



LABORATOIRES
SÉROBIOLOGIQUES

Division de Cognis France

ELESTAB® HP100

HEXAMIDINE DIISETHIONATE

DEFINITION / COMPOSITION

ELESTAB® HP 100 is a hydrosoluble antimicrobial cationic substance with a wide spectrum of activity against bacteria, fungi and yeasts.

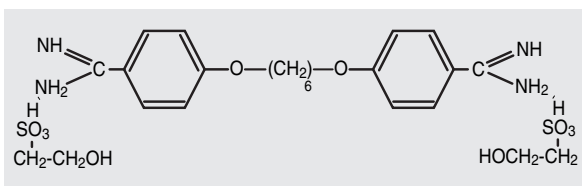
ELESTAB® HP 100 may be used as a polyvalent preservative, as well as a cutaneous aseptizer.

• **Chemical denomination:**

4,4'-diamidino- α - ω -diphenoxyhexane, bis (β -hydroxyethane sulfonate),

• **DCI:** Hexamidine diisethionate,

• **Chemical structure:**



• **Molecular formula:** C₂₄ H₃₈ N₄ O₁₀ S₂,

• **Molecular weight:** 606.72.

ANTIMICROBIAL PROPERTIES

- ELESTAB® HP 100 has strong microbiostatic and/or microbicidal activity against:
 - Gram (+) bacteria: Staphylococcus, Sarcina, Streptococcus, Corynebacterium, Propionibacterium, Bacillus,
 - Gram (-) bacteria: Escherichia, Proteus, Klebsiella, Salmonella, Serratia,
 - Gram (-) bacteria, oxydase (+): Pseudomonas,
 - Fungi: Aspergillum, Penicillium, Actinomyces^[1], Geotrichum^[1], Trichophyton^[1], Hormodendron^[1],
 - Yeasts: Candida, Pityrosporum.
- The antimicrobial effects of ELESTAB® HP 100 vary according to:
 - the concentration and duration of contact with the anti-microbial agent,
 - the number of micro-organisms,
 - the nature and virulence of the germs,
 - the properties and characteristics of the medium.

COSMETIC USE

ELESTAB® HP 100 is suitable for incorporation into cosmetic and hygiene preparations, such as emulsions, masks, gels, aqueous and alcoholic solutions, foaming preparations, sprays, sticks:

1. for their **microbiological stabilization**. We recommend a special study for each cosmetic formulation (see overleaf),
2. for a **local aseptizing activity** on skin and relative areas (hair...). For example:
 - care of oily skin and/or skin with acneic tendencies because of:
 - its antimicrobial effect on specific strains,
 - its inhibiting effect of the lipase of P. acnes,
 - its indirect anti-irritating effect (slows the hydrolysis of the sebaceous triglycerides),
 - anti-dandruff care (action on Pityrosporum ovale),
 - deodorant preparations.

ADVANTAGES

ELESTAB® HP 100 contains neither free nor combined formaldehyde, has a good cutaneous/mucous local tolerance and has an excellent coefficient of security compared to other antiseptics. It resists to inactivation by sebum, and is a substantive and an indirect anti-irritant for the skin.

DOSAGE / SOLUBILITY / MODE OF INCORPORATION

1. Dose of use:

- as a cutaneous aseptizer: 0.10%,
- as a preservative: 0.01% to 0.1%.

The relevant antimicrobial protection of the cosmetic product has to be checked by a challenge test.

2. Solubility: ELESTAB® HP 100 is soluble in water (80°C) and propylene glycol (60°C), soluble in ethanol and insoluble in oils and fats.

3. Mode of incorporation: ELESTAB® HP 100 must be dissolved under stirring into the formula's water previously heated to 80°C. It can also be introduced as a mother solution in propylene glycol. This way is recommended in the case of anionic emulsions and nonionic emulsions with alkyl-glucosides and sucrose esters.

COMPATIBILITY / INCOMPATIBILITY

ELESTAB® HP 100 is a cationic substance, thus it is incompatible or interacts with all anionic raw materials. In most cases, this incompatibility leads either to a crystallization of ELESTAB® HP 100, or to a more complex precipitation. To avoid this phenomenon, particularly in the formulation of limpid, transparent products, it is imperative to "neutralize" ELESTAB® HP 100 with anionic surfactants, **before its introduction into the product**.

The suitable pH is between 3 and 8, avoid high alkaline medium.

ANALYTICAL CHARACTERISTICS

1. **Aspect:** white powder with a weak odor.
2. **Specifications:** upon request.

TOLERANCE

Good.

EFFICACY

Test summaries overleaf.

STORAGE

In its original packaging, at 15 - 25°C.

REGULATORY STATUS

Approved: USA, EC, Australia, Canada.

INCI NAME

Hexamidine Diisethionate.

SUPPLIER

Laboratoires Sérobiologiques, division de Cognis France.

[1] Wien R., Harrison J., Freeman W.A.: Diamidines as antibacterial compounds in "Brit. J. Pharmacol.", 3, 211-218, 1948

EFFICACY TESTS

AS A PRESERVATIVE: WIDE SPECTRUM, POLYVALENT

When using ELESTAB® HP 100 as preservative for cosmetic products, a microbiological study should be performed to check:

- the absence of incompatibilities,
- the exact dosage according to the panel of micro-organisms tested and the kinetics of negativation, selected by the challenge test,
- the possible necessity to associate other preservatives with ELESTAB® HP 100.

Such synergistic associations of preservatives are supplied by Laboratoires Sérobiologiques as ELESTAB® 4112, ELESTAB® 388...

See *LS Preservative Catalogue*.

Strains			ELESTAB® HP 100	
			Concentration (µg/ml)	
			MIC	MMC
Bacteria				
<i>Staphylococcus aureus</i>	ATCC	6538	0.8	25
<i>Staphylococcus epidermidis</i>	NCIB	8853	0.8	25
<i>Bacillus subtilis</i>	ATCC	6633	3.2	6.4
<i>Escherichia coli</i>	NCTC	8196	1.6	25
<i>Klebsiella pneumoniae</i>	NCIB	10341	12.5	50
<i>Proteus vulgaris</i>	NCIB	4175	25	50
<i>Pseudomonas aeruginosa</i>	ATCC	9027	50	50
<i>Salmonella typhimurium</i>	NCIB	10258	100	> 100
<i>Serratia marescens</i>	ATCC	14041	50	> 100
Fungi				
<i>Aspergillus niger</i>	ATCC	16404	0.8	0.8
<i>Penicillium funiculosum</i>	ATCC	9644	0.8	1.6
Yeast				
<i>Candida albicans</i>	ATCC	10231	3.2	6.4

Table 1 – ELESTAB® HP 100 as a polyvalent preservative. Minimum Inhibitory Concentration (MIC) and Minimum Microbicidal Concentration (MMC) of ELESTAB® HP 100 against a range of bacteria, fungi and yeasts.

AS A SKIN ASEPTIZER

ELESTAB® HP 100 can be used at 0.10% in topical preparations to kill harmful micro-organisms on the skin's surface.

ELESTAB® HP 100 can be used for:

- care of oily skin with acneic tendency,
- care of pityrospores of the face (= seborrheic state) and the scalp (pityriasis capitis or dandruff state).
- deodorant preparations.

Strains			ELESTAB® HP 100	
			Concentration (µg/ml)	
			MIC	MMC
<i>Sarcina lutea</i>	ATCC	9341	0.8	1.6
<i>Streptococcus pyogenes</i>	NCTC	8198	1.6	1.6
<i>Corynebacterium xerosis</i>	NCTC	8481	3.2	3.2
<i>Propionibacterium acnes</i>	NCTC	521	0.1	12.5
<i>Propionibacterium granulosum</i>	ATCC	25564	0.1	12.5
<i>Pytirosporum ovale</i>	NCYC	0218	12.5	100

Table 2 – ELESTAB® HP 100 as a skin aseptizer. MIC and MMC of ELESTAB® HP 100 against a range of specific strains.