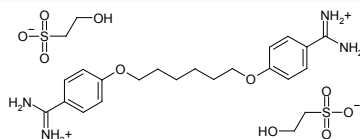


Specifications and Characteristics

MinaSolve Hexam

INCI	Hexamidine Diisethionate
CAS REG. N°	659-40-5
APPEARANCE	White or slightly yellow powder
PURITY	Min. 98.0 %
SOLUBILITY	Water (4%)
RECOMMENDED pH OF USE	3.5 ▶ 6.0
RECOMMENDED USE LEVEL	0.01 ▶ Max. 0.1 %
REGULATORY STATUS	Globally approved
ORIGIN	Non-natural (petrochemical)

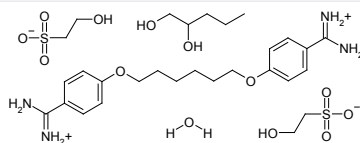
CHEMICAL STRUCTURE



EasySafe Hexam+

INCI	Pentylene Glycol (and) Water (and) Hexamidine Diisethionate
CAS REG. N°	5343-92-0, 7732-18-5, 659-40-5
APPEARANCE	Clear colourless liquid
ODOUR	Odourless or faint
SOLUBILITY	Water and ethanol in all proportions
RECOMMENDED pH OF USE	3.5 ▶ 6.0
RECOMMENDED USE LEVEL	0.2 ▶ Max. 2.0 %
REGULATORY STATUS	Globally approved
ORIGIN	Derived-natural
NATURAL ORIGIN INDEX	0.95 (ISO 16128)

CHEMICAL STRUCTURE



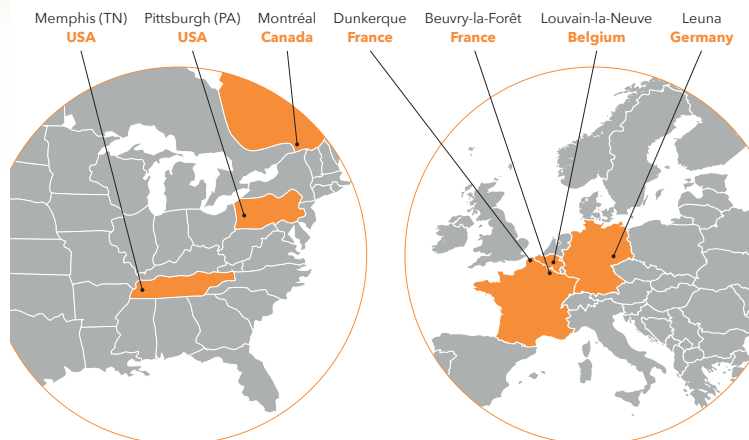
The given information is accurate to the best of our knowledge. Buyers are advised to make their own studies on the usefulness of any product for a particular application or purpose. Recommended usage information is only provided as indication, and should not be considered as recommendations to use the products in violation of any patents, intellectual property rights, laws, or regulations relating, but not limited to, manufacture, composition, product design or end usage.

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Created in 2004, The Minafin® Group is an expert in Health Chemistry, Green Chemistry and Challenging Chemistry. Activities include industrial subcontracting, development of chemical syntheses and industrial scale-up of custom-made processes as well as proprietary products with high added value for the pharmaceutical, cosmetics, agriculture and high-tech industries. Strong synergies exist between all business units: MINASOLVE, MINAKEM, PENNAKEM, PRESSURE CHEMICAL and MINASCENT.

Serving market leaders as well as emerging players we support our customers' efforts to improve the quality of life in the global community by:

- ▶ Improving our chemistry and operational excellence today
- ▶ Creating and innovating for tomorrow
- ▶ Driving our enterprises together to go beyond expectations



300
M€ SALES

1050
EMPLOYEES

150
SCIENTISTS

7
PRODUCTION
SITES

MINAFIN®
GROUP

Preservative solutions for Skin Care, Baby Care, Sensitive Areas

MinaSolve Hexam

- ✓ **Mild and Efficient Preservative**
- ✓ **Proprietary Production Process**

EasySafe Hexam+

- ✓ **Easy to use liquid**
- ✓ **Boosted antimicrobial effect**
- ✓ **Skin moisturizer**



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2023 12. V4.1

Antimicrobial activity

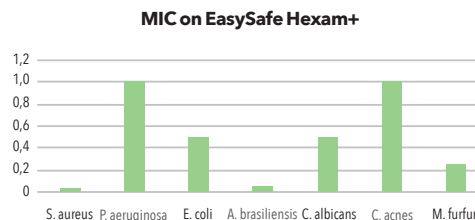
Challenge test results (ISO 11930) in O/W emulsion, pH 5.5



MinaSolve Hexam and **EasySafe Hexam+** act as broad-spectrum standalone preservatives, **EasySafe Hexam+** demonstrates synergistic effect on formula protection

Multifunctional ingredients

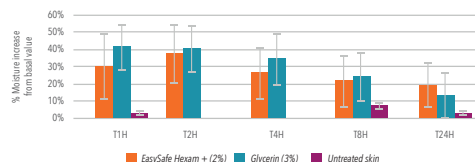
Anti-dandruff and anti-acne properties



In addition to its preservation effect, **EasySafe Hexam+** also shows activity against *Cutibacterium acnes* and *Malassezia furfur*

Skin moisturizer

Corneometry study over 24 hours, 12 volunteers



EasySafe Hexam+ is an effective skin humectant, with a long lasting moisturizing effect similar to that of glycerin

MinaSolve Hexam & EasySafe Hexam+ from MINASOLVE:

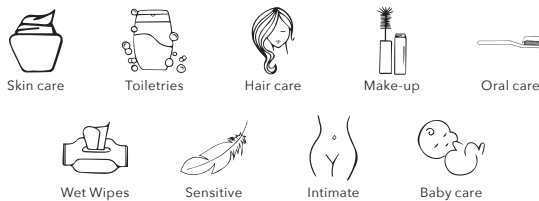
FOR MILD AND EFFICIENT PROTECTION

MinaSolve Hexam is a unique quality of **Hexamidine Diisethionate** produced by a proprietary process that avoids the presence of toxic solvents (such as chloroform, dichloroethane, benzene, toluene, xylene). It is globally approved with a long track record of use.

MinaSolve Hexam is an **efficient preservative and sanitizer with good cutaneous and mucous tolerance**. It belongs to the class of membrane-active microbicides. Related to its structure, **MinaSolve Hexam** is a stable ingredient that does not contain, nor release formaldehyde or any other substance of concern.

EasySafe Hexam+ is a **synergistic blend** of bio-sourced Pentylene Glycol and **MinaSolve Hexam** with a long-lasting skin moisturizing effect in addition to its preservative action.

MinaSolve Hexam and **EasySafe Hexam+** are suitable for sensitive skin, scalp and mucous areas (oral, eye and intimate care).



O/W emulsion used for the challenge test, pH 5.5

Phase	Ingredient	INCI name	%
A	Water	Aqua	ad 100
	EasySafe Hexam+ or MinaSolve Hexam ⁽¹⁾	Hexamidine Diisethionate	1.00 or 0.10
	Xanthan Gum QC ⁽²⁾	Xanthan Gum	0.5
B	Emulgade PL 68/50 ⁽³⁾	Cetearyl Glucoside (and) Cetearyl Alcohol	5.0
	Shea Butter ⁽⁴⁾	Butyrospermum Parkii (Shea) Butter	3.0
	Joboba Oil ⁽⁴⁾	Simmondsia Chinensis (Jojoba) Seed Oil	3.0
	Hazelnut Oil ⁽⁵⁾	Corylus Avellana (Hazel) Seed Oil	3.0
C	Bioxan T70 ⁽⁶⁾	Tocopherol	0.1
D	Citric Acid (50%)	Citric Acid (and) Aqua	ad pH 5.5
	Sodium Hydroxide (10% aq.)	Aqua (and) Sodium Hydroxide	ad pH 5.5

Raw material suppliers:

⁽¹⁾ Minasolve ⁽²⁾ Jungbunzlauer ⁽³⁾ BASF ⁽⁴⁾ Caesar & Loretz ⁽⁵⁾ Sanabio ⁽⁶⁾ BTSa

Applications

MinaSolve Hexam is stable within the pH-range of 3.5 - 6.0. Before adding **MinaSolve Hexam** to any formulation, the pH of the product should be adjusted to this range.

MinaSolve Hexam is a cationic substance that can interact with anionic ingredients. The compatibility should be therefore checked individually. Nonetheless, **MinaSolve Hexam** is generally compatible with the most common types of anionic surfactants.

In products where a thickening agent is required, **MinaSolve Hexam** is best formulated with non-ionic thickeners, e.g. non-surface treated cellulose and cellulose derivatives, non-ionic natural gums or polyethylene glycol based thickeners.

The liquid mixture **EasySafe Hexam+** optimizes the formulation with Hexamidine by eliminating the solubilization step.

EasySafe Hexam+ also simplifies the formulation in combination with anionic polymers (e.g. Xanthan Gum, poly-acrylates). For instance, **EasySafe Hexam+** can be blended with surfactants at pH 3.5-6.0 prior to the addition to the anionic polymer in its gelled form. Alternatively, the addition of surfactants to a Carrageenan or Xanthan Gum gel allows for the addition of **EasySafe Hexam+** without leading to gel collapse.