

BUNKERSPOT

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INSIDE:

RISK MANAGEMENT

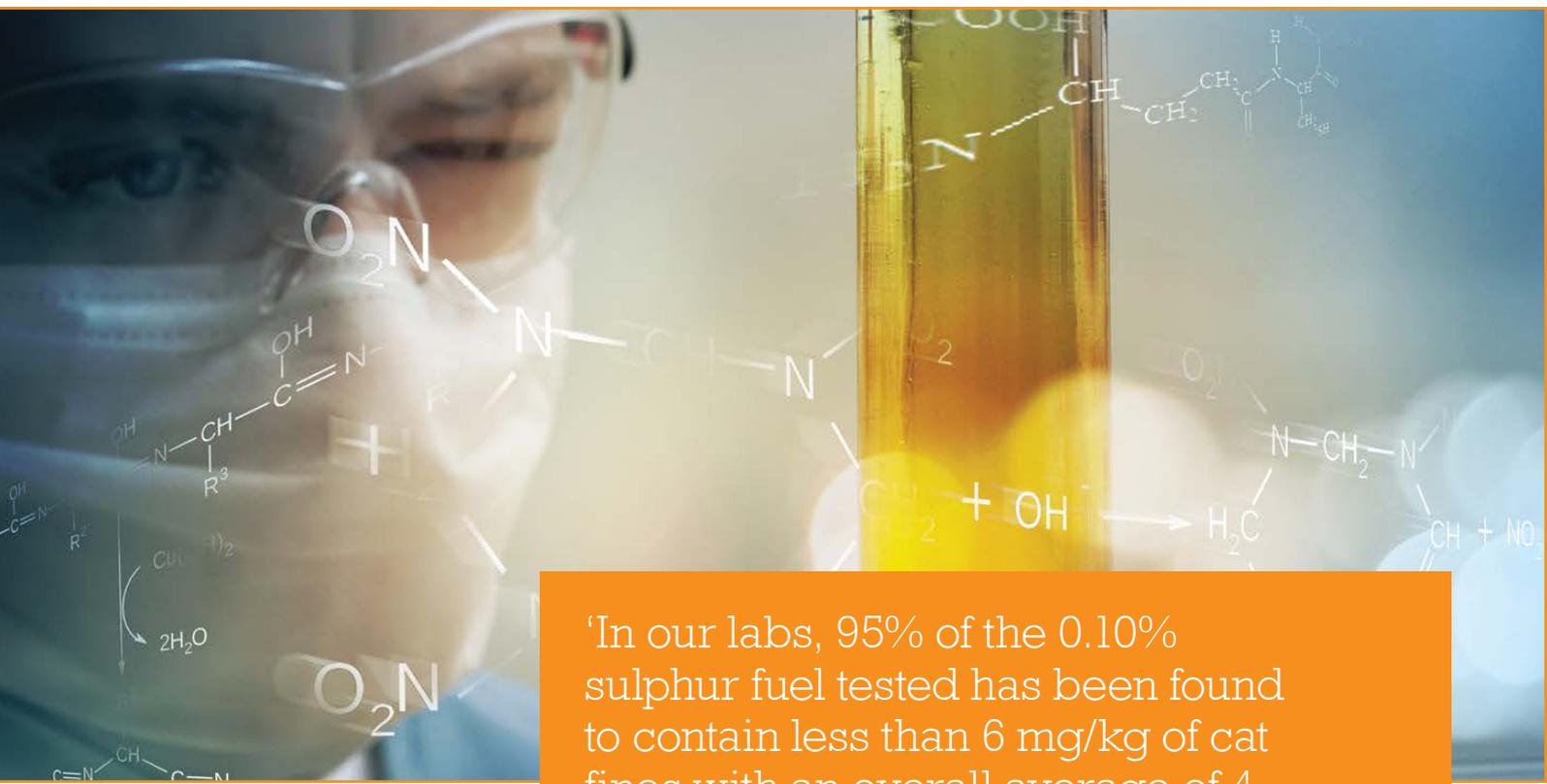
FUEL PROCUREMENT

CYBER RISK

ECA COMPLIANCE

A fine distinction

The incidence of cat fines in fuel samples has markedly declined with the increased use of 0.1% sulphur fuels, but Wajdi Abdmessih of Seahawk Services calls on vessel operators to remain vigilant about their presence in the fuel supply chain



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At the time of writing, it is just over nine months since the introduction of the 0.10% sulphur limit in emission control areas (ECA) on 1 January, which superseded the previous cap of 1.00% mg/kg sulphur. After several months of testing the new ECA 0.10% fuels, the findings of our initial laboratory research, which was undertaken in November last year ahead of the new regulations, have been confirmed and proved.

Understanding how to handle the new fuel has been key in making a smooth transition from 1.00% sulphur to 0.10% sulphur. Overall, the majority of users of the new ECA fuels

appear to have understood how to handle them and have reported no major problems.

As tested, there are mainly two types of 0.10% sulphur fuel in the market – one which is called 'black diesel', similar to DMB grade but with a higher viscosity (9 to 40 mm²), and one which is the vacuum gasoil (VGO) type fuel identified by its opaque, brown colour.

The DMB-like grade is much

easier to handle since it has a high tolerance when blended with other fuel, and usually has no compatibility issues. This type is mainly blended fuel produced by the fuel supplier/refinery.

As for the VGO type, as long as it is kept in segregated storage and the cold filter plugging point (CFPP)/pour point are monitored, all should be fine. This type of fuel is produced

by a refinery and it is not blended fuel.

Many refineries are moving to improve and produce this type of fuel since the demand for low sulphur marine fuel will only increase with the implementation of the global 0.5% sulphur cap (in 2020 or 2025).

Overall, the new 0.10% sulphur fuel has given vessels a much needed break from the problem of high cat fines (Aluminum and Silicon) which frequently occurred during the use of 1.00% sulphur fuel.

In our labs, 95% of the 0.10% sulphur fuel tested has been found to contain less than 6 mg/kg of cat fines with an overall average of 4 mg/kg compared to 1.00% sulphur fuel, which had been shown to have an average 35 mg/kg of cat fines.

So, this is good news – but what about the high sulphur fuels?

Unfortunately, this 'break' does not extend to these fuels which have much higher cat fine levels. As you may know, the main source of these cat fines is low viscosity cutter stock, referred to as heavy cycle oil or slurry oil, which is produced by refineries as an output product of the catalytic cracker. This slurry oil is used to blend down high viscosity fuel and adjust the viscosity of the final product.

Although slurry is still used for blending the 0.10% sulphur fuel, the percentage used is very small to keep the sulphur content under 0.10%, thereby allowing cat fines to be kept at very low levels.

High sulphur fuel represents the perfect product for the use of the slurry for blending; therefore the cat fine levels have dramatically increased in these fuels since the beginning of January 2015. Significantly, more than 85% of major fuel related problems can be attributed to the presence of high cat fines.

More than 60% of the high sulphur fuel has been found to contain cat fines higher than 30 mg/kg, and 12% contains more than 61 mg/kg, which exceeds the maximum specification limit for the ISO 8217:2010 RMG and RMK grades. Some 74% of the high sulphur fuels tested has a cat fine level greater than 20 mg/kg.

It is very important for the vessel operator to treat newly purchased fuel as if it is high in cat fines, despite the fact that suppliers may introduce fuel analysis reports which indicate that the fuel shows low cat fine levels. The quality of the fuel delivered must be confirmed before use, meaning that a representative sample must be taken according to MARPOL Annex VI

and tested by an independent laboratory.

Remember: if you have to use the fuel before receiving the analysis report, you must treat the fuel as if it has a high level of cat fines.

There are many issues that may go wrong during fuel delivery that could result in fuel contamination before even reaching the vessel tanks.

For example, a supplier may have a certified tank which is located in a tank farm with a number of other tanks that contain other products. These tanks are most likely sharing the same pipeline. If for any reason the pipeline is not cleared from previous products, like slurry, this product will end up in your vessel tank.

On the other hand, barges also are used to move many types of products. If it so happens that the barge has products remaining onboard from previous high cat fine deliveries, these could contaminate your fuel and end up in your vessel tanks as well.

Suppliers and barge companies are very careful and work very hard to investigate every issue before transporting any product so as to avoid contamination. It only takes one mistake to have catastrophic consequences on the vessel engine. However, it has happened before and it is certain to happen again – guaranteed!

Although 0.10% sulphur fuel has low cat fines, it is still very important to treat it as if it has high levels, especially if you are planning to use it immediately.

It is important to remember that most engine manufacturers require cat fines to be beneath 15 mg/kg at the engine inlet.

Cat fines will drop much faster in low viscosity fuel compared to high viscosity fuel. Even though the cat fine level is low in 0.10% sulphur fuel, you still need to let the fuel settle and centrifuge in order to remove the large particles from the fuel.

More than 80% of high wear cases are related to cat fines since its hardness is higher than the wear component in the engine. It is not only the level of cat fines that will cause damage but also the size of the particles. Those particles larger than eight microns were found to be the most problematic, causing major damage, since they can be trapped between the piston and liner. Particles can also cause major damage on the ring and pistons if they get trapped in the piston ring groove. The most common cat fine particle size is found to be between 5-15 microns.

Preventing these particles from getting

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into your engine will depend on the vessel treatment plant, which includes the settling tank (time and temperature), purifier efficiency, and service tank and filtration.

However, do you actually know your vessel purifier efficiency rate?

Purifier performance efficiency varies from 25% to 70%. Unless you check the vessel purification efficiency rate, you may be introducing a high level of cat fines to the engine and increasing the potential for wear.

A purifier with 60% efficiency will reduce fuel containing 50 mg/kg cat fines to 20 mg/kg, which is still a higher level than most engine manufacturers recommend.

Purifier efficiency should be checked on a regular basis, by taking a sample before and after purification for cat fines analysis and particle size distribution.

The optimisation of the vessel treatment system during each bunker delivery is key to prolonging the life of the vessel engine. Remember, technology is on your side. Fuel testing and proven technologies are available to help you safeguard your engine against cat fines.

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