

grotan[®] TK 5 Plus

Preservative for concrete admixtures

- For aqueous concrete admixtures and sugar solutions
- Highly effective in ligninsulphonate based admixtures
- Bactericidal and fungicidal effect
- Broad, balanced spectrum of effect against bacteria, yeasts and moulds
- Good immediate effect
- Enhanced efficacy against bacteria
- Contains no organically bound chlorine (has no effect on the AOX value)

Active substance

EINECS-Name:	CAS-No.	EC-No.
(Ethylenedioxy)dimethanol	3586-55-8	222-720-6
2-Octyl-2H-isothiazol-3-one	26530-20-1	247-761-7

Physico-chemical properties

Colour	colourless - light yellow
Form	Liquid
Odour	aldehyde like
Density (20 °C)	1.242 - 1.255 g/ml
Refractive index (20 °C)	1.458 - 1.469
Initial boiling point	ca. 100 °C
Flash point (ISO 2719)	93 °C
Flow time (DIN 53211 - 20 °C)	43 s
Water solubility (20 °C)	< 10 g/l
Foaming characteristics (DIN 53902)	Non foaming (0.15 % in water)
VOC-Content to Directive 2004/42/EC	66 %

Fields of application

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

	Recommended dosage	
Ligninsulphonate based concrete admixtures (compounded from ligninsulphonate powder)	1.0 - 2.0 g/kg	(0.1 - 0.2 %)
Ligninsulphonate based concrete admixtures (compounded from liquid ligninsulphonate)	2.0 - 5.0 g/kg	(0.2 - 0.5 %)
Polycarboxylate based concrete admixtures	0.5 - 2.0 g/kg	(0.05 - 0.2 %)
Other uses	Kindly contact us.	

Indications for use

Solubility	On account of its limited solubility in water, in purely aqueous systems grotan [®] TK 5 Plus can only be dissolved in low concentrations.
Recommended use pH range	3 - 11
Maximum use temperature	max. 60 °C
Additional advice	In order to avoid microbial growth and the resultant consumption of preservative from the outset, it is advisable to add grotan [®] TK 5 Plus to the fresh mix of concrete admixture. When adding grotan [®] TK 5 Plus, it should be added at a point with good turbulence in order to ensure good distribution in the system. Cleaning of equipment is possible by rinsing with water.

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>Enterobacter aerogenes</i>	0.050	<i>Kocuria rhizophila</i>	0.025	<i>Candida albicans</i>	0.025
<i>Escherichia coli</i>	0.050	<i>Staphylococcus aureus</i>	0.050	<i>Rhodotorula mucilaginosa</i>	0.0125
<i>Klebsiella pneumoniae</i>	0.025	<i>Staphylococcus epidermidis</i>	0.050	<i>Saccharomyces cerevisiae</i>	0.025
<i>Pseudomonas aeruginosa</i>	0.050			Moulds	MIC
<i>Pseudomonas fluorescens</i>	0.050			<i>Alternaria alternata</i>	0.025
<i>Pseudomonas putida</i>	0.050			<i>Aspergillus niger</i>	0.0125
<i>Proteus mirabilis</i>	0.050			<i>Aspergillus oryzae</i>	0.025
				<i>Fusarium oxysporum</i>	0.025
				<i>Penicillium expansum</i>	0.025
				<i>Penicillium funiculosum</i>	0.00625
				<i>Trichoderma virens</i>	0.0125

grotan[®] TK 5 Plus

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	From the available test results, it can be concluded that the addition of grotan [®] TK 5 Plus has virtually no influence on the medium to be preserved. When selecting sealing materials, piping systems, collection baths, etc., the presence of grotan [®] TK 5 Plus as the preservative in the recommended use-concentration can be disregarded.	

*Compatibility has to be proved in each case

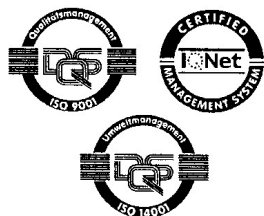
Labelling	
R-phrases(s)	R22, R36/37/38, R43, R51/53
S-phrases(s)	S24, S35, S37
Labelling	Xn (Harmful), N (Dangerous for the environment)
	For further hazard instructions and safety advice please refer to the actual material safety data sheet.

Environmental information
 At a sufficient degree of dilution, all components of grotan[®] TK 5 Plus are completely biodegradable. Dilutions of grotan[®] TK 5 Plus do not normally interfere with the operation of waste water treatment plants. grotan[®] TK 5 Plus contains no organic chlorine compounds, so that there is no effect on the AOX as a result of grotan[®] TK 5 Plus in the waste water. 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 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)*
ECL (Korea)
DSL / NDSL (Canada)*
ENCS (Japan)*
AICS (Australia)
PICCS (Philippines)
BfR XIV, XXXVI
Fulfills the requirements of the TRGS 611 (Germany)
* In preserved aqueous products the (ethylenedioxy)dimethanol can be described also as a hydrolyzing product, ethane-1,2-diol and formaldehyde.

Transport & Storage	
Dangerous goods	Yes
UN-Number	3082
Packaging group	III
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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