Laboratory	**Central Power Research Institute, Prof. Sir C.V. Raman Road, Sadashivnagar P.O., Bangalore, Karnataka**			
Accreditation Standard	**ISO/IEC 17025: 2005**			
Discipline	**Chemical Testing**	**Issue Date**	**10.06.2015**	
Certificate Number	**T-0008**	**Valid Until**	**09.06.2017**	
Last Amended on	**26.06.2015**	**Page**	**1 of 6**	

S. No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
I.	**LUBRICANTS**			
1.	**Inhibited & Un-Inhibited Mineral Insulating Oil, Turbine Oil, Hydraulic Oil**	Appearance	IS 335: 1993 (RA 2010) Cl. 6.0 IEC 60296: 12 Cl.6.6 ASTM D 4176: 14	Qualitative (Visual)
		Density	IS 1448 (Part 16): 1990 (RA 2013) ISO 3675: 1998 ASTM D 1298: 12b	0.80 g/ml to 0.90 g/ml
		Kinematic viscosity at 27 °C, 40 °C 100 °C & (-)30 °C	IS 1448 (Part 25): 1976 (RA 2013) ISO 3104: 1994 ASTM D 445: 15	2 cSt to 2000 cSt
		Neutralization value- (Total Acidity)	IS 1448 (Part 2): 2007 (RA 2013) ISO 6619: 1988 IEC 62021-1: 2003 ASTM D 664: 2011a	0 to 2.0 mg KOH/g
		Oxidation Stability by RPVOT	IS12958: 90 (RA 2011) ASTM D 2272: 14a	100 min to 3000 min
		Pour Point	ISO 3016: 1994 ASTM D 97: 2012	(-) 50 °C to 10 °C
2.	**Turbine Oil Hydraulic Oil**	Viscosity Index	IS 1448 (Part 56): 2013 ASTM D 2270: 2010 ISO 2909: 2002	50 to 200
		Flash and Fire Point	IS 1448 (Part 69): 2013 ASTM D 92: 12a	80 °C to 400 °C
		Water content by KF Potentiometric method	ASTM D 4377: 11	0 to 2 % wt

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	Turbine Oil Hydraulic Oil	Colour	ASTM D 1500: 12	0.05 to 8
		Foaming Characteristics After 5 Min After 10 Min	ASTM D892: 13 IS 1448 (Part 67): 2011 Amendment 1	 10 ml to 1000 ml
		Water separability Time Volume of Water Volume of Oil Volume of Emulsion	ASTM D 1401: 12 IS 1448 (Part 91): 2013	0 to 30 min 0 to 40 ml 0 to 40 ml 0 to 80 ml
		Demulsibility/ Emulsion Characteristics Total Free Water Water in Oil Emulsion	ASTM D2711: 11	 0 to 45 ml 0 to 2 ml 0 to 1 ml
		Rust Prevention Characteristics	ASTM D665: 14 IS 1448 (Part 96): 2013	Qualitative (Rusted /Rust Free)
		Copper Strip Corrosion	ASTM D130: 12 IS 1448 (Part 15): 2011 ISO 2160: 1998	Slight Tarnish to Corrosion (1A to 4C)
		Air Release Value	ASTM D3427: 14 IS 1448 (Part 102): 2013	0 to 30 min
		Trace Sediment	ASTM D 2273: 12	0 to 0.05 % vol.
3.	**Inhibited & Un-Inhibited Mineral Insulating Oil**	Interfacial Tension	IS 6104: 1971 (RA 2011) ASTM D 971: 12	0 to 80 mN/m
		Flash Point	IS 1448 (Part 21): 1992 (RA 2012) ISO 2719: 2002 ASTM D 93: 02a	40 °C to 360 °C

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	Inhibited & Un-Inhibited Mineral Insulating Oil	Oxidation Stability- Total Acidity Total Sludge DDF at 90 °C	IS 335: 1993 (RA 2010) Annex C IEC 61125: 1992 IS 12422: 1988 (RA 2013)	 0 to 25 mg KOH/g 0 to 5.0 % wt 0.00001 to 9.9
		Corrosive Sulphur	DIN 51353: 1985 ASTM D 1275: 2006 IEC 62535: 2008	Qualitative (Visual)
		Ageing characteristics Total Acidity DDF at 90 °C Resistivity 27 °C Resistivity 90 °C Total Sludge	IS 12177: 1987 (RA 2013) Method A	 0 to 2.0 mg KOH/g 0.00001 to 9.9 10^9 Ω–cm to 10^{16} Ω–cm 10^9 Ω–cm to 10^{16} Ω–cm 0 to 5.0 % by wt
		Presence of Oxidation Inhibitor (Phenolic type oxidation inhibitor)	IS13631: 2000 (RA 2013) IEC 60666: 10	Qualitative (Present or Absent) 0 to 1 %
		Water Content by KF Coulometric method	IS 13567: 1992 (RA 2013) IEC 60814: 1997	0 to 35000 mg/kg
		PCB Content	IEC 61619 : 1997	0 to 30 mg/kg
		2 – Furfural and related compounds	IEC 61198 : 1993	0 to 30,000 µg/kg
		Potentially Corrosive Sulphur	IEC 62535 : 2008	Qualitative (Non Corrosive to Corrosive)
		DBDS	IEC 62697-1: 2012	1 mg/kg to 2000 mg/kg
		Metal Passivator Additives	IEC 60666: 2010 Annex B	0 to 10 mg/kg

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	Inhibited & Un-Inhibited Mineral Insulating Oil	Dissolved Gas Analysis	IS 9434: 1992 (RA 2013) IEC 60567: 2011	
		Methane	IS 10593: 2006 (RA 2011)	0 to 25,000 mg/kg
		Ethane	IEC 60599: 1999	0 to 25,000 mg/kg
		Ethylene		0 to 25,000 mg/kg
		Acetylene		0 to 25,000 mg/kg
		Hydrogen		0 to 25,000 mg/kg
		Carbon Monoxide		0 to 25,000 mg/kg
		Carbon Di Oxide		0 to 25,000 mg/kg
		Oxygen		0 to 2,10,000 mg/kg
		Nitrogen		0 to 7,90,000 mg/kg
		Gassing Tendency	IS 12475 (Part 1): 1988 (RA 2013) IEC 60628: 1985 Method A	(-)16.66 mm^3/min to (+)33.33 mm^3/min
		Sediment & sludge	IS 1866: 00 (RA 2010) Annex. A IEC 6042: 2013-01 Annex. C	0 to 1.0 % by wt.
		Carbon Type Analysis (PNA)	IS13155: 1991 (RA 2011)	
		C_A	IEC 60590: 1977	0 to 100 %
		C_P		0 to 100 %
		C_N		0 to 100 %
		Total Sulphur content	ISO 14596: 2007	0 to 25000 mg/kg
		PCA Content	IP 346: 1992	0 to 10 %
		Electric Strength	IS 6792: 1972 (RA 2013) IEC 60156: 1995	5 kV to 100 kV
		Dielectric Dissipation Factor	IS 6262: 1971 (RA 2011) IEC 60247: 2004	0.00001 to 9.9

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	Inhibited & Un-Inhibited Mineral Insulating Oil	Specific Resistance (Resistivity)	IS 6103: 1971 (RA 2011) IEC 60247: 2004	At 90 °C: 10^9 Ω–cm to 10^{16} Ω–cm At 27 °C: 10^9 Ω–cm to 10^{16} Ω–cm
4.	**Polymeric Materials**	Glass Transition	ASTM D 3418: 12e	30 °C to 700 °C
		Melting Temperature by DSC	ASTM D 3417: 83	30 °C to 700 °C
		Thermal Analysis-Decomposition by TGA (Upto 1000 °C)	ASTM D 3850: 94	0 to 100 % wt.
		Coefficient of Linear Thermal Expansion by TMA (Upto 900 °C)	ASTM E 831: 14	0 to 2500 µm/m °C
		Halogen Acid Test	IS 10810 (Part 59): 1988 IEC 60754-1: 2011	0 to 1 % by wt.
II.	**COAL, COKE & OTHER SOLID FUEL**			
1.	**Coal and Coke**	Moisture Content	ASTM D 7582-12	0.1 % to 70 %
		Volatile Matter	ASTM D 7582-12	0.1 % to 70 %
		Ash Content	ASTM D 7582-12	0.1 % to 70 %
		Fixed Carbon	ASTM D 7582-12	By difference
		Gross Calorific Value	ASTM D 5863-13	3000 cal/g to 8000 cal/g for 1 g sample
		Carbon	ASTM D 5373-14	0.1 % to 95 %

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	Coal and Coke	Hydrogen	ASTM D 5373-14	0.01 % to 20 %
		Nitrogen	ASTM D 5373-14	0.01 % to 20 %
		Sulphur	ASTM D 4239-14	0.02 % to 20 %

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