



SOLUFLUID® HEAT PUMP



Non contractual photo.

SOLUFLUID® HEAT PUMP is a **READY-TO-USE** heat transfer fluid based on **MONOPROPYLENE GLYCOL** and corrosion inhibitors. It is suitable for ground source geothermal (buried collector circuits) and aérothermal Air to Water heat pump systems.

The **SOLUFLUID® HEAT PUMP** formula contains no Borax, an additive now classified as toxic by the 30th ATP (Adaptation to Technical Progress).

The corrosion inhibition technology used in **SOLUFLUID® HEAT PUMP** is organic, based on neutralised carboxylic acids, without phosphates, nitrites or amines. These anti-corrosion agents provide a long lasting protection.

SOLUFLUID® HEAT PUMP offers very efficient protection against frost and gives strong protection against corrosion of the metals present in the different circuits (steel, aluminium, copper, brass, solder, etc.). It therefore avoids any formation of sludge within the pipework.

The **SOLUFLUID® HEAT PUMP** formula is **authorised by the General Directorate of Health, in compliance with the advice from ANSES (ex AFSSA)**, as a heat transfer fluid for thermal exchange in single exchange domestic water production systems.

SOLUFLUID® HEAT PUMP can be identified by its green colour.



1. PHYSIOCHEMICAL PROPERTIES OF SOLUFLUID® HEAT PUMP

- Appearance green liquid
- Density (AFNOR NF R 15-602-1 / ASTM D 1122) 1,040 ± 0,005 kg/dm³
- Boiling temperature °C (AFNOR NF R 15-602-4 / ASTM D 1120)
at atmospheric pressure 104 ± 2°C
- pH (AFNOR NF T 90-008 / ASTM D 1287) 7,5 to 9
- Alkaline reserve on 10 ml product (AFNOR NF T 78-101 / ASTM D 1121) ≥ 3
- Freezing point °C (AFNOR NF T 78-102 / ASTM D 1177) - 25 ± 2°C
(formation of a crystalline mixture and not a measurement in compact mass)

1.1. Density of Solufluid® Heat Pump based on temperature (kg/dm³)

| | | | | | | | | | |
|-------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Temperature (°C) | - 20 | - 10 | 0 | + 10 | + 20 | + 40 | + 60 | + 80 | + 100 |
| Density (kg/dm ³) | 1,055 | 1,053 | 1,049 | 1,045 | 1,040 | 1,027 | 1,013 | 0,998 | 0,981 |

1.2. Kinematic viscosity of Solufluid® Heat Pump based on temperature (centistokes)

| | | | | | | | | | |
|------------------|-------|-------|-------|------|------|------|------|------|-------|
| Temperature (°C) | - 20 | - 10 | 0 | + 10 | + 20 | + 40 | + 60 | + 80 | + 100 |
| Viscosity (cSt) | 57.00 | 27.80 | 15.00 | 8.80 | 5.60 | 2.70 | 1.60 | 1.00 | 0.80 |

1.3. Specific heat of Solufluid® Heat Pump based on temperature (kJ. kg⁻¹.K⁻¹)*

| | | | | | | | | | |
|---|------|------|------|------|------|------|------|------|-------|
| Temperature (°C) | - 20 | - 10 | 0 | + 10 | + 20 | + 40 | + 60 | + 80 | + 100 |
| Specific heat (kJ.kg ⁻¹ .K ⁻¹) | 3.53 | 3.56 | 3.59 | 3.62 | 3.65 | 3.71 | 3.78 | 3.84 | 3.90 |

1.4. Thermal conductivity of Solufluid® Heat Pump based on temperature (W.m⁻¹.K⁻¹)*

| | | | | | | | | | |
|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Temperature (°C) | - 20 | - 10 | 0 | + 10 | + 20 | + 40 | + 60 | + 80 | + 100 |
| Thermal conductivity (W.m ⁻¹ .K ⁻¹) | 0.404 | 0.404 | 0.404 | 0.404 | 0.403 | 0.402 | 0.401 | 0.403 | 0.407 |



1.5. Vapour pressure of Solufluid® Heat Pump based on temperature (bar)

| | | | | | | | | | | | | | |
|-----------------------|-----|-----|-----|------|------|------|------|------|------|------|------|-------|-------|
| Temperature (°C) | 50 | 70 | 90 | 110 | 120 | 130 | 140 | 150 | 160 | 170 | 180 | 190 | 200 |
| Vapour pressure (bar) | 0.1 | 0.2 | 0.5 | 1.10 | 1.60 | 2.20 | 3.00 | 4.00 | 5.20 | 6.80 | 8.70 | 11.00 | 13.80 |

*Indicative library data.

2. PROTECTION OF METALS PROVIDED BY SOLUFLUID® HEAT PUMP

The table below shows a comparison of corrosion measurements of different metals when in contact with tap water and **SOLUFLUID® HEAT PUMP**.

| Metals (weight loss in mg/test tube) | Tap water | SOLUFLUID® HEAT PUMP |
|---|-----------|-----------------------------|
| COPPER | 3 | ± 2 |
| SOLDER | 100 | ± 4 |
| BRASS | 4,5 | ± 2 |
| STEEL | 700 | ± 1 |
| CAST IRON | 775 | ± 2 |
| ALUMINIUM | 120 | ± 8 |

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

The above values are obtained by performing the test with antifreeze base concentrate.

3. CHARGE LOSS

When calculating the performance of an installation it is necessary to take into account the viscosity of **SOLUFLUID® HEAT PUMP**, especially for the calculation of charge loss.



4. RECOMMENDATIONS FOR USE OF SOLUFLUID® HEAT PUMP

It is strongly recommended that the installations be thoroughly cleaned with Dispersant D** before filling them with the **SOLUFLUID® HEAT PUMP** mixture if they contain deposits and especially metal oxides.

In fact, glycol solutions have an important wetting power and can dislodge pre-existing deposits (e.g: rust, etc) which can be responsible for sludge creation.

Cleaning should be done in the following manner:

- Circulate the water in the circuit for 1 to 2 hours, then drain the installation quickly and fully at the lowest point.
- Prepare and introduce a "dispersant D**" solution at 20 g/litre of water in the installation.
- Let the product circulate for at least 2 hours.

- Carefully and adequately rinse with water.

Depending on the state of the circuit, it may be necessary to clean several times. It is important to drain and carefully rinse with water after each time it has been cleaned.

If an older installation has a high build-up of sludge, Thermonett® Sludge Remover can be an effective cleaner. Contact your Climalife sales representative for more information.

SOLUFLUID® HEAT PUMP must not be used with galvanized steel.

*** Marketed by Climalife.*

*** The data stated in this document is merely indicative and does not constitute a sales specification.**

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