

**11TH INTERNATIONAL CONFERENCE ON STABILITY,
HANDLING AND USE OF LIQUID FUELS
October 18-22, 2009
Prague, Czech Republic**

UNDERSTANDING THE LOW TEMPERATURE PROPERTIES OF BIODIESEL.

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The addition of FAME to diesel fuel can have a considerable impact on the low temperature properties (cloud point and CFPP) of the fuel. Understanding this impact is one of the key aspects of ensuring fuel fitness for purpose. This paper aims to describe the various ways in which FAME can affect fuel cold properties, discuss the reason why these occur and present advice for minimizing the effects. Issues seen with a common impurity “mono-glycerides” will be considered in this context

The low temperature properties of diesel fuel can be influenced through two distinct mechanisms: through the fatty acid methyl ester composition of the FAME and through the presence of impurities in the FAME.

Methyl esters are the main components of FAME and the low temperature properties are mainly influenced by the saturated methyl ester content of the FAME. This influences basic cold flow properties such as the Cloud Point and CFPP.

The presence of impurities in FAME can also influence the cold properties. These impurities can precipitate from the fuel mixture at temperatures above the cloud point, which can lead to blockage of fuel filters. This paper discusses the two impurities that have been identified in relation to field problems of this kind, saturated mono-glycerides and sterol glucosides.

Saturated mono-glycerides have been identified as one of the main problem species related to field problems observed in Sweden. They have poor solubility in diesel fuel. FAME specifications only contain limits on total mono-glycerides and the proportion of these in a particular FAME that are saturated will depend on the FAME type.