

Laboratory	APAR Industries Ltd. (Power Oil Petroleum Product Division), Survey No. 148/1 & 148/3/1, Kudacha Village, Silvassa, Dadra and Nagar Haveli		
Accreditation Standard	ISO/IEC 17025: 2005		
Discipline	Electrical Testing	Issue Date	04.05.2014
Certificate Number	T-2232	Valid Until	03.05.2016
Last Amended on	19.05.2014	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 - LIQUID DIELECTRIC MATERIALS

1.	TRANSFORMER OIL/ RPO/ INDUSTRIAL OIL	Density	ASTM D 1298:2012b IS 1448 (Part: 16)-90, (RA 2007) ISO 3675: 1998	0.800 g/cm ³ to 0.950 g/cm ³
		Viscosity (-35°C to 100°C)	ASTM D 445-2012 IS 1448 (Part: 25)-76, (RA 2007), ISO 3104/COR 1-1997	2 cSt to 500 cSt >500 cSt
		Pour Point	ASTM D 97-2012, IS 1448 (Part: 10)-70, (RA 2008), ISO 3016: 1994	30°C to -57°C
		Flash Point (PMCC)	ASTM D 93-2013 E1 IS 1448 (Part: 21)-2012, ISO 2719 : 2002	90°C to 370°C
		Flash Point (CoC)	ASTM D 92-2012 B IS 1448 (Part: 66)-69, (RA 2008)	50°C to 400°C
		Interfacial tension at 25°C / 27°C	ASTM D 971-99a, (RE 2011) IS 6104 : 1971, (RA 2006), ISO 6295:1983	0 to 90 dynes/cm
		Total Acid no.	ASTM D 974- 2012 IS 1448 (Part: 2)-1967, (RA 2008), IEC 62021-1-2003, IEC 62021-11-2007	Upto 10 mgKOH/gm

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	TRANSFORMER OIL / RPO / INDUSTRIAL OIL	Corrosive Sulphur	ASTM D 130-2012, IS 335, Annex. B, (RA 2010), IEC 62535-2008-10, DIN 51353-2008 ISO 5662-1978, ASTM D 1275 B-06	Qualitative
		Antioxidant / Oxidation inhibitor content	ASTM D 2668-2013, IS 13631 (Section - I & II):1993 (RA 2008), IEC 60666 : 2010	0 to 0.9%
		Water Content	ASTM D 1533-2012 IS 13567 : 1992, (RA 2008), IEC 60814 : 1997	Upto 700 ppm
		Break Down Voltage	ASTM D 877-2013, IS 6792 : 1992, (RA 2008), IEC 60156 : 1995	0 to 100 kV
		Dielectric Dissipation Factor (25°C to 100°C)	ASTM D 924-08, IS 6262 : 1971, (RA 2008), IEC 60247-2004, IEC 61620-1998	Up to 2×10^{-1}
		Specific Resistance (27°C to 100°C)	ASTM D 1169-11, IS 6103 : 1971 (RA 2006) IEC 60247-2004	1×10^9 to $1 \times 10^{18} \Omega \text{ cm}$

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	TRANSFORMER OIL / RPO / INDUSTRIAL OIL	Oxidation Stability	ASTM D 2440: 2013	
		a. Neutralization value	IS 335, Annex. C, (RA 2010),	0.0001 to 10 mgKOH/gm
		b. Sludge	IEC 60296:74,	0 to 20%
		c. Dielectric Dissipation factor @ 90°C	IEC 61125, Method A, C-1992-08	
		Viscosity Index	ASTM D 2270-10e IS 1448 (Part 56), (RA 2008)	0 to 300
		Ageing Characteristics	IS 12177 : 1987, Method A, (RA 2008),	
		a. Sp. Resistance @27°C & 90°C	IS 6103 : 1971, (RA 2006),	1 X 10 ⁹ to 1 X 10 ¹⁸ Ωcm
		b. Dielectric Dissipation Factor @ 90°C	IS 6262 : 1971, (RA 2011),	Upto 2X10 ⁻¹
		c. Total Acidity	IS 1448 (Part: 2)-1967, (RA 2008)	0.0001 to 10 mgKOH/gm
		d. Total Sludge	Annex. A of IS 12177-87, (RA 2008)	0 to 20%
	Carbon Type Analysis	IS 13155 : 1991, (RA 2006), IEC 60590:1977-01 ASTM D 2300-08	Aromatic: 0 to 20% Paraffin: 30% to 80% Naphthanic: 20% to 60%	
	PCA content	BS 2000 (Part 346) 1996 IP 346-1994	0.1% to 15%	

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	TRANSFORMER OIL / RPO / INDUSTRIAL OIL	Aniline Point	ASTM D 611-12 IS 1448 (Part 3) (RA 1993)	25°C to 170°C
		Appearance	IEC 60296-2012, IS 335-1993 (RA 2010)	Qualitative
		Grassing Tendency	IEC 60625:1985, ASTM D 2300:08, IS 12475 (Part 1): 1988	-10 mm ³ /min to 30 mm ³ /min

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