1.03	4.08	0.415
+ 90	1014	0.89	4.16	0.416
+ 100	1011	0.73	4.24	0.416
+ 110	1009	0.62	4.32	0.416
+ 120	1007	0.53	4.4	0.415
+ 130	1004	0.46	4.48	0.414
+ 140	1002	0.4	4.56	0.412
+ 150	999	0.35	4.64	0.409
+ 160	996	0.31	4.72	0.406
+ 170	992	0.28	4.8	0.402
+ 180	988	0.25	4.88	0.398
+ 190	984	0.22	4.96	0.393
+ 200	979	0.2	5.03	0.388

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

3. PRESSURE LOSS

The pressure drop is calculated according to the viscosity of **Greenway® Neo Heat Pump N** at the desired temperatures.

Compatibility lists (not exhaustive):

Material	Greenway Neo Heat Pump N
CR (Neoprene)	+
CSM (Hypalon)	+
EPDM	+
FPM (Viton)	+
NBR (Buna N)	+
PE_{HD}	+
PP	+
PTFE (Teflon)	+
PVC	+
PVDF	+
TS (Nitrile)	+
Fibre	X

Material	Greenway Neo Heat Pump N
Aluminium T356 (Al/Si)	+
Cast iron (Fe>2%)	+
Hastelloy (Nickel alloy)	+
Stainless steel 304	+
Stainless steel 316	+
Galvanised steel	-
Coated steel	-

+ = compatible
x = not recommended
- = not compatible

Once the installation is in service, APC* analysis (once a year) to check the main characteristics of the **Greenway® Neo Heat Pump N** is recommended to verify the condition and correct operation of the installation and prevent possible breakdowns or damage.

The data given (viscosity, specific heat, etc.) are intended to help the user in the application of the product. It is the user's responsibility to carry out any calculations (pressure drop, etc.) necessary for the correct operation of the installation.