UDC 621.643.414-036.742.2
:621.644.2-986 : 628.1

DEUTSCHE NORM

June 1987

Pipe joint assemblies and fittings for high-density polyethylene (PE-HD) pressure pipes
Pipe couplings
Dimensions

DIN 16963 Part 15

Rohrverbindungen und Rohrleitungsteile für Druckrohrleitungen aus Polyethylen hoher Dichte (PE-HD); Rohrverschraubungen; Maße

In keeping with current practice in standards published by the International Organization for Standardization (ISO), a comma has been used throughout as the decimal marker.

Dimensions in mm

1 Scope and field of application

This standard specifies requirements for pipe couplings with gasket (type V 1 couplings), with internal thread and gasket (type V 1 I couplings), with external thread and gasket (type V 1 A couplings) or with O ring (type V 2 couplings), to be joined with high-density polyethylene (PE-HD) pipes of pipe series 3, 4 and 5 by heated tool butt welding as described in DIN 1910 Part 3 or DVS 2207 Part 1, or with threaded pipes made from other materials.

The PE-HD components shall comply with the requirements specified in DIN 16963 Part 5.

For technical reasons, PE-HD nipples, threaded bushes and adaptors (item Nos. 14, 18 and 21 below) may only be welded to pipes conforming to DIN 8074 or to pipe components of the same pipe series, the use of other components being permitted if their wall thickness in the weld area is equal to that of the pipes.

2 Dimensions, designation

Pipe couplings and components are not expected to conform to the designs illustrated here; compliance is only required in the case of the dimensions specified.

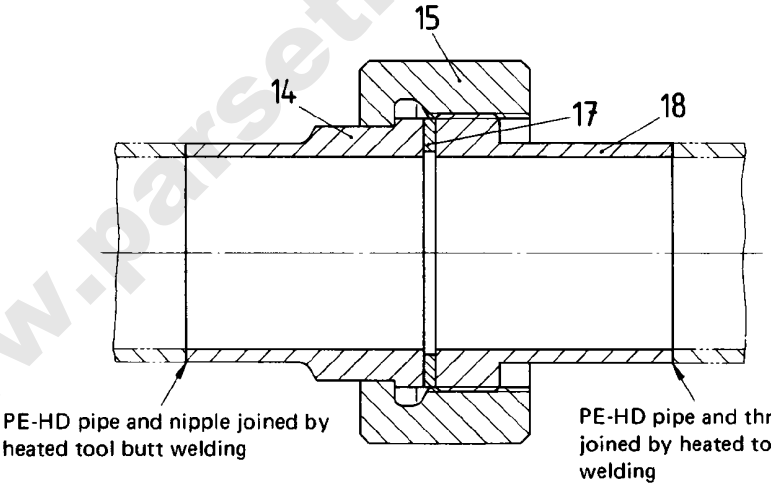
Where limit deviations are to be specified for dimensions without tolerance indication, these shall comply with DIN 7168 Part 1 or DIN 16901.

2.1 Pipe couplings

For specifications for components, see subclause 2.2.

Type V 1

Pipe coupling with gasket

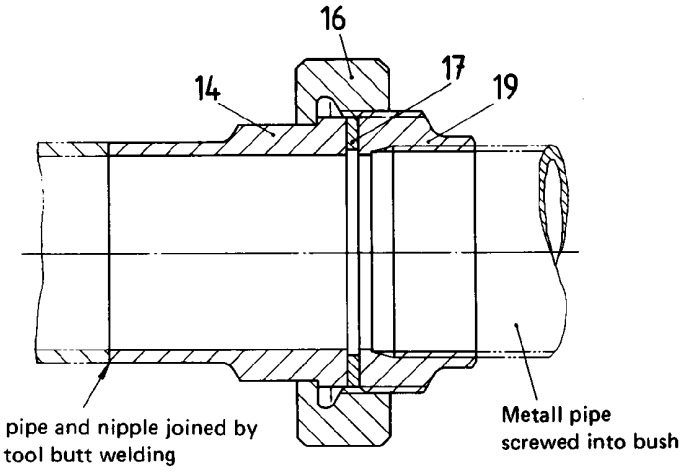


Continued on pages 2 to 8

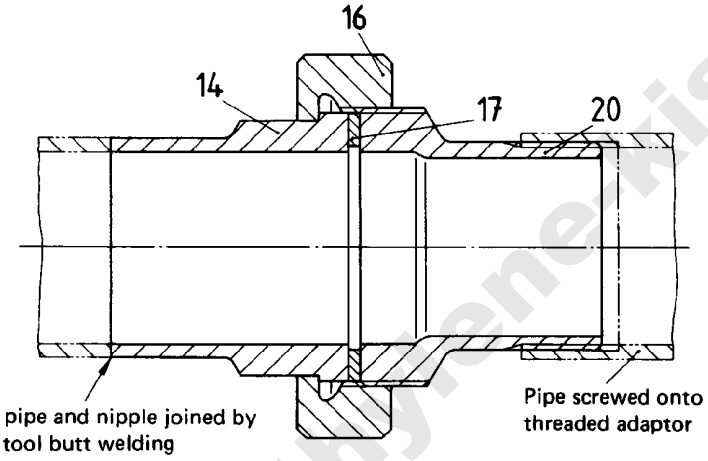
Beuth Verlag GmbH, Berlin, has the exclusive right of sale for German Standards (DIN-Normen).
11.88

DIN 16963 Part 15 Engl. Price group 7
Sales No. 0107

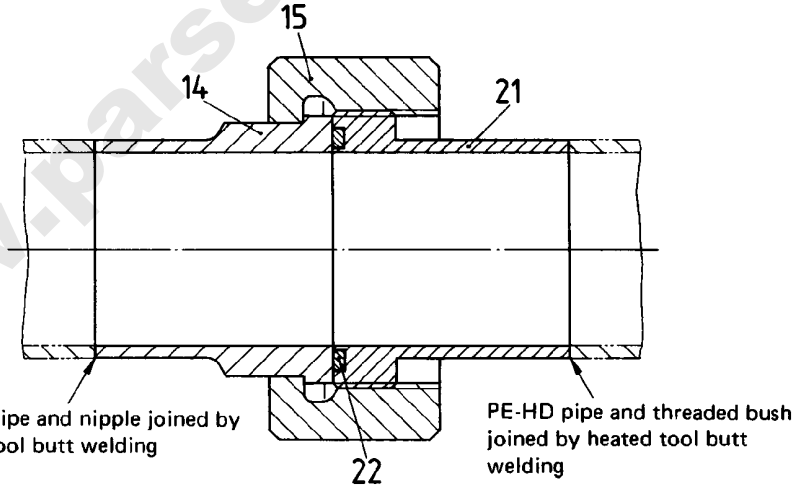
Type V 1 I
Pipe coupling with internal thread and gasket



Type V 1 A
Pipe coupling with external thread and gasket



Type V 2
Pipe coupling with O ring

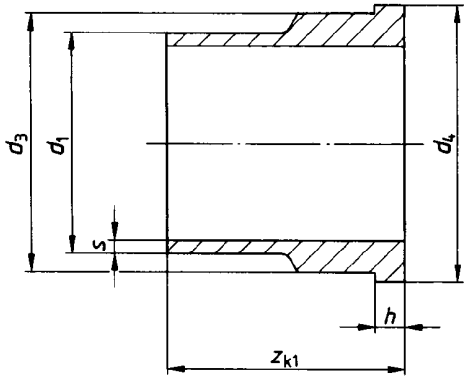


Designation of a series 5 type PE-HD pipe coupling with gasket (V1), with a pipe outside diameter, d_1, of 25 mm:

Pipe coupling DIN 16963 – V1 – 25 – 5 – PE-HD

2.2 Components

Nipple (item No. 14)

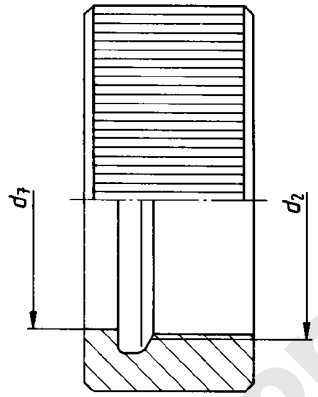


For dimensions, see table 6.

Designation of a series 5 PE-HD nipple (item No. 14) for pipe couplings with gasket or O ring, for use with pipes of 32 mm outside diameter:

Nipple DIN 16963 – 14 – 32 – 5 – PE-HD

Union nut (item No. 15)



For dimensions, see table 6.

Designation of an PE-HD union nut (item No. 15) for pipe couplings with gasket or O ring, for use with pipes of 25 mm outside diameter:

Union nut DIN 16963 – 15 – 25 – PE-HD

Union nut (item No. 16)

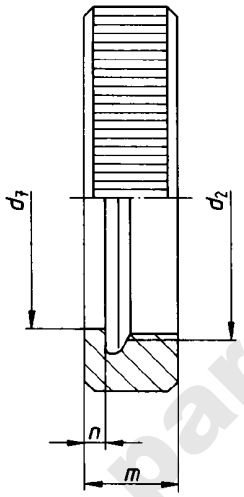


Table 1. **Union nut** (item No. 16)

Pipe outside diameter, d	Union nut required
20	DIN 8063 – 6 – 20...[1]
25	DIN 8063 – 6 – 25...[1]
32	DIN 8063 – 6 – 32...[1]
40	DIN 8063 – 6 – 40...[1]
50	DIN 8063 – 6 – 50...[1]
63	DIN 8063 – 6 – 63...[1]
75	DIN 8063 – 6 – 75...[1]
90	DIN 8063 – 6 – 90...[1]
For dimensions, see table 6.	
[1] The material shall be selected from table 7.	

Gasket (item No. 17)

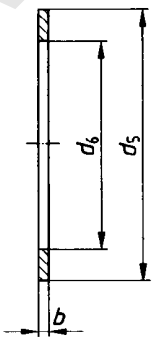
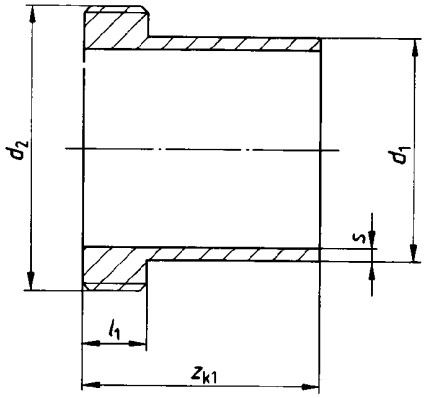


Table 2. **Gasket** (item No. 17)

Pipe outside diameter, d	Gasket required
20	DIN 8063 – 2 – 20
25	DIN 8063 – 2 – 25
32	DIN 8063 – 2 – 32
40	DIN 8063 – 2 – 40
50	DIN 8063 – 2 – 50
63	DIN 8063 – 2 – 63
75	DIN 8063 – 2 – 75
90	DIN 8063 – 2 – 90
For dimensions, see table 6.	

Threaded bush (item No. 18)



Designation of a series 3 PE-HD threaded bush (item No. 18) for pipe couplings with gasket, for use with pipes of 40 mm outside diameter:

Threaded bush DIN 16963 – 18 – 40 – 3 – PE-HD

Threaded bush (item No. 19)
(for joining with threaded pipe)

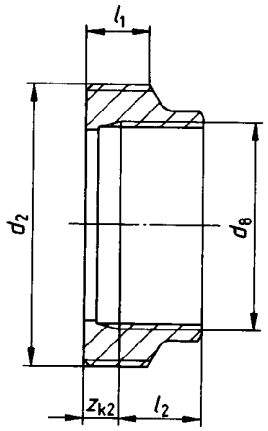


Table 3. **Threaded bush** (item No. 19)

Pipe outside diameter, d	Threaded bush required
20	DIN 8063 – 4 – 20 ... [1]
25	DIN 8063 – 4 – 25 ... [1]
32	DIN 8063 – 4 – 32 ... [1]
40	DIN 8063 – 4 – 40 ... [1]
50	DIN 8063 – 4 – 50 ... [1]
63	DIN 8063 – 4 – 63 ... [1]
75	DIN 8063 – 4 – 75 ... [1]
90	DIN 8063 – 4 – 90 ... [1]

For dimensions, see table 6.

[1] The material shall be selected from table 7.

Threaded adaptor (item No. 20)

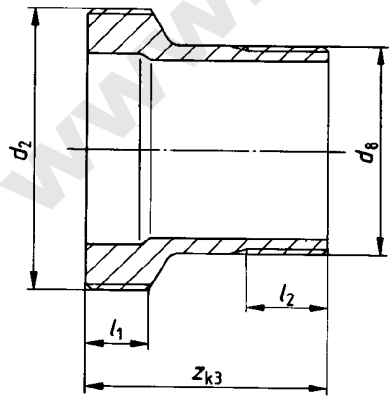


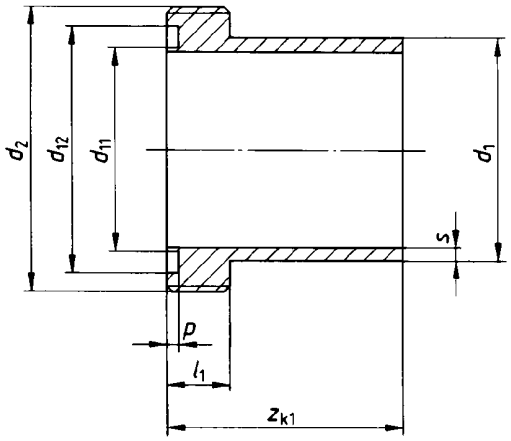
Table 4. **Threaded adaptor** (item No. 20)

Pipe outside diameter, d	Threaded adaptor required
20	DIN 8063 – 18 – 20 ... [1]
25	DIN 8063 – 18 – 25 ... [1]
32	DIN 8063 – 18 – 32 ... [1]
40	DIN 8063 – 18 – 40 ... [1]
50	DIN 8063 – 18 – 50 ... [1]
63	DIN 8063 – 18 – 63 ... [1]
75	DIN 8063 – 18 – 75 ... [1]
90	DIN 8063 – 18 – 90 ... [1]

For dimensions, see table 6.

[1] The material shall be selected from table 7.

Threaded bush for coupling with O ring (item No. 21)



For dimensions, see table 6.

Designation of a series 5 PE-HD threaded bush (item No. 21) for pipe couplings with O ring, for use with pipes of 32 mm outside diameter:

Threaded bush DIN 16963 – 21 – 32 – 5 – PE-HD

O ring (item No. 22)

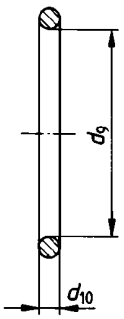


Table 5. **O ring** (item No. 22)

Pipe outside diameter, d	O ring required
20	DIN 8063 – 13 – 20
25	DIN 8063 – 13 – 25
32	DIN 8063 – 13 – 32
40	DIN 8063 – 13 – 40
50	DIN 8063 – 13 – 50
63	DIN 8063 – 13 – 63
75	DIN 8063 – 16 – 63
90	DIN 8063 – 16 – 75
For dimensions, see table 6.	

Table 6. **Dimensions of pipe couplings as a function of pipe outside diameter**

Pipe outside diameter, d, as in DIN 8074	Mean diameter, d_1	Limit deviations	d_2 [1]	d_3	Limit deviations	d_4	Limit deviations	d_5	d_6	d_7	Limit deviations	d_8 [2]	d_9	Limit deviations	d_{10}	Limit deviations
20	20	$^{+0,3}_{0}$	G 1	27,5	$^{0}_{-0,15}$	30,1	$^{0}_{-0,15}$	30	21	27,6	$^{+0,15}_{0}$	R ½	20,2	± 0,4	3,5	± 0,1
25	25		G 1¼	36	$^{0}_{-0,15}$	38,8	$^{0}_{-0,15}$	38	27	36,1	$^{+0,15}_{0}$	R ¾	28,2	± 0,4	3,5	± 0,1
32	32		G 1½	41,5	$^{0}_{-0,15}$	44,7	$^{0}_{-0,15}$	44	32	41,6	$^{+0,15}_{0}$	R 1	32,9	± 0,4	3,5	± 0,1
40	40	$^{+0,4}_{0}$	G 2	53	$^{0}_{-0,15}$	56,5	$^{0}_{-0,15}$	55	42	53,1	$^{+0,15}_{0}$	R 1¼	40,6	± 0,5	5,3	± 0,13
50	50	$^{+0,5}_{0}$	G 2¼	59	$^{0}_{-0,2}$	62,6	$^{0}_{-0,2}$	62	46	59,1	$^{+0,2}_{0}$	R 1½	47	± 0,5	5,3	± 0,13
63	63	$^{+0,6}_{0}$	G 2¾	74	$^{0}_{-0,2}$	78,4	$^{0}_{-0,2}$	78	60	74,1	$^{+0,2}_{0}$	R 2	59,7	± 0,5	5,3	± 0,13
75	75	$^{+0,7}_{0}$	G 3½	92,5	$^{0}_{-0,2}$	97,2	$^{0}_{-0,2}$	97	75	92,6	$^{+0,2}_{0}$	R 2½	–	–	–	–
90	90	$^{+0,9}_{0}$	G 4	105	$^{0}_{-0,3}$	110	$^{0}_{-0,3}$	110	88	105,1	$^{+0,2}_{0}$	R 3	–	–	–	–

1) Pipe thread as in ISO 228 Part 1. External threads shall be made to tolerance class A.
2) As in DIN 2999 Part 1.
3) For GTW union nuts, these dimensions are identical with those given in DIN 2950 for P1 union nuts.

3 Material

Table 7. **Material symbols for pipe couplings and allocation of materials to components**

Material symbol	Nipple (item No. 14)	Union nut (item No. 15)	Union nut (item No. 16)	Gasket (item No. 17)	Threaded bush (item No. 18)	Threaded bush (item No. 19)
PE-HD	PE-HD	PE-HD[1]	–	Materials subject to agreement.	PE-HD	–
GTW	PE-HD	–	GTW		–	GTW
Ms	PE-HD	–	Ms		–	Ms
Rg	PE-HD	–	Rg		–	Rg

PE-HD complying with the requirements specified in DIN 16963 Part 5.
GTW = GTW-45-07 as specified in DIN 1692 (material number 0.8045).
Ms = CuZn40Pb2 as specified in DIN 17660 (material number 2.0402).
Rg = G-CuSn5ZnPb as specified in DIN 1705 (material number 2.1096.01).
For item Nos. 17 and 22, the material shall be agreed as a function of the type, concentration and service temperature of the medium conveyed.

1) Union nuts (item No. 15) may be manufactured of other suitable plastics, such as polypropylene (PP) or polyvinyl chloride (PVC).

d_{11}	Limit deviations	d_{12}	Limit deviations	h	l_1 min.	l_2 [2] Effective thread length	m [3]	n [3]	p	Limit deviations	s Pipe series 3	Limit deviations	4	Limit deviations	5	Limit deviations	b	z_{k1}	z_{k2}	z_{k3}
18	$^{+0,1}_{0}$	26,6	$^{0}_{-0,1}$	6	10	13,2	18	4	2,8	± 0,1	–	–	–	–	1,9	$^{+0,4}_{0}$	2	53	7	32
25,9	$^{+0,1}_{0}$	34,4	$^{0}_{-0,1}$	6	11	14,5	20	4	2,8	± 0,1	–	–	–	–	2,3	$^{+0,5}_{0}$	2	56	8	49
30,6	$^{+0,1}_{0}$	39,2	$^{0}_{-0,1}$	6,5	12	16,8	22	5	2,8	± 0,1	–	–	–	–	3	$^{+0,5}_{0}$	2	59	9	53
37,7	$^{+0,2}_{0}$	50,5	$^{0}_{-0,2}$	7,5	14	19,1	24	6	4,3	± 0,1	–	–	–	–	3,7	$^{+0,6}_{0}$	2	62	9	54
44,1	$^{+0,2}_{0}$	56,9	$^{0}_{-0,2}$	8	16	19,1	25	6	4,3	± 0,1	–	–	2,9	$^{+0,5}_{0}$	4,6	$^{+0,7}_{0}$	2	65	10	62
56,7	$^{+0,2}_{0}$	69,5	$^{0}_{-0,2}$	8,5	18	23,4	27	6	4,3	± 0,1	–	–	3,6	$^{+0,6}_{0}$	5,8	$^{+0,8}_{0}$	3	68	10	69
–	–	–	–	12	18	26,7	34	6	–	–	2,9	$^{+0,5}_{0}$	4,3	$^{+0,7}_{0}$	6,9	$^{+0,9}_{0}$	3	71	11	74
–	–	–	–	13	18	29,8	36	6	–	–	3,5	$^{+0,6}_{0}$	5,1	$^{+0,8}_{0}$	8,2	$^{+1,1}_{0}$	3	74	11	83

Threaded adaptor (item No. 20)	Threaded bush (item No. 21)	O ring (item No. 22)
–	PE-HD	Materials subject to agreement.
GTW	–	
Ms	–	
Rg	–	

Standards and other documents referred to

DIN 1692	Malleable cast iron; concepts, properties
DIN 1705	Copper-tin and copper-tin-zinc casting alloys; castings
DIN 1910 Part 3	Welding; welding of plastics, processes
DIN 2950	Malleable cast iron fittings
DIN 2999 Part 1	Pipe threads for threaded pipes and fittings; parallel internal threads and taper external threads; thread sizes
DIN 7168 Part 1	General tolerances; linear and angular dimensions
DIN 8063 Part 3	Pipe joint assemblies and fittings for unplasticized polyvinyl chloride (rigid PVC) pressure pipes; pipe couplings; dimensions
DIN 8074	High-density polyethylene (PE-HD) pipes; dimensions
DIN 16901	Plastics mouldings; tolerances and acceptance conditions for linear dimensions
DIN 16963 Part 5	Pipe joint assemblies and fittings for high-density polyethylene (PE) pressure pipes; general quality requirements, testing
DIN 17660	Wrought copper alloys; copper-zinc alloys; composition
ISO 228 Part 1	Pipe threads where pressure-tight joints are not made on the threads; designations, dimensions and tolerances
DVS 2207 Part 1	Welding of thermoplastics; high-density polyethylene pipes and fittings for gas and water conduits *)

Other relevant standards

DIN 8075	High-density polyethylene (PE-HD) pipes; general quality requirements, testing
DIN 16963 Part 1	Pipe joint assemblies and fittings for types 1 and 2 high-density polyethylene (PE-HD) pressure pipes; pipe bends of segmental construction for butt welding; dimensions
DIN 16963 Part 2	Pipe joint assemblies and fittings for types 1 and 2 high-density polyethylene (PE-HD) pressure pipes; tees and branches produced by segment inserts and necking for butt welding; dimensions
DIN 16963 Part 3	Pipe joint assemblies and fittings for types 1 and 2 high-density polyethylene (PE-HD) pressure pipes; pipe bends for butt welding; dimensions
DIN 16963 Part 4	(at present at the stage of draft) Pipe joint assemblies and fittings for types 1 and 2 high-density polyethylene (PE-HD) pressure pipes; nipples for heated tool butt welding flanges, sealings; dimensions
DIN 16963 Part 6	(at present at the stage of draft) Pipe joint assemblies and fittings for types 1 and 2 high-density polyethylene (PE-HD) pressure pipes; injection moulded fittings for butt welding; dimensions
DIN 16963 Part 7	Pipe joint assemblies and fittings for types 1 and 2 high-density polyethylene (PE-HD) pressure pipes; injection moulded electric fusion fittings; dimensions
DIN 16963 Part 8	Pipe joint assemblies and fittings for types 1 and 2 high-density polyethylene (PE-HD) pressure pipes; injection moulded elbows for socket welding; dimensions
DIN 16963 Part 9	Pipe joint assemblies and fittings for types 1 and 2 high-density polyethylene (PE-HD) pressure pipes; injection moulded tees for socket welding; dimensions
DIN 16963 Part 10	Pipe joint assemblies and fittings for types 1 and 2 high-density polyethylene (PE-HD) pressure pipes; injection moulded sockets and caps for socket welding; dimensions
DIN 16963 Part 11	Pipe joint assemblies and fittings for types 1 and 2 high-density polyethylene (PE-HD) pressure pipes; bushes, flanges and seals for socket welding; dimensions
DIN 16963 Part 13	Pipe joint assemblies and fittings for types 1 and 2 high-density polyethylene (PE-HD) pressure pipes; turned and pressed reducers for butt welding; dimensions
DIN 16963 Part 14	Pipe joint assemblies and fittings for types 1 and 2 high-density polyethylene (PE-HD) pressure pipes; injection moulded reducers and nipples for socket welding; dimensions

International Patent Classification

F 16 L 13/00

*) Obtainable from *Deutscher Verlag für Schweißtechnik GmbH,* Postfach 27 25, D-4000 Düsseldorf.