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OSA 4: KINNITUSDETAILIDE VALIK SURVESEADMETE
DIREKTIIVI 2014/68/EL KÄSITLUSALAS

Flanges and their joints - Bolting - Part 4: Selection of
bolting for equipment subject to the Pressure
Equipment Directive 2014/68/EU

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 1515-4:2021 sisaldab Euroopa standardi EN 1515-4:2021 ingliskeelset teksti.	This Estonian standard EVS-EN 1515-4:2021 consists of the English text of the European standard EN 1515-4:2021.
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ICS 21.060.10, 21.060.20, 23.040.60

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EUROPEAN STANDARD

EN 1515-4

NORME EUROPÉENNE

EUROPÄISCHE NORM

March 2021

ICS 21.060.10; 21.060.20; 23.040.60

Supersedes EN 1515-4:2009

English Version

**Flanges and their joints - Bolting - Part 4: Selection of
bolting for equipment subject to the Pressure Equipment
Directive 2014/68/EU**

Brides et leurs assemblages - Boulonnerie - Partie 4 :
Sélection de la boulonnerie pour équipements relevant
de la Directive Equipments sous pression 2014/68/EU

Flansche und ihre Verbindungen - Schrauben und
Muttern - Teil 4: Auswahl von Schrauben und Muttern
zur Anwendung im Gültigkeitsbereich der
Druckgeräterichtlinie 2014/68/EU

This European Standard was approved by CEN on 1 February 2021.

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

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.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



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COMITÉ EUROPÉEN DE NORMALISATION
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European foreword

This document (EN 1515-4:2021) has been prepared by Technical Committee CEN/TC 74 “Flanges and their joints”, the secretariat of which is held by DIN.

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 September 2021, and conflicting national standards shall be withdrawn at the latest by September 2021.

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 1515-4:2009.

EN 1515, *Flanges and their joints — Bolting*, consists of the following parts:

- *Part 1: Selection of bolting;*
- *Part 2: Classification of bolt materials for steel flanges, PN designated;*
- *Part 3: Classification of bolt materials for steel flanges, class designated;*
- *Part 4: Selection of bolting for equipment subject to the Pressure Equipment Directive 2014/68/EU.*

Main changes compared to edition EN 1515-4:2009:

- explanation of requirements for starting material in accordance to EN 10269:2013;
- some temperature ranges and assignment of material groups are amended in Table 3;
- option for traceability by means of lot identification marking instead of inspection documents;
- separate requirements have been given to bolting other than those in EN 10269:2013;
- requirements for prevention of brittle fracture have been updated.

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.

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This document is applicable to the selection of bolting for flanged joints on equipment subject to the Pressure Equipment Directive 2014/68/EU.

It specifies standards and additional requirements for dimensions, material properties and technical conditions of delivery for bolting.

NOTE 1 Washers are not within the scope of this document.

The selection is based on commonly used bolting. It covers common temperature ranges of the general service of flanges.

When selecting bolting according to this document it is essential to take into account environmental conditions and other parameters including type of fluids, corrosion hazards, sour service, low temperature brittle failure and relaxation at elevated temperatures.

The purpose of this document is to provide a selection of most commonly used bolting types and bolting material combinations.

It is not the intention to specify all possible applications but to give guidance on the most common applications. For example, application limits for material in the creep range are not explicitly covered in this document. Where material standard provides mechanical properties for the creep range respective reference is made in Table 3.

NOTE 2 Special services and ambient conditions may require the application of coatings. It is the purchaser's option to decide on this. Depending on the coating used, a verification of the temperature ranges given in Table 3 and Table 4 may be required.

NOTE 3 In Annex B there are bolting types and bolting material combinations according to commonly used national standards other than those listed in Table 2, Table 3 and Table 4.

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 764-5:2014, *Pressure equipment - Part 5: Inspection documentation of metallic materials and compliance with the material specification*

EN 1092-1:2018, *Flanges and their joints - Circular flanges for pipes, valves, fittings and accessories, PN designated - Part 1: Steel flanges*

EN 1759-1:2004, *Flanges and their joint - Circular flanges for pipes, valves, fittings and accessories, Class designated - Part 1: Steel flanges, NPS 1/2 to 24*

EN 10204:2004, *Metallic products - Types of inspection documents*

EN 10269:2013, *Steels and nickel alloys for fasteners with specified elevated and/or low temperature properties*

EN 13445-3:2014,¹ *Unfired pressure vessels - Part 3: Design*

¹ As impacted by EN 13445-3:2014/A1:2015, EN 13445-3:2014/A2:2016, EN 13445-3:2014/A3:2017, EN 13445-3:2014/A4:2018, EN 13445-3:2014/A5:2018, EN 13445-3:2014/A6:2019, EN 13445-3:2014/A7:2019 and EN 13445-3:2014/A8:2019.

EN 13480-3:2017,² *Metallic industrial piping - Part 3: Design and calculation*

EN ISO 898-1:2013, *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 898-1:2013)*

EN ISO 898-2:2012, *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 898-2:2012)*

EN ISO 3269:2019, *Fasteners - Acceptance inspection (ISO 3269:2019)*

EN ISO 3506-1:2020, *Fasteners - Mechanical properties of corrosion-resistant stainless steel fasteners - Part 1: Bolts, screws and studs with specified grades and property classes (ISO 3506-1:2020)*

EN ISO 3506-2:2020, *Fasteners - Mechanical properties of corrosion-resistant stainless steel fasteners - Part 2: Nuts with specified grades and property classes (ISO 3506-2:2020)*

EN ISO 4014:2011, *Hexagon head bolts - Product grades A and B (ISO 4014:2011)*

EN ISO 4017:2014, *Fasteners - Hexagon head screws - Product grades A and B (ISO 4017:2014)*

EN ISO 4032:2012, *Hexagon regular nuts (style 1) - Product grades A and B (ISO 4032:2012)*

EN ISO 4033:2012, *Hexagon high nuts (style 2) - Product grades A and B (ISO 4033:2012)*

EN ISO 4042:2018, *Fasteners - Electroplated coating systems (ISO 4042:2018)*

EN ISO 6892-2:2018, *Metallic materials - Tensile testing - Part 2: Method of test at elevated temperature (ISO 6892-2:2018)*

EN ISO 16228:2018, *Fasteners - Types of inspection documents (ISO 16228:2017)*

EN ISO 16426:2002, *Fasteners - Quality assurance system (ISO 16426:2002)*

ISO 261:1998, *ISO general purpose metric screw threads — General plan*

ISO 965-2:1998, *ISO general purpose metric screw threads — Tolerances — Part 2: Limits of sizes for general purpose external and internal screw threads — Medium quality*

3 Terms and definitions

3.1 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 <https://www.iso.org/obp>

3.1.1

bolting

type of fastener such as a bolt, screw or stud with normal, reduced or waisted shank or nut

² As impacted by EN 13480-3/A1:2021, EN 13480-3/A2:2020 and EN 13480-3/A3:2020.