



BIOBAN BP-40 Liquid Preservative

Liquid Preservative For Water-Containing Systems

EPA Reg. No. 464-676

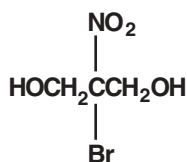
General

BIOBAN™ BP-40 liquid preservative contains the active ingredient 2-bromo-2-nitro-1,3-propanediol (bronopol) and is used for controlling bacterial growth in water-containing systems such as adhesives, starch pigment and extender slurries, printing inks, fountain solutions, paints, latex and antifoam emulsion systems, absorbent clays, corn cobs and ground wood.

BIOBAN BP-40 liquid preservative is EPA registered. It is supplied in a 40% active solution in water and dipropylene glycol methyl ether, and provides the following benefits:

- Broad-spectrum bacterial efficacy
- Control of *Pseudomonas* sp.
- Control of slime forming bacteria
- Control of organisms responsible for microbiologically-induced corrosion
- Especially effective in combination with other biocides

Structure



Physical Properties

The following are typical properties of BIOBAN BP-40 liquid preservative; they are not to be considered product specifications.

Appearance	Pale yellow liquid
Purity, % by wt.	38.7-42.6
Density @ 22°C	1.23
pH (as is)	<4.5
Flash Point	>180°F (82°C)
Solubility	Highly soluble in water and the lower alcohols. Generally soluble in glycols and other polyols. Insoluble in aliphatic hydrocarbons such as mineral oil.

Antimicrobial Activity

BIOBAN BP-40 liquid preservative is effective against a broad array of bacteria as illustrated by the minimum inhibitory concentrations (MIC) listed below. These data are intended only as an indication of the broad spectrum of activity of BIOBAN BP-40 liquid preservative and should not be interpreted as having relevance to the effectiveness or dosage against specific bacteria in formulated products or process systems.

Organism	MIC (ppm active ingredient)
<i>Escherichia coli</i>	12.5-50
<i>Pseudomonas aeruginosa</i>	12.5-50
<i>Pseudomonas putida</i>	25
<i>Pseudomonas cepacia</i>	25
<i>Pseudomonas stutzeri</i>	25
<i>Pseudomonas fluorescens</i>	25
<i>Klebsiella pneumoniae</i>	25
<i>Enterobacter aerogenes</i>	25
<i>Staphylococcus aureus</i>	12.5-30
<i>Staphylococcus epidermidis</i>	50

BIOBAN BP-40 liquid preservative, in contrast to the majority of other antibacterial agents, is particularly effective in controlling *Pseudomonas aeruginosa*. These organisms are difficult to control with most antimicrobial agents and can develop resistance to preservatives. BIOBAN BP-40 liquid preservative is also very effective at controlling the anaerobic sulfate-reducing bacteria (SRB) that are responsible for causing microbiologically influenced corrosion as well as generating gases such as H₂S. BIOBAN BP-40 liquid preservative also exhibits limited fungal efficacy at typical use levels.

In order to obtain the full benefits of BIOBAN BP-40, avoid use in systems containing reducing agents or secondary amines. In neutral to alkaline systems, bronopol can slowly decompose to release nitrite ions. In the presence of secondary amines these nitrite ions have the potential to form nitrosamines. Bronopol itself is not a nitrosating agent. It is also recommended that BIOBAN BP-40 liquid preservative should not be subjected to temperatures greater than 40°C to avoid decomposition. For formulations that will be repeatedly exposed to microbial challenges during use and storage (user opening and closing product container) the optimum pH range for use of these preservatives is below 8; however, products that are greater than pH 8 can still be preserved with BIOBAN BP-40 liquid preservative. Testing should be performed to confirm that preservation meets the requirements outlined for the product

Formulating Considerations

The active ingredient in BIOBAN BP-40 liquid preservatives, bronopol, is compatible with a range of materials used in water-containing systems. However, strong reducing agents such as bisulfite (>50 ppm) and oxidizing agents such as free residual chlorine (>5ppm) should be avoided. BIOBAN BP-40 liquid preservative maintains its antimicrobial activity over a wide pH range despite some decrease in chemical stability as conditions become more alkaline (pH>8.5).

BIOBAN BP-40 liquid preservative can be used alone or in combination with other biocides. The use of multiple preservatives provides additional protection against bacterial and fungal spoilage. In addition, combination systems can be more cost effective. Multiple biocide combinations help prevent the establishment of populations of organisms resistant to a single biocide.

BIOBAN BP-40 liquid preservative can be used in combination with a wide variety of biocides. The most popular combinations are those with 5-chloro-2-methyl-4-isothiazolin-3-one and 2-methyl-4-isothiazolin-3-one (CMIT/MIT) or 1,2-benzisothiazolin-3-one (BIT). The dosage levels of CMIT/MIT, typically 25-30 ppm active ingredient for preservation applications, can be reduced to 7.5 to 15 ppm active ingredient when combined with 100-200 ppm (active ingredient) BIOBAN BP-40 liquid preservative.

The benefits of the combination of these two actives are as follows:

- Synergistic activity has been reported between bronopol and isothiazolinones in both the USA and Japan.
- *Pseudomonas* efficacy – BIOBAN BP-40 liquid preservative has extremely good efficacy against *Pseudomonas*, a weakness of isothiazolinone chemistry.
- BIOBAN BP-40 liquid preservative can improve the stability of CMIT/MIT in the presence of reducing agents.

Application	Purpose	Suggested Concentration of BIOBAN BP-40 Liquid Preservative	How to Apply
Absorbent Clays, Corn Cobs & Ground Wood	To inhibit the growth of odor-causing bacteria in absorbent clays.	50-1250 ppm of BIOBAN BP-40.	Impregnate material.
Adhesives	For the preservation of water-based adhesives.	0.2-1.0 pint of BIOBAN BP-40 per 1000 lb total formulation weight.	Add directly to water to be incorporated into the formulation.
Inks and Fountain Solutions	To inhibit bacterial growth during the storage and use of water-based printing inks and fountain solutions.	200 to 1000 ppm based on final formulation volume for in-can preservation. 40 to 200 ppm in fountain solutions.	For in-can preservation, add as a final step. During use, shock dose in the fountain reservoir where there is adequate flow or agitation.
Paints, Latex and Antifoam Emulsions	For in-can preservation of latex emulsion concentrates and paints. Also, for silicone and other antifoam emulsion systems.	200-1000 ppm based on final formulation volume.	Add as a final step before packing into bulk or sales packs.
Starch and Pigment Slurries	To control bacteria in aqueous starch suspensions, mineral and pigment slurries.	200-1000 ppm based on final formulation volume.	Add directly to the process water during or close to the end of the manufacturing process.

Uses

BIOBAN BP-40 liquid preservative is appropriate for the following end-use applications.

Absorbent Clays, Corn Cobs and Ground Wood

BIOBAN BP-40 liquid preservative may be used in absorbent clays, corn cobs and ground wood to inhibit the growth of odor-causing bacteria. BIOBAN BP-40 may be impregnated into the absorbent material at a suggested application rate of 50 to 1250 ppm (0.08 to 2.0 oz. av. per 100 lb of absorbent material).

Adhesives

BIOBAN BP-40 liquid preservative can be used to control microbial contamination in water-based adhesive formulations. Typical treatment levels for BIOBAN BP-40 liquid preservative are 0.2 to 1.0 pint per 1000 lb total formulation weight.

Starch and Pigment Slurries

BIOBAN BP-40 liquid preservative is useful for the control of bacterial growth in starch suspensions and pigment slurries during manufacture, storage and distribution. BIOBAN BP-40 liquid preservative should be added near or at the end of the manufacturing process. If the manufacturing process involves a heating stage, it should be added after the product has cooled below 40°C/104°F. BIOBAN BP-40 liquid preservative should be dosed at 200 to 1000 ppm based on the final formulation volume (1.6 to 8 pt./1000 gallons).

Paints, Latex and Antifoam Emulsion Systems

BIOBAN BP-40 liquid preservative may be used to provide in-can preservation and to prevent bacterial spoilage during manufacture and bulk storage of acrylic, styrene-acrylic, polyvinyl acetate, and other latex emulsion-based paints. It is also effective for the preservation of silicone and other antifoam emulsion systems and to prevent spoilage in in-service paint application tanks. In addition, BIOBAN BP-40 liquid preservative may be added as a final step just prior to packing the product into bulk or sales packs. If a heating stage is involved in the manufacturing process, BIOBAN BP-40 liquid preservative should be added after the product has cooled below 40°C/104°F. BIOBAN BP-40 liquid preservative should be dosed at 200 to 1000 ppm on the final formulation volume (1.6 to 8 pt./100 gallons).

Water-Based Printing Inks and Fountain Solutions

BIOBAN BP-40 liquid preservative can inhibit the growth of spoilage bacteria during the storage and use of water-based printing inks and fountain solutions. For in-can preservation, BIOBAN BP-40 liquid preservative should ideally be added as a final step. To control bacterial spoilage during the use of fountain solutions, BIOBAN BP-40 liquid preservative should be shock-dosed at a suitable point in the fountain reservoir where there is adequate flow or turbulence to insure quick dissolution. BIOBAN BP-40 liquid preservative may be shock-dosed once or twice weekly as a normal routine. Where conditions indicate, more frequent shock dosing may be required. As an in-can preservative, BIOBAN BP-40 liquid preservative should be dosed at 200 to 1000 ppm based on the final formulation volume (1.6 to 8 pt./1000 gallons). In fountain solutions, BIOBAN BP-40 liquid preservative should be shock-dosed at between 40 and 200 ppm (0.32 to 1.6 pt./1000 gallons).

Toxicity

The oral toxicity of BIOBAN BP-40 liquid preservative can be estimated at 540 mg/kg. BIOBAN BP-40 is considered orally toxic under OSHA Hazard Communication Standard (29 CFR 1910). It is considered harmful or fatal if swallowed, and in a concentrated solution it can be absorbed through the skin in harmful amounts. BIOBAN BP-40 liquid preservative is considered to be corrosive to the eye.

Environmental Effects

No direct testing of BIOBAN BP-40 liquid preservative was conducted. The active ingredient is toxic to aquatic species so it should not be allowed to enter lakes, ponds, streams, estuaries, oceans or other public waters.

First Aid

If swallowed, call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by a poison control center or doctor. Do not give anything by mouth to an unconscious person.

If on skin or clothing, take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.

If inhaled, move person to fresh air. If person is not breathing, call 911 or an ambulance, then given artificial respiration, preferably mouth-to-mouth, if possible. Call a poison control center or doctor for further treatment advice.

If in eyes, hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.

Have the product container or label with you when calling a poison control center or doctor, or going for treatment.

NOTE TO PHYSICIAN

Probable mucosal damage may contraindicate the use of gastric lavage.

Precautionary Labeling

The label for BIOBAN BP-40 liquid preservative bears these caution statements:

DANGER!

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

CORROSIVE: CAUSES IRREVERSIBLE EYE DAMAGE AND SKIN BURNS. HARMFUL IF SWALLOWED OR ABSORBED THROUGH THE SKIN.

Do not get in eyes, on skin, or on clothing.

Avoid breathing spray mist.

Prolonged or frequently repeated skin contact may cause allergic reaction in some individuals.

Remove contaminated clothing and wash clothing before reuse.

Handling and Storage

BIOBAN BP-40 liquid preservative may be corrosive to certain metals if left in contact for any significant period. Spillages of the concentrate should be washed off immediately to prevent the likelihood of corrosion.

Individuals handling BIOBAN BP-40 liquid preservative should wear appropriate protective equipment to insure that skin and eye contact are prevented. Safety glasses or goggles are recommended whenever splashing of BIOBAN BP-40 liquid preservative might occur. Rubber gloves and apron should be used to prevent skin contact. Wash thoroughly after handling.

Shipping and Packaging

BIOBAN BP-40 liquid preservative is classified as a Class 8 Packing Group III corrosive liquid because of its corrosive effects on aluminum.

The bill of lading description used by Dow for all domestic shipments of BIOBAN BP-40 liquid preservative is:

DISINFECTANT, LIQUID CORROSIVE, N.O.S (2-BROMO-1-NITROPROPANE-1,3-DIOL SOLUTION) 8, UN1903, PGIII. IN CASE OF EMERGENCY USE DOT GUIDE 60 ATTACHED. DISINFECTANT NOI, OTHER THAN MEDICINAL FOR TOILET PREPARATIONS. TRADE NAME = BIOBAN BP-40.

Shipping Containers	Net Wt.
1000L poly/steel composite tote tank	2706 lb
55-gallon polyethylene drum	550 lb
5-gallon polyethylene drum	45 lb

Customer Notice

Dow encourages its customers to review their applications of Dow products from the standpoint of human health and environmental quality. To help ensure that Dow products are not used in ways for which they are not intended or tested, Dow personnel are willing to assist customers in dealing with ecological and product safety considerations. Your Dow sales representative can arrange the proper contacts.

For further information visit our website: www.dowbiocides.com or call...

United States 1-800-447-4369 (phone)
and Canada: 1-989-832-1560 (phone)
1-989-832-1465 (fax)
Europe: 800-3-694-6367 (phone)
32-3-450-2240 (phone)
32-3-450-2815 (fax)
Pacific: 603-7958-3392 (phone)
603-7958-5598 (fax)
Latin America: 55-11-5188-9555 (phone)
55-11-5188-9937 (fax)
Other Global 1-989-832-1560 (phone)
Areas: 1-989-832-1465 (fax)

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