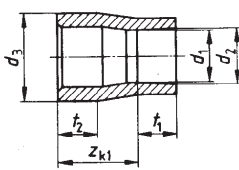
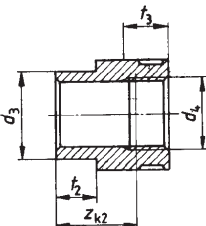


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DEUTSCHE NORM

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	<p>Pipe joint assemblies and fittings for types 1 and 2 high-density polyethylene (HDPE) pressure pipes Injection moulded reducers and nipples for socket welding Dimensions</p>	<p>DIN 16 963 Part 14</p>
<p>Rohrverbindungen und Rohrleitungsteile für Druckrohrleitungen aus Polyethylen hoher Dichte (HDPE) Typ 1 und 2; Reduzierstücke und Nippel aus Spritzguss für Muffenschweissung; Masse</p>		
<p><i>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.</i></p>		
<p>Dimensions in mm</p>		
<p>1 Scope and field of application</p>		
<p>This standard applies to types 1 and 2 high-density polyethylene (HDPE) injection moulded¹⁾ reducers and nipples intended for socket welding using heated tools to series 5 pressure pipes conforming to DIN 8074 Part 1 or Part 2. The reducers and nipples shall comply with the requirements specified in DIN 16 963 Part 5 or Part 25 (at present at the stage of draft).</p>		
<p>2 Dimensions, designations</p>		
<p>The reducers and nipples need not conform to the illustrations, only the dimensions specified are to be adhered to.</p>		
<p>Type R 4 Reducer 4</p> 	<p>Type NRG1 Reducing nipple, threaded internally at one end only</p> 	
<p>Designation of a type 1 HDPE reducer 4 (R 4) for type A socket welding, reduced from pipe outside diameter $d = 25$ mm to $d = 20$ mm:</p>		
<p style="text-align: center;">Reducer DIN 16 963 – R 4 A 25 × 20 – 1</p>		
<p>Designation of a type 2 HDPE reducing nipple, threaded internally at one end only (NRG1) for type B socket welding, reduced from pipe outside diameter $d = 32$ mm to internal thread size R 3/4:</p>		
<p style="text-align: center;">Nipple DIN 16 963 – NRG1 – B 32 × R 3/4 – 2</p>		
<p>¹⁾ For definition of 'injection moulded', see DIN 16 700.</p>		
<p style="text-align: right;">Continued on pages 2 to 5</p>		

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Table 1. Type A reducers 4 (for unpeeled pipe ends)

Reduction in pipe outside diameter		to		d_1 2) 5)		Out-of- round- ness 5) 6)	d_2 2) 5)		d_3	z_{k1} 4)	t_1 3) 5)	t_2	
from	Per. dev. *)	d	Per. dev. *)	Per. dev. *)	Per. dev. *)		Per. dev. *)						
d		d								min.	min.	min.	
20	$+0,3$ 0	16	$+0,3$ 0	15,4	$-0,3$	0,4	15,5	$-0,3$	20	$+0,3$ 0	16	13,3	11
25	$+0,3$ 0	16	$+0,3$ 0	15,4	$-0,3$	0,4	15,5	$-0,3$	25	$+0,3$ 0	18,5	13,3	12,5
		20	$+0,3$ 0	19,3	$-0,3$	0,4	19,5	$-0,3$			14,5		
32	$+0,3$ 0	20	$+0,3$ 0	19,3	$-0,3$	0,4	19,5	$-0,3$	32	$+0,3$ 0	22,5	14,5	14,6
		25	$+0,3$ 0	24,3	$-0,4$	0,4	24,5	$-0,3$			16		
40	$+0,3$ 0	20	$+0,3$ 0	19,3	$-0,3$	0,4	19,5	$-0,3$	40	$+0,3$ 0	27	14,5	17
		25	$+0,3$ 0	24,3	$-0,4$	0,4	24,5	$-0,3$			16		
		32	$+0,3$ 0	31,3	$-0,4$	0,5	31,5	$-0,4$			18,1		
50	$+0,4$ 0	20	$+0,3$ 0	19,3	$-0,3$	0,4	19,5	$-0,3$	50	$+0,4$ 0	32,5	14,5	20
		25	$+0,3$ 0	24,3	$-0,4$	0,4	24,5	$-0,3$			16		
		32	$+0,3$ 0	31,3	$-0,4$	0,5	31,5	$-0,4$			18,1		
		40	$+0,3$ 0	39,2	$-0,4$	0,5	39,45	$-0,4$			20,5		
63	$+0,4$ 0	25	$+0,3$ 0	24,3	$-0,4$	0,4	24,5	$-0,3$	63	$+0,4$ 0	39,5	16	24
		32	$+0,3$ 0	31,3	$-0,4$	0,5	31,5	$-0,4$			18,1		
		40	$+0,3$ 0	39,2	$-0,4$	0,5	39,45	$-0,4$			20,5		
		50	$+0,4$ 0	49,2	$-0,5$	0,6	49,45	$-0,4$			23,5		
75	$+0,5$ 0	63	$+0,4$ 0	62,1	$-0,5$	0,6	62,5	$-0,6$	75	$+0,5$ 0	43,5	27,4	25
90	$+0,6$ 0	63	$+0,4$ 0	62,1	$-0,5$	0,6	62,5	$-0,6$	90	$+0,6$ 0	50,5	27,4	28
		75	$+0,5$ 0	73,7	$-0,6$	1	74,9	$-0,6$			30		
110	$+0,6$ 0	90	$+0,6$ 0	88,5	$-0,6$	1	89,9	$-0,6$	110	$+0,6$ 0	59,5	33	32
125	$+0,6$ 0	63	$+0,4$ 0	62,1	$-0,5$	0,6	62,5	$-0,6$	125	$+0,6$ 0	66	27,4	35
		75	$+0,5$ 0	73,7	$-0,6$	1	74,9	$-0,6$			30		
		90	$+0,6$ 0	88,5	$-0,6$	1	89,6	$-0,6$			33		

2) The mean inside diameter shall be calculated from the arithmetic mean of two inside diameters measured at right angles to each other.

3) For type A and B with $d \leq 63$ mm: $t_1 = 0,3 d + 8,5$ mm
 For type A with $d \geq 75$ mm: $t_1 = 0,2 d + 15$ mm
 For type B with $d \geq 75$ mm: $t_1 = 0,3 d + 8,5$ mm

4) As specified in ISO/DIS 7334.

5) As specified in ISO/DIS 7333.

6) Out-of-roundness is the difference between the maximum and minimum inside diameter measured.

*) Per. dev. = permissible deviation.

Table 2. Type B reducers 4 (for peeled pipe ends)

Reduction in pipe outside diameter						Out-of- round- ness 5) 6)					$z_{k1}^{4)}$	$t_1^{3) 5)}$	t_2
from	to						$d_2^{2) 5)}$	d_3	$z_{k1}^{4)}$	$t_1^{3) 5)}$			
d	Per. dev. *)	d	Per. dev. *)	$d_1^{2) 5)}$	Per. dev. *)		Per. dev. *)	Per. dev. *)	min.	min.	min.		
20	-0,2	16	-0,2	15,4	-0,3	0,4	15,5	-0,3	20	-0,2	16	13,3	11
25	-0,2	16	-0,2	15,4	-0,3	0,4	15,5	-0,3	25	-0,3	18,5	13,3	12,5
		20	-0,2	19,3	-0,3	0,4	19,5	-0,3				14,5	
32	-0,2	20	-0,2	19,3	-0,3	0,4	19,5	-0,3	32	-0,3	22,5	14,5	14,6
		25	-0,2	24,3	-0,4	0,4	24,5	-0,3				16	
40	-0,2	20	-0,2	19,3	-0,3	0,4	19,5	-0,3	40	-0,3	27	14,5	17
		25	-0,2	24,3	-0,4	0,4	24,5	-0,3				16	
		32	-0,2	31,3	-0,4	0,5	31,5	-0,4				18,1	
50	-0,2	20	-0,2	19,3	-0,3	0,4	19,5	-0,3	50	-0,4	32,5	14,5	20
		25	-0,2	24,3	-0,4	0,4	24,5	-0,3				16	
		32	-0,2	31,3	-0,4	0,5	31,5	-0,4				18,1	
		40	-0,2	39,2	-0,4	0,5	39,45	-0,4				20,5	
63	-0,3	25	-0,2	24,3	-0,4	0,4	24,5	-0,3	63	-0,4	39,5	16	24
		32	-0,2	31,3	-0,4	0,5	31,5	-0,4				18,1	
		40	-0,2	39,2	-0,4	0,5	39,45	-0,4				20,5	
		50	-0,2	49,2	-0,5	0,6	49,45	-0,5				23,5	
75	-0,3	63	-0,3	62,1	-0,5	0,6	62,5	-0,6	75	-0,4	44,5	27,4	26
90	-0,3	63	-0,3	62,1	-0,5	0,6	62,5	-0,6	90	-0,5	53	27,4	30,5
		75	-0,3	73,95	-0,5	1,0	74,25	-0,6				31	
110	-0,4	90	-0,3	88,85	-0,6	1,0	89,2	-0,6	110	-0,5	64	35,5	36,5
125	-0,4	63	-0,3	62,1	-0,5	0,6	62,5	-0,5	125	-0,5	72	27,4	41
		75	-0,3	73,95	-0,5	1,0	74,25	-0,6				31	
		90	-0,3	88,85	-0,6	1,0	89,2	-0,6				35,5	

For footnotes 2) to 6), see table 1.

Table 3. Type A NRG1 nipples (for unpeeled pipe ends)

Reduction in pipe outside diameter			d_3	Permissible deviation	t_2 min.	t_3 ⁷⁾	z_{k2} min.
from d	Permissible deviation	to thread size d_4 ⁸⁾					
20	$+0,3$ 0	R 3/8	20	$+0,3$ 0	11	11,4	17
25	$+0,3$ 0	R 1/2	25	$+0,3$ 0	12,5	15	19
32	$+0,3$ 0	R 3/4	32	$+0,3$ 0	14,6	16,3	21
40	$+0,3$ 0	R 1	40	$+0,3$ 0	17	19,1	24
50	$+0,4$ 0	R 1 1/4	50	$+0,4$ 0	20	21,4	28

7) t_3 = maximum useful length of thread as specified in DIN 2999 Part 1.
8) Thread size as specified in DIN 2999 Part 1.

Table 4. Type B NRG1 nipples (for peeled pipe ends)

Reduction in pipe outside diameter			d_3	Permissible deviation	t_2 min.	t_3 ⁷⁾	z_{k2} min.
from d	Permissible deviation	to thread size d_4 ⁸⁾					
20	0 -0,2	R 3/8	20	0 -0,2	11	11,4	17
25	0 -0,2	R 1/2	25	0 -0,3	12,5	15	19
32	0 -0,2	R 3/4	32	0 -0,3	14,6	16,3	21
40	0 -0,2	R 1	40	0 -0,3	17	19,1	24
50	0 -0,2	R 1 1/4	50	0 -0,4	20	21,4	28

For footnotes 7) to 8), see table 3.

Standards referred to and other documents

DIN 8074 Part 1	Type 1 rigid polyethylene (rigid PE) pipes; dimensions
DIN 8074 Part 2	Type 2 high-density polyethylene (HDPE) pipes; dimensions
DIN 16 700	Plastics; moulding technique; processing methods and tools; definitions
DIN 16 963 Part 5	Pipe joint assemblies and fittings for type 1 rigid polyethylene (rigid PE) pressure pipes; general quality requirements, testing
DIN 16 963 Part 25	(at present at the stage of draft) Pipe joint assemblies and fittings for type 2 high-density polyethylene (HDPE) pressure pipes; general quality requirements, testing, supplement to DIN 16 963 Part 5
ISO/DIS 7333	Polyethylene (PE) fittings for pipes under pressure; sockets for fusion using heated tools; metric series; dimensions of sockets
ISO/DIS 7334	Polyethylene (PE) fittings for pipes under pressure; sockets for fusion using heated tools; metric series; design lengths

Other relevant standards

DIN 8075 Part 1	Type 1 rigid polyethylene (rigid PE) pipes; general quality requirements, testing
DIN 8075 Part 2	Type 2 high-density polyethylene (HDPE) pipes; general quality requirements, testing
DIN 16 963 Part 1	Pipe joint assemblies and fittings for types 1 and 2 high-density polyethylene (HDPE) pressure pipes; bends produced by segment inserts for butt welding, dimensions
DIN 16 963 Part 2	Pipe joint assemblies and fittings for types 1 and 2 high-density polyethylene (HDPE) pressure pipes; tees and branches produced by segment inserts and by necking for butt welding, dimensions
DIN 16 963 Part 3	Pipe joint assemblies and fittings for types 1 and 2 high-density polyethylene (HDPE) pressure pipes; bends formed from pipes for butt welding, dimensions
DIN 16 963 Part 6	(at present at the stage of draft) Pipe joint assemblies and fittings for type 1 and 2 high-density polyethylene (HDPE) pressure pipes; injection moulded fittings for butt welding, dimensions
DIN 16 963 Part 7	Pipe joint assemblies and fittings for types 1 and 2 high-density polyethylene (HDPE) pressure pipes; injection moulded electric fusion fittings, dimensions
DIN 16 963 Part 8	Pipe joint assemblies and fittings for types 1 and 2 high-density polyethylene (HDPE) pressure pipes; injection moulded elbows for socket welding, dimensions
DIN 16 963 Part 9	Pipe joint assemblies and fittings for types 1 and 2 high-density polyethylene (HDPE) pressure pipes; injection moulded tees for socket welding, dimensions
DIN 16 963 Part 10	Pipe joint assemblies and fittings for types 1 and 2 high-density polyethylene (HDPE) pressure pipes; injection moulded sockets and caps for socket welding, dimensions
DIN 16 963 Part 11	Pipe joint assemblies and fittings for types 1 and 2 high-density polyethylene (HDPE) pressure pipes; bushes, flanges and seals for socket welding, dimensions
DIN 16 963 Part 12	Pipe joint assemblies and fittings for types 1 and 2 high-density polyethylene (HDPE) pressure pipes; injection moulded reducers for connection to electric fusion fittings
DIN 16 963 Part 13	Pipe joint assemblies and fittings for types 1 and 2 high-density polyethylene (HDPE) pressure pipes; turned and pressed reducers for butt welding, dimensions

Explanatory notes

Owing to differences in the welding process regarding the preparation of pipe ends for welding, it was necessary to specify two fitting types (A and B) with different dimensions.

Basic work on these two fitting types undertaken by ad hoc Working Group 2/4 of ISO/TC 138 led to the preparation of ISO/DIS 7333 and ISO/DIS 7334.

International Patent Classification

F 16 B 7-00