

# GLACELF PLUS



**GLACELF PLUS** is a “**long life**” antifreeze based upon monoethylene glycol and **inorganic corrosion inhibitors (silicates)**, a long proven coolant and heat transfer technology.

**GLACELF PLUS** antifreeze, when mixed with an appropriate quantity of water, becomes a coolant fluid recommended for all cooling circuits in internal combustion engines in cars and vans, trucks, construction machinery and agricultural tractors. It contains also an organic inhibitor, it is a semi-organic technology.

In accordance with French Decree No. 95-326 of 20<sup>th</sup> March 1995 concerning the distribution of certain substances containing monoethylene glycol, **GLACELF PLUS** contains **an additive to give it a bitter taste** as a guarantee against accidental ingestion by children or users.

**GLACELF PLUS** is the semi organic product in our range of antifreezes

## APPLICATIONS

**Dilution in demineralised or softened water**

**Minimum 33%**

**Maximum 70%**

**Lifetime**

● **GLACELF PLUS** is diluted in demineralised water (< 8°F) to form a **permanent coolant fluid** that can be used throughout the year, giving effective protection against engine freezing or overheating.

● To obtain a coolant perfectly mixed, it is recommended **to mix mechanically** the antifreeze with the water. Protection against freezing depends upon the proportions of **GLACELF PLUS** in the water.

| % by vol. of <b>GLACELF PLUS</b>                              | 33  | 40  | 50  | 68  |
|---|-----|-----|-----|-----|
| Temperature at which crystals first appear, °C, (NF T 78 102) | -20 | -26 | -37 | -69 |

These are mean values provided for indicative purposes only

● It is recommended that at least 30% of the final solution should be **GLACELF PLUS**.

Maximum protection against freezing is obtained at 68%.

**Do not use in proportions above 70%**

● **GLACELF PLUS** is effective:

- over at least **250,000 km** (3000 hours) when used in trucks

- over at least **100,000 km** (800 hours) in cars.

It is recommended that the coolant fluid should be replaced **every 3 years** or at the mileage limits given above

The antifreeze **GLACELF PLUS**, meets the *international specifications* concerning antifreeze, and the tenders of the important vehicle manufacturers.

## SPECIFICATIONS

AFNOR NFR 15-601

ASTM D 3306

ASTM D4656

ASTM D4985

BS 6580

GM 1825M

TL 774 B/C

Man 324

## CUSTOMER BENEFITS

The function of a coolant fluid

Protection against corrosion

**Laboratory test :**  
250 ml antifreeze\*  
500 ml corrosive water  
336 hours  
6l/h air  
88°C

● **GLACELF PLUS** has been approved by the following manufacturers

- FORD
- BMW
- MAN
- VOLKSWAGEN
- PORSCHE

● **GLACELF PLUS** meets the requirements of the following manufacturers

- ROVER
- CHRYSLER EUROPE
- JAGUAR
- OPEL-GM
- SAAB
- AUDI
- SEAT
- SKODA

● *In a petrol or diesel engine, some 30 to 40% of the heat produced in combustion is not converted into motion power and has to be dissipated. An engine's cooling system must be capable of removing this excess heat together with that due to friction of the moving parts. The coolant fluid cools the different parts of the engine by heat transfer and then gives up heat in the radiator.*

● *Running an engine without coolant for only a few minutes is sufficient to cause piston seizing and cracks in the cylinder head owing to heat not being removed.*

● **GLACELF PLUS** provides an effective solution to the problems of corrosion affecting all materials used in cooling circuits.

**Table 1 : ASTM D1384, Glassware corrosion test**

|                      | Laiton | Cuivre | Soudure | Acier | Fonte Fe | Aluminium |
|----------------------|--------|--------|---------|-------|----------|-----------|
| GM 1825M (max.)      | 10     | 10     | 20      | 10    | 10       | 20        |
| ASTM D 4985 (max.)   | 10     | 10     | 30      | 10    | 10       | 30        |
| ASTM D 3306 (max.)   | 10     | 10     | 30      | 10    | 10       | 30        |
| <b>GLACELF PLUS*</b> | -2     | -2     | +3      | +1    | +1       | 0         |

● **GLACELF PLUS** performs well in the corrosion tests required by the specifications: hot plate and glassware corrosion

● *Air or gas can enter a circuit in various ways, and then exacerbates the phenomenon of cavitation; also the presence of oxygen in the circuit can*

**Protection against the corrosion of metals, especially aluminium**

**Protection of aluminium water pumps against corrosion and erosion due to cavitation**

**Optimised physical chemical properties**

*affect the performance of corrosion inhibitors.*

● **GLACELF PLUS** gives excellent protection against cavitation that can perforate liners and cause water pump faults.

● In the very severe **ASTM D 2809** test on an aluminium water pump – a test of corrosion-erosion caused by cavitation – **GLACELF PLUS** obtained a **score of 9/10**.

● The additives in **GLACELF PLUS** give the coolant fluid a **reserve of alkalinity** (to neutralise the acids resulting from the combustion gases), **resistance to foaming** (mainly instability of the foam that might form) and **compatibility with hard water (maximum 40°F)**.

The coolant fluids obtained by diluting **GLACELF PLUS** are also inert to elastomeric seals and paints.

*We remind you that antifreezes and coolant fluids containing monoethylene glycol should not be poured into the drains. They are regarded as special industrial wastes (potentially hazardous to man and the environment) and should be destroyed by approved disposal centres.*

## CHARACTERISTICS

The typical characteristics mentioned represent mean values

| <b>GLACELF PLUS</b>                          |             |               |
|--|-------------|---------------|
| Colour                                       |             | Blue green    |
| Specific gravity at 15 °C                    | ASTM D1122  | 1.129         |
| pH (undiluted)<br>pH, 50% dilution by volume | ASTM D1287  | 8.4           |
| Alcalinity reserve(pH 5.5)                   | ASTM D 1121 | 17ml HCl 0.1N |
| Temperature at which crystal appear          | ASTM D1177  | -37°C         |
| Boiling temperature                          | ASTM D1120  | 174°C         |