DIN EN 1092-1

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DIN EN 1092-1:2008-09

Flanges and their joints – Circular flanges for pipes, valves, fittings and accessories, PN designated – Part 1: Steel flanges; English version EN 1092-1:2007+A1:2013, English translation of DIN EN 1092-1:2013-04

Flansche und ihre Verbindungen –
Runde Flansche für Rohre, Armaturen, Formstücke und Zubehörteile, nach PN bezeichnet –
Teil 1: Stahlflansche;
Englische Fassung EN 1092-1:2007+A1:2013,
Englische Übersetzung von DIN EN 1092-1:2013-04

Brides et leurs assemblages –
Brides circulaires pour tubes, appareils de robinetterie, raccords et accessoires, désignées PN –
Partie 1: Brides en acier;
Version anglaise EN 1092-1:2007+A1:2013,
Traduction anglaise de DIN EN 1092-1:2013-04

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In case of doubt, the German-language original shall be considered authoritative.

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National foreword

This document (EN 1092-1:2007+A1:2013) has been prepared by Technical Committee CEN/TC 74 “Flanges and their joints” (Secretariat: DIN, Germany).

The responsible German body involved in its preparation was the *Normenausschuss Rohrleitungen und Dampfkesselanlagen* (Piping and Boiler Plant Standards Committee), Working Committee NA 082-00-16 AA *Flansche und ihre Verbindungen*.

The DIN Standards corresponding to the International Standards referred to in Clause 2 of this standard are as follows:

ISO 7-1	DIN EN 10226-1
ISO 7-2	DIN EN 10226-2
ISO 2768-1	DIN ISO 2768-1

Amendments

This standard differs from DIN EN 1092-1:2008-09 as follows:

a) Amendment 1:2013 has been incorporated;

b) the standard has been editorially revised.

Previous editions

DIN HNA FI 31: 1923-08
DIN 2501: 1926-07, 1927-10, 1928-01, 1942-11, 1949-06
DIN 2543: 1926-07, 1943-05, 1949-12, 1968-01, 1977-09
DIN 2544: 1926-07, 1943-05, 1949x-12, 1968-01, 1977-09
DIN 2545: 1926-07, 1943-05, 1949-12, 1968-01, 1977-09
DIN 2566: 1926-07, 1936-08, 1943-11, 1949-06, 1962-01, 1975-03
DIN 2641: 1926-07, 1928-10, 1949-06, 1962-01, 1975-03
DIN 2642: 1926-07, 1928-10, 1941-04, 1949-06, 1962-01, 1969-05, 1970-08, 1975-03
DIN 2512: 1927-01, 1936-08, 1943x-11, 1966-05, 1975-03, 1999-08
DIN 2513: 1927-01, 1936-08, 1949-06, 1966-05
DIN 2514: 1927-01, 1929-07, 1949-06, 1967-06, 1975-03
DIN 2652: 1927-10, 1949-06, 1962-01
DIN 2653: 1927-10, 1931-04, 1940-02, 1949-06, 1962-01
DIN 2630: 1928-04, 1940-10, 1943-11, 1949-05, 1954-12, 1962-08, 1966-08, 1975-03
DIN 2631: 1928-04, 1936-10, 1943-11, 1949-05, 1954-12, 1962-08, 1966-08, 1975-03
DIN 2546: 1928-07, 1947-06, 1949x-12, 1969-04, 1969-11
DIN 2547: 1928-07, 1947-06, 1949-12, 1969-04, 1977-09
DIN 2632: 1928-10, 1931-04, 1936-08, 1943-11, 1949-05, 1954-12, 1962x-08, 1966-08, 1975-03
DIN 2500: 1928-10, 1949x-09, 1966-08
DIN 2655: 1928-10, 1949-06, 1962-01, 1975-03
DIN 2656: 1928-10, 1949-06, 1962-01, 1975-03
DIN 2673: 1928-10, 1931-04, 1940-09, 1949-06, 1962-08
DIN 3156: 1935x-11
DIN 2633: 1936-08, 1943-11, 1949-05, 1962-08, 1966-08, 1975-03
DIN 2634: 1936-08, 1943-11, 1949-05, 1962-08, 1966-08, 1975-03
DIN 2635: 1936-08, 1943-11, 1949-05, 1962x-08, 1966-08, 1975-03
DIN 2636: 1936-08, 1947-08, 1949x-12, 1962-08, 1962-12, 1975-03
DIN 2637: 1936-08, 1947-08, 1949-12, 1962-08, 1962-12, 1975-03
DIN 2548: 1940-09, 1944-09, 1949-12, 1969-04
DIN 2549: 1940-09, 1944-09, 1949x-12, 1969-04
DIN 2550: 1940-09, 1944-09, 1949-12, 1969-04
DIN 2551: 1940-09, 1949-12, 1969-04
DIN 2573: 1940-10, 1949-05, 1962-01, 1975-03
DIN 2638: 1941-03, 1944-11, 1949-12, 1962-08, 1975-03
DIN 2628: 1941-07, 1944-11, 1949-12, 1962-08, 1975-03
DIN 2629: 1941-07, 1944-11, 1949-12, 1962-08, 1975-03
DIN 2519: 1947x 01, 1964-01, 1966-08
DIN 86031: 1952-04
DIN 86043: 1952-04
DIN 2527: 1963-09, 1969-03, 1971-11, 1972-04
DIN 2526: 1963-11, 1975-03
DIN 2576: 1963x-12, 1975-03
DIN 2627: 1969-04, 1970-08, 1975-03
DIN 2501-1: 1970-11, 1972-02
DIN 2528: 1991-06
DIN EN 1092-1: 2002-06, 2007-11, 2008-09

National Annex NA
(informative)

Information and national supplement to DIN EN 1092-1

NA.1 Correspondence between flanges as in previous DIN Standards and those as in DIN EN 1092-1

Table NA.1 shows the correspondence between the flanges specified in DIN EN 1092-1 with those specified in DIN Standards which have been replaced, either fully or partially, by DIN EN 1092-1.

Table NA.1 — Correspondence between DIN and DIN EN flanges

DIN[a]	Flange type as in DIN EN	Subject(s) covered	Nominal size as in previous DIN	Nominal size as in DIN EN 1092-1
2512	—	Tongues and grooves for flanges, PN 160 — Gaskets PN 10 up to PN 160	<= PN 160 DN 4 up to DN 1 000	<= PN 100 DN 10 up to DN 2 000
2513	—	Projections and recesses	DN 10 up to DN 1 000	<= PN 100 DN 10 up to DN 2 000
2514	—	Projections with groove and recess	DN 10 up to DN 3 000	<= PN 100 DN 10 up to DN 2 000
2527	05	Blind flanges, PN 2,5	Not specified	DN 10 up to DN 2 000
	05	Blind flanges, PN 6	DN 10 up to DN 500	DN 10 up to DN 2 000
	05	Blind flanges, PN 10	DN 10 up to DN 500	DN 10 up to DN 1 200
	05	Blind flanges, PN 16	DN 10 up to DN 500	DN 10 up to DN 1 200
	05	Blind flanges, PN 25	DN 10 up to DN 500	DN 10 up to DN 600
	05	Blind flanges, PN 40	DN 10 up to DN 500	DN 10 up to DN 600
	05	Blind flanges, PN 64 (new PN 63)	DN 10 up to DN 400	DN 10 up to DN 400
	05	Blind flanges, PN 100	DN 10 up to DN 350	DN 10 up to DN 350
2528	—	Steel flanges	No sizes specified, only materials / service temperatures	—
2543	21	Cast steel flanges, PN 16	DN 10 up to DN 2 200	DN 10 up to DN 2 000
2544	21	Cast steel flanges, PN 25	DN 10 up to DN 2 000	DN 10 up to DN 2 000
2545	21	Cast steel flanges, PN 40	DN 10 up to DN 1 600	DN 10 up to DN 600
2546	21	Cast steel flanges, PN 64 (new PN 63)	DN 10 up to DN 1 200	DN 10 up to DN 1 200
2547	21	Cast steel flanges, PN 100	DN 125 up to DN 700	DN 10 up to DN 500
2548	21	Cast steel flanges, PN 160	DN 10 up to DN 300	DN 10 up to DN 300
2549	21	Cast steel flanges, PN 250	DN 10 up to DN 300	DN 10 up to DN 300
2550	21	Cast steel flanges, PN 320	DN 10 up to DN 250	DN 10 up to DN 250
2551	21	Cast steel flanges, PN 400	DN 10 up to DN 200	DN 10 up to DN 200
2566	13	Threaded flanges with hub, PN 10 up to PN 16	DN 6 up to DN 100	DN 10 up to DN 600
2573	1	Plate flanges for brazing or welding, PN 6	DN 10 up to DN 500	DN 10 up to DN 600
2576	1	Plate flanges for brazing or welding, PN 10	DN 10 up to DN 500	DN 10 up to DN 600

Table NA.1 *(continued)*

DIN[a]	Flange type as in DIN EN	Subject(s) covered	Nominal size as in previous DIN	Nominal size as in DIN EN 1092-1
2627	11	Weld-neck flanges, PN 400	DN 10 up to DN 200	DN 10 up to DN 200
2628	11	Weld-neck flanges, PN 250	DN 10 up to DN 250	DN 10 up to DN 300
2629	11	Weld-neck flanges, PN 320	DN 10 up to DN 250	DN 10 up to DN 250
2630	11	Weld-neck flanges, PN 1 and PN 2,5	DN 10 up to DN 4 000	DN 10 up to DN 4 000
2631	11	Weld-neck flanges, PN 6	DN 10 up to DN 3 600	DN 10 up to DN 3 600
2632	11	Weld-neck flanges, PN 10	DN 10 up to DN 3 000	DN 10 up to DN 3 000
2633	11	Weld-neck flanges, PN 16	DN 10 up to DN 2 000	DN 10 up to DN 2 000
2634	11	Weld-neck flanges, PN 25	DN 10 up to DN 1 000	DN 10 up to DN 1 000
2635	11	Weld-neck flanges, PN 40	DN 10 up to DN 500	DN 10 up to DN 600
2636	11	Weld-neck flanges, PN 64 (new PN 63)	DN 10 up to DN 400	DN 10 up to DN 400
2637	11	Weld-neck flanges, PN 100	DN10 up to DN 350	DN 10 up to DN 350
2638	11	Weld-neck flanges, PN 160	DN 10 up to DN 300	DN 10 up to DN 300
2641	02, 33, 32	Loose plate flanges; Weld-on plate collars; Lapped end pipes, PN 6	DN 10 up to DN 1 200	DN 10 up to DN 600
2642	02, 33, 32	Loose plate flanges; Weld-on plate collars; Lapped end pipes, PN 10	DN 10 up to DN 800	DN 10 up to DN 600
2655	02, 33, 32	Loose plate flanges; Lapped end pipes, PN 25	DN 10 up to DN 500	DN 10 up to DN 600
2656	02, 33, 32	Loose plate flanges; Lapped end pipes, PN 40	DN 10 up to DN 400	DN 10 up to DN 600
2673	04, 34	Loose plate flanges with weld-on collar, PN 10	DN 10 up to DN 1 200	DN 10 up to DN 600

[a] These standards have been fully replaced by DIN EN 1092-1.

Flanges which comply with withdrawn DIN Standards but which have dimensions deviating from those specified in EN 1092-1 may still be used for replacement purposes.

NOTE Flanges complying with withdrawn DIN Standards are not state of the art in terms of flange joint design. Users of flanges which comply with withdrawn DIN Standards are to check whether calculations as in EN 1591-1:2001 or as in DIN V 2505:1986 need to be carried out.

NA.2 Correspondence between facing type designations in previous DIN Standards and those in DIN EN 1092-1

Table NA.2 shows the correspondence between facing type designations in previous DIN Standards and those in DIN EN 1092-1.

Table NA.2 — Facing type designations

Old designation as in previous DIN Standards	New designation as in DIN EN 1092-1
Type A	Type A
Type B	
Type C	Type B1
Type D	
Type E	Type B2[a]
Type F	Type C
Type N	Type D
Type V 13	Type E
Type R 13	Type F
Type V 14	Type H
Type R 14	Type G

a The use of type B2 facings shall be agreed between the purchaser and the flange manufacturer; see Table 2, Footnote b in EN 1092-1.

NA.3 Lens gasket

Flanges may also be delivered with a lens gasket as in DIN 2696.

NA.4 Diaphragm weld assemblies

Flanges may also be delivered with facings having a reduced diameter d_4 (for diaphragm weld assemblies) as in DIN 2695.

National Annex NB
(informative)

Bibliography

DIN 2695, *Diaphragm-weld packings and weld ring seals for flange connections*

DIN 2696, *Flange connections with lens shaped gasket*

DIN EN 10226-1, *Pipe threads where pressure tight joints are made on the threads — Part 1: Taper external threads and parallel internal threads — Dimensions, tolerances and designation*

DIN EN 10226-2, *Pipe threads where pressure tight joints are made on the threads — Part 2: Taper external threads and taper internal threads — Dimensions, tolerances and designation*

DIN ISO 2768-1, *General tolerances — Tolerances for linear and angular dimensions without individual tolerance indications*

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 1092-1:2007+A1

January 2013

ICS 23.040.60

Supersedes EN 1092-1:2007

English Version

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

Brides et leurs assemblages - Brides circulaires pour tubes, appareils de robinetterie, raccords et accessoires, désignées PN - Partie 1: Brides en acier

Flansche und ihre Verbindungen - Runde Flansche für Rohre, Armaturen, Formstücke und Zubehörteile, nach PN bezeichnet - Teil 1: Stahlflansche

This European Standard was approved by CEN on 23 June 2007 and includes Amendment 1 approved by CEN on 24 November 2012.

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.

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Foreword

This document (EN 1092-1:2007+A1:2013) 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 July 2013, and conflicting national standards shall be withdrawn at the latest by July 2013.

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 ⟦A1⟩ EN 1092-1:2007 ⟨A1⟧.

This document includes Amendment 1, approved by CEN on 2012-11-24.

The start and finish of text introduced or altered by amendment is indicated in the text by tags ⟦A1⟩ ⟨A1⟧.

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 97/23/EC.

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

EN 1092 consists of the following four parts:

— *Part 1: Steel flanges;*

— *Part 2: Cast iron flanges;*

— *Part 3: Copper alloy flanges;*

— *Part 4: Aluminium alloy flanges.*

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, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

When the Technical Committee CEN/TC 74 commenced its work of producing this European Standard it took as its basis, the International Standard, ISO 7005-1, Steel flanges.

In taking this decision, CEN/TC 74, agreed that this standard would differ significantly from the ISO standard in respect of the following:

a) whereas ISO 7005-1 included in its scope both the original DIN based flanges and also the original ANSI/ASME based flanges, EN 1092-1 contains only the PN based flanges. CEN/TC 74 has produced a separate series of standards, EN 1759-1, EN 1759-3 and EN 1759-4, dealing with the ANSI/ASME based flanges in their original Class designations;

b) the opportunity was taken to revise some of the technical requirements applicable to the DIN origin flanges.

Consequently, whilst the mating dimensions, the flange and facing types and designations are compatible with those given in ISO 7005-1, it is important to take account of the following differences which exist in EN 1092-1:

1) the p/t ratings of this standard have been reduced in many cases by either limiting the lower temperature ratings which can no longer exceed the PN value, or by increasing the rate at which allowable pressures shall reduce with increase in temperature;

2) in addition to the range of PN 2,5 to PN 40 DIN origin flanges contained in the ISO standard, EN 1092-1 also includes flanges up to PN 400.

Major changes against edition 2001:

i. flanges PN 160, PN 250, PN 320 and PN 400 have been introduced;

ii. further methods of manufacture have been introduced;

iii. welding conditions, inspection and testing have been introduced;

iv. flange facing height f_1 changed back to former DN related dimensions;

v. further collar types have been introduced;

vi. materials have been updated;

vii. new p/t-ratings are related to the flange material;

viii. rings for tongue and groove flanges have been introduced;

ix. the following flange types have been re-calculated according to the calculation method in EN 1591-1 with the basic rules as described in Annex E of this standard:

- flanges type 11 for PN 2,5 to PN 400. Types 12 and 13 have been adjusted to the results for Type 11. As a result the thickness of some flanges above DN 500 had to be increased and the A1 wall thickness A1 had to be adjusted;
- flanges type 05;
- flanges type 01;
- flanges type 02 with 32 resp. 33 up to DN 600 for PN 2,5 to PN 40;
- flanges types 35, 36 and 37 for PN 10 to PN 40;
- types 21 and 04 with 34 have not been re-calculated according to EN 1591-1.

1 Scope

This European Standard for a single series of flanges specifies requirements for circular steel flanges in PN designations PN 2,5 to PN 400 and nominal sizes from DN 10 to DN 4000.

This European Standard specifies the flange types and their facings, dimensions, tolerances, threading, bolt sizes, flange jointing face surface finish, marking, materials, pressure/ temperature ratings and approximate flange masses.

For the purpose of this European Standard, "flanges" include also lapped ends and collars.

This European Standard applies to flanges manufactured in accordance with the methods described in Table 1.

Non-gasketed pipe joints are outside the scope of this European Standard.

2 Normative references

[A1] 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. [A1]

[A1] EN 287-1:2011 [A1], *Qualification test of welders — Fusion welding — Part 1: Steels*

[A1] *deleted text* [A1]

EN 571-1:1997, *Non destructive testing — Penetrant testing — Part 1: General principles*

EN 764-5:2002, *Pressure equipment — Part 5: Compliance and Inspection Documentation of Materials*

[A1] *deleted text* [A1]

EN 1333:2006, *Flanges and their joints — Pipework components — Definition and selection of PN*

EN 1418, *Welding personnel — Approval testing of welding operators for fusion welding and resistance weld setters for fully mechanized and automatic welding of metallic materials*

EN 1435:1997, *Non-destructive examination of welds — Radiographic examination of welded joints*

[A1] EN 1591-1:2001+A1:2009 [A1], *Flanges and their joints — Design rules for gasketed circular flange connections — Part 1: Calculation method*

[A1] EN 1708-1:2010 [A1], *Welding — Basic weld joint details in steel — Part 1: Pressurized components*

[A1] *deleted text* [A1]

EN 4014:2004, *Aerospace series — Inserts, thickwall, self-locking — Design standard*

[A1] EN 10028-2:2009 [A1], *Flat products made of steels for pressure purposes — Part 2: Non-alloy and alloy steels with specified elevated temperature properties*

[A1] EN 10028-3:2009 [A1], *Flat products made of steels for pressure purposes — Part 3: Weldable fine grain steels, normalized*

[A1] EN 10028-4:2009 [A1], *Flat products made of steels for pressure purposes — Part 4: Nickel alloy steels with specified low temperature properties*

[A1] EN 10028-7:2007 [A1], *Flat products made of steels for pressure purposes — Part 7: Stainless steels*

EN 10160:1999, *Ultrasonic testing of steel flat product of thickness equal or greater than 6 mm (reflection method)*