

Pipe Joints and Elements for High Density Polyethylene (HDPE) Pressure Pipelines

Types 1 and 2
Bushes, Flanges and Seals for Socket-welding Dimensions

DIN
16 963
Part 11

Rohrverbindungen und Rohrleitungsteile für Druckrohrleitungen aus Polyethylen hoher Dichte (HDPE), Typ 1 und 2; Bunde, Flansche, Dichtungen für Muffenschweissung, Masse

Dimensions in mm

1 Scope

This Standard applies to bushes, flanges and seals for socket-welded flanged joints for connecting pipes of high density polyethylene (HDPE) types 1 and 2 in accordance with DIN 8074 Part 1 or Part 2, and for connecting pipes and pipe elements of other materials for pressure pipelines.

The bushes and flanges of HDPE types 1 and 2 must conform to the requirements of DIN 16963 Part 5 or Part 25 *).

Note: Instead of the designation "Hard polyethylene (hard PE)", this Standard uses the designation "High density polyethylene (HDPE)" in accordance with DIN 7728 Part 1, April 1978 edition.

The previously used code designation "Hard polyethylene (hard PE)" may, however, continue to be used during the transitional period (e.g. the service life of the stamping tools for marking pipes and pipe elements).

2 Other relevant Standards

- DIN 1691 Cast iron with flake graphite (grey iron)
- DIN 2501 Part 1 Flange; connecting dimensions
- DIN 7168 Part 1 General tolerances (untoleranced dimensions); length and angular dimensions
- DIN 7735 Part 1 Laminated plastic materials; laminated paper, laminated fabric, resin bonded glass mat; requirements, testing
- DIN 8063 Part 4 Pipe joints and elements for pressure pipelines of unplasticised polyvinylchloride (hard PVC); bushes, flanges and seals, dimensions
- DIN 8063 Part 5 (at present still in draft form) Pipe joints and elements for pressure pipelines of unplasticized polyvinylchloride (hard PVC); general quality requirements, testing
- DIN 8074 Part 1 Hard polyethylene (hard PE) pipes; type 1, dimensions
- DIN 8074 Part 2 High density polyethylene (HDPE) pipes; type 2, dimensions
- DIN 16901 Moulded plastic components; tolerances and allowable deviations for dimensions
- DIN 16963 Part 5 Pipe joints and elements of hard polyethylene (hard PE) for pressure pipelines; type 1, general quality requirements, testing
- DIN 16963 Part 25 (at present still in draft form) Pipe joints and elements of high density polyethylene (HDPE) for pressure pipelines; type 2, general quality requirements, testing
- DIN 17100 General structural steels; quality specifications

*) At present still in draft form

Continued on pages 2 to 8
Explanations on page 8

No guarantee can be given in respect of this translation. In all cases the latest German language version of this Standard shall be taken as authoritative.

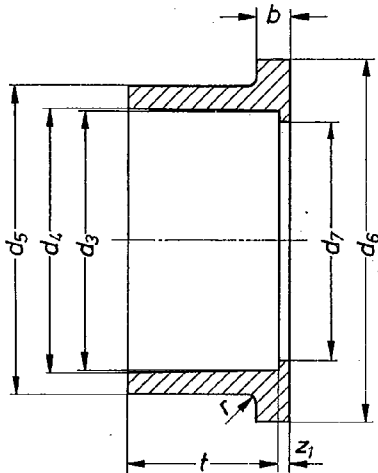
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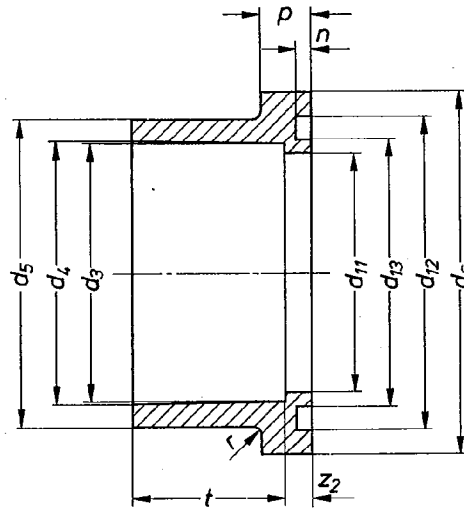
3 Dimensions, designation

The bushes, flanges and seals do not have to conform to the illustrations; only the specified dimensions must be adhered to. Where permissible deviations are necessary for dimensions without tolerance specification they must be agreed according to DIN 7168 Part 1 or DIN 16901.

Flanged bush for flat sealing ring (serial number 9)



Flanged bush for O-ring seal (serial number 12)



Designation of a flanged bush (serial number 9) for socket-welding type A external diameter of pipe $d_1 = 75$ mm of HDPE type 2:

Flanged bush DIN 16963-9A 75-2

For external pipe diameters from $d = 16$ mm to $d = 63$ mm the flanged bushes are only to be designated in accordance with type A.

Table 1. Flanged bush (serial numbers 9 and 12)

External diameter of pipe d_1	d_3 1) 4)		per. dev.	d_4 1) 4)		Out-of-roundness 4) 5) max.	d_5	per. dev.	d_6	d_7	d_{11}	d_{12}	per. dev.	d_{13}	per. dev.	n	p	r	t 2) 3) 4)		z_1	z_2
	Type A	Type B		Type A	Type B														Type A	Type B		
16	6	15,4		15,5		0,4	22	$\pm 0,1$	29	13	13	25		16,2		2,8	9	1	13	3	6	6
20	6	19,3	0 $-0,3$	19,5	$-0,3$	0,4	27	$\pm 0,15$	34	16	16	29,7	0 $-0,1$	20,9		2,8	9	1	14,5	3	6	6
25	7	24,3		24,5		0,4	33	$\pm 0,15$	41	21	21	34,5		25,7		2,8	10	1,5	16	3	6	6
32	7	31,3	0 $-0,4$	31,5	$-0,4$	0,5	41		50	28	28	42,4		33,6		2,8	10	1,5	18	3	6	6
40	8	39,2		39,45		0,5	50	$\pm 0,2$	61	36	36	53,7		40,1		4,3	13	2	20,5	3	8	8
50	8	49,2	0 $-0,5$	49,45	$-0,5$	0,6	61		73	45	45	63,2		49,6		4,3	13	2	23,5	3	8	8
63	9	62,1		62,5	$-0,6$	0,6	76		90	57	57	78,9	0 $-0,2$	65,3	0 $-0,2$	4,3	14	2,5	27,5	3	8	8
75	10	73,7	0 $-0,6$	74,9	$-0,6$	1	90		106	69	69	91,6		78		4,3	15	2,5	30	3	8	8
90	11	88,5	0 $-0,6$	89,9	$-0,6$	1	109	$\pm 0,3$	125	84	84	110,5		96,9		4,3	16	3	33	5	10	10
110	12	108,3		110	$-0,6$	1	131		150	102	102	132,8	0 $-0,3$	114,8	0 $-0,3$	5,6	18	3	37	5	10	10

1) The mean internal socket diameter is determined from the arithmetical mean of two internal socket diameters measured at right angles to each other.
 2) For type A and B $d_1 \leq 63$ mm: $t = 0,3 d_1 + 8,5$ mm
 For type A $d_1 \geq 75$ mm: $t = 0,2 d_1 + 15$ mm
 For type B $d_1 \geq 75$ mm: $t = 0,3 d_1 + 8,5$ mm
 3) Corresponding to ISO 138/2 N 227
 4) Corresponding to ISO 264 - 1976
 5) Out-of-roundness is the difference between the measured maximum and minimum internal socket diameters.

Flat sealing ring (serial number 10)

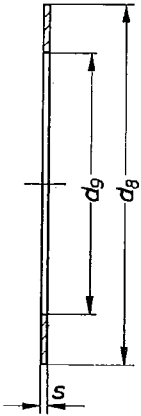
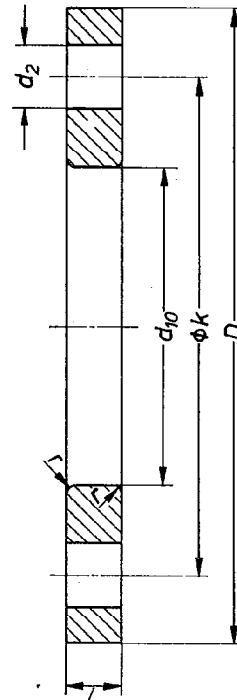


Table 2. Flat sealing ring (serial number 10)

External diameter of pipe d_1	d_8	d_9	s	Flat sealing ring to be used (Identification group)
16	27	16	2	DIN 8063 – 8 – 16
20	32	20	2	DIN 8063 – 8 – 20
25	39	25	2	DIN 8063 – 8 – 25
32	48	32	2	DIN 8063 – 8 – 32
40	59	40	2	DIN 8063 – 8 – 40
50	71	50	2	DIN 8063 – 8 – 50
63	88	63	2	DIN 8063 – 8 – 63
75	104	75	2	DIN 8063 – 8 – 75
90	123	90	2	DIN 8063 – 8 – 90
110	148	110	3	DIN 8063 – 8 – 110

Flange (serial number 11)

Flange connecting dimensions for pipe series 4 in accordance with DIN 2501 Part 1, PN 6, for pipe series 5 as specified in DIN 2501 Part 1 for PN 16



Thickness of the flange is designed to give adequate strength depending on the material

Designation of a flange (serial number 11) for external diameter of pipe $d_1 = 75$ mm and pipe series 5 of HDPE type 1:

Flange DIN 16963 – 11 – 75 – 5 HDPE 1

If a flange of material (see table 5) other than HDPE type 1 or type 2, it is to be designated in accordance with DIN 8063 Part 4.

Table 3. Flange (serial number 11)

External diameter of pipe d_1	d_{10}		Pipe series 4					Pipe series 5					r
			D	k	Number	Thread	d_2	D	k	Number	Thread	d_2	
16	23	-0,5	75	50	4	M10	11	90	60	4	M12	14	1
20	28		80	55	4	M10	11	95	65	4	M12	14	1
25	34		90	65	4	M10	11	105	75	4	M12	14	1,5
32	42	-0,5	100	75	4	M10	11	115	85	4	M12	14	1,5
40	51		120	90	4	M12	14	140	100	4	M16	18	2
50	62		130	100	4	M12	14	150	110	4	M16	18	2
63	78	-1	140	110	4	M12	14	165	125	4	M16	18	2,5
75	92		160	130	4	M12	14	185	145	4	M16	18	2,5
90	110		190	150	4	M16	18	200	160	8	M16	18	3
110	133		210	170	4	M16	18	220	180	8	M16	18	3

O-ring type seal (serial number 13)

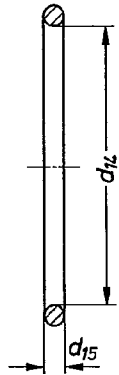


Table 4. O-ring type seal (serial number 13)

External diameter of pipe d_1	d_{14}		d_{15}		O-ring type seal to be used (identification group)
	per. dev.	per. dev.	per. dev.	per. dev.	
16	18,6	±0,3	3,5	±0,1	DIN 8063 - 16 - 16
20	23,4	±0,4	3,5	±0,1	DIN 8063 - 16 - 20
25	28,2	±0,4	3,5	±0,1	DIN 8063 - 13 - 25
32	36,1	±0,4	3,5	±0,1	DIN 8063 - 16 - 32
40	43,8	±0,5	5,3	±0,13	DIN 8063 - 16 - 40
50	53,3	±0,5	5,3	±0,13	DIN 8063 - 16 - 50
63	69,2	±0,7	5,3	±0,13	DIN 8063 - 16 - 63
75	81,9	±0,7	5,3	±0,13	DIN 8063 - 16 - 75
90	101	±0,7	5,3	±0,13	DIN 8063 - 16 - 90
110	120	±0,7	7	±0,15	DIN 8063 - 16 - 110

4 Material

Table 5. Material correlation

Serial number	Component	Material						
		GG	St	Al	Hp	PVC, rigid	GFK	HDPE type 1 and type 2
9	Flanged bush							+
10	Flat sealing ring	Corresponding to type, concentration and operating temperature of the medium flowing in the pipe						
11	Flange	+	+	+	+	+	+	+
12	Flanged bush							+
13	O-ring type seal	Corresponding to type, concentration and operating temperature of the medium flowing in the pipe						
Material: GG Cast iron (grey iron) in accordance with DIN 1691 St USt 37-1 in accordance with DIN 17 100 Al Light metal alloy Hp Laminated paper in accordance with the requirements of DIN 7735 Part 1 Rigid PVC Unplasticized polyvinylchloride in accordance with the requirements of DIN 8063 Part 5 (at present still in draft form) GFK Fibre-glass reinforced plastic HDPE Type 1 and 2 High density polyethylene in accordance with the requirements of DIN 16963 Part 5 or Part 25 (at present still in draft form)								

6 Design

Table 6. Correlation of nominal diameters

Nominal diameter		External diameter of pipe d_1	per. dev.	
Type F 4	Type F 5		without peeling of the pipe Type A	with peeling of the pipe Type B
10	—	16	$+0,3$ 0	0 $-0,2$
15	15	20		
20	20	25		
25	25	32		
32	32	40		
40	40	50	$+0,4$	0 $-0,3$
50	50	63		
65	65	75		
80	80	90	$+0,6$	0 $-0,4$
100	100	110		

The following flanged joints can be made with the bushes, flanges and seals in accordance with Section 4:

Flanged joint Form F 4

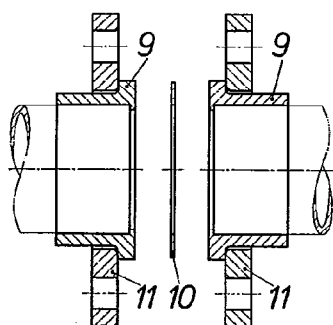


Table 7. Parts list

Serial number	Designation
9	Flanged bush
10	Flat sealing ring
11	Flange

Flanged joint Form F 5

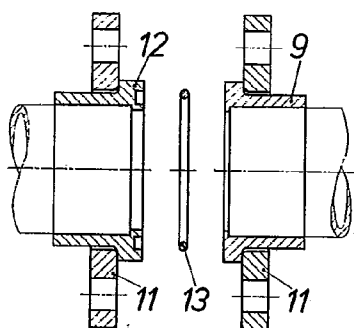


Table 8. Parts list

Serial number	Designation
9	Flanged bush
11	Flange
12	Flanged bush
13	O-ring type seal

Further Standards

- DIN 8075 Part 1 Hard polyethylene (hard PE) pipes; type 1, general quality requirements, testing
- DIN 8075 Part 2 High density polyethylene (HDPE) pipes; type 2, general quality requirements, testing
- DIN 16963 Part 1 Pipe joints and elements of high density polyethylene (HDPE) for pressure pipelines; types 1 and 2, pipe bends of segmental construction for butt-welding, dimensions
- DIN 16963 Part 2 (at present still in draft form) Pipe joints and elements of high density polyethylene (HDPE) for pressure pipelines; types 1 and 2, tee pieces and branch connections of segmental construction with necked ends for butt-welding, dimensions
- DIN 16963 Part 3 Pipe joints and elements of high density polyethylene (HDPE) for pressure pipelines; types 1 and 2, pipe bends for butt-welding, dimensions
- DIN 16963 Part 4 (at present still in draft form) Pipe joints and elements of high density polyethylene (HDPE) for pressure pipelines; types 1 and 2, bushes, flanges and seals for butt-welding, dimensions
- DIN 16963 Part 6 (at present still in draft form) Pipe joints and elements of high density polyethylene (HDPE) for pressure pipelines; types 1 and 2, injection moulded fittings for butt-welding, dimensions
- DIN 16963 Part 7 (Preliminary Standard) Pipe joints and elements of high density polyethylene (HDPE) for pressure pipelines; types 1 and 2, injection moulded fittings for resistance-welding, dimensions
- DIN 16963 Part 8 Pipe joints and elements of high density polyethylene (HDPE) for pressure pipelines; types 1 and 2, injection moulded elbows for socket-welding, dimensions
- DIN 16963 Part 9 Pipe joints and elements of high density polyethylene (HDPE) for pressure pipelines; types 1 and 2, injection moulded tee pieces for socket-welding, dimensions
- DIN 16963 Part 10 Pipe joints and elements of high density polyethylene (HDPE) for pressure pipelines; types 1 and 2, injection moulded sockets and caps for socket-welding, dimensions
- DIN 16963 Part 12 (Preliminary Standard) Pipe joints and elements of high density polyethylene (HDPE) for pressure pipelines; types 1 and 2, injection moulded reducing sockets for joining resistance-welded fittings, dimensions
- DIN 16963 Part 13 Pipe joints and elements of high density polyethylene (HDPE) for pressure pipelines; types 1 and 2, turned and pressed reducing sockets for butt-welding, dimensions
- DIN 16963 Part 14 (at present still in draft form) Pipe joints and elements of high density polyethylene (HDPE) for pressure pipelines; types 1 and 2, injection moulded reducing sockets and nipples for socket-welding, dimensions

Explanations

This Standard was drawn up by the Subcommittee 504.4 "Kunststoff-Fittings für Rohre aus Thermoplasten" (Plastic fittings for thermoplastic pipes) of the Normenausschuss Kunststoffe (Standards Committee Elastomers).

Compared to the draft Standard DIN 16963 Part 11, February 1978 edition, the possible flanged joint forms F 4 and F 5 in Section 6 "Design" were adopted and the examples of designation were deleted since flanged joints are not ordered and supplied complete.