

**Laboratory** Transformer Oil Testing Laboratory, Shree Abirami Engineering Works, Plot No. 9, Palani Nagar, Mouliwakkam, Porur, Chennai, Tamil Nadu

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

**Certificate Number** TC-6879 (in lieu of T-2055)

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**Validity** 29.01.2018 to 28.01.2020

**Last Amended on** 07.02.2018

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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**ELECTRICAL TESTING**

I.	<b>ELECTRICAL MATERIALS - LIQUID DIELECTRIC MATERIALS</b>			
1.	<b>Transformer Oil (Mineral Insulating Oil)</b>	Interfacial Tension (IFT)	IS: 6104-1971 (RA 2016)	0.01 N/m to 0.090 N/m
		Acidity (Neutralization Number)	IEC : 62021-3 : 2014 Method-B Coloumetric Method and ISO 6618 : 1997	0.1 mg-KOH/g to 1.0 mg-KOH/g
		Sludge/Sediment	IS: 1866:2005 (RA:2010)	Qualitative (Present/Absent)
		Water Content	IS: 13567:1992 (RA:2013) Method-I	1 mg/kg to 1000 mg/kg
		Flash Point	IS:1448 Part: 21: 1992 (RA 2012)	27°C to 370°C
		Dissolved Gas Analysis	IS:9434 -1992 (RA 2013) & IS:10593 - 2006 (RA 2016)	1 µl/l to 25,000 µl/l
		Methane		
		Ethane		
		Ethylene		
		Acetylene		
		Propane		
		Propylene		
		Hydrogen		
		Oxygen		
		Carbon monoxide		
Carbon dioxide				
Break Down Voltage	IS:6792-2017/ IEC 60156-1995	1 kV to 100 kV		
Tan Delta Test @ 90°C	IS:6262-1971 (RA 2016)	1x10 <sup>-6</sup> to 1		
Specific Resistivity Test	IS:6103-1971 (RA 2016)	10 <sup>9</sup> Ω-cm to 10 <sup>15</sup> Ω-cm		
Density	IS:1448 Part: 16: 2014 IS: 1866:2005 (RA: 2010) IS: 335:2005 (RA 2015)	0.8 g/cm <sup>3</sup> to 1.0 g/cm <sup>3</sup>		

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		Appearance	IS: 335:2005 (RA 2015)	Qualitative
		Viscosity	IS:1448 Part:25: 1976 (RA 2013)	7 cSt to 35 cSt
		2-furfural & related compounds	IEC 61198 / 1993-09	0.1 mg/kg to 25 mg/kg
		5 Hydroxymethyl 2- Furaldehyde	IS 15668-2006 (RA 2016 )	
		2 Furfuryl Alcohol	Method A (Liquid - Liquid Extraction)	
		2- Furaldehyde		
		2 Acetyl furan		
		5 Methyl – 2- Furaldehyde		
2.	Insulating Paper of Transformer	Degree of Polymerization	ASTM D 4243-99 (Reapproved 2016)	1 to 1500