

<b>Laboratory</b>	<b>Bharat Petroleum Corporation Limited, QA Laboratory, Sewree 'K' Installation, Sewree Fort Road, Sewree (East), Mumbai, Maharashtra</b> Location 1: QA Laboratory Sewree (East) Location 2: QA Laboratory, Borkhedi, Nagpur Location 3: QA Laboratory, Kandla Location 4: QA Laboratory, Manmad		
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<b>Discipline</b>	<b>Chemical Testing</b>	<b>Issue Date</b>	<b>09.04.2014</b>
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<b>S.No.</b>	<b>Product / Material of Test</b>	<b>Specific Test Performed</b>	<b>Test Method Specification against which tests are performed</b>	<b>Range of Testing / Limits of Detection</b>
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**Location 1**

**I. PETROLEUM**

<b>1.</b>	<b>ATF</b>	Acidity Total	IS 1448 (Part-113):1983 Reaffirmed 2010 / ASTM D 3242-11/ IP 354-09	0 to 0.100 mgKOH/g
		Aniline Point	IS 1448 (Part-3):1984 Reaffirmed 2007 / IP 2-98 (2004) / ISO 2977-97 / ASTM D 611-12	40.0 to 80.0
		API Gravity	IS 1571-2008 (Table -1)	30 to 80
		Doctor Test	IS 1448 (Part-19)-1989 Reaffirmed 2007/ IP 30-07/ASTM D 4952 -12	Qualitative (Positive to Negative)
		Electrical Conductivity	IS 1448 (Part-148)-2002 Reaffirmed 2007 / IP 274-09 / ISO 6297-97/ASTM D 2624-09	20 to 1000 pS/m
		Specific Energy	ASTM D 3338-09	30 to 60 MJ/kg
		Silver Strip Corrosion Classification	IP 227 / 99	0 to 4 Rating

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<b>Location 1</b>				
	<b>ATF</b>	Freezing Point	IS 1448 (Part-11)-2004/ ASTM D 2386-06 (2012)	-70 to 0 °C
		Kinematic Viscosity at (-20)°C	IS 1448 (Part-25)-1976 Reaffirmed 2007/ ASTM D 445-2012 / IP 71 (Sec.1)-97/ ISO 3104	1.0 to 10 cSt
		Naphthalene	IS 1448 (Part-118)-1985 Reaffirmed 2007 / ASTM D1840-07 (2013)	0 to 5% by Vol.
<b>2.</b>	<b>LUBRICANTS/ HSD/ LDO</b>	Kinematic Viscosity at 40°C	IS 1448 (Part-25)-1976 Reaffirmed 2007/ ASTM D 445-2012 / IP 71 (Sec.1)-97/ ISO 3104	1.0 to 200 cSt
<b>3.</b>	<b>FO</b>	Kinematic Viscosity at 50°C	IS 1448 (Part-25)-1976 Reaffirmed 2007/ ASTM D 445-2012 / IP 71 (Sec.1)-97/ ISO 3104	100 to 400 cSt
		Relative Density at 15/15°C	IS 1448 (Part-32)-1992 Reaffirmed 2008 / IS 1448 (Part-16)- 1990 Reaffirmed 2007 / IP 160-99 / ISO 3675-98/ ASTM D 1298-12b	850 to 1000

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<b>Location 1</b>				
4.	<b>LUBRICANTS/LSHS</b>	Kinematic Viscosity at 100°C	IS 1448 (Part-25)-1976 Reaffirmed 2007/ ASTM D 445-2012 / IP 71 (Sec.1)-97/ ISO 3104/ ASTM D 7042	1.0 to 50 cSt
5.	<b>LUBRICANTS/HSD</b>	Kinematic Viscosity at 40°C	ASTM D 7042-2012	1.0 to 200 cSt
		Kinematic Viscosity at 100°C	ASTM D 7042-2012	1.0 to 50 cSt
6.	<b>MS/HSD/SKO/ATF/ SOLVENT/ ETHANOL/ NAPHTHA/ LUBRICANTS</b>	Appearance	WI-02-Rev. No. 01 Rev. Date: 15.04.2014	Qualitative (Visual)
7.	<b>ATF/ SOLVENTS/ NAPHTHA/ MS</b>	Aromatics	IS 1448(Part-23)-2004 Reaffirmed 2010 / IP156-08 / ISO 3837-93 / ASTM D 1319-13	Aromatics: 5 to 50% by Vol. Olefins 0.3 to 40% by Vol.
8.	<b>MS</b>	Benzene Content	ASTM D 5580-13	0.1 to 3.0% by Vol.
		Research Octane No.(RON)	IS 1448 (Part-27)-2013/ ASTM D 2699-13b / ISO 5164-05/ IP 237-06	80 to 100

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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
<b>Location 1</b>				
	<b>MS</b>	Ethanol Content	IS 2796 (Annexure E) ASTM D 4815-13	0 to 20% by Vol. Alcohols : 0.1 to 20% by Vol.
		Unwashed Gum	IS 1448 (Part-29)-2004 Reaffirmed 2010/ IP131-99 / ISO 6246-95 / ASTM 381-12	1 to 800 ppm
<b>9.</b>	<b>NAPHTHA/ LSHS</b>	Calorific Value-Gross	IS 1448 (Part-7)-2004 Reaffirmed 2010 / ASTM D 4868-00 (2010)	9000 to 12000 kcal/kg, Min
<b>10.</b>	<b>NAPHTHA</b>	Carbon and Hydrogen Ratio by weight	WI-30A, Rev. No. 01, Rev. Date: 15.04.2014	5 to 6
		Non Volatile Residue	IS 1448 (Part-64)	0.0001 to 0.1 gm/100 ml
<b>11.</b>	<b>HSD</b>	Cetane Index (Calculated)	ASTM D 4737-10 / IP 380-08/ ISO 4264-07	40 to 65
<b>12.</b>	<b>HSD / LDO/ LUBRICANTS/ LSHS</b>	Cloud and Pour Point	IS 1448 (Part-10)-Sec I-2012 , Sec II-2013 /ASTM D 97-2012 / IP 15-95(04) / ISO 3016-94	-36°C to 21°C
<b>13.</b>	<b>SKO/SOLVENTS</b>	Colour, Saybolt	IS 1448 (Part-14):1960 Reaffirmed 2008/ ASTM D 156 -12	0 to 30

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<b>Location 1</b>				
14.	MS/HSD/SKO	Colour	WI-03, Rev. No. 01, Rev. Date: 15.04.2014	Qualitative (Visual)
15.	MS/HSD/SKO/ LDO/ ATF/ SOLVENTS / LUBRICANTS	Cu Strip Corrosion Rating	IS 1448 (Part-15)-2004 Reaffirmed 2010 / IP 154-2000 / ISO 2160-98 / ASTM D 130-12	1a to 4c Unit
16.	MS/HSD/ SKO/ LDO/ FO/ SOLVENTS/ ATF/ NAPHTHA/ LUBRICANT	Density	IS 1448 (Part-16)-1990 Reaffirmed 2007 / ASTM D 1298-2012b / IP 160-99 / ISO 3675-98	0.660 to 1.00 gm/ml or 660 to 1000 kg/m <sup>3</sup>
17.	MS/HSD/ SKO/ ATF/ SOLVENT (SBP & MTO)/ NAPHTHA	<b>Distillation</b>	IS 1448 (Part-18)-1991 (Reaffirmed 2010)/ ASTM D-86-2012 / IP 123-2011/ISO 3405-11	
		<i>Temperature</i>		30 to 400°C
		<i>Volume</i>		0 to 100 ml % Vol.
18.	ETHANOL	Ethanol Content at 15.6	IS 15464 2004	94 to 100 % by Vol.
		Miscibility with Water	IS 15464 2004 (Annexure-C) Reaffirmed 2009	Qualitative (Yes / No)
		Relative Density at 15.6/15.6°C	IS 15464 2004(Annexure-A)	0.60 to 0.85

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<b>Location 1</b>				
19.	<b>MS/ATF/ SOLVENT/ NAPHTHA</b>	Existent Gum	IS 1448 (Part-29)-2004 Reaffirmed 2010/ IP131-99 / ISO 6246-95 / ASTM D 381-12	0 to 40 g/m <sup>3</sup>
20.	<b>SKO/HSD/ ATF/ SOLVENTS</b>	Flash Point (Abel)	IS 1448 (Part-20)-1998 Reaffirmed 2008 / IP 170-09 / ISO 13736-2013	19 to 70°C
21.	<b>HFHSD/LDO/ FO/ LUBRICANTS/ LSHS</b>	Flash Point (Pensky Marten)	IS 1448 (Part-21):2012 / ASTM D 93-2013 / IP 34-03 / ISO 2719	40 to 300°C
22.	<b>HSD/ LDO/ FO/ LSHS</b>	Sediments	IS 1448 (Part-30)-1970 Reaffirmed 2008 / IP 53-00 / ISO 3735-99/ ASTM D 473-07(2012)	0 to 10% by mass
23.	<b>ATF/SKO</b>	Smoke Point	IS 1448 (Part-31)-1968 Reaffirmed 2008/ISO 3014-1993/ ASTM D 1322-12E/ IP 57-95(2013)	10 to 30 mm
24.	<b>MS/HSD/SKO/ LDO/ FO/ ATF/ NAPHTHA/ LSHS</b>	Sulphur Total	IP336-2004 /ISO20847 -2004/ ASTM D 4294-2010 /P:153	0.0017 to 5.0 % by Mass

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<b>Location 1</b>				
25.	MS/ HSD/ SKO/ ATF/ NAPHTHA	Sulphur Total	ASTM D 3120 :10	3 to 1000 mg/kg
26.	HSD/LDO/FO/ LUBRICANTS/ LSHS	Water Content	IS 1448 (Part-40)-2004 Reaffirmed 2010 / IP 74-2000 / ISO 3733-99/ ASTM D 95-13e	0 to 25% by Vol.
27.	ATF/MS	<b>Water Reaction</b>	IS 1448 (Part-42)-2004 Reaffirmed 2010 / ASTM D 1094-07 (2013) / IP 289-06	
		<i>i. Interface Rating</i>		0 to 4 Units
		<i>ii. Separation Rating</i>		1 to 3 Units
28.	FO/HSD	Condarsion Carbon Residue	IS 1448 (Part-122)-1987 Reaffirmed 2010 / IP 13-94 (2003) / ISO 6615 -93 / ASTM D 189-06e (2010)	0.01 to 30% wt.
29.	HSD/LDO/FO/ LUBE	Ash Content	IS 1448 (Part-4)-2008 / IP 4 -05(2012) / ISO 6245-01/ASTM D 482 -12	0.001 to 0.18% wt.

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**Location 1**

30.	MS/HSD/SKO/ SOLVENTS/ATF / NAPHTHA/ LUBRICANT	Density	ASTM D 4052 -2011	0.660 to 1.00 gm/ml or 660 to 1000 kg/m <sup>3</sup>
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**II. OILS & LUBRICANTS**

1.	LUBRICANTS	Colour, ASTM	ASTM D 1500-2012/ IS 1448 (Part-12)-1967 Reaffirmed 2008 / IP 196-97(2011) / ISO 2049-96	0 to 8.0 Rating
		Crackle Test	WI-03A, Rev. No. 01, Rev. Date: 15.04.2014	Qualitative
		Flash Point (COC)	ASTM D 92-2012b / IS 1448 (Part-69)-1969 Reaffirmed 2008 / IP 36-02 / ISO 2592-00	80°C to 400°C
		Total Acid Number (TAN)	ASTM D 664-11a/ IS 1448 (Part- 1/Sec 1)-2002 Reaffirmed 2007/ IP 177-13	0.1-10.0 mgKOH/gm
		Total Base Number (TBN)	ASTM D 2896-11/ IS 1448 (Part-86)-1977 Reaffirmed 2011/ IP 276-12 / ISO 3771 – 11	0.1 to 40.0 mgKOH/gm



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<b>Location 1</b>				
	<b>LUBRICANTS</b>	Emulsion Characteristics	ASTM D1401-2012	0 to 30 min
		Viscosity Index	ASTM D 2270-10e1/ IS 1448 (Part- 56)-2013 / IP 226-04/ ISO 2909-02 ASTM D 7042-2012	85 to 150
<b>2.</b>	<b>GREASE</b>	Consistency of worked Grease at 25 + 0.5°C	IS 1448(Part- 60)-2004 Reaffirmed 2010 / IP 50-12/ASTM D 217 -10	160 to 400 Units
		Drop Point	IS 1448 (Part-52)-1971 Reaffirmed 2007 / ASTM D 566-02 (2009) / ASTM D 2265- 06 / ISO 2176-95	30°C to 300°C

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Location 2

**I. PETROLEUM PRODUCTS**

1.	MS/HSD/ SKO/ ATF/ SOLVENT/ ETHANOL/ HEXANE/ NAPHTHA/ LUBRICANTS	Appearance	WI 02, Rev. No. 01, Rev. Date: 15.04.2014	Qualitative (Visual)
2.	ATF/ SOLVENTS/ NAPHTHA/ MS	Aromatics Olefins Content	IS 1448 (Part-23) 2004 Reaffirmed- 2010 / IP156-08 / ASTM D 1319-13	Aromatics : 5 to 50% by Vol. Olefins : 0.3 to 40% by Vol.
3.	NAPHTHA/ LSHS	Calorific Value-Gross	IS 1448 (Part-7)-2004 Reaffirmed 2010/ ASTM D 4868-00 (2010)	9000 to 12000 kcal/kg, Min
4.	NAPHTHA	Carbon and Hydrogen Ratio by weight (calculation)	WI-30A, Rev. No. 01, Rev. Date: 15.04.2014	5 to 6
5.	HSD	Cetane Index, (Calculated)	ASTM D 4737-10	40 to 65
6.	SKO/ SOLVENTS/ ATF/ MTL	Colour, Saybolt	IS 1448 (Part-14)-1960 Reaffirmed 2008 / ASTM D 156 -12	0 to (+) 30 Units

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<b>Location 2</b>				
7.	<b>MS/HSD/SKO/ LUBRICANT</b>	Colour	WI 03 Rev. No. 01, Rev. Date: 15.04.2014	Qualitative (Visual)
8.	<b>MS/ HSD/ SKO/ LDO/ ATF/ SOLVENTS/ LUBRICANTS</b>	Cu Strip Corrosion	IS 1448 (Part-15)-2004 Reaffirmed 2010 / ASTM D 130-12	1a to 4c unit
9.	<b>MS/HSD/ SKO/ LDO/ FO/ SOLVENTS/ ATF/ NAPHTHA/ HEXANE/ LUBRICANT</b>	Density	IS 1448 (Part-16)-1990 Reaffirmed 2007 / ASTM D 1298-12b	660 to 1000 kg/m <sup>3</sup> 0.660 to 0.1000 gm/ml
10.	<b>MS/ HSD/ SKO/ ATF/ SOLVENT (SBP &amp; MTO)/ HEXANE/ NAPHTHA</b>	<b>Distillation</b>  <i>Temperature</i>  <i>Volume</i>	IS 1448 (Part-18)-1991/ ASTM D 86-12	30 to 400 °C  0 to 100% by Vol.
11.	<b>MS/ ATF/ SOLVENT/ NAPHTHA</b>	Existent Gum	IS 1448 (Part-29)-2004 Reaffirmed 2010 / ASTM D 381-12	0 to 40 g/m <sup>3</sup>

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<b>Location 2</b>				
12.	<b>SKO/ HSD/ ATF/ SOLVENTS</b>	Flash Point (Abel)	IS 1448 (Part-20)-1998/ IP 170-09	19 to 70°C
13.	<b>HFHSD/ LDO/ FO/ LUBRICANTS/ LSHS</b>	Flash Point (PMCC)	IS 1448 (Part-21):2012/ ASTM D 93-13	40 to 300°
14.	<b>LUBRICANTS/ LSHS</b>	Kinematic Viscosity at 100°C	IS 1448 (Part-25)-1976 Reaffirmed 2007/ ASTM D 445-12	1.0 to 200 cSt
15.	<b>LSHS/FO</b>	Kinematic Viscosity at 50°C	IS 1448 (Part-25)-1976 Reaffirmed 2007/ ASTM D 445-12	100 to 400 cSt
		Relative Density at 15/15°C	IS 1448 (Part-32)-1992 Reaffirmed 2008	850 to 1000 gm/ml
16.	<b>LUBRICANTS/ HSD/LDO</b>	Kinematic Viscosity at 40°C	IS 1448 (Part-25)-1976 Reaffirmed 2007/ ASTM D 445-12	1.0 to 50 cSt
17.	<b>ETHANOL</b>	Ethanol Content at 15.6/15.6°C	IS 15464 : 2004	94 to 100
		Miscibility with Water	IS 15464 : 2004 (Annexure-C)	Qualitative (Yes / No)
		Relative Density at 15.6/15.6°C	IS 15464 : 2004 (Annexure-A)	0.60 to 0.85 gm/cc

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<b>Location 2</b>				
18.	<b>HSD/ LDO/ LUBRICANTS/ LSHS</b>	Pour Point	IS 1448 (Part-10)-2013/ ASTM D 97-12	-36 to 21°C
19.	<b>MS</b>	Ethanol Content	IS 2796 (Annexure E)	0 to 20 % by vol
		Research Octane No. (RON)	IS 1448 (Part-27)-2013 / ASTM D 2699-13b	80 to 100
		Unwashed Gum	IS 1448 (Part-29)-2004	1 to 800 gm/m <sup>3</sup>
20.	<b>ATF/SKO</b>	Smoke point	IS 1448 (Part-31)-1968 Reaffirmed 2008	10 to 30 mm
21.	<b>MS/ HSD/ SKO/ LDO/ FO/ ATF/ NAPHTHA/ LSHS</b>	Sulphur, Total	ISO 20847-04/ ASTM D 4294-10	0.0017 to 5.0% by Mass
22.	<b>HSD/ LDO/ FO/ LUBRICANTS/ LSHS</b>	Water Content	IS 1448 (Part-40)-1987	0 to 25% by Vol.
23.	<b>HSD/ LUBRICANTS</b>	Kinematic Viscosity at 40°	ASTM D 7042-12	1.0 to 200 cSt

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<b>S.No.</b>	<b>Product / Material of Test</b>	<b>Specific Test Performed</b>	<b>Test Method Specification against which tests are performed</b>	<b>Range of Testing / Limits of Detection</b>
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Location 2

## II. OILS & LUBRICANTS

<b>1.</b>	<b>LUBRICANTS</b>	Colour, ASTM	ASTM D 1500-12/ IS 1448 (Part-12)-1967 Reaffirmed 2008	0 to 8.0 Rating
		Crackle Test	WI 03A, Rev. No. 01, Rev. Date: 15.04.2014	Qualitative
		Flash Point (COC)	ASTM D 92-12 / IS 1448 (Part-69)-1969 Reaffirmed 2008	80 to 400 °C
		Kinematic Viscosity at 100°C	ASTM D 7042-12	1.0 to 50 cSt
		Viscosity Index	ASTM D 2270-10/ IS 1448 (Part - 56)-2013 / ASTM D 7042-2012	85 to 150

**Ruchi Guntuku**  
Convenor

**N. Venkateswaran**  
Program Manager

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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
<b>Location 3</b>				
<b>I. PETROLEUM PRODUCTS</b>				
1.	<b>MS/HSD/SKO/ ATF/ SOLVENT/ ETHANOL/ HEXANE/ NAPHTHA/ LUBRICANTS</b>	Appearance	WI - 02, Rev. No. 01, Rev. Date: 15.04.2014	Qualitative (Visual)
		Colour	WI-03, Rev. No. 01, Rev. Date: 15.04.2014	Qualitative (Visual)
2.	<b>ATF/SOLVENTS /NAPHTHA/ MS</b>	Aromatics, Olefins Content	IS 1448 (Part-23)-2004 Reaffirmed 2010	Aromatics : 5 to 50% by Vol. Olefins : 0.3 to 40% by Vol.
		Existent Gum	IS 1448 (Part-29)-2004 Reaffirmed 2010	0 to 40 g/m <sup>3</sup>
3.	<b>NAPHTHA/FO</b>	Calorific Value-Gross	IS 1448 (Part-7)-2004 Reaffirmed 2010 / ASTM D 4868-00 (2010)	9000 to 12000 kcal/kg, Min
4.	<b>NAPHTHA</b>	Carbon and Hydrogen Ratio by weight (Calculation)	WI-30A, Rev. No. 01, Rev. Date: 15.04.2014	5 to 6
5.	<b>HSD/HFHS</b>	Calculated Cetane Index (Calculated)	ASTM D 4737-10 / ISO 4264-07/IP 380-08/ IS 1148 (Part-9)-1960 Reaffirmed 2002	40 to 65

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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
<b>Location 3</b>				
6.	SKO/ SOLVENTS	Colour, Saybolt	IS 1448 (Part-14)-1960 Reaffirmed 2008 / ASTM D 156 -12	0 to 30 Unit
7.	MS/HSD/SKO/ LDO/ATF/ SOLVENTS/ LUBRICANTS	Cu Strip Corrosion	IS 1448 (Part-15)-2004 Reaffirmed 2010 / ISO 2160-1998 / ASTM D 130-10	1a to 4c Rating
8.	MS/HSD/SKO/ LDO/FO/ SOLVENTS/ ATF/ NAPHTHA/ HEXANE/ LUBRICANT	Density	IS 1448 (Part-16) -1990 Reaffirmed 2007/ ASTM D 1298-2012/ ISO 3675-98	0.660 to 1.00 gm/ml or 660 to 1000 kg/m <sup>3</sup>
9.	MS/HSD/SKO/ ATF/ MTO/ HEXANE/ NAPHTHA	<b>Distillation</b>  Temperature Volume % Rec.	IS 1448 (Part-18)-1991 Reaffirmed 2010/ ASTM D 86-2012	30 to 400°C 0 to 100 ml
10.	SKO/HSD/ATF/ SOLVENTS	Flash Point (Abel)	IS 1448 (Part-20)-1998 Reaffirmed 2008/ IP 170-09/ISO 13736-97	19 to 70°C



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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
<b>Location 3</b>				
11.	<b>HFHSD/LDO/FO /LUBRICANTS</b>	Flash Point (Pensky Marten)	IS 1448 (Part-21):1992/ ASTM D 93-2012/ISO 3104-94	40°C to 300°C
12.	<b>LUBRICANTS/ HSD/LDO</b>	Kinematic Viscosity at 40°C	IS 1448 (Part-25)-1976 Reaffirmed 2007/ ASTM D 445-2012/ ISO 1719-02	1.0 to 200 cSt
		Pour Point	IS 1448 (Part-10/Sec1) -2012/ ASTM D 97-2012/ ISO 3016-1994	-36°C to +21°C
13.	<b>FO</b>	Kinematic Viscosity at 50°C	IS 1448 (Part-25)-1976 Reaffirmed 2007/ ASTM D 445-2012/ ISO 1719-02	100 to 400 cSt
		Relative Density at 15/15°C	IS 1448 (Part-32)-1992 Reaffirmed 2008/ IS 1448 (Part-16)-1990 Reaffirmed 2007	850 to 1000 kg/m <sup>3</sup>
14.	<b>ETHANOL</b>	Ethanol Content at 15.6/15.6°C	IS 15464 : 2004	94 to 100% by Vol
		Miscibility with Water	IS 15464 : 2004 (Annexure-C) Reaffirmed 2009	Qualitative (Yes / No)
		Relative Density at 15.6/15.6°C	IS 15464 : 2004(Annexure-A)	0.60 to 0.85 gm/cc

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<b>Location 3</b>				
15.	<b>HSD/LDO/FO</b>	Total Sediments	IS 1448 (Part-30)-1970 Reaffirmed 2008/ ASTM D 473-07/ ISO 3735-99	0 to 10% by mass
16.	<b>ATF/SKO</b>	Smoke point	IS 1448 (Part-31)-1968 Reaffirmed 2008/ISO 3014-1993	10 to 30 mm
17.	<b>MS/HSD/SKO/ LDO/ FO/ATF/ NAPHTHA</b>	Sulphur	IP336-2004 / ASTM D 3120:10/ ISO 20847-2004/ ASTM D 4294-2010	0.0017 to 5.0% by wt
18.	<b>HSD/LDO / FO/ LUBRICANTS</b>	Water Content	IS 1448 (Part-40)-1987 Reaffirmed 2011 / ASTM D 95-05 Reaffirmed 2010/ ISO 3733-99	0 to 25% by Vol.
19.	<b>ATF/MS</b>	<b>Water Reaction</b>	IS 1448 (Part-42)-1977/ ASTM D 1094-07	
		Interface Rating		0 to 4 unit
		Separation Rating		1 to 3

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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
<b>Location 3</b>				
20.	MS	Benzene Content	ASTM D 3606-07	0.1 to 3.0% by Vol.
		Benzene Content, (Individual & Total)	ASTM D 5580-13	Benzene: 0.1 to 3 % by Vol.
		Ethanol Content	IS 2796 (Annexure E)	0 to 20% by Vol.
		Oxygenates	ASTM D 4815-09	Alcohols : 0.1 to 20% by Vol.
		Research Octane No.(RON)	IS 1448 (Part-27)-2013 / ASTM D 2699-12a/ ISO 5164-1990	80 to 100
21.	LUBRICANTS/ HSD	Kinematic Viscosity at 40°C	ASTM D 7042-2012	1.0 to 200 cSt
		Kinematic Viscosity at 100°C	ASTM D 7042-2012	1.0 to 50 cSt
<b>II. OILS &amp; LUBRICANTS</b>				
1.	LUBRICANTS	Colour –ASTM	ASTM D 1500 -2012 / IS 1448 (Part-12)-1967 Reaffirmed 2003	0 to 8.0
		Crackle Test	WI – 03A, Rev. No. 01, Rev. Date: 15.04.2014	Qualitative

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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
<b>Location 3</b>				
	<b>LUBRICANTS</b>	Flash Point (COC)	ASTM D 92-2012b/ IS 1448 (Part-69)-1969 Reaffirmed 2008	80 to 400°C
		Kinematic Viscosity at 100°C	IS 1448 (Part-25)-1976 Reaffirmed 2007/ ASTM D 445-2012/ ISO 1719-02	1.0 to 50 cSt
		Viscosity Index	ASTM D 2270-10 e1/ IS 1448 (Part-56)-2013  ASTM D 7042-2012	85 to 150

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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
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**Location 4**

**I. PETROLEUM PRODUCTS**

1.	MS/ HSD/ SKO/ ETHANOL/ LUBRICANTS	Appearance	WI – 02, Rev. No. 01, Rev. Date: 15.04.2014	Qualitative (Visual)
		Colour	WI – 03, Rev. No. 01, Rev. Date: 15.04.2014	(Qualitative Visual)
2.	MS	Aromatics Olefins Content	IS 1448 (Part-23)-2004	Aromatics : 5 to 50 % by Vol Olefins : 0.3 to 40% by Vol
		Existent Gum	IS 1448 (Part-29)-2004 Reaffirmed 2010	0 to 40 g/m <sup>3</sup>
		Research Octane No.(RON)	IS 1448 (Part-27)-2013/ ASTM D 2699-13b	80 to 100
3.	HSD	Cetane Index (Calculated)	ASTM D 4737-10	40 to 65
4.	SKO	Colour Saybolt	IS 1448 (Part-14)-1960 Reaffirmed 2011 / ASTM D 156-12	0 to 30 Units
		Smoke point	IS 1448 (Part-31)-1968 Reaffirmed 2008/ ISO 3014-1993	10 to 30 mm

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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
<b>Location 4</b>				
5.	<b>MS/ HSD/ SKO/ LUBRICANTS</b>	Cu Strip Corrosion	IS 1448 (Part-15)-2004 Reaffirmed 2010	1a to 4c Rating
		Density	IS 1448 (Part-16)-1990 Reaffirmed 2007/ ASTM D 1298- 2012b	660 to 1000 kg/m <sup>3</sup> or 0.660 to 0.1000 gm/ml
6.	<b>MS/HSD/SKO</b>	<b>Distillation</b>	IS 1448 (Part-18)-1991 (Reaffirmed 2010)/ ASTM D 86-2012	
		<i>Temperature</i>		30 to 400 °C
		<i>Volume</i>		0 to 100% by Vol.
7.	<b>ETHANOL</b>	Ethanol Content at 15.6/15.6°C	IS 15464 : 2004	94 to 100% by Vol.
		Miscibility with Water	IS 15464 : 2004 (Annexure-C) Reaffirmed 2009	Qualitative (Yes / No)
8.	<b>SKO/HSD</b>	Flash Point (Abel)	IS 1448 (Part-20)-1998 Reaffirmed 2008/IP 170-09	19 to 70°C
9.	<b>LUBRICANTS/ HSD</b>	Kinematic Viscosity at 40°C	IS 1448 (Part-25)-1976 Reaffirmed 2007/ ASTM D 445-12	1.0 to 200 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
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**Location 4**

	<b>LUBRICANTS/ HSD</b>	Pour Point	IS 1448 (Part-10)-2013/ ASTM D 97-11	-36°C to 21°C
<b>10.</b>	<b>MS/HSD</b>	Sulphur Total	IP 336-04 /ISO 20847-04/ ASTM D 4294-11	0.0017 to 5.0 % by Mass

**II. OILS & LUBRICANTS**

<b>1.</b>	<b>LUBRICANTS</b>	Colour, ASTM	ASTM D 1500-07/ IS 1448 (Part-12)-1967 Reaffirmed 2008	0 to 8.0 Rating
		Flash Point (COC)	ASTM D 92-12b IS 1448 (Part-69)-1969 Reaffirmed 2008	80°C to 400°C
		Flash Point (Pensky Marten)	IS 1448 (Part-21):2012 / ASTM D 93- 2013	40°C to 300°C
		Kinematic Viscosity at 100°C	IS 1448 (Part-25)-1976 Reaffirmed 2007/ ASTM D 445-12	1.0 to 50 cSt
		Viscosity Index	ASTM D 2270-2010/ IS 1448 (Part-56)-2013	85 to 150

<b>Laboratory</b>	<b>Bharat Petroleum Corporation Limited, QA Laboratory, Sewree 'K' Installation, Sewree Fort Road, Sewree (East), Mumbai, Maharashtra</b> Location 1: QA Laboratory Sewree (East) Location 2: QA Laboratory, Borkhedi, Nagpur Location 3: QA Laboratory, Kandla Location 4: QA Laboratory, Manmad		
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<b>S.No.</b>	<b>Product / Material of Test</b>	<b>Specific Test Performed</b>	<b>Test Method Specification against which tests are performed</b>	<b>Range of Testing / Limits of Detection</b>
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#### **PFS MOBILE FACILITY**

##### **Location 1**

##### **I. LUBRICANTS**

<b>1. Lubricants</b>	Appearance	Visual	Qualitative
	Crackle Test	Qualitative	Qualitative
	Density at 29.5 °C	IS 1448 (Part 16)-2014 fourth revision/ASTM D1298 -12b ASTMD 7042-2014	0.880 to 0.900 g/ml
	Kinematic Viscosity at 100°C	ASTM D 7042-14	1.0 to 400 cSt
	Kinematic Viscosity at 40°C	IS 1448 (Part 25): 1976 (RA 2002) ASTM D445 2012	1.0 to 400 cSt
<b>II. PETROLEUM</b>			
<b>1. MS/ HSD</b>	Appearance	Visual	Qualitative
	Density	IS 1448 (Part 16)-2014 Fourth revision/ASTM D1298- 12b	0.660 to 1.00 g/ml
	Sulphur, Total	ASTM D 4294-10 ISO 20847:2004	0.0005 % to 5.0 % by Mass
	<b>Distillation</b>	IS 1448 (Part 18): 1991 (RA 2010)	
	Temperature	ASTM D 86: 2012	30 to 400 °C
	Volume		5 % to 100 % Vol.
	Recovery at 360 °C		85 % to 99 % Vol.



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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
<b>Location 1</b>				
2	<b>HSD</b>	Flash Point (Abel)	IS 1448 (Part 20): 1998 (RA 2008) IP 170: 09	18 °C to 70 °C
		Kinematic Viscosity at 40°C	IS 1448 (Part 25): 1976 (RA 2002) ASTM D445 2012 ASTM D 7042-14	1.0 cSt to 400 cSt  1.0 cSt to 400 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
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#### PFS MOBILE FACILITY

##### Location 2

<b>I. LUBRICANTS</b>	Appearance	Visual	Qualitative
<b>1. Lubricants</b>	Crackle Test	Qualitative	Qualitative
	Density at 29.5 °C	IS 1448 (Part 16)-2014 fourth revision/ASTM D1298 -12b ASTMD 7042-2014	0.880 to 0.900 g/ml
	Kinematic Viscosity at 100°C	ASTM D 7042-14	1.0 to 400 cSt
	Kinematic Viscosity at 40°C	IS 1448 (Part 25): 1976 (RA 2002) ASTM D445 2012	1.0 to 400 cSt
<b>II. PETROLEUM</b>			
<b>1. MS/ HSD</b>	Appearance	Visual	Qualitative
	Density	IS 1448 (Part 16)-2014 Fourth revision/ASTM D1298- 12b	0.660 to 1.00 g/ml
	Sulphur, Total	ASTM D 4294-10 ISO 20847:2004	0.0005 % to 5.0 % by Mass
	<b>Distillation</b>	IS 1448 (Part 18): 1991 (RA 2010)	
	Temperature	ASTM D 86: 2012	30 to 400 °C
	Volume		5 % to 100 % Vol.
	Recovery at 360 °C		85 % to 99 % Vol.

**Laboratory** Bharat Petroleum Corporation Limited, QA Laboratory, Sewree 'K' Installation,  
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<b>Location 2</b>				
2	HSD	Flash Point (Abel)	IS 1448 (Part 20): 1998 (RA 2008) IP 170: 09	18 °C to 70 °C
		Kinematic Viscosity at 40°C	IS 1448 (Part 25): 1976 (RA 2002) ASTM D445 2012 ASTM D 7042-14	1.0 cSt to 400 cSt 1.0 cSt to 400 cSt

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