



## DIESEL and JET FUEL MICROBICIDE

Biobor®JF is the original, industry standard microbicide used to kill and prevent microbial contamination in fuels such as diesel, jet fuel and heating oil. Biobor JF provides highly effective, proven dual-phase chemistry to eliminate the growth of harmful bacteria and fungi that contaminate fuel systems, clog filters, corrode metal surfaces and cause service interruptions.

For contaminated systems with microbial growth present, Biobor JF may be used as a “shock treatment” to kill and control microorganisms in the tank or equipment. Biobor JF may also be used routinely in sterile systems as a preventative, “maintenance treatment” to ensure fuel quality and prevent contamination. Continued use of a biocide extends filter life, prevents biofilm and sludge accumulation, and inhibits microbial influenced corrosion (MIC).

As an added benefit, Biobor JF has been proven to increase the lubricity properties of ULSD providing additional protection to injection systems and fuel delivery components.

Biobor JF is fully compatible with a wide variety of fuels, fuel system components and common materials. It does not affect fuel performance and is more stable, less corrosive and safer to handle than many other biocide chemistries.

Since 1965, Biobor JF has proven effective and compatible by many of the largest refineries, terminals, militaries, airlines, fleets, vessels, railroads and end users worldwide.

### BENEFITS:

- **Highly effective biocide to kill and prevent microbial growth in hydrocarbon fuels (bacteria & fungi)**
- **Dual Phase – partitions to both the water and fuel phases for more effective and complete protection**
- **Prevents corrosion of tanks and delivery system caused by the acidic by-products of microbial growth**
- **Safer handling and less harsh/corrosive than competitive biocides**
- **The original, most widely used biocide since 1965**
- **Does not add Sulfur to ULSD - contains less than 15ppm sulfur**

### APPROVALS:

- **EPA Biocide Registration # 65217-1**
- **MILITARY SPEC - MIL-S-53021A**
- **Aviation APPROVED** - approved for aviation use by turbine and airframe OEMs, FAA and IATA
- **OEM APPROVED** - Recommended in diesel and turbine engine OEM operation manuals

| <u>Maintenance Dosage (135ppmW*)</u> | <u>Shock Dosage (270 ppmW*)</u> |
|--------------------------------------|---------------------------------|
| 1 gal : 10,000 gal of fuel           | 1 gal : 5,000 gal of fuel       |
| 1 oz : 80 gal of fuel                | 1 oz : 40 gal of fuel           |
| *equivalent to <u>100 ppmV</u>       | *equivalent to <u>200 ppmV</u>  |

**Application:** For existing contamination, long term storage or initial treatment, a shock dosage should be used for effective sterilization. Subsequent fuel may be treated with a maintenance dosage to prevent future growth and ensure fuel quality. Drain water bottoms prior to application and keep tanks dry with proper housekeeping. Biocide may be applied by metered inject on, or by splash blending during fueling or with circulation to ensure uniform blending.

**Storage & Handling:** Containers should be kept closed to atmosphere and protected from water contamination. It is a violation of Hammonds quality standards and EPA regulations to remove Biobor JF from its original packaging. Please refer to the Safety Data Sheet for specific safety, handling and storage information. Shelf life is 3 years from date of manufacture.



**The Industry Standard since 1965**

**Kills and prevents microbial growth that cause fuel contamination**

**For use in all hydrocarbons such as diesel, biodiesel, jet fuel, heating oils, heavy distillates and lubricants**

- **MIL-S-53021A**
- **Aviation APPROVED**
- **OEM APPROVED**

Available in 8, 16, 32oz bottles. 1 gallon, 5 gallon, 55 gallon, 330 gallon containers.



**Hammonds Fuel Additives, Inc.**  
6951 W Little York Dr.  
Houston | Texas | 77040  
281.999.2900 | 800.548.9166  
[sales@biobor.com](mailto:sales@biobor.com)  
[www.biobor.com](http://www.biobor.com)



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## Fuel Tank Maintenance & Fuel Quality Management

### BIOCIDE TREATMENT PROGRAM

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#### BIOBOR JF - Fuel Biocide

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- EPA registered pesticide, kills and prevents microbial growth in fuel systems – bacteria & fungi
- Prevents MIC (microbial influenced corrosion) on metal tank and equipment surfaces
- Eliminates microbial biomass that contaminates tanks and interrupts product delivery components
- Approved for diesel, aviation jet fuel and all hydrocarbon fluids \*does NOT add Sulfur\*
- The original, most widely used biocide worldwide since 1965 – The only OEM approved product – MILSpec

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#### Dosage:

- Shock Treatment** - an effective 'kill' concentration – use when contamination is present & in PM applications
- **1 gallon : 5,000 gallons of fuel = 270ppmW (200 ppmV)**

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#### Application:

- Blending:**
- If available, apply biocide prior to fuel delivery or filtration for efficient distribution
  - Biobor JF is dual-phase soluble and will distribute effectively between fuel and free water phases for complete coverage
  - While most microbial activity occurs at the fuel/water interface, colonies may proliferate throughout the fuel system on tank walls, components or in minute water pockets. It is important to reach all areas of the fuel tank with biocide treated fuel, consequently, higher fuel levels during treatment and the use of a dual-phase biocide are beneficial.
- Contact Time:**
- Biobor JF begins killing microbes immediately once contacted. With any biocide, the heavier the contamination/biomass issue, the longer contact time required for complete kill. (Eight hour soak time is generally effective for contamination. Up to 24 hours is suggested for heavy growth.)
  - While it is ideal to leave the tank idle, biocide will continue to kill as long as it is present in the system. At high throughput sites, if new fuel is added within 24hrs additional biocide may be applied to incoming fuel to maintain effective biocide levels.
  - Filters may require monitoring and replacement after biocide treatment of a contaminated system, as they may be the first line for removal of dead biomass. Dead microbes will appear as a used coffee ground-like particulate, in comparison to the large, slimy mass formations of active microbial colonies. Mechanical cleaning after biocide treatment will assist in removal of dead microbial growth and water to mitigate subsequent issues.

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#### Fuel Quality Maintenance: TEST | TREAT | PROTECT

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- Sampling:** Regular sampling and testing of storage tanks is recommended in a comprehensive fuel quality program. This includes consistent, properly performed bottom samples for visual observation and testing of water, debris and growth. It should be noted, a test is only as good as your sample, and is only representative of the area from which it was taken. Samples used for microbial testing should be "dead-bottom" samples taken from the storage tank.
- Testing:** Microbial testing should be performed on each tank regularly to monitor microbial condition and initiate biocide spot treatments, if required. Microbial testing methods include available on-site testing kits or laboratory evaluation methods.
- Monitoring:** If visual observation of a sample does not show excessive free water, testing and/or biocide treatment should continue as microbial growth may proliferate in many different areas of the tank and require only minimal water to establish. If excessive water is present, immediate removal and/or contacting your service partner for tank cleaning is recommended. Regular water level monitoring and water bottom removal should be standard practice.
- Treatment:** Proactive, preventative treatments of an effective biocide are the foundation of microbial fuel quality management. For bulk fuel systems, quarterly or bi-annual shock treatments are recommended to maintain a stronghold over microbial contamination and help prevent the long list of residual effects they create. If tank cleaning/polishing is performed, apply biocide prior to cleaning to aid in filtration efficacy and efficiency by killing active growth and releasing dead biomass to tank bottoms for removal.