

**Laboratory**                      **Bharat Petroleum Corporation Limited, Quality Assurance Laboratory,  
Tondiarpet, 35, Vaidyanatha Mudali Street, Tondiarpet, Chennai,  
Tamil Nadu**

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

**Certificate Number**        **TC-7213 (in lieu of T-0842)**

**Page 1 of 10**

**Validity**                        **23.04.2018 to 22.04.2020**

**Last Amended on 26.04.2018**

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 AND PRODUCTS</b>			
1.	<b>Motor Gasoline (MS)</b>	Appearance	WI 02a - Issue No. II & Issue Dt. 01.10.2017	Qualitative (Descriptive by visual)
		Colour	WI 03 - Issue No. II & Issue Dt. 01.10.2017	Qualitative (Descriptive by visual)
		Aromatics Content	IS 1448 (Part-23)	5 % to 99 % by volume
		Olefins Content		0.3 % to 55 % by volume
		Cu Strip Corrosion Rating	IS:1448 (Part-15)	Qualitative (1a to 4c) by rating
		Density/ Relative Density at 15/15°C	IS:1448 (Part-15)/ ASTM D 130-12b	650 Kg/m <sup>3</sup> to 1200 Kg/m <sup>3</sup> 0.650 gm/ml to 1.200 gm/ml
		<b>Distillation:</b> Boiling Range	IS:1448 ( Part-18)/ ASTM D-86	20°C to 400°C
		Volume recovered/ Residue		Up to 100 %
		Gum content	IS:1448 (Part-29)	1 mg/100ml to 60mg/100ml 10 g/m <sup>3</sup> to 600 g/m <sup>3</sup>
		Research Octane Number (RON)	IS:1448 (Part-27)/ ASTM D2699	40 to 100
		Total Sulphur	ASTM D : 4294	0.0017% to 4.6% by Mass
			ISO 13032	8 mg/kg to 50 mg/kg
			IS:1448( Part-153) / ISO 20847	30 mg/kg to 500 mg/kg
		Ethanol Content	IS 2796 (Annexure E)	Up to 20% by vol

**Soundira Pandian K  
Convenor**

**N. Venkateswaran  
Program Director**

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Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-7213 (in lieu of T-0842)

Page 2 of 10

Validity 23.04.2018 to 22.04.2020

Last Amended on 26.04.2018

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
2.	High Speed Diesel			
a.	Hi Speed Diesel or Automotive Diesel Fuel (HSD)	Appearance	WI 02a ; Issue No. II & Issue Dt. 01.10.2017	Qualitative (Descriptive by visual)
		Colour	WI 03 ; Issue No. II & Issue Dt. 01.10.2017	Qualitative (Descriptive by visual)
		Cetane Index (Calculated)	ASTM D-4737	30 to 65
		Cu Strip Corrosion	IS:1448 (Part-15)	Qualitative (1a to 4c) by rating
		Density/ Relative Density at 15/15°C	IS:1448 (Part-15)/ ASTM D 130	650 Kg/m <sup>3</sup> to 1200 Kg/m <sup>3</sup> 0.650 gm/ml to 1.200 gm/ml
		Density	ASTM D 4052	650 Kg/m <sup>3</sup> to 1200 Kg/m <sup>3</sup> 0.650 gm/ml to 1.200 gm/ml
		<b>Distillation:</b> Boiling Range	IS:1448 (Part-18)/ ASTM D-86	20 °C to 400 °C
		Volume recovered/ Residue		Up to 100 %
		Flash Point (Abel)	IS:1448 ( Part-20)/ IP 170- 2014	0 to (+) 70 °C
		Flash Point (Pensky Marten)	IS:1448 (Part-21)/ ASTM D93	40°C to 360°C
		Kinematic Viscosity at 40°C	IS:1448 (Part-25)/ ASTM D445	1.0 cst to 20.0 cst
			ASTM D 7042	1.0 cst to 20.0 cst
		Pour Point	IS:1448 (Part-10)/ ASTM D 97	-38°C to +69 °C
			ASTM 5949	-38°C to +50 °C
		Sediments	IS:1448 (Part-30)	Up to 10 % by mass
		Total Sulphur	ASTM D : 4294	0.0017% to 4.6%by Mass
			IS:1448 (Part-153)/ ISO 20847	30 mg/kg to 500 mg/kg

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Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-7213 (in lieu of T-0842)

Page 3 of 10

Validity 23.04.2018 to 22.04.2020

Last Amended on 26.04.2018

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b.	High Flash High speed Diesel (HFHSD)	Ash Content	IS:1448 (Part-4)	0.001 % to 0.18 % wt.
		Appearance	WI 02a ; Issue No. II & Issue Dt. 01.10.2017	Qualitative (Descriptive by visual)
		Density/ Relative Density at 15/15°C	IS:1448 (Part-15)/ ASTM D 130-12b	650 Kg/m <sup>3</sup> to 1200 Kg/m <sup>3</sup> 0.650 gm/ml to 1.200 gm/ml
		Density	ASTM D 4052-2016	650 Kg/m <sup>3</sup> to 1200 Kg/m <sup>3</sup> 0.650 gm/ml to 1.200 gm/ml
		<b>Distillation:</b> Boiling Range	IS:1448 (Part-18) / ASTM D-86	20°C to 400°C
		Volume recovered/ Residue		Up to 100 %
		Flash Point (Pensky Marten)	IS:1448(Part-21)/ ASTM D93	40°C to 360°C
3.	Light Diesel Oil (LDO)	Kinematic Viscosity at 40°C	IS:1448(Part-25)/ ASTM D445	1.0 cst to 20.0 cst
			ASTM D 7042	1.0 cst to 20.0 cst
		Pour Point	IS:1448(Part-10)/ ASTM D 97	-38°C to +69 °C
			ASTM 5949	-38°C to +50 °C
		Total Sulphur	ASTM D : 4294	0.0017% to 4.6% by Mass
		Cu Strip Corrosion	IS:1448(Part-15)	Qualitative (1a to 4c unit)
		Density / Relative Density at 15/15°C	IS:1448(Part-16) / ASTM D1298	650 Kg/m <sup>3</sup> to 1200 Kg/m <sup>3</sup> 0.650 gm/ml to 1.200 gm/ml
		Flash Point (Pensky Marten)	IS:1448(Part-21) / ASTM D93	40°C to 360°C
		Kinematic Viscosity at 40°C	IS:1448(Part-25)/ ASTM D445 / ASTM D 7042	1.0 cst to 20.0 cst

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

**Certificate Number** TC-7213 (in lieu of T-0842)

**Page 4 of 10**

**Validity** 23.04.2018 to 22.04.2020

**Last Amended on** 26.04.2018

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		Pour Point	IS:1448 (Part-10)/ ASTM D 97	-38°C to +69 °C
		Sediments	IS:1448 (Part-30)	Up to 10 % by mass
		Total Sulphur	ASTM D:4294	0.0017 to 4.6% by Mass
		Water Content	IS:1448 (Part-40)	Up to 25% by Vol.
		Ash Content	IS:1448 (Part-4)	0.001% to 0.18% wt.
<b>4.</b>	<b>Fuel Oil (FO)</b>	Calorific Value-Gross	IS:1448 (Part-7)	9000 kcal/kg to 12000 kcal/kg
		Density / Relative Density at 15/15°C	IS:1448 (Part-16) / ASTM D1298	650 Kg/m <sup>3</sup> to 1200 Kg/m <sup>3</sup> 0.650 gm/ml to 1.200 gm/ml
		Flash Point (Pensky Marten)	IS:1448 (Part-21) / ASTM D93	40 °C to 360°C
		Kinematic Viscosity at 50°C	IS:1448 (Part-25)	50.0 cst to 400 cst
		Pour Point	IS:1448(Part-10) / ASTM D 97	-38°C to +69 °C
		Sediments	IS:1448(Part-30)	Up to10 % by mass
		Water Content	IS:1448(Part-40)	Up to 25% by Vol.
		Conradson Carbon Residue	IS 1447 (Part-122)	0.01% to 30 % wt
		Ash Content	IS:1448(Part -4)	0.001 % to 0.18% wt.
		Total Sulphur	ASTM D : 4294	0.0017% to 4.6% by Mass
<b>5.</b>	<b>SKO: Kerosene</b>	Appearance	WI 02a ; Issue No. II & Issue Dt. 01.10.2017	Qualitative (Descriptive by visual)
		Colour, Saybolt	IS:1448 (Part-14) /D 156	(-)16 Units to (+)30 Units
		Colour	WI 03 ; Issue No. II & Issue Dt. 01.10.2017	Qualitative (Descriptive by visual)
		Cu Strip Corrosion	IS:1448 (Part-15)	Qualitative (1a to 4c unit)
		Density, Relative Density at 15/15°C	IS:1448(Part-16) / ASTM D1298	650 Kg/m <sup>3</sup> to 1200 Kg/m <sup>3</sup> 0.650 gm/ml to 1.200 gm/ml

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**Certificate Number**        **TC-7213 (in lieu of T-0842)**

**Page 5 of 10**

**Validity**                        **23.04.2018 to 22.04.2020**

**Last Amended on 26.04.2018**

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		Density	ASTM D 4052	650 Kg/m <sup>3</sup> to 1200 Kg/m <sup>3</sup> 0.650 gm/ml to 1.200 gm/ml
		<b>Distillation:</b> Boiling Range	IS:1448 (Part-18)/ ASTM D-86	20° C to 400°C
		Volume recovered/ Residue		Up to 100 %
		Flash Point (Abel)	IS:1448(Part-20)/IP 170	0°C to (+)70 °C
		Smoke point	IS:1448 (Part-31)/ ISO 3014	5 mm to 35 mm
		Sulphur, Total	ASTM D:4294	0.0017% to 4.6% by Mass
<b>6.</b>	<b>Naptha</b>	Appearance	WI 02a ; Issue No. II & Issue Dt. 01.10.2017	Qualitative (Descriptive by visual)
		Aromatics, Olefins Content	IS:1448 (Part-23)	5 % to 99 % by Volume 0.3 % to 55% by Volume
		Calorific Value-Gross	IS:1448 (Part-7)	9000 kcal/kg to 12000 kcal/kg
		Density/ Relative Density at 15/15°C	IS:1448 (Part-16) / ASTM D:1298	650 Kg/m <sup>3</sup> to 1200 Kg/m <sup>3</sup> 0.650 gm/ml to 1.200 gm/ml
		Density	ASTM D 4052	650 Kg/m <sup>3</sup> to 1200 Kg/m <sup>3</sup> 0.650 gm/ml to 1.200 gm/ml
		<b>Distillation:</b> Boiling Range	IS:1448 (Part-18)/ ASTM D-86	20°C to 400°C
		Volume recovered/ Residue		Up to 100 %
		Gum content	IS:1448(Part-29)	1 mg/100ml to 60mg/100ml 10 g/m <sup>3</sup> to 600 g/m <sup>3</sup>
		Total Sulphur	ASTM D : 4294	0.0017% to 4.6%by Mass
<b>7.</b>	<b>Hexane</b>	Appearance	WI 02a ; Issue No. II & Issue Dt. 01.10.2017	Qualitative (Descriptive by visual)

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Certificate Number TC-7213 (in lieu of T-0842)

Page 6 of 10

Validity 23.04.2018 to 22.04.2020

Last Amended on 26.04.2018

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		Density, Relative Density at 15/15°C	IS:1448 (Part-16) / ASTM D1298	650 Kg/m <sup>3</sup> to 1200 Kg/m <sup>3</sup> 0.650 gm/ml to 1.200 gm/ml
		Density	ASTM D 4052	650 Kg/m <sup>3</sup> to 1200 Kg/m <sup>3</sup> 0.650 gm/ml to 1.200 gm/ml
		<b>Distillation:</b> Boiling Range	IS:1448 (Part-18) / ASTM D-86	20°C to 400°C
		Volume recovered/ Residue		Up to 100 %
		Non-Volatile Residue	IS 3470 (Annexure A)	0.0001 g/100 m to 0.1g/100 ml
8.	<b>Aviation Turbine Fuel (ATF)</b>	Total Acidity	IS:1448(Part-113)	Up to 0.100 mg KOH/g
		Appearance	WI 02a ; Issue No. II & Issue Dt. 01.10.2017	Qualitative (Descriptive by visual)
		Aromatics,	IS:1448 (Part-23)	5 - 40% by Vol
		Colour Saybolt	IS:1448(Part-14)/ D:156	(-)16 to (+)30, Units
		Cu Strip Corrosion	IS:1448(Part-15)	1a to 4c unit
		Density	IS:1448(Part-16) / ASTM D1298	650 Kg/m <sup>3</sup> to 900 Kg/m <sup>3</sup>
		Density	ASTM D 4052	650 Kg/m <sup>3</sup> to 900 Kg/m <sup>3</sup>
		<b>Distillation:</b> Boiling Range	IS:1448 (Part-18) / ASTM D-86	20°C to 400°C
		Volume recovered/ Residue		Up to 100 %
		Doctor Test	IS:1448 (Part-19)	Qualitative (Negative/ Positive)
		Electrical conductivity	ISO 6297	Up to 2000 pS/m
		Gum	IS:1448 (Part-29)	1 mg/100ml to 10mg/100ml

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**Page 7 of 10**

**Validity**                        **23.04.2018 to 22.04.2020**

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		Flash Point (Abel)	IS:1448(Part-20)/ IP 170	0 to (+) 70 °C
		Freezing Point	IS:1448(Part-11)/ ASTM D 2386	(-) 70 to 0°C
		Freezing Point	ASTM D 5972	(-) 70 to 0°C
		Kinematic Viscosity at (-20)°C	IS:1448 (Part-25)/ ASTM D445	1.0 cst to 10 cst
		Kinematic Viscosity at (-20)°C	ASTM D 7042	1.0 cst to 10 cst
		Silver Strip Corrosion classification	IP 227	0 unit to 4 units
		Smoke point	IS:1448 (Part-31)/ ISO 3014	5 mm to 35 mm
		Total Sulphur	ASTM D : 4294	0.0017% to 0.40% by mass
		<b>Water reaction:</b> Interface rating	IS:1448 (Part-42)	0 units to 4 units
		Separation Rating		1 to 3
		Naphthalene	IS:1448(Part-118)/ ASTM D-1840	0.05 % to 5 % Vol
<b>9.</b>	<b>Petroleum Solvents</b>			
<b>a.</b>	<b>Mineral Turpentine Oil (MTO)</b>	Appearance	WI 02a ; Issue No. II & Issue Dt. 01.10.2017	Qualitative (Descriptive by visual)
		Aromatics	IS:1448(Part -23)	2 % to 50 % vol
		Colour ,Saybolt	IS:1448(Part -14)/ D 156	(-)16 Units to (+)30 Units
		Cu Strip Corrosion	IS:1448(Part-15)	Qualitative (1a to 4c unit by rating)
		Density	IS:1448(Part-16) / ASTM D1298	0.650 gm/ml to 1.200gm/ml

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Tamil Nadu

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-7213 (in lieu of T-0842)

Page 8 of 10

Validity 23.04.2018 to 22.04.2020

Last Amended on 26.04.2018

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		<b>Distillation:</b> Boiling Range	IS:1448 (Part -18) / ASTM D-86	20°C to 400°C
		Volume recovered/ Residue		Up to 100 %
		Gum, mg/100ml	IS:1448 (Part-29)	1 to 60
		Flash Point (Abel)	IS:1448 (Part-20)/ IP 170- 2014	0 to (+) 70°C
<b>b.</b>	<b>Special Boiling Point Spirit (SBS)</b>	Appearance	WI 02a ; Issue No. II & Issue Dt. 01.10.2017	Qualitative (Descriptive by visual)
		Aromatics	IS:1448(Part -23)	2 % to 50 % by vol
		Colour Saybolt	IS:1448(Part -14)/ D 156	(-)16 Units to (+)30 Units
		Cu Strip Corrosion	IS:1448 (Part -15)	Qualitative (1a to 4c) by rating
		Density	IS:1448(Part -16) / ASTM D1298	0.650 gm/ml to 1.20gm/ml
		<b>Distillation:</b> Boiling Range	IS:1448 (Part -18) / ASTM D-86	20°C to 250°C
		Volume recovered/ Residue		Up to 100 %
		Gum content	IS:1448(Part -29)	1 mg/100ml to 60 mg/100ml
<b>II.</b>	<b>LUBRICANTS</b>			
<b>1.</b>	<b>Lubricant</b>	Appearance	WI 02a - Issue No. II & Issue Dt. 01.10.2017	Qualitative (Descriptive by visual)
		Colour	WI 03 - Issue No. II & Issue Dt. 01.10.2017	Qualitative (Descriptive by visual)
		Colour, ASTM	IS:1448 (Part -12)/ ASTM D:1500	0.5 to 8.0
		Crackle Test	WI 02b ; Issue No. II & Issue Dt. 01.10.2017	Qualitative (Positive or Negative)

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**Page 9 of 10**

**Validity**                         **23.04.2018 to 22.04.2020**

**Last Amended on 26.04.2018**

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		Cu Strip Corrosion	IS:1448 (Part-15)	1a to 4c unit
		Density	IS:1448 (Part-16) / ASTM D1298	0.650 gm/ml to 1.100gm/ml
		Density	ASTM D 4052	0.650 gm/ml to 1.100gm/ml
		Emulsion Characteristics	ASTM D1401	0 to 30
		Flash Point (COC)	ASTM D : 92 / IS:1448 (Part-69)	79°C to 400°C
		Flash Point (Pensky Marten)	IS:1448(Part-21)/ ASTM D93	65°C to 150°C
		Foaming Characteristics	ASTM D892	Up to 500 ml
		Insoluble (Hexane & Toluene)	ASTM D893	0.01% to 5.0%wt
		Kinematic Viscosity, at 40°C	IS:1448(Part-25)/ ASTM D445	1.0 cSt to 500 cSt
			ASTM D 7042	1.0 cSt to 500 cSt
		Kinematic Viscosity, at 100°C	IS:1448 (Part-25)/ ASTM D445	1.0 cSt to 50 cSt
			ASTM D 7042	1.0 cSt to 50 cSt
		Pour Point	IS:1448(Part-10) / ASTM D 97	-38°C to +69°C
			ASTM 5949	-38°C to +50°C
		Total Acid Number (TAN)	ASTM D:664	0.1 mg KOH/gm to 10.0mg KOH/gm
		Total Base Number (TBN)	ASTM D:2896	0.1 mg KOH/gm to 40.0 mg KOH/gm
		Viscosity Index	IS:1448 (Part- 56)/ ASTM D : 2270	85 to 150
		Water Content,	IS:1448(Part -40)	Up to 25% by Vol

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**Page 10 of 10**

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		Emulsion Stability Test	IS 1448 (Part -98)	0.1ml Oil / 0.2 Cream
		Frothing Test	IS:1448(Part -99)	Up to 30
<b>2.</b>	<b>Greases</b>	Drop Point	ASTM D 2265	30°C to 230°C
		Consistency of worked Grease at 25 + 0.5°C	IS:1448(Part- 60)	1 to 475