**Appendix 1**

**Comparative Table**

**Changes to *Low Sulfur Fuel Oil Futures Contract of the Shanghai International Energy Exchange***

Note: words with double strikethrough are deleted and those in red and bold are newly added.

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| **Revised Version** | **Version on March 1, 2022** |
| **Appendix to *Low Sulfur Fuel Oil Futures Contract of the Shanghai International Energy Exchange***  **II. Quality Standards**  ……  **Quality Standards of Low Sulfur Fuel Oil of the Shanghai International Energy Exchange**   |  |  |  | | --- | --- | --- | | **Properties** | **Limit** | **Test Method** | | Kinematic viscosity (50 °C, mm2/s) | 380.0 max  100.00 min | ASTM D445 | | Density (15 °C, kg/m3) | 991.0 max  925.0 min | ASTM D1298 | | Calculated Carbon Aromaticity Index (CCAI) | 870 max | ISO 8217:2017(E) | | Sulfur content (m/m, %) | 0.50 max | ASTM D4294 | | Flash point (closed cup) (°C) | 60.0 min | ASTM D93 | | Hydrogen sulfide (mg/kg) | 2.00 max | IP 570 | | Acid value (mg KOH/g) | 2.5 max | ASTM D664 | | Total sediment (thermal aging test) (m/m, %) | 0.10 max | ASTM D4870 | | Carbon residue (m/m, %) | 18.00 max | ASTM D4530 | | Pour point (°C) | 30 max | ASTM D97 | | Moisture (V/V, %) | 0.50 max | ASTM D95 | | Ash content (m/m, %) | 0.100 max | ASTM D482 | | Vanadium (mg/kg) | 350 max | IP 501 | | Sodium (mg/kg) | 100 max | IP 501 | | Aluminum + Silicon (mg/kg) | 60 max | IP 501 | | Net calorific value (cal/g) | 9,500 min | ASTM D240 | | Used lubricating oil (ULO) (mg/kg)  Calcium and Zinc  Calcium and phosphorus | Fuel oil should be free of ULO, which is deemed to be present if any of the following conditions is met:  Ca > 30 and Zn > 15 or Ca > 30 and P > 15 | IP 501 | | Compatibility (level) | No higher than spot No. 2 | ASTM D4740 | | Cleanness (level) | No higher than spot No. 2 | ASTM D4740 | | Styrene (mg/kg) | **300** 50 max | GB/T 6041 | | Phenol (mg/kg) | **300** 50 max | GB/T 6041 | | **Appendix to *Low Sulfur Fuel Oil Futures Contract of the Shanghai International Energy Exchange***  **II. Quality Standards**  ……  **Quality Standards of Low Sulfur Fuel Oil of the Shanghai International Energy Exchange**   |  |  |  | | --- | --- | --- | | **Properties** | **Limit** | **Test Method** | | Kinematic viscosity (50 °C, mm2/s) | 380.0 max  100.00 min | ASTM D445 | | Density (15 °C, kg/m3) | 991.0 max  925.0 min | ASTM D1298 | | Calculated Carbon Aromaticity Index (CCAI) | 870 max | ISO 8217:2017(E) | | Sulfur content (m/m, %) | 0.50 max | ASTM D4294 | | Flash point (closed cup) (°C) | 60.0 min | ASTM D93 | | Hydrogen sulfide (mg/kg) | 2.00 max | IP 570 | | Acid value (mg KOH/g) | 2.5 max | ASTM D664 | | Total sediment (thermal aging test) (m/m, %) | 0.10 max | ASTM D4870 | | Carbon residue (m/m, %) | 18.00 max | ASTM D4530 | | Pour point (°C) | 30 max | ASTM D97 | | Moisture (V/V, %) | 0.50 max | ASTM D95 | | Ash content (m/m, %) | 0.100 max | ASTM D482 | | Vanadium (mg/kg) | 350 max | IP 501 | | Sodium (mg/kg) | 100 max | IP 501 | | Aluminum + Silicon (mg/kg) | 60 max | IP 501 | | Net calorific value (cal/g) | 9,500 min | ASTM D240 | | Used lubricating oil (ULO) (mg/kg)  Calcium and Zinc  Calcium and phosphorus | Fuel oil should be free of ULO, which is deemed to be present if any of the following conditions is met:  Ca > 30 and Zn > 15 or Ca > 30 and P > 15 | IP 501 | | Compatibility (level) | No higher than spot No. 2 | ASTM D4740 | | Cleanness (level) | No higher than spot No. 2 | ASTM D4740 | | Styrene (mg/kg) | 300 max | GB/T 6041 | | Phenol (mg/kg) | 300 max | GB/T 6041 | |