# METALLKONSTRUKTSIOONIDE EELPINGESTAMATA POLTLIITED. OSA 1: ÜLDNÕUDED

# Non-preloaded structural bolting assemblies - Part 1: General requirements

EESTI STANDARDIKESKUS
ESTONIAN CENTRE FOR STANDARDISATION

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

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|---|---|
| See Eesti standard EVS-EN 15048-1:2016 sisaldab Euroopa standardi EN 15048-1:2016 ingliskeelset teksti. | This Estonian standard EVS-EN 15048-1:2016 consists of the English text of the European standard EN 15048-1:2016. |
| Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas | This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation. |
| Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 20.07.2016. | Date of Availability of the European standard is 20.07.2016. |
| Standard on kättesaadav Eesti Standardikeskusest. | The standard is available from the Estonian Centre for Standardisation. |

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

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EUROPEAN STANDARD

NORME EUROPÉENNE

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English Version

# Non-preloaded structural bolting assemblies - Part 1: General requirements

Boulonnerie de construction métallique non précontrainte - Partie 1: Exigences générales

Garnituren für nicht vorgespannte Schraubverbindungen im Metallbau - Teil 1: Allgemeine Anforderungen

This European Standard was approved by CEN on 19 March 2015.

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This European Standard exists 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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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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## European foreword

This document (EN 15048-1:2016) has been prepared by Technical Committee CEN/TC 185 "Fasteners", the secretariat of which is held by BSI.

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 January 2017, and conflicting national standards shall be withdrawn at the latest by April 2018.

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 15048-1:2007.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports basic work 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.

EN 15048 consists of the following parts, under the general title *Non-preloaded structural bolting assemblies:*

— *Part 1: General requirements*;

— *Part 2: Fitness for purpose*.

Compared to the previous version, the modifications are the following:

— the standard was revised to meet the new format for harmonized standards and in relation to the Regulation (EU) No. 305/2011 (CPR);

— the requirements of this standard only relate to the product characteristics of bolting assemblies which are necessary for CE marking;

— all clauses dealing with further technical or other requirements have been transferred to EN 15048-2;

— washers are not considered as part of the non-preloaded bolting assemblies, however they can be used as relevant;

— addition of bolting assemblies made in aluminum and aluminum alloys;

— addition of nominal diameters M5 to M10;

— Railway rail fasteners have been excluded.

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.

# Introduction

Rules for design and execution of bolted connections with non-preloaded structural bolts are defined for instance in EN 1993-1-8 and EN 1090-2 for steel structures or EN 1999-1-1 and EN 1090-3 for aluminium or aluminium alloy structures.

The parts of this European Standard on structural bolting assemblies specify the general requirements which ensure that bolting assemblies comprising bolts and nuts are suitable for use as non-preloaded structural bolting in structural metallic works. They can be used in shear connections and/or in tension connections if no preload is required.

Structural bolting assemblies which meet the requirements of this part of this European Standard have been designed to allow tensile resistance of at least $f_{ub} \times A_s$. For this purpose the tensile test of bolting assemblies specified in EN 15048-2 is a mean to check whether the function of the assembly is fulfilled.

Washers or other elements can be used additionally if necessary.

# 1 Scope

This part of this European Standard specifies the general requirements for bolting assemblies for non-preloaded structural bolting. Bolting assemblies in accordance with this European Standard are designed to be used in structural bolting connections for shear and/or tensile loading.

The intended use of bolting assemblies in accordance with this European standard is structural metallic works.

It applies to bolts (the term used when bolts partially threaded, screws, studs and stud-bolts are considered all together) and nuts made of carbon steel, alloy steel, stainless steel or aluminium or aluminium alloy with the following property classes:

— bolts made of carbon steel or alloy steel: 4.6, 4.8, 5.6, 5.8, 6.8, 8.8, 10.9 (in accordance with EN ISO 898-1);

— nuts made of carbon steel or alloy steel: 5, 6, 8, 10, 12 (in accordance with EN ISO 898-2);

— bolts made of austenitic stainless steel: 50, 70, 80 (in accordance with EN ISO 3506-1);

— nuts made of austenitic stainless steel: 50, 70, 80 (in accordance with EN ISO 3506-2);

— bolts made of aluminium or aluminium alloy: AL1 to AL6 (in accordance with EN 28839);

— nuts made of aluminium or aluminium alloy: AL1 to AL6 (in accordance with EN 28839).

This European Standard applies to bolting assemblies with ISO metric coarse pitch thread from sizes M12 to M39 for use in steel structures according to EN 1090-2, and from M5 to M39 for use in aluminium or aluminium alloy structures according to EN 1090-3. The use of thread sizes larger than M39 is not precluded provided all applicable requirements of this standard are met.

**WARNING —** Only bolting assemblies are covered by this harmonized standard: separate bolts or nuts, not tested as part of an assembly lot of bolting assemblies in accordance with EN 15048-2, are not covered by this harmonized standard and cannot be CE marked.

NOTE 1 The property classes 4.8, 5.8 and 6.8 may be subjected to limitations of use.

NOTE 2 High-strength structural bolting assemblies for preloading which meet the requirements of EN 14399–1 are not within the scope of this European Standard but they are also suitable for use in non-preloaded structural bolting.

NOTE 3 Bolts and nuts made of aluminium or aluminium alloys are not designed to be used in steel structures, see EN 1090–2.

Bolting assemblies in accordance with this European Standard are not designed to be welded.

Railway rail fasteners are not covered by 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 1090-2, *Execution of steel structures and aluminium structures — Part 2: Technical requirements for steel structures*

EN 15048-2, *Non-preloaded structural bolting assemblies — Part 2: Suitability test*

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

EN ISO 225, *Fasteners — Bolts, screws, studs and nuts — Symbols and descriptions of dimensions (ISO 225)*

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 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 4759-1, *Tolerances for fasteners — Part 1: Bolts, screws, studs and nuts — Product grades A, B and C (ISO 4759-1)*

EN ISO 10684:2004, *Fasteners — Hot dip galvanized coatings (ISO 10684:2004)*

ISO 965-1, *ISO general purpose metric screw threads — Tolerances — Part 1: Principles and basic data*

ISO 965-2, *ISO general purpose metric screw threads — Tolerances — Part 2: Limits of sizes for general purpose external and internal screw threads — Medium quality*

ISO 965-3, *ISO general purpose metric screw threads — Tolerances — Part 3: Deviations for constructional screw threads*

ISO 965-4, *ISO general purpose metric screw threads — Tolerances — Part 4: Limits of sizes for hot-dip galvanized external screw threads to mate with internal screw threads tapped with tolerance position H or G after galvanizing*

ISO 965-5, *ISO general purpose metric screw threads — Tolerances — Part 5: Limits of sizes for internal screw threads to mate with hot-dip galvanized external screw threads with maximum size of tolerance position h before galvanizing*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 1090-2 and the following apply.

**3.1**
**bolting assembly**
matching bolts (including screws, studs and stud bolts) and nuts

**3.2**
**manufacturing lot**
quantity of components of a single designation including product grade, property class, type, and size, manufactured from bar, wire, rod or flat product from a single cast, processed through the same or