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VALMISTAMINE. OSA 3: TEHNILISED NÕUDED
ALUMIINIUMKONSTRUKTSIOONIDELE

Execution of steel structures and aluminium structures
- Part 3: Technical requirements for aluminium
structures

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

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English Version

Execution of steel structures and aluminium structures -
Part 3: Technical requirements for aluminium structures

Exécution des structures en acier et des structures en
aluminium - Partie 3: Exigences techniques pour
l'exécution des structures en aluminium

Ausführung von Stahltragwerken und
Aluminiumtragwerken - Teil 3: Technische
Anforderungen an Aluminiumtragwerke

This European Standard was approved by CEN on 6 January 2019.

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CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (EN 1090-3:2019) 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 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of an identical text or by endorsement, at the latest by October 2019, and conflicting national standards shall be withdrawn at the latest by October 2019.

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

This document supersedes EN 1090-3:2008.

The main changes with respect to the previous edition are contained in the following clauses: Clause 1, Clause 2, Clause 3, 4.1.1, 4.1.2, Table 1, Table 5, 5.6.2, 6.1, 7.3, 7.4.1, 7.4.3, 7.4.4, 7.5.1, 7.5.9, 7.5.10, 7.5.11, 7.5.12, 7.5.13, 7.6, 8.3.1, 11.2.3.1, 12.4.2.1, 12.4.2.2, 12.4.3.2, 12.4.4.3, 12.4.5 and 12.7. Annex E has been deleted and the annexes correspondingly renumbered. The main changes in the annexes are contained in the following sub-clauses: E.2.2, Table F.3, I.1, Table I.1, Table I.2, Table K.1, Table K.2 and K.4. Annex N is a new annex. The Bibliography has been revised. In addition to the major changes in the clauses listed above, some editorial changes have been made.

This document is part of the EN 1090 series, which comprises the following parts:

- EN 1090-1, *Execution of steel structures and aluminium structures - Part 1: Requirements for conformity assessment of structural components*
- EN 1090-2, *Execution of steel structures and aluminium structures - Part 2: Technical requirements for steel structures*
- EN 1090-3, *Execution of steel structures and aluminium structures - Part 3: Technical requirements for aluminium structures*
- EN 1090-4, *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, *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*

According to the CEN-CENELEC Internal Regulations, the national standards organisations 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, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

This European Standard specifies requirements for the execution of aluminium structures, in order to ensure adequate levels of mechanical resistance and stability, serviceability and durability.

This document specifies requirements for the execution of aluminium structures, in particular those that are designed according to EN 1999-1-1, EN 1999-1-2, EN 1999-1-3, EN 1999-1-4 and EN 1999-1-5.

This document presupposes that the work is carried out with the necessary skill and adequate equipment and resources to perform the work in accordance with the execution specification and the requirements of this document.

1 Scope

This document specifies requirements for the execution of aluminium structural components and structures made from:

- a) rolled sheet, strip and plate;
- b) extrusions;
- c) cold drawn rod, bar and tube;
- d) forgings;
- e) castings.

NOTE 1 The execution of structural components is referred to as manufacturing, in accordance with EN 1090-1.

This document specifies requirements independent of the type and shape of the aluminium structure, and this document is applicable to structures under predominantly static loads as well as structures subject to fatigue. It specifies requirements related to the execution classes that are linked with consequence classes.

NOTE 2 Consequence classes are defined in EN 1990.

NOTE 3 Recommendations for selection of execution class in relation to consequence class are given in EN 1999-1-1.

This document covers components made of constituent products with thickness not less than 0,6 mm for welded components not less than 1,5 mm.

For components made from cold formed profiled sheeting that are within the scope of EN 1090-5, the requirements of EN 1090-5 take precedence over corresponding requirements in this document.

This document applies to structures designed according to the relevant parts of EN 1999. If this document is used for structures designed according to other design rules or used for other alloys and tempers not covered by EN 1999, a judgement of the reliability elements in these design rules is intended to be made.

This document specifies requirements for surface preparation prior to application of a protective treatment, and gives guidelines for application for such treatment in an informative annex.

This document gives options for specifying requirements to match project specific requirements.

This document is also applicable to temporary aluminium structures.

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 485-1, *Aluminium and aluminium alloys - Sheet, strip and plate - Part 1: Technical conditions for inspection and delivery*

EN 485-3, *Aluminium and aluminium alloys - Sheet, strip and plate - Part 3: Tolerances on dimensions and form for hot-rolled products*

EN 485-4, *Aluminium and aluminium alloys - Sheet, strip and plate - Part 4: Tolerances on shape and dimensions for cold-rolled products*

EN 515, *Aluminium and aluminium alloys - Wrought products - Temper designations*

EN 573-1, *Aluminium and aluminium alloys - Chemical composition and form of wrought products - Part 1: Numerical designation system*

EN 573-2, *Aluminium and aluminium alloys - Chemical composition and form of wrought products - Part 2: Chemical symbol based designation system*

EN 573-3, *Aluminium and aluminium alloys - Chemical composition and form of wrought products - Part 3: Chemical composition and form of products*

EN 586-1, *Aluminium and aluminium alloys - Forgings - Part 1: Technical conditions for inspection and delivery*

EN 586-3, *Aluminium and aluminium alloys - Forgings - Part 3: Tolerances on dimensions and form*

EN 754-1, *Aluminium and aluminium alloys - Cold drawn rod/bar and tube - Part 1: Technical conditions for inspection and delivery*

EN 754-3, *Aluminium and aluminium alloys - Cold drawn rod/bar and tube - Part 3: Round bars, tolerances on dimensions and form*

EN 754-4, *Aluminium and aluminium alloys - Cold drawn rod/bar and tube - Part 4: Square bars, tolerances on dimensions and form*

EN 754-5, *Aluminium and aluminium alloys - Cold drawn rod/bar and tube - Part 5: Rectangular bars, tolerances on dimensions and form*

EN 754-6, *Aluminium and aluminium alloys - Cold drawn rod/bar and tube - Part 6: Hexagonal bars, tolerances on dimensions and form*

EN 754-7, *Aluminium and aluminium alloys - Cold drawn rod/bar and tube - Part 7: Seamless tubes, tolerances on dimensions and form*

EN 754-8, *Aluminium and aluminium alloys - Cold drawn rod/bar and tube - Part 8: Porthole tubes, tolerances on dimensions and form*

EN 755-1, *Aluminium and aluminium alloys - Extruded rod/bar, tube and profiles - Part 1: Technical conditions for inspection and delivery*

EN 755-3, *Aluminium and aluminium alloys - Extruded rod/bar, tube and profiles - Part 3: Round bars, tolerances on dimensions and form*

EN 755-4, *Aluminium and aluminium alloys - Extruded rod/bar, tube and profiles - Part 4: Square bars, tolerances on dimensions and form*

EN 755-5, *Aluminium and aluminium alloys - Extruded rod/bar, tube and profiles - Part 5: Rectangular bars, tolerances on dimensions and form*

EN 755-6, *Aluminium and aluminium alloys - Extruded rod/bar, tube and profiles - Part 6: Hexagonal bars, tolerances on dimensions and form*

EN 755-7, *Aluminium and aluminium alloys - Extruded rod/bar, tube and profiles - Part 7: Seamless tubes, tolerances on dimensions and form*

EN 755-8, *Aluminium and aluminium alloys - Extruded rod/bar, tube and profiles - Part 8: Porthole tubes, tolerances on dimensions and form*

EN 755-9, *Aluminium and aluminium alloys - Extruded rod/bar, tube and profiles - Part 9: Profiles, tolerances on dimensions and form*

EN 1011-1, *Welding - Recommendations for welding of metallic materials - Part 1: General guidance for arc welding*

EN 1011-4, *Welding - Recommendations for welding of metallic materials - Part 4: Arc welding of aluminium and aluminium alloys*

EN 1090-2, *Execution of steel structures and aluminium structures - Part 2: Technical requirements for steel structures*

EN 1301-1, *Aluminium and aluminium alloys - Drawn wire - Part 1: Technical conditions for inspection and delivery*

EN 1301-3, *Aluminium and aluminium alloys - Drawn wire - Part 3: Tolerances on dimensions*

EN 1337-3, *Structural bearings - Part 3: Elastomeric bearings*

EN 1337-4, *Structural bearings - Part 4: Roller bearings*

EN 1337-5, *Structural bearings - Part 5: Pot bearings*

EN 1337-6, *Structural bearings - Part 6: Rocker bearings*

EN 1337-8, *Structural bearings - Part 8: Guide Bearings and Restraint Bearings*

EN 1337-11, *Structural bearings - Part 11: Transport, storage and installation*

EN 1559-1, *Founding - Technical conditions of delivery - Part 1: General*

EN 1559-4, *Founding - Technical conditions of delivery - Part 4: Additional requirements for aluminium alloy castings*

EN 1706, *Aluminium and aluminium alloys - Castings - Chemical composition and mechanical properties*

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

EN 1999-1-2, *Eurocode 9 - Design of aluminium structures - Part 1-2: Structural fire design*

EN 1999-1-3, *Eurocode 9: Design of aluminium structures - Part 1-3: Structures susceptible to fatigue*

EN 1999-1-4, *Eurocode 9 - Design of aluminium structures - Part 1-4: Cold-formed structural sheeting*

EN 1999-1-5, *Eurocode 9 - Design of aluminium structures - Part 1-5: Shell structures*

EN 10204, *Metallic products - Types of inspection documents*

EN 12020-1, *Aluminium and aluminium alloys - Extruded precision profiles in alloys EN AW-6060 and EN AW-6063 - Part 1: Technical conditions for inspection and delivery*

EN 12020-2, *Aluminium and aluminium alloys - Extruded precision profiles in alloys EN AW-6060 and EN AW-6063 - Part 2: Tolerances on dimensions and form*

EN 14399-2, *High-strength structural bolting assemblies for preloading - Part 2: Suitability for preloading*

EN 14399-3, *High-strength structural bolting assemblies for preloading - Part 3: System HR - Hexagon bolt and nut assemblies*

EN 14399-4, *High-strength structural bolting assemblies for preloading - Part 4: System HV - Hexagon bolt and nut assemblies*

EN 14399-5, *High-strength structural bolting assemblies for preloading - Part 5: Plain washers*

EN 14399-6, *High-strength structural bolting assemblies for preloading - Part 6: Plain chamfered washers*

EN 14399-7, *High-strength structural bolting assemblies for preloading - Part 7: System HR - Countersunk head bolt and nut assemblies*

EN 14399-8, *High-strength structural bolting assemblies for preloading - Part 8: System HV - Hexagon fit bolt and nut assemblies*

EN 14399-10, *High-strength structural bolting assemblies for preloading - Part 10: System HRC - Bolt and nut assemblies with calibrated preload*

EN 15048-1, *Non-preloaded structural bolting assemblies - Part 1: General requirements*

EN 15088, *Aluminium and aluminium alloys - Structural products for construction works - Technical conditions for inspection and delivery*

EN 28839, *Mechanical properties of fasteners - Bolts, screws, studs and nuts made of non-ferrous metals (ISO 8839)*

EN ISO 898-1, *Mechanical properties of fasteners made of carbon steel and alloy steel - Part 1: Bolts, screws and studs with specified property classes - Coarse thread and fine pitch thread (ISO 898-1)*

EN ISO 898-2, *Mechanical properties of fasteners made of carbon steel and alloy steel - Part 2: Nuts with specified property classes - Coarse thread and fine pitch thread (ISO 898-2)*

EN ISO 1479, *Hexagon head tapping screws (ISO 1479)*

EN ISO 1481, *Slotted pan head tapping screws (ISO 1481)*

EN ISO 2009, *Slotted countersunk flat head screws - Product grade A (ISO 2009)*

EN ISO 3452-1, *Non-destructive testing - Penetrant testing - Part 1: General principles (ISO 3452-1)*

EN ISO 3506-1, *Mechanical properties of corrosion-resistant stainless steel fasteners - Part 1: Bolts, screws and studs (ISO 3506-1)*

EN ISO 3506-2, *Mechanical properties of corrosion-resistant stainless steel fasteners - Part 2: Nuts (ISO 3506-2)*

EN ISO 3834-2, *Quality requirements for fusion welding of metallic materials - Part 2: Comprehensive quality requirements (ISO 3834-2)*

EN ISO 3834-3, *Quality requirements for fusion welding of metallic materials - Part 3: Standard quality requirements (ISO 3834-3)*

EN ISO 3834-4, *Quality requirements for fusion welding of metallic materials - Part 4: Elementary quality requirements (ISO 3834-4)*

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

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

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

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

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

EN ISO 4034, *Hexagon regular nuts (style 1) - Product grade C (ISO 4034)*

EN ISO 4063, *Welding and allied processes - Nomenclature of processes and reference numbers (ISO 4063)*

EN ISO 4288, *Geometrical product specifications (GPS) - Surface texture: Profile method - Rules and procedures for the assessment of surface texture (ISO 4288)*

EN ISO 4762, *Hexagon socket head cap screws (ISO 4762)*

EN ISO 6520-1:2007, *Welding and allied processes - Classification of geometric imperfections in metallic materials - Part 1: Fusion welding (ISO 6520-1:2007)*

EN ISO 6789 (all parts), *Assembly tools for screws and nuts - Hand torque tools (ISO 6789)*

EN ISO 7046-2, *Countersunk flat head screws (common head style) with type H or type Z cross recess - Product grade A - Part 2: Steel screws of property class 8.8, stainless steel screws and non-ferrous metal screws (ISO 7046-2)*

EN ISO 7049, *Cross-recessed pan head tapping screws (ISO/FDIS 7049)*

EN ISO 7089, *Plain washers - Normal series - Product grade A (ISO 7089)*

EN ISO 7090, *Plain washers, chamfered - Normal series - Product grade A (ISO 7090)*

EN ISO 7091, *Plain washers - Normal series - Product grade C (ISO 7091)*

EN ISO 7093-1, *Plain washers - Large series - Part 1: Product grade A (ISO 7093-1)*

EN ISO 7093-2, *Plain washers - Large series - Part 2: Product grade C (ISO 7093-2)*

EN ISO 7094, *Plain washers - Extra large series - Product grade C (ISO 7094)*

EN ISO 8062-1, *Geometrical product specifications (GPS) - Dimensional and geometrical tolerances for moulded parts - Part 1: Vocabulary (ISO 8062-1)*

CEN ISO/TS 8062-2, *Geometrical Product Specifications (GPS) - Dimensional and geometrical tolerances for moulded parts - Part 2: Rules (ISO/TS 8062-2)*

EN ISO 8062-3, *Geometrical Product Specifications (GPS) - Dimensional and geometrical tolerances for moulded parts - Part 3: General dimensional and geometrical tolerances and machining allowances for castings (ISO 8062-3)*

EN ISO 9013:2017, *Thermal cutting - Classification of thermal cuts - Geometrical product specification and quality tolerances (ISO 9013:2017)*

EN ISO 9017, *Destructive tests on welds in metallic materials - Fracture test (ISO 9017)*

EN ISO 9018, *Destructive tests on welds in metallic materials - Tensile test on cruciform and lapped joints (ISO 9018)*

EN ISO 9606-2, *Qualification test of welders - Fusion welding - Part 2: Aluminium and aluminium alloys (ISO 9606-2)*

EN ISO 9712, *Non-destructive testing - Qualification and certification of NDT personnel (ISO 9712)*

EN ISO 10042:2018, *Welding - Arc-welded joints in aluminium and its alloys - Quality levels for imperfections (ISO 10042:2018)*

EN ISO 10642, *Hexagon socket countersunk head screws (ISO 10642)*

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- EN ISO 25239-3, *Friction stir welding - Aluminium - Part 3: Qualification of welding operators (ISO 25239-3)*
- EN ISO 25239-4, *Friction stir welding - Aluminium - Part 4: Specification and qualification of welding procedures (ISO 25239-4)*
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- ISO 17123-4, *Optics and optical instruments - Field procedures for testing geodetic and surveying instruments - Part 4: Electro-optical distance meters (EDM measurements to reflectors)*
- ISO 17123-7, *Optics and optical instruments - Field procedures for testing geodetic and surveying instruments - Part 7: Optical plumbing instruments*