



VIN-FP-592 / 002

climalife®



Nonfood Compounds
(HT1)

GREENWAY® NEO N



Non contractual photo

Greenway® Neo N is a renewable plant-based heat transfer fluid (1,3-propanediol and corrosion inhibitors), specially formulated for refrigeration, air conditioning, fire protection system circuits and heat pump installations (under-floor heating/cooling circuits).

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

Greenway® Neo N, registered in the HT1 category on the official NSF list, can be used as a heat transfer medium in circuits presenting a risk of accidental contact with food.

It contains no biocide, no volatile organic compounds and no Borax; a toxic additive according to the 30th European ATP (Adaptation to Technical Progress). The anti-corrosive H-OAT (neutralised carboxylic acids) formulation is nitrite and amine free.

The raw material of renewable plant origin and 1,3-propanediol, has a lower viscosity than MPG (Mono Propylene Glycol).

1. **USE:** The dilution must be prepared with demineralised water.

Prepare the **Greenway® Neo N** solution at a minimum concentration of 40% by volume for optimum corrosion protection and fill the installation through the drain point.

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 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 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 Deoxidiser P* (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 N

Appearance	Green liquid
Density at 20°C (AFNOR NF R 15-602-1 / ASTM D 1122).....	1.053 ± 0.002 kg/dm ³
pH (AFNOR NF T 90 008 / ASTM D 1287)	
at 50% by volume in water	8.5 to 9.5
at 33% by volume in water	8.0 to 9.0
Alkaline Reserve (AFNOR NF T 78-101 / ASTM D 1121) (ml HCl N/10 for 10 ml of GREENWAY® NEO N)	≥ 9 ml
Freezing point °C (AFNOR NF T 78-102 / ASTM D 1177)	
Pure product	- 55 ± 2°C
at 50 % by volume in water	- 15 ± 2°C
Boiling point °C (AFNOR R 15-602-4 / ASTM D 1120)	
at atmospheric pressure	111 ± 2°C

3. PROPERTIES OF GREENWAY® NEO N SOLUTIONS

Greenway® Neo N is miscible with water in all proportions.

3.1. Freezing point of Greenway® Neo N solutions (in °C)

The freezing points indicated correspond to the formation of a crystalline mix.

GREENWAY® NEO N concentration (as a % of volume)	40	45	50	55	60	65	70	75	80	85	90	95	100
Freezing point in °C ± 2	-11	-13	-15	-17	-20	-23	-26	-30	-34	-39	-44	-49	-55

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

NB: we recommend using Greenway® Neo N with a minimum concentration of 40% for optimum corrosion protection.

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



Frost and corrosion protection

Loss of **Greenway® Neo N**, even when brought to boiling point, is virtually nil due to its low volatility and because it does not form an azeotrope with water.

Closed, non-leaking systems prevent the water from evaporating and preserve the antifreeze power of **Greenway® Neo N**.

For installations with an expansion tank and venting, maintain the pressure gauge by adding water and **Greenway® Neo N** to maintain the correct concentration.

Concentration can be checked by measuring the density.

In all cases, the concentration of **Greenway® Neo N** must be checked at least once a year by measuring its density at 20°C with a suitable hydrometer or the freezing point with a suitable refractometer .

It is essential to check the pH of **Greenway® Neo N** in service, external corrosion of the pipes and areas of poor circulation or blocked valves.

3.2. Density of Greenway® Neo N at 20°C (in kg/m³)

Greenway® Neo N Concentration as a % of volume	Density of the solution kg/dm3
40	1.022
45	1.025
50	1.028
55	1.030
60	1.033
65	1.036
70	1.039
75	1.041
80	1.044
85	1.046
90	1.048
95	1.050
100	1.053

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

3.3. Boiling points of Greenway® Neo N (in °C)

Greenway® Neo N Concentration as a % of volume	40	50	55	60	65	70	75	80
Boiling point (in °C)	103	103	104	104	105	105	106	107

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



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3.4. Density relative to the temperature of Greenway® Neo N (in kg/dm³)

Greenway® Neo N Concentration as a % of volume	40	50	60	70	80	90	100							
Temperature in °C	FREEZING ZONE													
-55														1.150
-50														1.100
-40													1.085	1.091
-30												1.071	1.077	1.083
-20			1.052	1.058	1.065	1.070	1.076							
-10	1.033	1.040	1.046	1.053	1.058	1.064	1.069							
0	1.029	1.035	1.041	1.047	1.053	1.058	1.063							
10	1.024	1.030	1.036	1.042	1.048	1.053	1.058							
20	1.022	1.028	1.033	1.039	1.044	1.048	1.053							
30	1.019	1.024	1.029	1.034	1.038	1.043	1.048							
40	1.016	1.021	1.026	1.030	1.035	1.039	1.044							
50	1.013	1.018	1.023	1.028	1.032	1.037	1.042							
60	1.010	1.015	1.020	1.025	1.029	1.034	1.039							
70	1.007	1.012	1.017	1.022	1.026	1.031	1.036							
80	1.004	1.009	1.014	1.019	1.023	1.028	1.033							
90	1.000	1.005	1.010	1.015	1.019	1.024	1.029							
100	0.997	1.002	1.007	1.012	1.016	1.021	1.026							

Library data provided for information purposes.

3.5. Kinematic viscosity of Greenway® Neo N (in cSt)*

Greenway® Neo N Concentration as a % of volume	40	50	60	70	80	90	100							
Temperature in °C	FREEZING ZONE													
-55														1810.02
-50														1390.81
-40													358.54	544.02
-30												98.15	154.84	266.71
-20			27.48	35.44	47.94	67.94	100.76							
-10	9.91	11.81	14.65	18.87	25.23	35.01	50.34							
0	6.21	7.76	9.69	12.08	15.03	18.67	23.17							
10	3.79	4.81	6.02	7.43	9.03	10.83	12.81							
20	2.45	3.04	3.84	4.94	6.45	8.56	11.54							
30	1.90	2.31	2.86	3.57	4.53	5.83	7.59							
40	1.49	1.78	2.15	2.65	3.32	4.24	5.49							
50	1.18	1.40	1.68	2.03	2.48	3.06	3.80							
60	0.94	1.12	1.34	1.62	1.96	2.40	2.95							
70	0.82	0.97	1.14	1.36	1.63	1.96	2.38							
80	0.67	0.77	0.89	1.06	1.27	1.56	1.94							
90	0.58	0.67	0.78	0.91	1.07	1.27	1.50							
100	0.49	0.56	0.64	0.74	0.88	1.07	1.33							

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3.6. Specific heat of Greenway® Neo N (in kJ. kg⁻¹.K⁻¹)*

Greenway® Neo N Concentration as a % of volume	40	50	60	70	80	90	100							
Temperature in °C	FREEZING ZONE													
-55														1.964
-50														2.016
-40													2.479	2.122
-30												2.890	2.576	2.227
-20			3.483	3.249	2.979	2.674	2.332							
-10	3.901	3.746	3.556	3.330	3.068	2.771	2.438							
0	3.957	3.811	3.629	3.411	3.157	2.868	2.543							
10	4.013	3.875	3.701	3.491	3.246	2.965	2.648							
20	4.070	3.939	3.774	3.572	3.335	3.062	2.753							
30	4.126	4.004	3.846	3.653	3.424	3.159	2.859							
40	4.182	4.068	3.919	3.734	3.513	3.256	2.964							
50	4.238	4.133	3.991	3.815	3.602	3.353	3.069							
60	4.294	4.197	4.064	3.895	3.691	3.451	3.175							
70	4.351	4.262	4.137	3.976	3.780	3.548	3.280							
80	4.407	4.326	4.209	4.057	3.869	3.645	3.385							
90	4.463	4.390	4.282	4.138	3.958	3.742	3.491							
100	4.519	4.455	4.354	4.218	4.047	3.839	3.596							

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3.7. Thermal conductivity of Greenway® Neo N (in W.m⁻¹.K⁻¹)*

Greenway® Neo N Concentration as a % of volume	40	50	60	70	80	90	100							
Temperature in °C	FREEZING ZONE													
-55														0.275
-50														0.280
-40													0.302	0.288
-30												0.327	0.310	0.295
-20			0.373	0.354	0.336	0.318	0.302							
-10	0.429	0.406	0.385	0.364	0.344	0.325	0.307							
0	0.443	0.418	0.395	0.372	0.351	0.331	0.312							
10	0.456	0.429	0.404	0.380	0.358	0.336	0.317							
20	0.467	0.439	0.412	0.387	0.363	0.341	0.320							
30	0.478	0.448	0.420	0.393	0.368	0.345	0.323							
40	0.487	0.456	0.426	0.398	0.372	0.347	0.325							
50	0.495	0.462	0.431	0.402	0.375	0.350	0.326							
60	0.503	0.468	0.436	0.406	0.378	0.351	0.327							
70	0.509	0.473	0.440	0.409	0.379	0.352	0.327							
80	0.515	0.478	0.443	0.410	0.380	0.352	0.327							
90	0.519	0.481	0.445	0.412	0.381	0.352	0.326							
100	0.522	0.483	0.446	0.412	0.380	0.351	0.323							

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4. PRESSURE LOSS

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

Compatibility lists (not exhaustive):

Material	Greenway® Neo 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 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 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.

The information contained in this product data sheet is the result of our studies and experience. It is given in good faith, but can under no circumstances constitute a guarantee on our part, nor engage our responsibility, particularly in the event of infringement of the rights of third parties, nor in the event of failure on the part of the users of our products to comply with the regulations in force concerning them.

