

DESCRIPTION

AMERSTAT HD heavy-duty microbiocide is a microbial agent for use in oilfield applications such as drilling muds, workover or completion fluids, pipeline and tank maintenance, water treatment and waterflood applications.

Offshore crude reservoirs typically contain a mixture of hydrocarbons, present as oil and gas, salt, inorganic solids, and organic compounds, including bacteria. With oil for food and plenty of water, bacteria continue to reproduce every fifteen to twenty minutes and create a biofilm at the oil-water interface that allows other microorganisms to grow and thrive. Without treatment, a diverse consortium of bacteria and fungi form a large biomass generating slimy waste and sludge. Moreover, certain types of sulfate reducing bacteria generate

hydrogen sulfide (H₂S), which is a toxic and flammable hazard.

AMERSTAT HD microbiocide is caustic-based and it is extremely effective against acid and H₂S producing bacteria. As an electrophilically-active biocide, AMERSTAT HD microbiocide reacts with specific nucleophilic entities of the microbes' cells, thus damaging the inner cell membrane of bacteria and fungi. Once damaged, the intracellular constituents leak out, the individual cells undergo lysis and break down, the electrochemical potential of protons dissipate, and the enzymes responsible for cell membrane integrity are inhibited.

As a broad-based biocide, AMERSTAT HD microbiocide remains effective for up to 180 days, which is six times longer than other leading biocides, such as THPS² and

FEATURES

- Single, cost-effective biocide
- Registered active ingredient - Dazomet³ as a broad-based biocide
- Broad spectrum of kill
- Provides longer term kill remaining effective six times longer than conventional oilfield biocides
- Stable formulation
- Non-ionic
- Non-emulsifying
- Non-formaldehyde releaser
- Easy-to-feed liquid formulation
- Inhibits microbially induced corrosion (MIC)
- Boosts performance of anionic and cationic friction reducer additives in pipelines;
- No cross-linking with polyacrylamide or polysaccharides

BENEFITS

- No need to use multiple biocides for effective treatment
- Extremely effective against acid and H₂S producing bacteria
- Improves operator safety concerns over H₂S generation
- Effective for up to 180 days
- Compliance with U.S. EPA, Canadian Pesticide Management Regulatory Agency (PMRA), EU REACH & Offshore Chemicals Notification Scheme, and Brazil registration requirements
- No compatibility issues with oxygen scavengers and other commonly used additives
- Compatible with other oilfield chemicals such as separation aids or friction reducers
- Remains effective when subjected to high pressures and temperatures
- Ensures uninterrupted production of oil and gas
- No complex blending equipment or mixing required
- Provides long-term protection of well casing
- Lower surface-pumping pressure and faster pumping rates improves productivity



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glutaraldehyde, available from the marine and offshore industries. Furthermore, AMERSTAT HD microbiocide has better compatibility with many of the commonly used downhole additives (i.e., corrosion and scale inhibitors, oxygen scavengers, emulsion breakers, coagulants, flocculants, clarifiers, etc.). Since it does not interfere with these other additives, AMERSTAT HD microbiocide offers a more effective, long-term solution to downhole problems without short or long-term risk to the well and its production.

SAMPLING AND MONITORING

Where applicable, it is essential to sample and monitor H₂S content as produced water properties and volumes from offshore production processes can vary over time. While sampling frequency and H₂S limits requirements will vary from different regions, the level of H₂S will also depend on the fluid removal and inflow. Samples can be tested for microbial contamination using the onboard test kit – Sulfate Reducers Test Set (PCN 1701019). Consult your local Drew Marine representative for further discussion on sampling bottles, onboard test kits, and analytical services.

APPLICATION AND USE

Based on the severity of bacterial contamination, greater or lesser amounts of the AMERSTAT HD microbiocide may be prescribed. AMERSTAT HD microbiocide can be added upstream of bacterial contamination or directly to the application areas to control microbiological contamination and prevent spoilage. AMERSTAT HD microbiocide can be dosed as a batch, semi-continuous or continuous biocide treatment program dependent upon specific application needs.

For treating tanks with produced water, typically a mixture of oil and water, AMERSTAT HD microbiocide can be dosed to the tank bottoms. This is achieved by feeding through a tank bottom drain valve or pouring down a tank sounding pipe prior to loading. If feeding to the tank bottom is not practical, slug dose through the tank top access ports or feed continuously during the filling operations to achieve the required concentration to achieve long term control. Add more AMERSTAT HD microbiocide to maintain the proper concentration based on additional fluid inflow.

The growth of SRB and facultative acid-producing bacteria are often responsible for the generation of H₂S and acid components which can be very corrosive to surface equipment and tanks. AMERSTAT HD microbiocide is an effective treatment to maintain control over the following microorganisms:

- Aerobic bacteria
- Anaerobic bacteria
- Facultative bacteria
- Acid producing bacteria
- Pseudomonas species
- Bacillus species
- Enterbacter species
- Serratia species
- Clostridia species
- Fungi
- Sulfate reducing bacteria (SRB)

The dosage of AMERSTAT HD microbiocide will depend on a number of factors such as the type of system being treated, the nature and extent of microbial contamination, and the degree of control required. The dosage can range from 1:500 (1 liter per 0.5 tons) to 1:200,000 (1 liter per 200 tons), depending on the application area and whether it is the initial treatment or subsequent treatment being applied. For initial treatment, always start with the highest concentration dosage rate listed by application area. Once microbial control is achieved, subsequent treatment may be reduced by fifty percent (50%) of the previous dosage rate applied.

Since AMERSTAT HD microbiocide is designed for effective long-term kill, subsequent treatment may be based on test results (e.g., H₂S content) or by time intervals that can be extended up to 180 days. Remember that the subsequent treatment dosage rate used may only be reduced to the lowest rate listed by application area. Subsequent treatment and dosage rate may also depend on fluid medium removal and inflow. Additional treatment may be necessary in certain cases to achieve the desired level of microbial control. Refer to the Dosage Rate Guide below for recommended ranges listed by application area.

Dosage Rate Guide	
APPLICATION AREAS	AMERSTAT HD
Drilling Fluids	1 to 1,000 1 to 10,000
Work Over, Completion Fluids	1 to 1,000 1 to 5,000
Water Floods, Packer Fluids, Pigging & Scraping, Guar Preservation	1 to 2,000 1 to 5,000
Hydro Testing, Pipeline & Tank Maintenance	1 to 500 1 to 5,000
Recirculating Cooling Water	1 to 16,500 1 to 200,000

 **Contact your Drew Marine representative for more information**

TYPICAL PHYSICAL PROPERTIES

Appearance:	Pale yellow to light green liquid
Flash point:	> 93°C
Freezing point:	< -20°C
	pH: 13.6
Density @25°C:	1.16 g/cm ³
Viscosity @24°C:	7.2 cP
Solubility:	Complete at use concentration

NOTE: Always wear the appropriate personal protective equipment when using this product.

PACKAGING

AMERSTAT HD microbicide is available in 208-liter drums (241 kg net) (PCN 0096264).

IMPORTANT INFORMATION

Drew Marine maintains Safety Data Sheets on all of its products. Safety Data Sheets contain health and safety information for your development of appropriate product handling procedures to protect your employees.

Our Safety Data Sheets should be read and understood by all of your supervisory personnel and employees before using Drew Marine products.

¹ Both gram-positive and gram-negative bacteria

² Tetrakis (Hydroxymethyl) Phosphonium Sulfate

³ tetrahydro-3,5-dimethyl-2H-1,3,5-thiadiazine-2-thione



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