

BUNKERSPOT

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BUNKERING IN A
TIME OF TRANSITION

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Degrees of separation

Wajdi Abdmessih of Seahawk Services discusses the growing problem of wax formation as a result of the increased use of ECA-compliant fuels

With the introduction of the 0.1% sulphur regulation within emission control areas (ECA) on 1 January 2015, unless a vessel is fitted with a scrubber or can run on an alternative fuel such as liquefied natural gas (LNG), it has no alternative but to use marine distillate fuel (marine diesel oil (MDO)/marine gasoil (MGO)). To keep up with the demand for 0.1% sulphur fuel, many of the refiners have increased distillate production and also introduced new ECA-compliant fuels. Some of the new ECA fuels are produced from vacuum gas oil which is rich in paraffins/wax.

While the fuel producers have acknowledged that these new products have compatibility issues with residual fuel, they have stated that they are compatible with distillate gasoil. The results of our laboratory investigations have indicated that some of these ECA-compliant fuels may appear to be compatible and stable after mixing with MGO/MDO, but after settling for 24-72 hours the fuels started to separate which indicates instability. This separation could contribute to wax dropping of the fuel as soon as the temperature drops below the cloud point for any fuels within a blended product.

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For example, an analysis report may indicate that a fuel has a pour point of -21°C and a cloud point of -15°C while in fact the fuel is a blend of two fuels, one of which has a pour point of 15°C and a cloud point of 25°C while the other MGO/MDO has a pour point of -27°C and a cloud point of -20°C .

If for any reason the blended fuel is incompatible, separation of the fuel will result in two separate fuels in the vessel tank, one with a high pour point/high cloud point which will start to accumulate wax as soon as the temperature drops below the cloud point of 25°C and which may become completely solid at 15°C .

Some vessels may also commingle the distillate fuel due to storage capacity which may also lead to instability issues and wax dropping. At Seahawk Services, we have seen more wax problems in the first few months of 2015 than we saw throughout the whole of 2014.

Wax formation in tanks can cause major problems for a vessel, including, but not limited to, fuel starvation – as wax crystallisation will clog the filter and prevent the fuel from passing to the engine – and accumulation of wax in the tank/pipes which may be very difficult to remove.

So is heating the solution to prevent the formation of wax? This may seem to be the obvious answer, but what about your viscosity requirement? Remember that you have to have a minimum viscosity of 2.00 centiStokes (cSt) @ 40°C at the engine, therefore heating the fuel to keep the wax from forming maybe in direct opposition with the viscosity requirement, if the viscosity will be lower than 2 cSt at the engine.

It is recommended to keep the fuel heated 10°C above the fuel pour point in order to prevent wax formation where the fuel meets outside temperatures in pipe and tank surfaces.

Your first line of defence is to test the fuel to ensure safe handling. Stability, cloud and pour point test results will give a clear indication if

there may be a problem with wax accumulation.

Fuel with a high cloud point could indicate the potential for wax formation and filter clogging.

The cloud point is the temperature at which the wax precipitates out of the fuel in the form of small wax crystals, making the fuel cloudy and more difficult to move within the fuel lines.

To ensure a good flow of the fuel to the engine, it is very important to test the fuel for its cold filter plugging point (CFPP), especially if there is large difference between the cloud point and the pour point.

The CFPP is good for estimating the

lowest temperature at which a fuel will give a trouble-free flow in certain fuel systems. You may assume that a fuel with a cloud point of -1°C and a pour point of -24°C is safe to use if the vessel is operating in an environment above -24°C .

If the vessel is operating in an environment below the cloud point of -1°C , although the fuel may not become completely solid, wax may start crystallising at the cloud point and start to plug the filter at a temperature well above the pour point and below the cloud point.

Fuel must be kept above the CFPP temperature to avoid fuel starvation. If heating is not available or if it will lower the viscosity to below the minimum 2.00 cSt at the engine, then using an additive may be the easy way to overcome this problem. Remember, whether you are using heat or an additive it must occur before wax starts dropping out of the fuel; applying heat or adding an additive to the fuel after the event may not solve the problem.

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