

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE

**Pressboard and presspaper for electrical purposes –  
Part 3: Specifications for individual materials – Sheet 1: Requirements for  
pressboard, types B.0.1, B.0.3, B.2.1, B.2.3, B.3.1, B.3.3, B.4.1, B.4.3, B.5.1, B.5.3  
and B.6.1**

[IEC 60641-3-1:2008](#)

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**Carton comprimé et papier comprimé à usages électriques –  
Partie 3: Spécifications pour matériaux particuliers – Feuille 1: Exigences pour  
les cartons comprimés, types B.0.1, B.0.3, B.2.1, B.2.3, B.3.1, B.3.3, B.4.1, B.4.3,  
B.5.1, B.5.3 et B.6.1**



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IEC Central Office  
3, rue de Varembe  
CH-1211 Geneva 20  
Switzerland  
Email: [inmail@iec.ch](mailto:inmail@iec.ch)  
Web: [www.iec.ch](http://www.iec.ch)

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**PRESSBOARD AND PRESSPAPER  
FOR ELECTRICAL PURPOSES –****Part 3: Specifications for individual materials –  
Sheet 1: Requirements for pressboard, types B.0.1, B.0.3, B.2.1,  
B.2.3, B.3.1, B.3.3, B.4.1, B.4.3, B.5.1, B.5.3 and B.6.1**

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IEC 60641-3-1 has been prepared by IEC technical committee 15: Solid electrical insulating materials.

This second edition cancels and replaces the first edition published in 1992. This edition constitutes a technical revision.

The main changes with respect to the previous edition are listed below:

- requirements for types B.0.3 and B.5.3 were added;
- the precompressed type B.3.1 was divided in B.3.1A and B.3.1B (higher flexibility);
- types B.6.1 has been replaced with a new type, but the designation has been kept;
- type B.7.1 has been deleted;
- the thickness relation of the properties has been simplified;

– the values were adjusted to today's needs of users.

The text of this standard is based on the following documents:

|            |                  |
|------------|------------------|
| CDV        | Report on voting |
| 15/390/CDV | 15/439/RVC       |

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all the parts in the IEC 60641 series, under the general title *Pressboard and presspaper for electrical purposes*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

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## PRESSBOARD AND PRESSPAPER FOR ELECTRICAL PURPOSES –

### Part 3: Specifications for individual materials – Sheet 1: Requirements for pressboard, types B.0.1, B.0.3, B.2.1, B.2.3, B.3.1, B.3.3, B.4.1, B.4.3, B.5.1, B.5.3 and B.6.1

#### 1 Scope

This International Standard gives the requirements for pressboard for electrical purposes comprised of 100 % sulphate wood pulp or a mixture of sulphate wood pulp and cotton.

Materials which conform to this specification meet established levels of performance. However, the selection of a material by a user for a specific application should be based on the actual requirements necessary for adequate performance in that application and not based on this specification alone.

#### SAFETY WARNING

It is the responsibility of the user of the methods contained or referred to in this document to ensure that they are used in a safe manner.

#### 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60641-1:2008, *Pressboard and presspaper for electrical purposes – Part 1: Definitions and general requirements*

IEC 60641-2:2004, *Pressboard and presspaper for electrical purposes – Part 2: Methods of test*

### 3 Designation (according to IEC 60641-1)

| Type           | Composition  | Description  | Table |
|----------------|--|--|-------|
| B.0.1<br>B.0.3 | 100 % sulphate wood pulp<br>Mixture of sulphate wood pulp and cotton | Pressboard of particularly high chemical purity.   | 1     |
| B.2.1<br>B.2.3 | 100 % sulphate wood pulp<br>Mixture of sulphate wood pulp and cotton | Pressboard characterized by high chemical purity.  | 1     |
| B.3.1<br>B.3.3 | 100 % sulphate wood pulp<br>Mixture of sulphate wood pulp and cotton | Precompressed pressboard, a hard and rigid board, characterized by high chemical purity and mechanical strength. Its surface bears a cloth mark. | 1     |
| B.4.1<br>B.4.3 | 100 % sulphate wood pulp<br>Mixture of sulphate wood pulp and cotton | Pressboard characterized by high chemical purity and high oil absorption and capable of being shaped.  | 2     |
| B.5.1<br>B.5.3 | 100 % sulphate wood pulp<br>Mixture of sulphate wood pulp and cotton | Mouldable pressboard of high chemical purity and high oil absorption.  | 2     |
| B.6.1          | 100 % sulphate wood pulp   | Pressboard of low porosity for dry type application.   | 2     |

NOTE 1 Qualities with specially high densities are designed in column B of B.0.1 (Table 1), B.2.1 (Table 1) and B.6.1 (Table 2).

NOTE 2 Precompressed board with high rigidity is designed in column A of B.3.1 (Table 1); precompressed board with moderate rigidity and higher flexibility in column B of B.3.1 (Table 1).

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### 4 Requirements

IEC 60641-3-1:2008

The material shall conform to the general requirements as given in IEC 60641-1 and to the specific requirements of the appropriate type given in Tables 1 and 2 of this Sheet.



Table 1 – Requirements for pressboard types B.0, B.2 and B.3

| Property   | IEC 60641-2<br>Clause or<br>subclause | Unit              | Min. / Max.<br>or<br>range | B.0 Pressboard of particularly<br>high chemical purity |   |   | B.2 Pressboard characterized by<br>high chemical purity |   |   | B.3 Precompressed pressboard, a<br>hard and rigid board,<br>characterized by high chemical<br>purity and mechanical strength. |   |   |   |
|--|---------------------------------------|-------------------|----------------------------|--|---|---|---|---|---|---|---|---|---|
|  |                                       |                   |                            | B.0.1 A<br>100 %<br>sulphate<br>wood pulp              | B.0.1 B<br>100 %<br>sulphate<br>wood pulp | B.0.3<br>Mixture of<br>sulphate<br>wood pulp<br>and<br>cotton | B.2.1 A<br>100 %<br>sulphate<br>wood pulp               | B.2.1 B<br>100 %<br>sulphate<br>wood pulp | B.2.3<br>Mixture of<br>sulphate<br>wood pulp<br>and<br>cotton | B.3.1 A<br>100 %<br>sulphate<br>wood pulp   | B.3.1 B<br>100 %<br>sulphate<br>wood pulp | B.3.3<br>Mixture of<br>sulphate<br>wood pulp<br>and<br>cotton |   |
| Thickness<br>Deviation from nominal<br>≤ 1,6 mm<br>> 1,6 mm  | 5                                     | %                 | Max.                       | ± 7,5<br>± 5   | ± 7,5<br>± 5                              | ± 7,5<br>± 5  | ± 7,5<br>± 5  | ± 7,5<br>± 5                              | ± 7,5<br>± 5  | ± 7,5<br>± 5  | ± 7,5<br>± 5                              |   |   |
|  |                                       |                   |                            | 1,0 – 1,2<br>1,0 – 1,2<br>1,0 – 1,2                    | 1,2 – 1,3<br>1,2 – 1,3<br>1,2 – 1,3       | 1,0 – 1,2<br>1,0 – 1,2<br>1,0 – 1,2                           | 1,0 – 1,2<br>1,0 – 1,2<br>1,0 – 1,2                     | 1,0 – 1,2<br>1,0 – 1,2<br>1,0 – 1,2       | 1,0 – 1,2<br>1,0 – 1,2<br>1,0 – 1,2                           | 1,0 – 1,2<br>1,0 – 1,2<br>1,0 – 1,2   | 0,95 – 1,15<br>1,05 – 1,2<br>1,1 – 1,25   | 0,95 – 1,15<br>1,05 – 1,2<br>1,1 – 1,25                       | 0,95 – 1,15<br>1,05 – 1,2<br>1,1 – 1,25 |
|  |                                       |                   |                            | 80<br>80<br>80   | 90<br>90<br>90                            | 60<br>60<br>60  | 80<br>80<br>80  | 90<br>90<br>90                            | 60<br>60<br>60  | 100<br>105<br>110   | 80<br>85<br>90                            | 80<br>85<br>90  | 45<br>50<br>55                          |
| Apparent density<br>≤ 1,6 mm<br>> 1,6 – 3,0 mm<br>> 3,0 mm   | 6                                     | g/cm <sup>3</sup> | Range                      | ± 7,5<br>± 5   | ± 7,5<br>± 5                              | ± 7,5<br>± 5  | ± 7,5<br>± 5  | ± 7,5<br>± 5                              | ± 7,5<br>± 5  | ± 7,5<br>± 5  | ± 7,5<br>± 5                              |   |   |
|  |                                       |                   |                            | 1,0 – 1,2<br>1,0 – 1,2<br>1,0 – 1,2                    | 1,2 – 1,3<br>1,2 – 1,3<br>1,2 – 1,3       | 1,0 – 1,2<br>1,0 – 1,2<br>1,0 – 1,2                           | 1,0 – 1,2<br>1,0 – 1,2<br>1,0 – 1,2                     | 1,0 – 1,2<br>1,0 – 1,2<br>1,0 – 1,2       | 1,0 – 1,2<br>1,0 – 1,2<br>1,0 – 1,2                           | 1,0 – 1,2<br>1,0 – 1,2<br>1,0 – 1,2   | 0,95 – 1,15<br>1,05 – 1,2<br>1,1 – 1,25   | 0,95 – 1,15<br>1,05 – 1,2<br>1,1 – 1,25                       | 0,95 – 1,15<br>1,05 – 1,2<br>1,1 – 1,25 |
|  |                                       |                   |                            | 80<br>80<br>80   | 90<br>90<br>90                            | 60<br>60<br>60  | 80<br>80<br>80  | 90<br>90<br>90                            | 60<br>60<br>60  | 100<br>105<br>110   | 80<br>85<br>90                            | 80<br>85<br>90  | 45<br>50<br>55                          |
| Tensile strength<br>Machine direction<br>≤ 1,6 mm<br>> 1,6 – 3,0 mm<br>> 3,0 mm<br>Cross machine direction<br>≤ 1,6 mm<br>> 1,6 – 3,0 mm<br>> 3,0 mm | 7                                     | MPa               | Min.                       | ± 7,5<br>± 5   | ± 7,5<br>± 5                              | ± 7,5<br>± 5  | ± 7,5<br>± 5  | ± 7,5<br>± 5                              | ± 7,5<br>± 5  | ± 7,5<br>± 5  | ± 7,5<br>± 5                              |   |   |
|  |                                       |                   |                            | 1,0 – 1,2<br>1,0 – 1,2<br>1,0 – 1,2                    | 1,2 – 1,3<br>1,2 – 1,3<br>1,2 – 1,3       | 1,0 – 1,2<br>1,0 – 1,2<br>1,0 – 1,2                           | 1,0 – 1,2<br>1,0 – 1,2<br>1,0 – 1,2                     | 1,0 – 1,2<br>1,0 – 1,2<br>1,0 – 1,2       | 1,0 – 1,2<br>1,0 – 1,2<br>1,0 – 1,2                           | 1,0 – 1,2<br>1,0 – 1,2<br>1,0 – 1,2   | 0,95 – 1,15<br>1,05 – 1,2<br>1,1 – 1,25   | 0,95 – 1,15<br>1,05 – 1,2<br>1,1 – 1,25                       | 0,95 – 1,15<br>1,05 – 1,2<br>1,1 – 1,25 |
|  |                                       |                   |                            | 80<br>80<br>80   | 90<br>90<br>90                            | 60<br>60<br>60  | 80<br>80<br>80  | 90<br>90<br>90                            | 60<br>60<br>60  | 100<br>105<br>110   | 80<br>85<br>90                            | 80<br>85<br>90  | 45<br>50<br>55                          |



Table 1 (continued)

| Property  | IEC 60641-2<br>Clause or<br>subclause | Unit  | Min. / Max.<br>or<br>range | B.0 Pressboard of particularly<br>high chemical purity |   |   | B.2 Pressboard characterized by<br>high chemical purity |   |   | B.3 Precompressed pressboard, a<br>hard and rigid<br>board,<br>characterized by high chemical<br>purity and mechanical strength. |   |   |                     |
|---|---------------------------------------|-------|----------------------------|--|---|---|---|---|---|--|---|---|---------------------|
|   |                                       |       |                            | B.0.1 A<br>100 %<br>sulphate<br>wood pulp              | B.0.1 B<br>100 %<br>sulphate<br>wood pulp | B.0.3<br>Mixture of<br>sulphate<br>wood pulp<br>and<br>cotton | B.2.1 A<br>100 %<br>sulphate<br>wood pulp               | B.2.1 B<br>100 %<br>sulphate<br>wood pulp | B.2.3<br>Mixture of<br>sulphate<br>wood pulp<br>and<br>cotton | B.3.1 A<br>100 %<br>sulphate<br>wood pulp  | B.3.1 B<br>100 %<br>sulphate<br>wood pulp | B.3.3<br>Mixture of<br>sulphate<br>wood pulp<br>and<br>cotton |                     |
| Moisture content  | 13                                    | %     | Max.                       | 8  | 8   | 8   | 8   | 8   | 8   | 8  | 6   | 6   |                     |
| Ash content   | 14                                    | %     | Max.                       | 0,7  | 0,7                                       | 0,7   | 0,7   | 0,7                                       | 0,7   | 0,7  | 0,7                                       | 0,7   |                     |
| Conductivity of aqueous<br>extract<br>≤ 1,6 mm<br>> 1,6 – 3,0 mm<br>> 3,0 - 6,0<br>> 6,0 mm | 15                                    | mS/m  | Max.                       | 6<br>6<br>6<br>6                                       | 6<br>6<br>6<br>6                          | 5<br>5<br>5<br>5  | 8<br>8<br>8<br>8  | 8<br>8<br>8<br>8                          | 7<br>7<br>7<br>7  | 7<br>7<br>7<br>7   | 5<br>6<br>8<br>10                         | 4<br>5<br>7<br>9  |                     |
| pH of aqueous extract   | 16                                    |       | Range                      | 6 – 9  | 6 – 9                                     | 6 – 9   | 6 – 9   | 6 – 9                                     | 6 – 9   | 6 – 9  | 6 – 9                                     | 6 – 9   |                     |
| Oil absorption<br>≤ 1,6 mm<br>> 1,6 – 3,0 mm<br>> 3,0 – 6,0<br>> 6,0 mm                     | 17                                    | %     | Min.                       | 13<br>13<br>13<br>13                                   | 6<br>6<br>6<br>6                          | 13<br>13<br>13<br>13  | 13<br>13<br>13<br>13                                    | 13<br>13<br>13<br>13                      | 13<br>13<br>13<br>13  | 13<br>13<br>13<br>13   | 11<br>9<br>7<br>6                         | 13<br>11<br>9<br>8  | 15<br>12<br>10<br>7 |
| Electric strength<br>in air<br>in oil<br>≤ 1,6 mm<br>> 1,6 mm                               | 20                                    | kV/mm | Min.                       | 12<br>40<br>30   | 12<br>40<br>30                            | 12<br>40<br>30  | 12<br>40<br>30  | 12<br>40<br>30                            | 12<br>40<br>30  | 12<br>40<br>30   | 12<br>45<br>35                            | 12<br>40<br>35  | 12<br>45<br>35      |