TECHNICAL INFORMATION

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BULLETIN VC-848

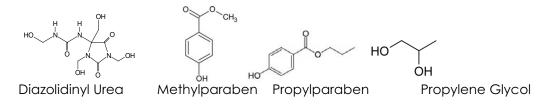
Germaben™ II

Preservative for the Cosmetics Industry

Product Description

Germaben II preservative is a ready-to-use, broad spectrum liquid preservative system for use in a variety of personal care and cosmetic products. Germaben II preservative combines Germall II preservative a highly efficacious bactericide with Methyl- and Propylparaben solubilised in propylene glycol. This unique combination provides a broad spectrum protection without the need of additional preservatives.

Formula



Suggested Applications

Germaben II preservative is ideal for leave-on and rinse-off products, and is generally recommended for water soluble formulations and emulsions with an oil phase of approximately 25% or less. Typical applications include shampoos, conditioners, creams and lotions. Germaben II is readily soluble up to a level of 1.0% over a 3.0 – 7.5 pH range.

Dosage and Processing

Germaben II preservative is typically dosed at 0.5 – 1.0% of the final formulation depending upon the complexity of the individual formulation.

The convenient liquid form of Germaben II preservative allows easy incorporation into a variety of personal care formulations, including hot and cold processed shampoos, creams and lotions during manufacture. The preferred method of addition is to add it slowly to the formulation below 60 °C with good stirring prior to the addition of fragrance.

Research show that Germaben II preservative can also be added pre-emulsification to the water phase at the time of manufacture. However, as with any part of process development, manipulation of the formulation must first be validated before the process is implemented.



Product Properties

Microbiological Profile

Germaben[™] II is a broad spectrum liquid preservative. It inhibits the growth of Gram-negative, Gram positive bacteria, yeast and molds, and troublesome house organisms. In general no additional preservatives are needed to be added to the final formulation, reducing the total amount of preservatives necessary for proper preservation.

Representative Minimum Inhibitory Concentration (MIC) is shown in the table below. MIC values were determined by serial dilution in TSB as the lowest active ingredient concentration that inhibited visible growth after an overnight incubation.

| Organism | ATCC | MIC(ppm) |
|------------------------|-------|----------|
| Pseudomonas aeruginosa | 9027 | 300 |
| Escherichia coli | 8739 | 1200 |
| Burkhoderia cepacia | 25416 | 1200 |
| Staphylococcus aureus | 6538 | 600 |
| Aspergillus niger | 16404 | 2500 |
| Candida albicans | 10231 | >5000 |

For the determination of the optimum dosage we recommend a preservation test, as the efficacy of this preservative is highly influenced by the product matrix. The staff of Ashland's microbiological laboratories will be pleased to give customers the appropriate support.

Technical Data

| Appearance: | Pale to light yellow, viscous liquid | |
|---|---|--|
| Odour: | Characteristically mild | |
| Solubility (g/100 g solvent): water 1g; ethanol < 0.1g; ethanol 50% miscible; methanol <0.1g; | | |
| | isopropanol < 0.1g; propylene glycol miscible; butylenes glycol 4.5g; | |
| | glycerine miscible; HCl (10%) 2.0g; NaOH (10%) 22.5g. | |

Labelling

For information regarding labelling of products and the Risk and Safety phrases or Hazard and Precautionary Statements of Germaben II preservative please seek specific advice from Ashland or refer to the separate Safety Data Sheet (SDS).

INCI-Nomenclature

| 78491-02-8 | Diazolidinyl Urea |
|------------|-------------------|
| 99-76-3 | Methylparaben |
| 94-13-3 | Propylparaben |
| 57-55-6 | Propylene Glycol |

Regulatory requirements governing the use, registration, and approval of preservatives around the world are continually changing and evolving.

All statements, information and data presented herein are believed to be accurate and reliable, but are not to be taken as a guarantee, an express warranty, or an implied warranty of merchantability or fitness for a particular purpose, or representation, express or implied, for which Ashland Inc. and its subsidiaries or affiliates assume legal responsibility. It is the customer's responsibility to ensure that its use of preservative products is in accordance with all applicable laws and regulations. In addition, customers are strongly advised to confirm that the preservative they are purchasing has all necessary regulatory approvals for the intended use and the country where the product is going to be used.

