

Laboratory Liquid Dielectrical Testing Laboratory, Raj Petro Specialities Pvt. Ltd.,
Survey No. 146/2/3, Madhuban Dam Road, Village Karad, Silvassa,
Dadra and Nagar Haveli

Accreditation Standard ISO/IEC 17025: 2005

Discipline Electrical Testing **Issue Date** 09.03.2014

Certificate Number T-2184 **Valid Until** 08.03.2016

Last Amended on 28.03.2014 **Page** 1 of 4

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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I. ELECTRICAL MATERIALS

1.	Transformer Oil	Appearance	IEC 60296 : 2003 IS 335 : 1993	Qualitative
		Density	ISO 3675 : 1993 IS 1448 (Part 16): 1990, (RA 2002)	0.7 g/cm ³ to 0.9 g/cm ³
		Kinematic Viscosity	ISO 3104 :1994 IS 1448 (Part 25): 1976, (RA 2002) ASTM D 445	1.5 cSt and above
		Pour Point	ISO 3016 : 1994 IS 1448 (Part 10): 1970, (RA 2003)	+ 20°C to -60°C
		Flash Point	ISO 2719 : 1988 IS 1448 (Part 21): 1992, (RA 2003)	0 to 380°C
		Neutralization Value	IEC 62021-1:2003 IS 1448 (Part 2): 2007	0 to 100 mg KOH/g
		Corrosive Sulfur	IEC 62535 : 2008 ASTM D 1275 B IS 335 : 1993, (RA 2005) Annex B DIN 51353	Qualitative

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	Transformer Oil	Electric Strength	IEC 60156 : 1995 IS 6792:1992, (RA 2003)	0 to 100 kV
		Dielectric Dissipation Factor (Tan δ)	IEC 60247 : 2004 IS 6262 :1971, (RA 2001)	0.00001 to 9.99
		Specific Resistance	IEC 60247 : 2004 IS 6103 : 1971, (RA 2001)	1 x 10 ⁹ to 1 x 10 ¹⁸ Ω cm
		(A) Oxidation stability a. Total Acidity b. Total Sludge	IEC 61125 : 1992 Method A IS 335 : 1993, (RA 2005) Annex C	0 to 100 mg KOH/ g 0 to 5 % by weight
		(B) Oxidation stability a. Total Acidity b. Total Sludge c. Tan δ	IEC 61125 : 1992 Method C	0 to 100 mg KOH/ g 0 to 5 % by weight 0.00001 to 9.99
		(C) Ageing Characteristics a. Total Acidity b. Total Sludge c. Specific Resistance	IS 12177 : 1987, (RA 2003) Method A	0 to 25 mg KOH/ g 0 to 5 % by weight 1x10 ⁻⁹ to 1x10 ¹⁷ Ohm-cm
		d. Dielectric Dissipation Factor		0.00001 to 9.99

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	Transformer Oil	Presence of Oxidation Inhibitor	IEC 60666 : 1979 IS 13631: 1993, (RA 2003)	0 to 0.5%
		Water Content	IEC 60814 : 1997 IS 13567: 1992, (RA 2003)	1 mg/kg and above
		Interfacial Tension	ISO 6295 : 1983 IS 6104 : 1971, (RA 2001)	0 to 90 N/m
		Furfural Content	IEC 61198 : 1993	0 to 200 mg/kg
		PCB Content	IEC 61619 : 1997	0 to 250 mg/kg
		PCA Content	BS 2000 (Part 346): 1996	0 to 5 %
		Carbon type composition (% of Aromatics, Paraffins & Naphtanics)	IEC 60590 : 1977 IS 13155 : 1991	Paraffinic (C _p) : 0 to 100% Aromatics (C _a): 0 to 100% Naphtanics (C _n): 0 to 100%
		Oxidation Stability (Rotating Bomb test)	ASTM D 2112-01a	1 Min and above

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	Transformer Oil	Gassing Tendency	IEC 60628 : 1985 Method A IS 12475 (Part 1): 1988 ASTM 2300	± 30 (+gas evolving & - gas absorbing)
		Total Sulfur Content	ISO 8754 : 2003 ASTM D 4294-98	0 to 5 %

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