

C16.23-2 COMMERCIAL MARINE GAS OIL MINIMUM SPECIFICATION REQUIREMENTS (DESC JAN 2001)

Offered product shall conform to the following requirements that define a fuel suitable for Marine Gas Turbine engines.

| <u>TEST</u> | <u>METHOD</u> | <u>REQUIREMENTS</u> |
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| 1. Cetane Number or Cetane Index | ASTM D 613 ASTM D 976 | 42 min 43 min |

NOTE: The cetane index requirement shall apply to the base fuel without cetane improving additives, and the value shall be reported as the cetane index.

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| 2. Appearance @ 21°C or ambient temp. (whichever higher) or Water & Sediment | Visual ASTM D 2709 | Clear & Bright 0.05 vol. % max. |
| 3. Distillation, 90% point | ASTM D 86 | 357°C max. |
| 4. Flash Point | ASTM D 93 | 60°C min |

NOTE: The flash point value is absolute and no value less than 60°C is permissible.

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| 5. Cloud Point | ASTM D 2500 | -1.1°C (30°F) max. |
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NOTE: Cloud Point results will be evaluated based upon bunkering location.

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| 6. Viscosity @ 40°C | ASTM D 445 | 1.7 - 4.5 cSt |
| 7. Color | ASTM D 1500 | 3 max. |

NOTE FOR DOMESTIC ITEMS: This Color test requirement is deleted if red dye has been added in compliance with U.S. Environmental Protection Agency or Internal Revenue Service regulations; however, the resulting fuel/dye blend must have a red tint. It shall not be visually brown or darker in appearance.

NOTE FOR OVERSEAS ITEMS: Suppliers must submit information on the composition, color, and desired concentration of any dye to be used in order to obtain approval.

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| 8. Density @ 15°C | ASTM D 1298 | 876 kg/m ³ max. |
| 9. Carbon Residue on 10% bottoms | ASTM D 524 ASTM D 189 | 0.35 mass % max. |
| 10. Ash | ASTM D 482 | 0.01 mass % max. |
| 11. Sulfur | ASTM D 4294, ASTM D 1552, or ASTM D 2622 | 1.0 mass % max. |
| 12. Corrosion | ASTM D 130 | 3 max. |
| 13. Distillate Fuel (fuel shall contain no residual) | None | 100% |

(DESC 52.246-9FAQ)