

Specification No. **TRE 224**  
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Rev. 01 Dt. : 03-10-2020

1. **General** - This specification governs the quality requirements of thermally upgraded micro-crepe kraft paper. The material in insulating oil shall have temperature index of at least 105°C.
2. **Applications** – This paper can be used as insulation paper for wrapping over winding conductor in transformers, reactors etc.
3. **Technical Particulars** – Paper should generally as per IS: 9335 / IEC: 60554-3-3 having specific requirement for thermally upgraded micro-crepe paper as below -

	Parameters	Values
1.	Nominal thickness	80 to 85 micron
2.	Tolerance on nominal thickness	±6 micron
3.	Density	> 0.95 g/cm <sup>3</sup>
4.	Surface finish	Micro-creped
5.	Elongation-MD	> 15%
6.	Tensile strength-MD	> 5.25 kN/m
7.	Conductivity of 5% aqueous extract	< 10 mS/m
8.	pH of 5% aqueous extract	6 to 8
9.	Ash content	< 1%
10.	BDV in air	> 8 kV/mm
11.	Nitrogen / Chemical content used for thermal upgrade	> 2%
12.	Type of paper	Thermally upgraded

4. **Test samples** – 20 sheets of 500 x 500 mm size.
5. **Test certificates** - Unless otherwise stated, test certificates shall be supplied along with each consignment. In addition, the supplier shall ensure to send one copy of test certificates along with their dispatch documents to facilitate quick clearance of the material. The test certificates shall bear the information as per above table.
6. **Packing & marking** – As the material is hygroscopic in nature, same should be seal packed in high density polyethylene bags. Packing shall be marked legibly at least with the BHEL Order No., Quantity & Date of manufacturer.

REV	DATE	ALT CHD	REV 01	DATE 03.10.20	ALT CHD	REV 00	NAME	SIGN	DATE
			Clause 3 and its sub-clause 3, 6, 7, 8 revised.			PREP.	AKSHAY DAVE	-sd-	21.12.19
						CHD.	R.K.SINGH	-sd-	21.12.19
DWI/TCB/TRE/010									