



SLOVENSKI STANDARD
oSIST prEN 14566:2014
01-december-2014

Mehanska pritrdilna sredstva za sisteme mavčnih plošč - Definicije, zahteve in preskusne metode

Mechanical fasteners for gypsum board systems - Definitions, requirements and test methods

Mechanische Befestigungsmittel für Gipsplattensysteme - Begriffe, Anforderungen und Prüfverfahren

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Fixations mécaniques pour systèmes en plaques de plâtre - Définitions, spécifications et méthodes d'essai

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Ta slovenski standard je istoveten z: prEN 14566

ICS:

21.060.99	Drugi vezni elementi	Other fasteners
91.100.10	Cement. Mavec. Apno. Malta	Cement. Gypsum. Lime. Mortar

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

DRAFT
prEN 14566

October 2014

ICS 21.060.99; 91.100.10

Will supersede EN 14566:2008+A1:2009

English Version

Mechanical fasteners for gypsum board systems - Definitions, requirements and test methods

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Définitions, spécifications et méthodes d'essai

Mechanische Befestigungsmittel für Gipsplattensysteme -
Begriffe, Anforderungen und Prüfverfahren

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 241.

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

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prEN 14566:2014 (E)

Foreword

This document (prEN 14566:2014) has been prepared by Technical Committee CEN/TC 241 “Gypsum and gypsum based products”, the secretariat of which is held by AFNOR.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 14566:2008+A1:2009.

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 EU Directive(s).

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

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1 Scope

This European Standard specifies the characteristics and performance of mechanical fasteners made of steel, including nails, screws and staples, intended to be used for the fixing of gypsum board in accordance with EN 520, gypsum boards with fibrous reinforcement in accordance with EN 15283-1 and EN 15283-2, composite panels according to EN 13950, products from secondary processing in accordance with EN 14190 and suitable ancillary products, to timber and metal, as appropriate, in building construction works. The fasteners secure the board to the framing enabling its surface to be finished by jointing or plastering to receive decoration. They can also be used for the construction of the framing and for the connection between substructure and load bearing components and for fixing boards together.

This European Standard covers the following product performance characteristics: reaction to fire and flexural strength to be measured according to the corresponding European test methods.

It provides for the evaluation of conformity of the product to this European Standard.

This European Standard also covers the additional technical characteristics that are of importance for the use and acceptance of the products by the construction industry and the reference tests for these characteristics.

This European Standard does not cover nails, screws and staples intended for use with materials other than gypsum board and the gypsum based products referred to above and their associated system components.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 338, *Structural timber — Strength classes*

EN 520, *Gypsum plasterboards — Definitions, requirements and test methods*

EN 10230-1, *Steel wire nails — Part 1: Loose nails for general applications*

EN 10346, *Continuously hot-dip coated steel flat products — Technical delivery conditions*

EN 13950, *Gypsum plasterboard thermal/acoustic insulation composite panels — Definitions, requirements and test methods*

EN 14190, *Gypsum plasterboard products from reprocessing — Definitions, requirements and test methods*

EN 14195, *Metal framing components for gypsum plasterboard systems — Definitions, requirements and test methods*

EN 14592, *Timber structures — Dowel-type fasteners — Requirements*

EN 15283-1, *Gypsum boards with fibrous reinforcement. Definitions, requirements and test methods. Gypsum boards with mat reinforcement*

EN 15283-2, *Gypsum boards with fibrous reinforcement. Definitions, requirements and test methods. Gypsum fibre boards*

EN ISO 2702:2011, *Heat-treated steel tapping screws — Mechanical properties*

EN ISO 9001:2000, *Quality management system — Requirements (ISO 9001:2000)*

EN ISO 9227, *Corrosion tests in artificial atmospheres — Salt spray tests (ISO 9227:2006)*

EN ISO 12777-1:2008, *Methods of test for pallet joints — Part 1: Determination of bending resistance of pallet nails, other dowel-type fasteners and staples (ISO 12777-1:1994 + Amd 1:2008)*

3 Terms, definitions, symbols and abbreviated terms

3.1 Terms and definitions

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

3.1.1

gypsum board nail

corrosion resistant steel wire nail with purpose made head, shank and point

Note 1 to entry: Nails can vary in head profile, material and level of corrosion resistance. See Table 3 and Table A.1.

3.1.2

gypsum board screw

screw used without pilot holes for the assembly of gypsum board systems

Note 1 to entry: Screws which go directly into gypsum board usually have a trumpet head. They are straight and free from burrs and capable of being driven by a power operated screwdriver. See Table A.2.

3.1.3

head

wide part of nail or screw used to drive the nail or screw into the materials to be joined

Note 1 to entry: The head of nails can be one of two types according to function (see Table A.1). The surface can be smooth or chequered. The head of screws can be domed, flat or concave depending upon its use (see Table A.2).

3.1.4

point

sharp end opposite to the head which first penetrates the materials to be joined

Note 1 to entry: The style and shape of the nail point is formed to permit entry and penetration of the timber.

3.1.5

shank

connection between the head and the point

Note 1 to entry: Nails have a straight shank. The diameter of the round shank can vary according to length, function and thickness of the corrosion resistant treatment. It may be plain, have indentations, be annular ring rolled or may be separately treated to improve resistance to withdrawal.

3.1.6

thread

spiral extension to the shank of specific pitch and diameter appropriate to its function and use

Note 1 to entry: The thread may be of single or multiple lead design.

3.1.7

gypsum board staple

double right angle, fastener, made from round, oval, square or rectangular wire, with two legs (shanks) usually of the same length connected by its crown (head) with the tips inclined, see Table A.4

Note 1 to entry: Staples are U shaped, neatly formed and free from defects. Staples can be resin coated to increase withdrawal strength. The legs are straight and parallel and can be designed, in conjunction with the tip, to provide additional holding power when driven into substrate. The style and shape of the tips permit entry and guide and control the line and shape of the penetration of the timber or substrate. The tips have an inclined plane on one or both sides.

3.2 Symbols and abbreviated terms

For the purpose of simplification in product marking and performance information characteristics may be identified through the symbols and abbreviations given in Table 1.

Table 1 — Symbols and abbreviated terms

Requirement	Subclause	Symbol or abbreviated term
Reaction to fire	4.1	R2F
Flexural strength	4.2	F
Dangerous substances	4.3	DS

4 Requirements

4.1 Reaction to fire

Gypsum board nails, screws and staples made from steel are classified A1 (EN 13501-1) (no contribution to fire) without testing when they are not coated with organic material.

According to Commission Decision 96/603/EC, as amended, nails, screws and staples are classified as A1 without testing if they contain less than 1 % organic material by weight or volume (whichever is the more onerous).

When nails, screws and staples have an organic coating of more than 1 %, their contribution to reaction to fire in end use condition is so small in the total assembly that they have no influence on the classification of the system tested and therefore are classified as A1 without testing.

4.2 Flexural strength (expressed as bending behaviour and breaking torque)

4.2.1 Bending behaviour (for nails and staples)

When tested in accordance with 5.5 no fastener shall show signs of breakage or cracking. This applies only to nails and staples with a minimum nominal length of 20 mm.

4.2.2 Breaking torque (for screws)

The breaking torque of the gypsum board screws shall comply with table 2.

Table 2 — Breaking torque of gypsum board screws

Nominal diameter of thread mm	Minimum breaking torque Nm
3,5	2,1
3,8 / 3,9 / 4,0	2,8
4,2	3,5
4,8 / 4,9 / 5,0	5,6
5,5	6,0

Breaking torque of the screw shall be tested in accordance with 5.9. No more than 10 % of the screws shall fail.

4.3 Dangerous substances

National regulations on dangerous substances may require verification and declaration on release, and sometimes content, when construction products covered by this standard are placed on those markets.

In the absence of European harmonized test methods, verification and declaration on release/content should be done taking into account national provisions in the place of use.

NOTE An informative database covering European and national provisions on dangerous substances is available at the Construction web site on EUROPA accessed through: <http://ec.europa.eu/enterprise/construction/cpd-ds/>

4.4 Additional requirements

4.4.1 Protective treatment

Where the manufacturer is using a protective coating to achieve durability, the coating shall be sufficient to provide a satisfactory level of protection against corrosion. It shall reflect the condition where the fastener is subjected to temporary exposure during storage, construction and its remaining life in an unexposed cavity of the completed building.

Fasteners protected with coating other than zinc shall satisfy one of the three classes of performance given in Table 3, when tested in accordance with EN ISO 9227. This class shall be stated by the manufacturer in its technical literature.

Table 3 — Classes of corrosion protection

Classification	Test duration In hours	Criterion
Class 24	24	No visible rusting
Class 48	48	No visible rusting
Class 96	96	No visible rusting

Fasteners protected with zinc coating shall have a minimum coating thickness of 5 µm (35 g/m²) for screws and nails and 3 µm (21 g/m²) for staples when tested in accordance with 5.7.

4.4.2 Requirements for gypsum board nails

4.4.2.1 Head – Dimensions and tolerances

The diameter and tolerance of the head shall be stated by the manufacturer in its technical literature. When measured in accordance with 5.3.3.3, no more than 10 % of the nails shall fail.

4.4.2.2 Shank

The shank diameter and tolerance shall be stated by the manufacturer in its technical literature. When measured in accordance with 5.3.3.1, no more than 10 % of the nails shall fail.

4.4.2.3 Length

The nominal length and tolerance shall be stated by the manufacturer in its technical literature. When measured in accordance with 5.3.3.2, no more than 10 % of the nails shall fail.

4.4.2.4 Pull-out force

The pull-out force from wood shall be at least 200 N when tested in accordance with 5.4. Not more than 10 % of the nails shall fail.

4.4.2.5 Pull-through force

The head should be capable of providing sufficient pull-through force to allow the nail to achieve a minimum value of 300 N when tested in accordance with 5.8. Not more than 10 % of the nails shall fail.

4.4.3 Requirements for gypsum board screws

4.4.3.1 Head diameter

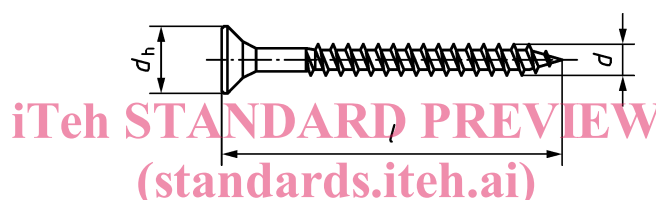
The diameter and tolerance of the head shall be stated by the manufacturer in its technical literature. When measured in accordance with 5.3.3.3, no more than 10 % of the nails shall fail.

4.4.3.2 Diameter of thread

The diameter and tolerance of the thread according to figure 1 shall be stated by the manufacturer in its technical literature. When measured in accordance with 5.3.3.1, no more than 10 % of the screws shall fail.

4.4.3.3 Length

The nominal length and tolerance according to figure 1 shall be stated by the manufacturer in its technical literature. When measured in accordance with 5.3.3.2, no more than 10 % of the screws shall fail.



Key

- l length of screw
- d diameter of thread
- d_h diameter of head

Figure 1 — Dimensions of screws

4.4.3.4 Pull-out force

Depending on the intended use, the pull-out force of screws shall be tested from wood or steel. The diameter and pitch of the threaded portion shall also be capable of providing sufficient pull-out force to allow the screw to achieve a minimum value of 450 N when tested in accordance with 5.4. No more than 10 % of the screws shall fail.

4.4.3.5 Pull-through force

The head should be capable of providing sufficient pull through force to allow the screw to achieve a minimum value of 450 N when tested in accordance with 5.8. No more than 10 % of the screws shall fail.

4.4.3.6 Drilling performance

The points shall be designed to be self-tapping (designation N) or self-drilling (designation D) (see Table A.2 for examples of fastener types).

For type N screws, the points shall be designed with suitable thread to be capable of penetrating galvanised steel sheet according to EN 10346 with a nominal thickness of 0,6 mm, when screws are tested in accordance with 5.6. No more than 10 % of the screws shall exceed a penetration time of 1 s.

For type D screws, the points shall be designed to allow penetration of sections made from steel sheet to EN 10346 up to a nominal thickness of 2 mm when screws are tested in accordance with 5.6. No more than 10 % of the screws shall exceed a penetration time of 4 s.

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4.4.4 Requirements for gypsum board staples

4.4.4.1 Crown width

The nominal width and tolerances of the crown shall be stated by the manufacturer. When measured in accordance with 5.3.3.3, no more than 10 % of the staples shall be outside the stated tolerances.

4.4.4.2 Wire

The nominal wire diameter and tolerance shall be stated by the manufacturer in its technical literature. When measured in accordance with 5.3.3.1, no more than 10 % of the staples shall fail.

4.4.4.3 Length

The nominal length and tolerances shall be stated by the manufacturer. When measured in accordance with 5.3.3.2, not more than 10 % of the staples shall be outside the stated tolerances.

4.4.4.4 Pull-out force

The pull-out force of the staple from timber shall be 100 N when tested in accordance with 5.4. No more than 10 % of the staples shall fail.

4.4.4.5 Pull-through force

The crown should be capable of providing sufficient pull through force to allow the staple to achieve a minimum value of 200 N when tested in accordance with 5.8. No more than 10 % of the screws shall fail.

5 Test methods

5.1 General

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Not all tests specified in Clause 4 are appropriate to every type of fastener. Those tests which result from the requirements of clause 4 shall be carried out. For convenience, these are summarised in table 4.

Table 4 — Test methods

Tests to be done	Nails	Screws	Staples
5.3.3.1 Diameter of shank	4.4.2.2	-	-
5.3.3.1 Diameter of thread	-	4.4.3.2	-
5.3.3.1 Diameter of wire	-	-	4.4.4.2
5.3.3.2 Length	4.4.2.3	4.4.3.3	4.4.4.3
5.3.3.3 Head diameter or crown width	4.4.2.1	4.4.3.1	4.4.4.1
5.4 Pull-out force	4.4.2.4	4.4.3.4	4.4.4.4
5.5 Bending behaviour	4.2.1	-	4.2.1
5.6 Drilling performance	-	4.4.3.6	-
5.7 Protection against corrosion	4.4.1	4.4.1	4.4.1
5.8 Pull-through force	4.4.2.5	4.4.3.5	4.4.4.5
5.9 Breaking torque	-	4.2.2	-