SLOVENSKI STANDARD
SIST EN 14592:2009+A1:2012

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Nadomešča:
SIST EN 14592:2009

Lesene konstrukcije - Paličasta vezna sredstva - Zahteve

Timber structures - Dowel-type fasteners - Requirements

Holzbauwerke - Stiftförmige Verbindungsmittel - Anforderungen

Structures en bois - Eléments de fixation de type tige - Exigences

Ta slovenski standard je istoveten z: **EN 14592:2008+A1:2012**

ICS:

21.060.01	Vezni elementi na splošno	Fasteners in general
91.080.20	Lesene konstrukcije	Timber structures

SIST EN 14592:2009+A1:2012 **en,fr,de**

EUROPEAN STANDARD

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EN 14592:2008+A1

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Timber structures - Dowel-type fasteners - Requirements

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

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Contents

Page

Foreword

This document (EN 14592:2008+A1:2012) has been prepared by Technical Committee CEN/TC 124 “Timber structures”, the secretariat of which is held by AFNOR.

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of an identical text or by endorsement, at the latest by November 2012, and conflicting national standards shall be withdrawn at the latest by November 2012.

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 document includes Amendment 1, approved by CEN on 2012-04-09.

This document supersedes EN 14592:2008.

The start and finish of text introduced or altered by amendment is indicated in the text by tags A1 A1.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EC Directive(s).

For relationship with EC Directive(s), see informative Annex ZA, which is an integral part of this document.

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, Croatia, 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, Turkey and the United Kingdom.

1 Scope

This European Standard specifies the requirements and test methods for materials, geometry, strength, stiffness and durability ascpects (i.e. corrosion protection) of dowel-type fasteners for use in load bearing timber structures.

Only dowel-type fasteners manufactured from steel are covered by this European Standard. For the purpose of this standard, dowel-type fasteners for timber structures are taken to be nails, staples, screws, dowels, and bolts with nuts. Definitions of these items are given in Clause 3. This European Standard specifies also the evaluation of conformity procedures and includes requirements for marking of these products.

〚A1〛 This European Standard does not cover fasteners treated with fire retardants to improve their fire performance.

This European Standard covers fasteners that may be coated for the following purposes:

1 Corrosion protection (e.g. hot dip galvanization, epoxy coating);

2 Lubricants (to facilitate insertion);

3 Withdrawal enhancement and/or collation (adhesive coating). 〚A1〛

2 Normative references

The following referenced documents are indispensable for the application 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 409, *Timber structures - Test methods - Determination of the yield moment of dowel type fasteners - Nails*

EN 1382, *Timber structures - Test methods - Withdrawal capacity of timber fasteners*

EN 1383:1999, *Timber structures - Test methods - Pull-through resistance of timber fasteners*

EN 1995-1-1:2004, *Eurocode 5: Design of timber structures - Part 1-1: General - Common rules and rules for buildings*

EN 10016 (all parts), *Non-alloy steel rod for drawing and/or cold rolling*

EN 10025-2, *Hot rolled products of structural steels - Part 2: Technical delivery conditions for non-alloy structural steels*

EN 10025-3, *Hot rolled products of structural steels - Part 3: Technical delivery conditions for normalized/normalized rolled weldable fine grain structural steels*

EN 10083-1, *Steels for quenching and tempering - Part 1: General technical delivery conditions*

EN 10083-2, *Steels for quenching and tempering - Part 2: Technical delivery conditions for non alloy steels*

〚A1〛 EN 10088 (all parts), *Stainless steels* 〚A1〛

EN 10149-1, *Hot-rolled flat products made of high yield strength steels for cold forming – Part 1: General delivery conditions*

EN 10218-1, *Steel wire and wire products - General - Part 1: Test methods*

[A1] EN 10263 (all parts), *Steel rod, bars and wire for cold heading and cold extrusion*

EN 10269, *Steels and nickel alloys for fasteners with specified elevated and/or low temperature properties* [A1]

[A1] EN 10277-2, *Bright steel products - Technical delivery conditions - Part 2: Steels for general engineering purposes* [A1]

EN 14358, *Timber structures - Calculation of characteristic 5-percentile values and acceptance criteria for a sample*

[A1] EN 15737, *Timber structures - Test methods - Torsional resistance of driving in screws* [A1]

EN ISO 780, *Packaging - Pictorial marking for handling of goods (ISO 780:1997)*

EN ISO 1461, *Hot dip galvanised coatings on fabricated iron and steel articles - Specifications and test methods (ISO 1461:1999)*

EN ISO 4014, *Hexagon head bolts - Product grades A and B (ISO 4014:1999)*

EN ISO 4016, *Hexagon head bolts - Product grade C (ISO 4016:1999)*

EN ISO 4017, *Hexagon head screws - Product grades A and B (ISO 4017:1999)*

EN ISO 4018, *Hexagon head screws - Product grade C (ISO 4018:1999)*

EN ISO 4032, *Hexagon nuts, style 1 - Product grades A and B (ISO 4032:1999)*

EN ISO 4034, *Hexagon nuts - Product grade C (ISO 4034:1999)*

[A1] EN ISO 6892-1, *Metallic materials - Tensile testing - Part 1: Method of test at room temperature (ISO 6892-1:2009)* [A1]

EN ISO 9001, *Quality management systems - Requirements (ISO 9001:2000)*

EN ISO 10666:1999, *Drilling screws with tapping screw thread - Mechanical and functional properties (ISO 10666:1999)*

[A1] *deleted text* [A1]

ISO 2081, *Metallic coatings - Electroplated coatings of zinc on iron or steel*

3 Terms and definitions

For the purposes of this document, terms and definitions given in EN 1995-1-1:2004 and the following apply.

3.1
plain shank nail (smooth nail)
nail that has a constant cross-section along its entire length (e.g. round, square or grooved nails)

3.2
threaded nail
nail that has its shank profiled or deformed over a part of its length [A1] l_g as defined in Figure 1 b [A1]

3.3
staple crown width
distance between the outer edges of the staple legs

3.4
dowel
cylindrical metal fastener that does not contain an integral head

NOTE Dowels may be threaded and have nuts fitted at either end.

3.5
bolt
cylindrical metal fastener containing an integral head at one end and a threaded portion to receive a nut at the other end

3.6
withdrawal parameter
parameter measuring the resistance of a timber test piece to the withdrawal of a timber fastener

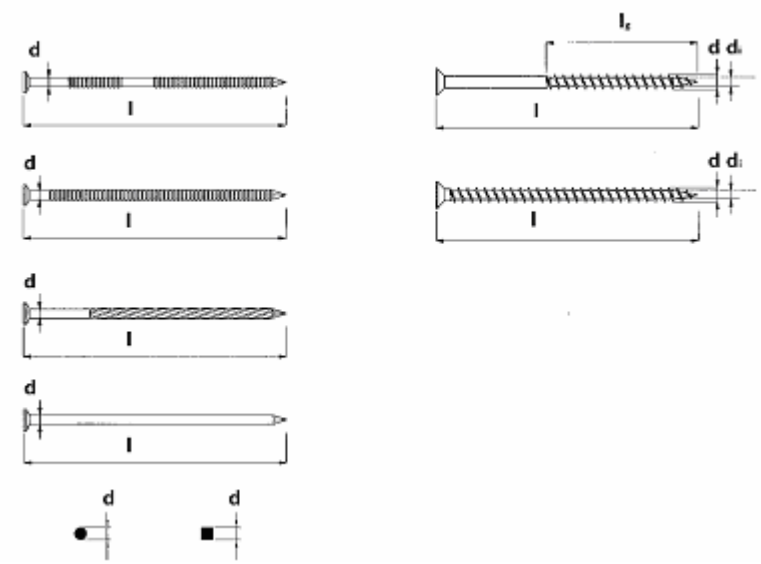
3.7
head pull-through parameter
parameter measuring the resistance of a timber test piece to the pulling through of the head of a timber fastener or the crown of a staple

3.8
tensile capacity
tensile capacity measured during a test following the principle of EN 1383, as described in 6.1.4.5

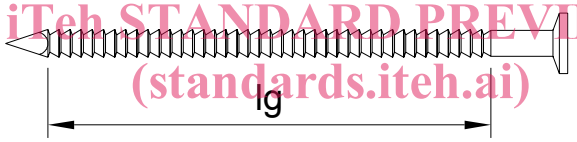
3.9
nominal diameter
screws intended for use in load bearing timber structures, d being the maximum outer cross-section diameter of the threaded part, and for nails d being the minimum outer cross-sectional dimension of the unprofiled part, when measured as described in 5.3

NOTE For plain shank nails, spiral rolled nails or annular ring shank nails, intended for use in load bearing timber structures, d is the minimum outer cross-sectional diameter of the round nail wire, or the side length dimension of the minimum cross-sectional for a square nail, for all other profiled nails, intended for use in load bearing timber structures; d is the minimum cross-sectional diameter of the original wire rod, from which the profiled nail has been produced (see Figure 1).

A1



a) Nominal diameter *d* and length *l* of nails (left) and screws (right). For screws the threaded length is shown, see also Figure 3



b) Length of the threaded part l_g of threaded nails

Figure 1 – Nominal diameter, length and length of the threaded part of nails and screws A1

A1 **3.10**
thread root diameter
inner diameter of the thread of a screw

NOTE The inner diameter is used in EN 1995-1-1 to determine the effective diameter for laterally loaded dowel type fasteners. A1

3.11
stiffness
value based on required bend angle (deformation), α of the characteristic yield strength (capacity) either found by testing or calculated according to EN 1995-1-1

A1 **3.12**
coating type
defines the purpose of a coating

Coating type 1: Corrosion protection

Coating type 2: Lubricant to facilitate insertion

Coating type 3: Adhesive coating for improving withdrawal strength and/or for collation purposes A1

4 Symbols and abbreviations

For the purposes of this standard, the symbols and abbreviations given in EN 1995-1-1 and the following apply.

A_{80}	percentage elongation (%)
A_h	nail head cross-sectional area (mm^2)
A_s	staple leg cross-sectional area (mm^2)
d	nominal diameter (mm)
d_h	head diameter (mm)
[A1] d_1 [A1]	inner thread diameter; inner diameter of fluting (mm)
d_{ef}	effective screw diameter (mm)
$f_{ax,k}$	characteristic withdrawal parameter (N/mm^2)
$f_{head,k}$	characteristic head pull-through parameter (N/mm^2)
$f_{tens,k}$	characteristic tensile capacity (head pull-off or shank tensile capacity) (kN)
$f_{tor,k}$	characteristic torsional strength (Nmm)
f_u	tensile strength of the wire (N/mm^2)
h_t	nail head thickness (mm)
l	overall fastener length (mm)
l_g	length of profiling/threading (mm)
l_p	length of the nail point (mm)
$M_{y,k}$	characteristic yield moment (Nmm)
$R_{tor,k}$	characteristic torsional resistance to insertion into timber with a density of 450 kg/m^3 when conditioned to constant mass at 20 ºC and 65 % relative humidity (Nmm)
α	bend angle (°)
ρ_k	characteristic timber density when conditioned to constant mass at 20 ºC and 65 % relative humidity (kg/m^3)

5 Dimensions and tolerances

5.1 Method of measurement and accuracy

Dimensions shall be taken on the completed fastener using a calibrated device capable of achieving an accuracy of ± 1 % of the measurement.

5.2 Length

Where appropriate the overall length of a fastener shall be measured and the result declared. When sampled in accordance with Tables 2 to 6 and measured, the overall length shall be within ± 2,5 % of the declared value.

5.3 Nominal diameter

Where appropriate, the nominal diameter of a fastener shall be measured and the result declared. Unless otherwise stated in this standard, the nominal diameter shall be within ± 2,5 % of the declared value when sampled in accordance with Tables 2 to 6 and measured as follows:

— the diameter shall be measured at several points around the circumference and along the length;

— the [A1] minimum [A1] measurement shall be taken as the nominal diameter.

5.4 Other dimensions

Where appropriate, other dimensions, e.g. point length of a fastener, threaded length and head thickness, shall be measured and the result declared. When sampled in accordance with Tables 2 to 6 and measured, these other dimensions shall be within ± 5 % of the declared values.

5.5 Cross-sectional area

Where appropriate, the cross-sectional area of a fastener shall be measured and the result declared. When sampled in accordance with Tables 2 to 6 sufficient measurements shall be taken to enable the cross-sectional area to be calculated. The cross-sectional area shall be within ± 5 % of the declared value.

6 Requirements

6.1 Nails

6.1.1 General

[A1] Not applicable. [A1]

6.1.2 Materials

Nail shall be produced from a wire with a minimum tensile strength of 600 N/mm^2 determined in accordance with EN 10218-1. The wire shall be drawn from either non-alloy steel rods produced in accordance with EN 10016 (all parts), or wire drawn from austenitic stainless steel rods produced in accordance with [A1] EN 10088. The relevant specification shall be declared.

Other steel grades may be used, provided it has been documented that the steel has at least equivalent mechanical properties to any of the grades listed in the above standards. All relevant information of the alternative steel grades shall be obtained from testing and declared as a part of the ITT. [A1]

6.1.3 Geometry

The nominal diameter, d, of nail shall not be less than 1,9 mm and shall not be greater than 8,0 mm.

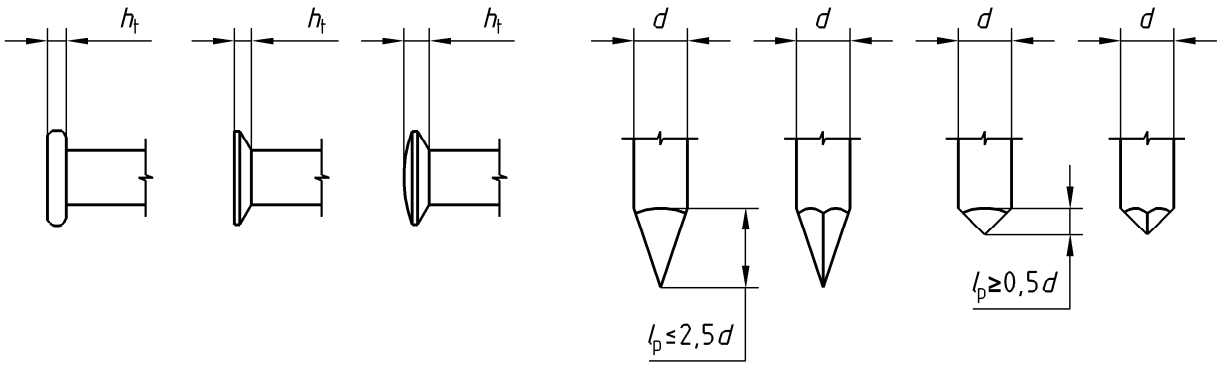
The area of the nail head, A_h, shall not be less than 2,5 d^2, and the thickness of the head, h_t, shall not be less than 0,25 d (see Figure 2).

The length (l) of the nail (see Figure 1) and the length of the point, l_p, shall not be less than 0,5 d and shall not be greater than [A1] 2,5 d [A1] (see Figure 2).

For profiled nails the length of the the threated part shall be minimum 4,5 d.

[A1] If nails are coated with a type 3 coating, the coated length shall be at least 0,5 l. [A1]

[A1]



[A1]

Figure 2 – Geometry of nails heads and points

[A1] *deleted text* [A1]

6.1.4 Mechanical strength and stiffness

6.1.4.1 General

For the purpose of the mechanical strength of nails the following characteristic properties shall be used in this standard:

— characteristic yield moment,

— characteristic withdrawal parameter,

— characteristic head pull-through parameter,

— characteristic tensile capacity.

The characteristic strength results for nails (see 6.1.4.2 to 6.1.4.5) shall be declared either directly from tests or, in certain cases and types of nails, from equations given in EN 1995-1-1. Where characteristic strength values are declared from test results, they shall be calculated in accordance with EN 14358.

For the purposes of strength calculations for nailed joints, the nail diameter shall be taken as the nominal diameter, d, measured in accordance with 5.3.

For the purpose of the mechanical stiffness of nails the following characteristic properties shall be used in this standard:

— characteristic yield moment.

For the purposes of stiffness (bend angle α), for round or square cross-section nails, the declaration is related to the result of the characteristic yield moment $M_{y,k}$ which shall be declared either directly by testing in accordance with EN 409 or calculated from the relevant equations given in EN 1995-1-1.

For all other types of nail the result shall be declared by testing in accordance with EN 409.