

grotan[®] OK

Preservative for technical products

- Bactericidal effect
- Broad, balanced spectrum of effect (incl. sulphate-reducing bacteria)
- Immediate effect with improved long term efficacy
- Demonstrable effective against Mycobacteria
- Good anticorrosion properties
- Contains no nitrate, nitrosing agents or organically bound chlorine (has no effect on the AOX value)
- Odour improved methylenebisoxazolidine

Active substance

EINECS-Name:	CAS-No.:	EC-No.:
3,3'-Methylenebis[5-methyloxazolidine]	66204-44-2	266-235-8

Physico-chemical properties

Colour	colourless - light yellow
Form	Liquid
Odour	amine-like
Density (20 °C)	1.080 - 1.120 g/ml
Refractive index (20 °C)	1.476 - 1.493
Initial boiling point	> 100 °C
Flash point (ISO 2719)	> 100 °C
Flow time (DIN 53211 - 20 °C)	ca. 180 s
Water solubility (20 °C)	in all proportions
VOC-Content to Directive 2004/42/EC	93 %

Fields of application

The optimum use level should be evaluated by means of a repeated challenge test (e.g. at Schülke Technical and Microbiological dept).
Use biocides safely. Always read the label and product information before use.

	Recommended dosage	
Watermiscable metalworking fluids	1.0 - 1.5 g/kg	(0.10 - 0.15 %)
Technical emulsions	1.0 - 1.5 g/kg	(0.10 - 0.15 %)
Metalworking fluid concentrates [1.5 g/kg (0.15 %) in the end dilutions]	20 - 40 g/kg	(2 - 4 %)
System cleaner [1.0 - 1.5 g/kg (0.10 - 0.15 %) in the end dilutions]	100 - 150 g/kg	(10 - 15 %)

Indications for use

General Information	Grotan [®] OK is suitable for use in water-mixed metalworking fluids, metalworking fluid concentrates and other technical emulsions.
Solubility	Fully soluble in water and in most polar organic solvents.
Recommended use pH range	8 - 11
Maximum use temperature	max. 80 °C
Additional advice	In order to avoid microbial growth and the resultant consumption of preservative from the outset, it is advisable to add Grotan [®] OK to the fresh mix of metalworking fluid. More can be added at weekly to fortnightly intervals depending on the discharge of the metalworking fluid. When adding Grotan [®] OK, it should be added at a point with good turbulence in order to ensure good distribution in the system. Before refilling the plant, system cleaning is recommended (e.g. with Grotanol [®]). In centralised plants with heavy fungal contamination, a combination of Grotan [®] OK with Grotan [®] F 10 or Grotan [®] F 30 is recommended.

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
<i>Alcaligenes faecalis</i>	0.075	<i>Staphylococcus aureus</i>	0.050	<i>Candida albicans</i>	0.200
<i>Enterobacter ergoviae</i>	0.100			<i>Rhodotorula mucilaginosa</i>	< 0.025
<i>Escherichia coli</i>	0.050	Sulphate-reducing bacteria	0.050	<i>Saccharomyces cerevisiae</i>	0.050
<i>Klebsiella pneumoniae</i>	0.050			Moulds	MIC
<i>Mycobacterium terrae</i>	< 0.075			<i>Alternaria alternata</i>	0.050
<i>Mycobacterium chelonae</i>	< 0.075			<i>Aspergillus niger</i>	0.050
<i>Mycobacterium immunogenum</i>	< 0.075			<i>Aspergillus oryzae</i>	0.100
<i>Proteus mirabilis</i>	0.100			<i>Fusarium oxysporum</i>	0.100
<i>Pseudomonas aeruginosa</i>	0.050			<i>Penicillium funiculosum</i>	< 0.025
<i>Pseudomonas fluorescens</i>	0.050			<i>Penicillium expansum</i>	0.050
<i>Pseudomonas putida</i>	0.050			<i>Trichoderma viride</i>	< 0.025

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Longterm efficacy

In the BOKO-test Grotan[®] OK shows up to a 50 - 75% improved long-term efficacy compared to other N-formals such as Grotan[®] OX, Grotan[®] BK or Grotan[®] WS. The inoculation was made with a standard mixed suspension containing bacteria, yeasts and fungi.

Compatibility*

	compatible	to be avoided
concentrate	stainless steel, steel, polypropylene, polyethylene, polytetrafluoroethylene	sealants and plastics other than mentioned, PVC (hard)
aqueous dilution (0.15 %)	No significant difference to water	Water incompatible materials
Further information	On contact with non-ferrous metal or non-ferrous metal containing alloys, discolourations of the surface wetted with Grotan [®] OK can occur if the coolants do not contain a non-ferrous corrosion inhibitor. From the available test results, it can be concluded that the addition of Grotan [®] OK has virtually no influence on the medium to be preserved.	

*Compatibility has to be proved in each case

Labelling

R-phrased(s)	R21/22, R34, R52
S-phrased(s)	S26, S35, S36/37/39, S45, S61
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, all components of Grotan[®] OK are completely biodegradable. Dilutions of Grotan[®] OK do not normally interfere with the operation of waste water treatment plants. Grotan[®] OK contains no organic chlorine compounds, so that there is no effect on the AOX as a result of Grotan[®] OK in the waste water. The canisters and drums used by Schülke are made of polyethylene (HDPE) and are labelled accordingly. The containers are covered by a return scheme that ensures collection of the used containers free of charge and appropriate reuse all over Europe. 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)
 TSCA (USA)
 AICS (Australia)
 ECL (Korea)
 DSL / NDSL (Canada)
 PICCS (Philippines)
 IECSC (China)
 Fulfills the requirements of the TRGS 611 (Germany)

Transport & Storage

Dangerous goods	Yes
UN-Number	2735
Packaging group	III
Package sizes	10 kg, 200 kg, 1000 kg
Shelf life	18 Months
Storage	Protect from frost, heat and direct sunlight. Store at room temperature in the original container.

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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. It is the responsibility of the final product manufacturer to assure that claims made for the final product are in conformance with all applicable local laws. In other respect our Conditions of Sale and Supply apply.

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