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Specification for
**Presspaper for
electrical purposes**

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Committee references ELE/16, ELE/16/53, ELE/16/53/5 Draft for comment 72/25772

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Electrical Installation Equipment Manufacturers' Association (BEAMA)	



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Foreword

This revision is based on information supplied by the Electrical Research Association and uses SI units.

The definition of presspaper is substantially in agreement with international proposals, although it should be noted that internationally the difference between 'paper' and 'board' is by 'grammage' (mass per unit area) whereas the electrical industry regards paper as being produced by a continuous process and board as being produced by an intermittent machine. A series of preferred thicknesses is given and the

electric strength is now a breakdown voltage and not a proof test. In the previous edition presspaper of type A of 0.3 mm and greater thickness could have layers bonded with adhesive but this is no longer permitted. Such laminated papers are the subject of a separate specification, BS . . . 'Laminated pressboard for electrical purposes', in course of preparation. *Certification.* Attention is drawn to the certification facilities described on the inside back cover of this standard.

British Standard Specification for

Presspaper for electrical purposes

1. Scope

This British Standard specifies requirements for presspaper either dyed or of natural colour; of four different types, each up to 0.5 mm thick; supplied either in roll form or as sheets cut from the roll; and with a smooth calendered finish.

NOTE 1. Sheet material made on an 'intermittent board' machine is covered by BS 231.

NOTE 2. Presspaper is available in greater thickness than 0.5 mm and with other types of finish (see clause 6) but, for such presspaper, limits should be subject to agreement between the purchaser and the manufacturer.

2. References

The titles of the British Standards referred to in this standard are listed on the inside back cover.

3. Definitions

For the purposes of this British Standard the following definitions apply.

3.1 presspaper. Multi-layer paper made by a continuous process from pulp entirely of natural vegetable origin and of high chemical purity.

3.2 machine direction. The direction in the plane of the paper corresponding to the flow of the stuff on the machine.

3.3 cross direction. The direction in the plane of the paper at right angles to the machine direction.

3.4 central value. When the values are arranged in ascending order, the middle value of an odd number of test results or the mean of the two middle values of an even number of test results.

4. Classification

The types of presspaper specified in this standard are as follows.

Type A. A high-density presspaper having good electrical and mechanical properties with a high degree of chemical purity and resistance to ageing.

Type B. A dense presspaper, more absorbent than type A, and having good resistance to ageing.

Type C. A soft porous presspaper, intended primarily for use in oil, and having a greater oil absorption than types A and D.

Type D. A hard presspaper, sometimes referred to as presspahn; usually made from chemical wood pulp.

5. Composition

Presspaper of all types covered by this specification shall be made entirely from vegetable fibre, with or without a suitable dye, and shall be free from conducting particles and other extraneous matter.

6. Finish

Presspaper complying with this specification shall have a smooth calendered finish. Presspaper of all types is available with a matt (i.e. uncalendered) finish and type D is available also with a glazed finish. When one of these types of finish is required it should be specified at the time of enquiry or order and the limiting values agreed with the supplier.

7. Preferred thicknesses and tolerances on thickness

The thickness shall be determined as described in appendix B. The thickness of the material at any point shall not differ from the nominal thickness by more than the appropriate value detailed in table 1.

Table 1. Preferred thicknesses and tolerances on thickness

Preferred nominal thickness*	Tolerance
mm	mm
0.10	± 0.01
0.15	+ 0.02 - 0.01
0.20	± 0.02
0.25	± 0.02
0.30	+ 0.03 - 0.02
0.40	+ 0.04 - 0.03
0.50	± 0.04

*For a nominal thickness other than the preferred value the tolerance shall be that given for the next thicker preferred nominal thickness.

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8. Density

The density shall be determined by the method described in appendix C, and shall be as detailed in table 2.

Table 2. Density

Type	Density	
	Minimum	Maximum
	kg/m ³	kg/m ³
A	1150	—
B	1000	1200
C	900	1100
D	1000	—

9. Electric strength in air or oil

The purchaser and the supplier shall agree whether the test be made in air or oil or both.

9.1 In air. When tested in accordance with appendix E, the electric strength shall be not less than the appropriate value read from figure 1 and, in addition, the individual results of all five tests shall be greater than 80 % of the appropriate value read from figure 1.

9.2 In oil. When tested in accordance with appendix E, the electric strength shall be not less than the appropriate value read from figure 2 and, in addition, the individual results of all five tests shall be greater than 80 % of the appropriate value read from figure 2.

10. Tensile strength

The tensile strength shall be determined as described in appendix F. The tensile strength in both the machine direction and the cross direction of the material shall be not less than the appropriate value read from figure 3.

11. Ageing in air

The effect of ageing in air shall be determined by the method described in appendix G. The decrease in bursting strength due to heat treatment at 130 °C for 168 h shall not exceed the appropriate value detailed in table 3.

Table 3. Effect of ageing in air

Type	Maximum decrease in bursting strength
	%
A	35
B	45
C	50
D	60

12. Oil absorption

The oil absorption shall be determined as described in appendix D, and shall be not less than the appropriate value read from figure 4 unless otherwise agreed between purchaser and supplier.

13. Freedom from conducting particles (optional test)

When tested by the method described in appendix H, presspaper shall be free from conducting particles.

14. Conductivity of aqueous extract

The conductivity of the aqueous extract shall be determined by the method described in appendix J. The conductivity of the aqueous extract shall not exceed the appropriate value detailed in table 4.

Table 4. Conductivity of aqueous extract at 25 °C

Type	Maximum conductivity
	S/m
A	7.5×10^{-3}
B	11.0×10^{-3}
C	11.0×10^{-3}
D	15.0×10^{-3}

15. pH value of aqueous extract

The pH value of the aqueous extract shall be determined by the method described in appendix K, and shall be as detailed in table 5.

Table 5. pH value

Type	Minimum	Maximum
A	7.0	9.0
B	6.5	8.5
C	6.0	8.5
D	6.0	8.5

16. Moisture content

The moisture content shall be determined as described in appendix L. The amount of moisture in presspaper as received shall not exceed 8 %.