



# SLOVENSKI STANDARD

## SIST EN 15737:2010

01-januar-2010

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**Lesene konstrukcije - Metode preskušanja - Torzijska trdnost in odpornost pri privijanju lesnih vijakov**

Timber Structures - Test methods - Torsional strength and resistance to driving of screws

Holzbauwerke - Prüfverfahren - Bruchdrehmoment und Eindrehwiderstand von Schrauben

Structures en bois - Méthodes d'essai - Force de torsion et résistance au vissage

**Ta slovenski standard je istoveten z: EN 15737:2009**

SIST EN 15737:2010  
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**ICS:**

91.080.20

Lesene konstrukcije

Timber structures

**SIST EN 15737:2010**

**en,fr,de**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 15737**

August 2009

ICS 91.080.20

English Version

**Timber Structures - Test methods - Torsional resistance of  
driving in screws**

Structures en bois - Méthodes d'essai - Force de torsion et  
résistance au vissage

Holzbauwerke - Prüfverfahren - Einschraubdrehmoment  
von Schrauben

This European Standard was approved by CEN on 17 July 2009.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN Management Centre or to any CEN member.

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 CEN Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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## Foreword

This document (EN 15737:2009) has been prepared by Technical Committee CEN/TC 124, "Timber Structures", the secretariat of which is held by SFS.

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 2010, and conflicting national standards shall be withdrawn at the latest by February 2010.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This test standard provides information how to determine the torsional resistance to insertion of screws into timber with a reference to requirements specified in EN 14592.

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

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## 1 Scope

This standard specifies a test method to determine the torsional resistance to driving of screws in solid timber or glued laminated timber or other wood based materials.

## 2 Normative references

The following referenced documents are essential to the use of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 14592:2008, *Timber Structures – Dowel type fasteners - Requirements*

ISO 3130, *Wood – Determination of moisture content for physical and mechanical tests*

ISO 3131, *Wood – Determination of density for physical and mechanical tests*

## 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

### 3.1

#### Moment cell

device that records the torque applied

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### 3.2

#### Test piece

element or part of an element that will include the driven screw after the test made of solid timber, glued laminated timber or wood based materials or combinations of these materials

## 4 Symbols

$P$  Penetration ratio;

$R_{\text{tor,max}}$  maximum screw insertion moment, in Newton millimetre;

$R_{\text{tor,r}}$  screw insertion resistance, in Newton millimetre;

$R_{\text{tor,s}}$  screw insertion strength, in Newton millimetre;

$d$  nominal diameter, in millimetre;

$l$  is total length of the screw, in millimetre.

## 5 Material requirements

### 5.1 Fasteners

The screws shall comply with the requirements given in 6.3 of EN 14592:2008

## 6 Test Methods

### 6.1 General

The moisture content and density of the test piece shall be determined according to ISO 3130 and ISO 3131.

### 6.2 Conditioning

The test pieces shall be manufactured at an equilibrium moisture content corresponding to  $(20 \pm 2) ^\circ\text{C}$  and  $(65 \pm 5) \%$  relative humidity. The material is conditioned when it attains constant mass. Constant mass is considered to be attained when the results of successive weightings, carried out at an interval of 6 h, do not differ, by more than 0,1 % of the mass of the material.

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

### 6.3 Sampling

The density of the test pieces or components of the test piece shall comply with the density of the grade used in practise.

The upper surface (receiving the point) shall predominantly be radial or tangential.

### 6.4 Test piece dimensions

For solid timber and glued laminated timber test pieces the minimum dimensions are given in Figure 1. For test pieces made of wood based materials or combinations of wood based materials and solid timber or glued laminated timber the dimensions in the direction perpendicular to penetration shall be as minimum  $20 d$ , where  $d$  is the nominal diameter of the screw. The test piece dimension in penetration direction shall always allow full penetration of the screw.

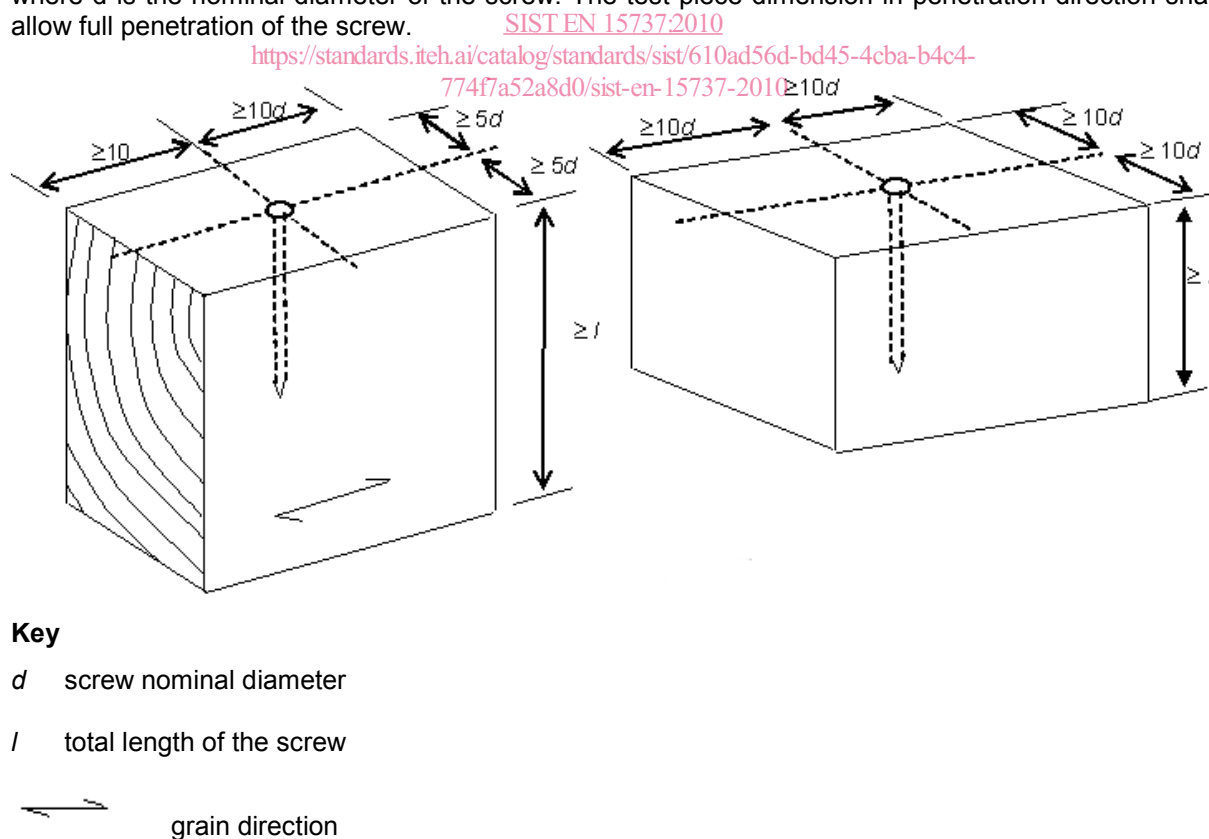


Figure 1 — Test piece of solid wood (left) and wood based materials (right)

## EN 15737:2009 (E)

## 7 Test

### 7.1 Test setup

The test piece is mounted on the base plate of a frame and fixed in such a way as to prevent any movement during the test.

The test rig should allow fixing a moment cell to the screwing device capable of moving in a vertical axis and mounting displacement transducers on either side of the screwing device to measure vertical displacement. An example is given in Figure 2.

The moment cell used shall be capable of measuring the torque to an accuracy of 1 % of the torque applied to the screw.

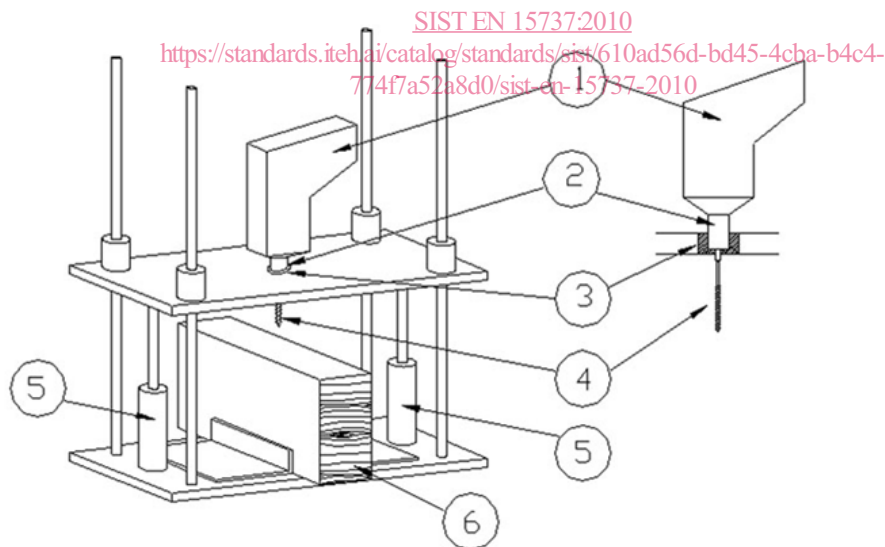
The equipment for measuring displacement shall be capable of measuring to an accuracy of 1 % of the measured value.

### 7.2 Procedure

Fix a drive bit into the moment cell and mount a screw into the bit. The screw should be installed according to the manufacturer's instructions, including any advice on pre-drilling requirements.

Move the cross-head/screw assembly into a position where the screw tip is resting on the top of the test specimen.

Drive the screw into the test specimen, either by using a mechanical drill or screwing machine, or by using a hand screw wrench ( $\leq 100$  revolutions per minute), until the screw is fully embedded along its entire length in the specimen. For countersunk screws this includes the thickness of the head.



#### Key

- 1 Mechanical drill, screwing machine, or hand screw wrench, screwing device
- 2 Drill chuck/bit
- 3 Moment cell
- 4 Screw
- 5 Displacement transducers
- 6 Timber

Figure 2 — Example of a test arrangement for screw insertion in timber