

schülke -+

euxyl® K 712

Preservative for cosmetics & toiletries



the plus of pure
performance

euxyl® K 712

Product description

Euxyl® K 712 is a liquid cosmetic preservative, which can be used in leave-on as well as in rinse-off products.

Euxyl® K 712 was developed for use in cosmetic formulations with a skin-friendly pH value of up to 5.5. It has a broad, balanced spectrum of effect against bacteria, yeasts and mould fungi.

EU-INCI-declaration

Sodium Benzoate
Potassium Sorbate
Aqua

US-INCI-declaration

Water (and)
Sodium Benzoate (and)
Potassium Sorbate

Microbiological effectiveness

Euxyl® K 712 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 712 to perform effectively in destroying organisms in products already contaminated, a minimum contact time of 48 hours is necessary. Since the effect of Euxyl® K 712 takes place through chemical reactions with the microorganisms, when it is used in heavily contaminated products 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 correct raw material control, are of course vital prerequisites for the production of microbiologically faultless finished products.

Germ count reduction test

Dilutions of Euxyl® K 712 are prepared with a standard shampoo formulation. 50 ml portions of the end solutions are inoculated with 0.5 ml microorganism suspension (initial microorganism count approx. 10^8 cfu/ml) and stirred.

Standard Shampoo with Betaine (Ch. 602/124)

Sodium Laureth Sulfate (70%)	11.4%
Cocamidopropyl Betain (30%)	10.0%
Sodium Chloride	0.1%
Water	78.5%

Test organisms

ATCC-No.

<i>Pseudomonas aeruginosa</i>	15442
<i>Escherichia coli</i>	11229
<i>Candida albicans</i>	10231
<i>Aspergillus niger</i>	6275

The solutions are streaked out onto tryptone soya agar or Sabouraud-dextrose 4% agar after 3, 6, 24, 48, 72 and 168 hours, depending on the test organism. The cultures are incubated for 48 hours at 37 °C, except for *Aspergillus niger*, which is incubated for 72 hours at 25 – 27 °C.

The evaluation is made on the basis of semi-quantitative assessment of the microbial growth of the streaks.

In the table below, the microorganism reduction achieved by Euxyl® K 712 at pH 5.0 as a function of the contact time and use-concentration is presented for the various test organisms:

Test organism	Use-concentration [%]	Contact time [h]					
		3	6	24	48	72	168
<i>Pseudomonas aeruginosa</i>	0.5	C	C	++++	+	-	-
	0.75	C	C	+++	-	-	-
	1.0	C	C	-	-	-	-
	1.25	C	++++	-	-	-	-
	1.5	C	+++	-	-	-	-
<i>Escherichia coli</i>	0.5	C	++++	++++	+++	++	-
	0.75	C	++++	+++	++	+	-
	1.0	C	++++	+++	+	-	-
	1.25	C	++++	+	-	-	-
	1.5	C	++++	-	-	-	-
<i>Candida albicans</i>	0.5	++++	++++	++	++	-	-
	0.75	++++	++++	++	++	-	-
	1.0	++++	++++	++	++	-	-
	1.25	+++	+++	+	+	-	-
	1.5	+++	++	-	-	-	-
<i>Aspergillus niger</i>	0.5	-	-	-	-	-	-
	0.75	-	-	-	-	-	-
	1.0	-	-	-	-	-	-
	1.25	-	-	-	-	-	-
	1.5	-	-	-	-	-	-

Symbol

Finding

Germ count/ml

-	= no growth	< 100
+	= slight growth	approx. 10^2
++	= moderate growth	approx. 10^3
+++	= heavy growth	approx. 10^4
++++	= massive growth	approx. 10^5
C	= surface covered	approx. 10^6

Repeated challenge test (Schülke Koko test)

This method is used to determine 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 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 before 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 in the original packaging required in practice (30 months).

Oil/water and water/oil systems, as well as shampoos and bath additives preserved with use-concentrations of between 0.5 and 1.5% Euxyl® K 712 proved to be well preserved even after three months storage at + 40 °C.

Use-concentrations

	acc. Schülke-recommendation	acc. EU and ASEAN Cosmetics Directive	acc. CIR (USA)
Leave-on (i. e. creams, lotions etc.)	0.5 – 1.5 %	max. 1.96%	max. 19.6 %
Rinse-off (i. e. shampoos, bath preparations etc.)	0.5 – 1.5 %	max. 1.96%	max. 19.6 %

The Schülke recommended 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 efficacy and optimum use-concentration should always be determined in the end product with the aid of a preservation load test (i. e. Schülke & Mayr Technical Service Department and Microbiology). All responsibility for determining the most effective percentage for a given use remains with the final product manufacturer since the optimal use-concentration level will vary due to product-specific variables such as choice of raw materials, production hygiene, etc.

Indications for use

General

Temperature stability:

When using Euxyl® K 712 prolonged heating periods (max. 4 hours) > 80 °C should be avoided.

It is advantageous to add Euxyl® K 712 in the cooling phase, e.g. with the fragrance (t < 40 °C). As a result of the low surface tension of Euxyl® K 712 solutions, good dispersion in the various systems even at low temperatures is guaranteed.

pH stability:

Euxyl® K 712 is adapted for use in products with a skin-friendly pH value of up to 5.5.

If pH values exceeding 5.5 occur in the production process after the addition of Euxyl® K 712, Euxyl® K 712 is stable but ineffective.

In all cases the pH value of the finished product must be checked at the end of the production process, and if necessary adjusted to max. 5.5. The measurement of a w/o emulsion is problematic, in this case the measurement must be performed in the water phase.

As a rule, highly acidic products should be tested for skin compatibility/sensitivity.

Emulsions

Emulsions are preserved in practice with 0.5 – 1.5% Euxyl® K 712.

Solutions

For shampoos, bath preparations and hand cleansing preparations good preservation results are achieved with 0.5 – 1.5% Euxyl® K 712.

Wet wipes

For wet wipes good preservation results are achieved with 0.5 – 1.5% Euxyl® K 712.

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, certain incompatibilities of Euxyl® K 712 with other ingredients have been established, and are listed below.

General

Euxyl® K 712 is fully effective in anionic as well as cationic and non-ionic systems. Euxyl® K 712 should preferably be used in the pH range up to 5.5. Euxyl® K 712 is fully effective in acidic media. pH values > 5.5 lead to losses of effectiveness.

Compatibility with surfactants

Euxyl® K 712 proved to have good compatibility with anionic surfactants such as sulphates, ether sulphates and sulphosuccinates, as well as with non-ionogenic surfactants.

Compatibility with sulphite ions

Euxyl® K 712 shows no interactions with sulphite ions.

Discolouration

Euxyl® K 712 has no colour stability. The concentrate is a clear yellowish until brownish liquid with tendency to discolouration. When used in the cosmetic preparation it doesn't lead to further discolouration as long as the formulation remains acidic.

Product-specific properties

Material compatibility

Concentrate

In the material compatibility tests with the concentrate of Euxyl® K 712 stainless steel, polyethylene (PE) and hard polyvinyl chloride (hard PVC) proved to be suitable materials for handling the undiluted product.

Non-metallic materials must be tested for their suitability, especially polycarbonate (PC), polymethyl-methacrylate (PMMA) and acrylonitrilebutadiene-styrene copolymer (ABS) should not be used. As sealing material when handling undiluted Euxyl® K 712 fluorinated rubber (FKM), ethylene-propyleneterpolymer (EPDM) and polytetra-fluoro-ethylene (PTFE) should be preferred. Other sealing materials could lead to severe swelling or to pronounced discolouration of Euxyl® K 712.

Dilutions

Euxyl® K 712 in 1,0% aqueous solution showed material compatibility behaviour which was not significantly different from that of the water used for dilution. No incompatibilities with plastics have been observed with products preserved with Euxyl® K 712.

Please check the compatibility in individual cases

Effect on surface tension

The addition of 1,0% Euxyl® K 712 in water has no effect on the surface tension.

Foaming behaviour

In the foaming test in accordance with DIN 53 902, a 1,0% solution of Euxyl® K 712 in demineralised water proved to be non-foaming.

Solubility

Euxyl® K 712 is fully soluble in water.

In polar solvents such as 1,2-propylene glycol, propanol

Euxyl® K 712 is readily soluble.

In polyalcohols such as glycerol and sorbitol

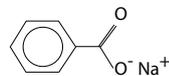
Euxyl® K 712 is readily soluble.

In aliphates with hydrophilic groups such as 2-octyldecanol and isopropyl myristate, Euxyl® K 712 is limitedly soluble.

In pure aliphatic solvents, it is slightly soluble.

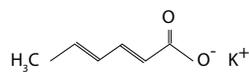
General information

Descriptions of the individual substances (active ingredients)



C₇H₅O₂Na
144.10 g/mol

CAS no.:	532-32-1
INCI name:	Sodium Benzoate
Name according to 76/768/EEC:	Benzoic acid, its salts and esters
No. according to 76/768/EEC:	1
EINECS name:	Sodium Benzoate
EINECS no.:	208-534-8



C₆H₇O₂K
150.22 g/mol

CAS no.:	24634-61-5
INCI name:	Potassium Sorbate
Name according to 76/768/EEC:	Sorbic acid (Hexa-2,4-dienoic acid) and its salts
No. according to 76/768/EEC:	4
EINECS name:	Potassium-(E,E)-hexa-2,4-dienoate
EINECS no.:	246-376-1

Physical-chemical data

Appearance:	clear yellowish – brownish liquid
Odour:	characteristic
Refractive index n_D^{20} :	1.436 – 1.441
Density (20 °C):	approx. 1.17 g/ml
Vapour pressure (20 °C):	approx. 25 hPa
Flash point (DIN 51 758):	> 100 °C
Flow time (DIN 53 211/20 °C):	< 15 DIN seconds
Viscosity (20 °C):	approx. 11 mPa s
Water solubility (20 °C):	In all proportions

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 canisters 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. Our packaging materials contain no PVC and are recyclable.

Expert opinions

The toxicology and tolerance of the preservative Euxyl® K 712, Dr. Susanne Hendrich, Schülke & Mayr GmbH, November 2007



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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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