

# grotan<sup>®</sup> Forte

## Preservative for technical products

- Bactericidal and fungicidal effect
- Broad, balanced spectrum of effect (incl. sulphate-reducing bacteria)
- Good immediate effect
- Good anticorrosion properties
- Contains no nitrate, nitrosing agents or organically bound chlorine (has no effect on the AOX value)

### Active substance

EINECS-Name:	CAS-No.:	EC-No.:
2,2',2''-(Hexahydro-1,3,5-triazine-1,3,5-triyl)triethanol	4719-04-4	225-208-0
Pyridine-2-thiol-1-oxide, Sodium salt	3811-73-2	223-296-5

### Physico-chemical properties

Colour	light yellow - pale red-brown
Form	Liquid
Odour	amine-like
Density (20 °C)	1.148 - 1.160 g/ml
Refractive index (20 °C)	1.474 - 1.483
Initial boiling point	> 100 °C
Flash point (ISO 2719)	> 100 °C
Flow time (DIN 53211 - 20 °C)	50 - 80 s
Water solubility (20 °C)	in all proportions
VOC-Content to Directive 2004/42/EC	none

### 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	1.5 g/kg	(0.15 %)
Technical emulsions	1.5 g/kg	(0.15 %)
Metalworking fluid concentrates [1.5 g/kg (0.15 %) in the end dilutions]	20 - 40 g/kg	(2 - 4 %)

### Indications for use

General Information	Grotan <sup>®</sup> Forte is suitable for use in water-mixed metalworking fluids, metalworking fluid concentrates and other technical emulsions.
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 <sup>®</sup> Forte 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 <sup>®</sup> Forte, 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 <sup>®</sup> ).

### 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>	0.025	<i>Brevibacterium ammoniagenes</i>	0.025	<i>Candida albicans</i>	0.010
<i>Escherichia coli</i>	0.010	<i>Staphylococcus aureus</i>	0.006	<i>Candida mogii</i>	0.010
<i>Micrococcus luteus</i>	0.010			<i>Rhodotorula mucilaginosa</i>	0.075
<i>Proteus vulgaris</i>	0.010				
<i>Pseudomonas aeruginosa</i>	0.025				
<i>Pseudomonas putida</i>	0.050				
<i>Pseudomonas stutzeri</i>	0.025				
		Sulphate-reducing bacteria	MIC	Moulds	MIC
		<i>Desulfovibrio desulfuricans</i>	< 0.001	<i>Aspergillus niger</i>	0.025
				<i>Aspergillus oryzae</i>	0.100
				<i>Fusarium oxysporum</i>	0.010
				<i>Penicillium expansum</i>	< 0.006
				<i>Penicillium funiculosum</i>	< 0.006

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Compatibility*		
	compatible	to be avoided
concentrate	plastics, sealants, stainless steel, steel, aluminium, zinc	brass, copper
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 <sup>®</sup> Forte 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 <sup>®</sup> Forte has virtually no influence on the medium to be preserved. When selecting sealing materials, piping systems, collection baths, etc., the presence of Grotan <sup>®</sup> Forte as the preservative in the recommended use-concentration can be disregarded.	

\*Compatibility has to be proved in each case

Labelling	
R-phrases(s)	R22, R43
S-phrases(s)	S24, S35, S37
Labelling	Xn (Harmful)
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 <sup>®</sup> Forte are completely biodegradable. Dilutions of Grotan <sup>®</sup> Forte do not normally interfere with the operation of waste water treatment plants. Grotan <sup>®</sup> Forte contains no organic chlorine compounds, so that there is no effect on the AOX as a result of Grotan <sup>®</sup> Forte in the waste water. Grotan <sup>®</sup> Forte is free of organic solvents. 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)
DSL / NDSL (Canada)
ENCS (Japan)
AICS (Australia)
ECL (Korea)
PICCS (Philippines)
IECSC (China)
Fulfills the requirements of the TRGS 611 (Germany)

Transport & Storage	
Dangerous goods	No
UN-Number	-
Packaging group	-
Package sizes	10 kg, 200 kg, 1000 kg
Shelf life	36 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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