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High-density polyethylene (HDPE) pipes and fittings for hot-water resistant drains and sewers inside buildings

Dimensions

DIN 19 535 Part 1

Rohre und Formstücke aus Polyethylen hoher Dichte (PE-HD) für heißwasserbeständige Abwasserleitungen (HT) innerhalb von Gebäuden; Maße

This standard, together with DIN 19 535 Part 2, April 1987 edition, supersedes DIN 19 535, March 1977 edition, withdrawn in January 1986.

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

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1 Field of application

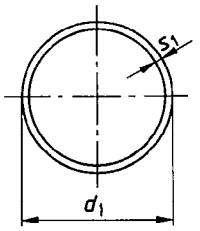
This standard specifies dimensions of hot-water resistant high-density polyethylene (HDPE) pipes, fittings, sockets, couplings and connectors, which are installed in buildings, for waste water discharge as specified in DIN 1986 Part 3, in applications as specified in DIN 1986 Part 4. All such pipes and fittings shall meet the requirements specified in DIN 19535 Part 2.[1)]

2 Dimensions, designation [2)]

2.1 Pipes

Pipes shall be manufactured with plain ends. Their outside diameter and wall thickness shall be as specified in tables 1 and 2. They shall be supplied in overall lengths, l, of 3, 5 and 6 m, in greater lengths where agreed, with limit deviations, measured at a temperature of (23 ± 2) °C, not exceeding ± 2 %.

Pipes shall be designated by their nominal size, overall length, and those exceeding size DN 100, also by the series to which they belong.



Designation of a series 2 HDPE pipe of nominal size DN 100 and of overall length, l = 6 m:

Pipe DIN 19535 – DN 100 × 6 – 2

For size DN 50 pipes, two outside diameters have been specified. When ordering such pipes, diameter d_1 shall be additionally specified.

Designation of an HDPE pipe of nominal size DN 50, outside diameter, d_1 = 63 mm and overall length, l = 5 m:

Pipe DIN 19535 – DN 50 – 63 × 5

1) Fittings, sockets, couplings and connectors not illustrated in the present standard shall also meet the requirements specified in DIN 19535 Part 2.

2) Owing to the variety of commonly used fittings, sockets, couplings and connectors z dimensions have not been specified. The information given by the manufacturer shall be observed in this respect.

Table 1. **Dimensions for DN 40 to DN 70 pipes**

Nominal size DN	Outside diameter d_1, d_2, d_4 or d_5	Outside diameter Limit deviations	Required inside diameter	Wall thickness s_1, s_2, s_4 or s_5	Wall thickness Limit deviations
40	50	$^{+0,5}_{0}$	44	3,0	$^{+0,5}_{0}$
50	56	$^{+0,5}_{0}$	50	3,0	$^{+0,5}_{0}$
50	63	$^{+0,6}_{0}$	57	3,0	$^{+0,5}_{0}$
70	75	$^{+0,7}_{0}$	69	3,0	$^{+0,5}_{0}$

Table 2. **Dimensions for DN 100 to DN 300 pipes**

Nominal size DN	Outside diameter d_1, d_2, d_4 or d_5	Outside diameter Limit deviations	Series 2 [1)] Required inside diameter DS	Series 2 [1)] Wall thickness s_1, s_2, s_4 or s_5	Series 2 [1)] Wall thickness Limit deviations	Series 3 [1)] Required inside diameter DS	Series 3 [1)] Wall thickness s_1, s_2, s_4 or s_5	Series 3 [1)] Wall thickness Limit deviations
100	110	$^{+1}_{0}$	103	3,5	$^{+0,6}_{0}$	101,4	4,3	$^{+0,7}_{0}$
125	125	$^{+1,2}_{0}$	117,2	3,9	$^{+0,6}_{0}$	115,2	4,9	$^{+0,7}_{0}$
150	160	$^{+1,5}_{0}$	150	5	$^{+0,7}_{0}$	147,6	6,2	$^{+0,9}_{0}$
200	200	$^{+1,8}_{0}$	187,6	6,2	$^{+0,9}_{0}$	–	–	–
250	250	$^{+2,3}_{0}$	234,4	7,8	$^{+1,0}_{0}$	–	–	–
300	315	$^{+2,9}_{0}$	295,4	9,8	$^{+1,2}_{0}$	–	–	–

1) Series 2 and 3 as specified in DIN 8074.

2.2 Fittings

Diameters and associated limit deviations for fitting spigot ends shall be as specified in tables 1 and 2. The wall thickness shall, at points where the fittings are in contact with waste water, be at least equal to that of the associated pipe sizes.

Fittings are not expected to conform to the design illustrated here; compliance is only required in the case of the dimensions specified.

For size DN 50 fittings, two outside diameters have been specified. When ordering such fittings, the outside diameter shall additionally be specified. The designation shall then read, e.g. for an HDPE single branch of nominal size DN 1 = 50 (with d_1 = 63 mm) and nominal size DN 2 = 40, as follows:

Branch DIN 19535 – PEEA 50 – 63 × 40

2.2.1 Nomenclature and symbols

Table 3. **Nomenclature and symbols**

Fitting type	symbol
Bend	PEB
Single branch	PEEA
Double branch	PEDA
Corner double branch	PEED
Multiple branch	PEMA
Y fitting	PEHT
Reducer	PER
Access piece	PERE

2.2.2 Free lengths of fitting spigot ends

The spigot ends of fitting shall be designed so as to permit the use of one of the common jointing methods, such as welding using electric fusion sockets, heated tool butt welding or jointing by means of push-in sockets.

The length of fitting spigot ends shall be as specified in table 4,

where

t_e is the length of the spigot end for jointing using electric fusion sockets (PEME) or for joints made by heated tool butt welding;

t_m is the length of the spigot end for jointing by means of push-in sockets (PEMS).

The spigot lengths are designated t_1, t_2, t_3, etc. in the illustrations on the following pages. Either t_e or t_m shall be used instead of these values, depending on which of the above jointing methods is applicable.

Fittings having a spigot length smaller than specified shall only be fitted to a pipe (section) at works, otherwise the manufacturer shall provide a suitable device for jointing or suitable sockets or couplings.

Table 4. **Free length of spigot ends**

Outside diameters, d_1 and d_2	Minimum free length, t_e	Minimum free length, t_m
50	1)	48
56	1)	51
63	1)	53
75	1)	57
110	29	67
125	32	71
160	32	80
200	75	89
250	75	101
315	75	115

1) As pipes and fittings with this outside diameter may also be manually jointed by butt welding using heated tools, no specifications for t_e have been specified here.

For jointing using electric fusion sockets, the minimum of t_e is a function of the depth of engagement of the socket used. Given the wide range of products available and existing patent rights, harmonization of the depth of engagement for the types of electric fusion sockets (PEME) commonly used has proved to be impossible. Attention is drawn here to the information given by the manufacturers.

Dimension t_e is a function of the maximum depth of engagement, t', of electric fusion sockets (PEME) as specified in table 6 and takes into account the common clamping devices of machines used for heated tool butt welding.

Dimension t_m shall be calculated from

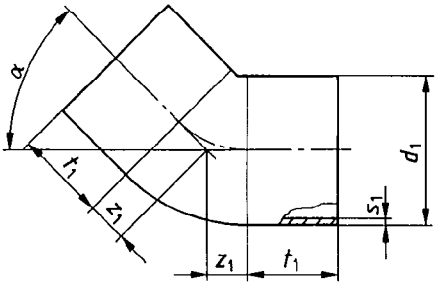
$$t_{m\,min} = u_{min} + c_{max}$$

where

the values given in table 7 shall be substituted for u_{min} and c_{max}, i.e. for u_{min}, the values given for a pipe length of 1 m.

The z dimensions of branches and bends shall be selected to ensure that when two electric fusion sockets are applied to the same fitting, the depth of engagement can still be fully utilized.

2.2.3 Type A bends α = 15°, 30°, 45°, 88,5° or 90°

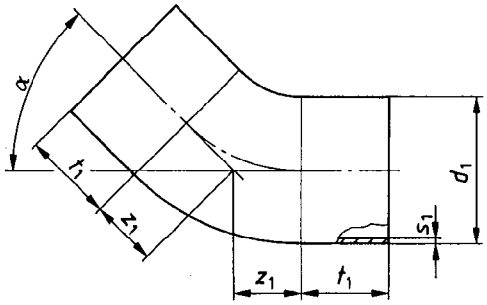


Designation of a series 3 type A HDPE (PEB–A) bend of nominal size DN 100 and with α = 45°:

Bend DIN 19535 – PEB – A 100 – 45 – 3

In the designation, 88 shall be used to denote a bend angle, α, of 88,5°.

2.2.4 Type B bends α = 15°, 30°, 45°, 88,5° or 90°

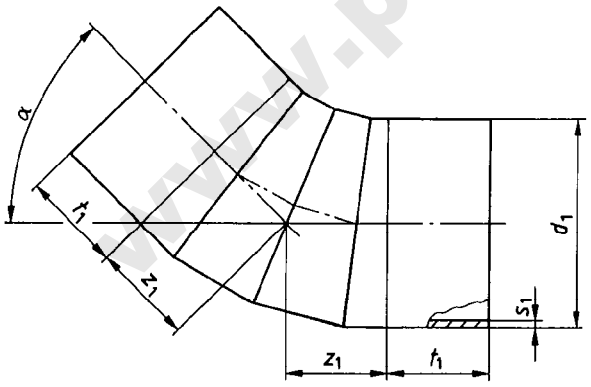


Designation of a series 2 type B HDPE (PEB–B) bend of nominal size DN 100 and with α = 45°:

Bend DIN 19535 – PEB – B 100 – 45 – 2

In the designation, 88 shall be used to denote a bend angle, α, of 88,5°.

2.2.5 Type C bends (segmental type) α = 15°, 30°, 45°, 88,5° or 90°



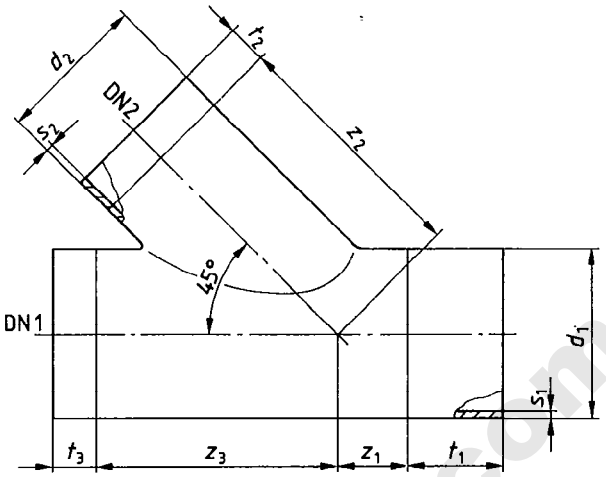
Designation of a series 2 type C HDPE (PEB–C) bend of nominal size DN 200 and with α = 45°:

Bend DIN 19535 – PEB – C 200 – 45 – 2

In the designation, 88 shall be used to denote a bend angle, α, of 88,5°.

Note. These bends are only manufactured in size DN 200.

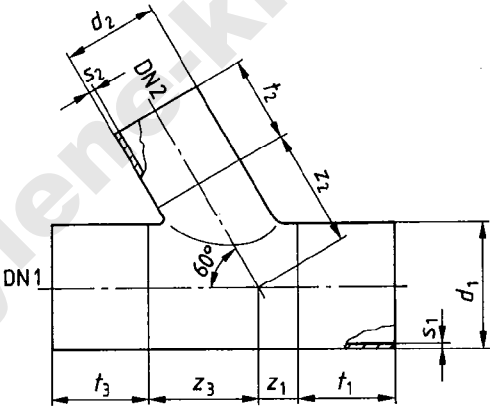
2.2.6 45° single branches



Designation of a series 3 HDPE (PEEA) single branch of nominal size DN 1 = 125 and nominal size DN 2 = 100, with a 45° branch angle:

Branch DIN 19535 – PEEA 125 X 100 – 45 – 3

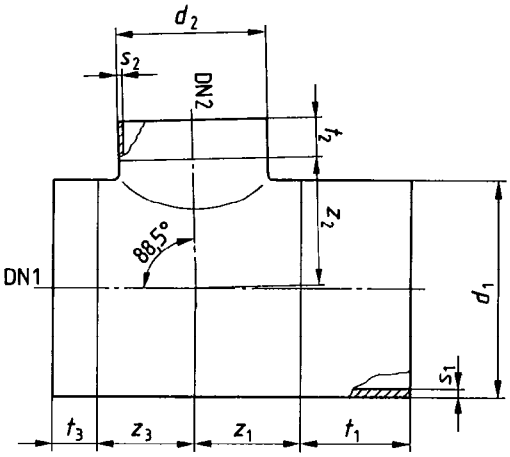
2.2.7 60° single branches



Designation of a series 2 HDPE (PEEA) single branch of nominal size DN 1 = 75 and nominal size DN 2 = 50, with d_2 = 56 mm and a 60° branch angle:

Branch DIN 19535 –
PEEA 75 X 50 – 56 – 60 – 2

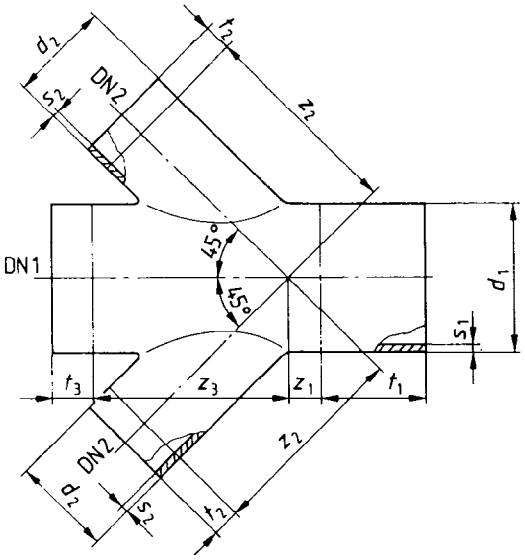
2.2.8 88,5° single branches



Designation of a series 2 HDPE (PEEA) single branch of nominal size DN 1 = 150 and nominal size DN 2 = 100, with 88,5° branch angle (88):

Branch DIN 19535 – PEEA 150 X 100 – 88 – 2

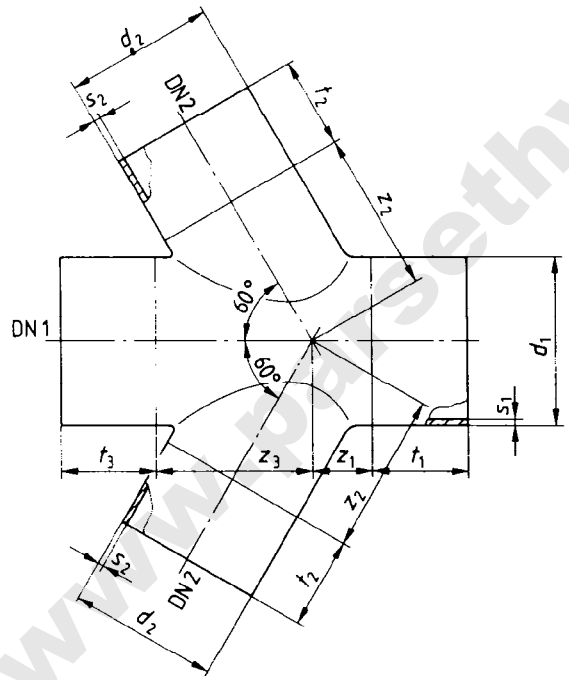
2.2.9 45° double branches



Designation of a series 3 HDPE (PEDA) double branch of nominal size DN 1 = 100 and nominal size DN 2 = 70, with 45° branch angles:

Double branch DIN 19535 –
PEDA 100 × 70 × 70 – 45 – 3

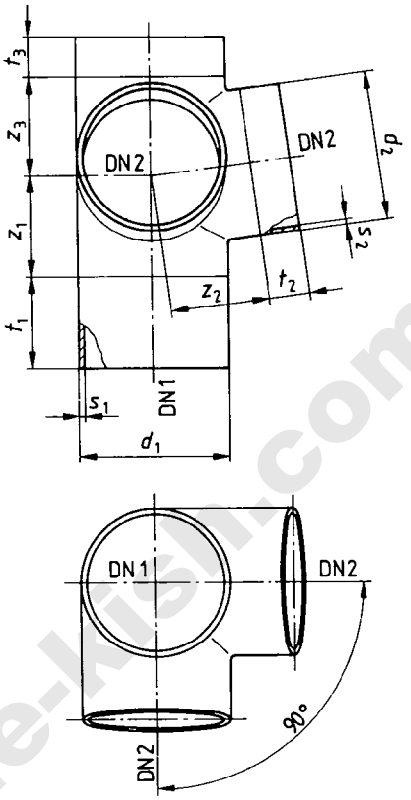
2.2.10 60° double branches



Designation of a series 2 HDPE (PEDA) double branch of nominal size DN 1 = 125 and nominal size DN 2 = 100, with 60° branch angles:

Double branch DIN 19535 –
PEDA 125 × 100 × 100 – 60 – 2

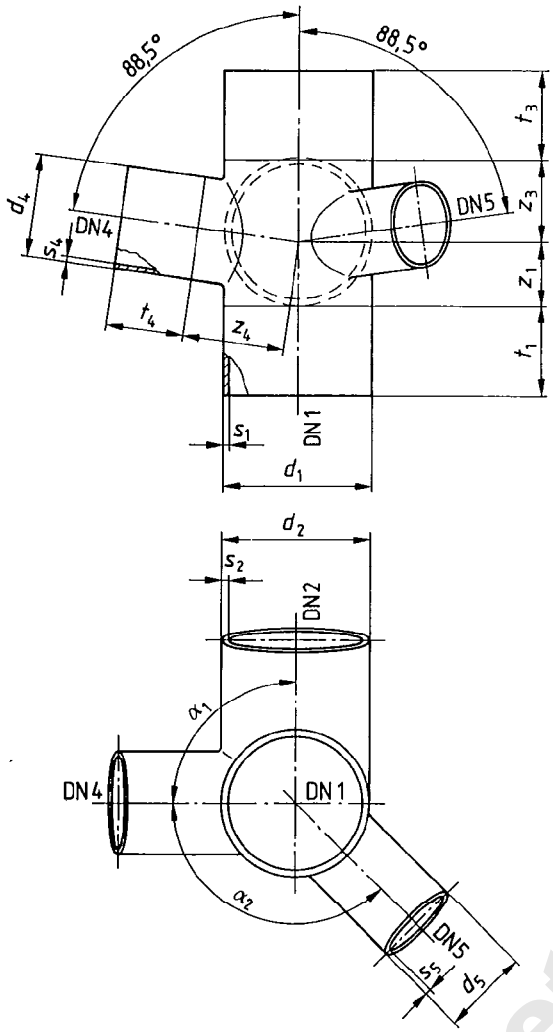
2.2.11 88,5° corner double branches



Designation of a series 3 HDPE (PEED) corner double branch of nominal size DN 1 = 100 and nominal size DN 2 = 100, with 88,5° branch angles (88):

Corner double branch DIN 19535 –
PEED 100 × 100 × 100 – 88 – 3

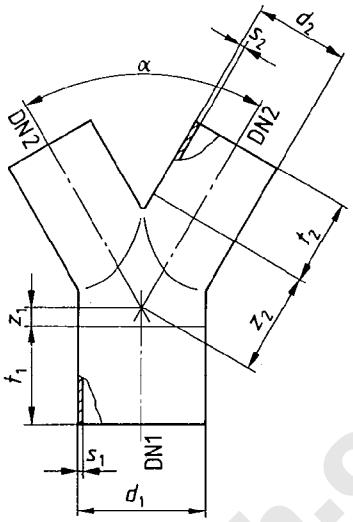
2.2.12 88,5° multiple branches



Designation of a series 3 HDPE (PEMA) multiple branch of nominal sizes DN 1 = 100, DN 2 = 100, DN 4 = 70 and DN 5 = 50, with d_5 = 63 mm, α_1 = 90°, α_2 = 135° and a 88,5° branch angle (88):

Multiple branch DIN 19535 –
PEMA 100 × 100 × 70 – 90 × 50 –
63 – 135 – 88 – 3

2.2.13 Y fittings

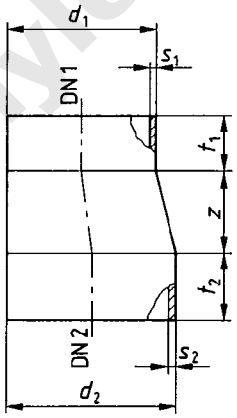


Designation of a series 3 HDPE Y fitting (PEHT) of nominal size DN 1 = 70 and nominal size DN 2 = 50, with d_2 = 56 mm and a 60° branch angle:

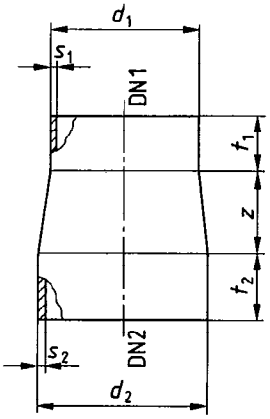
Y fitting DIN 19535 –
PEHT 70 × 50 – 56 × 50 – 56 – 60 – 3

2.2.14 Reducers

Type A
(eccentrical)



Type B
(centrical)

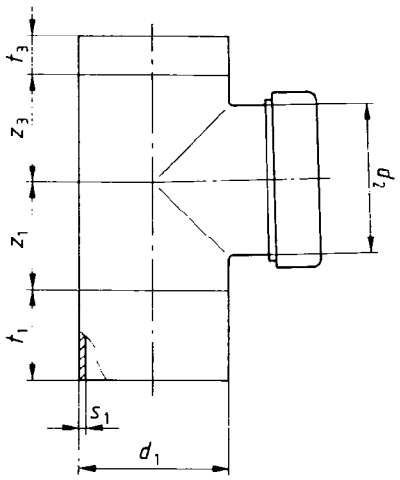


Designation of a series 3 type B HDPE (PER) reducer of nominal size DN 1 = 100 and nominal size DN 2 = 125:

Reducer DIN 19535 –
PER – B 100 × 125 – 3

2.2.15 Access piece

Type A
(with circular door)



Designation of a series 3 type A HDPE (PERE) access piece of nominal size DN 100:

Access piece DIN 19535 – PERE – A 100 – 3

Type B
(with oval door)

Dimensions and designation as in DIN 19537 Part 1.

2.3 Sockets and couplings

2.3.1 Nomenclature and symbols

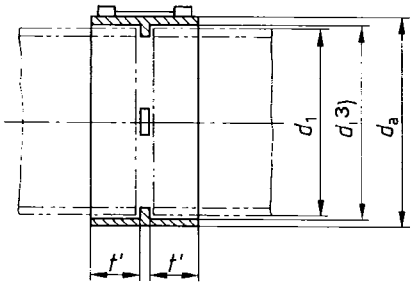
The symbols given in the following table shall be used to denote sockets and couplings.

Table 5. **Nomenclature and symbols**

Type of component	Symbol
Electric fusion socket	PEME
Push-in socket	PEMS
Coupling	PERV

2.3.2 Electric fusion sockets

The design feature in the socket limiting the depth of engagement is, if required, to be designed so as to ensure easy removal.



Designation of an electric fusion socket (PEME) of nominal size DN 100:

Electric fusion socket DIN 19535 – PEME 100

Table 6. **Dimensions of electric fusion sockets**

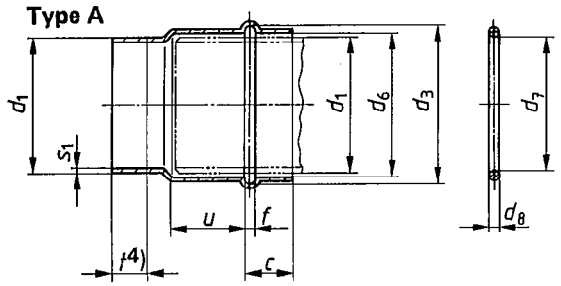
Nominal size DN	Pipe outside diameter, d_1, d_2, d_4 or d_5	Maximum depth of engagement, t'	Maximum outside diameter of electric fusion socket, d_a
40	50	28	65
50	56	28	70
50	63	28	78
70	75	28	90
100	110	29	125
125	125	32	142
150	160	32	180
200	200	75	230
250	250	75	285
300	315	75	350

For fusion jointing using electric fusion sockets, the welding equipment specified by the manufacturer shall be used.

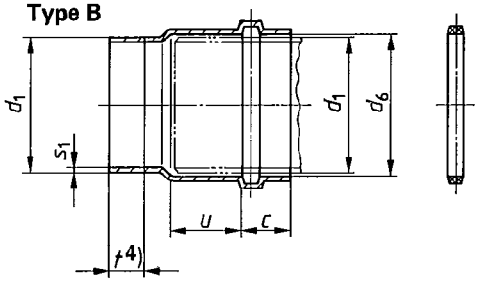
3) The manufacturer shall select diameter d_i and the limit deviations so as to ensure proper assembly of those pipes and fittings designated by the manufacturer as suitable for this type of socket.

2.3.3 Push-in sockets

Type A



Type B



Designation of a series 2 HDPE socket (PEMS) of nominal size DN 100 for pipe lengths not exceeding 3 m:

Socket DIN 19535 – PEMS – 100 × 3 – 2

Ring seals and the socket design in the sealing area are not expected to conform to the designs illustrated here; compliance is only required in the case of the dimensions specified.

The same dimensions have been specified for ring seals and grooves of type A sockets (see table 7). In the case of type B sockets, it is the manufacturer's responsibility to select the dimensions and limit deviations [5]) of ring seal and groove.

Table 7. **Dimensions of push-in sockets**

Nominal size DN	Outside diameter [1]), d_1	Inside diameter [2]), d_6		Groove internal diameter (type A), d_3		Length of groove (type A), f		Lengths behind groove for spigot pipes to be connected, of lengths exceeding [3]) 1 m	2 m	3,5 m	5 m	6 m	$c^4)$	Ring seal (for type A sockets), d_7		d_8	
			Limit deviations +... 0		Limit deviations +... 0		Limit deviations +... 0	u min.	u min.	u min.	u min.	u min.	max.		Limit deviations +... 0		Limit deviations +... 0
40	50	50,5	0,6	59,6	1,0	6,0	2,0	21	37	61	85	101	27	49	1,0	6,0	0,4
50	56	56,6	0,6	65,6	1,0	6,0	2,0	22	38	62	86	102	29	55	1,0	6,0	0,4
50	63	63,7	0,6	72,6	1,0	6,0	2,0	23	39	63	87	103	30	62	1,0	6,0	0,4
70	75	75,8	0,7	84,5	1,0	6,0	2,0	24	40	64	88	104	33	74	1,2	6,0	0,4
100	110	111,1	0,9	120,6	1,8	7,0	2,0	27	43	67	91	107	40	109	1,4	7,0	0,4
125	125	126,3	0,9	137,5	1,8	8,0	2,0	29	45	69	93	109	42	124	1,6	8,0	0,4
150	160	161,6	1,5	174,3	1,8	9,0	2,0	32	48	72	96	112	48	159	1,6	9,0	0,4
200	200	202,0	2,0	216,2	2,0	10,0	2,0	36	52	76	100	116	53	199	2,0	10,0	0,5
250	250	252,5	2,0	–	–	–	–	41	57	81	105	121	60	–	–	–	–
300	315	318,2	2,0	–	–	–	–	48	64	88	111	128	67	–	–	–	–

1) The limit deviations for d_1 shall be as given in tables 1 and 2.

2) Dimension d_6 is to be calculated from $d_6 = 1{,}01\, d_1$.

3) u is to be calculated from $u_{min} = 0{,}016 \cdot l + 0{,}1\, d_1$, where l is the maximum length of the pipe to be connected. Factor 0,016 allows for a fluctuation in temperature of 80 °C given a linear thermal expansion coefficient of $2 \cdot 10^{-4}$.

4) Dimension c is to be calculated from $c_{max} = 3{,}75\, d_1$.

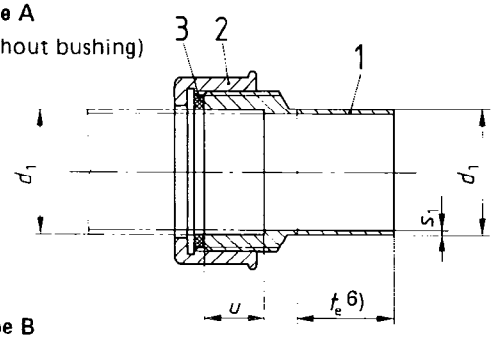
The manufacturer shall specify the maximum length of the pipe to be connected in his mounting instructions.

4) Dimension t as given in table 4.

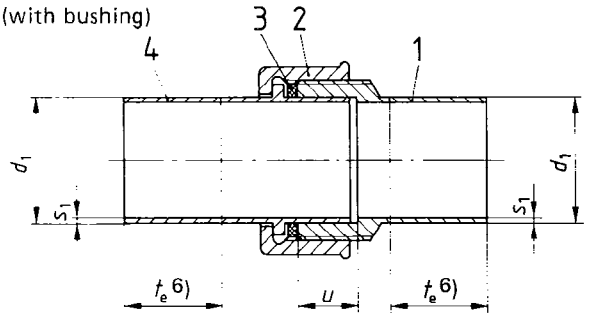
5) See DIN 7182 Part 1.

2.3.4 Couplings

Type A
(without bushing)



Type B
(with bushing)



1 Threaded socket 3 Seal
2 Union nut 4 Bushing

Designation of a series 2 type B HDPE (PERV) coupling of nominal size DN 70:

Coupling DIN 19535 – PERV – B 70 – 2

Table 8. **Dimensions of couplings**

Nominal size DN	Outside diameter [1], d_1	Inside diameter, d_6	Limit deviations	Minimum depth of engagement, u
40	50	50,5	$^{+2,0}_{0}$	25
50	56	56,6	$^{+2,0}_{0}$	25
50	63	63,7	$^{+2,5}_{0}$	25
70	75	75,8	$^{+2,5}_{0}$	35
100	110	111,1	$^{+3,0}_{0}$	45

[1] The limit deviations of d_1 shall be as given in tables 1 and 2.

2.4 Connectors for jointing pipes and sanitary equipment

2.4.1 Nomenclature and symbols

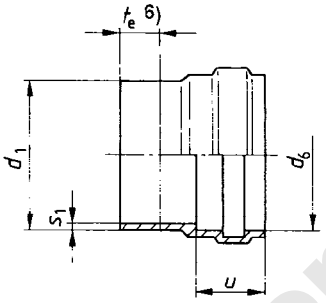
The symbols given in the following table shall be used to denote connectors.

Table 9. **Nomenclature and symbols**

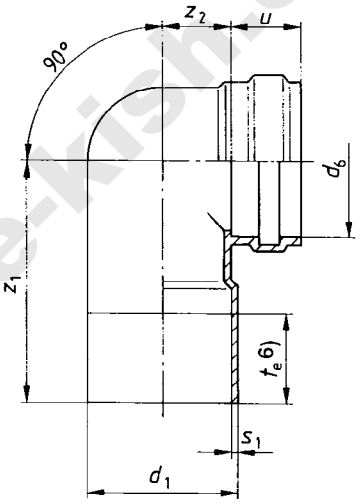
Type of connector	Symbol
Connector for water closets	PEWK
Connector for traps and urinals	PEAG

2.4.2 Connectors for water closets as in DIN 1389 Part 1

Type A
(socket without bend)



Type B
(socket with 90° bend)



Designation of a series 3 type B HDPE (PEWK) connector for water closets as specified in DIN 1389 Part 1, of nominal size 100:

Connector DIN 19535 – PEWK – B 100 – 3

Table 10. **Dimensions of connectors for water closets**

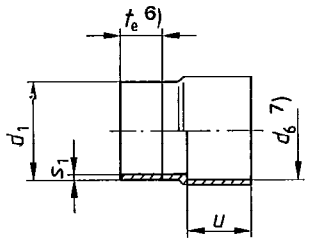
Nominal size DN	Outside diameter [1], d_1	Inside diameter, d_6	Limit deviations	Minimum depth of engagement, u
100	110	111,1	$^{+0,5}_{0}$	25

[1] The limit deviations of d_1 shall be as given in tables 1 and 2.

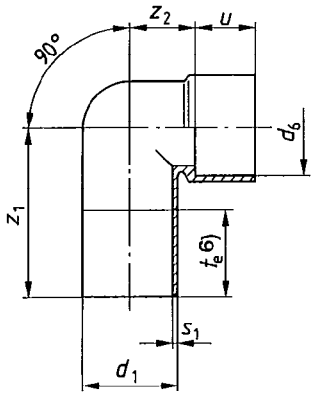
[6] Dimension t_e as given in table 4.

2.4.3 Connectors for traps and urinals

Type A
(socket without bend)



Type B
(socket with 90° bend)



Dimensions d_1 and s_1 shall be as given in tables 1 and 2 and dimensions t_e, as given in table 4; d_6 and u are a function of the sealing system.

Designation of a type A HDPE (PEAG) connector for traps of nominal size DN 50 and with d_1 = 56 mm:

Connector DIN 19535 – PEAG – A 50 – 56

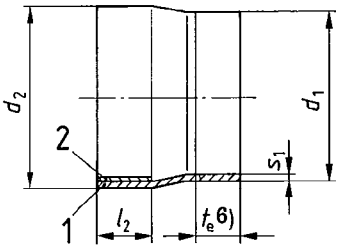
2.5 Connectors for jointing pipes made of different materials

2.5.1 Nomenclature and symbols

Table 11. **Nomenclature and symbols**

Connector type	symbol
Connector for cast iron pipe spigot ends	PEUG
Connector for steel pipe spigot ends	PEUST
Connector for PVC pipe spigot ends	PEMS
Connector for vitrified clay pipe sockets	See DIN 19537 Part 1.
Connector for vitrified clay pipe spigot ends	See DIN 19537 Part 1.
Connector for fibre cement pipe spigot ends	PEUFZ

2.5.2 Connectors for spigot ends of cast iron pipes as in DIN 19522 Part 1



1 HDPE connector
2 Supporting ring made of X5CrNi1810 steel as in DIN 17441 (material number 1.4301)

Jointing of the connector to cast iron spigot ends shall be by means of commercial clamps.

Designation of an HPHE (PEUG) connector of nominal size DN 125 for cast iron spigot ends, with d_2 = 135 mm:

Connector DIN 19535 – PEUG – 125 – 135

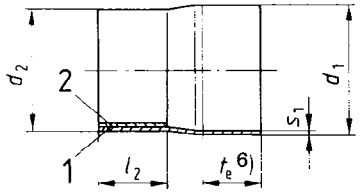
Table 12. **Dimensions of PEUG connectors**

Nominal size DN	d_1 1)	Outside diameter 2), d_2	Limit deviations	Minimum length, l_2
40	50	58	$^{+2}_{-1}$	30
50	56	58	$^{+2}_{-1}$	30
50	63	58	$^{+2}_{-1}$	30
70	75	78	$^{+2}_{-1}$	30
100	110	110	$^{+2}_{-1}$	30
100	110	135	±2	30
125	125	135	±2	40
150	160	160	±2	40
200	200	210	±2	40

1) The limit deviations of d_1 shall be as given in tables 1 and 2.
2) As specified in DIN 19522 Part 1.

For 6), see page 9.
7) See DIN 1380 Part 1.

2.5.3 Connectors for spigot ends of steel pipes as in DIN 19530 Part 1



1 HDPE connector

2 Supporting ring made of X5CrNi1810 steel as in DIN 17 441 (material number 1.4301)

Jointing of the connector to steel pipe spigot ends shall be by means of commercial clamps.

Designation of an HDPE (PEUST) connector of nominal size DN 70 for steel pipe spigot ends, with d_2 = 73 mm:

Connector DIN 19535 – PEUST – 70 – 73

Table 13. **Dimensions of PEUST connectors**

Nominal size DN	d_1 1)	Outside diameter 2), d_2		Minimum length, l_2
			Limit deviations	
40	50	42	$^{+0,4}_{0}$	40
50	56	53	$^{+0,5}_{0}$	40
50	63	53	$^{+0,5}_{0}$	40
70	75	73	$^{+0,7}_{0}$	40
100	110	102	$^{+1,0}_{0}$	40
125	125	133	$^{+1,2}_{0}$	40
150	160	159	$^{+1,5}_{0}$	40
200	200	219	$^{+2,0}_{0}$	40

1) The limit deviations of d_1 shall be as given in tables 1 and 2.

2) As specified in DIN 19530 Part 1.

2.5.4 Connectors for spigot ends of PVC pipes as in DIN 19534 Part 1

As specified in subclause 2.3.3.

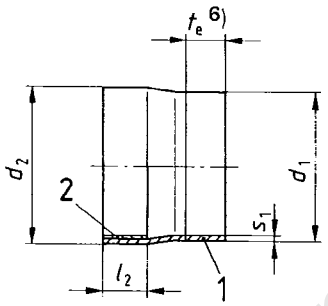
2.5.5 Connectors for sockets of vitrified clay pipes as in DIN 1230 Part 1

Dimensions and designation as specified in DIN 19537 Part 1.

2.5.6 Connectors for spigot ends of vitrified clay pipes as in DIN 1230 Part 1

Dimensions and designation as specified in DIN 19537 Part 1.

2.5.7 Connectors for spigot ends of fibre cement pipes as in DIN 19840 Part 1



1 HDPE connector

2 Supporting ring made of X5CrNi1810 steel as in DIN 17 441 (material number 1.4301)

Jointing of the connector to the spigot ends shall be by means of commercial clamps.

Designation of an HDPE (PEUFZ) connector for fibre cement pipe spigot ends of nominal size DN 100, with d_2 = 116 mm:

Connector DIN 19535 – PEUFZ – 100 – 116

Table 14. **Dimensions of PEUFZ connectors**

Nominal size DN	d_1 1)	Outside diameter 2), d_2		Minimum length, l_2
			Limit deviations	
50	56	64	$^{+3}_{0}$	28
50	63	64		28
70	75	84		28
100	110	116		32
125	125	141		32
150	160	168		40
200	200	220		40
250	250	270		80
300	315	322		80

1) The limit deviations of d_1 shall be as given in tables 1 and 2.

2) As specified in DIN 19840 Part 1.

For 6), see page 9.

Standards referred to

DIN 1230 Part 1	Vitrified clayware for sewers; socket pipes and fittings; dimensions
DIN 1380 Part 1	Connectors for urinals; dimensions
DIN 1389 Part 1	Connectors for water closets; dimensions
DIN 1986 Part 3	Site drainage systems; rules for service and maintenance
DIN 1986 Part 4	Site drainage systems; fields of application of sewer pipes and fittings of different materials
DIN 7182 Part 1	Sizes, deviations, tolerances and fits; basic concepts
DIN 8074	High-density polyethylene (HDPE) pipes; dimensions
DIN 17 441	Stainless steels; technical delivery conditions for cold rolled strip and slit strip and for plate and sheet cut therefrom
DIN 19 522 Part 1	Cast iron spigot (SML) drain pipes and fittings; dimensions
DIN 19 530 Part 1	Steel socket pipes and fittings for sewers; dimensions
DIN 19 534 Part 1	Pipes and fittings of unplasticized polyvinyl chloride (rigid PVC) with socket for drains and sewers; dimensions
DIN 19 535 Part 2	High-density polyethylene (HDPE) pipes and fittings for hot-water resistant (HT) drains and sewers inside buildings; technical delivery conditions
DIN 19 537 Part 1	High-density polyethylene (HDPE) pipes and fittings for drains and sewers; dimensions
DIN 19 840 Part 1	(at present at the stage of draft) Fibre cement waste pipes and fittings for drains; dimensions

Previous edition

DIN 19 535: 03.77.

Amendments

The following amendments have been made to the March 1977 edition of DIN 19 535, withdrawn in January 1986.

a) DIN 19 535 has been split up into Part 1, dealing with dimensions, and Part 2, dealing with technical delivery conditions.

b) New fitting designs have been included.

c) Specifications for dimensions of sockets, couplings and different types of connectors have been included.

Explanatory notes

Owing to the variety of fittings, no specifications for the z dimensions of fittings could be given. The same applies to sockets and couplings, for which only a limited number of dimensions could be specified, given the wide range of products available and existing patent rights. A further consideration was that standardization should not impede technical developments in this field particularly. The specifications for size DN 100 and above are largely in agreement with DIN 19 537 Part 1.

International Patent Classification

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F 16 L 9/12
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