



Heat transfer fluids

GREENWAY® NEO N



Nonfood Compounds
(HT1)



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.

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).

Greenway® Neo N is bacteriostatic in accordance with ISO 11930: its formula prevents the development of bacteria, mould, fungi and algae, all of which affect the flow and heat exchange in networks.

Greenway® Neo 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 N** was found to biodegrade between 90% and 100% in 28 days.



1. USE :

We recommend preparing the Greenway® Neo N solution with demineralised water, at a minimum concentration of 40% by volume for optimum protection against corrosion, before filling the installation via 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 **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.

Use **Nettoyant N*** Cleaner to clean a component or piping in a refrigerant installation prior to changing the heat transfer fluid.

*** 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

N.B. : 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 / dm ³
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	85
Boiling point (in °C) ± 1	103	103	104	104	105	105	106	107	108

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



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							
-55							1.150
-50	FREEZING ZONE						
-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							
-55							1810.02
-50	FREEZING ZONE						
-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

Library data provided for information purposes.



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 en °C	FREEZING ZONE												
-55													1.964
-50													2.016
-40													2.479
-30												2.890	2.576
-20										3.483	3.249	2.979	2.674
-10	3.901	3.746	3.556	3.330	3.068	2.771							
0	3.957	3.811	3.629	3.411	3.157	2.868							
10	4.013	3.875	3.701	3.491	3.246	2.965							
20	4.070	3.939	3.774	3.572	3.335	3.062							
30	4.126	4.004	3.846	3.653	3.424	3.159							
40	4.182	4.068	3.919	3.734	3.513	3.256							
50	4.238	4.133	3.991	3.815	3.602	3.353							
60	4.294	4.197	4.064	3.895	3.691	3.451							
70	4.351	4.262	4.137	3.976	3.780	3.548							
80	4.407	4.326	4.209	4.057	3.869	3.645							
90	4.463	4.390	4.282	4.138	3.958	3.742							
100	4.519	4.455	4.354	4.218	4.047	3.839							

Library data provided for information purposes.

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
-30												0.327	0.310
-20										0.373	0.354	0.336	0.318
-10	0.429	0.406	0.385	0.364	0.344	0.325							
0	0.443	0.418	0.395	0.372	0.351	0.331							
10	0.456	0.429	0.404	0.380	0.358	0.336							
20	0.467	0.439	0.412	0.387	0.363	0.341							
30	0.478	0.448	0.420	0.393	0.368	0.345							
40	0.487	0.456	0.426	0.398	0.372	0.347							
50	0.495	0.462	0.431	0.402	0.375	0.350							
60	0.503	0.468	0.436	0.406	0.378	0.351							
70	0.509	0.473	0.440	0.409	0.379	0.352							
80	0.515	0.478	0.443	0.410	0.380	0.352							
90	0.519	0.481	0.445	0.412	0.381	0.352							
100	0.522	0.483	0.446	0.412	0.380	0.351							

Library data provided for information purposes.



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	+
Hastelloy (Nickel alloy)	+
Stainless steel 304	+
Stainless steel 316	+
Galvanised steel	-
Coated steel	-

+ = compatible
 x = not recommended
 - = not compatible

Tests carried out on **Greenway® Neo N -30** :

Metals	Mass loss (mg / test tube)	Standard limits NF R 15-601	Standard limits ASTM D 3306
Copper	- 1.6	[- 5 ; +5]	[- 10 ; +10]
Solder	- 1.7	[- 5 ; +5]	[- 30 ; +10]
Brass	- 1.5	[- 5 ; +5]	[- 10 ; +10]
Steel	+ 0.3	[- 2,5 ; +2,5]	[- 10 ; +10]
Cast iron	+ 1.8	[- 4 ; +4]	[- 10 ; +10]
Aluminium	- 1.9	[- 10 ; +20]	[- 30 ; +30]

Normative references test method: AFNOR NF R 15-602-7 / ASTM D 1384

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.

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