

BIO DIESEL

With thanks to Nick Vass of Omega Yacht Services who provided the foundation for this article and to Steve Moody, Technical Expert for Rix Biodiesel Ltd

Since the ending of derogation on Red Diesel in November 2008 we have frequently been asked why Red Diesel cannot be carried in spare cans when boating in other countries now that duty is paid at time of purchase on that portion declared for propulsion. The problem arises for 2 reasons; first, the belief that the colour is now irrelevant once the duty has been paid and secondly, members are concerned because they have read that white road diesel contains a percentage of bio-fuel, which they believe will damage their engines and dissolve GRP tanks.

So why can't I carry red diesel in spare cans now that derogation has ended?

The position in relation to fuel supplied to road vehicles (white diesel) is that there is no fiscal reason why a car driver cannot purchase fuel in one EU member state and transport it to another state in jerry cans – provided that the fuel is for personal use only. This would be consistent with purchasing other dutiable goods such as alcohol and cigarettes. There are, however, stringent rules about how much petrol can be transported in a car at one time (and on cross-channel ferries and trains) and these restrictions, together with the unpleasantness of storing diesel in a confined space and the inherent difficulty in proving that fuel is for personal use, may serve to discourage most people from attempting to do so. HMR&C Notice 1 on Travelling to the UK from an EU member state reads:

“Fuel: In addition to fuel held in the standard tank of a vehicle, tourist travellers to the UK may carry reserve fuel for use in that vehicle in an appropriate canister. It should be noted that for safety reasons ferry and train companies impose strict limits on the amount of fuel carried outside the fuel tank.”

Similarly, the RYA is not aware of any restriction on private pleasure craft transporting white diesel from one member state to another in jerry cans. The difficulty is not therefore in the carriage of diesel in jerry cans *per se* but in the colour of the diesel.

Although, the issue of fuel colour and duty are not specifically linked under EU law (the EU legislation simply refers to rebated fuel – the Irish, for example, use a green dye instead of red) several member states do make such a connection in the way in which they apply and/or enforce EU and domestic legislation and that such an approach is not necessarily in breach of EU law. The fact remains that any red diesel purchased in the UK should now be duty paid does not alter the fact that it remains unlawful for red-coloured diesel to be used in private pleasure craft in some member states, such as France and Belgium. Accordingly, because in France it is unlawful to use red-coloured diesel in private pleasure craft, it would not be lawful to purchase 6 parts white diesel (for propulsion) and 4 parts red (for heating) in France and mix them in the same fuel tank. Such comingling (in terms of both colour and rates of duty) would be lawful in the UK, however, because it continues to be lawful to purchase red-coloured diesel in the UK for use in private pleasure craft.

Those states in which it is unlawful to use red diesel in private pleasure craft generally accept, under the comity principle, that if it is lawful to purchase red diesel in another jurisdiction then it may nevertheless be used in those states provided that it is transported in the main fuel tank. However, those states generally take the view that carriage of red diesel in cans falls outside the comity principle and therefore consider the carriage of such fuel for use in a private pleasure craft to be unlawful. The EU Commission takes the same view (see <http://www.rya.org.uk/AboutRYA/lobbyact/Pages/legalhomepagereddiesel.aspx>)

It may be that this approach is incorrect and could be challenged in the ECJ. However, there is an attendant risk that such a challenge might back-fire with the result that the ECJ rules that the UK should not be permitting red-coloured diesel to be used in private

pleasure craft. Research shows that up to one third of UK fuel suppliers (especially those further away from the yachting centres of the South and East Coasts) would simply cease supplying diesel to private pleasure craft. In conclusion our advice to yachtsmen visiting other EU member states is that they should make an appropriate declaration in relation to the red-coloured diesel supplied in the UK to their yacht's main fuel tank, retain receipts showing that duty was paid in the UK when purchased and should carry only white diesel as spare fuel in cans.

So what is the difference between white and red diesel?

Apart from colour of course! EN590:2004 sets out the specification that all diesel fuel must meet if it is to be sold in the European Union, Iceland, Norway and Switzerland for road use. The original UK standard for red diesel was covered by BS 2869: 1988 (back then, this standard covered both road and non-road use). The most recent specification is covered by BS 2869:2006 which specifies requirements for eight classes of petroleum fuels for engines including red diesel. The new standard greatly reduces the sulphur content of red diesel and from 2011 it will be the same as road fuel although there is a waiver for some sectors until January 2012. This will mean more processing which will reduce the economic advantages of producing red diesel for off-road use. No engine adjustments are required to use low sulphur diesel. Both specifications permit the blending of up to 5% biodiesel by volume with 'conventional' diesel, so just because its red does not mean that it won't have any biodiesel in it. Biodiesel for engine use must conform to EN 14214:2003, the European standard that describes the minimum specification for biodiesel. Red and white diesel may also differ in cetane rating. Diesel's cetane rating is the opposite of petrol's octane rating. The higher the value, the easier the fuel is to ignite by compression, which makes for smoother running, especially when the engine is cold. Using a higher cetane fuel can improve combustion, meaning less soot or potentially increasing the power available. Diesel fuel supplied to the relevant British and European Standards must have a cetane rating of 46 or more. Typically, fuel supplied to BS 2869 has a cetane value of 47 and in general diesel engines run well with a cetane value between 40 and 55. It is also said that diesel engines run more smoothly on biodiesel, because it has good lubricating properties. When low sulphur fuels were introduced, problems were experienced with fuel pumps which often seized up because of the 'dryness' of the new fuel, biodiesel combats this problem. As the 2 specifications converge it is likely red diesel will be the same product as white diesel with the red dye and other 'euromarkers' added.

So what is biodiesel then?

Biodiesel is the generic name for fuels obtained by transesterification of a vegetable oil from plant crops such as rape seed or animal fat such as tallow. During manufacture, the oil molecules are broken up and are then reformed into fatty acid methyl esters (FAME) and glycerol, before being separated and purified. The process produces a fuel with very similar combustion properties to diesel. Almost three quarters of European biodiesel is commercially produced from oil seed rape, the remainder being produced from sunflower and waste vegetable oils. There are currently approximately 40 processing plants in the EU mainly located in Germany, Italy, Austria, France and Sweden. Biodiesel is blended with conventional diesel and blends are designated as 'B' followed by a number. B100 is 100% pure biodiesel; B5 is 5% biodiesel and 95% conventional diesel and so on. It is understood that in some countries such as France, all diesel sold routinely contains this 95/5 mix. The maximum limit for blending of biodiesel with conventional diesel is 5% by volume (B5) which is the maximum biofuel content allowed by the relevant standards.

So why are we putting bio fuels into retail supplies then?

In October 2007, Parliament approved the Renewable Transport Fuel Obligation (RTFO), requiring suppliers of road fuels to incorporate a proportion of biofuel in petrol or diesel, or pay a penalty. The Renewable Fuels Agency (RFA) was established on 26th October 2007 when the RTFO Order 2007 was made and is responsible for monitoring the implementation of the RTFO by obligated companies. The RTFO applies across the whole of the UK. Refiners, importers and any others who supply more than 450,000 litres of relevant hydrocarbon oil for road transport annually to the UK market are obligated by it.

The RTFO commenced on 15 April 2008 and in January 2009, Government announced the RTFO for the next 5 years. Subject to parliamentary approval, the yearly obligation level for fuel suppliers under the RTFO will be: 3.25% for 2009/10; 3.5% for 2010/11; 4% for 2011/12; 4.5% for 2012/13; 5% for 2013/14. The original RTFO targets envisaged a biofuel content of 3.75% in 2009/10, rising to 5% in 2010/11.

So how can biodiesel damage my engine?

Several practical issues concerning the use of pure or high percentage biodiesel blends have emerged from real-world use. The solvent properties of ester-based biodiesel are different from those of conventional diesel. In its raw state, it will degrade natural rubber products, some copper based alloys, painted surfaces, soft plastics and is harmful to teak decks with polysulfide seams. Engine parts and equipment with rubber seals and piping may need replacing with non-rubber alternatives such as fluoro-carbon rubber which is nonreactive to biodiesel. The solvent properties of Biodiesel have been known to break down deposits of residue in the fuel lines where petro-diesel has been used. As a result, fuel filters may become clogged with particulates if a quick transition to pure biodiesel is made. Therefore, it is recommended that fuel filters are changed shortly after first switching to a biodiesel blend. In addition and at colder temperatures, biodiesel is prone to 'waxing out' much like conventional diesel used to do 30 odd years ago. This effect (known as the Cold Filter Plugging Point) can clog fuel lines, fuel filters and fuel injectors. To reduce these problems, biodiesel blends should comply with EN 590, the standard for B5 and below. However, few if any of these problems are noticeable below a 20% biodiesel blend by volume. The fact is that most private and commercial vehicle manufacturers have approved the B5 (5%) Biodiesel blend within mineral diesel (some accept much more) and the UK Petroleum Industry Association (UKPIA) states that vehicle engines require no modification to use this level of blend. However, the oil industry is working with other organisations within the European Standards Organisation, CEN, to examine if the current limits on biofuel composition of road fuels can safely be increased to 7% and then to 10% for biodiesel. More recently under the Recreational Craft Directive, engine fuel system and components are covered by BS EN ISO16147:2002, this states that all materials used in fuel systems shall be resistant to deterioration by the fuel and to other liquids or compounds with which they may come into contact under normal operating conditions. So the 64K dollar question is will biodiesel affect my boat engine? The most compelling evidence that I can find is a survey carried out in the United States over a 4 year period and involving engines mostly between 10 and 25 years old and blends in excess of 50% biodiesel by volume. Results showed that 87% of those surveyed reported no problems. So in the volumes that may be found in red and white diesel either now or in the future, the answer is more than likely to be no! No doubt, those with warranties that are still extant will no doubt wish to check them, but it does seem that biodiesel blends conforming to agreed standards produce fewer harmful emissions in comparison with ordinary low sulphur diesel and can reduce wear and tear on engines, pumps and injectors.

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