SLOVENSKI STANDARD
oSIST prEN 1090-1:2019

01-januar-2019

Izvedba jeklenih in aluminijastih konstrukcij - 1. del: Ocenjevanje ter preverjanje nespremenljivosti lastnosti jeklenih in aluminijastih konstrukcijskih elementov

Execution of steel structures and aluminium structures - Part 1: Assessment and verification of constancy of performance of steel components and aluminium components for structural use

Ausführung von Stahltragwerken und Aluminiumtragwerken - Teil 1: Bewertung und Überprüfung der Leistungsbeständigkeit für tragende Bauteile aus Stahl und Aluminium

Exécution des structures en acier et des structures en aluminium - Partie 1 : Évaluation et vérification de la constance des performances des éléments en acier et des éléments en aluminium à usage structural

Ta slovenski standard je istoveten z: **prEN 1090-1**

ICS:

91.080.13	Jeklene konstrukcije	Steel structures
91.080.17	Aluminijaste konstrukcije	Aluminium structures

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EUROPEAN STANDARD

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ICS 91.080.13; 91.080.17

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English Version

Execution of steel structures and aluminium structures - Part 1: Assessment and verification of constancy of performance of steel components and aluminium components for structural use

Ausführung von Stahltragwerken und Aluminiumtragwerken - Teil 1: Bewertung und Überprüfung der Leistungsbeständigkeit für tragende Bauteile aus Stahl und Aluminium

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 135.

If this draft becomes a European Standard, 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.

This draft European Standard was established by CEN 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-CENELEC Management Centre has the same status as the official versions.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

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European foreword

This document (prEN 1090-1:2018) has been prepared by Technical Committee CEN/TC 135 “Execution of steel structures and aluminium structures”, the secretariat of which is held by SN.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 1090-1:2009+A1:2011.

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.

This harmonized European Standard has been prepared to satisfy Mandate M 120 – Structural metallic products and ancillaries (2/4) – issued by the European Commission.

1 Scope

This document specifies the product characteristics and performance criteria for steel components and aluminium components manufactured from steel or aluminium constituent products to be used for structural purposes in buildings and civil engineering works where their characteristic affects the mechanical resistance and stability of these construction works or parts thereof. This document only applies for components manufactured according to EN 1090-2:2018, FprEN 1090-3:2018, EN 1090-4:2018 and EN 1090-5:2017.

This document also gives methods for assessing the performance and specifies requirements for the assessment and verification of constancy of performance for these components.

This document covers series and non-series produced structural components including kits as well as steel parts of composite components.

This document does not cover (components for)

— Aluminium structural composite components,
— Amusement rides and devices which are machines or not permanently installed,
— Anchor channels for use in concrete,
— Balustrades unless fulfilling the function of a barrier,
— Blind rivets,
— Cabinets for cables and power supply installations,
— Cables, ropes and wires,
— Castings,
— Circulation fixtures except sign gantry and cantilevers,
— Components for suspended ceilings,
— Fasteners glued to timber structures,
— Fasteners for use in timber,
— Fasteners and anchors for use in concrete and masonry,
— Fastening plates and other cast into concrete fastenings,
— Flagpoles,
— Forgings,
— Foundation bolts, column shoes and pile joints cast into concrete,
— Joining devices for rail track isolation systems,
— Non-structural fences and railings,
— Ornamentations,
— Piles if non-fabricated,
— Pipelines and pipes,
— Playground equipment,
— Powder actuated fasteners,
— Prefabricated steel and stainless steel wire rope systems with end connectors,
— Prefabricated tension rod systems with end connectors,

- Racking and shelving systems, if not integral part of the load bearing structure of the construction works,
- Rails or sleepers for railway systems,
- Raised floors,
- Rebar connections,
- Reinforcing steel for concrete or masonry,
- Roof safety products incl. roof ladders and walkways,
- Scaffoldings,
- Sculptures (Metal Art),
- Self-drilling and self-tapping screws,
- Steel and aluminium components and elements produced on site,
- Steel and aluminium stairs, walkways and fences forming integral part of a machine, silo, tank, etc.,
- Steel spring elements,
- Structural components for offshore structures,
- Structural double skin metal faced sandwich panels,
- Temporary structures (e.g. tents, fairground and amusement park machinery and structures)
- Traditional craft type and non-structural components (e.g. weather cocks, letter boxes, bicycle racks, fences),
- Tuned mass damper systems,
- Wind turbine towers.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 1090-2:2018, *Execution of steel structures and aluminium structures - Part 2: Technical requirements for steel structures*

FprEN 1090-3:2018, *Execution of steel structures and aluminium structures — Part 3: Technical requirements for aluminium structures*

EN 1090-4:2018, *Execution of steel structures and aluminium structures — Part 4: Technical requirements for cold-formed structural steel elements and cold-formed structures for roof, ceiling, floor and wall applications*

EN 1090-5:2017, *Execution of steel structures and aluminium structures — Part 5: Technical requirements for cold-formed structural aluminium elements and cold-formed structures for roof, ceiling, floor and wall applications*

EN 1990, *Eurocode — Basis of structural design*

EN 1991 (all parts), *Eurocode 1: Actions on structures*

EN 1993 (all parts), *Eurocode 3: Design of steel structures*

EN 1993-1-1:2005, *Design of steel structures — Part 1-1: General rules and rules for buildings*

EN 1993-1-1:2005/A1:2014, *Design of steel structures — Part 1-1: General rules and rules for buildings*

EN 1993-1-4:2006, *Eurocode 3: Design of steel structures — Part 1-4: General rules — Supplementary rules for stainless steels*

EN 1993-1-4:2006/A1:2015, *Eurocode 3: Design of steel structures — Part 1-4: General rules - Supplementary rules for stainless steels*

EN 1999 (all parts), *Eurocode 9: Design of aluminium structures*

EN 1999-1-1:2007, *Eurocode 9: Design of aluminium structures — Part 1-1: General structural rules*

EN 1999-1-1:2007/A1:2009, *Eurocode 9: Design of aluminium structures — Part 1-1: General structural rules*

EN 1999-1-1:2007/A2:2013, *Eurocode 9: Design of aluminium structures — Part 1-1: General structural rules*

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

EN 13501-1:2007+A1:2009, *Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire tests*

EN 13501-5, *Fire classification of construction products and building elements — Part 5: Classification using data from external fire exposure to roofs tests*

CEN/TS 1187, *Test methods for external fire exposure to roofs*

EN ISO 1461, *Hot dip galvanized coatings on fabricated iron and steel articles — Specifications and test methods (ISO 1461)*

EN ISO 12944 (all parts), *Paints and varnishes — Corrosion protection of steel structures by protective paint systems*

EN ISO 2063 (all parts), *Thermal spraying — Zinc, aluminium and their alloys*

ISO 7976-1, *Tolerances for building — Methods of measurement of buildings and building products — Part 1: Methods and instruments*

ISO 7976-2, *Tolerances for building — Methods of measurement of buildings and building products — Part 2: Position of measuring points*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

3.1
constituent products
material and product used for manufacturing a component and which remains as part of it, e.g. structural steel or aluminium product, stainless steel product, mechanical fastener, welding consumable

3.2
component specification
document or documents provided by manufacturer and/or purchaser giving all necessary information and technical requirements for manufacturing the structural component

3.3
component
part of a steel or aluminium structure, which may itself be an assembly of several smaller components

4 Product characteristics

4.1 Material properties of the constituent products

The material properties are the properties of the constituent products. They are assessed according to 5.1.

4.2 Execution class

The execution class is a product characteristic linked to the manufacturing of a component. It is assessed according to 5.2.

4.3 Dimensions, shape and tolerances

The dimensions, the shape and the essential tolerances contribute to the load bearing capacity of components made of steel or aluminium. They are assessed according to 5.3.

4.4 Load bearing capacity

The load bearing capacity of a structural steel and a structural aluminium component is the capacity of the component to support the loads applied to it. The load bearing capacity is assessed according to 5.4.

4.5 Durability of load bearing capacity

Durability of load bearing capacity is the ability of the component to maintain its load bearing capacity in a corrosive environment. It is assessed according to 5.5.

4.6 Reaction to fire

The reaction to fire is the contribution that the component makes to fire growth in the event of fire. It is assessed according to 5.6.

4.7 External fire performance for roof covering products

The external fire performance of roof covering products is the ability to withstand fire penetration, fire spread across the external surface of the roof, fire spread within the roof assembly and production of flaming droplets or particles. It is assessed according to 5.7.

5 Testing and assessment methods

5.1 Material properties of the constituent products

The material properties of the constituent products shall be assessed by checking that the relevant material properties given on the documents supplied with the constituent products comply with material properties given in the component specification.

The inspection documents supplied with the constituent products are the ones given in EN 1090-2:2018, 5.2, FprEN 1090-3:2018, 5.2, EN 1090-4:2018, 5.2 or EN 1090-5:2017, 5.2.

Documents supplied with constituent products may include test reports, inspection certificates or declarations of compliance as given in EN 1090-2:2018, 12.2.1.

5.2 Execution class

The execution class shall be assessed by checking that the documented manufacturing system covers all the requirements for the specified Execution Class according to EN 1090-2:2018, Annex A.3, FprEN 1090-3:2018, Annex A.3, EN 1090-4:2018, 4.1.2 and EN 1090-5:2017, 4.1.2.

5.3 Dimensions, shape and tolerances

Dimensions and shape shall be measured according to ISO 7976-1 and ISO 7976-2 with the frequency according to 12.3 of EN 1090-2:2018, 12.3 of FprEN 1090-3:2018, 12.3 of EN 1090-4:2018 and 12.3 of EN 1090-5:2017 and shall be checked together with the essential tolerances according to Annex B of EN 1090-2:2018, Annex F and Annex H of FprEN 1090-3:2018, Annex D.2 and D.3 of EN 1090-4:2018 and Annex D.2 and D.3 of EN 1090-5:2017 to be in line with the component specification.

5.4 Load bearing capacity

The load bearing capacity of structural components made of steel or aluminium shall be determined by structural design according to EN 1990, EN 1991, EN 1993 and EN 1999.

5.5 Durability of load bearing capacity

Durability of the load bearing capacity of components made of steel is assessed by checking, where appropriate, that:

a) protective coatings are in accordance with the component specification, in particular that:

   1) the galvanized coating is in accordance with EN ISO 1461;

   2) the painting coating is in accordance with EN ISO 12944;

   3) metal thermal spray is in accordance with EN ISO 2063;

   4) metallic and organic coatings are in accordance with EN 1090-4:2018, Annex E;

b) the material is stainless steel according to the component specification, see EN 1993-1-4:2006, Annex A;

c) the material is weathering steel according to the component specification.

Durability of the load bearing capacity of components made of aluminium is assessed by checking that the component is in accordance with the component specification, see EN 1999-1-1:2007, EN 1999-1-1:2007/A1:2009, EN 1999-1-1:2007/A2:2013, Annex D and FprEN 1090-3:2018, Clause 10.

5.6 Reaction to fire

Reaction to fire of components made of steel, stainless steel, galvanized steel or aluminium or anodized aluminium is class A1 according to EN 13501-1.

In the case of organic coated components the components shall be tested and classified according to Table 1 of EN 13501-1:2007+A1:2009.

For profiled sheeting products with a polyester coating having a maximum nominal thickness of 25 µm and a PCS up to 1 MJ/m^2 (included) and a mass ≤ 70 g/m^2 are considered to satisfy the requirements for reaction to fire performance Class A1 without further testing in accordance with the EU Decision 2010/737/EU.

For profiled sheeting products with a plastisol coating having a maximum nominal thickness of 200 µm, a mass ≤ 300 g/m^2 and a PCS up to 7 MJ/m^2 (included) and are considered to satisfy the requirements for reaction to fire performance Class C-s3,d0 without further testing in accordance with the EU Decision 2010/737/EU.

5.7 External fire performance for roof covering products

5.7.1 Products deemed to satisfy the requirements for external fire performance

Products covered by this European Standard are considered "deemed to satisfy without the need for testing" in relation to the requirements for external fire performance provided that they meet the definitions given in Commission Decision 2000/553/EC, i.e. flat or profiled metal sheets of nominal thickness ≥ 0,4 mm with any external coating which is inorganic or has a gross calorific value, PCS ≤ 4,0 MJ/m² or a mass ≤ 200 g/m².

NOTE Individual Member States may have "deemed to satisfy" lists which go beyond the list given in the Commission Decision 2000/553/EC.

5.7.2 Products classified without the need for further testing (CWFT option)

The following products are considered to be classified in classes $B_{ROOF(t1)}$, $B_{ROOF(t2)}$, $B_{ROOF(t3)}$ and $B_{ROOF(t4)}$ without further testing in accordance with Commission Decision 2005/403/EC:

Profiled steel sheets, flat steel sheets or panels of coil coated galvanised or zinc-aluminium alloy coated steel of metal thickness ≥ 0,40 mm with an organic external (weather side) coating and, optionally, a reverse (internal) side organic coating. The external coating is of a liquid-applied Plastisol paint of maximum nominal dry film thickness 0,200 mm, a PCS of not greater than 8,0 MJ/m² and a maximum dry mass of 330 g/m². The reverse side organic coating (if any) shall have a PCS of not greater than 4,0 MJ/m² and a maximum dry mass of 200 g/m².

5.7.3 Other products

Products not meeting the definitions as given in 5.7.1 or 5.7.2 shall be tested in accordance with the relevant method(s) in CEN/TS 1187 and classified in accordance with EN 13501-5.

The products to be tested shall be installed, in addition to the general provisions given in CEN/TS 1187, in a manner representative of their intended use.