



# SLOVENSKI STANDARD SIST ENV 387:2000

01-april-2000

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**Lepljeni lamelirani les - Polni zobati spoji - Zahteve za uporabo in minimalne zahteve za proizvodnjo**

Glued laminated timber - Large finger joints - Performance requirements and minimum production requirements

Brettschichtholz - Universal-Keilzinkenverbindungen - Leistungs- und Mindestanforderungen an die Herstellung

Bois lamellé collé - Aboutages à entures multiples de grande dimension - Exigences de performance et prescriptions minimales de fabrication

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**Ta slovenski standard je istoveten z: ENV 387:1999**

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**ICS:**

79.060.99

Öl \* ^ Ä • } ^ Ä || z ^

Other wood-based panels

**SIST ENV 387:2000**

**en**

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EUROPEAN PRESTANDARD  
PRÉNORME EUROPÉENNE  
EUROPÄISCHE VORNORM

ENV 387

February 1999

ICS 79.060.99

English version

Glued laminated timber - Large finger joints - Performance  
requirements and minimum production requirements

Bois lamellé collé - Aboutages à entures multiples de  
grande dimension - Exigences de performance et  
prescriptions minimales de fabrication

Brettschichtholz - Universal-Keilzinkenverbindungen -  
Leistungs- und Mindestanforderungen an die Herstellung

This European Prestandard (ENV) was approved by CEN on 26 June 1997 as a prospective standard for provisional application.

The period of validity of this ENV is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the ENV can be converted into a European Standard.

CEN members are required to announce the existence of this ENV in the same way as for an EN and to make the ENV available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the ENV) until the final decision about the possible conversion of the ENV into an EN is reached.

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REPUBLIKA SLOVENIJA  
MINISTRSTVO ZA ZNANOST IN TEHNOLOGIJO  
Urad RS za standardizacijo in meroslovje  
LJUBLJANA

SIST.....ENV 387.....  
PREVZET PO METODI RAZGLASITVE

-04- 2000



EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

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## Foreword

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

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

## Introduction

This European Prestandard concerns the production of large finger joints, which are finger joints across the whole cross section of a structural glued laminated timber member. The requirements are to ensure the production of reliable and durable bonding, so that large finger joints may be used in timber structures of service classes 1 or 2. For timber structures of service class 3 special precautions shall be taken, among these only adhesives of the phenolic resin type which meet the requirements for adhesive type I of EN 301 shall be used. It is assumed that the production of large finger joints will take place at a factory in order to ensure a stable and reliable product.

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## 1 Scope

This prestandard specifies requirements for large finger joints and minimum requirements for the production of these in structural members of glued laminated timber made from coniferous wood. Such finger joints may be employed for joints in straight beams or for frame corners, see figure 1.

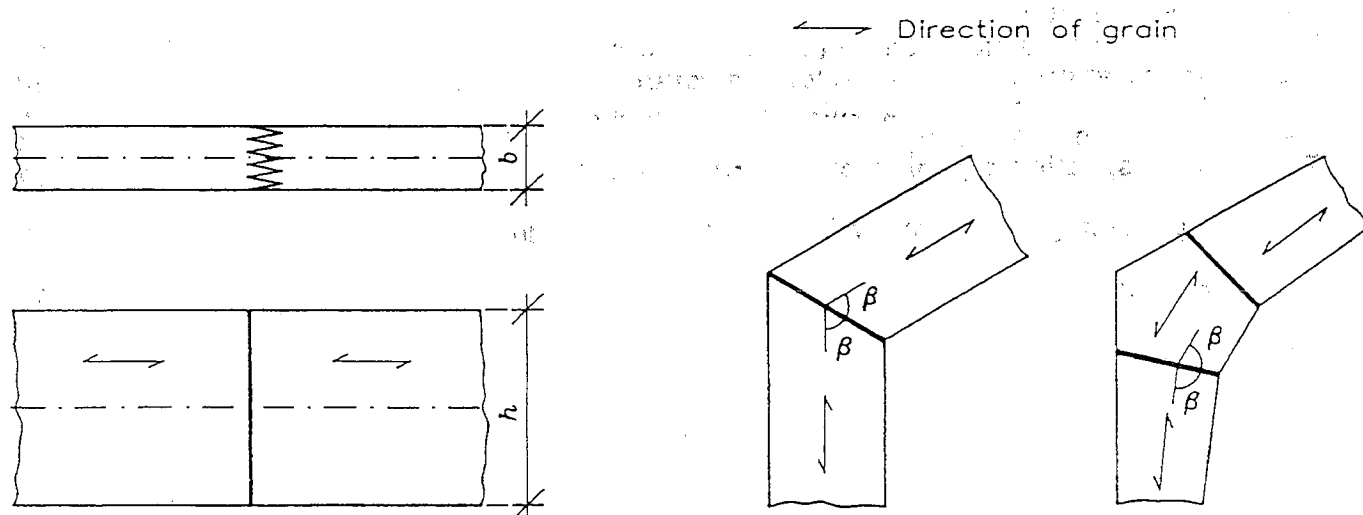


Figure 1: Large finger joints in a beam and at frame corners.

## 2 Normative references

This European Prestandard 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 Prestandard 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 385:1995 Finger jointed structural timber - Performance requirements and minimum production requirements
- EN 386:1995 Glued laminated timber - Performance requirements and minimum production requirements
- EN 408:1995 Timber structures - Structural timber and glued laminated timber - Determination of some physical and mechanical properties

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## 3 Definitions

For the purposes of this European Prestandard, the following definitions apply

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**3.1 large finger joint.** Finger joint through the full cross-sectional area at the ends of glulam members bonded together at any angle.

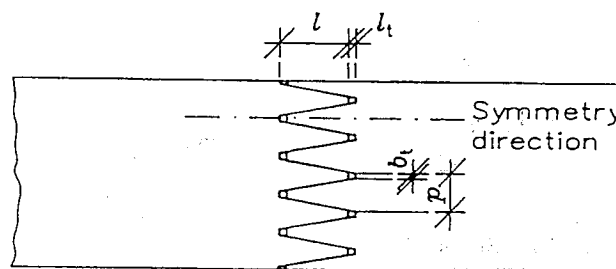


Figure 2:

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 slot base and the tip of the finger, measured along the centre line of the finger, see figure 2.

**3.3 glued laminated timber (glulam).** Structural member formed by bonding together timber laminations with the grain running essentially parallel.

**3.4 pitch.** Distance between fingers, centre to centre, see figure 2.

**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 width.** Distance between finger faces, measured at the tip of the finger, see figure 2.

**3.9 tip gap.** Distance between finger tip and finger base in a bonded finger joint, see figure 2.

## 4 Symbols

$b$  width of cross section, in millimetres;

$b_t$  tip width, in millimetres;

$d$  diameter of cylindrical specimen, in millimetres;

$f_m$  bending strength, in newtons per square millimetre;

$f_{m,k}$  characteristic bending strength, in newtons per square millimetre;

$f_{m,de,k}$  characteristic bending strength declared by the manufacturer, in newtons per square millimetre;

$h$  depth of cross section, in millimetres;

$l$  finger length, in millimetres;

$l_t$  tip gap, in millimetres;

- $M$  bending moment, in newton millimetres;  
 $\rho$  pitch, in millimetres;  
 $\beta$  between the cross section at the joint and the grain direction, see figure 1.

## 5 Requirements

### 5.1 General

The cutting and bonding operations of large 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.

The symmetry direction of the fingers shall be parallel to the grain, see figure 2.

### 5.2 Glulam

The glulam shall be produced in conformity with EN 386:1995 and from a coniferous species.

### 5.3 Adhesives

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The adhesive shall enable joints of such strength and durability to be produced in order that the integrity of the bond is maintained throughout the intended lifetime of the structure.

The type of adhesive shall be chosen in accordance with 5.3 of EN 385:1995. Additionally it shall be gap filling for gaps of at least 1,0 mm.

NOTE: The use of the phenolic resin type adhesives as defined in EN 301 is recommended.

### 5.4 Bending strength

The characteristic edgewise bending strength  $f_{m,k}$  of the large finger joints shall meet the following requirement:

$$f_{m,k} \geq f_{m,dc,k}$$

$f_{m,dc,k}$  is a characteristic bending strength declared by the manufacturer.

This requirement shall be deemed to be satisfied if the initial bending test of the large finger joints according to 8.4 have met this requirement and if the fit of the fingers in the end product meets the requirement in 7.1.



## 6 Manufacturing requirements

### 6.1 Production conditions

#### 6.1.1 Premises

The premises shall be suitable for the production. The production shall be carried out in a stable range of air temperature and relative air humidity such that the required temperature and moisture content of the glulam is obtained.

NOTE: Storage facilities of sufficient capacity should be available to ensure the required temperature and moisture content of the glulam.

The adhesive storage and a separate room for the preparation of the adhesive shall fulfil 6.1.2.6 of EN 386:1995.

#### 6.1.2 Equipment

The equipment given in the following subclauses of EN 386:1995 shall be available: 6.1.3.1, 6.1.3.2, 6.1.3.7, 6.1.3.8, 6.1.3.9 and 6.1.3.10.

A cutting machine of special stability, and equipment to obtain the required pressure in the finger joint shall be available.

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## 6.2 Glulam

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### 6.2.1 Temperature

The glulam shall have a temperature above the minimum temperature required by the adhesive manufacturer. The minimum temperature shall be not less than 15 °C.

### 6.2.2 Moisture content

The average moisture content in a glulam member shall conform to EN 386:1995. The difference in the average moisture content between the two glulam members shall not exceed 2 %.

## 6.3 Adhesives

Where the glulam members have been treated with preservatives, the advice of the suppliers of the adhesive and preservatives shall be obtained and followed.