

BS EN 14195:2014



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Metal framing components for gypsum board systems — Definitions, requirements and test methods

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National foreword

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The UK participation in its preparation was entrusted to Technical Committee B/544, Plastering, rendering, dry lining.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Metal framing components for gypsum board systems - Definitions, requirements and test methods

Éléments d'ossature métalliques pour systèmes en plaques
de plâtre - Définitions, spécifications et méthodes d'essai

Metall-Unterkonstruktionsbauteile für Gipsplatten-Systeme -
Begriffe, Anforderungen und Prüfverfahren

This European Standard was approved by CEN on 16 August 2014.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

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Foreword

This document (EN 14195:2014) has been prepared by Technical Committee CEN/TC 241 “Gypsum and gypsum based products”, 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of an identical text or by endorsement, at the latest by June 2015, and conflicting national standards shall be withdrawn at the latest by September 2016.

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 supersedes EN 14195:2005.

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 Regulation (EU) No. 305/2011.

For relationship with Regulation (EU) No. 305/2011, see informative Annex ZA, which is an integral part of this document.

The main technical changes that have been made in this new edition of EN 14195 are the following:

- a) Normative references have been updated;
- b) Clause 1, Scope, has been enlarged to include profiles, hangers and connectors and boards according to EN 520, EN 14190, EN 15283-1 and EN 15283-2;
- c) Annex ZA and Clause 6 have been revised to be in line with the Construction Products Regulation (CPR);
- d) document has been editorially revised.

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, Former Yugoslav Republic of Macedonia, 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 characteristics of metal framing components (e.g. profiles, hangers and connectors) intended to be used in building construction works in conjunction with gypsum boards manufactured according to EN 520, EN 15283-1 and EN 15283-2 and gypsum board products from reprocessing conforming to EN 14190 where the assembly is non-loadbearing. Such assemblies include, for example, partitions, wall and ceiling linings, ceilings with mechanically fixed boards and the cladding of beams, columns, ducts and shafts.

It covers the following performance characteristics: reaction to fire, flexural (yield) strength and loadbearing capacity of suspension components to be measured according to the relevant test methods as specified or cited in this European Standard.

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 10132 (all parts), *Cold-rolled narrow steel strip for heat-treatment*

EN 10244-2, *Steel wire and wire products - Non-ferrous metallic coatings on steel wire - Part 2: Zinc or zinc alloy coatings*

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

EN 13501-1, *Fire classification of construction products and building elements — Part 1: Classification using test data from reaction to fire tests*

EN 13964:2014, *Suspended ceilings - Requirements and test methods*

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

EN ISO 9227, *Corrosion tests in artificial atmospheres - Salt spray tests (ISO 9227)*

EN ISO 16120-2, *Non-alloy steel wire rod for conversion to wire - Part 2: Specific requirements for general-purpose wire rod (ISO 16120-2)*

3 Terms and definitions

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

3.1 General terms

3.1.1

non-loadbearing element

element which does not transfer vertical forces and whose contribution to the stability of the building is not taken into account

3.1.2

metal section

corrosion protected steel member, cold rolled to form profiles

Note 1 to entry: See examples in Annex C.

3.1.3

nominal thickness

thickness of steel stated by the manufacturer of the metal section including metallic surface coating

3.1.4

core thickness

thickness of steel excluding surface coating

3.1.5

flange

part of section to which gypsum board is usually attached, depending upon the position of the section

Note 1 to entry: See Figure 6.

3.1.6

web

central and connecting part of section between flanges of a stud and channel section

Note 1 to entry: See Table C.1.

Note 2 to entry: Some sections have no web, e.g. L.

3.1.7

nominal width/depth

width and depth of sections stated by the manufacturer

3.1.8

bend

curvature to impart shape and/or strength, for example, between flange and web

Note 1 to entry: See Figures 3, 4, and 5.

3.1.9

hanger

component connecting the metal sections to the loadbearing main structure

Note 1 to entry: See Annex D.

Note 2 to entry: Hangers are designated by H.

3.1.10

connector

components connecting metal section to metal section

Note 1 to entry: See Annex D.

Note 2 to entry: Connectors are designated by N.

3.2 Symbols and abbreviations

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 abbreviations

Requirement	Sub-clause	Symbol or abbreviation
Reaction to fire	4.1	R2F
Yield strength	4.2	σ
Loadbearing capacity of suspension components	4.6.2	L
Dangerous substances	4.3	DS

4 Requirements

4.1 Reaction to fire

When the intended use of metal components is for situations in building construction works where there is a risk of exposure to fire, metal components shall be classified A1 according to Commission Decision 96/603/EC, as amended, without the need of testing if they contain less than 1 % organic material by weight or volume (whichever is the more onerous).

For the purpose of classification in classes other than class A1, the metal components shall be tested and classified in accordance with EN 13501-1 using mounting and fixing defined in Annex F.

4.2 Flexural tensile strength (expressed as yield strength)

The manufacturer shall declare the yield strength of the hot dip coated steel strip to EN 10346, tested in accordance with EN ISO 6892-1 or other equivalent method. The yield strength shall be at least 140 N/mm². If necessary, the design value of the section shall be calculated in accordance with 4.6.

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 website on EUROPA accessed through: <http://ec.europa.eu/enterprise/construction/cpd-ds/>

The corrosion protection coating shall not contain hexavalent chromium [Cr (VI)].

4.4 Materials

Metal framing components shall be manufactured from mild steel strip having a protective coating conforming to EN 10346 or EN 10132. For suspension wires EN ISO 16120-2 and EN 10244-2 are relevant. For spring steel EN 10132 applies.

The protective coating shall conform or be equivalent to one of the classes given in Table 2. The equivalence shall be proved by salt spray test according to EN ISO 9227 until the first appearance of red rust.

Table 2 — Classes of protective coating

Class	Reference standard
Z275	EN 10346
Z140	
Z100	
ZA130	
ZA095	
AZ150	
AZ100	
NOTE 1 Z means zinc, ZA means zinc/aluminium, AZ means aluminium/zinc.	
NOTE 2 The figures give the total coating weight in g/m ² .	

4.5 Dimensions and tolerances

4.5.1 General

No individual measurement shall lie outside the stated tolerances.

4.5.2 Metal profiles

4.5.2.1 Thickness

The nominal thickness and tolerance shall be stated by the manufacturer of the section.

The thickness of metal shall be measured as described in 5.1.4.1 and compared with the nominal thickness.

4.5.2.2 Length of section

The nominal length of the section shall be stated by the manufacturer.

The length shall be measured as described in 5.1.4.2 and compared with the nominal length. The tolerances shall conform to Table 3.

Table 3 — Tolerance for length

Length in mm	Tolerance in mm
Up to 3 000	±3
Between 3 000 and 5 000	±4
Over 5 000	±5

4.5.2.3 Width of section

The nominal width of the section shall be stated by the manufacturer.

The width shall be measured as described in 5.1.4.5 and compared with the nominal width. The tolerance shall be ± 0,5 mm.

4.5.2.4 Cut-out/opening

In certain sections the size and the position of cut-outs/openings may be important and shall be declared by the manufacturer.

4.5.2.5 Widths of flange

The nominal width of the flange shall be stated by the manufacturer.

The widths of the flange shall be measured as described in 5.1.4.6 and compared with the nominal width of the flange. The tolerances shall conform to Table 4.

Table 4 — Flange width tolerance

Flange	Tolerance in mm
Flange between two bends	$\pm 0,5$
Flanges between bend and cut edge	$\pm 1,0$

4.5.2.6 Angular dimension

The design angle dimension between the web and the flange shall be stated by the manufacturer of the section. The angular dimensions shall be measured in accordance with 5.1.4.3 and compared with the nominal angle. The deviation shall not exceed $\pm 2^\circ$ (see Figure 1).

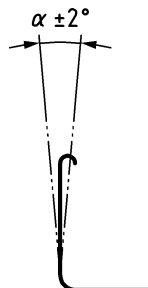


Figure 1 — Angular dimension

4.5.2.7 Straightness of the section

The straightness of the section shall be measured in accordance with 5.1.4.4 and shall not deviate from the flat surface by more than $L/400$ (where L is the nominal length in mm).

4.5.2.8 Twist of section

The maximum twist of the section shall be measured in accordance with 5.1.4.7. If h is the gap and W is the nominal width of the section (see Figure 7), the relation h/W shall not exceed 0,1.

4.5.3 Suspension components

When applicable, nominal dimensions and tolerances shall be stated by the manufacturer.

4.6 Mechanical properties

4.6.1 Calculation of section properties

Where users find it necessary or are required to predict the performance of the installed section, this can be undertaken by calculation using, as a basis, the mechanical properties of the metal framing component. In order to ensure that this can be done manufacturers shall provide the necessary material properties and, where required, the calculation shall be made in accordance with the methods/principles given in Annex B.

4.6.2 Loadbearing capacity of suspension components

When tested according to 5.2 suspension components shall comply with the following loadbearing capacity classes in Table 5.

Table 5 — Load bearing capacity classes

Class with safety factor $v = 3$	Class with safety factor $v = 2,5$	Admissible F (N)
L 150 a	L 150 b	≥ 150
L 250 a	L 250 b	≥ 250
L 400 a	L 400 b	≥ 400
L X00 a	L X00 b	$\geq 500^a$
^a $X \geq 5$, admissible load to be declared by the producer.		

When the intended use of a suspension component (e.g. hanger, connector) is in a suspended ceiling exposed to wind load, the suspension component shall pass functional tests carried out according to Annex E.

4.6.3 Impact resistance

For impact resistance EN 13964:2014, 4.3.6 and Annex D, is relevant.

5 Test methods

5.1 Measurement of dimensions of metal profiles

5.1.1 Sampling

Three sections of each type, thickness and profile shall be tested.

5.1.2 Principle

Thickness, length, angular dimensions, straightness, twist, section width and flange width shall be measured.

5.1.3 Apparatus

- A continuously flat surface capable of taking the longest section having a level of L/1000.
- A micrometer permitting a reading to 0,01 mm.
- A metal rule permitting a reading to 1 mm.

- d) A metal tape measure permitting a reading to 1 mm.
- e) A protractor with revolving arm permitting a reading to 1° (see Figure 2).
- f) A slide calliper permitting a reading to 0,1 mm.
- g) Hand vice or weight.

5.1.4 Procedure

5.1.4.1 Thickness

Measure the thickness with the micrometer in three separate positions on a representative surface area free from profile and any distortions from cutting. Record the results for thickness to the nearest 0,01 mm.

5.1.4.2 Length

Place the specimen on the flat surface and measure the length along the web using the metal tape measure. Record the results for length to the nearest 1 mm.

5.1.4.3 Angular dimension

Place the base of the protractor on one surface ensuring that it is in direct contact with the plane of the surface and registers it correctly. Move the protractor close to the angle and rotate the arm until it is in firm contact with the adjacent flange. Read off the angle shown on the protractor (see Figure 2).

Record the results for angular dimension to the nearest degree.

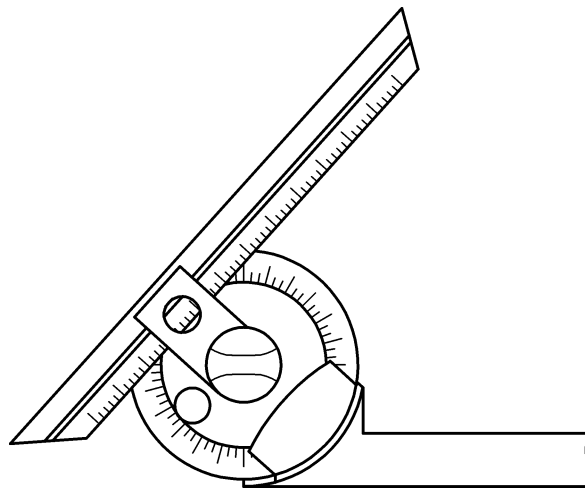


Figure 2 — Revolving arm protractor for accurate measurement of angles

5.1.4.4 Straightness

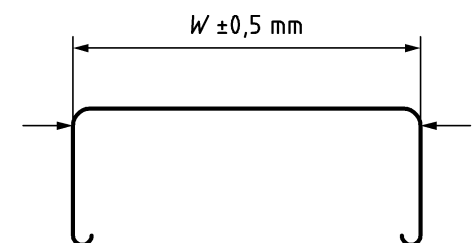
Place the specimen on the flat surface and use the metal rule to measure the maximum deviation from the plane of the flat surface.

Rotate the specimen through 90° about its longitudinal axis and repeat the measurement.

Record the results for straightness to the nearest 1,0 mm.

5.1.4.5 Web width of section

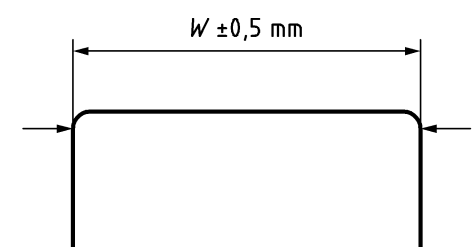
Place the specimen on the flat surface with the web uppermost. Select three positions not closer than 150 mm from the end of the section. Using the slide calliper measure the specimen on the outside in the position shown in the diagram (see Figures 3, 4 and 5). The measurements shall be taken as close to the bends as possible. Record the results for width to the nearest 0,1 mm.



Key

→ point where measurement is to be taken

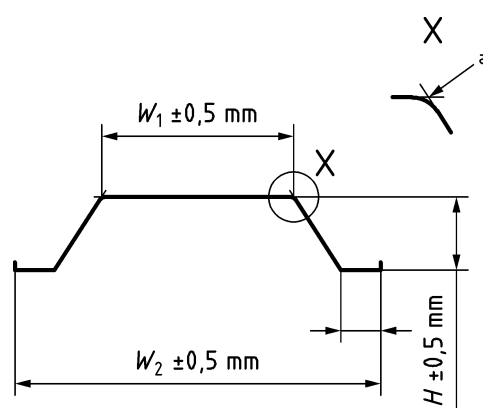
Figure 3 — C – Section



Key

→ point where measurement is to be taken

Figure 4 — U - Section



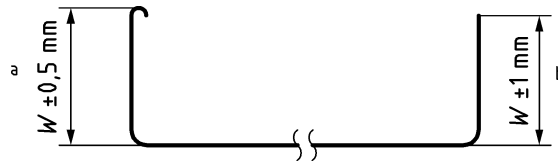
Key

a to eliminate the effect of the curve, measurements shall be taken at the point where the prolongations of the web and the edge meet

Figure 5 — Measurement with bends

5.1.4.6 Width of flange

Place the specimen on the flat surface, with the flange to be measured uppermost. Measure the flange using the slide calliper in three positions not closer than 150 mm from the ends of the section (see Figure 6). Record the results for width to the nearest 0,1 mm.



Key

- a measuring width of flange between two bends
- b measuring width of flange between bend and cut edge

Figure 6 — Width of flange

5.1.4.7 Measurement of twist of section

Place the specimen on the flat surface, web down. Press the end against the surface, using the hand vice or weight, in such a way that there is full contact between the web and the surface. At a distance 2 500 mm from the secured end of the specimen, measure the gap h using the metal rule (see Figure 7). When the length of the section is less than 2 500 mm the gap should be measured at the end of the section and calculated proportionately to an equivalent length of 2 500 mm.

Calculate the twist as h/W where h is the gap and W is the nominal width of the section.

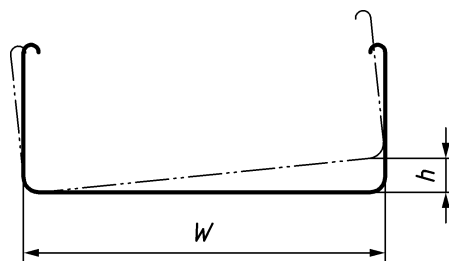


Figure 7 — Measurement of twist of section

5.2 Determination of mechanical strength of metal suspension components

5.2.1 General

The suspension test shall include both its connections to the top fixing and to the profile.