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**Prirobnice in prirobnični spoji - Okrogle prirobnice za cevi, ventile, fitinge in pribor z oznako Class - 4. del: Prirobnice iz aluminijevih zlitin**

Flanges and their joints - Circular flanges for pipes, valves, fittings and accessories, Class designated - Part 4: Aluminium alloy flanges

Flansche und ihre Verbindungen - Runde Flansche für Rohre, Armaturen, Formstücke und Zubehörteile, nach Class bezeichnet - Teil 4: Flansche aus Aluminiumlegierungen

Brides et leurs assemblages - Brides circulaires pour tubes, appareils de robinetterie, raccords et accessoires, désignés Class - Partie 4 : Brides en alliages d'aluminium

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**Ta slovenski standard je istoveten z: prEN 1759-4**

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EUROPEAN STANDARD  
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**prEN 1759-4**

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## Flanges and their joints - Circular flanges for pipes, valves, fittings and accessories, Class designated - Part 4: Aluminium alloy flanges

Brides et leurs assemblages - Brides circulaires pour tubes, appareils de robinetterie, raccords et accessoires, désignés Class - Partie 4 : Brides en alliages d'aluminium

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This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 74.

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
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EUROPÄISCHES KOMITEE FÜR NORMUNG

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## European foreword

This document (prEN 1759-4:2021) has been prepared by Technical Committee CEN/TC 74 “Flanges and their joints”, the secretariat of which is held by DIN.

This document is currently submitted to CEN Enquiry.

This document will supersede EN 1759-4:2003.

The main changes compared to EN 1759-4:2003 are:

- update of Annex ZA.

This document has been prepared under a standardization request given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s)<sup>1</sup>.

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

EN 1759 consists of the following parts:

- Flanges and their joint — Circular flanges for pipes, valves, fittings and accessories, Class designated — Part 1: Steel flanges (draft stage);
- Flanges and their joint — Circular flanges for pipes, valves, fittings and accessories, Class designated — Part 3: Copper alloy flanges (draft stage);
- Flanges and their joint — Circular flanges for pipes, valves, fittings and accessories, Class designated — Part 4: Aluminium alloy flanges (draft stage).

Annexes A and B are informative.

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<sup>1</sup> Directive 97/23 EC of the European Parliament and of the Council of 29 May 1997 on the approximation of the Laws of the Member States concerning pressure equipment; OIEC L 181.

**prEN 1759-4:2021 (E)****1 Scope**

This document specifies requirements for Class designated circular flanges for pipes, valves, fittings and accessories made from aluminium alloy in the range of DN 15 to DN 600 (NPS 1/2 to NPS 24) and Class 150 to Class 300 (see Table 1).

This document specifies the types of flanges and their facings, dimensions and tolerances, bolt sizes, surface finish of jointing faces, marking and materials together with associated pressure temperature ( $p/T$ ) ratings.

The flanges are intended to be used for piping as well as for pressure vessels.

**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 1515-1, *Flanges and their joints — Bolting — Part 1: Selection of bolting*

EN ISO 4287:1998, *Geometrical product specifications (GPS) — Surface texture: Profile method — Terms, definitions and surface texture parameters (ISO 4287:1997)*

EN 12392, *Aluminium and aluminium alloys — Wrought products and cast products — Special requirements for products intended for the production of pressure equipment*

EN 12560 (series), *Flanges and their joints — Gaskets for Class-designated flanges*

EN ISO 4287:1998, *Geometrical product specification (GPS) — Surface texture: Profile method — Terms, definitions and surface texture parameters (ISO 4287:1997)*

EN ISO 6708:1995, *Pipework Components — Definition and selection of DN (nominal size) (ISO 6708:1995)*

**3 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:

— ISO Online browsing platform: available at <https://www.iso.org/obp>

— IEC Electropedia: available at <https://www.electropedia.org/>

**3.1****DN**

see EN ISO 6708:1995

**3.2****Nominal pipe size****NPS**

alphanumeric designation of size for components of a pipework system, which is used for reference purposes. It comprises, for the purpose of Class designated flanges according to this document, the letters NPS followed by a dimensionless number which is indirectly related to the physical size of the bore or outside diameter of the end connections

Note 1 to entry: The number following the letters NPS does not represent a measurable value and should not be used for calculation purposes except where specified in the relevant standard.

Note 2 to entry: The relationship between DN and NPS is given in the tables.

### 3.3

#### **Class**

alphanumeric designation used for reference purposes related to a combination of mechanical and dimensional characteristics of a component of a pipework system. It comprises the word Class followed by a dimensionless whole number

Note 1 to entry: The number following the word Class does not represent a measurable value and should not be used for calculation purposes except where specified in the relevant standard.

Note 2 to entry: The designation Class is not meaningful unless it is related to the relevant component standard number.

Note 3 to entry: It is intended that all components with the same Class and NPS designations shall have the same mating dimensions for compatible flange types.

### 3.4

#### **$R_a, R_z$**

see EN ISO 4287:1998

### 3.5

#### **maximum allowable pressure** (standards.iteh.ai)

#### **$PS$**

$PS$  means the maximum pressure for which the equipment is designed, as specified by the equipment manufacturer

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### 3.6

#### **maximum allowable temperature**

#### **$TS$**

$TS$  means the maximum temperature for which the equipment is designed, as specified by the equipment manufacturer

## 4 Designations

### 4.1 Range of nominal sizes

The range of DN (NPS) applicable to each Class shall be as given in Table 1.

### 4.2 Range of Class designations

The range of Class designations shall be as given in Table 1.

### 4.3 Types of flanges

Figure 1 illustrates flanges identified according to type:

- a) Type 05 Blank flange;
- b) Type 11 Weld-neck flange.

**prEN 1759-4:2021 (E)****4.4 Designation of flanges**

The designation of the flanges shall contain the following information:

- a) description (flange);
- b) number of this standard (EN 1759-4);
- c) flange type (11, 05 resp.);
- d) flange facing type (e.g. C);
- e) DN or NPS (e.g. DN 300);
- f) for type 11 flanges only, neck diameter,  $A$  and neck thickness,  $S$  (e.g.  $324 \times 5$ );
- g) Class (e.g. Class 150);
- h) material (e.g. EN AW-5083-O).

EXAMPLE 1 For a type 11 flange:

**Flange EN 1759-4 — 11 — C — DN 300 —  $324 \times 5$  — Class 150 — EN AW-5083-O**

EXAMPLE 2 For a type 05 flange:

**Flange EN 1759-4 — 05 — C — DN 300 — Class 150 — EN AW-5083-O**

**5 General requirements**

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**5.1 Flange materials**

Flanges shall be manufactured from the material grades EN AW-5083 (AlMg4,5Mn0,7) -O or EN AW-6061 (AlMg1SiCu) -T6 according to EN 12392. Other materials may be used. For the  $p/T$  ratings see 5.5.

Weld-neck flanges shall be forged or made from extruded bars; blank flanges shall be forged or made from plate.

**5.2 Repairs**

Repair welding of the flanges is not permitted.

**5.3 Bolting**

**5.3.1** The bolting shall be chosen according to the pressure, temperature and gasket.

**5.3.2** Bolting materials shall be selected according to the following criteria:

- a) for all service conditions in accordance with EN 1515-1 (bolt/nut): 5.6/5, 8.8/8, 25Ni-15Cr-Ti/25Ni-15Cr-Ti, A4-70/A4-70, A2-70/A2-70, 18Cr-9Ni-Mo-AT+C/18Cr-9Ni-Mo, 18Cr-9Ni-AT+C/18Cr-9Ni;
- b) for less severe service conditions e.g. water service or in case of oversized flanged joints, in accordance with EN 1515-1 (bolt/nut): A4-50/A4-50, A2-50/A2-50, 18Cr-9Ni-Mo-/18Cr-9Ni-Mo, 18Cr-9Ni/18Cr-9Ni;

NOTE The choice of this bolting should be based on either special experience or on recalculations.



- c) where bolting other than specified in EN 1515-1 is required this shall be chosen according to the parameters above so that the flanged joint remains tight under the expected operating conditions.

**5.3.3** The use of washers is recommended.

## 5.4 Gaskets

Gaskets shall be selected from the relevant part of EN 12560.

NOTE If spiral wound gaskets are selected, then they should be low stress design ( $y = 5\,000$ ,  $m = 3$  for calculation in accordance with ASME Code).

## 5.5 Pressure/temperature ( $p/T$ ) ratings

The pressure temperature ratings ( $p/T$  ratings) for the material grades in 5.1 are given in Table 7.

## 5.6 Dimensions

**5.6.1** Dimensions of flanges shall be in accordance with the following figures and tables:

- Class 150 flanges: Figure 3 and Table 4;
- Class 300 flanges: Figure 4 and Table 5.

NOTE 1 Approximate masses of flanges are given in Annex A.

NOTE 2 Figures 3 and 4 are identical. They are repeated for better handling of the standard.

**5.6.2** Bolt holes shall be equally spaced on the pitch circle diameter.

**5.6.3** If neck thickness  $S$  is ordered smaller than given in Tables 4 and 5, the inside diameter at the neck shall be tapered at an angle of  $14^\circ$  to  $18^\circ$ . If  $S$  is ordered greater, the bore diameter shall be.

**5.6.4** For flanges made of EN AW-6061 (AlMg1SiCu) -T6 the neck thickness  $S$  shall be sufficient to take account of lower strength properties due to welding.

## 5.7 Flange facings

### 5.7.1 Types of jointing faces

For the types of jointing faces see Figure 2, for the dimensions of jointing faces see Table 2.

### 5.7.2 Jointing face finish

All jointing faces shall be machine finished and, when compared by visual or tactile means with reference specimens, shall be in accordance with Table 3.

NOTE 1 It is not intended that instrument measurements are taken on the jointing faces.

NOTE 2 Other finishes may be agreed between the manufacturer and purchaser.

For jointing face type B1, turning shall be carried out with a round-nosed tool in accordance with Table 3.

## 5.8 Spot facing and back facing of flanges

Any spot facing and back facing required shall not reduce the flange thickness to less than the thickness specified. When spot facing is used, the diameter shall be large enough to accommodate the outside

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diameter of the equivalent normal series of washers for the bolt size being fitted. When a flange is back faced, it is permissible for the fillet radius to be reduced but it shall not be eliminated entirely.

**5.9 Tolerances**

Tolerances on dimensions are as specified in Table 6.

**5.10 Marking**

All flanges shall be marked as follows:

- a) flange manufacturer's name or trade-mark (e.g. xxx);
- b) number of this standard (EN 1759-4);
- c) DN or NPS (e.g. DN 300);
- d) Class (e.g. Class 150);
- e) neck thickness if not standard (e.g. 7,1);
- f) material designation (e.g. EN AW-5083-0);
- g) batch number or suitable quality control number traceable to the batch number when test certification is required (e.g. yyy).

EXAMPLE

xxx — EN 1759-4 — DN 300 — Class 150 — 7,1 — EN AW-5083-0 — yyy

The flanges shall be clearly and permanently marked around the rim.

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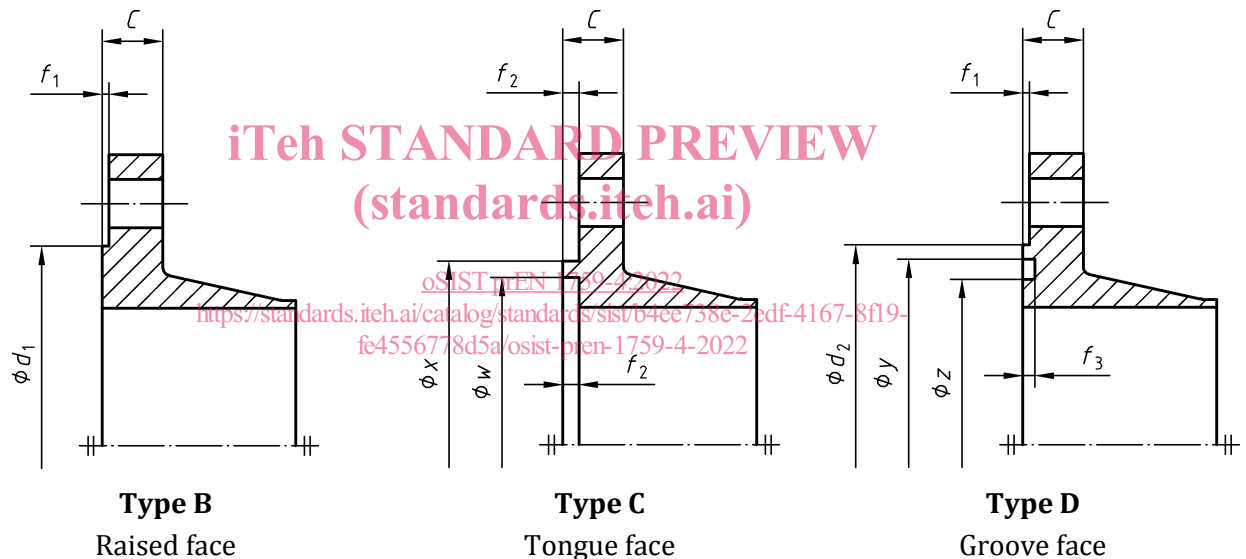
**Table 1 — Synoptic table**

Type	Class	DN and NPS														
		15 1/2	25 1	40 1 1/2	50 2	80 3	100 4	150 6	200 8	250 10	300 12	350 14	400 16	450 18	500 20	600 24
05, 11	150	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	300 <sup>a</sup>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

<sup>a</sup> Pressure temperature ( $p/T$ ) ratings for material EN AW-5083-0 are valid only for nominal sizes less and equal to DN 300 (NPS 12).



Figure 1 — Types of flanges



NOTE For types B and D, the transition from the edge of the raised face ( $d_1$ ) to the flange face is either by radius or chamfer.

Figure 2 — Flange facings

Table 2 — Flange facing dimensions

Dimensions in millimetres

DN	NPS	$d_1$	$d_2$		$f_1$	$f_2$	$f_3$	$w$	$x$		$y$		$z$
			Cl 150	Cl 300					Cl 150	Cl 300	Cl 150	Cl 300	
15	1/2	34,9	44,5	46,0	1,6	6,4	4,8	25,4	35,1	35,1	36,6	36,6	23,8
20	3/4	42,9	52,3	54,0	1,6	6,4	4,8	33,3	42,9	42,9	44,4	44,4	31,7
25	1	50,8	57,1	61,9	1,6	6,4	4,8	38,1	47,8	50,8	49,3	52,3	36,5