



SLOVENSKI STANDARD

SIST EN 383:1996

01-avgust-1996

Nadomešča:
SIST EN 383:2007

Lesene konstrukcije - Preskusni postopki - Ugotavljanje bočnih trdnosti in modulov stisljivosti mehanskih spojnih sredstev paličastih oblik

Timber structures - Test methods - Determination of embedding strength and foundation values for dowel type fasteners

Holzbauwerke - Prüfverfahren - Bestimmung der Lochleibungsfestigkeit und Bettungswerte für stiftförmige Verbindungsmittel

Structures en bois - Méthodes d'essais - Détermination des caractéristiques de fondation et de la portance locale d'éléments d'assemblages de type broche

Ta slovenski standard je istoveten z: EN 383:1993

ICS:

91.080.20 Lesene konstrukcije Timber structures

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EUROPEAN STANDARD

EN 383

NORME EUROPÉENNE

EUROPÄISCHE NORM

July 1993

UDC 694.142.2:624.011.1:620.176.3

Descriptors: Timber construction, sawn timber, laminated board, mechanical strength, determination, rigidity, fasteners

English version

**Timber structures - Test methods - Determination
of embedding strength and foundation values for
dowel type fasteners**

Structures en bois - Méthodes d'essais -
Détermination de caractéristiques de fondation
et de la portance locale d'éléments
d'assemblages de type broche

Holzbawerke - Prüfverfahren - Bestimmung der
Lochleibungsfestigkeit und Bettungswerte für
stiftförmige Verbindungsmittel

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Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

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Foreword

This European Standard was prepared by CEN/TC 124 "Timber structures". It was approved for the CEN final voting by the TC on 9th December 1991.

This standard is one of a series of standards for test methods for building materials and components. It was prepared by a working group under the convenorship of NSAI.

NOTE: It is considered desirable to maintain the same clause numbers consistently throughout this series of standards. Consequently, some clauses are void in this edition of this standard, but it is envisaged that future editions may need to include a text in these clauses.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by January 1994, and conflicting national standards shall be withdrawn at the latest by January 1994.

The standard was approved and in accordance with the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard : Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom.

No existing European Standard is superseded.

1 Scope

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This Standard specifies laboratory methods of determining the embedding strength and foundation values of solid timber, glued laminated timber, and wood based sheet products with dowel type fasteners.

2 Normative references

None.

3 Definitions

For the purpose of this standard, the following definitions apply:

3.1 dowel type fastener: Bolt, nail, dowel or the like with plain or patterned surfaces.

3.2 embedding strength: Average compressive stress at maximum load in a piece of timber or wood based sheet product under the action of a stiff linear fastener. The fastener's axis is perpendicular to the surface of the timber. The fastener is loaded perpendicular to its axis.

3.3 maximum load: Maximum load measured before the deformation of the specimen has reached the deformation limit.

3.4 fastener section dimension: 1) Actual diameter of a plain round fastener, or 2) Shank diameter of a profiled fastener, or 3) Length of one side of the section of a square fastener, or 4) Minimum dimension of the section of an oval or rectangular fastener.

4 Symbols

| | |
|----------------|---|
| d | fastener section dimension, in millimetres |
| F | load, in newtons |
| F_{\max} | maximum load, in newtons |
| $F_{\max,est}$ | estimated maximum load, in newtons |
| f_h | embedding strength, in newtons per square millimetre |
| $f_{h,est}$ | estimated embedding strength, in newtons per square millimetre |
| K_e | elastic foundation modulus, in newtons per cubic millimetre |
| K_i | initial foundation modulus, in newtons per cubic millimetre |
| K_s | foundation modulus, in newtons per cubic millimetre |
| t | thickness, in millimetres |
| w | indentation or deformation, in millimetres |
| w_e | elastic deformation, in millimetres |
| w_i | initial deformation, in millimetres |
| $w_{i,mod}$ | modified initial deformation, in millimetres |
| w_0 | deformation of the test apparatus at any given load, in millimetres |

5 Requirements

The fasteners and the timber, glued laminated timber or wood based sheet product shall be, as far as possible, of the minimum quality allowed by the relevant specification.

6 Test method

6.1 Principle

The test shall be carried out on the test piece and using the apparatus shown in figure 1. It is a principle of this test to avoid bending of the fastener under test.

The fastener is loaded perpendicular to its axis through a steel loading apparatus and the load and the corresponding indentation or deformation is measured, see figure 1.

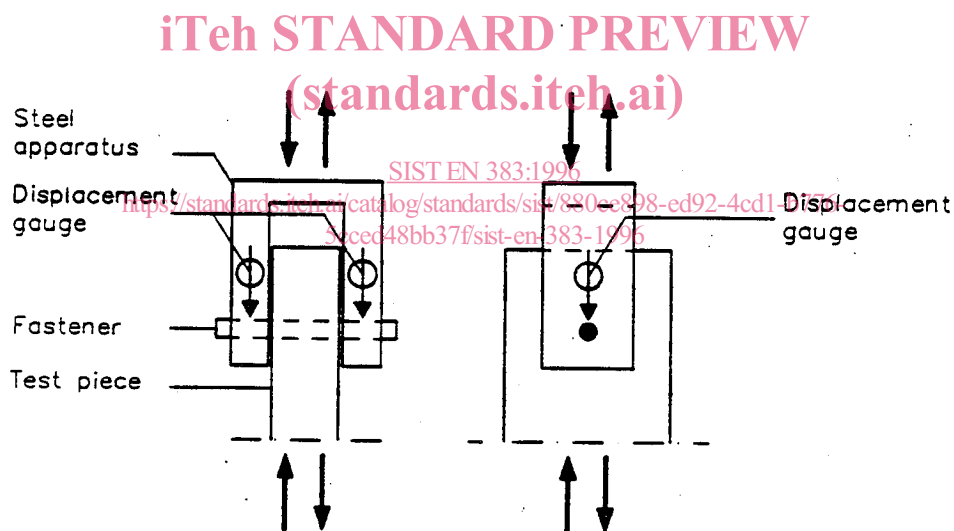


Figure 1: Test principle

The loading may be either in compression, see figure 2a or in tension, see figure 2b. For solid timber and layered wood products with only one grain direction the loading may be either parallel to the grain, see figures 2a and 2b or compression perpendicular to the grain, see figure 2c.

NOTE: The principles of this standard may be used for other angles between the load and the grain.

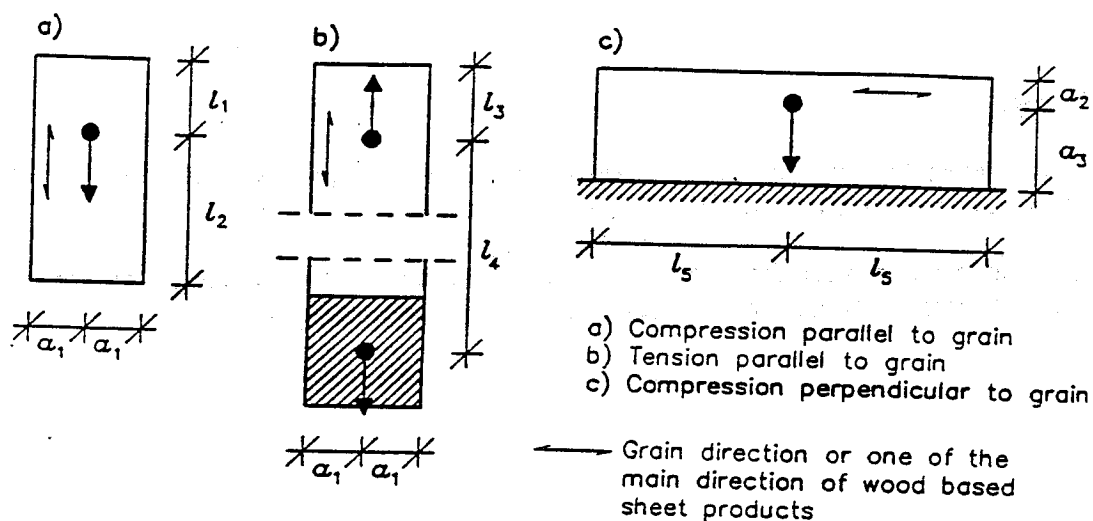


Figure 2: Sizes of test pieces as specified in table 1

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6.2 Test pieces

The test piece is a rectangular prism of wood or wood based sheet product with a fastener placed with its axis perpendicular to the surface of the prismatic test piece. The sizes of the test pieces are given in table 1.

NOTE: The thickness t should be in the range $1,5d$ to $4d$ in order to comply with the principle of the test.

For wood based sheet products, the thickness of the test piece shall be the thickness of the panel as produced.

6.3 Apparatus

The test apparatus shall be such that no friction between steel plates and test pieces may influence the measurements. In addition to equipment for measuring the geometry, moisture content, etc. of the test pieces, the following shall be available:

- loading equipment capable of applying and continuously recording the load to an accuracy of $\pm 1\%$ of the load applied to the test piece or, for loads less than 10 % of the maximum load applied to the piece, with an accuracy of $\pm 0,1\%$ of the maximum load;
- equipment to continuously record the displacement of the fasteners in the wood with an accuracy of $\pm 1\%$ of the displacement, or for displacement less than 2 mm with an accuracy of $\pm 0,02$ mm.

Table 1: Sizes of test pieces

| Measurement * | Nails - not prebored | Nails - prebored | Bolts or dowels | Test piece material |
|---------------|-------------------------|---------------------|-----------------|--|
| a_1 | $5d$ | $5d$ | $3d$ | Timber or wood based sheet products |
| l_1 | $20d$ | $12d$ | $7d$ | |
| l_2 | $20d$ | $12d$ | $7d$ | |
| l_3 | $20d$ | $12d$ | $7d$ | |
| l_4 | $40d$ | $40d$ | $30d$ | |
| a_2 | $5d$ | $5d$ | $2d$ | Timber or layered wood products with one grain direction |
| a_3 | $5d$ | $5d$ | $4d$ | |
| l_5 | $20d$ | $12d$ | $7d$ | |

* Measurement given in figure 2 are dependent on d , where d is defined, see clause 3.4.

NOTE: The equipment should ensure that eccentricities, twist, etc. have no influence on the measurements.

6.4 Preparation of test pieces

Before placing the fastener, the wood material shall be conditioned to constant mass in an environment having a relative humidity of $(65 \pm 5)\%$ and a temperature of $(20 \pm 2)^\circ\text{C}$. After fabrication the test piece shall be conditioned again in the same environment. Constant mass is considered to be attained when the results of two successive weighings, carried out at an interval of 6 h, do not differ by more than 0,1 % of the mass of the test piece.