



Customer Technical Service BIOFUEL USAGE GUIDELINE

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Overview

The marine industry stands at a crossroads. As the world pushes for decarbonization, ship operators must balance their environmental responsibilities with the need to stay operationally efficient. With stricter international regulations on greenhouse gas emissions coming into effect, biofuels have become a promising solution for reducing the industry's carbon footprint. By adopting biofuels, shipping companies can quickly and effectively comply with tightening regulations from the International Maritime Organization (IMO) and regional authorities like the EU's Emissions Trading System (ETS).

This guideline offers practical advice and technical insights to support the seamless integration of biofuels into vessel operations. It aims to assist shipowners, operators, and managers in maximizing the benefits of biofuel use while maintaining safety, efficient, and environmentally friendly.

Source of Biofuel

Many varieties of oil feedstock exist for FAME production, of which the chemical composition for each differs greatly. We recommend providing Innospec with the following information once you have it:

- a. Fuel Analysis Report or COA
- b. How much quantity of Biofuel will be procured.
- c. How long will the Biofuel be use for the vessel
- d. The trading route of vessel (If vessel use HVO and trade in cold climates)

Innospec will recommend the additives accordingly.

Innospec's Product Offering for Biofuel (≤30%)

	MGO blends ≤30%	VLSFO blends ≤30%	HSFO blends ≤30%
FAME	Octamar™ LI-5 PLUS Octamar™ ECOPOWER*	Octamar™ HF-10 PLUS Octamar™ ULTRA HF*	Octamar™ COMPLETE*
HVO	Octamar™ LI-5 PLUS Octamar™ ECOPOWER*	Octamar™ HF-10 PLUS Octamar™ ULTRA HF*	Octamar™ COMPLETE*

*Products providing enhanced performance with the addition of combustion improver to reduce fuel consumption

Innospec's Product for Biofuel (>B30 - B100): Octamar™ Bio 403E

Octamar™ Bio 403E is especially formulated to treat all Biofuel blends > 30%.

Other Innospec's Product for Biofuel

Octamar™ Winterflow is especially formulated to lower biodiesel pour point.

Gromatar 71 is especially formulated to prevent and/or eliminate microbial growth.

GUIDELINE ON PRECAUTIONARY MEASURES TO BE TAKEN FOR HANDLING/STORAGE OR CHANGEOVER FROM REGULAR HSFO/VLSFO/LSMGO

Document Requirements

1. Obtain consent letters from Original Equipment Manufacturers (OEMs), Classification Societies, and/or Flag authorities.
2. In most cases, all engine makers allow usage of biofuel for FAMEs blend up to 30%. Otherwise, follow OEMs advice if modification is required.
3. Conduct a NOx impact reassessment (not required for biofuels containing <30% FAME).
4. Verify supplier-provided International Sustainability and Carbon Certification (ISCC) or equivalent certifications.

Preparation before Bunkering

1. Provide crew training and briefing.
2. Select a tank capable of heating and draining for biofuel storage. Understanding your vessel tank configuration and check your line diagram if vessel have only 1 system with no separation, then may have to install additional tank installation.
3. Inspect designated fuel tanks for sludge or sediment accumulation and steam leakage.
4. Clean bunker storage tanks thoroughly if contamination is found.
5. Repair steam leakage if found.
6. Flush bunkering lines to ensure they are free of residual fuel.
7. Check all bunker line gaskets for integrity.
8. Plan bunkering to a maximum of three months to prevent degradation.
9. Dose biocides, stabilizers, and/or corrosion inhibitors to prepare the tanks for biofuel storage.
10. Pre-clean spare service and settling tanks.

Bunkering Procedure

1. Load biofuel into a designated clean fuel oil tank to avoid contamination.
2. Avoid co-mingling biofuels with other fuels.
3. Collect samples during bunkering using a continuous drip sampling method for lab analysis.
4. Request Proof of Sustainability (POS) from the supplier, to be submitted within 30 days of the bunkering date.

Biofuel Storage

1. Limit storage to a maximum of 30 days to prevent degradation*. However, with the use of stabilising additives, storage can be extended up to three months or more.
2. Regularly drain water from tanks to prevent microbial growth.
3. Maintain storage temperature at least 10°C above the pour point (PP). For biofuels, heat as required or 1 week prior to use, as prolonged heating accelerates oxidation and aging.
4. Adjust low and high temperature alarms for monitoring.
5. If bunkers are required to be stored for more than 30 days, adding biocide helps to prevent microbial growth.

*Degradation refers to a decline in quality from its original state, potentially affecting optimal performance. However, it does not necessarily mean the fuel will fall out of specification within 30 days.

Preparation before Biofuel Usage

1. Wait for the fuel analysis report before usage.
2. Recognize key risks: incompatibility, microbial contamination, and fuel instability.
3. Lower service and settling tank levels to a safe minimum if spare service and settling tanks are not available.
4. Treat tanks with stabilizers to minimize the comingling effect and clean all filters, including transfer pump filters.
5. Lower purifier throughput to optimum flow and operate two purifiers in parallel for enhanced separation.
6. Regularly drain sludge and water from service and settling tanks to maintain and check fuel quality.
7. Inspect fuel temperature, pressure, and viscosity sensors to ensure accurate readings and repair or clean them if required.

Switching to Biofuel

1. Assign personnel to monitor fuel system parameters, including pressure, temperature, and viscosity.
2. Gradually adjust fuel flow into the engine, ensuring temperature changes remain within an acceptable rate.
3. Continuously observe engine parameters, such as vibration, exhaust temperature, and smoke conditions.

Performance Monitoring

1. Inspect for filter clogging, sludge formation, and abnormal wear in the fuel system.
2. Measure and compare engine thermal parameters before and after biofuel usage to ensure consistent performance.
3. Monitor cylinder conditions and adjust the BN of cylinder oil (CLO) or feed rate based on acid number findings in the fuel report if required.
4. If any adjustments are made to the CLO feed rate or usage of higher BN CLO, perform self-testing or send CLO drain samples for analysis if required.

Do inform us if there is any issue arising from usage of Biofuel. Innospec will be able to advise accordingly.

Please contact your local sales representative for more information.

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For technical support or questions please email: marine.technical@innospecinc.com

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