

FUTURE FUELS 101 – BIODIESEL

Biodiesel, also known as a Fatty Acid Methyl Ester (FAME), is today the most commonly used biofuel quality in marine applications. It can be manufactured from various vegetable oils, used cooking oil or animal fats in a transesterification process which converts the fatty acids to biodiesel in a reaction with methanol in the presence of a catalyst.



Biodiesel quality is comparable to fossil distillate fuel though minor differences can be seen in various physical and chemical properties. Biodiesel is available as a pure product (B100) or as a blend with fossil distillate fuel – for example as B20, which contains 20% v/v of biodiesel mixed with regular fossil diesel.

Pros

- + **Virtually no sulphur emissions**
- + **Low particulate (PM) emissions**
- + **Reduced CO2 emissions (from well to tank)**
- + **Can be burned in existing engines without the need for modifications**
- + **Blends well with fossil diesel**
- + **Good lubrication properties**

Cons

- **Increased NOX emissions (~10–20%)**
- **Contains ~10% less energy than fossil diesel**
- **Reduction of water content with separator more challenging than with fossil diesel**
- **Can foster heightened microbial activity**
- **Long-term storage potential limited by oxidation**

“Biodiesel is a renewable fuel quality that can already be used in Wärtsilä medium-speed engines without any modifications. Wärtsilä started biofuel development activities in the 1990s so has extensive experience with various biofuel qualities. Although not 100% carbon neutral, biodiesel does enable overall GHG reductions of up to around 80% compared fossil diesel, making it a viable option for maritime decarbonisation.”

**Kai Juoperi, Chief Expert, Engine Fluids
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