

SCHEDULE-III**TECHNICAL SPECIFICATIONS FOR SUPPLY OF
EHV GRADE TRANSFORMER OIL AGAINST TN-2120**

3.01 This specification covers manufacture, testing, inspection, supply and delivery of fresh, unused and pure EHV grade insulating transformer oil. The transformer oil should be clear and transparent and free from moisture and other suspended matter which are likely to impair its properties and without any additive including oxidation inhibitor.

3.02 **QUANTITY:**

Transformer Oil - **1400 K.Ls.**

The quantity as indicated above is approximate and may be increased or decreased to any extent at the time of finalisation of this tender enquiry.

3.03 **SPECIFICATION OF TRANSFORMER OIL :**

The transformer oil is for insulation and cooling of the electric transformers and switchgears of extra high voltage conforming to the Technical particulars as available at Appendix-I. The oil should also be suitable for oil circuit breakers and other electrical equipments in which oil is used as insulating medium. The tests on transformer oil shall be conducted in accordance with the relevant methods detailed in IS:335/1993 as amended up to date and as per our specification.

The input materials for the manufacture of transformer oil viz transformer oil base stock/ transformer oil feed stock shall be from Lube Refineries of Indian Oil Corporation/ Hindustan Petroleum Corporation/ Madras Refineries or may be imported and such TOBS/ TOFS shall have viscosity of 50 Redwood second or more at 37.8 deg.c. The supplier shall furnish the relevant documents in token of purchase of TOBS/ TOFS from the Lube Refineries or bill of lading/ entry (for imported TOBS) before effecting the supplies.

The technical parameters of the transformer oil are available at Appendix-I.

3.04 **PACKING :**

Packing shall be done in brand new barrels on non returnable basis, generally conforming to IS-1783 (Part-I)/1993: Grade A Type-2, 200/210 litre nominal capacity barrels made from 1.25 mm nominal thickness CRCA steel sheets. Body provided with two extended rolling hoops. Finished with one coat of stowing general paint on the outside.

Both the bungs big and another small shall be provided with capsules over screw caps and provisions shall be made on the upper part of the drum in

such a way that capsule can provide a seal between the drum and its concerns.

There will in addition be a provision on the capsule to apply lead seal with identification mark on the upper part of the drum in such a way that capsule can provide a seal between the drum and its corners.

There will in addition be a provision on the capsule to apply lead seal with identification mark representative of purchaser in such way that it would be impossible to tear the capsule without destroying the purchasers leads of identification mark.

3.05 **Markings:**

Each barrel/drum shall be indelibly marked with the following:

- a) Manufacturer's name or trade mark.
- b) Quantity in litres.
- c) Transformer oil.
- d) The word "Low Viscosity Type".
- e) Identification in code or otherwise to enable the date and lots of manufacture to be traced back to the factory records.
- f) ISI Certification Mark.
- g) Jaipur Vidyut Vitran Nigam Limited, Jaipur
- h) Consignees name.
- i) Sr.No. of Drum

The ISI mark on each Drum body shall be provided invariable.

The above marking shall be done with such type of ink which is customarily employed/ approved in petroleum products.

3.06 **TEST CERTIFICATE:**

The transformer oil shall invariably bear ISI certification mark for which ISI registration number shall be clearly indicated. The test certificate obtained from a recognised independent testing laboratory for transformer oil as per the IS 335/1993 with latest amendments shall be furnished along with the tender offer failing which the offer is liable to be rejected. The test certificate shall not be more than one year old. The values obtained shall not be inferior to those specified at Appendix-1 of the specification.

3.07 **INSPECTION, CHECKING & TESTING :**

Inspection, checking and testing as per IS 335/1993 (with latest amendments) and as per GTP of the purchase order of transformer oil shall be carried out before despatch. The tests for electrical characteristics shall be conducted at the manufacturers works in the presence of our Inspecting Officer. **Our inspecting officer will also provide lead seal on each drum with identification for convenience of our field staff.**

3.08 STORE CHECKING

- i) Composite samples from each lot shall be drawn from Nigam's Store in presence of firm's representative and will be sent for complete testing at CPRI, Bangalore. The testing of composite sample will also be carried out as per GTP of the Purchase Order. The firm will provide all facilities for drawing composite sample and hence presence of firm's representative for drawing sample will be mandatory. In case the sample of oil drum fails in type test at CPRI, Bangalore then for the used material, payment will be released after 15% deduction and remaining material will be lifted back by the firm. Necessary Payment will be released only after selection of Composite sample and store checking.
- ii) All charges for testing at CPRI Bangalore shall be borne by the supplier. Sampling of the oil for testing will be done in accordance with IS 6855/1972 (amended upto date).
- iii) One out of every 100 drums or part thereof from each lot (i.e. quantity received in Store(s) after inspection) will be selected for verifying tare weight of drum, total weight of drum and quantity in liters & compared with the packing details provided in the inspection report/ drum. The highest variation in percentage on negative side in respect of volume (in Liters) will be applicable on the sub-lot (store-wise) for release of payment. A tolerance of (-) 0.5 Litre per drum shall be allowed in the measurement of Transformer Oil at Store Checking.
- iv) The work of composite samples selection from each lot shall be carried out by any of the ACOS to be nominated by the SE(MM) in presence of firm's representative and samples will be sent for complete testing at CPRI, Bangalore by the concerned ACOS. The ACOS concerned will intimate the scheduled date to the firm for composite sample selection.
- v) The XEn (CTL) will intimate the scheduled date to the firm for quantity verification.

3.09 PRICE VARIATION:

The variation in quoted price of transformer oil shall be as per Annexure-II. The base price will be one month prior to the opening of the techno-commercial bid of the tender.

- 3.10 The quantity on order can be supplied with plus/ minus half percent tolerance.

3.11 PAYMENT IN ABSENCE OF TYPE TEST REPORTS

The provision of 85% payment in absence of type test reports will be applicable only for the old manufacturers who have supplied this item to any of the State Electricity Board/ Utility and the same have been type tested as per provisions of relevant ISS.

APPENDIX-I
IMPORTANT TECHNICAL PARTICULAR OF TRANSFORMER OIL TO BE
SUPPLIED AGAINST TN-2120

| Sr.No. | Description | Requirement |
|--------|--|--|
| 1. | Appearance | Clear & transparent free from suspended materials or sediments |
| 2. | Density at 29.5 Deg. C. (Max.) | 0.89 g/cc. |
| 3. | Kinematic viscosity at 27 Deg. C. (Max.) | 27 cst |
| 4. | Interfacial tension at 27 Deg. C. (Min.) | 0.04 N/m |
| 5. | Flash point pen skv marten(closed) Min. | 140 Deg.C. |
| 6. | Pour point (Max.) | (-) 6 Deg.C. |
| 7. | Neutralisation value a) Total acidity (Max.) b) Inorganic acidity/alkalinity | 0.01 mgKOH/g NIL |
| 8. | Corrosive sulphur (In terms of classification of copper strip). | Non-Corrosive |
| 9. | Electric strength (Break down voltage) a) New unfiltered oil (Min.) b) After filtration (Min.) | 40 KV rms 60 KV rms |
| 10. | Dielectric dissipation factor. (tan delta) at 90 Deg. C. (Max.) | 0.002 |
| 11. | Specific resistance (resistivity) (In Ohm-Cm.) a) At 90 Deg.C. (Min.) b) At 27 Deg.C. (Min.) | 12 100x10 12 1500x10 |
| 12. | Presence of oxidation inhibitor. | Shall not present any antioxidant additives. |
| 13. | Water contents ppm (Max.) | 30 by Weight. |
| 14. | Oxidation stability : a) Neutralisation value after oxidation (Max.) b) Total sludge.after oxidation (Max.) | 0.2 mgKOH/g 0.05 % by weight |
| 15. | S.K. Value (Max.) | 6% |
| 16. | Ageing characteristic after accelerated aging test: a) Specific resistance (resistivity) (In Ohm-cm) j) At 27 Deg.C. (Min.) ii) At 90 Deg.C. (Min.) b) Dielectric dissipation factor (tan delta) at 90 Deg.C.(Max.). c) Total acidity (in mgKOH/g) Max. d) Total sludge (Max.) | 12 2.5x10 12 0.2x10 0.15 0.05 0.05 % by weight |
| 17. | Viscosity of TOBS/ TOFS at 37.8 Deg.C.(Min). | 50 red wood second |