

Product Fact Sheet

PHENONIP[®] XB



Preservative for the cosmetic industry

Chemical Name	Preservative blend consisting of Methyl p-hydroxybenzoate, Ethyl p-hydroxybenzoate, Propyl p-hydroxybenzoate and Phenoxyethanol.
INCI designation	Phenoxyethanol and Methylparaben and Ethylparaben and Propylparaben.

CLARIANT INTERNATIONAL LTD

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PRODUCT PROPERTIES¹

Appearance (20°C) Colourless to light straw viscous liquid

Chemical and physical data

Methyl Paraben	15 – 17 % w/w
Ethyl Paraben	3.5 – 4.5 % w/w
Propyl Paraben	7.5 – 8.5 % w/w
Phenoxyethanol	70 – 74 % w/w
Specific gravity (25°C)	1.123 g/cm ³
Refractive index (25°C)	1.5392

Uses

Phenonip[®] XB is a broad spectrum antimicrobial agent comprising a synergistic blend of esters of para-hydroxybenzoic acid (parabens) in phenoxyethanol designed for preservation of a wide range of cosmetics and toiletries.

pH stability

Phenonip[®] XB remains fully stable over a wide pH range from 3- 8.

Applications

Phenonip[®] XB provides activity against gram positive and gram negative bacteria, yeasts and molds.

It retains activity in the presence of most cosmetic ingredients.

Phenonip[®] XB protects most types of personal care products from microbial contamination. As with other preservatives, the correct use concentration depends upon several factors, including the chemical and physical nature of the product, its ability to support microbial growth and the likelihood of recontamination during use.

¹ These characteristics are for guidance only and not to be taken as product specifications. The tolerances are given in the product specification sheet. For further product properties, specifications, safety and ecological data, please refer to the MSDS.

Experience has shown that Phenonip® XB will preserve cosmetics and toiletries when incorporated at concentrations from 0.25 % to 1 %. The higher concentrations are generally required only for formulations which, by nature, are particularly difficult to preserve.

Shampoos and foam baths may be preserved with Phenonip® XB at concentrations between 0.25 % to 0.65 %. Products with high protein content may require levels from 0.5 % - 1 %. Other surfactant- based products, for example liquid dishwashing detergents, are generally preserved with Phenonip® XB over the range 0.2 %- 0.6 %. Emulsified systems, both O/W and W/O types, may be effectively preserved by the addition of Phenonip® XB at 0.6 %- 0.8 %. Phenonip® XB can also be used to preserve emulsions based on nonionic surfactants, but slightly increased concentrations may be required, e.g. 0.8 -1 %.

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Incorporation

Phenonip® XB can be added to the aqueous phase readily up to its limit of solubility. The relatively low aqueous solubility of Phenonip® XB means that if the water content of the formulation is low, it may not be convenient to add the preservative directly to water during manufacture. Heating the water to 60 – 70 °C prior to Phenonip® XB addition will, in most instances, allow the appropriate quantity to be dissolved. For aqueous systems which cannot be heated, Phenonip® XB can be incorporated by preparing a concentrate in a suitable solvent, e.g. Propylene Glycol, and stirring this concentrate into the water to give a final Phenonip® XB concentration below its maximum water solubility.

In emulsified systems, Phenonip® XB is readily dissolved in the lipid phase prior to emulsification although it is often good practice to divide the Phenonip® XB content between the aqueous and the lipid phases during their preparation. To add Phenonip® XB into the final emulsion during the cooling stage is also possible for a lot of emulsions.

In surfactant and detergent based products Phenonip® XB can be dissolved in the surfactant prior to the addition of water and other ingredients.

The following are examples of formulations in microbial challenge test:

Test species	Colony forming units per g after			
	2 days	7 days	14 days	28 days
0.5 % Phenonip XB in an all day shampoo				
PA	< 10	< 10	< 10	< 10
SA	3.5 x 10 ³	< 10	< 10	< 10
CA	NT	NT	< 10	< 10
AB	NT	NT	< 10	< 10
0.5 % Phenonip XB in a conditioner shampoo				
PA	< 10	< 10	< 10	< 10
SA	5.4 x 10 ⁵	6 x 10 ⁴	< 10	< 10
CA	NT	NT	< 10	< 10
AB	NT	NT	1 x 10 ³	1 x 10 ³

0.5 % Phenonip XB in a shower bath				
PA	< 10	< 10	< 10	< 10
SA	1.6 x 10 ⁴	< 10	< 10	< 10
CA	NT	NT	< 10	< 10
AB	NT	NT	8 x 10 ²	4 x 10 ²
0.8 % Phenonip XB in an O/W night cream				
PA	< 10	< 10	< 10	< 10
SA	1.6 x 10 ⁶	6 x 10 ³	< 10	< 10
CA	NT	NT	< 10	< 10
AB	NT	NT	< 10	< 10

PA: Pseudomonas aeruginosa

SA: Staphylococcus aureus

CA: Candida albicans

AB: Aspergillus brasiliensis

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Solubility

Soluble as follows:

Solvent	Solubility / % (w/w)
<i>Ethanol</i>	approx. 0.2 %
<i>Ethanol/ Water (50/50)</i>	soluble
<i>Isopropanol</i>	> 95 %
<i>Acetone</i>	miscible
<i>Propylene Glycol</i>	miscible
<i>Hazelnut Oil</i>	Miscible
<i>Liquid Paraffin</i>	approx.60 %
<i>Glycerol</i>	< 0.1 %
<i>Sodium Laureth Sulphate (28 %)</i>	approx. 8 %

Microbial Activity

Phenonip® XB exhibits microbiostatic activity against a wide range of bacteria, yeast and moulds. This is illustrated by the following table which shows the minimum inhibitory concentration (MIC) of Phenonip® XB against examples of different groups of microorganisms.

Microorganisms	Stock Culture and Number	MIC level (%)
Gram Negative Bacteria		
<i>Pseudomonas aeruginosa</i>	ATCC 9027	0.375
Gram Positive Bacteria		
<i>Staphylococcus aureus</i>	ATCC 6538	0.375
Yeasts		
<i>Candida albicans</i>	ATCC 10231	0.047
Moulds		
<i>Aspergillus brasiliensis</i>	ATCC 16404	0.047

Regulatory Status

Phenonip® XB can be used up to a maximum concentration of 1.35 % in cosmetic product, no further restrictions, according to Annex VI, 76/768/EEC (Europe).

Phenonip® XB is permitted for Japan up to 1.35 %, no further restrictions.

Phenonip® XB is permitted for USA.

Storage instructions

The product must be protected from excessively high and low temperatures during storage.

Further information on handling, storage and dispatch is given in the EC safety data sheet.

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