



TSD 6206

PLANT PURCHASING SPECIFICATION  
BHOPAL

BP 22896

REV NO. 05

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SUPERSEDES  
BP 22896 Rev.04

NATRIUM TREATED POLYTETRAFLUORO-ETHYLENE  
(PTFE) TAPE

1. GENERAL:

This specification governs the quality of polytetra fluoroethylene (PTFE) Tape manufactured from suitable grade of PTFE, with natrium (Sodium) treatment on surface which improves its adhesion to other materials.

The material is used upto maximum operating temperature of 250 deg.C.

2. APPLICATION:

For use in armature and field coils of class F/H insulated Traction Machines

3. COMPLIANCE WITH NATIONAL STANDARDS:

There is no Indian Standard covering this type of material.

4. DIMENSIONS AND TOLERANCES:

4.1 Sizes:

Thickness, width and length of the tape shall be stated on the order.

4.2 Preferred Thickness & Tolerances:

Thickness (mm)	Tolerance (mm)
0.04	± 0.01
0.13	+ 0.02 - 0.01
0.18	± 0.02

Revision :  
Reviewed & Brought upto date.

Issued by : *Sharda*  
STANDARDS AND MATERIALS GROUP  
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4.3 Preferred Widths & Tolerance:

12, 20, 25, 30 & 40 mm with tolerance of  $\pm 1.0$  mm.

4.4 Length:

30 metre/roll, unless otherwise specified.

5.0 FINISH:

The tape, when viewed by reflected light, shall be uniformly dark brown in colour. It shall be free from surface or edge defects, inclusions, voids and cracks which may affect its suitability for use.

6. TEST METHODS: As stated against each clause.

7. SAMPLE FOR TEST:

A roll of 30 metres length shall be supplied for testing and approval.

8. PHYSICAL PROPERTIES:

8.1 Melting Temperature (ASTM-D-1457) - (Type Test):

327  $\pm 10$  deg.C.

8.2 Presence of Pin Holes:

No in poles shall be found visually when tape is elongated by 50%.

9. MECHANICAL PROPERTIES:

Test shall be carried out on 5 test samples subjected to following condition.

i) As received Condition.

ii) After 24 hours of water immersion at room temperature (Type Test).

iii) After 4 hours of ageing in air at 250 deg.C (Type Test)

9.1 Tensile Strength: 20 N/mm<sup>2</sup>, Min.

9.2 Elongation: 300% Min.





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Note: Breaking Strength & Elongation test shall be carried out on full width of tape using a tensile testing machine with uniform rate of traverse of  $50 \pm 5$  mm per minute and gauge length of 25 mm.

10. CHEMICAL PROPERTIES:

10.1 Identification of Material:

The material shall be PTFE when identified by Infra-red spectrophotometer or by any conventional method.

11. ELECTRICAL PROPERTIES:

11.1 Electric Strength (BDV) IS:2584-1963, RA 2001

Test shall be carried out on 25 points on a sample and not more than 5 points shall show break-down voltage between the minimum & nominal value given in the table.

11.1.1 As Received Condition:

Thickness mm	Breakdown Voltage (kV)	
	Nominal	Minimum
0.04	3.5	2.2
0.13	10.4	6.0
0.18	12.0	8.0

11.1.2 After Water Immersion (Type Test):

A sample of suitable length shall be immersed in water at room temperature for  $24 \pm 1$  hours. Sample shall be taken out, water wiped off and then tested for breakdown voltage.

Thickness mm	Breakdown Voltage (kV)	
	Nominal	Minimum
0.04	3.0	2.0
0.13	7.8	4.5
0.18	9.5	6.0



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11.1.3 After Heat Ageing (Type Test):

A sample of suitable length shall be heated in air at  $250 \pm 5^\circ\text{C}$  for 4 hours. Sample shall be removed and allowed to cool to room temperature and then tested for breakdown voltage.

Thickness mm	Breakdown Voltage (kV)	
	Nominal	Minimum
0.04	2.5	1.5
0.13	6.5	4.0
0.18	7.5	5.0

11.2 Surface Resistivity (Annexure 1):

$10^8$  Ohms, Min.

12. TEST CERTIFICATE:

Unless otherwise specified, three copies of test certificates shall be supplied.

In addition, the supplier shall ensure to enclose one copy of the test certificate alongwith their despatch documents to facilitate quick clearance of the material.

The test certificate shall bear the following information.

BP 22896 : Natrium Treated Polytetrafluoroethylene (PTFE) Tape.  
Rev.05

BHEL Order No.

Batch/Lot No.

Test values obtained/certificates for compliance for Clause 4 and 8 to 11.



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13. PACKING AND MARKING:

The tape shall be supplied in rolls or reels wound on suitable bobbins, with both sides well protected. The rolls shall be suitably packed for protection against contamination and damage.

Each package shall be labelled with following:

BP 22896 : Natrium Treated Polytetrafluoroethylene (PTFE) Tape.

Manufacturer's/Suppliers Name & Trade Marks (if any)

Month & year of manufacture

BHEL Order No.

Batch/Lot No.

Thickness, Width & Length.

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ANNEXURE-I  
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TEST METHOD FOR SURFACE RESISTIVITY  
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Two strips of Aluminium foil shall be pasted on the surface of tape with petroleum jelly such that a gap of 10 mm is obtained. Apply 500 + 5 volts D.C. across the gap for one minute. The current is to be measured with a suitable current measuring device. The resistance per Cm length between two aluminium foils one cm apart gives the surface resistivity.