
Freecor[®] DSC

1 Description

Freecor[®] DSC - mixed with the appropriate amount of water - is used as a cooling and heat transferring fluid in combustion engines. The heat of the internal combustion is transferred via the fluid to the radiator where the mixture is cooled by means of airflow. **Freecor[®] DSC** is an ethylene glycol based

fluid that provides maintenance-free protection against *freezing and boiling* but also against *corrosion*. Extended coolant life, often for the whole life of the engine or vehicle, is obtained through the use of virtually non-depleting corrosion inhibitors.

2 Benefits

Freecor[®] DSC offers many benefits to the engine designer as well as to the user:

- **extended life** by the use of organic additive technology
- **improved heat transfer** leaves more flexibility to engine design
- **reduces repairs** to thermostat, radiator and water pump
- **reliability** depletion free and stable inhibitor
- **improved hard water stability** absence of silicates and phosphates
- **save time and money** maintenance-free coolant
- **environmentally friendly** by using carboxylic additives in the inhibitor package

Based on *silicate, nitrite and phosphate free* aliphatic additive technology, **Freecor[®] DSC** provides long-life corrosion protection for all engine metals, including aluminium and ferrous alloys. Excellent and lasting high temperature corrosion protection is provided for the aluminium heat transfer surfaces contained in modern engines.

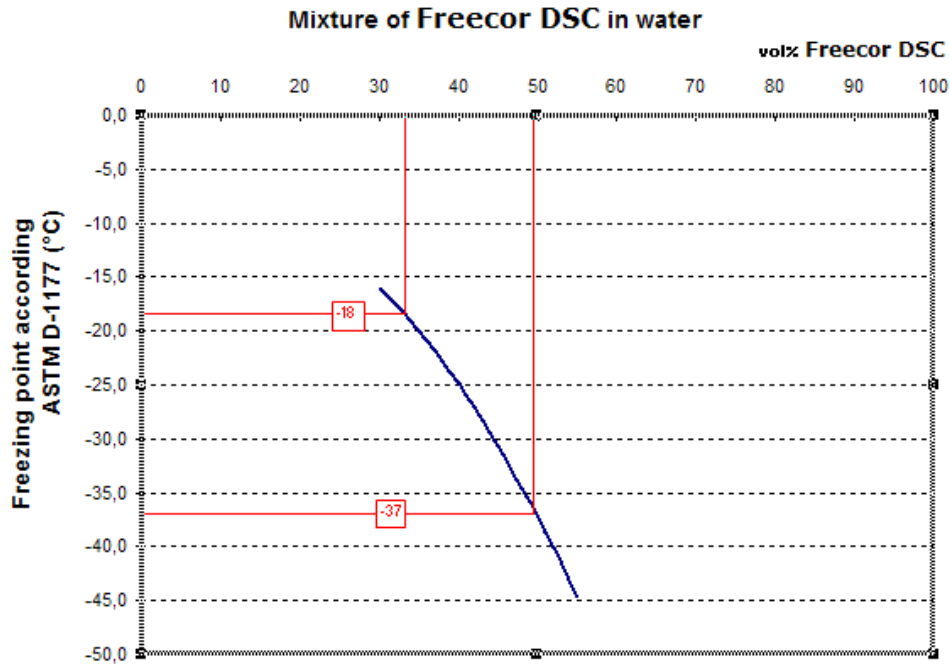
3 Application

Freecor[®] DSC provides long-life frost and corrosion protection. To ensure good corrosion protection it is recommended to use at least 33 vol.% of **Freecor[®] DSC** in the coolant solution, with freezing point -18°C. Typical mixtures in Northern Europe are 50/50, with freezing point -37°C. Mixtures with more than 70 vol. % **Freecor[®] DSC** in water are not recommended. The maximum frost

protection (about -69°C) is obtained at 68 vol. % **Freecor[®] DSC**. (Note: Frost protection level defined as the average of ASTM D-1177 freeze point and ASTM D97 pour point).

Freecor[®] DSC may be used with confidence in engines manufactured from cast iron, aluminium or combinations of the two metals, and in cooling systems made of aluminium or copper alloys.

Freecor® DSC



4 Compatibility and mixability

Freecor® DSC has been evaluated and found compatible with several competitive silicate free ethylene glycol based coolants. Exclusive use of **Freecor® DSC** is, however, recommended for optimum corrosion protection and sludge control. For optimal performance and controlled quality, we

recommend the use of deionised or distilled water to prepare the ready-to-use dilutions. We refer to our product information leaflet on water quality recommendations. Contact your local area sales manager for more information.

5 Approvals by OEMS

Freecor® DSC is a specialty product that meets the performance requirements of PSA B71 5110.

6 Availability

Freecor® DSC is available in bulk. Please contact your local **Arteco** area sales manager on availability of packages, dilutions and colors or customer adapted variants.

Freecor[®] DSC

7 Storage 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[®] DSC 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.

All information contained in this Product Information Leaflet, including but not limited to text or graphic material, is the property of Artego NV, and is accurate to the best of our knowledge at the date of issue specified. It supersedes all previous editions and information contained in them. Information is subject to change without notice. Any textual or graphic material you copy, print, or download from this document site is licensed to you for your personal, non-commercial use only, provided that you do not change or delete any copyright, trademark or other proprietary notices. Any other use, including but not limited to the reproduction, distribution, display or transmission of the content of this document is strictly prohibited, unless authorized by Artego NV in writing

Freecor[®] DSC

Addendum - technical information

Chemical and physical properties
Freecor[®] DSC

	Freecor [®] DSC	ASTM D3306 requirements	method
ethylene glycol	91 % w/w glycol	base	
other glycols	0.5 % max.	5 % w/w max.	
inhibitor content	47g/l typ.		PSA D50 1562
water content	4 % w/w max	5 % w/w max	ASTM D1123
ash content	2.9 % w/w typ.	5 % w/w max	NFR 156023
nitrite, amine, phosphate, borate, silicate	nil		
density kg/dm ³ , 20°C	1.134 typ.		ASTM D 5931
equilibrium boiling point	174°C typ.	> 163°C	ASTM D1120
reserve alkalinity (pH 5.5)	11.7 typ.	report	ASTM D1121
flash point	124°C typ.		ASTM D-92
auto ignition point	> 300°C		ASTM E-659

Chemical and physical properties
dilutions

	50 % dilution	40 % dilution	ASTM D3306 requirements	method
pH	7.7	7.6	7.5 to 11.0	NFT 78-103
foaming properties at RT ■ break time	50 ml max. 5 sec. max.	50 ml max. 5 sec. max.		CEC C10-X-97
initial crystallization	< - 37°C	< -24°C	< - 37 °C	ASTM D1177
density kg/dm ³ , 20°C	1.078 typ	1.064 typ		ASTM D 5931
refractive Index, 20°C	1.387 typ	1.376 typ		ASTM D1218
effect on elastomers and plastics	pass	-		PSA D47 1098
staining characteristics	no effect	-		PSA D27 5144
hard water stability	<0.05 ml	< 0.05 ml		NFR 156026

Freecor® DSC

Afnor R 15-602-7 glassware corrosion tests

	weight loss in mg/cm ² ⁽¹⁾					
	brass	copper	solder	steel	cast iron	aluminum
PSA B71 5110 (max)	-0.1 to 0.1	-0.1 to 0.1	-0.15 to 0.15	-0.1 to 0.1	-0.1 to 0.1	-0.15 to 0.15
Freecor® DSC	-0.04	-0.03	0.02	0.00	0.00	0.02

(1) weight loss after chemical cleaning. Weight gain is indicated by a positive sign.

CEC C05-X-95, dynamic corrosion test, 72h at 20vol%

	weight variation in mg/coupon ⁽¹⁾		
	aluminum (1000W)		cast iron (1400W)
	before chemical treatment	after chemical treatment	
PSA B71 5110 (max)	-40 to 10	-90 to 10	-10 to 10
Freecor® DSC	-31	-37	5

(1) weight gain indicated by a positive sign.

D 55 5345, high temperature stability test, 160°C, 192h at 20vol%

	PSA B71 5110	Freecor® DSC
pH after test	6.9 – 8.0	7.2
volume of deposits (ml)	Max 3.0	0.65
triazole content (g/l)	> 0.5	> 0.5