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**PRODUCT SPECIFICATION: AUTOMOTIVE DIESEL OIL FOR SINGAPORE, 10 PPM SULFUR**

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| **(GASOIL 0.001% SGP) INSPECTION** | | **TEST METHOD** | **LIMITS** |
| **PHYSICAL** | |  | |
| 1 | Density @ 15°C, kg/L | ASTM D1298 (\*1) / D4052 | 0.82 to 0.845 |
| 2 | Colour, ASTM | ASTM D1500 | 2.0 max |
| 3 | Appearance @ 30°C | ASTM D4176 Procedure  1 | Pass |
| 4 | Lubricity HFRR, (WSD 1,4) @ 60°C, um  (\*2) | IP450 / ASTM D6079 | 460 max |
| **COMPOSITION** | |  | |
| 5 | Total Sulfur, ppm | ASTM D5453 | 10 max |
| 6 | Polycyclic Aromatic Hydrocarbon, %m/m | ASTM D6591 | 8.0 max |
| **CORROSION** | |  | |
| 7 | Corrosion, Copper (3h @ 100°C) | ASTM D130 | No. 1 max |
| 8 | Strong Acid Number, mg KOH/g | ASTM D664 | Nil |
| 9 | Total Acid Number, mg KOH/g | ASTM D664 | 0.25 max |
| **VOLATILITY** | |  | |
| 10 | Distillation:  Initial Boiling Point  10% Recovered, °C  50% Recovered, °C  95% Recovered, °C  Recovered @ 250 °C, %v/v  Recovered @ 350 °C, %v/v | ASTM D86 | To report  To report  To report  360.0 max  65 max  85 min |
| 11 | Flash Point, °C | ASTM D93 | 66 min |
| **COMBUSTION** | |  | |
| 12 | Ash, % m/m | ASTM D482 | 0.01 max |
| 13 | Microcarbon Residue on 10% Distillation Residue, % m/m | ASTM D4530 | 0.10 max |
| 14 | Cetane Index | ASTM D4737 | 49.0 min |
| 15 | Cetane Number (\*3) | ASTM D613 | 51.0 min |
| **FLUIDITY** | |  | |
| 16 | Pour Point, °C (\*4) | ASTM D97 /D5950 | 9 max |
| 17 | Kinematic Viscosity @ 40°C, cSt | ASTM D445 | 1.7 to 5.5 |
| **CONTAMINANTS** | |  | |
| 18 | Sediment by Extraction, % m/m | ASTM D473 | 0.01 max |
| 19 | Water Content, % v/v | ASTM D95 (\*1) / D6304 | 0.05 max |

Notes:

\*1 Referee method.

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**PRODUCT : UNLEADED PREMIUM MOTOR GASOLINE 95R - ULG95**

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| **For Singapore Market INSPECTION** | | **TEST METHOD** | **LIMITS** |
| 1 | Colour | Visual | Undyed |
| 2 | Corrosion, Copper (3h @ 50°C) | ASTM D130 | No.1 max |
| 3 | Density @ 15°C, kg/L | ASTM D1298 (\*1)/ D4052 | To report |
| 4 | Distillation:  IBP, °C  10% Evaporated, °C  50% Evaporated, °C  90% Evaporated, °C  Final Boiling Point, °C  Residue, % v/v  Loss, % v/v | ASTM D86 | To report  74.0 max  77.0 to 110.0  130.0 to 180.0  215.0 max  2.0 max  To report |
| 5 | Doctor Test | IP 30 | Negative (\*2) |
| 6 | Existent Gum, mg/100 Ml | ASTM D381 | 4 max |
| 7 | Induction Period, minutes | ASTM D525 | 240 min |
| 8 | Lead, mg/L | IP 224 | 5 max (\*3) |
| 9 | Octane Number:  RON  MON | ASTM D2699  ASTM D2700 | 95.0 min  83.0 min |
| 10 | Odour | - | Marketable |
| 11 | Phosphorous, mg/L | ASTM D3231 | 1.3 max (\*3) |
| 12 | Dry Vapor Pressure Equivalent, kPa or  Reid Vapour Pressure, kPa | ASTM D5191 (\*1) ASTM D323 | 70.0 max  70.0 max |
| 13 | Sulfur, ppm(wt) | ASTM D7039/ D5453 | 50 max |
| 14 | Vapour-Liquid Ratio of 20:1 (Estimated), oC | ASTM D4814 | 54.0 min |

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| **INSPECTION** | | **TEST METHOD** | **LIMITS** |
| 15 | Benzene Content, % v/v | ASTM D5580 | 3.5 max |
| 16 | MTBE, % v/v | (\*4) | 10 max |
| Additives:  The type and amount (based on active ingredient) to be shown on quality documents: | | | |
| 1 | Anti-oxidant:  Type  Active concentration, mg/L | -  - | To report 71 max |

**Notes** :

\*1 Referee method.

\*2 Alternatively: Mercaptan Sulfur, % mass = 0.0015 max by ASTM D3227 \*3 On undyed product.

\*4 Volume calculation or tested by ASTM D4815.