

**Laboratory** Indian Oil Corporation Ltd., M.D., Hyderabad Laboratory, Survey No.183, IDA, Phase-III, Cherlapally , Hyderabad , Telangana

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

**Certificate Number** TC-7126 (in lieu of T-2174)

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**Validity** 05.04.2018 to 04.04.2020

Last Amended on 13.04.2018

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.	<b>PETROLEUM PRODUCTS:</b>			
1.	<b>Aviation fuel Jet A1</b>	Appearance	IOCL WI : 9; Issue no:02; Issue date :01.04.2013	Qualitative (Descriptive by visual)
		Colour	IOCL WI : 10; Issue no:02; Issue date:01.04.2013	Qualitative (Descriptive by visual)
		Colour (Saybolt)	ASTM D156	(-)16 to +30
		Water Reaction	IS 1448 P-42 /IP 289/ ASTM D1094	Qualitative Separation (1 to 3) by rating Interface (1 to 3) by rating
		Sulphur Mercaptan,	IS 1448 P-109 /IP 342/ ISO 3012/ASTM D3227	0.0003% to 0.01 %by mass
		Specific Energy,	ASTM D3338 M	40 MJ/Kg to 48 MJ/Kg
		Sulphur-EDXRF	IS 1448 P-153/ D 4294	Up to 50000 mg/kg Up to5.0%
		Smoke Point	IS 1448 P-31 /IP 57/ ISO 3014/ASTM D1322	5 Up to 30 mm
		Silver Corrosion	IP 227	Qualitative (0 to 4) by Classification
		Kinematic Viscosity at (-)20,(-)35,40,50	IS 1448 P-25 /IP 71/ ISO 3104/ASTM D445	0.5 cSt to 400 cSt
		Electrical Conductivity	IS 1448 P-148 /IP 274/ ISO 6297/ASTM D2624	15 pS/m to 1500 pS/m
		Freezing Point,	IS 1448 P-11 /IP 16/ ISO 3013/ASTM D2386	+20°C to (-)70 °C
		Flash Point (Abel)	IS 1448 P-20 /IP 170/ ISO 13736	19 °C to 70 °C
		Doctor Test	IS 1448 P-19 /IP 30	Qualitative (Positive or Negative)

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		Existent Gum	IS 1448 P-29 /IP 131/ ISO 6246/ASTM D381	Up to 200 g/m <sup>3</sup>
		Distillation - BP - Temp - Volume % Recovered -Residue -Loss	IS 1448 P-18 /IP 123/ ISO 3405/ASTM D86	30°C to 370 °C 5% to 100% Upto 2.0 %vol Upto 2.0 % vol
		Density by Hydrometer,	IS 1448 P-16 /IP 160/ ISO 3675/ASTM D1298	600 kg/m <sup>3</sup> to 1000 kg/m <sup>3</sup>
		Copper Corrosion	IS 1448 P-15 /IP 154/ ISO 2160/ASTM D130	Qualitative (Rating 1 to 4)
		Acidity Total	IS 1448 P-113 /IP 354/ ASTM D3242	Upto 0.1 mg of KOH/g
		Aniline Point	IS 1448 P-3 /IP 2/ ISO 2977/ASTM D611	50°C to 80 °C
		Aromatics	IS 1448 P-23 /IP 156/ ISO 3837/ASTM D1319	5% to 99% by vol.
		Olefins		0.3% to 55 % by vol.
		Naphthalene Content	IS 1448 P-118 / ASTM D1840	Up to 5 % by vol
2.	Aviation fuel Jet JP5	Appearance	IOCL WI : 9; Issue no:02; Issue date :01.04.2013	Qualitative (Descriptive by visual)
		Colour	IOCL WI : 10; Issue no:02; Issue date:01.04.2013	Qualitative (Descriptive by visual)
		Water Reaction	IS 1448 P-42 /IP 289/ ASTM D1094	Qualitative Separation (1 to 3) by rating Interface (1 to 3) by rating
		Sulphur-EDXRF	IS 1448 P-153/ D 4294	Upto 50000 mg/kg Upto 5.0%
		Sulphur Mercaptan,	IS 1448 P-109 /IP 342/ ISO 3012/ASTM D3227	0.0003% to 0.01 %by mass
		Specific Energy,	ASTM D3338 M	40 MJ/Kg to 48 MJ/Kg

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		Silver Corrosion	IP 227	Qualitative (0 to 4) by Classification
		Smoke Point	IS 1448 P-31 /IP 57/ ISO 3014/ASTM D1322	5 Upto 30 mm
		Flash Point (P&M)	IS 1448 P-21 /IP 34/ ISO 2719/ASTM D93	40 °C to 360 °C
		Kinematic Viscosity@ - 20, (-)35,40,50	IS 1448 P-25 /IP 71/ ISO 3104/ASTM D445	0.5 cSt to 400 cSt
		Freezing Point,	IS 1448 P-11 /IP 16/ ISO 3013/ASTM D2386	+20°C to (-) 70 °C
		Doctor Test	IS 1448 P-19 /IP 30	Qualitative (Positive or Negative)
		Existent Gum	IS 1448 P-29 /IP 131/ ISO 6246/ASTM D381	Upto 200 g/m <sup>3</sup>
		Density by Hydrometer,	IS 1448 P-16 /IP 160/ ISO 3675/ASTM D1298	600 kg/m <sup>3</sup> to 1000 kg/m <sup>3</sup>
		Distillation - BP - Temp - - Volume %Recovered -Residue -Loss	IS 1448 P-18 /IP 123/ ISO 3405/ASTM D86	30°C C to370 °C 5% to 100% Upto 2.0 %vol Upto 2.0 % vol
		Copper Corrosion	IS 1448 P-15 /IP 154/ ISO 2160/ASTM D130	Qualitative (Rating 1 to 4)
		Acidity Total	IS 1448 P-113 /IP 354/ ASTM D3242	Up to 0.1 mg of KOH/g
		Aniline Point	IS 1448 P-3 /IP 2/ ISO 2977/ASTM D611	50°C to 80 °C
		Aromatics Olefins	IS 1448 P-23 /IP 156/ ISO 3837/ASTM D1319	5% to 99% by vol. 0.3% to 55 % by vol.
<b>3.</b>	<b>AVGAS 100LL</b>	Appearance	IOCL WI : 9; Issue no:02; Issue date :01.04.2013	Qualitative (Descriptive by visual)
		Colour	IOCL WI : 10; Issue no:02; Issue date:01.04.2013	Qualitative (Descriptive by visual)

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		Water Reaction	IS 1448 P-42 /IP 289/ ASTM D1094	Qualitative Separation(1 to 3) by rating Interface(1 to 3) by rating
		Vapour Pressure – Reid	IS 1448 P-39 / IP 69/ISO 3007	3.4 kPa to 180 kPa
		Specific Energy, Freezing Point,	ASTM D3338 M IS 1448 P-11 /IP 16/ ISO 3013/ASTM D2386	40 MJ/Kg to 48 MJ/Kg +20°C to (-) 70 °C
		Existent Gum	IS 1448 P-29 /IP 131/ ISO 6246/ASTM D381	Upto 200 g/m <sup>3</sup>
		Distillation - BP - Temp - - Volume %Recovered -Residue -Loss	IS 1448 P-18 /IP 123/ ISO 3405/ASTM D86	30°C to 370 °C 5% to 100% Upto 2.0 %vol Up to 2.0 % vol
		Density by Hydrometer,	IS 1448 P-16 /IP 160/ ISO 3675/ASTM D1298	600 kg/m <sup>3</sup> to 1000 kg/m <sup>3</sup>
		Copper Corrosion	IS 1448 P-15 /IP 154/ ISO 2160/ASTM D130	Qualitative (Rating 1 to 4)
		Aniline Point	IS 1448 P-3 /IP 2/ ISO 2977/ASTM D611	50°C to 80 °C
4.	<b>High Speed Diesel (HSD)</b>	Appearance	IOCL WI : 9; Issue no:02; Issue date :01.04.2013	Qualitative (Descriptive by visual)
		Colour	IOCL WI : 10; Issue no:02; Issue date:01.04.2013	Qualitative (Descriptive by visual)
		Water Reaction	IS 1448 P-42 /IP 289/ ASTM D1094	Qualitative Separation(1 to 3) by rating Interface(1 to 3) by rating
		Sulphur-EDXRF	IS 1448 P-153/ D 4294	Upto 50000 mg/kg Upto 5.0%
		Pour Point	IS 1448 P-10 /IP 15/ ISO 3016/ASTM D97	(-) 15°C to (+) 51 °C
		Sediments by Extraction	IS 1448 P-30 /IP 53/ ISO 3735/ASTM D473	0.01% to 0.4 % wt

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		Flash Point (Abel)	IS 1448 P-20 /IP 170/ ISO 13736	19 °C to 70 °C
		Flash Point (P&M)	IS 1448 P-21 /IP 34/ ISO 2719/ASTM D93	40 °C to 360 °C
		Kinematic Viscosity@ - 20,-35,40,50	IS 1448 P-25 /IP 71/ ISO 3104/ASTM D445	0.5 cSt to 400 cSt
		Distillation - BP - Temp - - Volume %Recovered -Residue -Loss	IS 1448 P-18 /IP 123/ ISO 3405/ASTM D86	30°C to370 °C 5% to 100% Upto 2.0 %vol Upto 2.0 % vol
		Calculated Cetane Index	IP 380/ISO 4264/ ASTM D4737	40 to 70
		Density by Hydrometer,	IS 1448 P-16 /IP 160/ ISO 3675/ASTM D1298	600 kg/m <sup>3</sup> to 1000 kg/m <sup>3</sup>
		Ash Content,	IS 1448 P-4 /IP 4/ ISO 6245/ASTM D482	0.001 to 0.18 % by wt.
		Cetane Index (Calculated)	IP 380/ISO 4264/ ASTM D4737	32.5 to 65
		Copper Corrosion	IS 1448 P-15 /IP 154/ ISO 2160/ASTM D130	Qualitative (Rating 1 to 4)
		Colour (ASTM)	IS 1448 P-12 /IP 196/ ISO 2049/ASTM D1500	0.5color unit to 8.0 color units
<b>5.</b>	<b>Fuel oil (FO)</b>	Ash Content,	IS 1448 P-4 /IP 4/ ISO 6245/ASTM D482	0.001 to 0.18 % by wt.
		Calorific Value	IS 1448 P-7 / ASTM D4868	10000 Cal/g to 12000 Cal/g
		Density by Hydrometer,	IS 1448 P-16 /IP 160/ ISO 3675/ASTM D1298	600 kg/m <sup>3</sup> to 1000 kg/m <sup>3</sup>
		Flash Point (P&M)	IS 1448 P-21 /IP 34/ ISO 2719/ASTM D93	40 °C to 360 °C
		Kinematic Viscosity @ -20,-35,40,50	IS 1448 P-25 /IP 71/ ISO 3104/ASTM D445	0.5 cSt to 400 cSt

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		Pour Point	IS 1448 P-10 /IP 15/ ISO 3016/ASTM D97	(-) 15°C to (+) 51 °C
		Sediments by Extraction	IS 1448 P-30 /IP 53/ ISO 3735/ASTM D473	0.01% to 0.4 % wt
		Sulphur-EDXRF	IS 1448 P-153/ D 4294	Upto50000 mg/kg Upto5.0%
		Water Content by Dean & Stark	IS 1448 P-40 /IP 74/ ISO 3733/ASTM D95	0.05% to 20 % by vol.
<b>6.</b>	<b>Motor Gasoline</b>	Appearance	IOCL WI : 9; Issue no:02; Issue date :01.04.2013	Qualitative (Descriptive by visual)
		Colour	IOCL WI : 10; Issue no:02; Issue date:01.04.2013	Qualitative (Descriptive by visual)
		Vapour Pressure – Reid	IS 1448 P-39 / IP 69/ISO 3007	3.4 kPa to 180 kPa
		Sulphur-EDXRF	IS 1448 P-153 / ISO 20847	Upto 1000 mg/kg
		Distillation - BP - Temp - - Volume %Recovered -Residue -Loss	IS 1448 P-18 /IP 123/ ISO 3405/ASTM D86	30°C to370 °C 5% to 100% Upto 2.0 %vol Upto 2.0 % vol
		Density by Hydrometer,	IS 1448 P-16 /IP 160/ ISO 3675/ASTM D1298	600 kg/m <sup>3</sup> to 1000 kg/m <sup>3</sup>
<b>7.</b>	<b>Kerosine</b>	Appearance	IOCL WI : 9; Issue no:02; Issue date :01.04.2013	Qualitative (Descriptive by visual)
		Colour	IOCL WI : 10; Issue no:02; Issue date:01.04.2013	Qualitative (Descriptive by visual)
		Colour (Saybolt)	ASTM D156	(-)16 to +30
		Sulphur-EDXRF	IS 1448 P-153/ D 4294	Upto 50000 mg/kg Upto 5.0%
		Smoke Point	IS 1448 P-31 /IP 57/ ISO 3014/ASTM D1322	5 to 30 mm
		Sulphur-EDXRF	IS 1448 P-153/ D 4294	Upto 50000 mg/kg Upto 5.0%

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		Density by Hydrometer,	IS 1448 P-16 /IP 160/ ISO 3675/ASTM D1298	600 kg/m <sup>3</sup> to 1000 kg/m <sup>3</sup>
		Distillation - BP - Temp - - Volume %Recovered -Residue -Loss	IS 1448 P-18 /IP 123/ ISO 3405/ASTM D86	30°C to370 °C 5% to 100% Upto 2.0 %vol Upto 2.0 % vol
8.	SKO	Flash Point (Abel)	IS 1448 P-20 /IP 170/ ISO 13736	19 °C to 70 °C
		Copper Corrosion	IS 1448 P-15 /IP 154/ ISO 2160/ASTM D130	Qualitative (Rating 1 to 4)
9.	LDO	Water Content by Dean & Stark	IS 1448 P-40 /IP 74/ ISO 3733/ASTM D95	0.05% to 20 % by vol.
		Sulphur-EDXRF	IS 1448 P-153/ D 4294	Upto 50000 mg/kg Upto 5.0%
		Flash Point (P&M)	IS 1448 P-21 /IP 34/ ISO 2719/ASTM D93	40 °C to 360 °C
		Density by Hydrometer,	IS 1448 P-16 /IP 160/ ISO 3675/ASTM D1298	600 kg/m <sup>3</sup> to 1000 kg/m <sup>3</sup>
		Copper Corrosion	IS 1448 P-15 /IP 154/ ISO 2160/ASTM D130	Qualitative (Rating 1 to 4)
		Ash Content,	IS 1448 P-4 /IP 4/ ISO 6245/ASTM D482	0.001% to 0.18 % by wt.
10.	Motor Sprit (MS)	Copper Corrosion	IS 1448 P-15 /IP 154/ ISO 2160/ASTM D130	Qualitative (Rating 1 to 4)
		Existent Gum	IS 1448 P-29 /IP 131/ ISO 6246/ASTM D381	Upto 200 g/m <sup>3</sup>
II.	LUBRICANTS			
1.	Lube	Ash Content (Sulphated)	IP 163/ISO 3987/ ASTM D874	0.005 % to 0.10 % by wt.
		Colour (ASTM)	IS 1448 P-12 /IP 196/ ISO 2049/ASTM D1500	0.5 color unit to 8.0 color units

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		Flash Point (P&M)	IS 1448 P-21 /IP 34/ ISO 2719/ASTM D93	40°C to 360 °C
		Kinematic Viscosity at at 40°C	IS 1448 P-25 /IP 71/ ISO 3104/ASTM D445	0.5 cSt to 400 cSt