

schülke -+

Biocides for metalworking fluids

Optimal protection for your products and plant



the plus of pure
performance

Your Partner in Hygiene and Preservation

schülke

For over 115 years our business philosophy has had an unwavering focus: hygiene & preservation

Schülke & Mayr GmbH is a chemical and pharmaceutical company. Our products and services protect people and materials against infection and contamination.

Today, more than ever, germs cross borders. Their existence is dangerous, but not as dangerous as the underestimation of their threat to people and material. Taking precautions plays a special role – preventing contamination and infections is far easier than combating them.

schülke is fighting diseases and contamination before they emerge. For this we offer innovative technologies, highly effective products and expert support services.

Our company philosophy is based on a total quality concept that not only considers the quality of our products in the sense of effective product formulas, but one that encompasses a vast array of dimensions; such as:

- workplace safety
- environmental management and
- leadership and cooperation in our quality concept

The demand for total quality at schülke creates more than economic success. This concept is responsible for a sustainable contribution to the environment and society.

To realise this total quality concept our company values focus on:

Partnership

Not only in our daily cooperation, but also in the long term, we want to be a dependable partner for our customers worldwide.

With expert customer advice and an all-encompassing support service, we ensure that the interests of all parties are satisfied. This also applies to our relations with suppliers and other business partners.

Initiative

Forward thinking and taking action is a major factor of our success. We have to recognise the challenges of the future in order to be able to offer timely solutions. The desire for innovation also ensures our future competitiveness and the company's success.

Reliability

Reliability is a prerequisite for successful cooperation as it creates trust, and trust is the basis of long-term partnerships and sustainable success.

Our goal is the continual improvement of products, processes and services in order to ensure economic success, customer satisfaction and corporate social responsibility.

More than a century of competence in preservation and hygiene ...



1889 |

Foundation of the company by Rudolf Schülke & Julius Mayr in Hamburg.
Presentation of the first ever branded disinfectant in the world – lysol®



1892 |

Successful combating of the Hamburg cholera epidemic with lysol®

Special Additives International – our expertise from preservation to multifunctional additives



► Metalworking fluids

Microbiological spoilage of water-mixed metalworking fluids is one of the biggest threats for quality assurance, work and process safety in the mass production of metal parts; for example in the automotive industry. With the grotan® product line, schülke offers the metalworking industry a complete range of tailor-made biocides for all possible applications; such as preservation of metalworking fluid concentrates, post treatment of water-mixed metalworking fluids and micro-biocidal system cleaners.



► Coatings and Building Materials

The prevention of microbiological degradation of products containing water is one of the most important challenges now and in future.

schülke provides modern types of formulated in-can preservatives to protect your products under the brand names parmetol® and grotan®. Furthermore, with distinctive dry film preservatives we keep coated surfaces free from growth of fungi and algae and help to avoid material destruction and visible disfigurement.



► Household

Most cleaning products found in households today are water-based systems. These products are prone to microbiological build-up. To be safe for consumers to use, they require the protection of preserving agents. With the parmetol® and grotan® ranges, schülke offers products to preserve a wide range of household applications.



► Personal Care

Our euxyl® brand provides numerous preservative blends for the cosmetic industry. These optimised combinations of active substances offer broad spectrum efficacy, keeping cosmetic products free of microbial growth.

Our sensiva® brand includes versatile, multifunctional skin care additives for personal care products. With their unique properties, they are suitable for use in a wide range of cosmetic applications; including creams, lotions and deodorants.

► MQM

We support our customers with a comprehensive concept of Microbiological Quality Management (MQM) including lab services, application advice, plant audits and training programs for employees. It is not only a matter of eliminating the risk of infections for people, but also of protecting products and equipment from contamination.



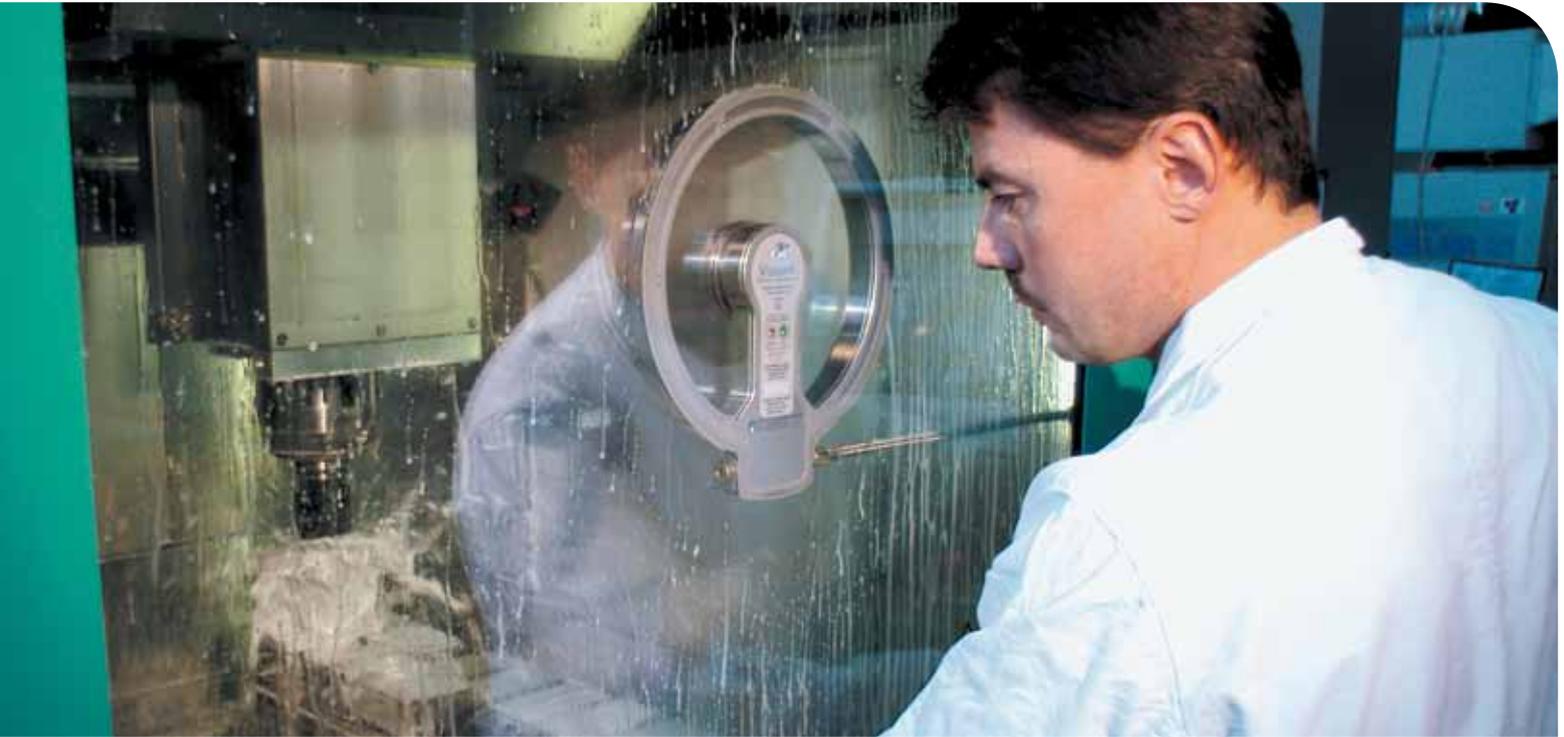
1892 | Schülke & Mayr GmbH issues its own series of postage stamps for the export business in German East Africa



1913 | Market launch of sagrotan®, the world's first household disinfectant.

1920 | Introduction of a disinfectant to combat tuberculosis pathogens

grotan® and parmetol® – balanced preservation systems



There is a number of factors to consider when choosing a suitable preservative for your product; different ingredients, pH value, material compatibility and legal approvals, to name a few. The large number of possible microorganisms, different packaging and storing conditions, and the enormous diversity of raw materials imposes demands that cannot be covered by just one microbial active used at an acceptable dosage. With the comprehensive grotan® and parmetol® product line, schülke has developed sophisticated multi component preservative systems to sufficiently protect your products.

The optimum combination of selected active substances offers sustainable preservation for all kinds of water based formulations used in metalworking fluid concentrates and other technical products.

Product benefits of grotan® and parmetol® at a glance:

- broad, balanced spectrum of efficacy against bacteria, yeast and mould
- liquid, stabilised formulations
- easy handling, safe application
- sustainable efficiency even at higher pH values and temperatures
- compliance with legal requirements, e.g. BPD, REACh, TRGS 611, etc.

Our biocides act rapidly and effectively, without altering the specific properties of the coolant. The protection against microbiological damage is lasting and is resistant to high temperatures and the effect of organic and inorganic substances. Our preservatives have good material compatibility and meet international legal requirements; e.g. in the countries of the European Union (EU) our products are supported under the Biocide Product Directive (BPD) and REACh.

More than a century of competence in preservation and hygiene ...



1924 |
First chemical-technical
preservative for glues: grotan®

1950 |
Introduction of an
antiviral disinfectant



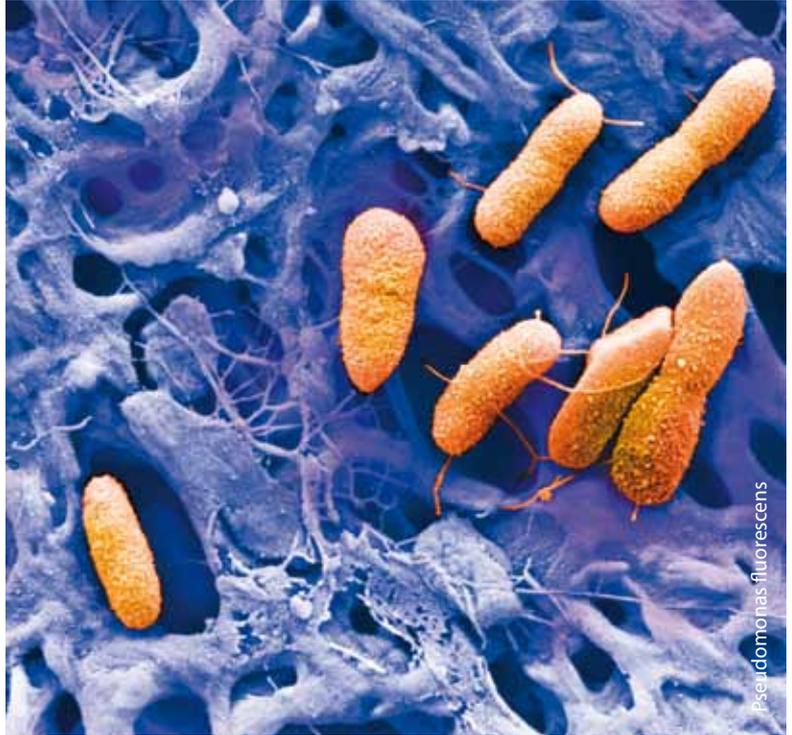
1960 |
Introduction of parmetol®
– preservatives for paints, glues, etc.

Microorganisms

– a threat to your products and plant



Water-based metalworking fluids are used in operations like drilling, turning, milling, sawing, grinding, etc. However, the water in the coolants offers microorganisms an attractive environment to grow. Contamination and subsequent spread of bacteria, yeasts and fungi can therefore hardly be avoided. As a result of their high growth potential, microbes can multiply within a few hours from 100 to 10,000,000 organisms per ml.



The consequences of microbial contamination are unpleasant and can lead to expensive manufacturing failures. The microorganisms can alter both the composition of the coolant and the technical properties, e.g. decreasing the amount of emulsifiers leading to manufacturing and quality problems. Microorganisms excrete metabolites that decrease the pH value and cause unpleasant odours. Uninhibited growth can lead to the formation of biofilms in the system. These can grow to a thickness of several centimetres and result in blockages of pumps and filtration units.

The symptoms of contamination are diverse and unpleasant:

- decrease in pH value
- corrosion
- blockage of pipes and filters
- odour formation
- oil separation
- foam formation
- sudden occurrence of skin irritation



Biofilm formation on system cover which is a high recontamination source for fresh coolants



Extreme mould formation in contaminated system. In this case complete system sanitation with biocidal system cleaner and mechanical cleaning is crucial.



Corrosion caused by microorganisms



1960 |
Introduction of the first preservative for cooling lubricants: grotan® BK

1965 |
First aldehyde-based disinfectant

1970 |
First patented preservative for water-based emulsion paints: parmetol® A 23

grotan® and parmetol® biocides

Preservation of water-mixed metalworking fluids and technical emulsions

■ bactericides

■ combination products

Product	Recommended application and use concentration (%)				Actives										
	Metalworking concentrate	Water-mixed metalworking fluids / post treatment	Technical emulsion / Aqueous systems	Metalworking fluid plants, production plants / circulating systems, equipment	MBO	CMI/ MI	Glutaraldehyde	OIT	Na-Py	BDA	BIT	TMAD	TTT	Ethylenedioxy-dimethanol	MIT
grotan® BA 21	0.40 – 2.00	0.02 – 0.20	0.02 – 0.20	–						○	○				
grotan® OK	2.00 – 4.00	0.10 – 0.15	0.10 – 0.15	–	○										
grotan® OX	2.00 – 4.00	0.10 – 0.15	0.10 – 0.15	1)	○										
grotan® TK 5	2.00 – 4.00	0.10 – 0.15	0.10 – 0.15	–										○	
grotan® TK 6	2.00 – 4.00	0.10 – 0.15	0.10 – 0.15	–								○			
grotan® WS	2.00 – 4.00	0.10 – 0.20	0.10 – 0.20	1)									○		
parmetol® A 26	–	0.10 – 0.20	0.10 – 0.20	–		○								○	
parmetol® DF 35	–	0.10 – 0.20	0.10 – 0.20	–		○								○	
parmetol® K 20	–	0.10 – 0.20 ²⁾	0.10 – 0.20 ²⁾	–		○									
parmetol® MBX	–	0.10 – 0.40	0.10 – 0.20	–						○	○				○
grotan® OK plus	2.00 – 4.00	0.10 – 0.15	0.10 – 0.15	–	○				○						
grotan® TK 5 plus	2.00 – 4.00	0.10 – 0.15	0.10 – 0.15	–				○						○	
grotan® WS plus	2.00 – 4.00	0.10 – 0.20	0.10 – 0.20	–					○				○		
grotanol® 3025	–	–	–	0.50 – 2.00		○	○								
grotanol® FF 1	–	–	–	1.00 – 3.00					○	○	○				
grotanol® SR 2	–	–	–	0.25 – 0.75	○				○						

¹⁾ Applicable for formulation of system cleaner. For more information please contact us.

²⁾ Use concentration above 0.1 % requires product labelling: Xi; R 43

MBO = 3,3'-Methylenebis[5-methyloxazolidine]

CMI / MI = Mixture of 5-Chloro-2-methyl-2H-isothiazol-3-one and 2-Methyl-2H-isothiazol-3-one

OIT = 2-Octyl-2H-isothiazol-3-one

Na-PY = Pyridine-2-thiol 1-oxide, sodium salt

More than a century of competence in preservation and hygiene ...



1975 |
gigasept® – the first
HBV-effective disinfectant



1976 |
Introduction of grotamar 71®,
a biocide for diesel fuels



1978 |
First Schülke & Mayr GmbH preservative
for cosmetics: euxyl® K 100

1985 |
schülke disinfectant
against HBV/HIV

system cleaners

Product type				Actives supported under BPD in product groups ⁵⁾		Listings and approvals of active ingredients								Technical properties			Product	
Bactericide	Fungicide	Amine-free	Formaldehyde-free	Product Type 6	Product Type 13	TRGS 611	EINECS / ELINCS (Europe)	TSCA (USA)	DSL / NDSL (Canada)	ECL (Korea)	ENCS (Japan)	PICCS (Philippines)	AICS (Australia)	IECSC (China)	Max. manufacturing temperature (°C)	pH-range for application		VOC-content acc. Directive 2004/42/EG (%)
○			○	○	○	○	○	○	○			○	○	○	100	3 – 11	0	grotan® BA 21
○				○	○	○	○	○	○			○	○	○	80	8 – 11	93	grotan® OK
○				○	○	○	○	○	○			○	○	○	80	8 – 11	100	grotan® OX
○		○		○	○	○	○	○ ³⁾	○ ³⁾	○	○ ³⁾	○	○	○	60	3 – 12	66	grotan® TK 5
○		○		○	○	○	○	○	○	○	○	○	○	○	60	3 – 11	3	grotan® TK 6
○				○	○	○	○	○	○					○	80	8 – 11	0	grotan® WS
○	○	○		○	○	○	○	○ ³⁾	○ ³⁾	○	○ ³⁾	○	○	○	60 ⁶⁾	3 – 9.5	9	parmetol® A 26
○	○	○		○	○	○	○	○ ³⁾	○ ³⁾	○	○	○	○	○	60 ⁶⁾	3 – 10	34	parmetol® DF 35
○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	60 ⁴⁾	3 – 8.5	0	parmetol® K 20
○	○		○	○	○	○	○	○	○			○	○	○	80	3 – 10	0	parmetol® MBX
○	○			○	○	○	○	○	○			○	○	○	80	8 – 11	92	grotan® OK plus
○	○	○		○	○	○	○	○ ³⁾	○ ³⁾	○	○ ³⁾	○	○	○	60	3 – 11	66	grotan® TK 5 plus
○	○			○	○	○	○	○	○					○	80	8 – 11	0	grotan® WS plus
○	○	○	○		○	○	○	○	○	○		○	○	○	50	3 – 10	0	grotanol® 3025
○	○		○		○	○	○	○	○			○	○	○	60	3 – 12	9	grotanol® FF 1
○	○				○	○	○	○	○	○		○	○	○	60	5 – 11	54	grotanol® SR 2

BDA = N-(3-Aminopropyl)-N-dodecylpropane-1,3-diamine

BIT = 1,2-Benzisothiazol-3(2H)-one

TMAD = Tetrahydro-1,3,4,6-tetrakis(hydroxymethyl)imidazo[4,5-d]imidazole-2,5(1H,3H)-dione

TTT = alpha,alpha',alpha''-Trimethyl-1,3,5-triazine-1,3,5(2H,4H,6H)-triethanol

MIT = 2-Methyl-2H-isothiazol-3-one

³⁾ In preserved aqueous products the (ethylenedioxy)dimethanol can be described also as a hydrolysing product, ethane-1,2-diol and formaldehyde.

⁴⁾ (pH > 6 up to 40 °C)

⁵⁾ Status as of October 2012 given in good faith with the best of our knowledge. Further product groups on request.

⁶⁾ According to pH value. 40 °C recommended.



1986 | Development of formaldehyde-free disinfectants, e.g. antifact®, gigasept® FF



1989 | Introduction of octenisept®, a mucous membrane and wound antiseptic

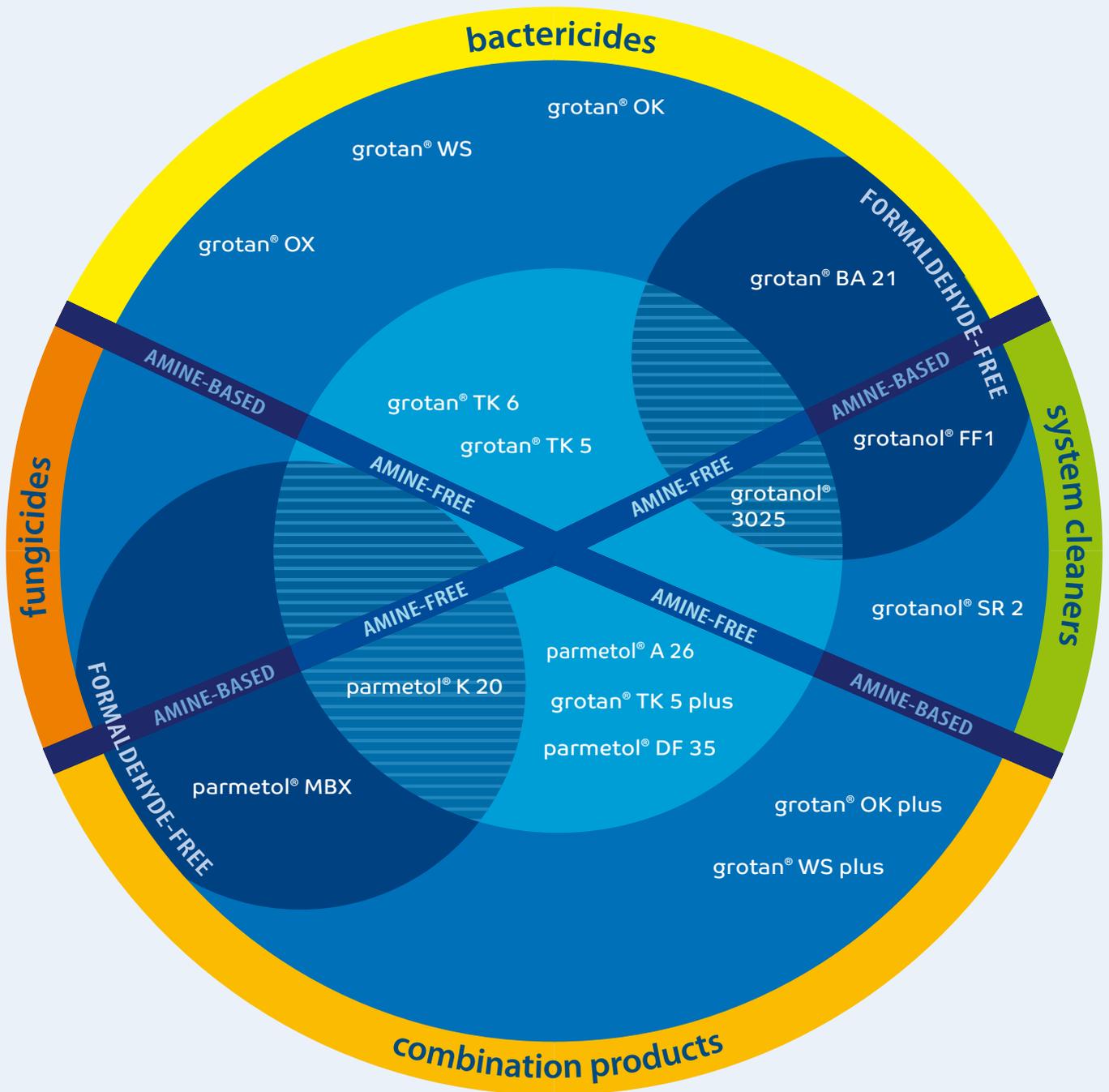


1989 | Schülke & Mayr GmbH celebrates its one hundred year anniversary



1991 | Introduction of sensiva® SC 50, a skin care additive and deodorant active

Our principle is:
As little as possible – as much as necessary



- Amine-free
- Formaldehyde-free and Amine-free
- Amine-based
- Formaldehyde-free and Amine-based

Use biocides safely. Always read the label and product information before use.

More than a century of competence in preservation and hygiene ...



1991/ 92 | Introduction of aldehyde-free disinfectants, e. g. terralin® and lysetol® AF



1992 | Patented cosmetic preservative based on organic acids: euxyl® K 702



1996 | schülke becomes a subsidiary of the Air Liquide Group



1998 | Move into the new office in Norderstedt

parmetol® MBX

– the new way to formulate formaldehyde-free

parmetol® MBX is schülke's answer to provide formaldehyde-free preservation for water-based metalworking fluids, concentrates and other aqueous systems. This product has been developed in response to the ongoing formaldehyde discussions in the EU, especially in France.

parmetol® MBX is the combination of bis(3-aminopropyl)-dodecylamine (BDA), Benzisothiazolinone (BIT) and Methylisothiazolinone (MIT) and is suitable especially for post preservation of water-based metalworking fluids. The synergistic combination of BDA, Benzisothiazolinone (BIT) and Methylisothiazolinone (MIT) shows excellent efficacy against pseudomonas species and other species and moreover the formulated MIT is completely stabilized, even in the presence of primary amines (e.g. Monoethanolamine). parmetol® MBX is a fast acting in-can preservative and offers long-term protection. parmetol® MBX is free of formaldehyde, chloromethylisothiazolinone and AOX and can be used for water-based metal working fluids as well as for metalworking fluid concentrates.

The efficacy of parmetol® MBX may depend on the selection of surfactants in the formulation. For further support please do not hesitate to contact us.

Benefits of parmetol® MBX:

- optimized ready-to-use biocide
- synergistic and fast acting combination of BIT, MIT and BDA offering long-term protection (comparable to CMI/MI)
- low use concentration required
- broad, balanced spectrum of effect against bacteria, yeasts and moulds
- enhanced efficacy especially against pseudomonas species
- compatible with primary amines (e.g. Monoethanolamine MEA), no degradation of MIT
- excellent stability within pH 3-10
- free of chloromethylisothiazolinone, formaldehyde, formaldehyde donors and other aldehydes



2000 | schülke: 111 years young and represented in more than 60 countries



2000 | Market launch of grotan® OX, a new biocide for coolants



2003 | Schülke & Mayr Inc. established in USA



2003 | Schülke & Mayr GmbH established in China

Plant Hygiene Support

mikrocount®

– the convenient hygiene monitoring system



In addition to production hygiene measures, quality assurance concepts require routine hygiene monitoring during the production process and documentation of the results.

mikrocount® combi provides every operation with individual means of rapid and reliable hygiene controls. The dip slide can be used for testing raw materials, for in-process controls during the production process and for quality control of finished products.

The mikrocount® combi dip slide enables simple sampling and evaluation of the results even by personnel without any microbiological training.

product benefits of mikrocount® combi:

- fast, safe and easy
- control of raw materials, intermediate and finished products
- separate evaluation of bacteria, yeast and moulds on different agar surface

cultura®

– the versatile small incubator

The cultura® incubator is compact and versatile enough for almost any laboratory or manufacturing setting. The built in tray has room to hold up to 18 mikrocount® combi dip slide samples. A transparent door allows for viewing of the contents without removing samples from the incubator.

The adjustable temperature is pre-set by the manufacturer to maintain 30 °C an optimum temperature for incubating mikrocount® dip slides. Results for bacteria are available after 24 to 48 hours. The detection of yeast and moulds takes slightly longer (72 hours).

product benefits:

- compact enough to use almost anywhere
- easy temperature adjustment
- designed for use with mikrocount® combi



More than a century of competence in preservation and hygiene ...



2004 |
Introduction of grotan® OK, a patented improved version of grotan® OX



2004 |
Patented cosmetic preservative based on Phenoxyethanol and Ethylhexylglycerin: euxyl® PE 9010



2007 |
Introduction of sensiva® SC 10, a versatile skin care additive

grotanol® SR 2 – the reliable system cleaner



Ensuring reliable product quality also requires a regular cleaning and microbiological sanitation of the production plant. grotanol® SR 2 is a mildly alkaline system cleaner (pH 10) 10g/l in deionised water which provides a good immediate effect at a low use concentration in combination with mechanical cleaning.

product benefits:

- excellent cleaning effect
- broad, balanced spectrum of effect against bacteria, yeast and moulds
- fast acting
- extremely low use concentration
- excellent material compatibility
- low foaming

use / use concentrations:

- production plants, circulating systems and equipment: 2.5 – 7.5 g/kg (0.25 – 0.75 %) in aqueous solutions

grotanol® 3025 – the formaldehyde-free sanitiser

grotanol® 3025 is a low-foaming, formaldehyde-free sanitising concentrate based on aldehyde compounds. grotanol® 3025 has a balanced spectrum of effect against bacteria and fungi. grotanol® 3025 is intended for use in the cosmetic industry for microbiological sanitising of surfaces, plant and apparatus. Use-solutions of grotanol® 3025 can be stored for several months.



product benefits:

- formaldehyde-free
- broad spectrum of effect
- low-foaming, therefore also suitable for plant sanitisation of pumped circulating systems
- can be rinsed off without leaving residue (if rinsing is necessary)
- acidic pH value (4,1)
- extensively tested material compatibility
- miscible with alkaline, anionic and non-ionic cleaning agents when diluted for use

use / use concentrations:

- production plants, circulating systems and equipment: 5 – 15 g/kg (0.5 – 1.5 %) in aqueous solutions

Use biocides safely. Always read the label and product information before use.



2007 |
Market launch of euxyl® K 220, an innovative preservative based on MIT and Ethylhexylglycerin

schülke →

2007 |
Our future: growth and competence throughout the world...
schülke, your partner for preservation and hygiene in the 21st century



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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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