FC G 20 Data Sheet

TI/EVO 1656 e July 2018
Supersedes edition of January 2016

GLYSANTIN® FC G 20 is a corrosion inhibited ready-to-use coolant based on ethylene glycol, exhibiting a very low electrical conductivity.

Properties

GLYSANTIN® FC G 20 has been developed especially for the fuel cell systems like PEMFC[1]. It must not be used as engine coolant in conventional combustion engines. Conventional engine coolants having a very high electrical conductivity are not allowed in fuel cell cooling circuits.

Due to the selected non-ionic inhibitors used in GLYSANTIN® FC G 20, it exhibits a very low long-term stable electrical conductivity. This assures safe operation of the fuel cell power unit.

GLYSANTIN® FC G 20 offers a safe freeze protection down to -36°C and good heat dissipation. Metals, which are currently employed in the construction of PEMFC cooling systems are well protected against corrosion.

[1] (Proton Exchange Membrane = Polymer Electrolyte Membrane Fuel Cell)

Chemical nature

Monoethylene glycol with corrosion inhibitors

Appearance

Clear colorless liquid without solid contaminants.

Physical data

Density at 20 °C	ca. 1.065 g/cm³	ISO 12185
Viscosity at 0 °C		ASTM D 445
At 0 °C	ca. 7.55 mm²/s	
At 20 °C	ca. 3.52 mm²/s	
At 40 °C	ca. 1.98 mm²/s	

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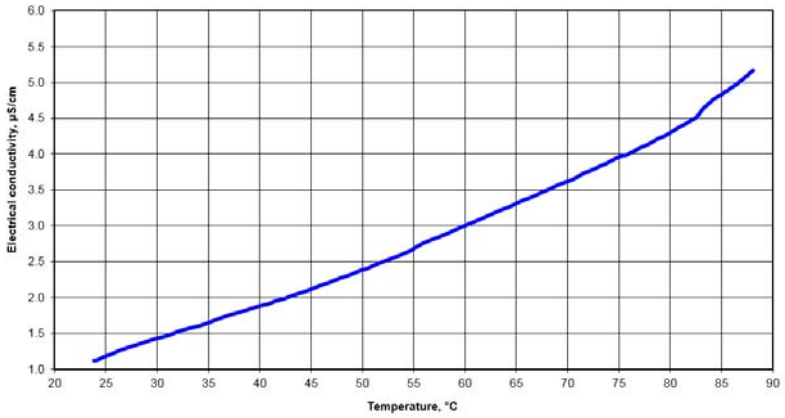
At 60 °C	ca. 1.29 mm²/s	
At 80 °C	ca. 0.91 mm²/s	
pH value	ca. 6	ASTM D1287
Refractive index, 20 °C	ca. 1.383	ASTM D 1218
Boiling Point	108°C	ASTM D 1120
Flash Point	none	ISO 2719
Pour Point	ca. -41°C	ASTM D 97
Freezing Point	ca. -36°C	ASTM D 1177
Electrical Conductivity		ASTM D 1125
(without temperature compensation)		
At 25 °C	ca. 1.3 µS/cm	
At 50 °C	ca. 2.4 µS/cm	
At 88 °C	ca. 5.2 µS/cm	



Stability

GLYSANTIN® FC G 20 operates at temperatures between -30°C and +90°C. In temperature range of -10°C to 90°C for 100 days resp. 2,500 h does not lead to any sediment, haze or other negative changes of the fluid in our tests.

Please take into account that the stability of the electrical conductivity depends on the materials used in the fuel cell cooling system and should be individually checked.

Application

GLYSANTIN® FC G 20 is ready-to-use and does not need any make-up water. It contains 48 % (vol/vol) ethylene glycol. Further dilution with distilled or demineralized water suppresses the electrical conductivity of this product and does not let it to exceed 2 µS/cm at 25°C. However, by addition of water corrosion protection decreases. The amount of water should be less than 10%. Addition of extra ethylene glycol slightly improves the frost protection but impairs the corrosion protection as well.

Miscibility

Mixing, this coolant, even in small amounts with conventional coolant/antifreeze or other ion-containing fluids disables this fuel cell coolant. Scrupulous cleanliness in terms of handling and application of GLYSANTIN® FC G 20 is indispensable to maintain the quality of the coolant. Close the GLYSANTIN® FC G 20 container tightly after usage.

Electrical conductivity

In contrast to deionized water (DI-water), GLYSANTIN® FC G 20 protects the system from frost. The electrical conductivity of GLYSANTIN® FC G 20 in comparison to non-inhibited ethylene glycol-water mixtures, remains quite steadily low. As a result, our product secures the electrical safety of the system and avoids loss of energy.

This performance is illustrated by the following test. The electrical conductivity of the system after addition of GLYSANTIN® FC G 20 has been remained low compared to ethylene glycol-water mixture.

The long-term protection of GLYSANTIN® FC G 20 may be prolonged by using a suitable mixed-bed ion exchanger in the coolant circuit.

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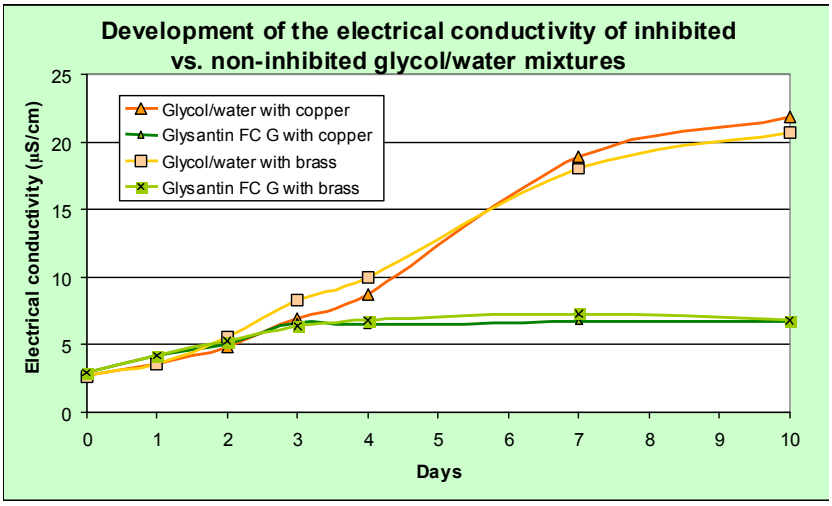

Material compatibility

As the development of fuel cell systems is a novel approach rather innovative, the compatibility of the coolant with construction constructed materials has to be tested for any the individual application.

The following types of construction materials have been tested with GLYSANTIN® FC G 20:

Compatible: Stainless steel, titanium, aluminum, copper, brass, graphite, PTFE, PE.

NotNon compatible: Zinc, galvanized steel, cast iron, carbon steel.

Polymer materials and elastomers often contain considerable amounts of fillers and additives, which might impact the electrical conductivity of

the coolant. Examples are EPDM, PVC, PA 66, silicone rubber, Viton, etc.

Quality Control

The above-listed data represent average values at the time of releasing this Data Sheet. They are intended as guide to facilitate handling this product and cannot be regarded as specified data. Specified product data are issued as a separate product specification.

Storage Stability

GLYSANTIN® FC G 20 may be stored in unopened, air-tight containers at a temperature of 30°C max. for 1 (one) year.
After one year, the applicability should be tested by measuring electrical conductivity and pH.

Do not use galvanized containers for storage, because they may corrode.

Color

GLYSANTIN® FC G 20 is usually available as colorless liquid.

Safety

When using this product, the information and advice given in our Material Safety Data Sheet should be observed. Due attention should also be given to the precautions necessary for handling chemicals.

Note

The data contained in this publication are based on our current knowledge and experience. In view of the many factors that may affect

processing and application of our product, these data do not relieve processors from carrying out their own investigations and tests; neither do these data imply any guarantee of certain properties, nor the suitability of the product for a specific purpose. Any descriptions, drawings, photographs, data, proportions, weights, etc. given herein may change without prior information and do not constitute the agreed contractual quality of the product. It is the responsibility of the recipient of our products to ensure that any proprietary rights and existing laws and legislation are observed.

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