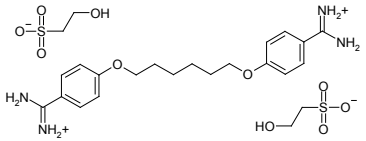
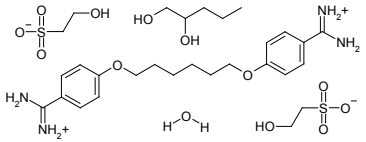
Specifications and Characteristics

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	3.0 ▸6.5
RECOMMENDED USE LEVEL	0.01 ▸ 0.1 %
REGULATORY STATUS	Globally approved
ORIGIN	Non-natural (petrochemical)
CHEMICAL STUCTURE	

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	3.0 ▸6.5
RECOMMENDED USE LEVEL	0.2 ▸ Max. 2.0%
REGULATORY STATUS	Globally approved
ORIGIN	Derived-natural
NATURALITY INDEX	0.83, Contains 95 % renewable carbon
CHEMICAL STUCTURE	

MINAFIN® GROUP

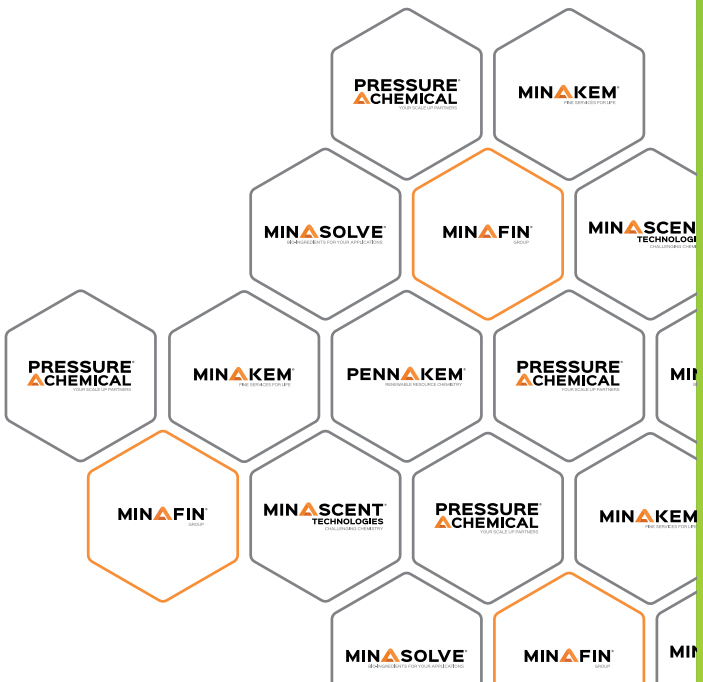
Minasolve® is a brand of Minafin® Group

The Minafin® Group, whose affiliates develop and manufacture active pharmaceutical ingredients, organic intermediates and specialty fine chemicals for the life science industries and technical applications **is organized around 5 brands**, each dedicated to specific end-users or chemical technologies :

- Minakem®
- Minasolve®
- Pennakem®
- Pressure Chemical®
- 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**



Preservative solutions for Skin Care, Baby Care, Sensitive Areas

MINASOLVE ™ HEXAM

- *Mild and Efficient Preservative*
- *Eco-improved production process*

EASYSAFE HEXAM+

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

PENDING PATENT PENDING

MINASOLVE®
BIO-INGREDIENTS FOR YOUR APPLICATIONS

green solving attitude.

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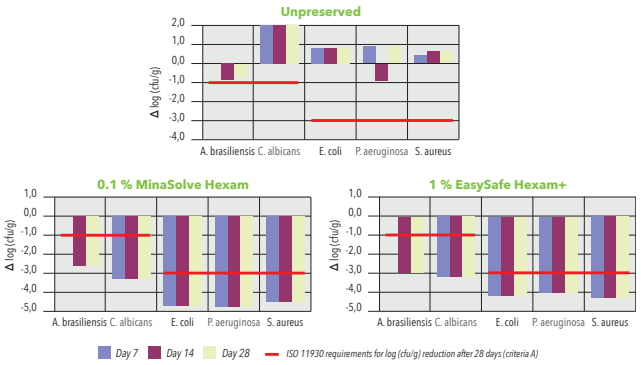
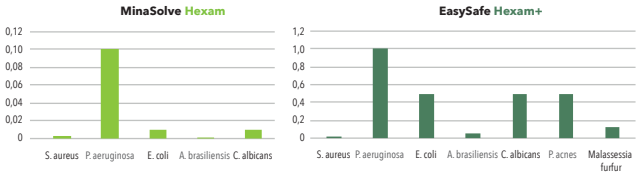
MinaSolve ™ Hexam and **EasySafe Hexam+** act as broad-spectrum standalone preservatives, as demonstrated by microbial challenge tests on cosmetic products according to ISO 11930:

O/W-emulsion, subjected to challenge tests, pH 5.5



Phase	Ingredient	INCI name	%
A	Water	Aqua	ad 100
	Minasolve Products		
	Xanthan Gum OC	Xanthan Gum	0.5
B	Emulgade PL 68/50	Cetearyl Glucoside (and) Cetearyl Alcohol	5.0
	Lipex Sheasoft	Butyrospermum Parkii (Shea) Butter	3.0
	Jojoba Oil	Simmondsia Chinensis (Jojoba) Seed Oil	3.0
	Lipovol HNO	Corylus Americana (Hazel) Seed Oil	3.0
C	Bioxan T70	Tocopherol	0.1
D	Sodium Hydroxide (10% aq.)	Aqua (and) Sodium Hydroxide	ad pH 5.5

Minimum inhibitory concentration (MIC)



MinaSolve ™ Hexam and **EasySafe Hexam+** are powerful broad-spectrum antimicrobial agents that inhibit the growth of bacteria, yeasts and fungi. Their powerful microbiostatic activity is demonstrated by low MIC values. In addition to its preservation effect, **EasySafe Hexam+** also shows activity against *Propionibacterium acnes* and *Malassessia furfur*. As a result it can be used as an additive in anti-acne and anti-dandruff products.

MinaSolve ™ Hexam is a unique quality of **Hexamidine Diisethionate**. It is produced through a proprietary and sustainable process without the use of toxic solvents such as chloroform, which may still be used in today's standard manufacturing processes.

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.

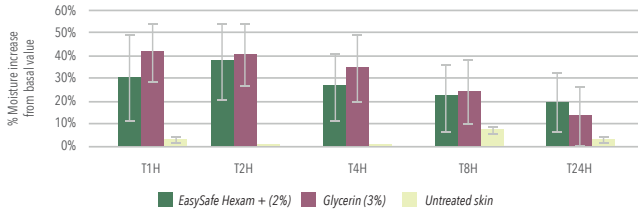
MinaSolve ™ Hexam is suitable for sensitive skin, scalp and mucous areas (oral, eye and intimate care).

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.

EasySafe Hexam+ can be conveniently used in skin care, hair care, make-up and toiletry formulations with a special focus on sensitive skin.

Corneometry study of aqueous solutions – PhD Trials, Lisbon

EasySafe Hexam+ is an effective skin humectant, as confirmed by a corneometry study.



EasySafe Hexam+ shows a long-lasting moisturizing effect similar to that of Glycerin. Both test substances were applied as aqueous solutions to the forearm areas.

Application in cosmetic formulations

MinaSolve ™ Hexam is stable within the pH-range of 3.0 – 6.5. Before adding **MinaSolve ™ Hexam** to any formulation, the pH of the product should be adjusted to this range.

MinasolveMinaSolve ™ 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. Furthermore, the presence of Pentylene Glycol **boosts the activity** of Hexamidine, leading to a **higher anti-microbial activity at lower use-levels**.

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 3.0-6.5 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.

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