

Comment on the proposed Standard for Fuel Parameters (Biodiesel)
Commonwealth Position - August 2003

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While it is clear that much careful work has gone into development of the proposed standard it is also clear that some opportunities have been missed.

Certainly there are advantages in harmonizing with international standards but this does not mean that the tests must be harmonized. It is the quality of the product that is the concern, not the test methods.

Biodiesel is an ester and as such is very different chemically from diesel fuel of petroleum origin. Because it is so different it is reasonable to examine the question of whether there may be tests more appropriate to determining its quality than those routinely used in the petroleum industry. On examination this turns out to be the case.

It is not my intention to go into this exhaustively but I suggest that efforts made in this direction will greatly reduce the cost of compliance and will maintain, or even increase, quality control.

Below is a brief outline of an approach based largely on gas chromatography. This is used to determine the degree of conversion, hence ester content, and gives also the content of unreacted and partially reacted starting material and free glycerol.

Once it is established that the conversion is adequate it can be deduced that the following parameters will be within the specified limits and no specific test will be required:

- 1 Density
- 2 Distillation
- 3 Viscosity
- 4 Carbon residue

It is possible to go further and use gas chromatography to derive a cetane index. This of course will not be the same as that for petroleum products but will require research to develop. The cost of doing so would be a minute fraction of the cost of routine cetane testing using conventional methods. Given that the cetane rating of biodiesel is considerably higher than that of petroleum diesel it is not really a critical factor, so an indirect procedure would be adequate.

Similar examination shows that there are ways of dealing with total contamination, sulphated ash and alkaline metals which would be more appropriate for ester fuel, based on the relatively cheap and accurate processes of titration and filtration. The accuracy of these tests is substantially higher than that of the sulphated ash test and together they provide information about the contaminant which is more specific and useful.

I encourage you to make the test procedures of the standard all suggestions rather than requirements initially. Thorough examination should be made of the options available to

generate a series of tests which are designed specifically for an ester fuel and appropriate to the real concerns of the biodiesel industry.

Biodiesel in Australia is likely to be produced mainly from waste oil hence small plants scattered around the nation would be most effective at sourcing raw material. For small plants the cost of petroleum industry style tests would be a severe burden which would tend to restrict development to a few large players. This would not be efficient nor would it maximize opportunities for regional Australia and the work force.