

## **Bulten 23**

### **CONTAMINATION/ADULTERATION OF BUNKER FUELS IN SINGAPORE - 2**

We have carried out GC/MS analysis of several samples sent from Singapore. We do find heavy contamination of several solvents, which have potential to destroy oil film and thereby cause damage of rubbing parts of the fuel pump and engine cylinder. The typical report given below analyses the GC/MS results and the likely causes.

#### **Contaminants**

##### Port no.1 fuel oil tank

C 15 to C45 Normal Petroleum Hydro carbon 96.11%  
Toluene 0.38%  
Methyl Benzene 0.14%  
Xylene 0.43%  
Other alkyl benzenes 0.96%

##### Starboard 2 Fuel oil tank

C 15 to C45 Normal Petroleum Hydro carbon 97.09%  
Toluene 0.55%  
Methyl Benzene 0.22%  
Xylene 0.89%  
Other alkyl benzenes 1.25%

#### **Likely sources**

These solvents are clearly contaminants in the bunker fuel. They do not and they cannot be part of a bunker fuel coming out of a refinery. As solvents their use is for cleaning purposes. Many laboratories use Xylene and Toluene for cleaning glassware. These solvents are considered hazardous substances and they are usually stored in separate containers and handled separately and disposed off separately using authorized environmental disposal procedure. After washing the glassware these solvents also have a black color and there is potential for mixing them with bunker fuel either through carelessness or for profit.

#### **Damage potential**

The damage potential is really high. A very high wear rate can be expected between a fuel pump, plungers and barrels and also inside the cylinder between the piston ring and the cylinder liner. In addition these solvents are hazardous and exposure at various ppm levels are not recommended. If these fuels are mixed with bunker fuels there is a real risk of the engine room operating staff coming in contact with the fumes of the solvents, particularly in the purifier room. We can supply the MSDS sheet if you require for these solvents.

In the absence of any set procedure it is better to pump out this fuel and not retain it on board and use it in the engines. Even though the levels of contamination appear to be low in percentage terms, they are high enough to cause damage to the machinery and hazard to the health of the engine room staff.

Under ISO 8217 even if a fuel meets with all the specification criteria it still has to meet another criteria that it should not contain harmful chemicals or chemical waste that would cause damage to the machinery or health hazard to the personnel attending on the machinery. Under the above criterion this fuel can be considered out-of-spec even if it meets other specification requirements.

Best regards,

Dr. Vis

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