

# PURIFIER EFFICIENCY MONITORING

**Analysis of data from samples submitted to Intertek Lintec's fuel testing programme has shown elevated levels of catalytic fines in fuels introduced by cutter stocks.**



The potential for damage these particles can cause is well known. Small particles can damage fuel injection components, abrading the fuel injection nozzle and distorting the spray pattern, resulting in the fuel oil becoming unevenly distributed.

In some cases the injector can begin to act as a flame thrower with fuel burning the oil film on the cylinder liner, leaving the piston rings without lubrication. This can progress to deposits being formed, causing the piston rings to stick in their grooves with piston rings breaking after only a few hundred hours operation. Small particles can also progress in to the combustion chamber itself, leading to excessive piston rod, piston ring and cylinder liner wear.

Larger particles, unable to progress past the fuel injection pump due to the small internal clearances, can cause localised damage - typically scoring of the plunger and barrel. In addition to the possibility of high levels of catalytic fines in delivered / bunkered fuel, it should be borne in mind that particles which might have settled in tanks on board can find their way in to fuel after being agitated - after a period of heavy weather, for example.

No matter how they arrived in the fuel, it is essential to ensure that the level of catalytic fines in the injected fuel oil meets the specification set by engine builder, typically in the region of 15 mg/kg. However, the current edition of ISO 8217, the international standard for marine fuels, specifies a maximum combined limit for Aluminium & Silicon (catalytic fines) of 60 mg/kg.

In order to reduce the likelihood of fuel with high levels of catalytic fines from progressing further, a combination of settling, purification and filtration is adopted.

As the time available for settling in tanks is limited, especially given the impact that the requirement for segregation of fuels with different sulphur levels has had on tank usage, the likelihood of catalytic fines settling out has reduced. It is vital therefore that a vessel's purifiers operate at optimum efficiency, minimising the need for filtering - which should always be regarded as the last line of defence. Typically, three things trigger purifier efficiency monitoring:

- When laboratory analysis indicates that exceptionally high levels of catalytic fines have been found in bunkered fuel.

- When operational problems with propulsion systems are encountered.
- As part of a planned maintenance routine.

Including purifier efficiency monitoring as part of a planned maintenance regime can significantly reduce the likelihood of the ingress of catalytic fines.

Full instructions for taking samples are provided - see overleaf - with samples forwarded to Intertek Lintec in order that analysis be undertaken. A comparison can then be made of the analysis results, with special attention being paid to the levels of catalytic fines and water content.

The results of the analysis, together with advice and comment from Intertek Lintec's Customer Service Department, are then issued to the ship and to the client's office, enabling appropriate action to be taken.

## PURIFIER EFFICIENCY MONITORING AS PART OF A PLANNED MAINTENANCE REGIME

### HOW TO TAKE SAMPLES AND FORWARD THEM TO INTERTEK LINTEC

**As is the case for all laboratory analysis, obtaining representative samples is essential and reference should be made to the purifier manufacturer's handbook for specific guidelines regarding the taking of fuel samples.**



However, a few general points to bear in mind are :-

- Reference to the shipping company's health and safety policy should be made.
- Ensure that all personnel who may come into contact with fuel are adequately equipped with the correct personal protection equipment
- Sample points should be free from dirt.
- Before any sample is drawn, a small amount of fuel oil, enough to ensure that the correct fuel is being sampled, should be flushed through. Note: Fuel oil collected from this operation should be segregated and carefully disposed of.
- Samples should then be captured in a clean and previously unused sample bottle.

- Sampling points will depend on the particular layout of each vessel but the 'before purifier' sample should be taken as close as possible to the inlet of the purifier and, if possible, before the purifier inlet filter.
- Similarly the 'after purifier' sample should be taken as close as possible to the clean oil outlet of the purifier.
- Taking these samples directly from the Settling Tank and Service Tank is not recommended due to the possibility of the build of particles in the bottom of tanks mentioned above and these becoming agitated. Taking samples from the tanks may not give a true representation of the purifier efficiency.

Samples should be forwarded to Intertek Lintec in order that analysis against the ISO 8217 specification can be carried out.


A comparison can then be made of the analysis results, with special attention being paid to the levels of catalytic fines and water content.

- Place the samples in the mailing cartons / boxes provided.
- Complete the proforma invoice and the DHL airway bill.
- Hand the mailing boxes / cartons to your agent, together with the proforma invoice and airway bill.
- Send the completed "Request for bunker sample collection" form to Intertek Lintec - via E-Mail ([lintec.dhl@intertek.com](mailto:lintec.dhl@intertek.com)). Intertek Lintec will then arrange for the samples to be collected and forwarded to our laboratory.

#### FOR MORE INFORMATION

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