Freecor® FGC

1 Description

Freecor® FGC is used as a cooling and heat transfer fluid in internal combustion engines. Excess heat is transferred via the fluid to the radiator where the mixture is cooled by means of airflow. To protect the engine and cooling system from corrosion and frost damage, a coolant concentrate is added to the cooling water. **Freecor® FGC** is a coolant concentrate based on OAT technology in ethylene glycol. **Freecor® FGC** is free from potentially harmfull additives such as nitrites, amines and phosphates and as such contributes to a safer environment.

2 Benefits

Freecor® FGC offers following benefits to the user:

- **Corrosion protection**, including non-ferrous metals
- **Frost protection**
- **Boiling protection**
- **Miscibility** with other engine coolants
- **Hard water stability** (silicate and phosphate free)

3 Application

Freecor® FGC provides year-round frost and corrosion protection. It is recommended to use at least 33 vol. % of **Freecor® FGC** in the cooling solution. This concentration will provide a freezing point down to -18°C. Concentrations higher than 70 vol. % are not recommended.

dilution vol % **Freecor® FGC**	freeze point °C (ASTM D1177)	dilution vol % **Freecor® FGC**	freeze point °C (ASTM D1177)
35.4	- 20	48.9	- 35
40.3	- 25	52.5	- 40
44.8	-30	55.8	- 45

4 Proof of Performance & Standards

Freecor® FGC has been used in an extensive range of automotive applications. Over the past 5 years more than 200,000 tons of **Freecor® FGC** has been sold into the market (This is equivalent to filling approximately 50 million passenger car cooling systems). **Freecor® FGC** has proven to offer protection for in excess of 80,000km in automotive applications.

Freecor® FGC conforms to British Standard BS 6580:2010*, ASTM D3306 as well as to the requirements of the Chinese Industrial standard NB/SH/T 0521-2010 and National Standard GB 29743-2013 LEC.

Freecor® FGC meets the requirements of:

- AS 2108-2004
- CUNA NC 956-16 & 18 (Except RA)
- UNE 26-361-88/1

** For product containing 25% or more 1,2 ethane diol (MEG) which is supplied as packaged goods intended for retail to the general public, BS 6580:2010 requires the addition of minimum 25 ppm of denatonium benzoate (bitterant),or the package has to be fitted with a childproof closure.*

5 Compatibility and mixability

As for any coolant, Arteco recommends the the use of deionised or distilled water to prepare the ready-to-use dilutions for optimal performance and controlled quality.

We refer to our dedicated product information leaflet for water quality recommendations. Contact your local area sales manager for more information.

6 Availability

Freecor® FGC is available in various packaging options, in different colors and with/without bittering agent. Please contact your local area sales manager on availability of packages, dilutions and colors or customer adapted variants.

7 Storage and requirements

The product should be stored above -20°C and preferably at ambient temperatures. Periods of exposure to temperatures above 35°C should be minimized.
Further, it is strongly advised not to expose the coolant in translucent packages to direct sunlight because this can degrade the colour dyes present in the coolant, and result in fading of the colour or discoloration over time. This reaction can be accelerated if coupled with high ambient temperatures. It is therefore advisable to store coolant filled in translucent packages indoors to avoid this issue. **Freecor® FGC** can be stored for minimum 3 years in unopened containers without any effect on the product quality or performance. It is strongly recommended to use new containers and not recycled ones.

As with any antifreeze coolant, the use of galvanized steel is not recommended for pipes or any other part of the storage/mixing installation.

8 Toxicity & Safety

For Toxicity and Safety Data we refer to the Material Safety Data Sheet. The information and advice given should be observed and due attention should be given to the precautions necessary for handling chemicals. This product should not be used to protect the inside of drinking water systems against freezing. The transport is not regulated.

The information contained in this Product Information Leaflet is intended to provide the customer and/or end-user with an understanding of the properties of the product, it being understood that this information may not be construed as any express or implied warranty that the product is suitable for a specific use or application.
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Version 06/2022-v05.5

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Addendum – Technical information

Chemical and physical properties **Freecor® FGC**

		specification limits		
	Freecor® FGC	BS 6580	NB/SH/T 0521-2010	method
appearance	clear liquid	clear liquid		visual
density 20°C, kg/l	1.112 typ	-	1.107 – 1.142	ASTM D1122 SH/T0068
refractive Index, 20°C	1.430 typ	-		ASTM D1218
pH (33 vol %)	8.4 typ	-	7.5 – 11.0	ASTM D1287 SH/T0069
freezing point, °C (50 vol %)	-36.6 typ	-33.0 max	-36.4 max	ASTM D1177 SH/T0090
reserve alkalinity (pH 5.5)	3.3 typ	-		ASTM D1121
foaming properties at 88°C				
■ foam, ml	50 max	50	150	ASTM D1881
■ break time, sec	5 max	5	5	SH/T0066

Chemical and physical properties **dilutions**

	50 % dilution	40 % dilution	33 % dilution	method
pH	8.5	8.4	8.4	ASTM D1287
Freezing point	-36°C typ.	-25 ° typ.	-18° typ.	ASTM D3321*
Density, 20°C, kg/l	1.066 typ.	1.054 typ.	1.044 typ.	ASTM D5931
Reserve alkalinity (pH 5.5)	1.7 typ.	1.4 typ.	1.1 typ.	ASTM D1121
Refractive Index, 20°C	1.384 typ.	1.374 typ.	1.367 typ.	ASTM D1218

** Freezing point measurement by means of a hand refractometer*

Freecor® FGC

BS 5117: 2.2 hot immersion glassware corrosion test

ASTM D1384 is almost identical to BS 5117:2.2

	weight loss in mg/coupon[1]					
	Brass	Copper	Solder	Steel	Cast iron	Aluminium
ASTM D3306 (max)	10	10	30	10	10	30
BS 6580 : 1992 (max)	10	10	15	10	10	15
Freecor® FGC (typ)	0.5	0.5	4.9	0.7	0.3	3.0

[1] weight loss AFTER chemical cleaning acc. to ASTM procedure. Weight gain is indicated by a - sign.

ASTM D4340 aluminium heat transfer test

ASTM D4340 is almost identical to BS 5117:2.6

	weight loss in mg/cm²/week
ASTM D3306 (max)	1.0
BS 6580 (max)	1.0
Freecor® FGC (typ)	0.3