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| <b>Specification No.</b><br><b><u>I.S. EN 590: 2009</u></b> | <b>Sulphur Free Diesel</b> |
|---|----------------------------|

| <u>Property</u>  | <b>Min</b>              | <b>Max</b> | <b>Units</b>       | <b>Test Method</b>           |
|--|-------------------------|------------|--------------------|------------------------------|
| Appearance   | Free from visible water |            |                    | Visual Inspection            |
| Odour  | Merchantable            |            |                    |                              |
| Colour   |                         | L2.0       |                    | ISO 2049                     |
| Density at 15°C  | 820                     | 845        | kg/m <sup>3</sup>  | EN ISO 3675<br>EN ISO 12185  |
| Flash Point  | 60                      | -          | °C                 | EN 2719                      |
| Cloud Point  |                         |            |                    |                              |
| Summer (Note 1)  | -                       | +5         | °C                 | EN 23015                     |
| Winter (Note 1)  | -                       | -5         | °C                 |                              |
| Cold Filter Plugging Point<br>(Notes 2 and 6)                |                         |            |                    | EN 116                       |
| Summer (Note 1)  | -                       | -5         | °C                 |                              |
| Winter (Note 1)  | -                       | -15        | °C                 |                              |
| Viscosity at 40°C  | 2.00                    | 4.50       | mm <sup>2</sup> /s | EN ISO 3104                  |
| Sulphur Content  | -                       | 10.0       | mg/kg              | EN ISO 20846<br>EN ISO 20884 |
| Cetane Index   | 46.0                    | -          |                    | EN ISO 4264                  |
| Cetane Number (Note 3)                                       | 51.0                    | -          |                    | EN ISO 5165                  |
| Copper Strip Corrosion<br>(3 hrs @ 50°C)                     | Class1                  |            | rating             | EN ISO 2160                  |
| Water content  | -                       | 200        | mg/kg              | EN ISO 12937                 |
| Ash Content  | -                       | 0.01       | % (m/m)            | EN ISO 6245                  |
| Carbon Residue on 10%<br>Distillation Residue                | -                       | 0.30       | % (m/m)            | EN ISO 10370                 |
| Total contamination  | -                       | 24         | mg/kg              | EN 12662                     |
| Oxidation Stability  | -                       | 25         | g/m <sup>3</sup>   | EN ISO 12205                 |
| Lubricity, corrected wear scar<br>diameter (wsd 1.4) at 60°C | -                       | 460        | Microns            | EN ISO 12156-1               |
| Electrical Conductivity (Note 4)                             | 50                      | -          | pS/m               | IP 274/D 2624                |

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|---|------------|------------|--------------|--------------------|
| Fatty acid methyl ester (FAME) Content (Note 5) | -          | 7          | % (v/v)      | EN 14078           |
| DISTILLATION:                                   |            |            |              | EN ISO 3405        |
| % v/v Recovered at 250°C                        | -          | < 65       | % v/v        |                    |
| % v/v Recovered at 350°C                        | 85         | -          | % v/v        |                    |
| 95% v/v Recovered at                            | -          | 360        | °C           |                    |
| Polycyclic aromatic hydrocarbons                | -          | 11         | % m/m        | EN 12916           |

1. The Summer and Winter specifications refer to products available ex Refinery jetty and loading rack in the following periods:

Summer Grade: 16 March – 15 October inclusive

Winter Grade: 16 October - 15 March inclusive

2. MDFI Additive may be used to meet the specified CFPP.
3. FAME shall meet the requirements of EN 14214.
4. This specification meets or exceeds EN590:2009.