

PREDICTION OF HEAVY FUEL OIL STABILITY

Heavy fuel oils are complex chemical mixtures containing high molecular weight compounds, known as asphaltenes. Asphaltenes have a strong tendency to flocculate, which may lead to sludge formation in the fuel. Asphaltenes have also been recognized to cause fouling in visbreakers, as well as, for example, in refinery heat exchangers and burners.

Heavy fuel oils are becoming more and more unstable due to decreasing quality of crude oils and also due to more severe refinery processing. To overcome stability problems due to flocculation and sedimentation of asphaltenes, chemical additives are being used to significantly improve the quality of heavy fuel oils. It is then necessary to have a technique that can accurately measure the stability of these fuels and which can also identify the most suitable additive to overcome problems with stability. By appropriate choice of additive and dosage rate, heavy fuel oils showing stability problems can be upgraded and a good quality heavy fuel oil provided to the end-user.

Application : Stability of heavy fuel oil

× Common method:

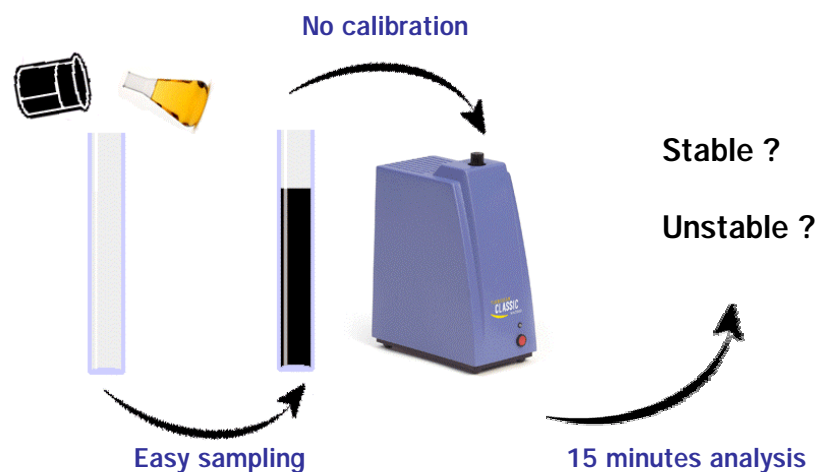
Different methods exist to measure the stability of heavy fuel oils. Among them, the "spot test" is one of the most widely used techniques, as it is very basic and easy to perform. However, it is very subjective and can lead to inaccurate results. Another method available is the "P-value"; it is more objective than the spot test, but does not always discriminate between fuels with similar stabilities. It is also very time consuming.

The existing stability methods are tedious and not very sensitive. Therefore, they are not best suited to optimise the use of chemical additives.

× Octel-Turbiscan® method:

Octel has developed a method using the Turbiscan® that is very quick. In only 15 minutes the stability of asphaltenes can be measured. The studies performed on a series of samples have proved the method to be more accurate than other techniques, such as the spot test or the P-value. The method is simple and can be performed on site as the equipment is portable.

Octel's method of using the Turbiscan® enables the quick, easy and accurate measurement of the stability of heavy fuel oils. Differentiation in results between fuels is such that it is easy to detect small variations in stability and find the most suitable additive with it's optimal dosage.



The relationship between Formulation and Octel brings together the knowledge behind a tried and tested piece of equipment for stability measurement, the Turbiscan®, and the experience from Octel in supplying performance enhancing additives into the heavy fuel oil market. A robust and portable technology with a simple and accurate method combined with chemical additives provides refiners an ideal tool to measure and optimise the stability of their heavy fuel oils.