


PROJECT: AUSTRALIAN FUEL QUALITY STANDARDS		
TOPIC: COMMENT ON CETANE NUMBER		
File: Comment_Cetane_AUS_200404	19.4.2004 / TH	pg. 1 of 2 pages

BDI's comment on:

National Fuel Quality Standards

Measuring Cetane Number: options for diesel and alternative diesel fuels Discussion Paper

prepared by the
Australian Government, Dept. of Environment and Heritage

Chapter. 3.2 Measuring Cetane in Biodiesel:

Biodiesel as an alternative diesel fuel derived from transesterification of oils and fats has a significant oxygen content. Compared to mineral oil diesel, combustion properties and distillation parameters of Biodiesel are different.

A calculation of the Cetane Index cannot be done for Biodiesel, because Biodiesel has an almost uniform distillation temperature.


Therefore, the calculation of the Cetane Index instead of determining the Cetane number is not a proper quality standard parameter for Biodiesel and cannot be recommended.

The current very cost intensive method for determining the Cetane number with an engine has been further developed. There are alternatives using cheaper equipment. One of these alternatives for estimating the Cetane number in Biodiesel is the correlation between the fatty acid composition and the Cetane number as described in literature §.

The determination of fatty acid composition of Biodiesel is an established analysis performed by gas chromatography. A gas chromatograph (GC) is essential in every Biodiesel producer's laboratory.

This could be an easier and cheaper way of indirect determination of the Cetane number in biofuels.

§ Knothe, G.; et.al.: "Cetane numbers of branched and straight-chain fatty esters determined in an ignition quality tester". fuel 82 (2003), 971-975
 Knothe, G.; et.al.: "Precombustion of Fatty Acids and Eters of Biodiesel. A Possible Explanation for Differing Cetane Numbers." JAOCS, Vol. 75; no. 8 (1998), 1007-1013
 Van Gerpen, J.: "Cetane Number Testing of Biodiesel." Proc. Liqu. Fuel Conf.; American Society of Agricultural Engineers, St. Joseph; 3rd (1986), 197-206
 Freedman, B.; Bagby, M.O.: "Predicting Cetane Numbers of n-Alcohols and Methyl Esters from their Physical Properties." JAOCS, Vol. 67; no. 9 (1990), 565-571

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If this is a convenient alternative for Australia's Biodiesel standard, **further research will be necessary for correlations covering all possible feedstocks** (all vegetable oils and fats, animal fats, used cooking oil, etc.) **for Biodiesel multi-feedstock production.**

In this regard, we can highly recommend Prof. Martin Mittelbach at Graz University, Dept. of Chemistry, who has been R&D partner of BDI for many years, for bringing this alternative route of Cetane number determination to a proper quality standard.

BDI is happy to support you in this matter. If requested, we'd be pleased to assist you in establishing contact with Austrian representatives involved in the CEN commission for Biodiesel.

