



Shell Trading & Supply

MARINE FUELS

Shell has developed an Ultra-Low Sulphur Fuel Oil (ULSFO 0.1%S max.) to meet the Shipping industry's demand for a 0.1%S maximum bunker fuel in advance of the 2015 ECA Sulphur specification change.

Shell's new residual fuel formulation (Patents Pending) is designed to be utilised by engines rated to use ISO 8217 residual fuels. It is a relatively low viscosity, low density fuel oil with good ignition properties.



ULSFO 0.1%S MAX



Shell's ULSFO has undergone extensive sea trials in both the North American and European ECA zones. The trials included numerous switchovers between ULSFO and higher sulphur fuels (LSFO 1%S, HSFO 3.5%S) and involved several engine types and tank/piping systems.

Major benefits of Shell's ULSFO

- Shell's ULSFO is designed to run in both Main and Auxiliary engines
- Viscosity at Main engine is higher than would be expected with DMA
- Reduced risk of thermal shock during fuel switchover as Shell's ULSFO can be heated
- Relative ease of fuel handling with no major increase in crew workload when working with Shell's ULSFO
- Runs successfully in both segregated systems, and single settling/service tank environments
- Better lubricity when compared with DMA, reducing the need for additives
- Good ignition properties

AVAILABILITY

Phase 1: Available in ARA, Rotterdam, Antwerp, Montreal and US Gulf Coast as of December 1, 2014.

Phase 2: New York Harbor and Singapore anticipated in 2015.

Typical Properties

| | SHELL'S ULSFO TYPICALS |
|--------------------------------------|------------------------|
| Density, kg/m ³ | 790 - 910 |
| Viscosity @ 50°C, mm ² /s | 10 - 60 |
| CCAI | 800 |
| Sulphur, mass % | <0.1 |
| Flash, °C | >60 |
| Hydrogen sulphide, mg/kg | <2 |
| Acid Number, mg KOH/g | <0.5 |
| Total Sediment accelerated, mass % | 0.01 - 0.05 |
| Total Sediment potential, mass % | 0.01 - 0.05 |
| Carbon Residue, mass % | 2 |
| Pour point, °C | 18 |
| Water, volume % | 0.05 |
| Ash, mass % | 0.01 |
| Aluminium plus silicon, mg/kg | 12 - 20 |
| Vanadium, mg/kg | 2 |
| Sodium, mg/kg | 10 |
| Used Lubricating oil | Free from ULO |



Main engine



Auxiliary engine front