



## **SOLUFLUID® HEAT PUMP**



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

The **SOLUFLUID® HEAT PUMP** formula is free of Borax, component recently classified as Toxic following the 30<sup>th</sup> European Adaptation to Technical Progress.

**SOLUFLUID® HEAT PUMP** offers a very efficient protection against frost (-25°C) and a reinforced protection against corrosion of the metals present in the different circuits (steel, aluminium, copper, brass, soldering, etc.). Therefore avoids any formation of mud within the piping.

The anti-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.

The **SOLUFLUID® HEAT PUMP** formula is **authorised by the General Directorate of Health, in compliance with the advice from the French Agency for Food Sanitary Security**, as a heat transfer fluid for thermal exchange in single exchange domestic water production systems, until a maximal concentration of 60% in volume.

The green colouring makes it immediately identifiable.

**SOLUFLUID® HEAT PUMP** can also be used for traditional central heating systems.

## 1. PHYSICOCHEMICAL PROPERTIES OF SOLUFLUID® HEAT PUMP

Appearance .....	green liquid
Density at 20°C (AFNOR NF R 15-602-1).....	1,040 ± 0,005 kg/dm <sup>3</sup>
Boiling temperature °C (AFNOR R 15-602-4) at atmospheric pressure .....	104 ± 2°C
pH (AFNOR NF T 78-103) .....	7,5 to 8,5
Alkaline reserve on 20 ml product (AFNOR NF T 78-101).....	≥ 7
Surface tension at 25°C .....	32 dyne/cm
Freezing point °C (AFNOR NF T 78-102) .....	- 25 ± 2°C (formation of a crystalline mixture and not a measurement in compact mass)

### 1.1. Cinematic viscosity of SOLUFLUID® HEAT PUMP based on temperature (centistokes)

Temperature (°C)	- 20	- 10	0	+ 10	+ 20	+ 40	+ 60	+ 80	+ 100
Viscosity (cSt)	46	21,3	12	6,9	4,1	2,1	1,2	0,9	0,55

### 1.2. Specific heat of SOLUFLUID® HEAT PUMP based on temperature

Temperature (°C)	- 20	- 10	0	+ 10	+ 20	+ 40	+ 60	+ 80	+ 100
Specific heat (kJ.kg <sup>-1</sup> .K <sup>-1</sup> )	3.71	3.71	3.72	3.73	3.75	3.79	3.84	3.90	3.98

### 1.3. Thermal conductivity SOLUFLUID® HEAT PUMP based on temperature

Temperature (°C)	0	50	80	100	120
Thermal conductivity (W.m <sup>-1</sup> .K <sup>-1</sup> )	0.42	0.42	0.43	0.43	0.43

### 1.4. Vapour pressure of SOLUFLUID® HEAT PUMP

Temperature (°C)	104	111	116	121	125	129	133	136	139	149	158	165	171
Vapour pressure (bar)	1.013	1.27	1.52	1.77	2.03	2.28	2.53	2.79	3.04	4.05	5.07	6.08	7.09



## **2. PROTECTION OF METALS PROVIDED BY SOLUFLUID® HEAT PUMP (TEST NF R 15 602-7)**

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

Metals (weight loss in mg/test tube)	Tap water	<b>SOLUFLUID® HEAT PUMP</b>
COPPER	3	2
SOLDERING	100	3
BRASS	4,5	2
STEEL	700	1
CAST IRON	775	1
ALUMINIUM	120	2

## **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 many deposits and especially metal oxides.

It is to be done in the following manner:

- make the circuit circulate water for 1 to 2 hours, then drain the installation quickly and fully to the lowest point.
- prepare and put "**dispersant D\***" solution at 20 g/litre of water in the installation
- let the product circulate for at least 2 hours,
- adequately and carefully rinse with water.

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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 every time it has been cleaned.

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

\* Marketed by **Climalife**.

**\* The data stated in this document are merely indicative and do not constitute a sales specification.**

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Direction et services : 26, avenue du Petit Parc - 94683 Vincennes Cedex  
Tél. : 01 43 98 75 00 – Fax : 01 43 98 21 51  
E-mail : [contact@climalife.dehon.com](mailto:contact@climalife.dehon.com)

Siège social : 4, rue de la Croix-Faubin - 75011 Paris  
[www.climalife.dehon.com](http://www.climalife.dehon.com)

Corporation with Executive and Supervisory Board at a capital of 5.100.000 €- 310 259 205 CTR Paris