

## TroyCare™ BD55

Product Code 401

### Description

TroyCare™ BD55 is a highly effective, water soluble antibacterial preservative. TroyCare™ BD55 is specifically engineered for use in Personal Care Products and Cosmetic formulations to provide protection across a wide range of pH and temperature. TroyCare™ BD55 is globally approved and has a long history of safe use across the entire range of rinse-off and leave-on personal care formulations.

### Features and Benefits

TroyCare™ BD55 demonstrates the following features and benefits in personal care products:

- Low cost-in-use
- Long-lasting activity against Gram-negative and Gram-positive bacteria.
- Excellent toxicity and safety profile
- Non-irritating to eyes, skin or mucous membranes
- Global regulatory approvals
- Easy to use, water soluble liquid
- Stable and effective from pH 3 - 10
- Temperature stable to 80°C

### Application/Use

TroyCare™ BD55 provides superior product preservation against microbiological attack and is easily incorporated into water-based personal care products and, such as:

- Body washes and Liquid soaps
- Shampoos and Conditioners
- Shaving creams, Gels, and Lotions
- Creams and Lotions
- Wet wipes
- Color cosmetics
- Sun care products

### Physical Properties

The following are typical physical properties, not specifications of TroyCare™ BD55.

Appearance:.....Colorless, Clear liquid  
Color (APHA).....10 Max  
Specific Gravity, 22°C..... 1.16  
pH (as is) ..... 7  
Solubility ..... Completely miscible in water

### Chemical Identification

<u>CFTA/INCI Name</u> <u>Active Ingredients</u>	<u>CAS Number</u>	<u>EINECS Number</u>
DMDM Hydantoin .....	6440-58-0.....	229-222-8

**Ingredient Information**

<b>Active Ingredients</b>	
1,3-Dimethylol-5,5-dimethylhydantoin.....	55 %
<b>Inert Ingredients</b>	
Water .....	45 %

**TroyCare™ BD55** is a composition comprised of the active ingredient 1,3-Dimethylol-5,5-dimethylhydantoin and inert ingredients. Each batch of TroyCare™ BD55 is produced to exact specifications and a certificate of analysis can be provided with each order. The above is presented as typical composition and does not constitute specifications.

**Formulating Considerations**

The microbiological performance of TroyCare™ BD55 in most personal care and cosmetic products is excellent. The use of proper handling and application techniques as it is incorporated into your formulation will enhance the overall performance of TroyCare™ BD55 and help to optimize your treatment costs. The following guidelines are presented for your consideration. As part of a best practice manufacturing strategy, it is advised to confirm compatibility in the development of new products.

**Typical Use Levels** - TroyCare™ BD55 is typically used at levels of 0.20 – 0.60% by weight in the final formulation. The actual level of treatment to protect any particular system depends on a variety of factors including, but not limited to, the initial level of microbiological contamination, the components of the system, and the likelihood of exposure to repeat microbiological challenges and the temperature and pH of the system. Because personal care formulations vary with each manufacturer and these variations may impact the preservative, it is recommended that the manufacturer confirm the efficacy and stability of TroyCare™ BD55 in use. The optimum use level will always be a function of several factors, including the composition of the formulation, anticipated microbial challenge, processing and storage conditions, and even local regulatory considerations (see Regulatory Status). Troy offers free preservative challenge testing and our TMMMA program to help you determine the best preservative system and optimum use levels for your specific situation (see Technical Support below).

**Addition to the Formulation** - TroyCare™ BD55 is a liquid product that is easily incorporated into water-based systems and can be added at any stage of the production process. The product should be added at a point where there is good agitation or mixing to achieve homogeneous distribution throughout the formulation. For best results, the product can be added as early into the process as possible provided.

**Effect of Temperature** - TroyCare™ BD55 remain effective over a wide temperature range. It can be heated to 80°C with no loss in performance. For systems that exceed 80°C, it is recommended to add TroyCare™ BD55 during the cooling stage, after the temperature has decreased below 80°C.

**Effect of pH** – TroyCare™ BD55 is stable and provides superior antifungal preservation over the wide formulation and product pH range of 3-10. This allows for considerable flexibility in processing and even final formulation conditions. TroyCare™ BD55 is long term stable up to a pH of 10.

**Compatibility** ---TroyCare™ BD55 is fully compatible with most PC formulation ingredients, including all types of cationic, nonionic and anionic surfactants.

**Antimicrobial  
Activity**

TroyCare™ BD55 provides excellent antimicrobial performance against Gram-negative and Gram-positive bacteria. This performance is illustrated in the following table which shows the minimum inhibitory concentration\* in ppm of TroyCare™ BD55 active ingredient (DMDM Hydantoin) that inhibited microbial growth in laboratory testing.

**Minimum Inhibitory Concentration (MIC)**

	Strain ATCC No.	Active Ingredient (ppm)
<b>Bacteria: Gram-negative</b>		
<i>Acinetobacter calcoaceticus</i>	17902	213
<i>Burkholderia cepacia</i>	25416	506
<i>Enterobacter aerogenes</i>	13048	366
<i>Enterobacter cloacae</i>	15361	328
<i>Enterobacter gergoviae</i>	33028	≤65
<i>Escherichia coli</i>	8739	506
<i>Escherichia coli</i>	10536	366
<i>Escherichia coli</i>	11229	171
<i>Klebsiella pneumoniae</i>	13883	138
<i>Myroides odoratus</i>	4651	213
<i>Proteus vulgaris</i>	13315	191
<i>Pseudomonas aeruginosa</i>	9027	300
<i>Pseudomonas fluorescens</i>	13525	300
<i>Pseudomonas putida</i>	11172	629
<i>Serratia marcescens</i>	14223	366
<b>Bacteria: Gram-positive</b>		
<i>Bacillus subtilis</i>	6051	≤65
<i>Enterococcus faecalis</i>	11420	564
<i>Enterococcus hirae</i>	10541	≤65
<i>Lactococcus lactis</i>	27861	366
<i>Staphylococcus aureus</i>	6538	171
<i>Staphylococcus aureus</i>	BAA-1720	111
<i>Staphylococcus epidermidis</i>	12228	154
<b>Fungi</b>		
<i>Aspergillus niger</i>	9642	1448
<i>Eupenicillium levitum</i>	10464	843
<i>Trichoderma reesei</i>	13631	2490
<i>Penicillium species</i>	12667	1046
<i>Chaetomium globosum</i>	6205	256
<b>Yeast</b>		
<i>Candida glabrata (yeast)</i>	2001	700
<i>Saccharomyces cerevisiae (yeast)</i>	7752	564

\*Minimum inhibitory concentration (MIC) is an indication of which microorganisms can be controlled by a preservative and the concentration at which growth of the test organism is inhibited under laboratory conditions. Lower MIC values correlate with greater product effectiveness against the specific pathogen tested. MIC values should only be used for general comparisons, however. Actual in-use concentrations should be only be established through rigorous microbiological challenge testing, a service that Troy provides free of charge to all Troy customers.

## Regulatory Status

TroyCare™ BD55 is globally approved with the following regional limitations

### Europe

- Rinse-off: Maximum DMDM Hydantoin concentration of 0.6%
- Leave-on: Maximum DMDM Hydantoin concentration of 0.6%

### Americas

- Approved for use

### Asia

- **General**
  - Rinse-off: Maximum DMDM Hydantoin concentration of 0.6%
  - Leave-on: Maximum DMDM Hydantoin concentration of 0.6%
- **Japan**
  - Rinse-off: Maximum DMDM Hydantoin concentration of 0.02%
  - Leave-on: Not allowed

## Chemical Inventories

This product is approved for sale under the following chemical inventories:

Country	Agency
United States	TSCA
Canada	DSL
Europe	EINECS
Australia	AICS
Korea	ECL
Japan	ENCS/MITI
Philippines	PICCS
China	IECSC
New Zealand	NZIoC
Taiwan	NECI

## Regulatory Considerations

Please refer to the Safety Data Sheet (SDS) for Toxicity, Ecotoxicity, Shipping and Labeling Information.

## Handling, Storage, and Disposal

Please refer to the Safety Data Sheet (SDS).

## Health and Safety

Please refer to the Safety Data Sheet (SDS)



## Technical Support

Troy offers a broad array of technical support services to our customers free of charge. Our world class microbiology, formulation and analytical laboratories are ready to help you identify and implement the optimum preservative solution for your specific personal care formulation needs.

**Microbiology** – Troy offers preservative challenge testing for all types of personal care formulations, including liquids, creams, wipes, solids and more. We can isolate and identify specific microorganisms that are challenging your system. In addition, Troy routinely performs minimum inhibitory concentration (MIC) testing, preservation (longevity) testing, sterility checks and more.

**TMMA** — Troy offers a technical consultative service called TMMA (Troy Microbiological Management Advantage Program). TMMA is a comprehensive system approach designed specifically for plant, process, and materials protection requirements, including the principles of good plant hygiene and preventative measures. TMMA services can also include an in-depth plant hygiene survey combined with a custom-developed preservation regimen. The program thereby enables personal care formulators to achieve contamination-free systems and plant operations, from raw materials to finished products. The intention of TMMA is to provide solutions that lead to reduced costs, improved product quality and risk minimization.

**Custom Solutions** – Troy can work with key customers to develop truly unique preservative blends that deliver convenience and value, optimized to the customer's specific preservation needs.

Please contact Troy Technical Service or your local Troy Sales Representative for further information regarding any of the support services described above.

## Shipping and Packaging

TroyCare™ BD55 is packaged in:

Shipping Container	Net Weight	Item Code
Pails	40 lbs. / 18 kg.	4011PC
Drums	500 lbs. / 227 kg.	4013PC

For further information visit our website:  
[www.troycorp.com](http://www.troycorp.com) or call...

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