

Laboratory Mumbai Refinery Laboratory, Hindustan Petroleum Corporation Ltd.,
B.D. Patil Marg, Mahul, Mumbai, Maharashtra

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number T- 1874 **Issue Date** 08.12.2016

Discipline Chemical Testing **Valid Until** 07.12.2018

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S. No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are Performed	Range of Testing / Limits of Detection
I.	PETROLEUM AND PRODUCTS			
1.	FGH	Benzene	ASTM D 4367-02 (2012)	0.005 % by volume to 1.0 % by volume
		Colour, Saybolt	IS 1448 P:14- 1960 (RA 2013) ASTM D 6045-12, ASTM D 156-15	0 to +30 unit
		Copper Strip Corrosion	IS 1448 P:15-2004 (RA 2011), IP 154-13, ASTM D 130-12	1 a to 4 c Rating
		Density by Digital Density Meter	IP 365-1997(04), ASTM D 4052-15	650.0 kg/m ³ to 1020.0 kg/m ³
		Density, API Gravity by Hydrometer	IS 1448 P:16- 16, IP 160-99 ASTM D 1298-12b	650.0 kg/m ³ to 1020.0 kg/m ³
		Distillation Temperature (IBP, FBP, Recovery temperature)	IS 1448 P:18-1991 (RA 2011), IP 123-11(14), ASTM D 86-15	30 °C to 400 °C
		Volume (Recovery volume)		0.1 ml to 100 ml
		Doctor Test	IS 1448 P:19-2015, IP 30-07914), ASTM D4952-12	Qualitative (Positive / Negative)
		Non-volatile Matter	Annex E of IS 3470:1966	0 to 0.0005 g/100ml
		Refractive Index at 20 °C	ASTM D 1218-12	1.3300 to 1.6000
		Sulphur	ASTM D2622-16	3 mg/Kg to 1000 mg/Kg

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S. No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are Performed	Range of Testing / Limits of Detection
2.	SOL14/25	Appearance	Visual	Qualitative
		Colour, Saybolt	IS 1448 P:14- 1960 (RA 2013) , ASTM D 6045-12, ASTM D 156-15	0 to +30 unit
		Copper Strip Corrosion	IS 1448 P:15-2004 (RA 2011), IP 154-13, ASTM D 130-12	1 a to 4 c Rating
		Density by Digital Density Meter	IP 365-1997(04), ASTM D 4052-15	650.0 kg/m ³ to 1020.0 kg/m ³
		Density, API Gravity by Hydrometer	IS 1448 P:16- 16, IP 160-99 ASTM D 1298-12b	650.0 kg/m ³ to 1020.0 kg/m ³
		Distillation Temperature (IBP, FBP, Recovery temperature)	IS 1448 P:18-1991 (RA 2011), IP 123-11(14), ASTM D 86-15	30 °C to 400 °C
		Volume (Recovery volume)		0.1 ml to 100 ml
		Doctor Test	IS 1448 P:19-2015, IP 30-07914), ASTM D4952-12	Qualitative (Positive / Negative)
		Existent Gum (ROE)	IS 1448 P:29-2004 (RA 2011), IP 131-99,ASTM D 381-12	1 g/m ³ to 50 g/m ³
		Hydrocarbon type by GC	ASTM D6839-16	0.05 % by volume to 95 % by volume
		Sulphur, Mercaptan	IS 1448 P:109-2004 (RA 2011), IP 342-2000(14), ASTM D 3227-13	0.0003 % by weight to 0.0050 % by weight

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S. No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are Performed	Range of Testing / Limits of Detection
	SOL14/25	Sulphur by WD-XRF	ASTM D2622-16	3 mg/Kg to 1000 mg/Kg
3.	NAPHTHA	Aromatics	IS 1448 P:23-2004 (RA 2011), IP 156-08, ASTM D 1319-15	5.0 % by volume to 45.0 % by volume
		Olefins		0.3 % by volume to 30.0 % by volume
		Calorific Value- Gross & Net (calculated)	IS 1448 P:7-2004 (RA 2011)	9,000 cal/gm to 12,000 cal/gm
		Colour ,Saybolt	IS 1448 P:14- 1960 (RA 2013) , ASTM D 6045-12, ASTM D 156-15	0 to +30 unit
		Density by Digital Density Meter	IP 365-1997(04), ASTM D 4052-15	650.0 kg/m ³ to 1020.0 kg/m ³
		Density, API Gravity by Hydrometer	IS 1448 P:16- 16, IP 160-99 ASTM D 1298-12b	650.0 kg/m ³ to 1020.0 kg/m ³
		Distillation		
		Temperature (IBP, FBP, Recovery temperature)	IS 1448 P:18-1991 (RA 2011), IP 123-11(14), ASTM D 86-15	30 °C to 400 °C
		Volume (Recovery volume)		0.1 to 100 ml
		Existent Gum (ROE)	IS 1448 P:29-2004 (RA 2011), IP 131-99,ASTM D 381-12	1 g/m ³ to 50 g/m ³
		Hydrocarbon type by GC	ASTM D6839-16	0.05 % by volume to 95 % by volume

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S. No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are Performed	Range of Testing / Limits of Detection
	NAPHTHA	Sulphur by ED-XRF	ISO 20847-04, ASTM D4294-16e1	0.003 % by weight to 5.0 % by weight
		Trace Oxygenates	UOP 960-06, ASTM D 7423-16e1	0.1 mg/kg to 100 mg/kg
		Vapor Pressure, Reid	IS 1448 P:39- 2012, IP 69-01 (15), ASTM D 323-15a	1 kPa to 100 kPa
4.	MS	Aromatics	IS 1448 P:23-2004 (RA 2011), IP 156-08, ASTM D 1319-15	5.0 % by volume to 45.0 % by volume
		Olefins		0.3 % by volume to 30.0 % by volume
		Benzene	ASTM D 5580-15	0.1 % by volume to 5 % by volume
		Colour	Visual	Qualitative
		Copper Strip Corrosion	IS 1448 P:15-2004 (RA 2011), IP 154-13, ASTM D 130-12	1 a to 4 c Rating
		Density by Digital Density Meter	IP 365-1997(04), ASTM D 4052-15	650.0 kg/m ³ to 1020.0 kg/m ³
		Density, API Gravity by Hydrometer	IS 1448 P:16- 16, IP 160-99 ASTM D 1298-12b	650.0 kg/m ³ to 1020.0 kg/m ³
		Distillation Temperature (IBP, FBP, Recovery temperature) Volume (Recovery volume)	IS 1448 P:18-1991 (RA 2011), IP 123-11(14), ASTM D 86-15	30 °C to 400 °C 0.1 ml to 100 ml

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	MS	Existent Gum (ROE)	IS 1448 P:29-2004 (RA 2011), IP 131-99,ASTM D 381-12	1 g/m ³ to 50 g/m ³
		Lead by XRF	IP 352-07	0.002 g/lit to 0.020 g/lit
		MON	IS 1448 P:26-2013, IP 236-14, ASTM D 2700-16	70 to 100
		Oxidation Stability	P:28-2008 (RA 2013), IP 40-97(14), ASTM D 525-12a	1 minute to 400 minutes
		RON	IS 1448 P:27-2013, IP 237-14, ASTM D 2699- 15a	80 to 100
		Sulphur by ED-XRF	ISO 20847-04, ASTM D4294-16e1	0.003 % by weight to 5.0 % by weight
		Sulphur by WD-XRF	ASTM D2622-16	3 mg/Kg to 1000 mg/Kg
		Vapor Pressure, Reid	IS 1448 P:39- 2012, IP 69-01 (15), ASTM D 323-15a	1 kPa to 100 kPa
		VLI, calculated	IS 2796: 2008,Table-1, SI No.xiii	500 to 1050
5.	ATF	Acidity, Total	IS 1448 P:113- 1983 (RA 2011), IP 354-09, ASTM D 3242-11	0.001 mg KOH/g to 0.020 mg KOH/g
		Appearance	Visual	Qualitative
		Aromatics	IS 1448 P:23-2004 (RA 2011), IP 156-08, ASTM D 1319-15	5.0 % by volume to 45.0 % by volume
		Olefins		0.3 % by volume to 30.0 % by volume

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	ATF	Saybolt Colour	IS 1448 P:14- 1960 (RA 2013), ASTM D 6045-12, ASTM D 156-15	0 to +30 unit
		Copper Strip Corrosion	IS 1448 P:15-2004 (RA 2011), IP 154-13, ASTM D 130-12	1 a to 4 c Rating
		Density by Digital Density Meter	IP 365-1997(04), ASTM D 4052-15	650.0 kg/m ³ to 1020.0 kg/m ³
		Density, API Gravity by Hydrometer	IS 1448 P:16- 16, IP 160-99 ASTM D 1298-12b	650.0 kg/m ³ to 1020.0 kg/m ³
		Distillation Temperature (IBP, FBP, Recovery temperature)	IS 1448 P:18-1991 (RA 2011), IP 123-11(14), ASTM D 86-15	30 °C to 400 °C
		Volume (Recovery volume)		0.1 ml to 100 ml
		Electrical Conductivity	IS 1448 P:148-2002(RA 2013), IP 274-09, ASTM D 2624-15	1 pS/m to 1000 pS/m
		Existent Gum (ROE)	IS 1448 P:29-2004 (RA 2011), IP 131-99,ASTM D 381-12	1 g/m ³ to 50 g/m ³
		Flash Point, Abel	IS 1448 P:20-1998 (RA 2013), IP 170-14	25.0 °C to 65.0 °C
		Freezing Point	IS 1448 P:11-2004 (RA 2011), IP 16-15, ASTM D 2386-15e1	- 70 °C to -30 °C
		Freezing Point	ASTM D 5972-15	-60.0 °C to -42.0 °C

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	ATF	Lubricity, WSD (BOCLE)	ASTM D 5001-10 (2014)	0.50 mm to 0.90 mm
		Micro Separometer Rating (MSEP)	IS 1448 P:142-1993 (RA 2011), ASTM D 3948-14	60 Scale to 100 Scale
		Naphthalene Content	IS 1448 P:118-1985(RA 2013), ASTM D 1840-07(2013)	0 to 4.00 % by volume
		Smoke Point	IS 1448 P:31-1968 (RA 2013), IP 57-95(13), ASTM D 1322-15e1	10.0 mm to 30.0 mm
		Particulate Contamination	IP 423-10, ASTM D 5452-12	0.00 to 2.00 mg/lit
		Particulate, cumulative channel particle counts	IP 564-13	Qualitative
		Silver Strip corrosion at 50 °C	IP 227-99	0 to 4 Rating
		Specific Energy	ASTM D 3338-09 (2014)e2	40 MJ/Kg to 50 MJ/Kg
		Sulphur, Mercaptan,	IS 1448 P:109-2004 (RA 2011), IP 342-2000(14), ASTM D 3227-13	0.0003 % by weight to 0.0050 % by weight
		Sulphur by ED-XRF	ISO 20847-04, ASTM D4294-16e1	0.003 % by weight to 5.0 % by weight
		Thermal Stability, JFTOT, Visual Rating	IS 1448 P:97-2015, IP 323-14, ASTM D 3241-15e2	0 to 4 Rating
		Pressure difference		0 to 25 mm
		Viscosity Kinematic at - 20 ⁰ C	IS 1448 P:25-1976 (RA 2013), ASTM D 445-15a	2.0 to 8.0

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	ATF	Water Reaction	IS 1448 P:42-2015, IP 289-06, ASTM D 1094-07 (2013)	1 to 4
6.	SKO	Acidity, Inorganic	IS 1448 P:2-2003 Section 8 Method C	0 to 0.05 mg KOH/g
		Saybolt Colour	IS 1448 P:14- 1960 (RA 2013) , ASTM D 6045-12, ASTM D 156-15	0 to +30 unit
		Colour	Visual	Qualitative
		Copper Strip Corrosion	IS 1448 P:15-2004 (RA 2011), IP 154-13, ASTM D 130-12	1 a to 4 c Rating
		Density by Digital Density Meter	IP 365-1997(04), ASTM D 4052-15	650.0 kg/m ³ to 1020.0 kg/m ³
		Density, API Gravity by Hydrometer	IS 1448 P:16- 16, IP 160-99 ASTM D 1298-12b	650.0 kg/m ³ to 1020.0 kg/m ³
		Distillation Temperature (IBP, FBP, Recovery temperature)	IS 1448 P:18-1991 (RA 2011), IP 123-11(14), ASTM D 86-15	30 °C to 400 °C
		Volume (Recovery volume)		0.1 ml to 100 ml
		Flash Point, Abel	IS 1448 P:20-1998 (RA 2013), IP 170-14	25.0 °C to 65.0 °C

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	SKO	Smoke Point	IS 1448 P:31-1968 (RA 2013), IP 57-95(13), ASTM D 1322-15e1	10.0 mm to 30.0 mm
		Sulphur by ED-XRF	ISO 20847-04, ASTM D4294-16e1	0.003 % by weight to 5.0 % by weight
7.	MTO	Appearance	Visual	Qualitative
		Aromatics	IS 1448 P:23-2004 (RA 2011), IP 156-08, ASTM D 1319-15	5.0 % by volume to 45.0 % by volume
		Olefins		0.3 % by volume to 30.0 % by volume
		Saybolt Colour	IS 1448 P:14- 1960 (RA 2013), ASTM D 6045-12, ASTM D 156-15	0 to +30 unit
		Copper Strip Corrosion	IS 1448 P:15-2004 (RA 2011), IP 154-13, ASTM D 130-12	1 a to 4 c Rating
		Density by Digital Density Meter	IP 365-1997(04), ASTM D 4052-15	650.0 kg/m ³ to 1020.0 kg/m ³
		Density, API Gravity by Hydrometer	IS 1448 P:16- 16, IP 160-99 ASTM D 1298-12b	650.0 kg/m ³ to 1020.0 kg/m ³
		Distillation Temperature (IBP, FBP, Recovery temperature)	IS 1448 P:18-1991 (RA 2011), IP 123-11(14), ASTM D 86-15	30 °C to 400 °C
		Volume (Recovery volume)		0.1 ml to 100 ml

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	MTO	Existent Gum (ROE)	IS 1448 P:29-2004 (RA 2011), IP 131-99,ASTM D 381-12	1 g/m ³ to 50 g/m ³
		Flash Point, Abel	IS 1448 P:20-1998 (RA 2013), IP 170-14	25.0 °C to 65.0 °C
		Sulphur, Mercaptan,	IS 1448 P:109-2004 (RA 2011), IP 342-2000(14), ASTM D 3227-13	0.0003 % by weight to 0.0050 % by weight
		Sulphur by ED-XRF	ISO 20847-04, ASTM D4294-16e1	0.003 % by weight to 5.0 % by weight
8.	HSD	Acidity, Inorganic	IS 1448 P:2-2003 Section 8 Method C	0 to 0.05 mg KOH/g
		Acidity, Total	IS 1448 P:2-2007 (RA 2013) Section 9	0.002 mg KOH/g to 0.20 mg KOH/g
		Ash	IS 1448 P:4-2008 (RA 2013), IP 4-05(12), ASTM D 482-13	0.001 % by weight to 0.18 % by weight
		Carbon Residue, Ramsbottom	IS 1448 P:8-2012, IP 14-94(04), ASTM D 524-15	0.01 % by weight to 20.0 % by weight
		Colour, ASTM	IS 1448 P:12- 2013, IP 196-97 (11), ASTM D 1500-12	0 to 8.0
		Cetane Index	IP 380-14, ASTM D 4737-10	32.5 to 65
		Cetane Number	IS 1448 P:9- 2013, ASTM D 613-15ae1	40.0 to 65.0

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	HSD	CFPP	IS 1448 P:110- 1981 (RA 2013), IP 309-99 (14), ASTM D 6371-05 (2010)	-20 °C to +30 °C
		Copper Strip Corrosion	IS 1448 P:15-2004 (RA 2011), IP 154-13, ASTM D 130-12	1 a to 4 c Rating
		Density by Digital Density Meter	IP 365-1997(04), ASTM D 4052-15	650.0 kg/m ³ to 1020.0 kg/m ³
		Density, API Gravity by Hydrometer	IS 1448 P:16- 16, IP 160-99 ASTM D 1298-12b	650.0 kg/m ³ to 1020.0 kg/m ³
		Distillation Temperature (IBP, FBP, Recovery temperature)	IS 1448 P:18-1991 (RA 2011), IP 123-11(14), ASTM D 86-15	30 °C to 400 °C
		Volume (Recovery volume)		0.1 ml to 100 ml
		Flash Point, Abel	IS 1448 P:20-1998 (RA 2013), IP 170-14	25.0 °C to 65.0 °C
		Flash Point, PMCC	IS 1448 P:21-2012, IP 34-03, ASTM D 93-15a	40 °C to 150 °C
		Lubricity (HFRR), WSD	IP 450-2000, ISO 12156 ASTM D 6079-11	200 microns to 600 microns
		PAH	IP 391-07	0 to 15.0 % by weight
		Pour Point	IS 1448P:10-2013 (RA 2013), IP 15-95 (14), ASTM D 97-16	- 21 °C to + 47 °C

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	HSD	Sulphur by ED-XRF	ISO 20847-04, ASTM D4294-16e1	0.003 % by weight to 5.0 % by weight
		Sulphur by WD-XRF	ASTM D2622-16	3 mg/Kg to 1000 mg/Kg
		Viscosity Kinematic at 40 ⁰ C	IS 1448 P:25-1976(RA 2013), ASTM D 445-15a	1.0 cSt to 600 cSt
		Water Content by Dean & Stark	IS 1448 P:40-2015, IP 74-2000, ASTM D 95-13e1	0 to 2.0 % by volume
		Water Content by coulometric	IP 438-01(13)	30 mg/Kg to 500 mg/Kg
9.	LDO	Acidity, Inorganic	IS 1448 P:2-2003 Section 8 Method C	0 to 0.05 mg KOH/g
		Ash	IS 1448 P:4-2008 (RA 2013), IP 4-05(12), ASTM D 482-13	0.001 % by weight to 0.18 % by weight
		Carbon Residue, Ramsbottom	IS 1448 P:8-2012, IP 14-94(04), ASTM D 524-15	0.01 % by weight to 20.0 % by weight
		Copper Strip Corrosion	IS 1448 P:15-2004 (RA 2011), IP 154-13, ASTM D 130-12	1 a to 4 c Rating
		Density by Digital Density Meter	IP 365-1997(04), ASTM D 4052-15	650.0 kg/m ³ to 1020.0 kg/m ³
		Density, API Gravity by Hydrometer	IS 1448 P:16- 16, IP 160-99 ASTM D 1298-12b	650.0 kg/m ³ to 1020.0 kg/m ³
		Flash Point, PMCC	IS 1448 P:21-2012, IP 34-03, ASTM D 93-15a	40 ⁰ C to 150 ⁰ C

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	LDO	Pour Point	IS 1448P:10-2013 (RA 2013), IP 15-95 (14), ASTM D 97-16	- 21 °C to + 47 °C
		Sediments by Extraction	IS 1448 P:30-2013, IP 53-2000 (14) ASTM D 473-07 (2012)e1	0.01 % by mass to 0.40 % by mass
		Sulphur by ED-XRF	ISO 20847-04, ASTM D4294-16e1	0.003 % by weight to 5.0 % by weight
		Viscosity Kinematic at 40°C	IS 1448 P:25-1976(RA 2013), ASTM D 445-15a	1.0 cSt to 600 cSt
		Water Content by Dean & Stark	IS 1448 P:40-2015, IP 74-2000, ASTM D 95-13e1	0 to 2.0 % by volume
10.	FO	Acidity, Inorganic	IS 1448 P:2-2003 Section 8 Method C	0 to 0.05 mg KOH/g
		Ash	IS 1448 P:4-2008 (RA 2013), IP 4-05(12), ASTM D 482-13	0.001 % by weight to 0.18 % by weight
		Calorific Value, Gross & Net (calculated)	IS 1448 P:7-2004 (RA 2011)	9,000 cal/gm to 12,000 cal/gm
		Carbon Residue, Micro method	IP 398-15, ASTM D 4530-15	0.10 % by weight to 20.0 % by weight
		Carbon Residue, Ramsbottom	IS 1448 P:8-2012, IP 14-94(04), ASTM D 524-15	0.01 % by weight to 20.0 % by weight
		Density by Digital Density Meter	IP 365-1997(04), ASTM D 4052-15	650.0 kg/m ³ to 1020.0 kg/m ³
		Density, API Gravity by Hydrometer	IS 1448 P:16- 16, IP 160-99 ASTM D 1298-12b	650.0 kg/m ³ to 1020.0 kg/m ³

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	FO	Flash Point, PMCC	IS 1448 P:21-2012, IP 34-03, ASTM D 93-15a	40 °C to 150 °C
		Pour Point	IS 1448P:10-2013 (RA 2013), IP 15-95 (14), ASTM D 97-16	- 21 °C to + 47 °C
		Sediments by Extraction	IS 1448 P:30-2013, IP 53-2000 (14) ASTM D 473-07 (2012)e1	0.01 % by mass to 0.40 % by mass
		Potential Sediment in Residual Fuels	IP 375-11, ASTM D 4870-09 (2014)	0 to 0.5 % by mass
		Sulphur by ED-XRF	ISO 20847-04, ASTM D4294-16e1	0.003 % by weight to 5.0 % by weight
		Viscosity Kinematic at 50°C	IS 1448 P:25-1976(RA 2013), ASTM D 445-15a	100.0 cSt to 400.0 cSt
		Water Content by Dean & Stark	IS 1448 P:40-2006,IP 74-2000, ASTM D 95-13e1	0 to 2.0 % by volume
11.	SPINDLE OIL	Appearance	Visual	Qualitative
		Ash	IS 1448 P:4-2008 (RA 2013), IP 4-05(12), ASTM D 482-13	0.001 % by weight to 0.18 % by weight
		Carbon Residue, Ramsbottom	IS 1448 P:8-2012, IP 14-94(04), ASTM D 524-15	0.01 % by weight to 20.0 % by weight
		Colour, ASTM	IS 1448 P:12- 2013, IP 196-97 (11), ASTM D 1500-12	0 to 8.0
		Copper Strip Corrosion	IS 1448 P:15-2004 (RA 2011), IP 154-13, ASTM D 130-12	1 a to 4 c Rating

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S. No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are Performed	Range of Testing / Limits of Detection
	SPINDLE OIL	Density by Digital Density Meter	IP 365-1997(04), ASTM D 4052-15	650.0 kg/m ³ to 1020.0 kg/m ³
		Density, API Gravity by Hydrometer	IS 1448 P:16- 16, IP 160-99 ASTM D 1298-12b	650.0 kg/m ³ to 1020.0 kg/m ³
		Flash Point, COC	IS 1448 P:69-2013, IP 36-02, ASTM D 92-12b	140 °C to 400 °C
		Pour Point	IS 1448P:10-2013 (RA 2013), IP 15-95 (14), ASTM D 97-16	- 21 °C to + 47 °C
		Sulphur by ED-XRF	ISO 20847-04, ASTM D4294-16e1	0.003 % by weight to 5.0 % by weight
		Sulphur by WD-XRF	ASTM D2622-16	3 mg/Kg to 1000 mg/Kg
		Viscosity Index	IS 1448 P:56-2003, IP 226-04 (14), ASTM D 2270-10 (2016)	80 to 140
		Viscosity Kinematic at 40 ⁰ C	IS 1448 P:25-1976(RA 2013), ASTM D 445-15a	1.0 cSt to 600 cSt
		Viscosity Kinematic at 100 ⁰ C	IS 1448 P:25-1976(RA 2013), ASTM D 445-15a	1.0 cSt to 35.0 cSt
		Water Content by coulometric	IP 438-01(13)	30 mg/Kg to 500 mg/Kg
		Aromatics, Total	ASTM D 7419-13	0.2 % by weight to 46 % by weight
12.	LOBS 150N	Appearance	Visual	Qualitative
		Ash	IS 1448 P:4-2008 (RA 2013), IP 4-05(12), ASTM D 482-13	0.001 % by weight to 0.18 % by weight

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S. No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are Performed	Range of Testing / Limits of Detection
	LOBS 150N	Carbon Residue, Ramsbottom	IS 1448 P:8-2012, IP 14-94(04), ASTM D 524-15	0.01 % by weight to 20.0 % by weight
		Colour, ASTM	IS 1448 P:12- 2013, IP 196-97 (11), ASTM D 1500-12	0 to 8.0
		Copper Strip Corrosion	IS 1448 P:15-2004 (RA 2011), IP 154-13, ASTM D 130-12	1 a to 4 c Rating
		Density by Digital Density Meter	IP 365-1997(04), ASTM D 4052-15	650.0 kg/m ³ to 1020.0 kg/m ³
		Density, API Gravity by Hydrometer	IS 1448 P:16- 16, IP 160-99 ASTM D 1298-12b	650.0 kg/m ³ to 1020.0 kg/m ³
		Flash Point, COC	IS 1448 P:69-2013, IP 36-02, ASTM D 92-12b	140 °C to 400 °C
		Pour Point	IS 1448P:10-2013 (RA 2013),IP 15-95 (14), ASTM D 97-16	- 21 °C to + 47 °C
		Sulphur by ED-XRF	ISO 20847-04, ASTM D4294-16e1	0.003 % by weight to 5.0 % by weight
		Sulphur by WD-XRF	ASTM D2622-16	3 mg/Kg to 1000 mg/Kg
		Viscosity Index	IS 1448 P:56-2003, IP 226-04 (14), ASTM D 2270-10 (2016)	80 to 140
		Viscosity Kinematic @ 40 °C	IS 1448 P:25-1976(RA 2013), ASTM D 445-15a	1.0 cSt to 600 cSt
		Viscosity Kinematic @ 100 °C	IS 1448 P:25-1976(RA 2013), ASTM D 445-15a	1.0 cSt to 35.0 cSt

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S. No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are Performed	Range of Testing / Limits of Detection
	LOBS 150N	Water Content by coulometric	IP 438-01(13)	30 mg/Kg to 500 mg/Kg
		Aromatics, Total	ASTM D 7419-13	0.2 % by weight to 46 % by weight
13.	LOBS 500N	Appearance	Visual	Qualitative
		Ash	IS 1448 P:4-2008 (RA 2013), IP 4-05(12), ASTM D 482-13	0.001 % by weight to 0.18 % by weight
		Carbon Residue, Ramsbottom	IS 1448 P:8-2012, IP 14-94(04), ASTM D 524-15	0.01 % by weight to 20.0 % by weight
		Colour, ASTM	IS 1448 P:12- 2013, IP 196-97 (11), ASTM D 1500-12	0 to 8.0
		Copper Strip Corrosion	IS 1448 P:15-2004 (RA 2011), IP 154-13, ASTM D 130-12	1 a to 4 c Rating
		Density by Digital Density Meter	IP 365-1997(04), ASTM D 4052-15	650.0 kg/m ³ to 1020.0 kg/m ³
		Density, API Gravity by Hydrometer	IS 1448 P:16- 16, IP 160-99 ASTM D 1298-12b	650.0 kg/m ³ to 1020.0 kg/m ³
		Flash Point, COC	IS 1448 P:69-2013, IP 36-02, ASTM D 92-12b	140 °C to 400 °C
		Pour Point	IS 1448P:10-2013 (RA 2013), IP 15-95 (14), ASTM D 97-16	- 21 °C to + 47 °C
		Sulphur by ED-XRF	ISO 20847-04, ASTM D4294-16e1	0.003 % by weight to 5.0 % by weight

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S. No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are Performed	Range of Testing / Limits of Detection
	LOBS 500N	Sulphur by WD-XRF	ASTM D2622-16	3 mg/Kg to 1000 mg/Kg
		Viscosity Index	IS 1448 P:56-2003, IP 226-04 (14), ASTM D 2270-10 (2016)	80 to 140
		Viscosity Kinematic at 40 ⁰ C	IS 1448 P:25-1976(RA 2013), ASTM D 445-15a	1.0 cSt to 600 cSt
		Viscosity Kinematic at 100 ⁰ C	IS 1448 P:25-1976(RA 2013), ASTM D 445-15a	1.0 cSt to 35.0 cSt
		Water Content by coulometric,	IP 438-01(13)	30 mg/Kg to 500 mg/Kg
		Aromatics,Total	ASTM D 7419-13	0.2 % by weight to 46 % by weight
14.	BS	Appearance	Visual	Qualitative
		Colour, ASTM	IS 1448 P:12- 2013, IP 196-97 (11), ASTM D 1500-12	0 to 8.0
		Copper Strip Corrosion	IS 1448 P:15-2004 (RA 2011), IP 154-13, ASTM D 130-12	1 a to 4 c Rating
		Density by Digital Density Meter	IP 365-1997(04), ASTM D 4052-15	650.0 kg/m ³ to 1020.0 kg/m ³
		Density, API Gravity by Hydrometer	IS 1448 P:16- 16, IP 160-99 ASTM D 1298-12b	650.0 kg/m ³ to 1020.0 kg/m ³
		Flash Point, COC	IS 1448 P:69-2013, IP 36-02, ASTM D 92-12b	140 ⁰ C to 400 ⁰ C
		Pour Point	IS 1448P:10-2013 (RA 2013), IP 15-95 (14), ASTM D 97-16	- 21 ⁰ C to + 47 ⁰ C

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	BS	Sulphur by ED-XRF	ISO 20847-04, ASTM D4294-16e1	0.003 % by weight to 5.0 % by weight
		Viscosity Index	IS 1448 P:56-2003, IP 226-04 (14), ASTM D 2270-10 (2016)	80 to 140
		Viscosity Kinematic at 40 ⁰ C	IS 1448 P:25-1976(RA 2013), ASTM D 445-15a	1.0 cSt to 600 cSt
		Viscosity Kinematic at 100 ⁰ C	IS 1448 P:25-1976(RA 2013), ASTM D 445-15a	1.0 cSt to 35.0 cSt
15.	RPO	Aniline point	IS 1448 P:3- 2007(RA 2013), IP 2-98 (14), ASTM D 611-12	25 ⁰ C to 80 ⁰ C
		Appearance	Visual	Qualitative
		Density by Digital Density Meter	IP 365-1997(04), ASTM D 4052-15	650.0 kg/m ³ to 1020.0 kg/m ³
		Density, API Gravity by Hydrometer	IS 1448 P:16- 16, IP 160-99 ASTM D 1298-12b	650.0 kg/m ³ to 1020.0 kg/m ³
		Flash Point, COC	IS 1448 P:69-2013, IP 36-02, ASTM D 92-12b	140 ⁰ C to 400 ⁰ C
		Loss on heating	IS 1212: 1998	0.05 % by weight to 5.00 % by weight
		Pour Point	IS 1448 P:10-2013 (RA 2013),IP 15-95 (14), ASTM D 97-16	- 21 ⁰ C to + 47 ⁰ C

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	RPO	Refractive Index at 60.0 ⁰ C	ASTM D 1747-09 (2014)	1.3300 to 1.6000
		Sulphur by ED-XRF	ISO 20847-04, ASTM D4294-16e1	0.003 % by weight to 5.0 % by weight
		Viscosity Kinematic at 100 ⁰ C	IS 1448 P:25-1976(RA 2013), ASTM D 445-15a	1.0 cSt to 35.0 cSt

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