

# BIODIESEL IN GAS OIL

## Background

New European Directives for Renewable Energy and Fuel Quality will require changes to the composition of gas oil in January 2011. Gas oil intended for use in non-road mobile machinery [tractors, etc] will have to have a sulphur content of 10ppm or less and may contain up to 7% by volume of biodiesel [Fatty Acid Methyl Ester {FAME}]; the requirements for this grade are likely to be achieved by the addition of the Customs' markers for rebated gas oil to automotive diesel at the refinery.

The changes are reflected in a revised edition of the British Standard for gas oil [BS 2869:2010] and fuel to the new specification will become available in late 2010. The existence of a new grade of gas oil with a significant biodiesel content creates increased possibilities of cross-contamination, wrong product delivery or delivered product not declared as containing biodiesel [although this is a requirement of the revised British Standard].

***Because of limitations in the production and supply infrastructure, only one type of gas oil may be widely available and this will inevitably be the non-road mobile machinery [NRMM] grade, probably with a significant biodiesel content [up to 7% FAME].***

## Potential problems

There is considerable experience with automotive diesel containing biodiesel and some published advice on handling this is available from the Department for Transport and major oil companies; much of this information has some relevance to gas oil containing biodiesel used in other applications, but is not sufficiently specific to these. Biodiesel is a powerful solvent, with good detergency properties, it is an effective paint stripper and will take up water from the surroundings; problems that may arise, caused by the presence of biodiesel in gas oil, can include:

- Material incompatibility - many common rubbers, plastics and surface coatings will degrade from contact with biodiesel
- Residual deposit flushing, causing clogged filters, etc.
- Water uptake, with enhanced potential for mould growth, producing solid matter and acids
- Fuel stability - biodiesel can degrade over time by oxidation and hydrolysis
- Cold flow, waxing and precipitation problems
- Burner and component tolerance of biodiesel and/or its degradation products



## Initial Preparation

Consult your fuel supplier as soon as possible to establish whether he will be supplying you with gas oil containing biodiesel when the NRMM grade is introduced. If this is a possibility, an initial check on tank condition and suitability for biodiesel-containing fuel should be carried out. This should include the construction material(s), age, condition and appearance of the tank; any damaged areas, surface coating{s}, etc or obvious deficiencies should be remedied.

Before taking delivery of any biodiesel-containing gas oil, the tank should be cleaned effectively internally and water and solid deposits or mould growth removed as efficiently as possible [this may require a specialised tank cleaning service]. The materials used for pipes, tubes, seals, etc. should be investigated for biodiesel compatibility and, if necessary, replaced with a suitable biodiesel-resistant alternative; the security of joints in the system should also be examined, ensuring that biodiesel-compatible sealing materials and compounds have been used. Check the material and condition of all filters and replace if necessary [this will be an ongoing requirement as biodiesel-containing fuel is introduced to the system]. Ensure that pump seals are made from biodiesel-resistant material.

## Housekeeping

The initial preparation, ongoing vigilance for potential problems and any enhanced routine maintenance required for biodiesel-containing fuel should be carried out by a qualified technician.

The routine checks and actions set out in the Oil Care Campaign booklet, "Get to know your oil tank"\* will be required more frequently for biodiesel-containing fuel due to its strong detergency, solvent and hygroscopic properties compared with those of purely hydrocarbon fuels. Tanks should be frequently examined for signs of degradation in structure, material or coatings and for any other apparent weaknesses. Regular checks, with prompt and appropriate removal and remedial action, must be undertaken for any water, dirt, mould growth, etc. present in the tank. Filters should be examined at frequent intervals and, if necessary, changed, especially following the first deliveries of biodiesel-containing fuel. Pipework, seals, pumps and other components must be checked continually for signs of actual, or potential, oil leaks and, if found, remedial work and/or material replacement undertaken immediately. Burner components should be examined regularly for signs of degradation or deposit formation and remedial action initiated, if necessary.

\* Available free from the FPS and OFTEC websites:

[www.fpsonline.co.uk](http://www.fpsonline.co.uk)

[www.oftec.org.uk](http://www.oftec.org.uk)

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