

Euxyl®

K 300



Product

- Broad, balanced spectrum of effect against bacteria, yeasts and mould fungi
- Effective even in low use-concentrations
- Good vapour phase effectiveness
- Can be used in pH ranges up to 8

Use/Use-concentrations

- | | |
|-------------------------------|-------------|
| ■ Creams, lotions | 0.50–1.00 % |
| ■ Shampoos, bath preparations | 0.25–0.65 % |

Product description

Euxyl® K 300 is a liquid universal preservative for cosmetic products. Its use is permitted both in products that remain on the skin as well as in rinse-off products.

Euxyl® K 300 has a broad, balanced spectrum of effect against bacteria, yeasts, and mould fungi. It acts even in low use-concentrations, and has good vapour phase effectiveness.

EU-INCI-declaration

Phenoxyethanol
Methylparaben
Butylparaben
Ethylparaben
Propylparaben
Isobutylparaben

US-INCI-declaration

Phenoxyethanol (and)
Methylparaben (and)
Butylparaben (and)
Ethylparaben (and)
Propylparaben (and)
Isobutylparaben

Microbiological effectiveness

Euxyl® K 300 is equally effective against bacteria, yeasts and mould fungi. It is a typically biostatic product with the biocidal properties necessary for practical use. For Euxyl® K 300 to perform effectively in destroying organisms in products already contaminated, a minimum contact time of 48 hours is necessary. The time required is dependent upon the level of contamination present, the product formulation, and the use level. Use as a disinfectant (as defined by the DGHM) is not possible.

Since, in contrast to antibiotics, the effect of Euxyl® K 300 takes place by means of chemical reactions with the microorganisms, when it is used in heavily contaminated products a loss of active ingredient must be taken into account. Good production hygiene as well as the use of raw materials with low microorganism levels as a result of good raw material control are of course vital prerequisites for the production of microbiologically faultless finished products.

MIC values

Determination of the minimum inhibitory concentration in serial dilution tests produced the following values:

Species:	ATCC-No.:	MIC value [%]
Gram-negative:		
Enterobacter cloacae	13047	0.25
Escherichia coli	11229	0.25
Klebsiella pneumoniae	4352	0.15
Proteus mirabilis	14153	0.20
Pseudomonas aeruginosa	15442	0.40
Pseudomonas cepacia	17759	0.20
Pseudomonas fluorescens	17397	0.25
Pseudomonas maltophilia	17444	0.15
Pseudomonas putida	12633	0.40
Pseudomonas stutzeri	11607	0.20
Gram-positive:		
Bacillus subtilis	6633	0.10
Corynebacterium ammoniagenes	6871	0.10
Staphylococcus aureus	6538	0.15
Streptococcus lactis	19435	0.15
Mould fungi:		
Aspergillus niger	6275	0.10
Aspergillus oryzae	(IAM 2961)	0.20
Microsporum gypseum	16428	0.05
Penicillium expansum	(IMB 11203)	0.10
Penicillium funiculosum	36839	0.10
Trichoderma viridae	(IMB 12098)	0.10
Yeasts:		
Candida albicans	10231	0.10
Saccharomyces cerevisiae	9763	0.10
Trichophyton mentagrophytes	(CBS 11065)	0.05

Repeated challenge test (S&M Koko test)

This method is used for determining the preservative effect of chemical preservatives in cosmetic formulations, e.g. creams, lotions, and shampoos. For this, in various test series, the preservative to be tested is added in different concentrations to the unpreserved samples. A constant microorganism load is achieved by means of periodic inoculation (inoculation cycles) of the test preparations. Immediately before inoculation, samples of the individual preparations are streaked out onto nutrient media. The preservative effect is evaluated on the basis of the microorganism growth on the nutrient media. The longer the time to the occurrence of the first microbial growth, the more effective is the preservative. Experience has shown that a well preserved product should remain growth-free for six inoculation cycles in order to ensure the shelf-life required in practice (30 months).

Use

On account of its limited solubility in water, in purely aqueous systems Euxyl® K 300 can only be dissolved in low concentrations. Particularly in formulations with a low water content, heating to 60–70 °C may be sufficient for incorporation of a sufficient amount of Euxyl® K 300 into the aqueous phase.

In formulations that contain surfactants, Euxyl® K 300 can be dissolved in the surfactants before the addition of water and other components.

Use-concentrations

	according S&M recommendations	according EU-Cosmetic Directive	according CIR (USA)
Leave-on (i.e. creams, lotions, etc.)	0.50 - 1.0 %	max. 1.39 %	no limits indicated
Rinse-off (i.e. shampoos, bath preparations, etc.)	0.25 - 0.65 %	max. 1.39 %	no limits indicated

The following percentages relate to the complete formulation in each case. The values given are recommended guides. The individual use-concentration is dependent on the sensitivity of the product to microbial contamination, the choice of raw materials, and production hygiene. The optimum use-concentrations should always be determined with the aid of a preservation load test (e.g. S&M Koko test) and certified (e.g. by Schülke & Mayr Research).

Cosmetic products of all kinds are adequately preserved with a use-concentration of 0.25–1.0 % Euxyl® K 300. The higher concentrations are especially necessary for formulations that are difficult to preserve.

w/o emulsions/o/w emulsions

Use concentrations of 0.4–0.7 % Euxyl® K 300 are sufficient for emulsified systems of both the w/o and o/w types.

Foam baths/shower preparations

Foam baths and shower preparations can normally be preserved with concentrations of 0.25–0.65 % Euxyl® K 300. Products with a high protein content require rather higher use-concentrations. Products based on non-ionic surfactants also require higher concentrations of Euxyl® K 300, in the range from 0.5–1.0 %.

For other uses please contact us.

Chemical compatibility

In general, it is possible for interactions to occur between various active ingredients and auxiliary substances in cosmetic formulations. Thus, during the years the active substances of Euxyl® K 300 have been used, certain incompatibilities with other ingredients have been established, and are listed below.

General

Euxyl® K 300 is fully effective both in anionic as well as cationic systems.

High pH values (> pH 8.0) should be avoided when using Euxyl® K 300. Euxyl® K 300 is fully effective in acidic media.

Compatibility with surfactants

Euxyl® K 300 proved to have good chemical compatibility with anionic surfactants such as sulphates, ether sulphates and sulphonates, as well as with non-ionogenic surfactants. Non-ionic surfactants and ether sulphates lead to losses of effectiveness.

Compatibility with sulphite ions

Euxyl® K 300 exhibits no interactions with sulphite ions.

Product-specific properties

Material compatibility

In the material compatibility tests with the **concentrate** of Euxyl® K 300, metals such as steel, brass, copper, zinc and aluminium as well as polyethylene (PE), and hard polyvinyl chloride (hard PVC) proved to be the most suitable materials for handling the undiluted product.

Non-metallic materials must be tested for their suitability; in particular, polycarbonate (PC), polymethyl methacrylate (PMMA) and acrylonitrile butadiene styrene copolymer (ABS) should not be used.

As sealing material when handling undiluted Euxyl® K 300, chloroprene rubber (CR/SBR), natural rubber/styrene-butadiene rubber (NR/SBR) and polytetrafluorethylene (PTFE) should be given preference. Other sealing materials showed severe swelling or led to severe discolouration of Euxyl® K 300.

The 0.2 % aqueous **solution** of Euxyl® K 300 shows no discolouration on contact with non-ferrous metals.

No incompatibilities with plastics have been observed with products preserved with Euxyl® K 300.

Effect on surface tension

The surface tension of water is clearly reduced by the addition of Euxyl® K 300. With a 0.2 % solution in water it is 51.6 mN/m (water: 71.8 mN/m).

Foaming behaviour

In the foaming test in accordance with DIN 53 902, a 0.2 % solution of Euxyl® K 300 in demineralised water proved to be non-foaming.

Solubility

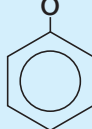
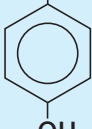
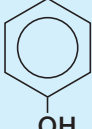
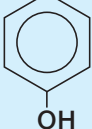
In water Euxyl® K 300 is only limitedly soluble. 100 g water at 20 °C dissolve 0.05 g Euxyl® K 300. To dissolve Euxyl® K 300 in water, an agitator with good turbulence is necessary.

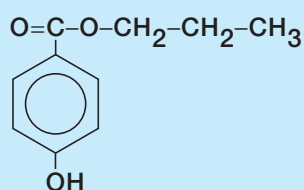
The dissolution of Euxyl® K 300 in finished formulated aqueous products such as shampoos proved in practice to be unproblematical.

In polar solvents such as 1,2-propylene glycol, propanol, and acetone, Euxyl® K 300 is readily soluble.

General information

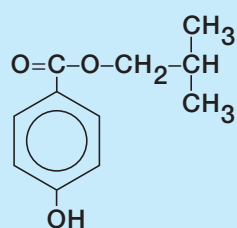
Descriptions of individual substances

$\text{CH}_2\text{-CH}_2\text{-OH}$ 	$\text{C}_8\text{H}_{10}\text{O}_2$ 138.16 g/mol
CAS-no.: INCI-name: Name acc. to 76/768/EEC: No. acc. to 76/768/EEC: EINECS-name: EINECS-no.:	122-99-6 Phenoxyethanol 2-Phenoxyethanol 29 2-Phenoxyethanol 204-589-7
$\text{O}=\text{C}-\text{O}-\text{CH}_3$ 	$\text{C}_8\text{H}_8\text{O}_3$ 152.05 g/mol
CAS-no.: INCI-name: Name acc. to 76/768/EEC: No. acc. to 76/768/EEC: EINECS-name: EINECS-no.:	99-76-3 Methylparaben 4-Hydroxybenzoic acid and its salts and esters 12 Methyl-4-hydroxybenzoate 202-785-7
$\text{O}=\text{C}-\text{O}-\text{CH}_2\text{-CH}_3$ 	$\text{C}_9\text{H}_{10}\text{O}_3$ 166.17 g/mol
CAS-no.: INCI-name: Name acc. to 76/768/EEC: No. acc. to 76/768/EEC: EINECS-name: EINECS-no.:	120-47-8 Ethylparaben 4-Hydroxybenzoic acid and its salts and esters 12 Ethyl-4-hydroxybenzoate 204-399-4
$\text{O}=\text{C}-\text{O}-\text{CH}_2\text{-CH}_2\text{-CH}_2\text{-CH}_3$ 	$\text{C}_{11}\text{H}_{14}\text{O}_3$ 194.23 g/mol
CAS-no.: INCI-name: Name acc. to 76/768/EEC: No. acc. to 76/768/EEC: EINECS-name: EINECS-no.:	94-26-8 Butylparaben 4-Hydroxybenzoic acid and its salts and esters 12 Butyl-4-hydroxybenzoate 202-318-7



$\text{C}_{10}\text{H}_{12}\text{O}_3$
180.20 g/mol

CAS-no.: 94-13-3
 INCI-name: Propylparaben
 Name acc. to 76/768/EEC: 4-Hydroxybenzoic acid and its salts and esters
 No. acc. to 76/768/EEC: 12
 EINECS-name: Propyl-4-hydroxybenzoate
 EINECS-no.: 202-307-7



$\text{C}_{11}\text{H}_{14}\text{O}_3$
194.23 g/mol

CAS-no.: 4247-02-3
 INCI-name: Isobutylparaben
 Name acc. to 76/768/EEC: 4-Hydroxybenzoic acid and its salts and esters
 No. acc. to 76/768/EEC: 12
 EINECS-name: Isobutyl-4-hydroxybenzoate
 EINECS-no.: 224-208-8

Physical-chemical data

Appearance: clear colourless liquid
 Colour index (Hazen): max. 40
 Odour: characteristic
 Refractive index n_D^{20} : approx. 1.540
 Density (20 °C): approx. 1.12 g/ml
 Vapour pressure (20 °C): < 1 hPa
 Flash point (DIN 51758): > 99 °C
 Run-out time (DIN 53211/20 °C): ca. 20 DIN seconds
 Viscosity (Brookfield-RV; 20 °C, Spindel 2/150 r. p. m.): ca. 30 mPa s
 Water solubility (20 °C): approx. 0.5 g/l

Storage

We recommend storing in the original container at room temperature.

Environmental information

Schülke & Mayr has DIN EN ISO 9001 and DIN EN 46001 certification (Reg. No. 4567-01) and a validated environmental management system in accordance with the Eco Audit Regulation (Reg No. DE-S-150 00003).

The 10 kg containers and drums used by Schülke & Mayr are made of polyethylene (HDPE) and are labelled accordingly.

The 1000 kg containers are affiliated to a recycling system that guarantees free pick-up and sensible utilisation of used containers throughout Europe.

The labels are made of PE. S&M packaging materials contain no PVC, and are recyclable.



Samples of our products are supplied together with extensive information material and are supported by personal advice.

Expert opinion

The toxicology and tolerance of the preservative Euxyl® K 300,
Dr. Jörg Siebert,
Schülke & Mayr, July 1998

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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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