



Petroleum and Petrochemical Bulletin

FAME CONTAMINATION IN AVIATION FUEL

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With increased levels of FAME being allowed in the EN590 Gas Oil (#2 Diesel) specification, the presence and concentration of FAME components in these cargoes may not be known by the vessel. This can create a major problem if a subsequent cargo is Aviation Fuel.

Current Jet Fuel specifications have a very low tolerance to FAME and, although not currently reflected in specifications, AVGAS is also critical with regard to FAME as noted in the Energy Institute publication HM50 *Guidelines for the cleaning of tanks and lines for marine tank vessels carrying petroleum or refined products*. (HM50)

IFIA member companies are sometimes asked to inspect ships tanks for cleanliness prior to receipt of cargo and to issue a respective Tank Inspection document. With increasing environmental restrictions, many of these inspections must be performed from deck level only as the tanks remain under inert gas. Any retained cargo must be determined by manual gauging and sampling through vapour control valves. It is therefore necessary to rely heavily on information provided by the vessel as to previous cargoes and tank cleaning methods. While IFIA members can review records of previous cargoes and tank cleaning methods they cannot attest to the accuracy of information provided by the vessel and clearly this may be critical in relation to FAME contamination of Aviation Fuel. IFIA members should report the conditions under which tank cleanliness and/or OBQ is determined and note where information is provided by the vessel.

There is an inherent problem in obtaining uncontaminated samples from cargoes which follow Bio diesels as FAME has a tendency to adhere to internal surfaces. This may lead to increased concentrations at sampling points, as they are difficult to clean. HM50 states under section 2.12.7 that the cleaning regime employed by the vessel should include sampling equipment, stand pipes and stilling wells. However, the Inspector normally has to rely on cleaning information provided by the vessel and cannot verify whether this operation has been carried out.

When a previous cargo has contained FAME and samples are drawn through the vessel sampling system their integrity may be in doubt due to the inherent difficulties in removing FAME residues from sampling fittings on the vessel. Therefore, in cases where analysis of samples obtained via closed or restricted systems indicates that FAME limits have been exceeded in a following cargo, it is recommended principals are advised accordingly and arrangements are made to take additional samples under open sampling conditions to confirm the results.

The responsibility for cleanliness and suitability of the vessel rests with the vessel and its charterer. It is recommended that charterers confirm whether FAME has been present in previous cargoes and ensure that appropriate cleaning procedures are adopted prior to considering the vessel for the carriage of Aviation Fuel. Where part cargoes are involved charterers should treat any non-nominated cargo tanks carrying FAME or Bio diesel in the same manner as the nominated cargo tanks to avoid the possibility of cross-contamination.

Revisions/Reaffirmations
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HM50 recommends three intermediate cargoes between FAME or Bio-diesel with a FAME content of 15% or above (B15) and an Aviation Fuel cargo, together with rigorous cleaning procedures for prior cargoes with lower FAME levels. IFIA members would consider the presence of FAME or Bio diesel in the three prior cargoes a reason to decline the vessel as fit for the loading of Aviation Fuel. Therefore, it is recommended that any charterer choosing to utilize such a vessel should inform the Inspector of its agreements with the vessel in advance of its arrival for inspection to reduce the chance of delay.

There is significant evidence to show that shore loading systems can retain enough residual FAME to contaminate an Aviation Fuel cargo. It is therefore recommended that the party with contractual responsibility for the loading operation verify with the terminal that manifolds, loading arms and hoses have not been used to transfer FAME or Bio diesels for the last three operations. IFIA members are not in a position to obtain and verify such information and cannot accept any duty or responsibility in this regard.

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