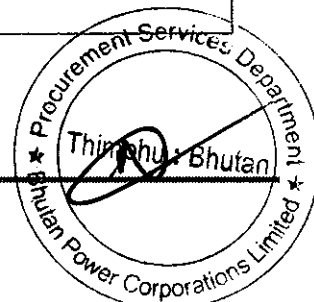


LOT 1: Lubricants

- 1.1 The insulating oil shall conform to all parameters either as per IEC-60296 or as specified below, while tested at supplier's premises. No inhibitors shall be used in oil. The supplier shall furnish test certificates from the supplier against their acceptance norms as mentioned below, prior to despatch of oil from refinery to site.

Sl #	Characteristics	Requirements	Method of Test
1	Appearance	The oil shall be clear and transparent and free from suspended matter or sediment	A representative sample of the oil shall be examined in a 100 mm thick layer, at ambient
2	Density at 20C (max.)	895 kg/m ³	IEC 60296
3	Kinematic Viscosity at 27C (Max.)	27 cSt	IS: 1448
4	Interfacial Tension at 27C (Min.)	43mN/m	IEC 60296
5	Flash point Pensky-Marten(closed) (Min.)	Min 135C	IEC 60296
6	Pour point (Max.)	-40C	IEC 60296
7	Neutralization value (total acidity) (Max.)	0.03 mg KOH/gm	IS: 335Appendix-1
8	Corrosive sulphur (in terms of Classification Of copper strip)	Non-Corrosive	IEC 60296
9	Electric strength (Breakdown voltage) (Min.)		
a)	New untreated oil	30kV (rms) (if this value is not attained the oil shall be treated)	IS: 6792
b)	After Treatment	60kV (rms)	-

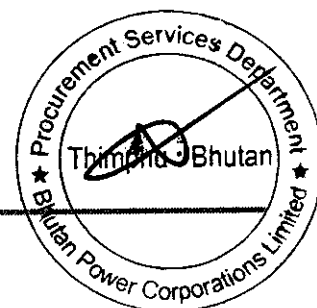


Section V- Schedule of Supply

Sl #	Characteristics	Requirements	Method of Test
10	Resistivity (Min.) (ohm cm)		IS: 6103
b)	at 27°C	1500x10 ¹²	
11	Oxidation stability		
a)	Neutralization value after oxidation (Max.)	0.40 mg KOH/gm	
b)	Total sludge after oxidation (Max)	0.05%	IEC 60296
12	Presence of oxidation inhibitor	The oil shall not contain anti-oxidant additives	IS: 335 Appendix-D
13	Water content (Max.)		
a)	New untreated oil	50ppm	IS: 2362
b)	After treatment	15ppm	IS: 1866
14	Aging Characteristics after 96hrs as per ASTM-D1934/IS: 12177 with catalyst (Copper)		
a)	Resistivity(Min) (ohm cm) at 27°C at 90°C	2.5x10 ¹² 0.2x10 ¹²	
b)	Tan delta at 90°C (Max.)	0.05	
c)	Total acidity (Max.)	0.03 mg KOH/gm	IEC 60296
d)	Sludge content wt. (Max.)	0.05 % (By weight)	
15	PCB Content	Less than 2 ppm	

1.2 Subsequently oil samples shall be drawn

- (i) Prior to filling in main tank at site and shall be tested for:
 - (1) BDV.
 - (2) Moisture content.



- (ii) Prior to energisation at site and shall be tested for following properties & acceptance norms:

(1)	BDV (kV rms)	60 kV (min.)
(2)	Moisture content	15 ppm (max.)
(3)	Tan-delta at 90°C	0.05 (max.)
(4)	Resistivity at 90°C	1×10^{12} ohm-cm (min.)
(5)	Interfacial Tension	0.03 N/m (min.)

- 1.3 At manufacturer's works oil sample shall be drawn before and after heat run test and shall be tested for following:

(1)	BDV	60 kV (min.)
(2)	Moisture content	15 ppm
(3)	Dissolved gas analysis:	

Samples for DGA shall be taken from sampling device within 24 hours prior to commencement of temperature rise test and immediately after this test. The acceptance norms with reference to various gas generation rates during the temperature rise test shall be as per IS: 10593 (based on IEC-599).

