

FUEL ANALYSIS

INFLOW MARINE FUEL BLENDING

Minimise organic deposition with industry-leading technology



Fuel blending can impact upon the quality of bunker fuel. Intertek InFlow aims to offer support to owners and operators by providing a fully integrated solution to potential problems in dealing with the handling or mixing of different fuels onboard.

Fuel Blending

Marine operators are facing increasing challenges in relation to the progressive development of emission legislation.

To comply with requirements for reduced sulphur levels, operators are turning to a more diverse range of non-traditional fuels.

Usage of new refinery streams and an increase in the blending of higher sulphur fuels to create compliant products has brought new challenges. In turn, these impact the way fuels are treated and handled on-board vessels.

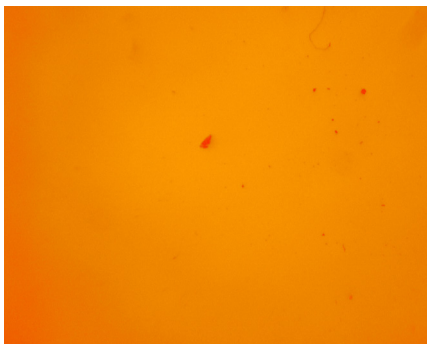
Large-scale fuel blending can impact upon the overall stability of the final product. This may lead to difficulties due to asphaltene drop out and sludge formation when the fuel is used.

This can be exacerbated further by mixing different products on board due to limited storage capacity or during fuel changeover to meet ECA (Emission Control Area) requirements.

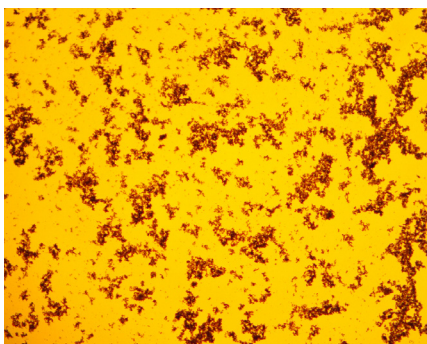
Existing Asphaltene Methodology

Identifying the deposition of asphaltenes by optical density is used within existing methods to identify parameters for neat fuels. Pure solvents and titrants such as heptane and toluene are used; these methods assume that there is no interaction between the fuels when blended.

However, fuel is a colloidal system which changes during blending.



Fuel prior to blending



Fuel after blending: Visible asphaltene content

The parameters are measured by optical density at a single wavelength which is not representative of chemical change or interactions between fuels.

Intertek InFlow

The programme assesses fuel oil blends using Near Infrared (NIR) and Intertek proprietary technology (InFlow).

This provides instability constraints that take account of interactions between fuel oils. Organic deposition is validated by microscopy, while InFlow examines chemical composition and physical properties to generate stability and instability constraints. It also accounts for the effects of time on the deposition of organic materials. This data can assist operators in making processing decisions about the storage of different fuels in a tank.

Programme Elements

The key elements of InFlow are:

- IR/NIR Spectroscopy - using FT-IR/FT-NIR
- Spectral blending algorithm
- Intertek Proprietary Technology
- Microscopy

- Intertek matrix blending algorithm
- Quality tracking (fingerprinting)
- Blend stability constraints

InFlow - Aggregate Plots

Different types of fuels have different types of spectra. InFlow uses aggregates to group fuels of the same type. These tend to have similar properties, shown by colours on the aggregate plot.

Within InFlow, the NIR spectra of different fuel oils, chemical composition (i.e. aromatic and paraffinic differences) and organic deposition properties, are visualised and validated by microscopy.

The stability of blends is determined from experimental data and by calculation utilising our blending algorithm, with aggregate plots used to visualise the instability and stability regions.

Blend Evaluation Reports

For each fuel blend an assessment is made based on NIR spectra, typical blend properties and operational issues experienced.

The experimental results and calculations from the evaluation are used to generate a set of reports for target fuel blends.

The blend evaluation reports include blend ratios that meet maritime sulphur constraints, a summary of neat fuel properties, calculated blend properties, the percentage range of fuels blended and minimum, maximum, average and span percentages.

FOR MORE INFORMATION



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