

Laboratory **Bharat Petroleum Corporation Ltd., Quality Assurance Laboratory,
Budge Budge Installation, P.O. Budge Budge, Kolkata, West Bengal**

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

Certificate Number **TC-7051 (in lieu of T-0841)**

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Validity **23.04.2018 to 22.04.2020**

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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
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CHEMICAL TESTING

I.	PETROLEUM PRODUCT			
1.	Aviation Turbine Fuel (ATF)	Acidity, Total	IS:1448(Part-113) / ASTM D3242	0.0001 mg.KOH/g to 0.100 mg.KOH/g
		Appearance	WI-02 (WIM Issue no II, Issue date 01.10.2017)	Qualitative (Descriptive)
		API Gravity	IS 1571 (Table-1)	Qualitative
		Aromatics	IS:1448(Part-23)	5% to 45 % by Volume.
		Colour Saybolt	IS:1448(Part-14) / ASTM D 156	-16 to (+)30 units
		Cu Strip Corrosion for 2 hrs at 100°C	IS:1448(Part-15)	Qualitative (1a to 4c rating)
		Density	IS:1448 (Part-16) ASTM D1298	750 kg/m ³ to 840 kg/m ³
		Distillation: -Temperature -Volume Recovery	IS:1448 (Part-18) / ASTM D 86 /IP:123	30 °C to 300°C 1.0% to 100 % Vol
		Doctor Test	IS:1448 (Part-19)	Qualitative
		Electrical conductivity	ISO 6297/ IP274	20 pS/m to 1000 pS/m
		Existent Gum	IS:1448(Part-29)/ ASTM D 381	0 .1 g/100 ml to 10 g/100 ml
		Flash Point (Abel)	IS:1448(Part-20) IP 170	10°C to 70°C
		Freezing Point	IS:1448(Part-11) / ASTM D 2386	(-) 70 to 0 °C
		Kinematic Viscosity at (-20)°C	IS:1448(Part-25) / ASTM D445 / ASTM D7042	1.0 cSt to 10 cSt

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		Naphthalene	IS:1448(Part-118) / ASTM D-1840	0.1% to 5.0 % v/v
		Silver Strip Corrosion Test for 4 hrs at 50°C	IP 227	Qualitative (0 to 4 Classification)
		Smoke point	IS:1448(Part-31) / ISO 3014	10 mm to 30 mm
		Specific Energy	ASTM D 3338	30 MJ/kg to 60 MJ/kg
		Water reaction (Interface rating)	IS:1448(Part-42)- / ASTM D1094	Qualitative0 - 4 ratings
		Total Sulphur	ASTM D 4294 : 2016e1	0.005% to 0.5% by Mass
2.	Motor Gasoline / Motor Spirit (MS)	Appearance	WI-02;(WIM Issue no II, Issue date 01.10.2017)	Qualitative (Descriptive)
		Colour	WI-03;(WIM Issue no II, Issue date 01.10.2017)	Qualitative (Descriptive)
		Aromatics	IS:1448(Part-23)	5.0% to 45.0 % by vol
		Olefins Content		0.3% to 21.0 % by vol
		Cu Strip Corrosion for 3 hrs at 50°C	IS:1448(Part-15)	Qualitative (1a to 4c Rating)
		Density	IS:1448 (Part-16) / ASTM D1298	660 kg/m ³ to 800 kg/m ³
		Distillation: -Temperature -Volume Recovery upto 70°C Recovery upto 100°C Recovery upto 150°C	IS:1448 (Part-18) / ASTM D 86 / IP:123	30 °C to 400°C 1.0% to 100 % Vol
		Gum Content (Solvent washed)	IS:1448(Part-29) / ASTM D 381	0.1 g/m ³ to 40 g/m ³
		Unwashed gum	IS:1448(Part-29) / ASTM D 381	1 g/m ³ to 800 g/m ³
		Ethanol Content	IS 2796; (Annexure C)	0.5 % to 20 % by vol

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		Research Octane No (RON)	ASTM D2699	80 to 100
		Total Sulphur	ASTM D 4294 / ISO 20847	5 mg/kg to 200 mg/kg
3.	High Speed Diesel (HSD) / High Flash High Speed Diesel (HFHSD)	Appearance	WI-02;(WIM Issue no II, Issue date 01.10.2017)	Qualitative (Descriptive)
		Ash Content	IS:1448(Part-4)	0.001% to 0.18% wt
		Colour	WI-03;(WIM Issue no II, Issue date 01.10.2017)	Qualitative (Descriptive)
		Cetane Index, (Calculated)	ASTM D-4737	40 to 65
		Cu Strip Corrosion for 3 hours at 50°C	IS:1448(Part-15)	Qualitative (1a to 4c ratings)
		Flash Point (Abel)	IS:1448(Part-20) / IP 170	10°C to 70°C
		Flash Point (PMCC)	IS:1448(Part-21)/ ASTM D93	66°C to 120°C
		Density	IS:1448 (Part-16) / ASTM D1298	700 kg/m ³ to 1000 kg/m ³
		Distillation: -Temperature -Volume Recovery	IS:1448 (Part-18) / ASTM D 86	30 °C to 400°C 1.0% to 100 % Vol
		Kinematic Viscosity at 40°C	IS:1448(Part-25) / ASTM D445 /ASTM D7042	1.0 cSt to 5.0 cSt
		Pour Point	IS:1448(Part-10) / ASTM D 97	-38 to +20°C
		Total Sulphur	ASTM D 4294 / ISO 20847	3.0 mg/kg to 200 mg/kg
4.	Light Diesel Oil (LDO)	Appearance	WI-02;(WIM Issue no II, Issue date 01.10.2017)	Qualitative (Descriptive)
		Ash Content	IS:1448(Part-4) : 2008 Reaffirmed July 2013	0.001% to 0.18% wt
		Colour	WI-03;(WIM Issue no II, Issue date 01.10.2017)	Qualitative (Descriptive)

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		Density	IS:1448 (Part-16) / ASTM D1298	700 kg/m ³ to 1000 kg/m ³
		Flash Point (Pensky Marten)	IS:1448(Part-21) / ASTM D93	66°C to 120°C
		Kinematic Viscosity at 40°C	IS:1448(Part-25) / ASTM D445/ASTM D7042	1.0 cSt to 20.0 cSt
		Pour Point	IS:1448(Part-10) / ASTM D 97	-38°C to +20°C
		Sediments	IS:1448(Part-30)	0.001% to 1.0% by mass
		Water Content	IS:1448(Part-40) / ASTM D95	0.05% to 10% by Vol.
		Total Sulphur	ASTM D 4294 / ISO 20847	0.005% to 2.0 % by Mass
5.	Kerosene	Appearance	WI-02;(WIM Issue no II, Issue date 01.10.2017)	Qualitative (Descriptive)
		Colour Saybolt	IS:1448(Part-14) /ASTM D 156	-16 to 30 units
		Colour	WI-03;(WIM Issue no II, Issue date 01.10.2017)	Qualitative (Descriptive)
		Cu Strip Corrosion for 3 hours at 50°C	IS:1448(Part-15)	Qualitative (1a to 4c Rating)
		Distillation: -Temperature -Volume Recovery	IS:1448 (Part-18) / ASTM D 86	30 °C to 400°C 1.0% to 100 % Vol
		Flash Point (Abel)	IS:1448(Part-20) / IP 170	10°C to 70°C
		Smoke point	IS:1448(Part-31) / ISO 3014	10 mm to 30 mm
		Total Sulphur	ASTM D 4294	0.1% to 3.0% % by Mass
6.	Furnace Oil (FO)	Appearance	WI-02;(WIM Issue no II, Issue date 01.10.2017)	Qualitative (Descriptive)
		Colour	WI-03;(WIM Issue no II, Issue date 01.10.2017)	Qualitative (Descriptive)

Soundirapandian K.
Convenor

N. Venkateswaran
Program Director

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		Calorific Value-Gross	IS:1448(Part-7)	9000 kcal/kg to 13000 kcal/kg
		Density	IS:1448 (Part-16) / ASTM D1298	700 kg/m ³ to 1000 kg/m ³
		Flash Point (PMCC)	IS:1448(Part-21) / ASTM D93	66°C to 120°C
		Pour Point	IS:1448(Part-10) / ASTM D 97	-38°C to +20°C
		Sediments	IS:1448(Part-30)	0.001% to 1.0% by mass
		Water Content	IS:1448(Part-40) / ASTM D95	0.05% to 25%
		Kinematic Viscosity at 50°C	IS:1448 (Part-25)	80 cSt to 400 cSt
		Total Sulphur	ASTM D 4294	0.5% to 5.0% by mass
II.	LUBRICANTS			
1.	Lubricating Oil	Appearance	WI-02;(WIM Issue no II, Issue date 01.10.2017)	Qualitative (Descriptive)
		Ash Content	IS:1448(Part-4)	0.001% to 0.18% wt
		Colour	WI-03;(WIM Issue no II, Issue date 01.10.2017)	Qualitative (Descriptive)
		Colour ASTM	ASTM D-1500/ IS:1448(Part-12)	0 to 8.0 units
		Additive elements Ca, Zn, & P	ASTM D6481	0.002% to 0.60% by mass
		Crackle Test	WI-02A;WIM Issue no II, Issue date 01.10.2017	Qualitative (Negative to Positive)
		Cu Strip Corrosion for 3 hours at 100°C	IS:1448(Part-15)	Qualitative (1a to 4c Rating)
		Density	IS:1448 (Part-16) / ASTM D1298	0.660 g/ml to 1.1 g/ml
		Emulsion Characteristics	ASTM D1401	Up to 30 minute

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		Emulsion Stability Test	IS 1448 (Part-98)	Up to 0.2 ml
		Frothing Test	IS:1448(Part-99)	0 to 30
		Foaming Characteristic	IS 1448 - P 67 / ASTM D892	Qualitative
		Flash Point (COC)	ASTM D : 92 / IS:1448(Part-69)	80°C to 400°C
		Flash Point (PMCC)	IS:1448(Part-21)/ ASTM D93	66°C to 120°C
		Kinematic Viscosity at 40°C	IS:1448(Part-25)/ ASTM D445 / ASTM D7042	1.0 cSt to 400 cSt
		Kinematic Viscosity at 100°C	IS:1448(Part-25) / ASTM D445 / ASTM D7042	1.0 cSt to 50 cSt
		Pour Point	IS:1448(Part-10) / ASTM D 97	-38 to +20°C
		Total Acid Number (TAN)	ASTM D : 664-11a / IS:1448 (P:1)	(0.1to 10.0) mg KOH/g
		Total Base Number (TBN)	ASTM D:2896/ IS:1448 (P:86)	(0.1 to 40.0) mg KOH/g
		Viscosity Index	ASTM D:2270/ IS:1448(P : 56)	Calculated
		Water Content	IS:1448(Part-40)/ ASTM D95	0.05 to 25% by vol
2.	Lubricating Grease	Appearance	WI-02;(WIM Issue no II, Issue date 01.10.2017)	Qualitative (Descriptive)
		Colour	WI-03;(WIM Issue no II, Issue date 01.10.2017)	Qualitative (Descriptive)
		Consistency of lubricating Grease at 25+0.5°C,	IS:1448 (P : 60)	160 units to 400 units
		Drop Point	IS:1448 (P : 52) / D566	150°C to 230°C
		Drop Point over wide temp. range	ASTM D 2265	150°C to 380°C

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III.	INDUSTRIAL FINE CHEMICALS			
1.	Ethanol	Appearance	WI-02;(WIM Issue no II, Issue date 01.10.2017)	Qualitative (Descriptive)
		Colour	WI-03;(WIM Issue no II, Issue date 01.10.2017)	Qualitative (Descriptive)
		Ethanol Content at 15.6/15.6°C	IS 15464	94% to 100 %v/v
		Miscibility with Water	IS 15464 (Annexure-C)	Qualitative
		Relative Density at 15.6/15.6°C	IS 15464 (Annexure-A)	0.60 to 0.85
2.	Solvents	Appearance	WI-02;(WIM Issue no II, Issue date 01.10.2017)	Qualitative (Descriptive)
		Aromatics	IS:1448(Part-23)	5% to 50 % by Vol
		Colour Saybolt	IS:1448(Part-14) / ASTM D 156	-16 to 30 units
		Cu Strip Corrosion for 3 hours at 50°C	IS:1448(Part-15)	Qualitative (1a to 4c Rating)
		Density	IS:1448 (Part-16) / ASTM D1298	0.660 g/ml to 0.850 g/ml
		Distillation: -Temperature -Volume Recovery	IS:1448 (Part-18) / ASTM D 86	30 °C to 300°C 1.0% to 100 % Vol
		Existent Gum	IS:1448(Part-29) / ASTM D 381	0.1 to 10 g/100 ml
		Flash Point (Abel)	IS:1448(Part-20) / IP 170	10°C to 70°C

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CHEMICAL TESTING

AT MOBILE LAB FACILITY				
I.	PETROLEUM PRODUCT			
1.	Motor Spirit (MS)	Appearance	WI-02;(WIM Issue no II, Issue date 01.10.2017)	Qualitative (Descriptive)
		Colour	WI-03;(WIM Issue no II, Issue date 01.10.2017)	Qualitative (Descriptive)
		Density	IS:1448 (Part-16) / ASTM D1298	660 kg/m ³ to 800 kg/m ³
		Distillation: -Temperature -Volume Recovery upto 70°C Recovery upto 100°C Recovery upto 150°C	IS:1448 (Part-18) / ASTM D 86 / IP:123	30 °C to 400°C 1.0% to 100 % Vol
		Total Sulphur	ASTM D 4294 / ISO 2084	10 mg/kg to 200 mg/kg
2.	High Speed Diesel (HSD)	Appearance	WI-02;(WIM Issue no II, Issue date 01.10.2017)	Qualitative (Descriptive)
		Colour	WI-03;(WIM Issue no II, Issue date 01.10.2017)	Qualitative (Descriptive)
		Cetane Index (Calculated)	ASTM D-4737: 2010 (Reaffirmed 2016)	40 to 65
		Flash Point (Abel)	IS:1448(Part-20) / IP 170	10°C to 70°C
		Density	IS:1448 (Part-16) / ASTM D1298	700 kg/m ³ to 1000 kg/m ³
		Distillation: -Temperature -Volume Recovery	IS:1448 (Part-18) / ASTM D 86	30 °C to 300°C 1.0% to 100 % Vol

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		Kinematic Viscosity, at 40°C	IS:1448(Part-25)/ ASTM D445 / ASTM D7042	1.0 cSt to 5.0 cSt
		Total Sulphur	ASTM D 4294 / ISO 20847	10.0 mg/kg to 200 mg/kg
II.	LUBRICANTS			
1.	Lubricating Oil	Appearance	WI-02;(WIM Issue no II, Issue date 01.10.2017)	Qualitative (Descriptive)
		Colour	WI-03;(WIM Issue no II, Issue date 01.10.2017)	Qualitative (Descriptive)
		Additive elements Ca, Zn, & P	ASTM D6481	0.002% to 0.60% by mass
		Crackle Test	WI-02A;WIM Issue no II, Issue date 01.10.2017	Qualitative (Negative to Positive)
		Density	IS:1448 (Part-16) / ASTM D1298	0.660 g/ml to 1.1 g/ml
		Flash Point (COC)	ASTM D : 92 / IS:1448(Part-69)	80°C to 400°C
		Kinematic Viscosity at 40°C	IS:1448(Part-25)/ ASTM D445/ ASTM D7042	1.0 cSt to 400 cSt
		Kinematic Viscosity at 100°C	IS:1448(Part-25) / ASTM D445 / ASTM D7042	1.0 cSt to 50 cSt
		Viscosity Index	ASTM D:2270/ IS:1448(P : 56)	90 to 130
		Water Content	IS:1448(Part-40) / ASTM D95	0.05% to 25% by vol.