SLOVENSKI STANDARD
SIST EN 1380:2000

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Lesene konstrukcije - Metode preskušanja - Nosilni žebljani spoji

Timber structures - Test methods - Load bearing nailed joints

Holzbauwerke - Prüfverfahren - Tragende Nagelverbindungen

Structures en bois - Méthodes d'essai - Assemblages cloués porteurs

Ta slovenski standard je istoveten z: EN 1380:1999

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91.080.20 Lesene konstrukcije Timber structures

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English version

Timber structures - Test methods - Load bearing nailed joints

Structures en bois - Méthodes d'essai - Assemblages cloués porteurs

Holzbauwerke - Prüfverfahren - Tragende Nagelverbindungen

This European Standard was approved by CEN on 11 July 1999.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

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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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Contents

Foreword

This European Standard has been prepared by Technical Committee CEN/TC 124 "Timber structures", the secretariat of which is held by DS.

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of an identical text or by endorsement, at the latest by February 2000, and conflicting national standards shall be withdrawn at the latest by February 2000.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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 National Standards Authority of Ireland (NSAI).

The Standard is based on ISO/DIS 9708 `Timber structures - Joints with mechanical fasteners - Testing of joints with nails or staples'.

1 Scope

This standard specifies test methods for determining the strength and deformation characteristics of laterally loaded nailed joints in load-bearing timber structures.

The methods assess joints with members of timber (solid timber or glued laminated timber) or wood- based products or metal plates (but not punched metal plate fasteners) in the combination proposed for use in service using all types of nails.

The methods are used to determine load-slip characteristics and maximum load of joints where various angles between the applied force and the timber grain direction, or the main direction of the wood-based products, respectively, are possible.

The methods can be used with joints made with other dowel type fasteners. In this event certain details of the test may need to be changed.

Note: The dowel type fasteners considered are screws, bolts and dowels. For these types of fasteners tests using other load grain angles than specified in this EN may be necessary.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 322	Wood-based panels - Determination of moisture content
EN 323	Wood-based panels - Determination of density
EN 26891 1991	Timber structures - Joints made with mechanical fasteners - General principles for the determination of strength and deformation characteristics (ISO 6891:1983)
EN 28970	Timber structures - Testing of joints made with mechanical fasteners - Requirements for wood density (ISO 8970:1989)
ISO 3130	Wood - Determination of moisture content for physical and mechanical tests
ISO 3131	Wood - Determination of density for physical and mechanical tests

3 Definitions

For the purposes of this standard, the following definition applies:

deformation of the joint: Mean value of the measurements of the relative displacements of the two side members with respect to the central member.

4 Symbols

b width of member cross-section, in millimetres

F load, in newtons

t member thickness, in millimetres

5 Materials

5.1 Timber

The timber (solid timber or glued laminated timber) shall be selected in accordance with either of the methods given in EN 28970.

For each test piece, the individual members to be joined shall be selected to ensure a test piece of balanced density. For a group of similar test pieces, separate planks shall be used for each test piece.

NOTE: The members should be free from major defects which could lead to premature failure in the area away from the fasteners.

5.2 Wood-based products

The specification of these products shall be established. The products used for the individual members of the test pieces shall be representative of the class or range of product to which they belong and the relevant properties shall be declared.

One unique grade shall be used to make the test pieces. For each test piece, the individual members in the joint shall be selected from separate pieces of material.

5.3 Metal plates and nails

The specification of these products shall be established.

6 Test methods

6.1 General

The moisture content and density of the timber or wood-based products members at test shall be determined as specified in ISO 3130, ISO 3131, EN 322 and EN 323 as appropriate.

6.2 Conditioning

The test pieces shall be manufactured with the timber or wood-based products at an equilibrium moisture content corresponding to (20 ± 2) °C and (85 ± 5) % relative humidity. The material is conditioned when it attains constant mass. 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 material.

After manufacture the test pieces shall be stored for at least one week at (20 ± 2) °C and (65 ± 5) % relative humidity.

For certain investigations other moisture conditioning can be appropriate, and shall be reported.

NOTE: For some hardwoods a much longer storing period can be necessary or the test pieces should be made with appropriate gaps between the members.

6.3 Fabrication of test pieces

If there are no special requirements, timber members shall be planed. Test pieces shall be fabricated with the nails perpendicular to the member surface. The insertion of the nails shall follow normal preparation (e.g. preboring) and practice, which shall be reported.

NOTE: The depth of nail head indentation will have an influence on the test result, particularly for joints loaded in double shear. Therefore, if the fabrication technique permits, the nail heads should protrude above the surface.

6.4 Preparation of test pieces

6.4.1 Load parallel to grain

For joints consisting solely of timber or wood-based products (or combinations thereof) the test pieces shall be fabricated either as

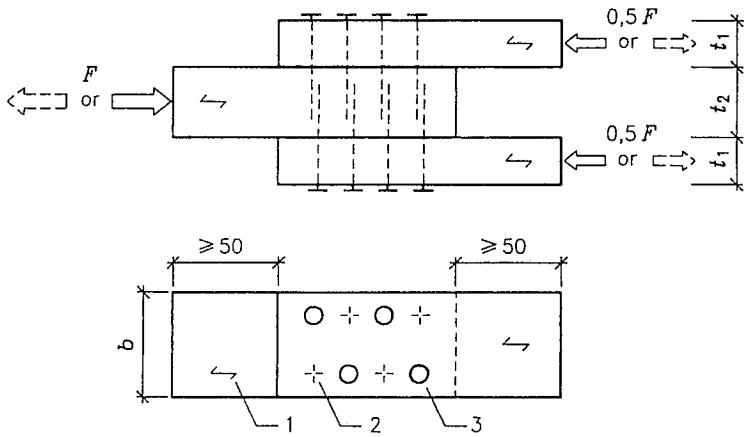
a) three-member joints with four nails from each side, loaded in single shear, see figure 1; or
b) three-member joints with two nails from each side, loaded in double shear, see figure 2.

NOTE: The 50 mm minimum end length shown in figures 1 and 2 may not be appropriate to thin timber or wood-based products subjected to compression loads.

For joints with metal plates nailed to timber or wood-based products members, the test pieces shall be fabricated either as

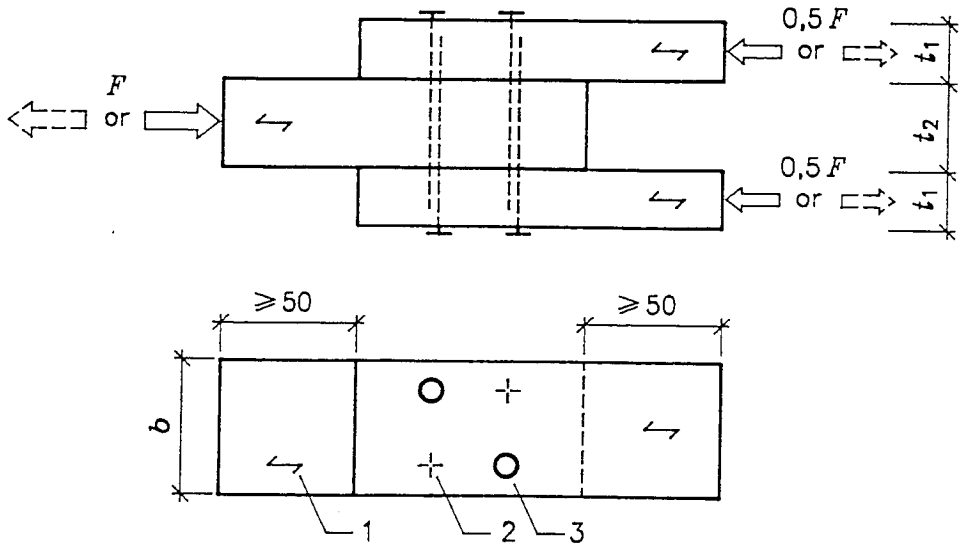
a) single shear test pieces with four nails from each side and with the side members of metal plates, see figure 1, or
b) (in the case of thin plates - thickness of about 2,5 mm or less) double shear test pieces with two nails from each side and with the metal plate as central member, see figure 2.

Dimensions in milimetres



1)Grain direction. 2) Nail point. 3) Nail head

Figure 1: Three-member nailed joint, single shear, loaded in tension or compression



1) Grain direction. 2) Nail point. 3) Nail head

Figure 2 Three-member nailed joint, double shear, loaded in tension or compression

6.4.2 Load perpendicular to grain

For joints consisting solely of timber or wood based products (or combinations thereof) the test pieces shall be fabricated either as

a) three-member joints with four nails from each side, loaded in single shear, see figures 3 and 4; or
b) three-member joints with two nails from each side, loaded in double shear, see figures 5 and 6.

NOTE: The 50 mm minimum end length shown in figures 3 and 4 may not be appropriate to thin timber or wood-based products subjected to compression loads.

For joints with metal plates nailed to timber or wood based products members, the test pieces shall be fabricated either as

a) single shear test pieces with four nails from each side and with the side members of metal plates, see figures 3 and 4, or
b) (in the case of thin plates - thickness of about 2,5 mm or less) double shear test pieces with two nails from each side and with the metal plate as central member, see figures 5 and 6.