

R04 UNINHIBITED SR POWERGRID

- 3.2.1.7 Each core lamination shall be insulated with a material that will not deteriorate due to pressure and hot oil.
- 3.2.1.8 The supporting frame work of the core shall be so designed as to avoid presence of pockets which would prevent complete emptying of the tank through drain valve or cause trapping of air during oil filling.
- 3.2.1.9 Adequate lifting lugs as required shall be provided to enable lifting of the core and winding.

3.3 Windings

- 3.3.1 The Contractor shall ensure that windings of reactors are made in dust proof and conditioned atmosphere.
- 3.3.2 The conductors shall be of electrolytic grade copper, free from scales and burrs.
- 3.3.3 The insulation of windings and connections shall be free from insulating components which are liable to soften, ooze out, shrink or collapse shall and be non-catalytic and chemically inactive in oil during service.
- 3.3.4 Coil assembly and insulating spacer shall be so arranged as to ensure free circulation of oil and to reduce the hot spots of the winding.
- 3.3.5 Coil shall be made up, shaped and braced to provide for expansion and contraction due to temperature changes.
- 3.3.6 The conductors shall be transposed at sufficient intervals in order to minimise eddy currents and to equalise the distribution of currents and temperature along the winding.

3.4 Unused uninhibited Insulating Oil

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

Sl. No.	Property	Test Method	Limits
A	Function		
1a	Viscosity at 40degC	ISO 3104	(Max.)12 mm ² /s
1b	Viscosity at -30degC	ISO 3104	(Max.)1800 mm ² /s
2	Appearance	A representative sample of the oil shall be examined	The oil shall be clear, transparent and free from

		in a 100 mm thick layer, at ambient temperature	suspended matter or sediment
2	Pour point	ISO 3016	(Max.)- 40 ^{deg} C
3	Water content a) for bulk supply b) for delivery in Drums	IEC 60814	(Max.) 30 mg/kg 40 mg/kg
4	Electric strength (breakdown voltage)	IEC 60156	(Min.) 30 kV/ 70 kV (after treatment)
5	Density at 20 deg C	ISO 3675 or ISO 12185	(max)0.895 g/ml
6	Dielectric dissipation factor (tan delta) at 90 ^{deg} C	IEC 60247 or IEC 61620	(Max)0.005
B Refining / Stability			
1	Acidity	IEC 62021-1	(Max)0.01 mg KOH/g
2	Interfacial tension at 27 ^{deg} C	ISO 6295	(Min)0.04 N/m
	Total sulfur content	BS 2000 part 373 or ISO 14596	0.15 %
3	Corrosive sulphur	CIGRE test method (TF A2.32.01 Revision of tests and specifications for corrosive sulfur in Transformer Oils)	Non-Corrosive ✓
4	Presence of oxidation inhibitor	IEC 60666	less than 0.02
5	2-Furfural content	IEC 61198	Max 0.1 mg/kg
C Performance			
1	Oxidation stability -Total acidity -Sludge	IEC 61125 (method c) Test duration 164 h	Max 0.3 mg KOH/g Max 0.05 %
2	Dielectric dissipation factor (tan delta) at 90 ^{deg} C	IEC 60247	Max 0.05
3	Gassing	IEC 60628 A	No general requirement, however <u>negative</u> gassing tendency is not acceptable.
D Health, safety and environment (HSE)			
1.	Flash point	ISO 2719	(Min.)135 ^{deg} C
2.	PCA content	BS 2000 Part 346	Max 3%
3.	PCB content	IEC 61619	Less than 1 mg/kg ↓
4.	Negative Impulse testing kVp	ASTM D-3300	≥145