



CORPORATE PURCHASING SPECIFICATION

AA 271 01

REV. No. 05

PAGE 1 OF 4

INSULATING OIL

1.0 GENERAL :

This specification governs the quality requirements of an unused and pure hydro carbon mineral oil, clean and free from matter likely to impair its properties and without any additive including oxidation inhibitor.

2.0 APPLICATION :

For use as a dielectric and cooling medium in Transformers, Switch gear, Capacitors and Bushings.

3.0 COMPLIANCE WITH NATIONAL STANDARDS :

There is no National standard covering the type of oil, however assistance has been draun from the following Indian Standard.

02

IS : 335-1993-New Insulating oils. (Reaffirmed 2000)

4.0 TEST METHODS :

Unless otherwise specified, the tests shall be conducted in accordance with relevant method of IS. 335.

5.0 SAMPLE FOR TEST:

5 litres of oil shall be supplied for testing and approval purposes.

6.0 PHYSICAL PROPERTIES :

The following tests shall be carried out on the oil in 'as received' condition.

6.1 Appearance:

Shall be clear,transparent and free from suspended matter or sediment.

6.2 Density at 27°C:

0.89 g/cm³ Max.

6.3 Interfacial Tension at 27°C :

0.04 N/m, Min.

6.4 Kinematic Viscosity at 27°C:

01

~~27 c St.~~ Max. 20 cst, max

6.5 Flash point, Pensky Marten (closed):

140°C, Min.

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A A 271 01

REV. No. 05

PAGE 2 of 4

CORPORATE PURCHASING SPECIFICATION



6.6 Water Content:

50 ppm, by weight Max.

6.7 Pour Point:

-15°C Max.

7.0 ELECTRICAL PROPERTIES:

7.1 Electric Strength (BDV):

7.1.1 As Received (New unfiltered Oil):

30 kV Min.

Note: If the above BDV value is not attained, the oil shall be filtered.

7.1.2 After Filtration:

60 kV(r.m.s.), Min.

7.2 Resistivity:

At 90°C: 35×10^{12} ohm - cm, Min.

At 27°C: 1500×10^{12} ohm - cm, Min.

7.3 Dielectric Dissipation Factor At 90°C (tan delta):

0.002, Max.

8.0 CHEMICAL PROPERTIES :

The following tests shall be carried out on the oil in 'as received' condition.

8.1 Neutralization Value (Total Acidity):

Total Acidity : 0.03 mg KOH^{1/3}, Max.

Inorganic Acidity/Alkalinity :

8.2 Corrosive Sulphur:

Non - Corrosive.

8.3 Oxidation Stability :

8.3.1 Neutralization Value after oxidation:

0.20 mg. KOH/g, Max.

8.3.2 Total Sludge after Oxidation:

0.05% by weight, Max.



CORPORATE PURCHASING SPECIFICATION

AA 271 01

REV. No. 05

PAGE 3 of 4

8.4 Presence of Oxidation Inhibitor:

Shall not contain any antioxidant additives.

Note: Value of 0.05 percent Max. shall be treated as absence of oxidation inhibitor.

8.5 SK Value :

6% Max

9.0 AGEING CHARACTERISTICS:

Accelerated ageing (115° C for 96 Hours) shall be done by open beaker method with copper catalyst.

9.1 Electrical Properties :

9.1.1 Resistivity :

At 90° C : 0.2×10^{12} ohm - cm, Min.

At 27° C : 2.5×10^{12} ohm - cm, Min.

9.1.2 Dissipation Factor (tan delta) at 90°C:

0.2, Max

9.2 Chemical Properties :

9.2.1 Total Acidity :

0.05 mg KOH/g, Max.

9.2.2 Total Sludge value :

0.05%, by weight, Max.

10.0 TEST REQUIREMENTS :

Oil samples taken after delivery at any place in India shall meet all test requirements stipulated in this specification.

11.0 TEST CERTIFICATE

Unless otherwise stated three copies of test certificates shall be sent along with each consignment.

In addition, the supplier shall ensure to send one set of test certificates along with the despatch documents to facilitate quick clearance of the material.

The test certificates shall bear the following information.

AA 27101 : (Revision: 05) : Insulating Oil

BHEL Order No.

Batch No /Lot No.

Quantity in litres/Number of drums:

Test values obtained and certificate for compliance with clauses 6 to 9.

AA 271 01	CORPORATE PURCHASING SPECIFICATION	
REV. No. 05		
PAGE 4 of 4		

12.0 PACKING AND MARKING :

Oil shall be delivered in perfectly clean steel drums of 210 Litre nominal capacity with flat or dished fixed ends conforming to Grade A or B of IS:1783. Inside surface of the drum may be coated with a suitable coating (e.g. epoxy lacquer, phosphate etc.) resistant to insulating oil. Outside surface of the drum shall be coated with suitable primer and finishing paint or be hot dip galvanized to IS:4759 for protection against atmospheric corrosion. The drums used shall be specially reserved for the purpose. Immediately after filling with oil the drums shall be effectively sealed so as to exclude ingress of moisture.

When stated on the order, oil shall be delivered in road tank wagons (tankers) specially reserved for this purpose and shall be suitably sealed so as to exclude ingress of moisture.

The drums/road tankers shall be indelibly marked with the following information:

AA 27101 : Insulating Oil

BHEL Order No.

Manufacturer's/Supplier's Name & Trade Mark

Batch No./Lot No.

Quantity in litres.