



Screening for chemical waste

Although the issue of sulphur content has received the lion's share of coverage since the advent of MARPOL and its subsequent revisions, it is not the only issue exercising the minds of the regulators.

For example, the presence of chemical waste contravenes both Regulation 18 of the revised Annex VI and Section 5 of ISO 8217:2010(E).

The revised ISO Standard places more emphasis on chemical contaminants within marine fuel, building on the previous revision and maintaining that fuel should not include any added substance or chemical waste which:

- Jeopardises the safety of ships, or
- Adversely affects the performance of machinery, or
- Is harmful to personnel, or
- Contributes overall to additional air pollution

However, it now also states that: "Fuels shall be free from any material that renders fuel unacceptable for use in marine applications" In addition to this further clauses have been added that specifically deal with presence of FAME (Fatty Acid Methyl Esters) and Deleterious Materials. These tighter restrictions have been specifically designed to reduce the likelihood of chemical contamination in fuels but even though this is the case it still strengthens the argument that regular chemical screening is as important as ever.

The refining industry has taken steps to ensure that chemical waste is minimised for all production processes and the majority of bunker fuels do not contain large concentrations of waste chemicals. However, the amount of naturally occurring chemicals varies enormously depending on several factors including crude source and processing techniques. It only needs delivery and use of one contaminated fuel to cause an extremely serious sequence of events coupled with potentially significant financial consequences.

Testing prior to fuel being burnt is the most cost-effective means of resolving this dilemma. Systematic testing using forensic techniques identifies accidental and deliberate adulteration of bunker fuels, and also ensures that fuels comply both with Annex VI and ISO 8217.

Lintec Testing Services Ltd offers a Gas Chromatography Mass Spectrometry (GCMS) screening programme designed to protect from operational and economic consequences resulting from engine damage caused by receipt and subsequent burning of fuels found to contain chemical waste. The Lintec screening programme identifies chemical waste in real time and provides information on this aspect of fuel quality before it is burnt.

Many types of contaminants can be detected using the Lintec forensic technique. Although these contaminants are often at exceedingly low concentrations, the potential to cause engine damage is still a possibility. Using this service, Lintec assists clients to identify implications for both vessel safety and the environment when fuels are found to contain chemical waste.

The screening programme identifies chemical concentrations and compares against average values for each chemical on a port-by-port basis. Clients are advised when markedly higher than average values for natural chemicals are detected and also abnormal levels of chlorinated or other waste chemicals.

Many Lintec clients have subscribed to the screening programme in order to operate safe and compliant vessels, with the added bonus of reducing the risk of engine damage. Latest Lintec data (for the first half of 2010) indicates that around 5% of fuels screened have been found to contain higher than normal levels of chemical waste.

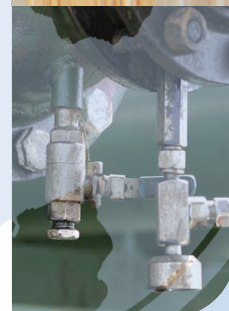
There is no published data available for the levels of waste chemicals known to cause damage to machinery, and the time and effort needed to establish these critical levels cannot be underestimated.

The variety of engines, fuel treatment systems and tolerance to the presence of chemicals requires a research programme involving all stake holders in the marine industry.

It appears unlikely that there will be a short-term understanding of the final effects of chemical waste on the mechanical parts of marine engines.

The long-term effects of burning waste chemicals which are dangerous and harmful to the environment are not known, and it is of paramount importance to the shipping industry that fuels containing hazardous chemicals are identified before the point of use.

Lintec Testing Services Ltd is committed to carrying out further investigations into the effects of waste chemicals on engine wear and has received interest from engine manufacturers in this regard. We look forward to participating in future research programmes.





Chemical screening proves its worth

Having been made aware of the benefits of our chemical screening programme by the Managing Director of a Lintec client, a Hamburg based ship owner placed their vessels on Lintec's fuel analysis programme.

Prior to the company accepting Lintec's offer (Autumn 2009) there was some discussion regarding the value of Lintec's chemical screening programme, given the relative low cost per sample screened.

Never the less, the whole fleet was placed with Lintec and all enrolled on the chemical screening programme.

Any doubts regarding the value of chemical screening were dispelled within weeks when bunkered fuel containing DCPD and Styrene was identified using Lintec's chemical screening technique and reported to the client.

The vessel concerned was under charter to a large shipping company which was made aware of the findings of the Lintec report.

The two companies then entered into discussions and it was agreed that Lintec's advice – that the fuel be used with caution and if any operational difficulties were encountered then the use of the fuel should cease – be followed.

After operating on this fuel for seven days the vessel began to encounter operational difficulties, including blocked fuel filters – as can be seen in the photograph here.

At the next scheduled port of call, and with minimum disruption, the charterer arranged for the fuel to be debunkered and replaced with a new fuel stem.

Further analysis was undertaken in order to determine the exact levels of contamination, following which charterer accepted liability for all costs.

Needless to say, the Hamburg ship owner continues to use our analysis service and, of course, our chemical screening programme.

