bsi.

...making excellence a habit.™

**Please be aware that this PDF has been created from the original hardcopy document, which might not be in good condition and so the PDF might reflect this.**

BSI Group
389 Chiswick High Road
London, W4 4AL
United Kingdom

T: +44 20 845 086 9001
F: +44 20 8996 7400
cservices@bsigroup.com
bsigroup.com

British Standards Limited
Registered in England no: 07864997
Registered address: 389 Chiswick High Road
London, W4 4AL, United Kingdom

AVA Documents
INVESTORS IN PEOPLE
Document Sharing Hub

Full document details: BS 373:1938

OFFICE COPY No Amds

Committee Room B

No. 373—1938.

# British Standards Institution

Incorporated by Royal Charter.

FORMED IN 1901 AS THE ENGINEERING STANDARDS COMMITTEE.
INCORPORATED IN 1918 AS THE BRITISH ENGINEERING STANDARDS ASSOCIATION.

Superseded by 1957 issue

BRITISH STANDARD

# METHODS OF TESTING SMALL CLEAR SPECIMENS OF TIMBER.

(REVISED, SEPTEMBER, 1938.)

LONDON:
PUBLISHED BY THE BRITISH STANDARDS INSTITUTION,
PUBLICATIONS DEPARTMENT,
28, VICTORIA STREET, LONDON, S.W.1.
*Telegrams:* Standards, Sowest, London. *Telephone:* Abbey 3333.

*September, 1938.*

COPYRIGHT.
ALL RIGHTS RESERVED, INCLUDING RIGHTS OF TRANSLATION.

5/-

ice ~~5/-~~ net. Post free ~~[illegible]~~

Documents
Document Sharing Hub

No. 373—1938.

British Standards Institution
Incorporated by Royal Charter.

FORMED IN 1901 AS THE ENGINEERING STANDARDS COMMITTEE.
INCORPORATED IN 1918 AS THE BRITISH ENGINEERING STANDARDS ASSOCIATION.

BRITISH STANDARD

# METHODS OF TESTING SMALL CLEAR SPECIMENS OF TIMBER.

(REVISED, SEPTEMBER, 1938.)

*These Methods of Testing, having been approved by the Building Divisional Council, were published under the authority of the General Council as a British Standard on 19th September, 1938.*

LONDON:
PUBLISHED BY THE BRITISH STANDARDS INSTITUTION,
PUBLICATIONS DEPARTMENT,
28, VICTORIA STREET, LONDON, S.W.1.

*Telegrams:* Standards, Sowest, London. *Telephone:* Abbey 3333.

*September, 1938.*

COPYRIGHT.
ALL RIGHTS RESERVED, INCLUDING RIGHTS OF TRANSLATION.

Price 2/- net. Post free 2/2.

AVA Documents
Document Sharing Hub

## CONTENTS.

| | PAGE |
|---|---|
| Co-operating Organisations ... ... ... ... ... | 3 |
| Foreword ... ... ... ... ... ... ... | 4 |
| **METHOD OF TEST.** | |
| 1. Moisture Content ... ... ... ... ... | 9 |
| 2. Compression Tests ... ... ... ... ... | 9 |
| 3. Beam Test (Static Bending) ... ... ... ... | 14 |
| 4. Impact Test ... ... ... ... ... ... | 18 |
| 5. Janka Indentation Test ... ... ... ... | 20 |
| 6. Shear Parallel to Grain Test ... ... ... ... | 20 |
| 7. Cleavage Test ... ... ... ... ... ... | 21 |
| 8. Tensile Test ... ... ... ... ... ... | 23 |
| 9. Specific Gravity and Weight per Cubic Foot ... | 25 |
| 10. Radial and Tangential Shrinkage ... ... ... | 25 |
| 11. Volumetric Shrinkage ... ... ... ... ... | 26 |
| 12. Photomicrographs ... ... ... ... ... | 28 |
| 13. Photographs of Specimens (Full Size or Reduced Scale) | 28 |
| **APPENDIX.** | |
| Tests Recommended to Indicate the Suitability of Timber for Specific Uses ... ... ... ... | 29 |



## CO-OPERATING ORGANISATIONS.

The Building Divisional Council under whose supervision this British Standard was prepared consists of representatives from the following Government Departments and Scientific and Industrial Organisations :—

*Admiralty.
*Board of Trade.
Crown Agents for the Colonies.
Department of Health for Scotland.
*Department of Scientific and Industrial Research.
General Post Office.
High Commissioner for India.
*H.M. Office of Works.
*Home Office.
*Imperial Institute.
*Ministry of Health.
*War Office.
Association of British Roofing Felt Manufacturers.
Association of Municipal Corporations.
Ballast, Sand and Allied Trades Association.
British Ironfounders' Association.
*British Constructional Steelwork Association.
British Waterworks Association.
Builders and Plumbers Merchants' Association.
Building Industries National Council.
Building Societies Association.
Cement Makers' Federation.
Central Association of the Lime and Limestone Industry of Great Britain.
*Chartered Surveyors' Institution.
County Councils Association (England).
Electrical Contractors' Association.
Federated Quarry Owners of Great Britain.
Federation of British Industries.
Federation of Civil Engineering Contractors.
Greystone Lime Burners' Association.
*Incorporated Association of Architects and Surveyors.
Institute of Plumbers.
*Institution of Civil Engineers.
Institution of Heating and Ventilating Engineers.
*Institution of Municipal and County Engineers.
*Institution of Structural Engineers.
*London County Council.
Metropolitan Boroughs Standing Joint Committee.
National Association of Heating, Ventilating and Domestic Engineering Employers.
*National Federation of Associated Paint, Colour and Varnish Manufacturers of the United Kingdom.
National Federation of Builders' Merchants.
National Federation of Building Trades Employers.
National Federation of Building Trades Operatives.
National Federation of Clay Industries.
*National Federation of House Builders.
*National Federation of Master Painters and Decorators of England and Wales.
*Railway Companies of Great Britain and Ireland.
Royal Institute of British Architects.
Royal Sanitary Institute.
Rural District Councils Association.
Sanitary Earthenware Manufacturers' Association.
Scottish National Building Trades Federation.
*Timber Trade Federation of the United Kingdom.
Urban District Councils Association.

The Government Departments and Scientific and Industrial Organisations marked with an asterisk in the above list, together with the following, were directly represented on the Committees entrusted with the preparation of this British Standard.

Building Research Station } D.S.I.R.
Forest Products Research Laboratory } D.S.I.R.
Crown Agents for the Colonies.
Forestry Commission.
High Commissioner for New Zealand.
H.M. East African Dependencies.
Trade Commissioner for Canada.
Trade Commissioner for India.
Trade Commissioner for the Union of South Africa.
British Furniture Trades Joint Committee.
Empire Forestry Association.
English Joinery Manufacturers' Association.
Federated Home Grown Timber Merchants.
Institution of Naval Architects.
National Federation of Furniture Trades.
National Federation of Saw-Mill Proprietors of Great Britain and Ireland.
Royal Incorporation of Architects in Scotland.
Railway Carriage and Wagon Builders and Financiers' Parliamentary Association.

Full document details: BS 373:1938
AVA Documents
Document Sharing Hub

## FOREWORD.

The revision of the British Standard Methods of Testing Small Clear Specimens of Timber, originally issued in 1929, was rendered desirable by the publication by the Department of Scientific and Industrial Research of the Report of the Committee on the Mechanical Testing of Timber (H.M. Stationery Office, 1934). In this Report attention is drawn to improved methods for testing small specimens of timber and these improvements have been incorporated in the revised specification.

The Methods of Testing cover the testing of timber for measurement of engineering properties which are required in the design of wooden structures. Correlation of the results of mechanical tests with the behaviour of the timber in practice may be either on a somewhat vague empirical basis derived from long experience or by calculation founded on fundamental engineering properties of the material. The tests hitherto in general use provide information which is suitable for correlation by the first method but which is frequently unsuitable for the second method because some tests do not measure the properties after which the tests are named, and because the measurements in some tests are affected by properties other than those which the tests purport to measure.

Eventually, information of the fundamental engineering properties will be needed for most commercially useful timbers. Where it is necessary to modify a test so that engineering properties of the material may be accurately measured, comparison with existing data can be effected by use of conversion factors. In order to provide these factors duplicate tests by both methods may be necessary for a short period.

Where preliminary information only is needed to ascertain how new timbers compare with those already in use, the methods at present in general use may suffice. For this reason two methods for some of the tests are given in the present specification. In such cases the method which is considered best for measurement of the engineering properties necessary for use in design has been given first. All tests are not necessarily made unless the information which they provide is desired in connection with the timber under test.

In the case of the shear tests the change which is introduced is not in the test but in the appliance used in testing. The new appliance reduces friction in the moving parts and also reduces the introduction of contributory secondary stresses, both of which features it is claimed affect the test results to a greater or less degree.





The Forest Products Research Laboratories will, for certain purposes, wish to continue the central loading method for static bending, including the computation therefrom of the quantity which has been erroneously accepted as "modulus of elasticity." Since this quantity, calculated without allowance for shear deflections, cannot be taken as the modulus of elasticity it should not in future be recorded as such. It is recommended, therefore, that to avoid future misinterpretation this quantity, which is affected by the arbitrary conditions of the test, should be called "stiffness coefficient" and that some symbol, other than E, to be agreed by the several laboratories interested, be adopted.

No useful purpose has been found for continuing the automatic record in the impact test. as the conditions of drop to cause failure and the results of the static bending test appear to provide all the information which can usefully be correlated with behaviour of the material in service.

The name "Janka Indentation Test" in place of "Hardness Test" has been adopted on the recommendation of the Committee on the Mechanical Testing of Timber of the Department of Scientific and Industrial Research. While recognising that it may be possible to associate the results of this indentation test with other properties besides hardness, it is suggested that as the "Janka Indentation Test" has been used by Forest Products Research Laboratories solely for measuring hardness, the quantities obtained from this test should continue to be tabulated under the heading "Hardness" with the words "Janka Indentation Test" in brackets underneath.

The other principal modifications introduced are as follows :—

Preference is placed on the bobbin-shaped turned test piece for the test in compression parallel to grain used in conjunction with the compression cage apparatus.

The 2 in. cube has been substituted for the test piece 6 in. × 2 in. × 2 in. compression perpendicular to the grain and the test may be carried out in both the radial and tangential directions.

The test for tension parallel to the grain has been introduced and standardised for use when required, and again when tension perpendicular to the grain is needed a turned test piece has been adopted in place of the old type which was, in effect, a double-end cleavage test piece.

With these modifications, the revised Methods of Testing conform with the recommendations of the Report on the

Full document details BS 373:1938
AVA Documents
Document Sharing Hub

Mechanical Testing of Timber issued by the Department of Scientific and Industrial Research. Some revision has been made in the Table of Tests Recommended to indicate the suitability of timber for specific uses. (Appendix, page 29).

Almost all of the mechanical properties of seasoned timber vary with the moisture content and it is therefore essential that the moisture contents of all test pieces be determined at the time of test.

Mechanical tests should be carried out upon timber both in the green condition and in the seasoned condition. When comparing the results obtained with the seasoned samples, due allowance must be made for differences in the moisture content. A more extensive comparison with the results of tests from laboratories both at home and abroad may be obtained if the results of tests on seasoned material be referred to a moisture content basis of 12 per cent.

In the case of dried timber, information should be available regarding the method of drying, *e.g.*, whether naturally seasoned, kiln-dried, etc.

As the mechanical properties of timber vary with the rate of application of the load it is desirable that the specified rates should be adhered to wherever possible in order that comparable results may be obtained. If the testing machine be of a type which does not permit the specified rate of loading, the actual rate employed should be recorded with the results obtained in order that these results may be corrected as and when the relationship between the observed mechanical property and the rate of application of the load has been definitely established.

It is recognised that some of these tests are of an arbitrary nature and are intended to provide comparative data rather than to measure absolute properties of the material. They have been included because they have been generally adopted and have produced useful results not only in the comparison of species of timber, but also in the improvement of the design of timber structures and the general economic application of timber in manufacturing processes.

This Specification does not cover the procedure adopted for the obtaining of specimens in different localities, the conversion of the log and the preparation of the test pieces, but it is desirable that the procedure should be as uniform as possible. It is therefore recommended that the procedure detailed in Project I of the Forest Products Research Laboratory be adopted wherever possible. Copies of this Project can be obtained, price 2/- net, on application to H.M. Stationery Office.



In order to keep abreast of progress in the Industries concerned, the British Standards are subject to periodical review.

Suggestions for improvements, addressed to the British Standards Institution, 28, Victoria Street, London, S.W.1, will be welcomed at all times. They will be recorded, and, in due course, brought to the notice of the Committees charged with the revision of the Publications to which they refer.

Full document details: BS 373:1938
AVA Documents
Document Sharing Hub