

# TECHNICAL REPORT #99

## FUEL QUALITY DIRECTIVE – GUIDANCE NOTE TO INDUSTRY

EU Directive 2009/30/EC requires that, from 1st January 2011, all gas oil marketed for use in non-road mobile machinery (i.e. mobile off road equipment) must contain no more than 10 milligrams of sulphur per kilogram of fuel (virtually 'sulphur free').

### Applicability to Marine Sector

It will be an offence to sell gas oil containing more than 10 mg (20 mg at point of sale) of sulphur per kilogram of fuel to inland waterway craft and recreational craft when not at sea. Sea going craft, heating or stationary equipment are excluded.

### Definition of 'at sea'

The Department for Transport has advised that the definitions from the Merchant Shipping (Prevention of Air Pollution) Regulations will be adopted to define the geographical limits of the Directive. This means that 'not at sea', and hence the limit of the applicability of the Directive, will include all of MCA Category A & B waters. In addition deep lakes and lochs within Category C will be considered 'not at sea' where the significant wave height will not exceed 1.2m.

### Supply

The overriding concern is that some suppliers will provide road diesel with a red marker dye and this supply will contain up to 7% biodiesel or FAME (fatty acid methyl ester). The Department of Transport has completed a survey of fuel suppliers and estimate that 75% of the gas oil supply to the relevant sectors will be 'sulphur free' and will not contain FAME. Full details of this survey are not yet available but the following suppliers have made their intent public:

- Greenergy - Dedicated sulphur free gas oil no FAME content
- Ineos - Dedicated sulphur free gas oil no FAME content
- Mabanafit – Dedicated sulphur free gas oil no FAME content from 5 out of 6 terminals, 1 will have FAME content

This supply is likely to incur a price premium estimated at between 2 and 4 pence per litre. A FAME free supply may not be available in all parts of the country so it is critical that you discuss the situation with your fuel supplier who should be able to advise you of the sulphur and bio-fuel content of the fuel. Wherever possible a FAME-free supply should be secured in which case the implications of the change are expected to be minimal and limited to the lubricity characteristics of the fuel which can be relatively easily addressed by the use of an additive.

### Ensure you know exactly what type of fuel is being supplied

If a FAME-free supply cannot be secured then the following precautions are advised:

#### Storage

Because of the changes in fuel quality, you will need to exercise increased care in the storage of sulphur free gas oil where this contains biodiesel. The following has been recommended by the UK petroleum industry:

- Remove all water from tanks and conduct monthly checks to ensure, as far as practical, that they remain free of water.
- Tanks that don't already have drain points for removing water are likely to need modification.
- Examine sight gauges on older fuel storage tanks for signs of leakage and replace any leaking seals.
- If you are having tanks serviced before you receive the new fuel it would be advisable to replace fuel seals as a one-off precautionary exercise.
- Replace fuel filters after 2 to 3 deliveries/turnover of the new fuel.
- Ensure the content of tanks is turned over every 6 months or in any event no less often than every 12 months.

#### Equipment

The majority of equipment and engines supplied in the last 10 years should not have any problems with the fuel but a few precautions are recommended particularly for installations of older engines and equipment.

- Examine fuel systems following the switch to the new fuel and ensure that any seals or pipes found to be leaking are replaced.
- If you are having older engines and equipment serviced, replace fuel seals and fuel hoses as a precaution.
- Replace fuel filters after the first 2 to 3 tank fulls of the new fuel.
- The current specification for fuel hose to meet the requirements of the Recreational Craft Directive for new craft construction is for the hose to be CE marked under the responsibility of a Notified Body. The hose is normally certified against the harmonised standard EN ISO 7840 for fire resistant hoses and EN ISO 8469 for non-fire resistant hoses. There is currently concern that these hose specifications have not been approved for use with bio-fuel and this should be checked with the hose supplier.
- Bio-fuel is a very good solvent and may release accumulated sediments in fuel tanks. Although it may not be necessary to clean fuel tanks and fuel lines before using bio-fuel in the lower levels of 7% it would be good practice to monitor filter plugging and keep extra filters to hand.
- Some metals as well as rubbers and plastics are not recommended for use with bio-fuel particularly at high concentrations, see table below. Although not normally a problem at low level concentrations it is known that bio-fuel will 'pick up' metal such as copper.

### Usage

The advice on storage on board the craft is the same as for shore based tanks. However, the ability to turn over the fuel contents within six months is not necessarily practical. A regular check on the condition of the fuel and fuel components is advisable.

### Compatibility

Diesel blends containing FAME up to 10% will generally not have any appreciable effect on materials currently used. However some sensitivity to nitrile rubbers has been reported and some metals should still be avoided in order to minimise the potential for metal pick-up. The following table and much of the following information is reproduced from the 'Concawe' document produced by its Fuels Quality and Emissions Management Group special task force, entitled 'Guidelines for handling and blending FAME' November 2009.

#### Material compatibilities with FAME (B100)

Material	Recommended	Not Recommended
Metals	Carbon steel Stainless steel Aluminium	Brass Bronze Copper Lead Tin Zinc
Elastomers	Fluorocarbon Nylon Teflon® Viton®	Nitrile rubber Neoprene Chloroprene Natural rubber Hypalon Styrene-Butadiene rubber Butadiene rubber
Polymers	Carbon filled acetal	Polyethylene Polypropylene Polyurethane Polyvinylchloride
Others	Fibreglass	

### Biological Growth (The Bug)

Due to its chemical structure, FAME, and diesel blends in particular, are more susceptible to biological attack by micro-organisms. These aerobic micro-organisms usually grow at the interface between fuel and water in tanks; anaerobic species can actively grow on tank surfaces and can contribute to metal corrosion. If microbiological growth remains undetected it will eventually cause fouling and filter plugging. If considering the use of fuel cleaning or biocide treatment, expert advice should be sought from your fuel supplier.

### Health and Safety and the Environment

Safety precautions for handling and storing diesel blends are similar to those used for hydrocarbon-only diesel fuels. Protective equipment including gloves should always be worn and skin that is inadvertently exposed to fuel should

be washed with soapy water. The relevant Safety Data sheets should be reviewed for recommendations on safe handling, type of gloves, and related procedures before beginning work with biodiesel blends.

Spills and underground leaks should be treated in the same manner as conventional diesel fuel spills and leaks including notification to the proper authorities. Rags and cloths saturated with diesel oil should be put into a dedicated disposal drum filled with water.

Fire protection and fire fighting agents use similar techniques as approaching a conventional diesel fire.

*NOTE: BMF have made considerable efforts to ensure the accuracy and reliability of the above information. However neither BMF nor its employees can accept liability for any loss, damage or injury whatsoever resulting from the use of this information.*