



**SLOVENSKI STANDARD**  
**SIST EN 385:1996**

**01-avgust-1996**

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**Konstruktivski les z zobatimi stiki - Zahteve za uporabo in minimalne zahteve za proizvodnjo**

Finger jointed structural timber - Performance requirements and minimum production requirements

Keilzinkenverbindungen in Bauholz - Leistungs- und Mindestanforderungen an die Herstellung

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Aboutages a entures multiples dans les bois de construction - Prescriptions de performance et prescriptions minimales de fabrication

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**Ta slovenski standard je istoveten z: EN 385:1995**

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**ICS:**

79.040      Les, hlodovina in žagan les      Wood, sawlogs and sawn timber

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EUROPEAN STANDARD

EN 385

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EUROPÄISCHE NORM

February 1995

ICS 79.040

Descriptors: wood, structural timber, sawn timber, coniferous timber, butt joints, adhesive bonded joints, manufacturing, machining, bend tests, classifications, marking

English version

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## CEN

European Committee for Standardization  
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## Foreword

This European Standard has been prepared by the Technical Committee CEN/TC 124 "Timber structures" of which the secretariat 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of an identical text or by endorsement, at the latest by August 1995, and conflicting national standards shall be withdrawn at the latest by August 1995.

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 and United Kingdom.

## Introduction

This standard was written based on Recommended Standard for Finger Jointing in Coniferous Sawn Timber prepared by the ECE (Economic Commission of Europe) Timber Committee and published in the Timber Bulletin for Europe (Vol XXXIV, Supplement 16, November 1982) with Draft Amendments, May 1988. This standard was developed on the basis of the use of European redwood and whitewood, but most of the requirements apply to any species.

Further, it was recognized that finger jointing standards are currently in use in different countries and experience with these has influenced this standard.

## 1 Scope

This standard specifies requirements for bonded finger joints and minimum requirements for the manufacture of cut, interlocking, bonded finger joints in structural timber members. Requirements are given for timber, adhesive, moisture content, cutting, bonding and preservative treatments and flame retardant treatments.

This standard is only applicable to finger joints between timber members of the same species type.

Although most finger joints are produced in coniferous species this standard also applies to broad leaved species where information is available to enable them to be satisfactorily bonded.

It does not cover impressed (die-formed) joints. In the case of glued laminated timber it applies only to individual laminations. Large finger joints in glued laminated timber are covered by prEN 387.

## 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 301 Adhesives, phenolic and aminoplastic for load bearing timber structures, - Classification and performance requirements

EN 408 Timber structures - Structural timber and glued laminated timber - Determination of some physical and mechanical properties

### 3 Definitions

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

**3.1 finger joint:** Self-locating end joint formed by machining a number of similar, tapered, symmetrical fingers in the ends of timber members which are then bonded together. See figure 1.



Figure 1: Typical profile of finger joint showing finger length  $l$ , pitch  $p$ , tip width  $b_t$ , and tip gap  $l_t$ .

**3.2 finger length:** Distance between the finger base and the tip of the finger, measured along the centre line of the finger.

**3.3 pitch:** Distance between fingers, centre to centre.

**3.4 production batch:** Joints, all of which have the same profile, manufactured from the same species of timber, having the same nominal cross section, bonded with the same adhesive and made during a continuous run on one production line.

**3.5 service class 1:** Service class characterized by a moisture content in the materials corresponding to a temperature of 20 °C and the relative humidity of the surrounding air only exceeding 65 % for a few weeks per year.

NOTE: In service class 1 the average equilibrium moisture content in most softwoods will not exceed 12 %.

**3.6 service class 2:** Service class characterized by a moisture content in the materials corresponding to

a temperature of 20 °C and the relative humidity of the surrounding air only exceeding 85 % for a few weeks per year.

NOTE: In service class 2 the average equilibrium moisture content in most softwoods will not exceed 20 %.

**3.7 service class 3:** Service class characterized by climatic conditions leading to higher moisture contents than service class 2.

**3.8 tip gap:** Distance between finger tip and slot base in a bonded finger joint.

**3.9 tip width:** Distance between finger faces, measured at the tip of the finger.

#### 4 Symbols

- A** area, in square millimetres; (standards.iteh.ai)
- A<sub>w</sub>** area of one wane, in square millimetres;
- a<sub>w</sub>** diagonal length of wane, in millimetres;
- b** width of cross section, in millimetres;
- b<sub>t</sub>** tip width, in millimetres;
- d** diameter, in millimetres;
- f<sub>m</sub>** bending strength, in newtons per square millimetre;
- f<sub>m,k</sub>** characteristic bending strength, in newtons per square millimetre;
- f<sub>m,15,k</sub>** characteristic bending strength of 15 specimens, see 7.1.4, in newtons per square millimetre;
- f<sub>m,dc,k</sub>** characteristic bending strength, declared by the manufacturer, in newtons per square millimetre;
- h** depth of cross section, in millimetres;
- k<sub>f</sub>** factor, see 7.1.4;
- k<sub>15</sub>** statistical factor, see 7.1.4;
- l** finger length, in millimetres;
- l<sub>t</sub>** tip gap, in millimetres;
- m** mean value (the variable is given in parenthesis);

- $p$  pitch, in millimetres;
- $s$  standard deviation (the variable is given in parenthesis).

## 5 Requirements

### 5.1 General

The cutting and the bonding operations of finger joints shall result in reliable and durable bonds of required strength.

These general requirements shall be considered satisfied if both the requirements in this clause and the minimum production requirements in clause 6 are fulfilled.

### 5.2 Timber

#### 5.2.1 Species

Sufficient information on the timber species shall be available to enable the timber to be satisfactorily bonded.

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#### 5.2.2 Knots and fissures

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For the following requirements knots with a diameter not greater than 6 mm shall be disregarded.

There shall be no knots, fissures or pronounced grain disturbance within the joint itself. Outside the joint the distance between a knot and the end of the cross-cut timber shall be not less than  $l + 3d$  where  $d$  is the diameter of the knot measured perpendicular to the grain direction (longitudinal direction), see figure 2.

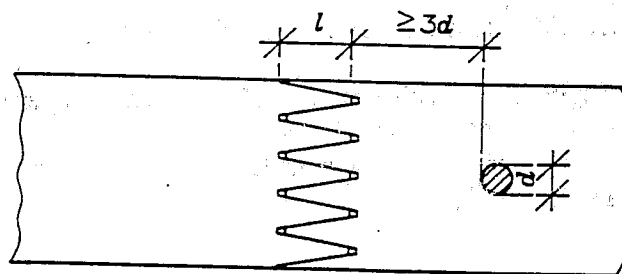


Figure 2: Minimum distance from the end of the timber to a knot

Where a member is cross-cut to remove a knot, the cut shall be made at a distance from the knot at least equal to a length of  $3d$ , see figure 3.



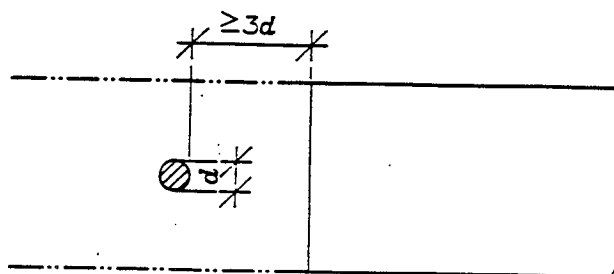


Figure 3: Minimum distance for a cross-cut to remove a knot

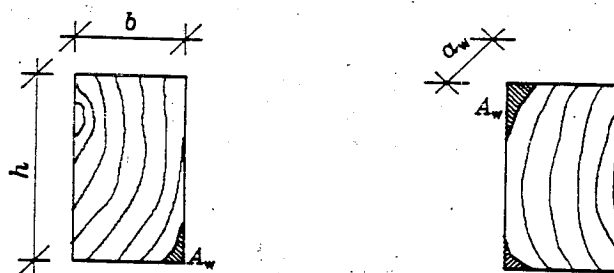
### 5.2.3 Wane or edge damage

There shall be no wane or edge damage affecting more than two corners at the joint within the finger length and within 75 mm of the root of the fingers. The area of the wane at any corner shall not exceed 1 % of the cross-sectional area, see figure 4.

NOTE: Conformity with this requirement can be verified by measuring the diagonal  $a_w$  of the wane and demonstrating that it is less than the maximum diagonal given in figure 5 as a function of the cross-sectional area  $A$ .

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The cross-sectional area is  $A = bh$ .  
The area of one wane is  $A_w$ .  
It is required that  $A_w \leq A/100$ .

Figure 4: Cross section of timber with wane