SLOVENSKI STANDARD
SIST EN 1515-1:2001

01-september-2001

Prirobnice in prirobnični spoji - Vijaki in matice - 1. del: Izbor vijakov in matic

Flanges and their joints - Bolting - Part 1: Selection of bolting

Flansche und ihre Verbindungen - Schrauben und Muttern - Teil 1: Auswahl von Schrauben und Muttern

Brides et leurs assemblages - Boulonnerie - Partie 1: Sélection de la boulonnerie

Ta slovenski standard je istoveten z: **EN 1515-1:1999**

ICS:

21.060.10	Sorniki, vijaki, stebelni vijaki	Bolts, screws, studs
23.040.60	Prirobnice, oglavki in spojni elementi	Flanges, couplings and joints

SIST EN 1515-1:2001 **en**

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 1515-1

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English version

Flanges and their joints - Bolting - Part 1: Selection of bolting

Brides et leurs assemblages - Boulonnerie - Partie 1: Sélection de la boulonnerie

Flansche und ihre Verbindungen - Schrauben und Muttern - Teil 1: Auswahl von Schrauben und Muttern

This European Standard was approved by CEN on 25 September 1999.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

Contents

Foreword

This European Standard 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 May 2000, and conflicting national standards shall be withdrawn at the latest by May 2000.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association. This European Standard is considered to be a supporting standard to those application and product standards which in themselves support an essential safety requirement of a New Approach Directive and which make reference to this European Standard.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

EN 1515 consists of two Parts:

Part 1: Selection of bolting

Part 2: Combination of flange and bolting materials for steel flanges, PN designated

1 Scope

This European Standard is applicable to the selection of bolting for PN designated flanges in accordance with EN 1092 series and Class designated flanges in accordance with EN 1759 series[1].

It specifies standards for dimensions, materials and technical conditions of delivery for bolts, stud bolts and nuts.

The bolting of within standard is selected for the combined use with flanges from the EN 1092 series and EN 1759 series but not for general purpose.

[1] prEN 1759-1 is in preparation whereas prEN 1759-3 and prEN 1759-4 are publicly available.

The selection of the materials is based on commonly used materials. It covers all pressure and temperature ranges of the general service of standard flanges.
For special applications other materials may be selected by the user.

In some cases, similar alloys have been included, which differ only by carbon contents (e.g. 0,25% or 0,42%), because of the different requirements of the national standards. When the new European Standards are produced, it is expected that the opportunity to rationalise these many grades, will result in a reduction of standardised grades.

2 Normative References

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard, only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 1092	Flanges and their joints - Circular flanges for pipes, valves, fittings and accessories - PN designated
prEN 1759-3	Flanges and their joints - Circular flanges for pipes, valves, fittings and accessories, class designated - Part 3: Copper alloy and composite flanges
prEN 1759-4	Flanges and their joints - Circular flanges for pipes, valves, fittings and accessories, class designated - Part 4: Alluminium alloy flanges
EN 10269	Steels and nickel alloys for fasteners with specified elevated and/or low temperature properties
EN 20898-1	Mechanical properties of fasteners - Part 1: Bolts, screws and studs (ISO 898-1: 1998)
EN 20898-2	Mechanical properties of fasteners - Part 2: Nuts with specified proof load values - Coarse thread (ISO 898-2: 1992)
EN 24014	Hexagon head bolts - Product grades A and B (ISO 4014 : 1988)
EN 24016	Hexagon head bolts - Product grade C (ISO 4016 : 1988)
EN 24032	Hexagon nuts, style 1 - Product grades A and B (ISO 4032 : 1986)
EN 24033	Hexagon nuts, style 2 - Product grades A and B (ISO 4033 : 1979)
EN 24034	Hexagon nuts - Product grade C (ISO 4034 : 1986)
EN ISO 3506-1	Mechanical properties of corrosion-resistant stainless steel fasteners - Part 1 : Bolts, screws and studs (ISO 3506-1 : 1997)
EN ISO 3506-2	Mechanical properties of corrosion-resistant stainless steel fasteners - Part 2 : Nuts (ISO 3506-2 : 1997)
ISO 261	ISO general purpose metric screw threads - General plan
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

3 Selection of bolting types

The selection of bolting types specified in table 1 is based on the material. It is necessary that all other service conditions such as fluids are taken into account by the user of the standard.

Table 1: Types of bolting

Dimensional Standard Bolts Stud bolts	Dimensional Standard Nuts	Material or property class	Remarks
EN 24016	EN 24034	4.6/5 5.6/5 6.8/6	Hexagon head bolt
EN 24014	EN 24032 EN 24033 [1)]	all	Hexagon head bolt
Annex A of this standard	EN 24032 EN 24033 [1)]	all	Stud bolt, threaded full length
1) Nuts in accordance with EN 24033 are normally used for industrial plants. For sizes ≥ M39 nuts with m=d are recommended.			

4 Selection of bolting materials

The selection of bolting materials specified in table 2 is based on PN or Class and the allowable temperature. It is necessary that all other service conditions such as fluid are taken into account by the user of this standard.

Table 2: Materials and service limits

Line No	PN Class up to	Temperature range °C	Type of material bolts	Type of material nuts	Steel designation name or property class Steel designation number Material standard bolts	Steel designation name or property class Steel designation number Material standard nuts
1	PN 40 Cl. 300	-10 to 120	C-St	C-St	4.6 - EN 20898-1	5 - EN 20898-2
2	PN 40 [1)] Cl. 300	-10 to 300	C-St	C-St	5.6 - EN 20898-1	5 - EN 20898-2
3	PN 40 [1)] Cl. 300	-10 to 300	C-St	C-St	6.8 - EN 20898-1	6 - EN 20898-2
4	PN 40 [1)] Cl. 300	-10 to 300	C-St	C-St	8.8 - EN 20898-1	8 - EN 20898-2
5	all	-10 to 450	0,25C-1Cr-Mo	C-St elev. temp.	25CrMo4 1.7218 EN 10269	C35E 1.1181 EN 10269
6	all	-10 to 450	0,42C-1Cr-Mo	C-St elev. temp.	42CrMo4 1.7225 EN 10269	C45E 1.1191 EN 10269
7	all	-60 to 400	0,25C-1Cr-Mo	18Cr-9Ni	25CrMo4 1.7218 EN 10269	A2-50, A2-70 - EN ISO 3506-2

continued

Table 2: (concluded)

Line No	PN Class up to	Tempe-rature range °C	Type of material		Steel designation name or property class Steel designation number Material standard	
			bolts	nuts	bolts	nuts
8	all	-100 to 450	0,42C-1Cr-Mo	0,42C-1Cr-Mo	42CrMo4 1.7225 EN 10269	42CrMo4 1.7225 EN 10269
9	all	-40 to 300	0,3C-2Cr-Ni-Mo	0,42C-1Cr-Mo	30CrNiMo8 1.6580 EN 10269	42CrMo4 1.7225 EN 10269
10	all	-10 to 500	0,42C-1,3Cr-0,6Mo	0,42C-1Cr-Mo	42CrMo5-6 - EN 10269	42CrMo4 1.7225 EN 10269
11	all	-10 to 500	0,40C-1Cr-0,6Mo-V	0,42C-1Cr-Mo	40CrMoV4-6 1.7711 EN 10269	42CrMo4 1.7225 EN 10269
12	all	-10 to 540	0,21C-1,3Cr-0,7Mo-V	0,21C-1,3Cr-0,7Mo-V	21CrMoV5-7 1.7709 EN 10269	21CrMoV5-7 1.7709 EN 10269
13	all	-10 to 600	0,2C-1Cr-1Mo-V-Ti-B	0,2C-1Cr-1Mo-V-Ti-B	20CrMoVTiB4-10 - EN 10269	20CrMoVTiB4-10 - EN 10269
14	all	-200 to 550	25Ni-15Cr-0,2Ti-Mo-V-B	25Ni-15Cr-0,2Ti-Mo-V-B	X6NiCrTiMoVB 25-15-2 1.4980 EN 10269	X6NiCrTiMoVB 25-15-2 1.4980 EN 10269
15	all	-10 to 550	16Cr-16Ni-Mo-B-Nb	16Cr-16Ni-Mo-B-Nb	X7CrNiMoBNb16-16 1.4986 EN 10269	X7CrNiMoBNb16-16 1.4986 EN 10269
16	PN 40 Cl. 300	-200 to 400	18Cr-9Ni-Mo	18Cr-9Ni-Mo	A4-50 - EN ISO 3506-1	A4-50 - EN ISO 3506-2
17	PN 100 Cl. 600	-200 to 400	18Cr-9Ni-Mo	18Cr-9Ni-Mo	A4-70 - EN ISO 3506-1	A4-70 - EN ISO 3506-2
18	PN 40 Cl. 300	-200 to 400	18Cr-9Ni	18Cr-9Ni	A2-50 - EN ISO 3506-1	A2-50 - EN ISO 3506-2
19	PN 100 Cl. 600	-200 to 400	18Cr-9Ni	18Cr-9Ni	A2-70 - EN ISO 3506-1	A2-70 - EN ISO 3506-2
20	PN 40 Cl. 300	-200 to 550	17Cr-12Ni-2Mo	17Cr-12Ni-2Mo	X5CrNiMo17-12-2 1.4401 EN 10269	X5CrNiMo17-12-2 1.4401 EN 10269
21	PN 100 Cl. 600	-200 to 200 2)	17Cr-12Ni-2Mo AT+C	17Cr-12Ni-2Mo	X5CrNiMo17-12-2 AT+C 1.4401 EN 10269	X5CrNiMo17-12-2 1.4401 EN 10269
22	PN 40 Cl. 300	-200 to 550	18Cr-10Ni	18Cr-10Ni	X5CrNi18-10 1.4301 EN 10269	X5CrNi18-10 1.4301 EN 10269
23	PN 100 Cl. 600	-200 to 200 2)	18Cr-10Ni AT+C	18Cr-10Ni	X5CrNi18-10 AT+C 1.4301 EN 10269	X5CrNi18-10 1.4301 EN 10269

1) Up to PN 63 for temperature up to 120 °C.
2) Allowable stresses for elevated temperatures may be taken from the material in AT condition, as no stresses exist for the cold worked condition.

5 Technical conditions of delivery

The technical conditions of delivery are included in the standards given for the bolting and the materials.

Annex A (normative): Stud bolts threaded full length

Stud bolts shall be threaded full length. The points shall be chamferred or rounded at the manufacturer's option. The height of point shall be a maximum one times the pitch of thread.

The length of stud bolts has to be measured including points. The lengths are stepped by increments of 5 mm for length up to 80 mm, by increments of 10 mm for length above 80 mm and up to 200 mm, and by increments of 20 mm for length above 200 mm.

Thread in accordance with ISO 261, ISO 965-2 tolerance class 6g. Type of thread is either coarse thread or above M39 fine thread with 4 mm pitch.

The type of thread shall be selected by the user.
Fine thread above M39 is normally used for industrial plants, coarse thread up to and including M64 is normally used for water service.