

grotamar 71®

Preservative for diesel fuels and technical products

- Good anti-corrosive properties and provides lasting protection against microbial material degradation
- Broad, balanced spectrum of effect (incl. sulphate-reducing bacteria)
- Contains no nitrate, nitrosing agents or organically bound chlorine (has no effect on the AOX value)
- Approved by the „Bundes Immissionsschutzgesetz“*
- Good solubility in diesel fuel and in water
- Bactericidal and fungicidal effect
- Good immediate effect

* German Law on the Prevention of Immissions

Active substance

EINECS-name	CAS-No.	EG-No.
3,3'-Methylenebis[5-methyloxazolidine]	66204-44-2	266-235-8

Physico-chemical properties

Appearance	Clear – nearly clear, colourless – yellowish liquid
Form	Liquid
Odour	Amine-like
Density (20 °C)	1.049 – 1.069 g/ml
Refractive index (20 °C)	1.469 – 1.479
Flashpoint (ISO 2719)	> 100 °C
Viscosity (DIN 53 211)	Flow time < 15 sec (20 °C)
VOC-Content to Directive 2004/42/EC	100 %

Use concentration

	Recommended dosage	
Diesel fuels (prophylactic treatment)	0.05 – 0.20 l/1000 l diesel continuously (50 – 200 ppm)	As with all preservatives, under-dosing must be avoided, because of the demand for biodegradability the effectiveness of preservatives used below the required activity level are quickly lost. Should under-dosing occur on a regular basis there is the possibility that some selected microorganisms may not be killed by the preservative. In those circumstances, as most other organisms have been killed, the selected microorganisms will find ideal growth conditions. Use biocides safely. Always read the label and product information before use.
Diesel fuels (decontamination of contaminated diesel fuel)	0.20 – 0.50 l/1000 l diesel (200 – 500 ppm)	
Diesel fuels (shock dosing)	0.5 – 1.0 l/1000 l diesel (500 – 1000 ppm)	

Instructions on application

For contaminated diesel fuel, 200 – 500 ppm of grotamar 71® is generally sufficient (this corresponds to 0.2 – 0.5 litres per 1000 litres of diesel fuel). As a result of the good stability of grotamar 71® in diesel fuel, after three months' storage at room temperature more than 80% of the initial concentrations was still detected. grotamar 71® can thus ensure adequate long-term protection even with low concentrations of 50 – 200 ppm. In case of microbial contamination of tank systems that is already visible or is causing technical problems, e.g. if filter blockages frequently occur, we recommend shock dosing with 500 – 1000 ppm of grotamar 71®. grotamar 71® is best added to the dewatered tank that is about a third full. When the tank is filled, the product is mixed into the system. The dosage must be related to the total volume. In cases of heavy fouling, the system should, if possible, be cleaned before grotamar 71® is used. **Product should only be used in places with good ventilation. Direct inhalation has to be avoided. Always wear long-sleeve shirts and pants (or coveralls), closed-toe shoes, gloves, and protective eyewear when applying grotamar 71® to the fuel, fuel tank or fuel system.**

Microbiological efficacy

The efficacy of the product has been tested against the following microorganisms according to DGHM (German Society for Hygiene and Microbiology). Determination of the minimum inhibitory concentration in the serial dilution test produced the following values (MIC in % of the product):

Bacteria (gram-negative)	MIC	Bacteria (gram-positive)	MIC	Yeasts	MIC
Escherichia coli	0.062	Staphylococcus aureus	0.062	Candida albicans	0.125
Pseudomonas aeruginosa	0.062	Sulphate-reducing bacteria	MIC	Moulds	MIC
		Desulfovibrio desulfuricans	0.050	Aspergillus brasiliensis	0.062
				Penicillium pinophilum	0.031
				Hormoconis resinae	0.150
				Fusarium oxysporum	0.060

grotamar 71[®]

Compatibility

Material compatibility	grotamar 71 [®] causes no corrosion of steel, stainless steels, aluminium or zinc. In the case of copper and brass there is a slight effect, which also leads to discolouration of the product.
Plastics	grotamar 71 [®] (in the concentrate) does not attack polyethylene (PE) or polypropylene (PP). When handling the concentrate, contact with other plastics should be avoided. In particular, the marked swelling of hard PVC as a result of grotamar 71 [®] must be noted. This effect does not occur in the recommended use concentration.
Sealants	For seals that come in contact with grotamar 71 [®] concentrate we recommend the use only of PTFE seals or PTFE-coated seals. In particular, the fact that chloroprene rubber (e.g. neoprene) swells to a marked degree must be taken into account. In the recommended use concentration, all common sealant materials show no adverse reaction.

Safety and Labelling

R-Phrases	R 21/22, 34, 52
S-Phrases	S 26, 35, 36/37/39, 45, 61
Labelling	C (Corrosive)
For further hazard instructions and safety advice please refer to the actual material safety data sheet.	

Environmental information

At a sufficient degree of dilution, grotamar 71[®] is completely biodegradable (method: OECD 301D/EEC 84/449 C6). Dilutions of grotamar 71[®] do not interfere with the operation of municipal sewage treatment plants. grotamar 71[®] contains no organic chlorine compounds, so that there is no effect on the AOX value as a result of grotamar 71[®] in the waste water. grotamar 71[®] is halogen-free, and can therefore be used in accordance with the 19th German Law on the Prevention of Emissions, which prohibits chlorine and bromine compounds. grotamar 71[®] contains no organic solvents. The canisters and drums used by schülke are made of polyethylene (HDPE) and are labelled accordingly. The 1000 kg-containers are covered by a return scheme that in Europe ensures collection of the used containers free of charge and appropriate re-use. The labels are made of PE. schülke packaging materials contain no PVC and can be recycled. For further information please ask for our detailed environmental report.

Listings and approvals of Active ingredients

EINECS / ELINCS (Europe)	EINECS-No. 266-235-8
AICS (Australia)	
PICCS (Philippines)	
TSCA (USA)	
BIMSCH approved (Germany)	

Shelf life / Transport / Storage

Dangerous good	Yes
UN-No.	UN 2735
Packaging group	III
Package sizes	500 ml, 10 kg, 200 kg, 1000 kg
Shelf life	36 months
Storage	Protect from heat and direct sunlight. Store at room temperature in the original container.

References / Approvals

Mercedes Benz AG – grotamar 71[®] has been tested and approved for use in diesel fuels • **NATO** – stock no. 6850-17-9179543 • **German armed forces** supply No. 6840-12-333-7409 • **Shell Netherlands** uses grotamar 71[®] for the preservation of diesel fuel • **Dr. G. Armstrong** School of Marine Technology, Newcastle University • **DAF Netherlands** recommends grotamar 71[®] for contaminated diesel fuel • **Kässbohrer company**, vehicle manufacturer, Ulm – grotamar 71[®] has been approved • **MAN Nutzfahrzeuge AG** – grotamar 71[®] has been tested and approved • **MTU – Friedrichshafen** – listed as an approved biocide • **Department of Trade and Industry, Aberdeen** – In the „Harmonized Offshore Chemical Notification Scheme List of Notified Chemicals“ (HOCNS) grotamar 71[®] is classified with „Gold Banner“ (CEFAS) • **UK NATO** – stock no. 6840-12-370-0291; -0293; -0296; -0298 • **Deutz AG** – the use of grotamar 71[®] is advised for contaminated diesel fuels • **Swiss Army** – grotamar 71[®] has been approved

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Our recommendations regarding our products are based on in-depth scientific testing in our Research Department, they are given in good faith, but no liability can be derived from them. In other respects our Conditions of Sale and Supply apply.

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