

STRUB Antifreeze EV Micro 10

low electrical conductivity fuel cell coolant

Art.-No. 33812

Description

STRUB Antifreeze EV Micro 10 is a low electrical conductivity coolant mixture of ultrapure water and high purity ethylene glycol antifreeze. The coolant contains non-ionic additives for corrosion protection and electrical conductivity control. STRUB Antifreeze EV Micro 10 is compatible with stainless steel, aluminum, copper, brass and common elastomers and thermoplastics used in cooling systems. STRUB Antifreeze EV Micro 10 is specifically designed as a low electrical conductivity coolant for fuel cell applications.

Application

STRUB Antifreeze EV Micro 10 is designed as a liquid heat transfer medium for fuel cell applications. Its use is not intended for traditional and conventional engine coolant applications. The use of carbon steel alloys, cast iron, zinc and galvanized parts is not recommended.

Features and advantages

- 5-fold protection

Excellent flow properties

- Low viscosity
- Reduced back pressure
- Less wear of the parts, protection of the bipolar plate and crack prevention.

Operational reliability for the fuel cell

- Stable and low electrical conductivity ($< 5 \mu\text{S}/\text{cm}$)

Ready to use

- No further manipulation or dilution required

Compatibility

- Compatible with fuel cell cooling system components such as ion exchangers, radiators and hoses

Material protection

- Corrosion protection for fuel cell system components, e.g. stainless steel, aluminum, copper, brass and common elastomers as well as thermoplastics found in fuel cell cooling systems

Performance and specifications

STRUB Antifreeze EV Micro 10 is approved for:

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| <ul style="list-style-type: none">• Renault-Hyvia fuel cell hydrogen vehicles |
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The information in this technical data sheet is based on general knowledge and possible applications. Strub + Co. AG is not liable for damage resulting from improper use of the products. The measurement and production tolerances customary in the industry apply to the characteristic data given. In general, no legal binding force can be derived from these data. Our products are subject to continuous further development. Therefore, Strub + Co. AG reserves the right to change all technical data in this data sheet at any time and without prior notice.

Technical data

Features	Typical value	Unit	Specification
Appearance	Clear liquid		
Electrical conductivity (25°C)	< 2	μS/cm	ASTM D1125
Electrical conductivity (80°C)	< 5	μS/cm	ASTM D1125
Density (20°C)	1,065	g/ml	ASTM D5931
Density (80°C)	1,027	g/ml	ASTM D5931
pH value	5,0 - 7,0		ASTM D1287
Freezing point	-35	°C	ASTM D1177
Kinematic viscosity (20 °C)	3.6	mm /s ²	ASTM D445
Kinematic viscosity (80 °C)	1.0	mm /s ²	ASTM D445
Boiling point	108	°C	ASTM D1120
Pour Point	-46	°C	ASTM D97

Temperature	Density ASTM D5931	Specific heat	Thermal Thermal conductivity	Volume Extension
	Observed	Observed	Theoretical*	Theoretical*
°C	g/ml	kJ/kg.K	W/mK	V(T)/V(20°C)
0	1,077	3,28	0,381	0,99
20	1,065	3,35	0,392	1,00
40	1,052	3,42	0,403	1,01
60	1,040	3,49	0,415	1,02
80	1,027	3,56	0,426	1,04
100	1,014	3,64	0,437	1,05

* Ethylene glycol-water mixture with the same freezing point

Inhibitor stability

Stability testing of the inhibitor under heating conditions over an extended period of time shows that STRUB Antifreeze EV Micro 10 remains stable and maintains its electrical conductivity.

Bench test results - measurement of electrical conductivity in operation without ion exchanger

To test the limits of STRUB Antifreeze EV Micro 10, the coolant in a 70kW fuel cell stack was evaluated in 4 different test procedures: IV curve measurement, hot operation test (90°C), WLTP driving cycles and electrical conductivity stability tests. In this electrical conductivity stability test, which ran for 12 hours at 25 kW continuous power, the ion exchanger was bypassed. This demanding test cycle demonstrated excellent electrical conductivity stability compared to the initial electrical conductivity. The hot operation test demonstrated that STRUB Antifreeze EV Micro 10 has excellent resistance to thermal stress, a key element in maintaining the required low electrical conductivity. The test results also clearly showed that STRUB Antifreeze EV Micro 10 was able to maintain its performance, especially and most importantly that it retained its electrical conductivity under actual load conditions.

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