

Comment on the proposed Standard for Fuel Parameters (Ethanol)
Commonwealth Position - April 2005

CSR Limited

The report provides a skimming over view of world fuel ethanol markets. There is little by way of recommendations for Australia on key parameters.

The report gathers fuel standards from all over the world, but strangely omits Canada, which has an active fuel ethanol market.

The report does not appear to be backed by hard data in relation to the history associated with petrol. The text relating to corrosion inhibitors reflects more on methanol, than ethanol and if DEH were to use this data, it should seek out more comprehensive materials compatibility data between ethanol and various metals at various blends of fuel ethanol.

P 7.

Ethanol does not meet a practical definition of being hygroscopic for fuel grades. It is hydrophilic and will slowly take up atmospheric water and ultra low water content anhydrous ethanol (< 500ppm water) will slowly drift off spec if the ethanol is exposed to high humidity. It is immaterial for fuel grade ethanol at 0.5% water. Thus fuel grade ethanol will not draw water in and go off-spec from sitting in a tank.

The explanation on vapour pressure is only correct in places - in terms of evaporative emissions the statement is essentially meaningless.

P 8.

Ethanol is not a very reactive substance as evidenced by its storage in neat form in mild steel. The image presented in the report is one of a substance which is highly corrosive to a many materials. The claims made need substantiation and would appear to overstate the case, especially for an E10 blend. E10 might for instance clean up the deposits in terne metal, including lead oxide, but it is not in itself corrosive to lead. In Australia we are not planning high concentration fuel ethanol. Swelling of elastomeric components has been shown to be within acceptable limits.

Comments relating to E85 fuel mileage performance need substantiation - the latest flex vehicles in Brazil are claiming increased fuel economy

as the higher levels of ethanol have allowed better optimisation of compression ratio with the new engine technologies.

The comment on cold starts pertains to neat ethanol

P14,17,42 Fusels

Fusel oils in the US are left behind in the ethanol for the benefit of the fuel. Fusels need to go into the fuel and should be inclusive in the fuel standards. There is generally no other outlet for fusels and US practice is for co produced products to be counted along with ethanol as fuel grade ethanol. Other controls can be considered such as no added chemicals to adulterate the ethanol outside of the fermentation process. Fusels are mostly higher alcohols and they burn well in cars - why test for them? Fusels increase the energy density, burn cleanly, and provide co-solvent protection against phase separation. It is in the interests of the manufacturers and users to have fusels included.

P 15

Synthetic ethanol might be regarded by that industry as the cleanest, but scrutiny would reveal high levels of croton aldehyde production in the raw ethanol from ethylene. Synthetic ethanol is not allowed for human consumption for instance.

P51

Aldehydes come from the combustion of fuel - there would never be formaldehyde in unburned fuel ethanol. There are aldehyde specs for industrial/beverage grades, but these would be burned or catalytically destroyed in an engine and any levels would be extremely low. Exhaust aldehyde may arise from the partial oxidation of ethanol and failure of the catalytic converter to complete the combustion process.

P 53.

This discussion omits the really important parameters.