

Laboratory Vashi Quality Control Laboratory, Hindustan Petroleum Corporation Ltd., Vashi Terminal, D-99, TTC Industrial Area, MIDC Turbhe, Navi Mumbai, Maharashtra

Accreditation Standard IS:O/IEC 17025: 2005

Certificate Number TC-5246

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Validity 13.01.2017 to 12.01.2019

Last Amended on 12.01.2018

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
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CHEMICAL TESTING

I	PETROLEUM AND PRODUCTS			
1	MS	Appearance	HP/WI/16; Issue No: 01; Date of issue: 01.04.2016	Qualitative (Visual)
		Colour	HP/WI/16; Issue No: 01; Date of issue: 01.04.2016	Qualitative (Visual)
		Density / API Gravity by Hydrometer	IS: 1448 (Part:16) / ISO: 3675 / ASTM-D 1298-12b	650 kg/m ³ to 1000 kg/m ³
		Density / Relative Density by Densitometer	ISO 12185 / ASTM-D 4052- 15	650 kg/m ³ to 1000 kg/m ³
		Distillation Temperature -IBP -FBP -Recovery temperature Distillation Recovery/ Volume -Recovery volume	IS: 1448 (Part:18) / IP 123-01/ASTM-D 86-15	20 °C to 400 °C 0.1 ml to 100 ml
		Research Octane Number (RON)	IS: 1448 (Part:27) / ISO: 5164/ASTM 2699 15a	40 to 110
		Existent Gum (ROE)	IS: 1448 (Part:29) / ASTM- D 381-12	1 g/m ³ to 100 g/m ³
		Sulphur	IS: 1448 (Part:153) / ISO: 13032/ISO:20847/ ASTM-D4294-16 / ASTM-D7220-12	17 mg/kg to 100 mg/kg 101 mg/kg to 1000mg/kg 0.1% to 4.6 % by mass
		Lead Content	IP-352	0.002 g/l to 0.020 g/l

K. Soundira Pandian
Convenor

N. Venkateswaran
Program Director

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		Reid Vapor Pressure (RVP)	IS: 1448 (Part:39) / ASTM-D 323-15a /	1 kPa to 100 kPa
		Vapour Lock Index (VLI)	IS: 2796 ;Table-1 & 3,SI No.xi	500 to 1500
		Benzene Content	ASTM-D 3606 -10	0.1% to 5 % by Volume
		Aromatics Olefins	IS: 1448 (Part:23) / IP 156-08 / ASTM-D 1319-15	5.0 % to 99.0 % by volume 0.3 % to 55.0 % by volume
		Ethanol Content	IS: 2796-Annex E	Up to 20 % by Volume
		Oxidation Stability	IS: 1448 (Part:28) / IP 40-97 (04) / ASTM-D 525-12a	1minute to 500 minutes
		Copper Strip Corrosion	IS: 1448 (Part:15) / ISO:2106/ASTM-D 130-12	1 a to 4 c Rating
2	HSD	Appearance	HP/WI/16; Issue No: 01; Date of issue: 01.04.2016	Qualitative (Visual)
		Colour	HP/WI/16; Issue No: 01; Date of issue: 01.04.2016	Qualitative (Visual)
		Density / API Gravity by Hydrometer	IS: 1448 (Part:16) / ISO:3675/ ASTM-D 1298-12b	650 kg/m ³ to1000 kg/m ³
		Density / Relative Density by Densitometer	ISO:12185/ ASTM-D 4052- 15	650 kg/m ³ to1000 kg/m ³
		Sulphur	IS: 1448 (Part:153) / ISO:13032 /ISO:20847 / ASTM-D4294-16 / ASTM-D7220-12	17 mg/kg to 100 mg/kg 101 mg/kg to 1000mg/kg
		Copper Strip Corrosion	IS: 1448 (Part:15) / ISO:2106 /ASTM-D 130-12	1 a to 4 c Rating

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		Distillation Temperature -IBP -FBP -Recovery temperature Distillation Recovery/ Volume -Recovery volume	IS: 1448 (Part:18) / IP 123-01/ASTM-D 86-15	20 °C to 400 °C 0.1 ml to 100 ml
		Total Acidity	IS:1448(Part:2) -Method B	0.002 mg KOH/g to 0.20 mg KOH/g
		Inorganic Acidity	IS:1448(Part: 2)-Method C	Up to 0.05 mg KOH/g
		Ash	IS: 1448 (Part: 4) / ISO:6245/ASTM-D 482-13	0.001% to 1.0 % by mass
		Carbon Residue (MCRT)	ISO:10370 / ASTM-D 4530-15	0.01% to 20.0 % by mass
		Cetane Number	IS: 1448 (Par: 9) / ISO:5165 / ASTM-D 613-15ae1	20 to 90
		Cetane Index	ISO:4264-07 / ASTM-D 4737-10	20 to 90
		Flash Point, PMCC	IS: 1448 (Part:21) / IP 34-03 / ASTM-D 93-15 a	40 °C to 360 °C
		Flash Point, Abel	IS: 1448 Part :20) / IP 170-09	-10 °C to 70.0 °C
		Pour Point	IS: 1448 (Part:10) -Sec 2 / ASTM-D 97-16	-36 °C to +51 °C
		Viscosity Kinematic at 40 °C	IS: 1448 (Part: 25) / ISO:3104/ ASTM-D 445-15a	0.5 cSt to 4.0 cSt 4.0 cSt to 10.0 cSt
		Sediment	IS: 1448 (Part:30)	0.01 % to 0.50 % by mass
		Total Contamination	IP 440 / EN 12662	0.1 mg/kg to 100 mg/kg

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Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Water Content by Dean & Stark	IS: 1448 (Part:40) / ISO:3733 / ASTM-D 95-13e1	Up to 25 % by volume
		Water Content by Karl Fischer Titrator	IP438-01/ ISO: 6296	10 mg/kg to 1000 mg/kg
		Cold Filter Plugging Point (CFPP)	IS: 1448 (Part:110) / EN 16329 / ASTM-D 6371-05	-38 °C to 50 °C
		Lubricity (HFRR), WSD	ISO:12156-1 / ASTM-D 6079 – 11	50 microns to 600 microns
		Oxygen Content	Annex B of IS: 1460	0.1% to 1% by mass
		Polycyclic Aromatic Hydrocarbon (PAH)	IP 391-07 / EN 12916 / ASTM-D 6591 – 11	Up to 20% by mass
		Oxidation Stability	ISO:12205 / ASTM-D 2274-14	1 g/m ³ to 50 g/m ³
3	SKO	Appearance	HP/WI/16; Issue No: 01; Date of issue: 01.04.2016	Qualitative (Visual)
		Colour	HP/WI/16; Issue No:01; Date of issue: 01.04.2016	Qualitative (Visual)
		Density / API Gravity by Hydrometer	IS: 1448 (Part:16) / ISO:3675/ ASTM-D 1298-12b	650 kg/m ³ to 1000 kg/m ³
		Density / Relative Density by Densitometer	ISO:12185/ ASTM-D 4052– 15	650 kg/m ³ to 1000 kg/m ³
		Distillation Temperature -IBP -FBP -Recovery temperature Distillation Recovery/ Volume -Recovery volume	IS: 1448 (Part:18) / IP 123-01/ ASTM-D 86-15	20 °C to 400 °C 0.1 ml to 100 ml

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Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Sulphur	IS: 1448 (Part:153) / ISO:13032/ ISO:20847/ ASTM-D4294-16 / ASTM-D7220-12	17 mg/kg to 100 mg/kg 101 mg/kg to 1000mg/kg 0.1% to 4.6 % by mass
		Copper Strip Corrosion	IS: 1448 (Part :15) / ISO:2106 /ASTM-D 130-12	1 a to 4 c Rating
		Inorganic Acidity	IS:1448(Part:2)-Method C	Up to 0.05 mg KOH/g
		Flash Point (Abel)	IS: 1448 (Part:20) / IP 170-09	-10 °C to 70.0 °C
		Colour (Saybolt)	IS 1448 (Part:14) / ASTM-D 156-15	-16 to +30
		Smoke Point	IS 1448 (Part:31) / ASTM-D 1322-15e1	10 mm to 50 mm
4.	FO	Appearance	HP/WI/16; Issue No:01; Date of issue: 01.04.2016	Qualitative (Visual)
		Density / API Gravity by Hydrometer	IS: 1448 (Part:16) / ISO:3675/ ASTM-D 1298-12b	650 kg/m ³ to1000 kg/m ³
		Density / Relative Density by Densitometer	ISO:12185 / ASTM-D 4052- 15	650 kg/m ³ to1000 kg/m ³
		Relative Density at 15°C	IS 1448 (Part:32)	0.650 kg/m ³ to 1.000 kg/m ³
		Inorganic Acidity	IS:1448 (Part:2)-Method C	Up to 0.05 mg KOH/g
		Ash	IS: 1448 (Part:4)/ ISO: 6245/ ASTM-D 482-13	0.001% to 1.0 % by mass
		Flash Point (PMCC)	IS: 1448 (Part:21) / IP 34-03 /ASTM-D 93-15 a	40 °C to 360 °C
		Pour Point	IS: 1448 (Part:10)-Sec 2 / ASTM-D 97-1/ ASTM-D 445-15a	-36 °C to +51 °C

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Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Viscosity Kinematic at 50 °C	IS: 1448 (Part :25)/ ISO: 3104/ ASTM-D 445-15a	10.0 cSt to 500 cSt
		Sediment	IS:1448 (Part: 30)	0.01 % to 0.50 % by mass
		Sulphur	IS:1448 (Part:153) / ISO: 13032 /ISO: 20847/ ASTM-D4294-16 / ASTM-D7220-12	0.1% to 4.6 % by mass
		Water Content by Dean & Stark	IS: 1448 (Part:40) / ISO: 3733/ ASTM-D 95-13e1	Up to 25 % by volume
		Gross Calorific Value	IS: 1448 (Part:7)	10000 cal/g to 15,000 cal/g
		Aluminium as Al	IP 501/ASTM-D4951	5 mg/kg to 150 mg/kg
		Silicon as Si		5 mg/kg to 250 mg/kg
		Vanadium as V		1 mg/kg to 400 mg/kg
		Sodium as Na		1 mg/kg to 5000 mg/kg
		Calcium as Ca		3 mg/kg to 2000 mg/kg
		Zinc as Zn		1 mg/kg to 14000 mg/kg
		Phosphorus as P		1 mg/kg to 60 mg/kg
		Boron as B		1 mg/kg to 5000 mg/kg
		Copper as Cu		1 mg/kg to 5000 mg/kg
		Molybdenum as Mo		1 mg/kg to 5000 mg/kg
		Magnesium as Mg		1 mg/kg to 5000 mg/kg
		Barium as Ba		1 mg/kg to 5000 mg/kg
5	LDO	Appearance	HP/WI/16; Issue No: 01; Date of issue: 01.04.2016	Qualitative (Visual)
		Density / API Gravity by Hydrometer	IS: 1448 (Part:16) / ISO: 3675/ ASTM-D 1298-12b	650 kg/m ³ to 1000 kg/m ³

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		Density / Relative Density by Densitometer	ISO: 12185/ ASTM-D 4052- 15	650 kg/m ³ to 1000 kg/m ³
		Relative Density at 15°C	IS 1448 (Part:32)	0.650 kg/m ³ to 1.000 kg/m ³
		Sulphur	IS: 1448 (Part:153) / ISO: 13032 / ISO: 20847/ ASTM-D4294-16 / ASTM-D7220-12	17 mg/kg to 100 mg/kg 101 mg/kg to 1000mg/kg 0.1% to 4.6 % by mass
		Copper Strip Corrosion	IS: 1448 (Part:15) / ISO: 2106 / ASTM-D 130-12	1 a to 4 c Rating
		Inorganic Acidity	IS:1448 (Part:2) -Method C	Up to 0.05 mg KOH/g
		Ash	IS: 1448 (Part:4) / ISO: 6245 / ASTM-D 482-13	0.001% to 1.0 % by mass
		Carbon Residue (MCRT)	ISO: 10370 / ASTM-D 4530-15	0.01% to 20.0 % by mass
		Flash Point (PMCC)	IS: 1448 (Part:21) / IP 34-03 /ASTM-D 93-15 a	40 °C to 360 °C
		Pour Point	IS: 1448 (Part:10) -Sec 2 / ASTM-D 97-16	-36 °C to +51 °C
		Viscosity Kinematic at 40 °C	IS: 1448 (Part:25)/ ISO: 3104/ ASTM-D 445-15a	0.5 cSt to 4.0 cSt 4.0 cSt to 10.0 cSt
		Sediment	IS: 1448 (Part:30) /	0.01 % to 0.50 % by mass
		Water Content by Dean & Stark	IS: 1448 (Part:40) / ISO: 3733 / ASTM-D 95-13e1	Up to 25 % by volume
6	ETHANOL	Appearance	HP/WI/16; Issue No: 01; Date of issue: 01.04.2016	Qualitative (Visual)

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		Density / Relative Density by Densitometer	ISO: 12185/ ASTM-D 4052- 15	650 kg/m ³ to1000 kg/m ³
		Relative Density at 15°C	IS 1448 (Part:32)	0.650 kg/m ³ to 1.000 kg/m ³
		Ethanol Content at 15.6 °C	IS:15464- Annex B / IS:2302	1 % to 100 %
		Miscibility with Water	IS:15464-Annex C	Qualitative Test
7	NAPHTHA	Research Octane Number (RON)	IS: 1448 (Part:27) / ISO:5164/ ASTM 2699 15a	40 to 110
8	BIODIESEL	Appearance	HP/WI/16; Issue No: 01; Date of issue: 01.04.2016	Qualitative (Visual)
		Colour	HP/WI/16; Issue No: 01; Date of issue: 01.04.2016	Qualitative (Visual)
		Density / API Gravity by Hydrometer	IS: 448 (Part:16) / ISO: 3675 / ASTM-D 1298-12b	650 kg/m ³ to1000 kg/m ³
		Density / Relative Density by Densitometer	ISO: 12185/ ASTM-D 4052- 15	650 kg/m ³ to1000 kg/m ³
		Sulphur	IS: 1448 (Part:153) / ISO: 13032/ISO:20847/ ASTM-D4294-16 / ASTM-D7220-12	17 mg/kg to 100 mg/kg 101 mg/kg to 1000mg/kg
		Copper Strip Corrosion	IS: 1448 (Part:15) / ISO:2106/ASTM-D 130-12	1 a to 4 c Rating
		Acid Value	IS: 1448 (Part:1)- Sec 1	0.001 mg KOH/g to 5.0 mg KOH/g
		Cetane Number	IS: 1448 (Part:9) / ISO:5165 / ASTM-D 613-15ae1	20 to 90

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		Carbon Residue (MCRT)	ISO:10370 / ASTM-D 4530-15	0.01% to 20.0 % by mass
		Flash Point, PMCC	IS: 1448 (Part :21)/ IP 34-03 /ASTM-D 93-15 a	40 °C to 360 °C
		Viscosity Kinematic at 40 °C	IS: 1448 (Part:25)/ ISO:3104/ ASTM-D 445-15a	0.5 cSt to 4.0 cSt 4.0 cSt to 10.0 cSt
		Water Content by Dean & Stark	IS: 1448 (Part: 40) / ISO: 3733/ ASTM-D 95-13e1	Up to 25 % by volume
		Water Content by Karl Fischer Titrator	IP438-01/ISO: 6296	10 mg/kg to 1000 mg/kg
		Cold Filter Plugging Point (CFPP)	IS: 1448 (Part:110) / EN 16329 / ASTM-D 6371-05	-38 °C to 50 °C
		Sulfated ash	IS:1448 (Part:4) -Sec1/ ISO: 6245	0.0001 % to 0.5 % by mass
		Methanol	EN: 14110	Up to 0.5 % by mass
		Ester content	EN:14103	90 % to 100 % by mass
		Monoglyceride content	D 6584-13e1 /EN14105	0.05 % to 1.0 % by mass
		Diglyceride content	D 6584-13e1 /EN14105	0.05 % to 0.5 % by mass
		Triglyceride content	D 6584-13e1 /EN14105	0.05 % to 0.5 % by mass
		Free Glycerol	D 6584-13e1 /EN14105	0.005% to 0.05 %by mass
		Total Glycerol	D 6584-13e1 /EN14105	0.05 % to 0.5 % by mass
		Phosphorous	D 6584-13e1 /EN14105	1 mg/kg to 10 mg/kg
		Sodium and Potassium	EN 14538	1 mg/kg to 10 mg/kg
		Calcium and Magnesium	EN 14538	1 mg/kg to 10 mg/kg
		Iodine value	EN 14111	1g of I ₂ /100ml to 200 g of I ₂ /100ml

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		Oxidation stability at 110°C	EN 14112 EN15751	0.1 hr to 60 hrs
		Linolenic acid- methyl ester	EN 14103	1 % to 15 % by mass
		Polyunsaturated- methyl esters (≥ 4 double bonds)	EN 15779	0.6 % to 1.5 % by mass
II	LUBRICANTS			
1	LUBE OIL	Aluminium as Al	IP 501 / ASTM-D4951	5 mg/kg to 150 mg/kg
		Silicon as Si		5 mg/kg to 250 mg/kg
		Vanadium as V		1 mg/kg to 400 mg/kg
		Sodium as Na		1 mg/kg to 5000 mg/kg
		Calcium as Ca		3 mg/kg to 2000 mg/kg
		Zinc as Zn		1 mg/kg to 14000 mg/kg
		Phosphorus as P		1 mg/kg to 60 mg/kg
		Boron as B		1 mg/kg to 5000 mg/kg
		Copper as Cu		1 mg/kg to 5000 mg/kg
		Molybdenum as Mo		1 mg/kg to 5000 mg/kg
		Magnesium as Mg		1 mg/kg to 5000 mg/kg
		Barium as Ba		1 mg/kg to 5000 mg/kg