
Freecor® NBI

1 Description

Freecor® NBI is a low-toxic, environmentally friendly inhibitor concentrate. Based on a combination of organic additive technology and traditional silicate technology, aqueous solutions of **Freecor® NBI** provide excellent protection against corrosion and cavitation to all engine metals, including aluminium, iron, copper and solder alloys. **Freecor® NBI** is free from potentially harmful additives, such as nitrites, amines and phosphates.

Diluted with the appropriate amount of deionised or distilled water, **Freecor® NBI** is recommended as a coolant, flushing fluid or hot test fluid for engine blocks and other cooling systems. The product is compatible with glycol-based engine coolants.

Freecor® NBI is designed especially to meet the requirements of engine manufacturers requiring hybrid coolants to protect modern engines containing aluminium, and do not need frost protection.

2 Benefits

Freecor® NBI offers a lot of benefits to the engine designer as well as to the user:

- | | |
|---|--|
| <ul style="list-style-type: none"> ▪ Efficient and long lasting corrosion protection ▪ More flexibility to engine design ▪ Excellent silicate stability ▪ Environmentally friendly ▪ Excellent seal compatibility | <p><i>Combination of silicate and carboxylate inhibitor technology</i></p> <p><i>Provided by the use of superior technology</i></p> <p><i>High-performing silicate stabilizer package</i></p> <p><i>By using carboxylic additives in the inhibitor package</i></p> <p><i>No adverse effects on good quality rubber hoses and gasket materials</i></p> <p><i>Specific lubrication additives</i></p> |
| <ul style="list-style-type: none"> ▪ Improved water pump seal durability | |

3 Application

Freecor® NBI provides excellent corrosion protection in demanding applications. For optimal performance a dilution 10% vol. of **Freecor® NBI** in water should be used.

Freecor® NBI 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.

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Freecor® NBI can be used in a wide range of applications:

- In **marine applications** which require no frost protection.
- **Off-road, truck and bus** application, operating in areas where no frost protection is required.
- In **stationary** engines.
- As a **hot test liquid** for new engine blocks. Newly manufactured engines are tested for duration of approximately 5 to 10 minutes, after which the fluid is drained and usually reused. If the engine blocks are not immediately built into vehicles, **Freecor® NBI** will provide corrosion protection of the empty engine for up to two months.
- **Freecor® NBI** has been specifically designed for use in heavy duty MTU diesel engines, which are commonly used in marine and industrial applications.

4 Compatibility and mixability

For optimal performance and controlled quality, we recommend the use of deionised or distilled water to prepare the ready-to-use dilutions. The use of soft water is preferred for dilution. The water used for dilution should

be free of zinc as presence of zinc will result in the formation of precipitate.

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

5 Approvals by OEM's

Freecor® NBI has been approved by MTU (specification MTL 5049).

6 Availability

Freecor® NBI is currently available in bulk. Please contact your local Artec area sales manager on availability of packages, dilutions and colours or customer adapted variants.

Freecor® NBI

7 Storage requirements

The product should be stored above -15°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® NBI can be stored for minimum 2 years in unopened containers without any effect on the product quality or performance. It is strongly recommend using 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 and Safety

For Toxicity and Safety Data we refer to the 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.

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Addendum – Technical information

	Freecor® NBI	method
inhibitor content	30 % w/w	
water content	40 % w/w	ASTM D1123
nitrite, amine, phosphate, borate	nil	
colour	blue-green	
specific gravity, 20°C	1.144 typ.	ASTM D5931
pH	9.6 typ.	ASTM D1287
effect on non-metals	no effect	MTL5049
hard water stability	no precipitate	MTL 5049
	10 % Dilution	method
pH	8.8 typ.	ASTM D1287

Dynamic heat transfer test (MTL 5061 / MTV 5061)

	weight loss	unit	10% v/v		5% v/v	
			value ¹	limit	value ¹	limit
AlMgSi10						
heated specimen	mg/sample		-12.55	30	245.83	800
non-heated specimen	mg/sample		5.25	30	25.03	80
sample temp. Increase	°C		< 10°C	10	< 10°C	10
GC25 (cast Fe)						
heated specimen	mg/sample		26.7	30	43.07	800
non-heated specimen	mg/sample		24.05	30	18.23	80
sample temp. Increase	°C		< 10°C	10	< 10°C	10
Cu-ETP EN 1976	mg/sample		0.35	15	-1.70	25
CuZn37 plated with S-Pb60Sn40	mg/sample		11.05		20.47	
CuZn37 DIN17660	mg/sample		0.65		0.60	
CuNi10Fe1Mn DIN 17664	mg/sample		0.20		-0.10	
St14	mg/sample		0.65		3.27	
EN-GJL-250 EN 1561	mg/sample		2.40		7.27	
EN AW-2017 (A)	mg/sample		-0.10		6.60	
EN AW-2024	mg/sample		-0.10		6.00	
EN AC-AISi10Mg(a)T6 EN 1706	mg/sample		1.05		11.37	

¹. weight loss. Weight gain is indicated by a - sign.

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Cavitation Chamber Test (MTV 5061)

Corrosion protection

weight loss	unit	10% v/v		5% v/v	
		value ¹	limit	value ¹	limit
cast Fe (MTU specific I)	mg/sample	11.70	30mg/168h	7.85	50mg/168h
EN AC-AISI10Mg(a)T6	mg/sample	7.40		13.00	
cast Fe (MTU specific II)	mg/sample	9.55		15.85	
EN-GJL-250	mg/sample	12.55		22.40	
Cu-ETP EN 1976	mg/sample	5.40	15mg/168h	3.75	25mg/168h
CuZn37 plated with S-Pb60Sn40	mg/sample	7.65		17.55	
CuZn37 DIN17660	mg/sample	9.15		4.35	
CuNi10Fe1Mn DIN 17664	mg/sample	4.95		4.95	
FePO ₄	mg/sample	0.60		2.00	
EN-GJL-250 EN 1561	mg/sample	1.25		1.85	
AlCuMg1 (A)	mg/sample	0.45		6.20	
AlCu4Mg1 (A)	mg/sample	0.40		5.85	
EN AC-AISI10Mg(a)T6 EN 1706	mg/sample	0.85	5.30		

¹ Weight loss. Weight gain is indicated by a - sign.