JSM DEVELOPMENTS LTD
PETROL FORECOURT ENGINEERS

Bio-Fuel Storage - Things to Consider

Although E5 and B5 remain within the requirements of EN 228 and EN 590 respectively, there are certain features of these fuels that need to be understood.

Phase separation

Unlike petrol, ethanol is highly soluble in water. When the water content of the E5 blend reaches a critical level the ethanol component and associated water will separate from the E5 blend and form an ethanol/water phase. This will accumulate at the bottom of a tank leaving petrol (without the ethanol component) in the upper layer. This is known as **phase separation**. If phase separation occurs the process needs very careful management, specialist equipment and expertise which JSM Developments have to recover from.

Solvent properties

The solvent properties of E5 and B5 can have a cleaning effect on existing storage systems. This can cause a softening and loosening of any organic residues, dirt or scale present in the tank system. This loosening can bring this material into a suspended state, and can therefore increase the risk of filter blockage. This is particularly the case with B5, which contains chemicals used commonly as degreasing agents. It is also

possible that E5 can be come discoloured due to these cleaning properties.

Electrical conductivity and corrosion

Because of the molecular composition of ethanol and FAME (fatty acid methyl esters) and their stronger association with water, E5 and B5 have a greater electrical conductivity than standard gasoline and diesel respectively (E5 more so than B5). The bio component present in the blend can increase the risk of corrosion in existing filling station systems form galvanic and electrolytic reactions where particular material combinations may be present. This can in addition increase the risk of pump filter blockage and infrastructure damage.

Microbial growth

Bacteria, yeasts and moulds can enter a filling station storage system through the distribution chain, via tanks, pipelines, filters, water and air. It is in the water phase that microbes survive, drawing nutrients from the fuel phase. With the addition of the FAME component in B5 blends, the nutrient sources available for microbes will increase and contamination may be more likely to occur. Microbial growth in the water phase can exacerbate localised corrosion, which may result in the blocking of dispense filters and fuel lines.

Essential preparation before introduction of E5 and

Firstly, it is necessary to ensure all the materials and components used – tanks, lines, valves, flanges seals, gaskets are compatible with the new fuels. This MUST be checked and assurance provided by a competent person or the original equipment manufacturer.

It is advisable the station management acquire an average flow rate for the associated pumps prior to the introduction of the new fuels to use as a benchmark comparison against any future pump issues.

Essential all tanks are checked for water content, especially the case for E5 as phase separation can occur immediately if there is enough water content to cause a saturation level. Note – water content as little as half a percent by volume is enough to cause phase separation contamination.

It is also recommended a pipe vent and tank integrity test is completed to ensure there are no leakages in the infrastructure that could cause ingress of water.

Existing fuel should be checked for suspended water and a part per

million analysis sample taken.

Conclusion

It cannot be emphasised enough only careful preparation and a proactive approach will minimise the risk involved in bio-fuel storage. Followed by specialised a periodic care of the tank and delivery infrastructure.

JSM Developments Ltd are leading industry experts in these areas and have prepared and decontaminated many tanks for leading UK organisations and independents.

For peace of mind, further advise, guidance or general information please contact us:-

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