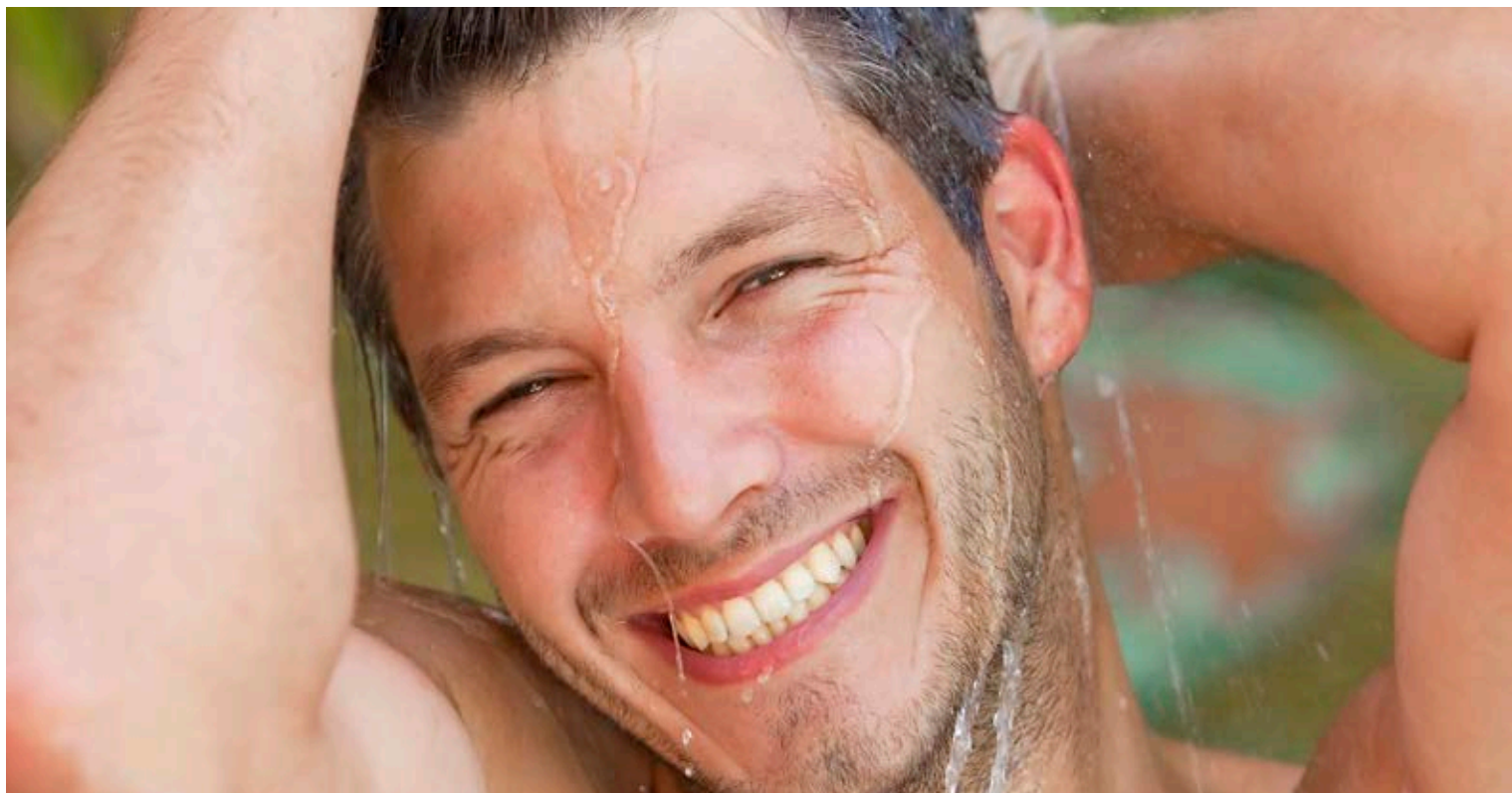


Glydant Plus®

Traditional Preservation for Broad Spectrum Product Protection



INCI Name: DMDM Hydantoin & Iodopropynyl Butylcarbamate (IPBC)

Key Product Attributes:

- Has a wide range of global regulatory approvals
- Unique and cost effective preservative
- Combination with a dual mode of action
- High level of antimicrobial activity in a wide variety of cosmetic and personal care formulations ("wash-off" or "leave-on" products)
- Highly effective in inhibiting the growth of gram positive and gram negative bacteria, yeasts and molds without the need of additional auxiliary preservatives
- Remains stable for extended periods of time over wide pH and temperature ranges
- Low odor
- White granular product
- Effective blend of DMDMH and IPBC
- Lower amount of preservative required
- Several modes of action
- Lower risk of microbial resistance

Glydant Plus® at 0.1 % in a GMS cream.

Efficacy-GMS Cream	CFU/days					
	Day 0	Day 1	Day 2	Day 3	Day 7	Day 28
<i>Pseudomonas aeruginosa</i>	<10	<10	<10	<10	<10	<10
<i>Escherichia coli</i>	2×10^5	<10	<10	<10	<10	<10
<i>Aspergillus niger</i>	8×10^5	8×10^3	<10	<10	<10	<10
<i>Candida albicans</i>	6×10^6	2×10^6	2×10^6	2×10^6	<10	<10
Control	10^6	10^6	10^6	10^6	10^6	10^6

Glydant Plus® was incorporated into a shampoo formula, a standard medium used for efficacy studies.

Shampoo Formulation

Ingredients	% wt/wt
Sodium Lauryl Ethersulfate	35.0
Triethanolamine Laurylsulfate	25.0
Coco-Diethanolamide	3.0
Water	36.0
Polypro 5000	1.0
Preservative	q.s.
Total	100.0

Glydant Plus® at various concentrations against a Mixed inoculum-Fungi.

Preservative, %	Log CFU/Contact time, days						
	0	1	2	3	7	14	28
Glydant Plus® 0.050	5	3	0	0	0	0	0
Glydant Plus® 0.075	5	3	0	0	0	0	0
Glydant Plus® 0.100	5	0	0	0	0	0	0
Control	4	5	6	5	6	5	6

Glydant Plus® at various concentrations against a mixed inoculum-Bacteria.

Preservative, %	Log CFU/Contact time, days						
	0	1	2	3	7	14	28
Glydant Plus® 0.05	5	3	0	0	0	0	0
Glydant Plus® 0.075	6	3	0	0	0	0	0
Control	5	5	6	5	4	5	6

Formulation Recommendations

- Low odor
- Wide pH range: 3–9
- Soluble in anionic surfactants, nonionic surfactants, cationic surfactants, alcohols, glycols, and glycol ethers
- Readily soluble in a 10 % or less active surfactant solution at recommended levels of preservative for shampoos; not soluble in water
- Soluble in the oil phase or emulsified portion of a cream, conditioner or lotion from room to elevated temperatures
- Best added at 45 °C during the cool down stage of processing
- Can be added to a surfactant by surfactant manufacturers where temperature is usually in the 50–60 °C and the pH is 7.5 to 8.5

Global Regulatory

Europe

- Both active ingredients approved, Annex V to Regulation EC/1223/2009.
- Finished products containing DMDMH must be labeled with the warning “contains formaldehyde” if the (free) formaldehyde concentration exceeds 0.05%
- Max use level: 0.6% DMDMH and 0.01% IPBC (leave-on except in creams and lotions aimed to be applied on a large part of the body), 0.6% DMDMH and 0.02% IPBC (rinse-off). Allowed in rinse-off products up to 0.02% IPBC and up to 0.01% IPBC
- Not allowed for oral hygiene and lip products
- Cannot be used in products for children under three years (except for rinse-off)

Japan

- Listed in the positive list. The following warning must be labeled: “should not be used by infants or by people who are hypersensitive to formaldehyde.”
- Cannot be used in leave-on due to DMDMH
- Max use level: 0.3% DMDMH and 0.02% IPBC for rinse-off

USA

- Approved by CTFA for both rinse-off and leave-on applications
- Max use level of 0.6% DMDMH and 0.01% IPBC

Typical Properties

Appearance	Granular
Color	White
Odor	Characteristic

USA

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