

**Laboratory** Central Insulating Oil Testing Laboratory, Power Grid, Ghatkesar,  
Ranga Reddy Dist., Telangana

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

**Certificate Number** TC-5121

Page 1 of 5

**Validity** 25.10.2018 to 24.10.2020

Last Amended on --

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 Oils</b>	Carbon Type Composition: Praffinic (Cp)	ASTM D 2140: 2008	0 to 75 %
		Oxidative Ageing: Self Rotating Oven Ambient to 120 deg C: DDF	ASTM D 1934: 1995	1 x 10 <sup>-6</sup> to 2
		Gassing Tendency(+Gas evolving, -Gas Absorbing)	ASTM D 2300: 2008	Qualitative
		Oxidative Stability Bath Temp 120: Acidity	IEC 61125 METHOD C: 2018: 2018	0.0001 mg KOH/g to 2 mg KOH/g
		Oxidative Stability Bath Temp 120: sludge	IEC 61125 METHOD C: 2018	0 to 0.02 %
		Carbon Type Composition: Aromatic (Ca)	ASTM D 2140: 2008	0 to 20 %
		Dissolved Gas Analysis CH <sub>4</sub>	ASTM D-3612: 2017	1 µl/l to 100000 µl/l
		Dissolved Gas Analysis CO	ASTM D-3612: 2017	1 µl/l to 100000 µl/l
		Dissolved Gas Analysis CO <sub>2</sub>	ASTM D-3612: 2017	1 µl/l to 100000 µl/l
		Oxidative Ageing: Self Rotating Oven Ambient to 120 deg C: DDF	IS 12177 Method A: 1987	1 x 10 <sup>-6</sup> to 2
		Oxidative Ageing: Self Rotating Oven Ambient to 120 deg C: Sludge	ASTM D 1934: 1995	0 to 0.02 >%
		Oxidative Ageing: Self Rotating Oven Ambient to 120 deg C: Sludge	IS 12177 Method A: 1987	0 to 0.02 >%

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Page 2 of 5

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		Oxidative Ageing: Self Rotating Oven Ambient to 120 deg C: Specific Resistance	ASTM D 1934: 1995	1 x 10 <sup>10</sup> Ohm-cm to 1 x 10 <sup>16</sup> Ohm-cm
		Oxidative Ageing: Self Rotating Oven Ambient to 120 deg C: Specific Resistance	IS 12177 Method A: 1987	1 x 10 <sup>10</sup> Ohm-cm to 1 x 10 <sup>16</sup> Ohm-cm
		Oxidative Ageing: Self Rotating Oven Ambient to 120 deg C: Total Acidity	ASTM D 1934: 1995	0.0001 mg KOH/g to 2 mg KOH/g
		Oxidative Ageing: Self Rotating Oven Ambient to 120 deg C: Total Acidity	IS 12177 Method A: 1987	0.0001 mg KOH/g to 2 mg KOH/g
		Oxidative Stability Bath Temp 120: Sludge by weight	IS 335: 1993	0 to 0.02 >%
		Dissolved Gas Analysis N2	ASTM D-3612: 2017	250 µl/l to 1000000 µl/l
		Oxidative Stability Bath Temp 120: Dielectric Dissipation Factor(DDF)	IEC 61125 METHOD C: 2018: 2018	1 x 10 <sup>-6</sup> to 2
		Total Acidity	IEC 62021: 2007	0.0001 mg KOH/g to 2 mg KOH/g
		Water Content	IS 13567: 1992	1 mg/kg to 1000 mg/kg
		Carbon Type Composition: Aromatic (Ca)	IEC 60590: 1997	0 to 20 %
		Carbon Type Composition: Aromatics (Ca)	IS 13155: 1991	0 to 20 %
		Carbon Type Composition: Napthenic (Cn)	ASTM D2140: 2008	0 to 55 %
		Carbon Type Composition: Napthenic (Cn)	IEC 60590: 1997	0 to 55 %
		Carbon Type Composition: Napthenic (Cn)	IS 13155: 1991	0 to 55 %

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Page 3 of 5

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		Carbon Type Composition: Praffinic (Cp)	IEC 60590: 1997	0 to 75 %
		Carbon Type Composition: Praffinic (Cp)	IS 13155: 1991	0 to 75 %
		Corrosive sulphur	ASTM D 1275: 2015	Qualitative
		Corrosive Sulphur	IS 335 Annex-B: 1993	Qualitative
		Degree Of Polymerisation	IEC 60450: 2007	200 to 1500
		Density	ASTM 4052: 2016	0 to 3 g/cc
		Density	ISO 12185: 1996	0 to 3 g/cc
		Dielectric Dissipation Factor (DDF)	IEC 60247: 2004	$1 \times 10^{-9}$ to 2
		Dielectric Dissipation Factor (DDF)	IS 6262: 1971	$1 \times 10^{-6}$ to 2
		Dielectric Strength	IEC 60156: 1995	10 KV to 100 KV
		Dielectric Strength	IS 6792: 2017	10 KV to 100 KV
		Dissolved Gas Analysis TGC	ASTM D-3612: 2017	0.1 µl/l to 1000000 µl/l
		Dissolved Gas Analysis O <sub>2</sub>	ASTM D-3612: 2017	50 µl/l to 1000000 µl/l
		Dissolved Gas Analysis C <sub>2</sub> H <sub>4</sub>	ASTM D-3612: 2017	1 µl/l to 100000 µl/l
		Dissolved Gas Analysis C <sub>2</sub> H <sub>4</sub>	IEC 60567: 2011	1 µl/l to 100000 µl/l
		Dissolved Gas Analysis C <sub>2</sub> H <sub>6</sub>	IEC 60567: 2011	1 µl/l to 100000 µl/l
		Dissolved Gas Analysis CH <sub>4</sub>	IEC 60567: 2011	1 µl/l to 100000 µl/l
		Dissolved Gas Analysis CO	IEC 60567: 2011	1 µl/l to 100000 µl/l
		Dissolved Gas Analysis CO <sub>2</sub>	IEC 60567: 2011	1 µl/l to 100000 µl/l
		Dissolved Gas Analysis H <sub>2</sub>	ASTM D-3612: 2017	1 µl/l to 100000 µl/l
		Dissolved Gas Analysis H <sub>2</sub>	IEC 60567: 2011	1 µl/l to 100000 µl/l
		Dissolved Gas Analysis N <sub>2</sub>	IEC 60567: 2011	250 µl/l to 1000000 µl/l
		Dissolved Gas Analysis O <sub>2</sub>	IEC 60567: 2011	50 µl/l to 1000000 µl/l

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Page 4 of 5

**Validity** 25.10.2018 to 24.10.2020

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		Dissolved Gas Analysis TGC	IEC 60567: 2011	0.1 µl/l to 1000000 µl/l
		Dissolved Gas Analysis C <sub>2</sub> H <sub>2</sub>	ASTM D-3612: 2017	1 µl/l to 100000 µl/l
		Dissolved Gas Analysis C <sub>2</sub> H <sub>2</sub>	IEC 60567: 2011	1 µl/l to 100000 µl/l
		Dissolved Gas Analysis C <sub>2</sub> H <sub>6</sub>	ASTM D-3612: 2017	1 µl/l to 100000 µl/l
		Flash Point	ASTM D 6450: 2016	20 °C to 250 °C
		Flash Point	ASTM D93: 2016	20 °C to 250 °C
		Flash Point	IS 1448 PART 21: 2012	20 °C to 250 °C
		Flash Point	ISO 2719: 2002	20 °C to 250 °C
		Furan Analysis	ASTM D 5837: 2015	0 mg/kg to 200 mg/kg
		Furan Analysis	IEC 61198: 1993	0 mg/kg to 200 mg/kg
		Inhibitor Content for new and In service Oils	ASTM D 2668: 2007	0 to 0.5 %
		Inhibitor Content for new and In service Oils	IEC 60666: 2010	0 to 0.5 %
		Inter Facial Tension at 27 deg C	ASTM D 971: 2012	0 mN/m to 80 mN/m
		Inter Facial Tension at 27 deg C	IS 6104 +A1-1985: 1971	0 mN/m to 80 mN/m
		Kinematic Viscosity	ASTM D 7042: 2016	0.2 mm <sup>2</sup> /Sec to 10000 mm <sup>2</sup> /Sec
		Oxidative Stability Bath Temp 120: Acidity	IS 335: 1993	0.0001 mg KOH/g to 2 mg KOH/g
		Oxidative Stability Bath Temp 120: Dielectric Dissipation Factor(DDF)	IS 335: 1993	1 X 10 <sup>-6</sup> to 2
		Pour Point	ASTM D 2500: 2017	25 °C to -48 °C
		Pour Point	ASTM D 97: 2017	25 °C to -48 °C
		Pour Point	IS 1448: 2013	25 °C to -48 °C
		Pour Point	ISO 3016: 1994	25 °C to -48 °C
		SK VALUE	IS 335 Annex-D: 1993	Qualitative

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Page 5 of 5

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		Sludge Content	IS 1866: 2017	0 to 0.02 >%
		Specific Resistance	IEC 60247: 2004	1 x 10 <sup>10</sup> Ohm-cm to 1 x 10 <sup>16</sup> Ohm-cm
		Specific Resistance	IS 6103 + A1:1987: 1971	1 10 <sup>10</sup> Ohm-cm to 1 10 <sup>16</sup> Ohm-cm
		Water Content	IEC 60814: 1997	1 mg/kg to 1000 mg/kg