

Laboratory **HPCL-Mittal Energy Limited, Village Phullokhari, Taluka Talwandi Saboo, Distt. Bathinda, Punjab**

Accreditation Standard **ISO/IEC 17025: 2005**

Certificate Number **TC-8001 (in lieu of T-3201)**

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Validity **14.11.2018 to 13.11.2020**

Last Amended on --

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 & PRODUCTS			
1.	Aviation Fuel- Aviation turbine fuel	Saybolt Color	ASTM D156	10 to 30
		Particulate Contamination at a point of manufacture	ASTM D5452	0.1 mg/l to 2.0 mg/l
		Total Acidity	IS1448:Part 113	0.001 mgKOH/g to 0.03 mgKOH/g
		Aromatics Content	IS1448:Part 23 ISO 3837	5 Vol.% to 30 Vol.%
		Total Sulphur	ASTM D4294	0.0017 mass% to 0.35 mass%
		Mercaptan Sulphur	IS1448:Part 109 ISO 3012	0.0003 mass % to 0.01 mass%
		Distillation: Temperature	IS1448:Part 18	125 °C to 400 °C
		Flash Point, Abel	IS1448:Part 20	20 °C to 65 °C
		Density at 15°C	IS1448:Part 16 ISO 3675 ASTM D1298	775 kg/m ³ to 840 kg/m ³
		Freezing Point	IS1448:Part 11	(-)75 °C to (-)35 °C
		Kinematic Viscosity at -20°C	IS1448:Part 25	1.2 cSt to 8 cSt
		Specific Energy	ASTM D3338	40.1 MJ/kg to 44.7 MJ/kg
		Smoke Point	IS1448:Part 31	10 mm to 30 mm
		Naphthalenes	IS1448:Part 118	0.1 %v/v to 3 %v/v
	Copper Strip Corrosion at 100°C for 2 hrs.	IS1448:Part 15 ISO 2160	1a to 4c	
	Silver Strip Corrosion at 50°C for 4 hrs.	IP 227	Upto 4	
	Thermal stability, JFTOT at Control	IS1448:Part 97		

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		Temperature of 260°C		
		a) Filter pressure differential		Upto 25 mm Hg
		b) Tube rating, visual		Upto 4
		Existent Gum with air	IS1448:Part 29 ISO 6246	1 mg/100ml to 10 mg/100ml
		Water Reaction: Interface Rating	IS1448:Part 42	1 to 4
		water separation characteristics Micro separometer rating (MSEP)	IS1448:Part 142	51 to 100
		Electrical conductivity	ISO 6297	1 pS/m to 800 pS/m
		Lubricity, Wear scar diameter (BOCLE)	ASTM D5001	0.35 mm to 0.930 mm
		Particulate, Cumulative channel Particle Counts	IP 565 ISO 4406	Upto 5000 counts/ml
2.	Fuels-Liquid-Motor Gasoline	Density at 15°C	ASTM D4052 ISO 12185	720 kg/m ³ to 775 kg/m ³
		Distillation	ASTM D86	
		Volume	IS1448:Part 18	1 Vol.% to 100 Vol.%
		Temp.	ISO 3405	25 °C to 300 °C
		Research Octane Number (RON)	ASTM D2699 IS1448:Part 27	60 to 110
		Motor Octane Number (MON)	ASTM D2700 IS1448:Part 26	60 to 95
		Benzene Content	ASTM D3606	0.1 Vol.% to 3 Vol.%
		Total Sulphur	ASTM D5453 ISO 20846	1 mg/kg to 60 mg/kg
		Reid Vapor Pressure at 38°C	ASTM D323 IS1448:Part 39	30 kPa to 90 kPa
			ASTM D5191	30 kPa to 90 kPa.
		Copper Strip Corrosion at 50°C for 3 hrs.	IS1448:Part 15 ASTM D130	1a to 4c

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		Olefin content	IS1448:Part 23 ASTM D1319	0.3 vol. % to 25 vol. %
		Aromatics content	IS1448:Part 23 ASTM D1319	5 vol.% to 50 vol. %
		Oxidation Stability	ASTM D525 IS1448:Part 28	0.1 min to 500 min
3.	Fuels-Liquid-Hexane	Density at 20°C	ASTM D4052 ISO 12185	0.660 g/cc to 0.900 g/cc
		Refractive Index at 20°C	ASTM D1218	1.3300 to 1.5000
		Distillation Temp. (IBP)	ASTM D1078 IS1448:Part 18	30 °C to 100 °C
		Dry Point		64 °C to 100 °C
		Volume Distilled between 64-70°C		1 Vol.% to 100 Vol.%
		Total Sulphur	ASTM D5453 ASTM D7183	0.5 mg/kg to 50 mg/kg
		Benzene	ASTM D6229	1.0 vol. ppm to 200 vol. ppm
		Bromine Index	ASTM D2710	1 mg Br/100g to 100 mg Br/100g
		Saybolt Color	IS1448:Part 14	5 to 30
		Composition by GC (i) Aromatic (ii) Saturates (iii) n-Hexane (iv) Cyclo Hexane	ASTM D5134 ASTM D6733	0.01 vol.% to 100 vol.%
		Copper Strip Corrosion at 50°C for 3 hrs.	IS 1448 Part:15	1a to 4c
4.	Fuels-Liquid-Naphtha	Density at 15°C	ASTM D4052 ISO 12185	660 kg/m ³ to 900 kg/m ³
		Distillation Temp.	ASTM D86 IS1448:Part 18 ISO 3405	25 °C to 300 °C

Pankaj Goyal
Convenor

Sunita Rawat
Program Manager

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		Total Sulphur	ASTM D5453 ASTM D7183	1 mg/kg to 500 mg/kg
		Total Chloride	UOP 779 ASTM D4929	0.3 mg/kg to 100 mg/kg
		Saybolt Color	ASTM D156	10 to 30
		Reid Vapour Pressure	ASTM D323 ASTM D5191	30 kPa to 90 kPa 30 kPa to 90 kPa.
		Composition by GC	ASTM D6839	
		Total Naphthenes		0.1 Vol.% to 20 Vol. %
		Total Paraffins		0.1 Vol.% to 30 Vol.%
		Total Aromatics		0.1 Vol.% to 30 Vol.%
		Total Olefins		0.1 Vol.% to 50 Vol.%
		i-paraffin	ASTM D6730	0.01 Wt.% to 45.0 Wt.%
		n-paraffin		0.01 Wt % to 45.0Wt.%
		Olefins		0.01 Wt % to 2.0 Wt.%
		Aromatics		0.01 Wt % to 10.0 Wt.%
		Benzene Content	ASTM D3606 ASTM D5580	0.1 Vol.% to 15 Vol.% 0.1 Wt % to 5 Wt %
		Low Oxygenates	UOP 960 / ASTM D7754	Upto 2000 mg/kg
		Research Octane Number (RON)	ASTM D2699 IS1448:Part 27	60 to 110
		Copper Strip Corrosion at 50°C for 3 hrs.	IS1448:Part 15 ASTM D130	1a to 4c
5.	Fuel Liquid-SKO	Saybolt Color	IS1448:Part 14	5 to 30
		Copper Strip Corrosion at 50°C for 3 hrs.	IS1448:Part 15 ISO 2160	1a to 4c
		Density at 15°C	ASTM D4052 ISO 12185	600 kg/m ³ to 900 kg/m ³
		Distillation Temp. Final boiling point, Max	IS1448:Part 18 ASTM D86	10°C to 400°C
		Volume Percent recovered below 200°C		Upto 100 Vol. %

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		Flash Point, Abel	IS1448:Part 20	20 °C to 65 °C
		Smoke Point	IS1448:Part 31 ASTM D1322	10 mm to 30 mm
		Total Sulphur	ASTM D4294 ISO 8754	0.0017 mass % to 4.6 mass % / 0.03 % to 5 %
			ASTM D5453 ASTM D7183	0.5 mg/kg to 400 mg/kg
6.	Fuel Liquid-MTO Mineral Turpentine Oil	Saybolt Color	IS1448:Part 14	10 to 30
		Density at 15°C	IS1448:Part 16 ASTM D1298	600 kg/m ³ to 900 kg/m ³
		Flash Point, Abel	IS1448:Part 20	20 °C to 65 °C
		Distillation	IS1448:Part 18 ASTM D86	100°C to 300 °C
		Aromatic Content	IS1448:Part 23 ISO 3837	5 Vol.% to 40 Vol.%
		Copper Strip Corrosion at 50°C for 3 hrs	IS1448:Part 15 ISO 2160	1a to 4c
7.	Fuels-Liquid: High Speed Diesel	Acidity, Total	ASTM D974	0.01 mgKOH/g to 1.0 mgKOH/g
		Ash	IS1448:Part 4 ASTM D482	0.001 wt.% to 0.01 wt.%
		Rams Bottom Carbon Residue	IS1448:Part 8 ISO 10370	0.1 mass % to 0.5 mass %
		Cetane Number	IS1448:Part 9 ASTM D613	30 to 65
		Cetane Index	ASTM D4737	Calculation 30 to 65
		Pour Point	IS1448:Part 10 ASTM D97	(-) 21°C to 21 °C
		Copper Strip Corrosion at 50°C for 3 hrs.	IS1448:Part 15 ASTM D130	1a to 4c
		Distillation	IS1448:Part 18	320 °C to 370 °C
		Temp. at 95% vol recovery	ISO 3405 ASTM D86	

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		Flash Point, Abel	IS1448:Part 20/IP 170	20 °C to 65 °C
		Kinematic Viscosity at 40°C	IS1448:Part 25 ASTM D445	1.2 cSt to 5.0 cSt
		Total Contamination	EN 12662	0.5 mg/kg to 30 mg/kg
		Density at 15°C	ASTM D4052 ASTM D1298	780 kg/m ³ to 900 kg/m ³
		Total Sulphur	ASTM D5453 ISO 20846	1.0 mg/kg to 60 mg/kg
		Water Content	ISO 12937	30 mg/kg to 300 mg/kg
		CFPP	ASTM D6371 IS1448:Part 110	(-) 30 °C to 10 °C
		Oxidation Stability	ASTM D2274 IS1448:Part 154	1 g/m ³ to 40 g/m ³
		Poly Aromatic Hydro Carbons	IP 391	0.1 mass% to 12 mass %
		Lubricity (HFRR)	ISO 12156-1	300 µm to 700 µm
8.	Fuel-Gaseous-LPG Liquefied Petroleum Gas	Density of LPG @15°C	IP 432	Qualitative
		Vapour Pressure at 40°C		520 kPa to 1050 kPa
		Composition a) C2 Hydrocarbons b) C3 Hydrocarbons c) C4 Hydrocarbons d) C5 Hydrocarbons and heavier e) Unsaturated hydrocarbons	ASTM D2163	0.01 Vol.% to 100 Vol. %
		Total Volatile Sulphur	ASTM D3246	1.5 mg/kg to 150 mg/kg
		Copper Strip Corrosion @ 38°C for 1 hour	ASTM D1838	1a to 4c
		Volatility: Evaporation Temp in °C for 95%v at 760 mm	IS1448:P 72	(-) 2 °C to 2 °C

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II.	PLASTICS AND RESINS			
1.	Polypropylene	Melt Flow Rate	ASTM D1238	0.5 g/10 min to 100 g/10 min
		Yellowness Index-Pellets	ASTM E 313	(-) 25 to 5
III.	INDUSTRIAL AND FINE CHEMICALS			
1.	Sulphur	Assay	IS 6655 (Method I)	95 % to 99.9 %
		Moisture	IS 6655	0.1 % to 10 %
		Acidity as H ₂ SO ₄	IS 6655	0.001 % to 1.0 %
IV.	SOLID FUEL			
1.	Coke	Volatile Matter	ASTM D7582	0.1 % to 20 %
		Sulphur	ASTM D4239	1.25 % to 12.5 %
		Gross Calorific Value	ASTM D5865	3500 kcal/kg to 8300 kcal/kg
V.	POLLUTION & ENVIRONMENT			
1.	Waste Water	pH	IS 3025:Part 11	1 to 13
		Ammonia	IS 3025:Part 34 (Nesslerization)	0.5 mg/l to 100 mg/l
		Sulphide	IS 3025:Part 29	0.1 mg/l to 2.0 mg/l
		Phenol	ASTM D2580 APHA 5530 C- Chloroform extraction.	0.5 mg/l to 20 mg/l 0.1 mg/l to 2.5 mg/l
		Bio Chemical Oxygen Demand	IS 3025:Part 44	1 mg/l to 200 mg/l
		Chemical Oxygen Demand	APHA 5220-C- Closed Reflux, Titrimetric method	40 mg/l to 400 mg/l
		Phosphate	APHA 4500-P D	0.1 mg/l to 5 mg/l

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