

# EasySafe Hexam+

MILD AND BROAD SPECTRUM  
STANDALONE PRESERVATIVE

- ✓ *Proprietary eco-improved process*
- ✓ *Sensitive skin, baby care,  
intimate area and wet wipes*
- ✓ *Skin moisturizer*
- ✓ *Pentylene Glycol and Water and  
Hexamidine Diisethionate*

# MinaSolve Hexam

## From pharma to cosmetic

**Preservative with a long track record of use and good cutaneous and mucous tolerance**



**Pierre Fabre**



**Sanofi Aventis**



**Bausch & Lomb**



**Cooper**

**Also found in a variety of cosmetics & hygienic products**



**Beiersdorf**



**Beiersdorf**



**Ataman**



**Procter & Gamble**

**MINASOLVE®**  
BIO-INGREDIENTS FOR YOUR APPLICATIONS

# MinaSolve Hexam

## Unique source of Hexamidine diisethionate

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➞ Performance ingredient **for Protection**

➞ **Mild & Effective preservative**

➞ **MinaSolve Hexam** is the **unique source** of Hexamidine diisethionate produced through a **new and sustainable process without the use of toxic solvents** such as chloroform, commonly used in today's standard manufacturing processes

➞ Suitable for **sensitive skin, scalp and mucous areas**

➞ **Oral, eye and intimate care**

➞ Suitable for **anti-dandruff & anti-acne** applications

# MinaSolve Hexam

## Performance Ingredient For Protection

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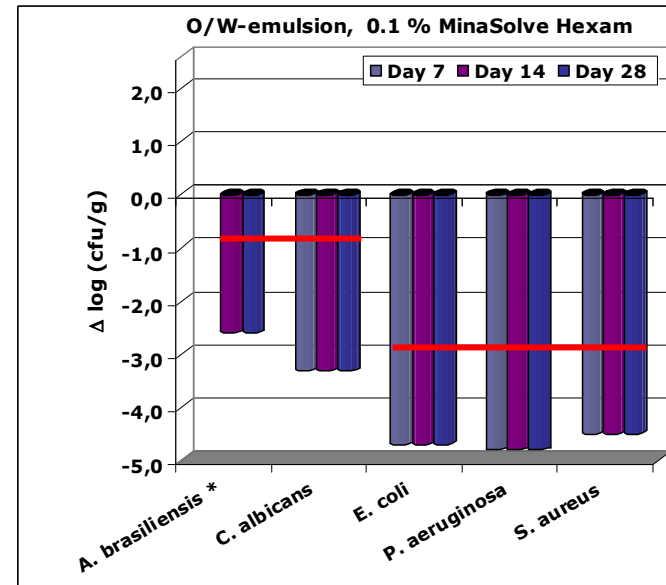
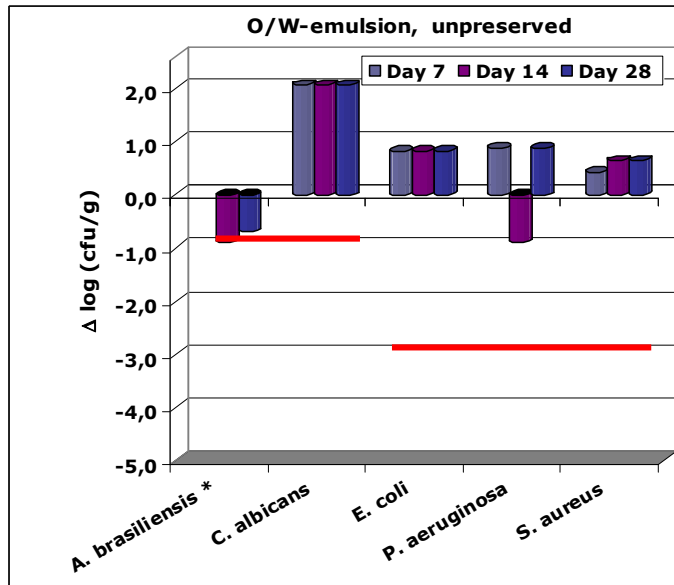
Challenge test in an O/W cream, pH 5,5

Phase	Ingredient	INCI name	%
<b>A</b>	Water	Aqua	ad 100
	<b>MinaSolve Hexam</b>	<b>Hexamidine Diisethionate</b>	<b>0.1</b>
	Xanthan Gum	Xanthan Gum	0.5
<b>B</b>	Emulgade PL 68/50	Cetearyl Glucoside (and) Cetearyl Alcohol	5.0
	Lipex Sheasoft	Butyrospermum Parkii (Shea) Butter	3.0
	Joboba Oil	Simmondsia Chinensis (Jojoba) Oil	3.0
	Hazelnut Oil	Corylus Americana (Hazel) Seed Oil	3.0
<b>C</b>	Bioxan T70	Tocopherol	0.1
<b>D</b>	Citric Acid (50 % aq.)	Aqua (and) Citric Acid	pH 5.5

# MinaSolve Hexam

## Performance Ingredient For Protection

Challenge test in an O/W cream, pH 5,5



— requirements of DIN EN ISO 11930 for log-reduction after 28 days

\* According to the ISO 11930 norm, the total germ count of *A. brasiliensis* is not to be assessed at day 7.

MinaSolve Hexam shows  
broad spectrum antimicrobial activity

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**Powder**



**MinaSolve  
Hexam**

**Liquid**

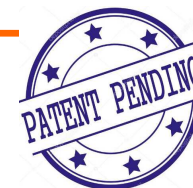


**EasySafe  
Hexam+**

Patent pending  
technical solution  
developed to  
strengthen the  
efficiency of  
MinaSolve Hexam and  
to facilitate its use

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# From MinaSolve Hexam to EasySafe Hexam+



	MinaSolve Hexam	EasySafe Hexam +
<b>INCI</b>	Hexamidine Diisethionate	Pentylene Glycol (and) Water (and) Hexamidine Diisethionate
<b>Appearance</b>	White or slightly yellow powder	Clear colourless liquid
<b>Solubility</b>	Water (4%)	Water and ethanol in all proportions
<b>Recommended use level</b>	0.01 - 0.1 %	0,2 - 2 %
<b>Formulation</b>	<p>Incorporation into the aqueous phase, or as a solution in water at any stage of the process, within a pH range 3 - 6.5</p> <p>Solubilisation can be accelerated by heating up to 50-100° C</p> <p>Compatibility with anionics should be checked individually</p>	<p>Easy to handle, water soluble liquid : can be introduced at any stage of the formulation within a pH range 3 - 6.5</p> <p>Suitable for cold and hot processes</p>

An Innovative and Alternative  
Preservative Solution for  
Sensitive Skin

# EasySafe Hexam+ Advantages

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## +Efficacy

**Synergistic blend** of Pentylene Glycol and Hexamidine Diisethionate  
**Long lasting skin moisturizing effect**

## +Formulation

Water soluble  
No need to heat  
Can be introduced at any stage of the formulation

## +Origin

Contains nature-derived Pentylene Glycol (A-Leen 5)  
Suitable for formulations with an emphasis on naturality

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Hexamidine diisethionate produced through a **new and sustainable process without the use of toxic solvents** such as toluene and chloroform, commonly used in today's standard manufacturing processes

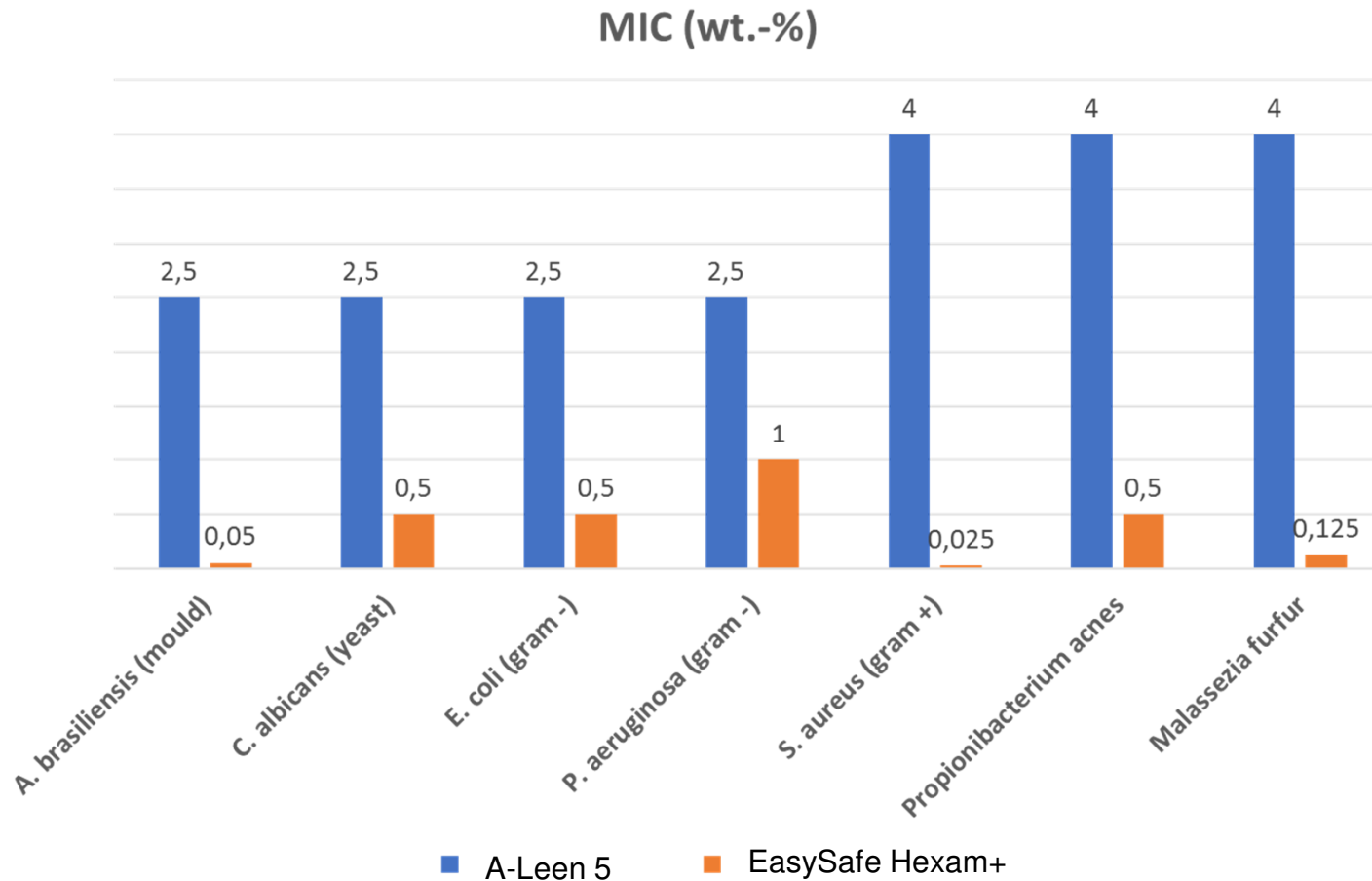
## +Production

No powder manipulation and eco-process



# EasySafe Hexam+

## Minimum Inhibitory Concentrations



**EasySafe Hexam+ can be used as an additive  
in anti-ance & anti-dandruff products**

# EasySafe Hexam+ Challenge test O/W emulsion

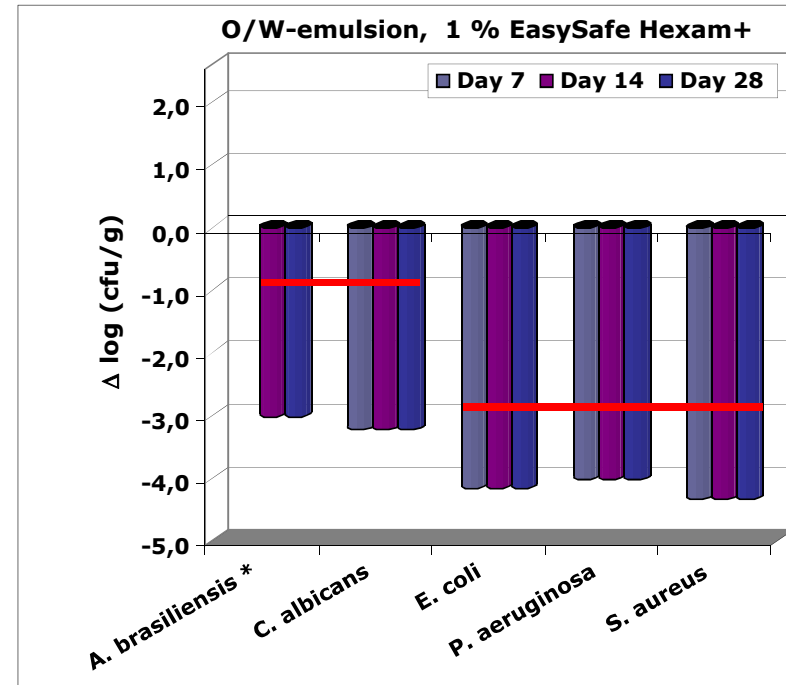
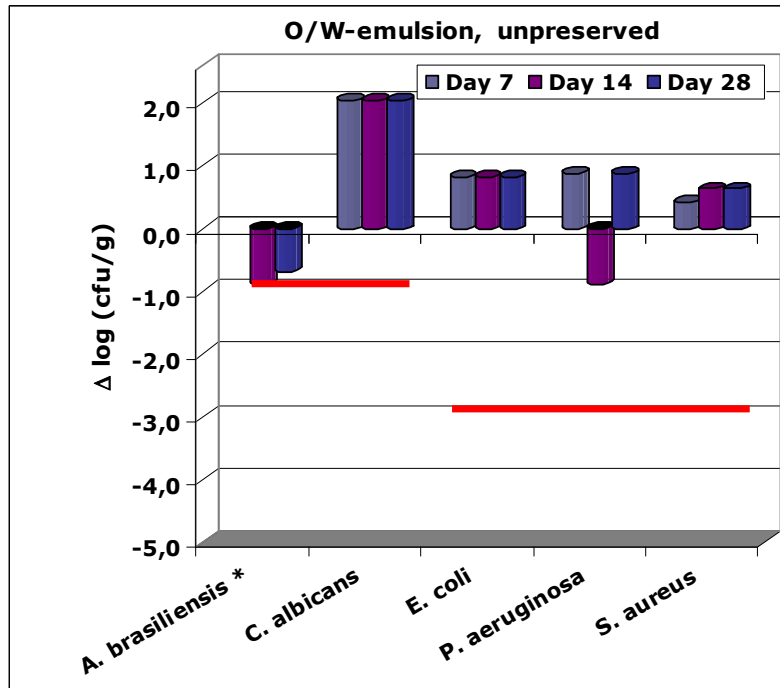
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## O/W-emulsion, pH 5.5

Phase	Ingredient	INCI name	%
A	Water	Aqua	ad 100.0
	<i>EasySafe Hexam+</i>	<i>Pentylene Glycol (and) Water (and) Hexamidine Diisethionate</i>	<i>1.0</i>
	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
	Joboba Oil	Simmondsia Chinensis (Jojoba) 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

# EasySafe Hexam+ Innovative & alternative preervatives

## O/W-emulsion, pH 5.5



— ISO 11930 requirements for log cfu reduction after 28 days (criteria A)

## EasySafe Hexam+ shows broad spectrum antimicrobial activity

# EasySafe Hexam+

## Challenge test Sulfate-free Shampoo

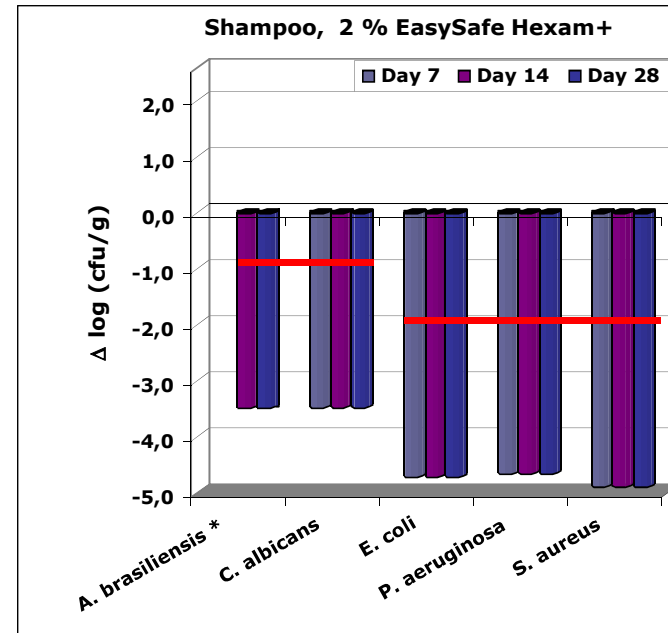
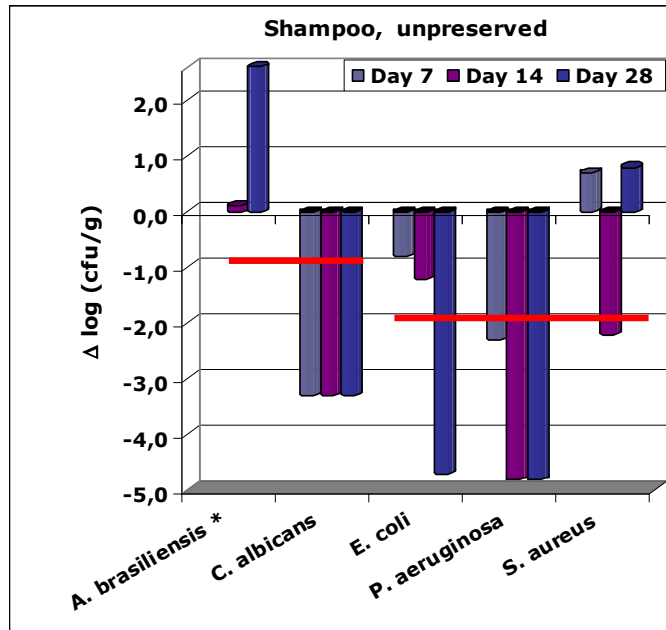
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### Sulfate-free Shampoo, pH 5.5

Phase	Ingredient	INCI name	%
<b>A</b>	Water	Aqua	ad 100.0
	Xanthan Gum OC	Xanthan Gum	0.6
	Cocoglucoside	Coco Glucoside	15.0
	Plantapon ACG HC	Sodium Cocoamphoacetate	5.0
	Tegobetain F50	Cocamidopropyl Betain	5.0
<b>B</b>	Citric acid (50% aq. solution)	Aqua (and) Citric acid	ad pH 5.5
<b>C</b>	<i>EasySafe Hexam+</i>	<i>Pentylene Glycol (and) Water (and) Hexamidine Diisethionate</i>	<i>2.0</i>

# EasySafe Hexam+ Innovative and Alternative preservative

## Sulfate-free Shampoo, pH 5.5



— ISO 11930 requirements for log cfu reduction after 28 days (criteria A)

## EasySafe Hexam+ shows broad spectrum antimicrobial activity

# EasySafe Hexam+

## Challenge test – wet wipes

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### Formulation: wipe juice, pH 5.5

Phase	Raw material	INCI name	%
<b>A</b>	Deionized Water	Aqua	ad 100
	Allantoin	Allantoin	0.2
	Glycerin	Glycerin	3.0
	Chamomile – ECO <sup>(1)</sup>	Glycerin (and) Aqua (and) Chamomilla Recutita (Chamomile) Flower Extract	1.0
<b>B</b>	Glycerox 767HC-LQ-(RB) <sup>(2)</sup>	PEG-6 Caprylic/Capric Glycerides	2.0
	Plantacare 810 UP <sup>(3)</sup>	Caprylyl/Capryl Glucoside	2.0
<b>C</b>	<b>EasySafe Hexam+</b>	...	<b>2.0</b>
	Lactic Acid	Lactic Acid	pH 5.5
	Citrate Buffer, pH 5.5	Water (and) Citric Acid (and) Sodium Citrate	3.0

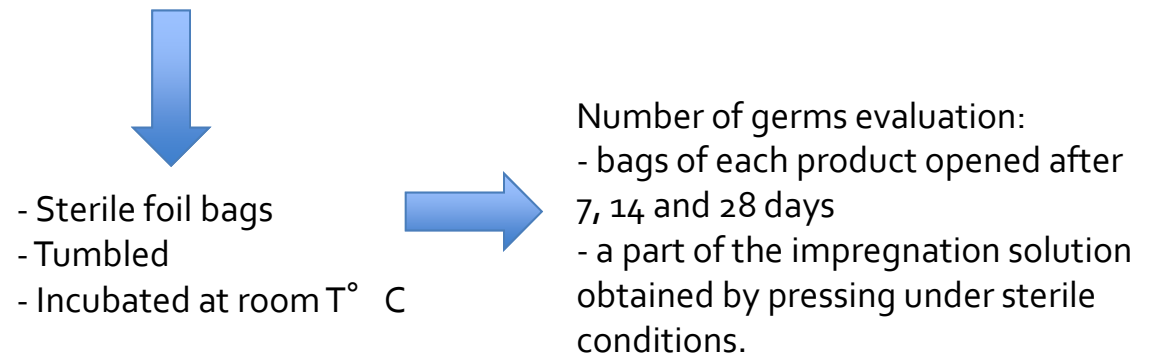
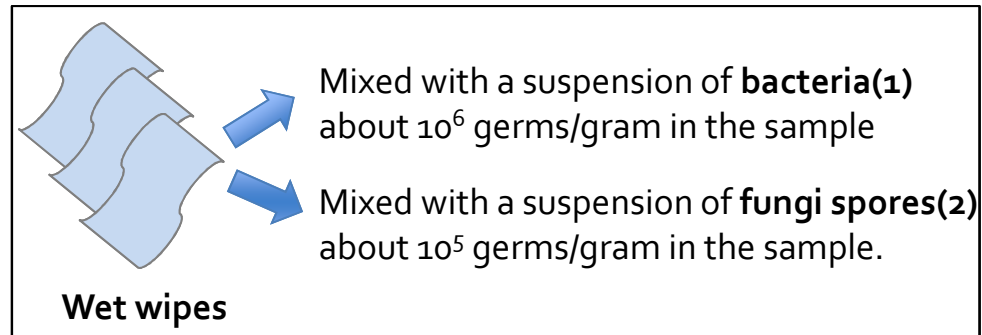
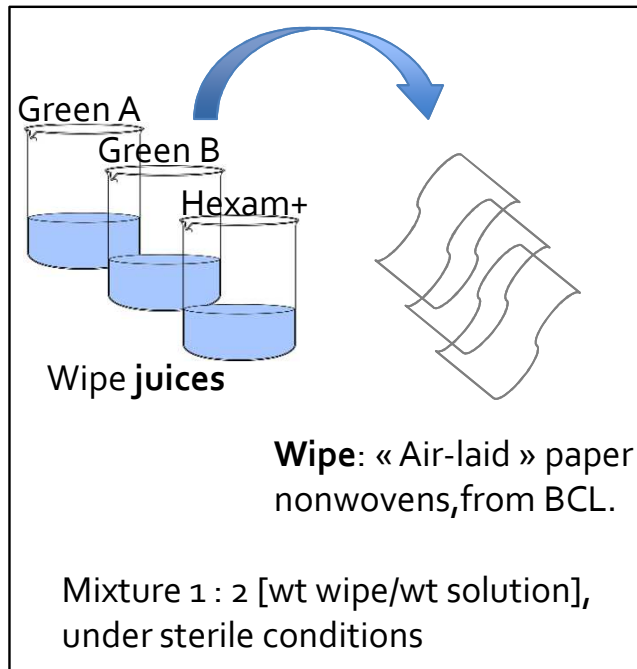
<sup>(1)</sup> Provital Group

<sup>(2)</sup> Croda

<sup>(3)</sup> BASF

# EasySafe Hexam+ Efficacy on wet wipes

## Procedure



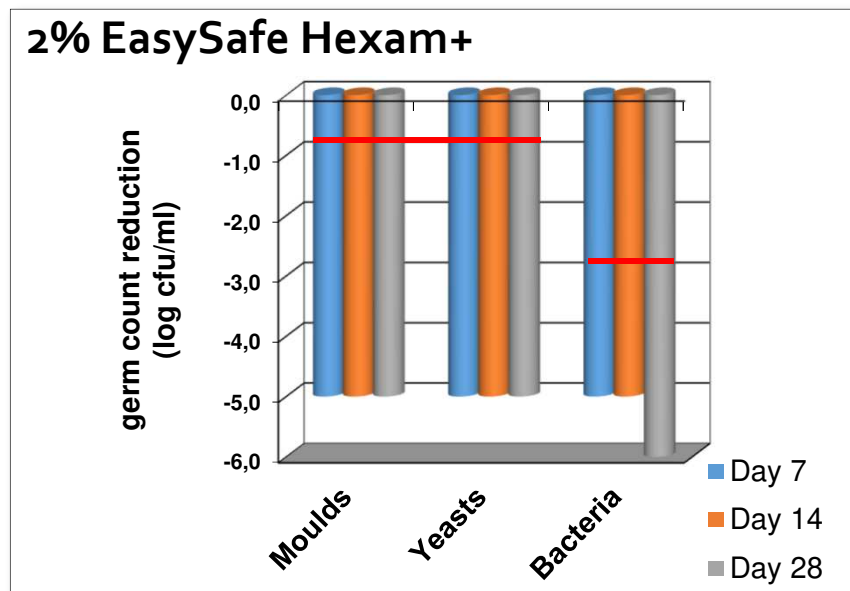
**(1) Bacteria:** *Pseudomonas aeruginosa*  
*Staphylococcus aureus*  
*Escherichia coli*  
*Proteus mirabilis*  
*Pluralibacter gergoviae*

**(2) Moulds :** *Aspergillus brasiliensis*  
*Penicillium expansum*  
*Trichoderma viride*

**(2) Yeast :** *Candida albicans*

# EasySafe Hexam+ Efficacy on wet wipes

## Challenge test results



— requirements of ISO 11930  
for reduction of log (cfu/mL) after 28 days

The unpreserved wipes showed a very high growth of all kinds of microbes

EasySafe Hexam+ is a good candidate for the **preservation of wet wipes juice** where **high tolerance** is required:

- ⇒ **Baby care** wet wipes
- ⇒ **Intimate** wet wipes

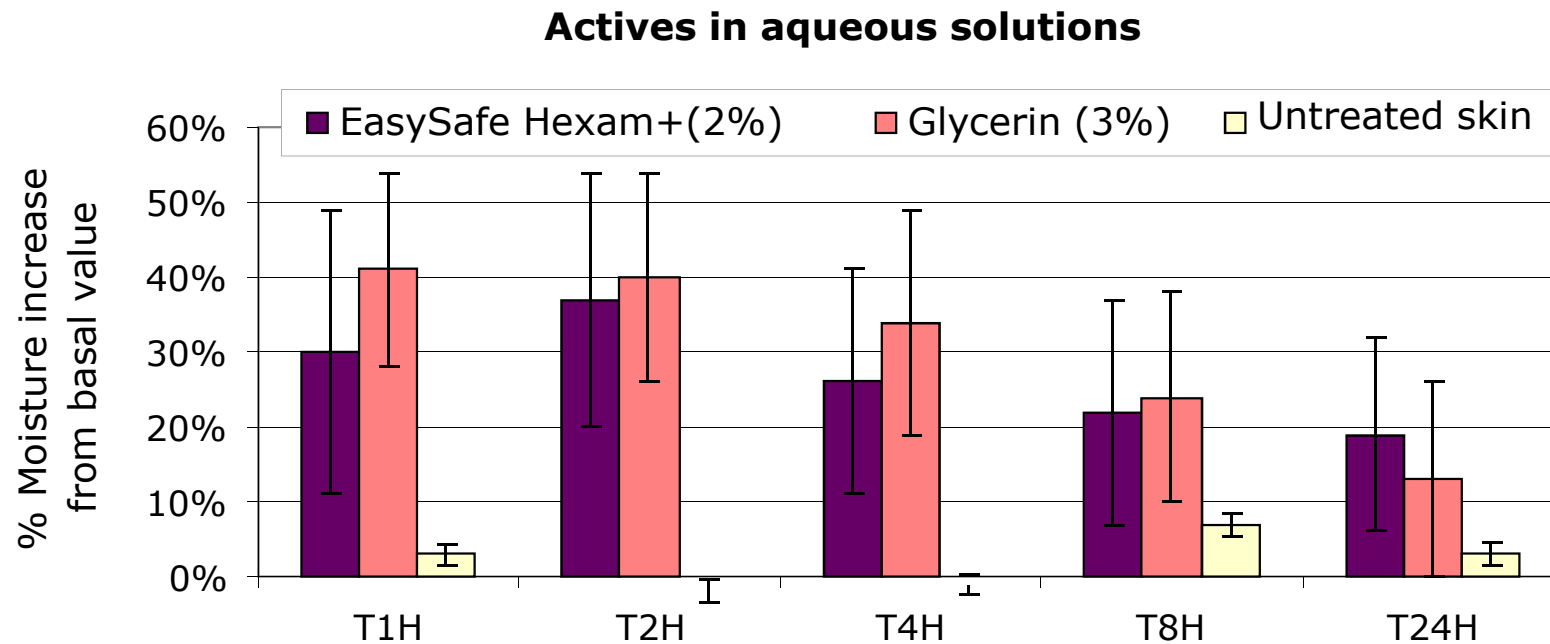


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# EasySafe Hexam+ Skin moisturizer

Corneometry study of aqueous solutions:



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

# EasySafe Hexam+ Safe preservative

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## HRIPT protocol :

Skin compatibility study and absence of allergenic potential, after repeated applications of the ingredients under occlusive conditions\*, over 36 days.

\* *Patch material* : Occlusive patch Finn Chamber standard

HRIPT	Hexam+
Number of subjects*	101
Age	18-65
Type of skin	All types
Skin Phototype (Fitzpatrick)	I to IV
RESULT	<ul style="list-style-type: none"><li>- No irritative reaction</li><li>- Very good skin compatibility</li><li>- No allergic reaction.</li></ul>

\*Within the focus group, about 30 % of the panel has a sensitive skin.  
After the test, nobody showed skin reaction



# EasySafe Hexam+ Concepts

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**Micellar Water**

## EasySafe Hexam +

**An Innovative and Alternative  
Preservative Solution for Sensitive Skin**



**Blueberry Children's Shampoo**



**Men's Aftershave Balsam**

# EasySafe Hexam+ Micellar Water

Phase	Raw material	INCI name	%
A	Water	Aqua	83,0
	Sodium Gluconate Granular	Sodium Gluconate	0,4
B	Glycerin (≥ 98%)	Glycerin	3,0
	A-leen 5	Pentylene Glycol	1,0
	D-Panthenol (≥98%)	Panthenol	2,0
	Softigen 767	PEG-6 Capric/Caprylic Glycerides	2,0
	Plantacare 818UP	Coco Glucoside	2,0
C	Tween 20	Polysorbate 20	5,0
	Perfume Fleurs de coco	Parfum	0,6
D	Lactic Acid (20%)	Aqua (and) Lactic Acid	Qs
E	EasySafe Hexam+	Pentylene Glycol (and) Water (and) Hexamidine Diisethionate	1,0



## Manufacturing process:

- 1/ Weigh out the water and dissolve the sodium gluconate under mixing.
- 2/ Add ingredients from phase B successively and under mixing.
- 3/ Premix the perfume and the Tween 20 and add to A+B under mixing.
- 4/ Adjust pH to  $6 \pm 0,2$
- 5/ Add EasySafe Hexam+ and mix thoroughly.

## Properties and stability:

Aspect : Clear and Colorless Liquid  
 pH :  $6 \pm 0,2$   
 Stable 3 months at room T° C and 42° C.

## Challenge Test:

Meets Criteria A / ISO 11930.

# EasySafe Hexam+ Blueberry Children's Shampoo

Phase	Raw material	INCI name	%
A	Water	Aqua	71,5
	Sodium Gluconate Granular	Sodium Gluconate	0,4
	Celquat SC-240C	Polyquaterium-10	0,2
	Xanthan Gum PC	Xanthan Gum	0,8
B	Plantacare 2000 UP	Decyl Glucoside	3,0
	Plantacare 818 UP	Coco Glucoside	5,0
	Rewoteric AMC	Sodium Cocoamphoacetate	10,0
	TegoBetain 810	Capryl/Capramidopropyl Betaine	3,0
	Tego Pearl N300	Glycol Distearate (and) Laureth-4 (and) Cocamidopropyl Betain	2,0
C	Perfume Blueberry Muffin DF	Parfum	0,4
	Tween 20	Polysorbate 20	1,2
D	Bleu Covarine w 6795 and D&C Red 33 solution	Water (and) CI 74160 (and) CI 17200	0,5
E	Citric acid (25%)	Aqua (and) Citric Acid	Qs
F	<b>EasySafe Hexam+</b>	<b>Pentylene Glycol (and) Water (and) Hexamidine Diisethionate</b>	<b>2,0</b>



## Manufacturing process:

- 1/ Weigh out water, dissolve Sodium Gluconate and Celquat, then add Xanthan Gum and mix at 700-800 rpm until complete hydration.
- 2/ Add ingredients from phase B and mix well between additions.
- 3/ Premix the perfume and the Tween 20 and add to A+B.
- 4/ Add the colour solution.
- 5/ Adjust the pH to  $5,5 \pm 0,3$  then add **EasySafe Hexam+**.

## Properties and stability:

Aspect : Dark violet, pearlescent, highly viscous gel with a sweet smell

pH :  $5,5 \pm 0,3$

Stable 3 months at ambient T° C, 42° C and during centrifugation at 1500g, 30 min.

## Challenge test:

**Meets criteria A / ISO 11930**

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# EasySafe Hexam+ Men's Aftershave Balsam

Phase	Raw material	INCI name	%
A	Water	Aqua	81,3
	<b>EasySafe Hexam+</b>	<b>Pentylene Glycol (and) Water (and) Hexamidine Diisethionate</b>	<b>2,0</b>
	Benecel K200M	Hydroxypropyl Methylcellulose	0,5
B	Tego Care PS	Methyl Glucose Sesquistearate	3,0
	1-Octadecanol (97%)	Stearyl Alcohol	2,0
	Jojoba Oil	Simmondsia Chinensis (Jojoba) Oil	5,0
	Sweet Almond Oil	Prunus Amygdalus Dulcis (Sweet Almond) Oil	4,0
	Squalane (98%)	Squalane	2,0
C	Tocomix L70-IP	Tocopherol (and) Helianthus Annuus (Sunflower) Seed oil	0,2
	Citric Acid (25%)	Aqua (and) Citric Acid	Qs



## Manufacturing process:

- 1/ Dissolve **EasySafe Hexam+** into water and start heating up to 75-80° C.
- 2/ Add Benecel to the hot water, slowly and under mixing. Leave to mix for 10 min.
- 3/ Weigh out ingredients from phase B into a separate beaker and heat up to 75-80° C.
- 4/ Add B to A under high shear (Ultra Turrax/ 3 min/ 8000 rpm), when both phases have reached 75-80° C.
- 5/ Cool down and add Tocomix when  $T < 40^{\circ} \text{C}$ . Keep cooling down while mixing.
- 6/ Adjust the pH to  $5,3 \pm 0,3$ .

## Properties and stability:

Aspect : Cream-colored emulsion  
 pH :  $5,3 \pm 0,3$   
 Stable 3 months at 20° C and 42° C

## Challenge test:

**Meets criteria A / ISO 11930**

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# MinaSolve Hexam Concepts

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## MinaSolve Hexam

**Face care for sensitive & dry skins**



# MinaSolve Hexam

## Face Cream for sensitive & dry skins

Phase	Raw material	INCI name	%
<b>A</b>	Water	Aqua	80.3
	<b>MinaSolve Hexam</b>	<b>Hexamidine Diisethionate</b>	<b>0.1</b>
	Ectoin	Ectoin	0.5
	D-Panthenol	Panthenol	2.0
	Glycerin (>98%)	Glycerin	2.0
<b>B</b>	Heliofeel	Glyceryl Stearate Citrate, Polyglyceryl-3 Stearate, Hydrogenated Lecithin	4.0
	Glyceryl Monostearate	Glyceryl Monostearate	1.5
	Joboba Oil	Simmondsia Chinensis (Jojoba) Seed Oil	3.0
	Almond Oil	Prunus Amygdalus Dulcis (Sweet Almond) Oil	2.0
	Cetyl Alcohol	Cetyl Alcohol	2.0
	Myrasil DM 350	Dimethicone	1.5
<b>C</b>	DL-a-Tocopherol (97%)	Tocopherol	0.1
	Sodium Hydroxide (10%)	Aqua (and) Sodium Hydroxyde	qs
	Buffer	Aqua (and) Citric Acid (and) Sodium Citrate	1.0



### Manufacturing process:

- 1/ Add **MinaSolve Hexam** to the water and mix until fully dissolved. Successively add the other ingredients from phase A, mixing well between each addition. Heat up to 75-80° C
- 2/ In a separate vessel, prepare phase B and heat up to 75-80° C.
- 3/ Add B to A, under high shear, 3 min with an Ultra Turrax, then mix with a propeller mixer while cooling down.
- 4/ When T < 40° C, add tocopherol.
- 5/ When room T° C has been reached, adjust the pH to 5.0 – 6.0. Add the buffer.

### Properties and stability:

Aspect : Thick, cream-coloured emulsion  
 pH : 5.5 ± 0.5  
 Stable during 3 months at 42° C and room T° C and during centrifugation at 1500g, 30 min.

### Challenge test:

**Meets criteria A / ISO 11930**

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Created in 2004, The MINAFIN® Group, specializes in fine chemistry for the life sciences and high the industries. Activities include industrial subcontracting, development of chemical syntheses and industrial scale-up of custom-made processes as well as proprietary products with high added values for the pharmaceutical, cosmetics, agriculture and high tech industries. Strong synergies exist between all business unites :

- Minakem
- Minagro
- Pennakem
- Pressure Chemical
- Minascent
- EcoXtract

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



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Presentation MinaSolve™ Hexam + - November 2018 - V10

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