

INTERNATIONAL STANDARD

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PE/metal and PP/metal adaptor fittings for pipes for fluids under pressure — Design lengths and size of threads — Metric series

*Raccords union métalliques pour les tubes en polyéthylène (PE) et
polypropylène (PP) destinés à la pression — Cotes de fabrication et
dimensions des filetages — Série métrique*



Reference number
ISO 9623:1997(E)

Foreword

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Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 9623 was prepared by Technical Committee ISO/TC 138, *Plastics pipes, fittings and valves for the transport of fluids*, Subcommittee SC 2, *Plastics pipes and fittings for water supplies*.

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PE/metal and PP/metal adaptor fittings for pipes for fluids under pressure — Design lengths and size of threads — Metric series

1 Scope

This International Standard specifies the design lengths and size of threads for polyethylene (PE)/metal adaptor fittings and polypropylene (PP)/metal adaptor fittings for pipes under pressure. It also specifies the dimensions at the socket and spigot ends of the fitting.

The adaptor fittings have one plain socket or spigot for fusion jointing a PE socket or spigot to a PE pipe, or a PP socket or spigot to a PP pipe. The other component of the fitting is metal and is threaded to enable connection to metal pipes, fitting, valves and/or apparatus with pipe threads. The pressure-tight joint is achieved by the compression of a gasket.

Metal adaptor fittings are intended for use in pipelines for water supply.

NOTE — The fittings illustrated in this International Standard have been arbitrarily chosen without prejudice to the designs of adaptor fittings.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 7-1:1994, *Pipe threads where pressure-tight joints are made on the threads — Part 1: Dimensions, tolerances and designation.*

ISO 49:1994, *Malleable cast iron fittings threaded to ISO 7-1.*

ISO 228-1:1994, *Pipe threads where pressure-tight joints are made on the threads — Part 1: Dimensions, tolerances and designation.*

ISO 3126:1974, *Plastics pipes — Measurement of dimensions.*

ISO 7279:1984, *Polypropylene (PP) fittings for pipes under pressure — Sockets for fusion using heated tools — Metric series — Dimensions of sockets.*

ISO 8085-1:—¹⁾, *Polyethylene fittings for use with polyethylene pipes for the supply of gaseous fuels — Metric series — Specifications — Part 1: Fittings for socket fusion using heated tools.*

1) To be published.

ISO 8085-2:—¹⁾, *Polyethylene fittings for use with polyethylene pipes for the supply of gaseous fuels — Metric series — Specifications — Part 2: Spigot fittings for butt fusion jointing, for socket fusion using heated tools and for use with electrofusion fittings.*

3 Definition

For the purposes of this International Standard, the following definition applies.

3.1 design length: The distance between the socket length and the length of the union (see figure 3). It is represented by the symbol z_d .

4 Symbols

For the purposes of this International Standard, the symbols given in 4.1 and 4.2 apply:

4.1 Symbols for socket fusion fittings

The principal dimensions and symbols are shown in figure 1:

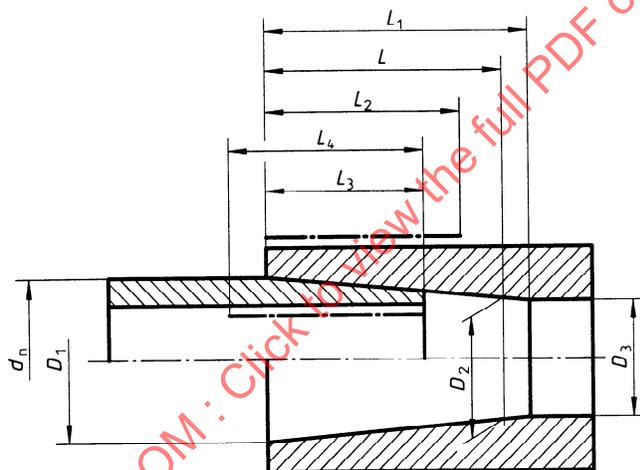


Figure 1 — Socket and pipe dimensions

where

d_n is the nominal (outside) diameter of the PE or PP pipe, which is equivalent to the nominal (inside) diameter of the socket.

D_1 is the mean inside mouth diameter of the socket, i.e. the mean diameter of the circle at the intersection of the extension of the socket with the plane of the socket mouth.

D_2 is the mean inside root diameter of the socket, i.e. the mean diameter of the circle in a plane parallel to the plane of the mouth and separated from it by a distance L which is the reference length of the socket.

D_3 is the minimum bore, i.e. the minimum diameter of the flow channel through the body of the fitting.

L is the reference socket length, i.e. the theoretical minimum socket length used for the purpose of calculation.

L_1 is the actual length of the socket from mouth to shoulder (if any).

L_2 is the heated length of the fitting, i.e. the length of penetration of the heated tool into the socket.

L_3 is the insertion depth, i.e. the depth of insertion of the heated pipe end into the socket.

L_4 is the heated length of pipe, i.e. the depth of penetration of the pipe end into the heated tool.

4.2 Symbols for spigot fittings

The principal dimensions and symbols used in this International Standard are shown in figure 2:

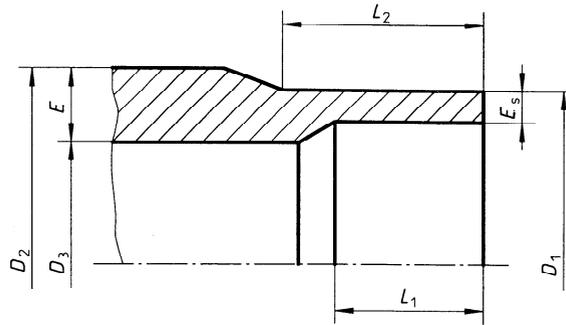


Figure 2 — Spigot fitting dimensions

where

D_1 is the mean outside diameter of the fusion end piece, measured in any plane parallel to the plane of the entrance face at a distance not greater than L_2 (the tubular length) from that plane.

D_2 is the mean outside body diameter of the fitting.

D_3 is the minimum bore, i.e. the minimum diameter of the flow channel through the body of the fitting. The measurement of the diameter does not include the fusion pad, if any.

E is the body wall thickness of the fitting, i.e. the thickness measured at any point on the wall of the fitting.

E_s is the fusion face wall thickness measured at any point at a maximum distance of L_1 (the cut-back length) from the entrance face.

L_1 is the cut back length of the fusion end piece, i.e. the initial depth of the spigot end which is necessary to butt weld or reweld.

This length may also be obtained by jointing a length of pipe, provided that the wall thickness of the latter is equal to E_s , for its whole length.

L_2 is the tubular length of the fusion end piece, i.e. the initial length of the fusion end piece. This tubular length must allow (in any combination):

- the use of clamps required in the case of butt welding;
- the assembly with an electrofusion fitting;
- the assembly with a socket fusion fitting.

5 Designation of size(s)

Adaptor fittings are designated by one or more of the following:

- the nominal diameter (corresponding to the nominal outside diameter d_n of the pipe) of the polyethylene or polypropylene components in accordance with ISO 8085-1 and ISO 8085-2 or ISO 7279;
- the nominal size of the pipe joint metal thread in accordance with ISO 7-1.

EXAMPLE

Adaptor union 25 × 3/4

6 Dimensions and tolerances

6.1 Sockets

When measured in accordance with ISO 3126, the socket dimensions shall conform to the requirements given in table 1.

6.2 Spigots

When measured in accordance with ISO 3126, the spigot dimensions shall conform to the requirements given in table 2.

Table 1 — Socket dimensions (nominal diameter 16 to 63)

Dimensions in millimetres

Nominal diameter of fitting d_n	Mean inside diameter of socket				Maximum absolute out-of-roundness	Minimum bore D_3	Socket reference length L	Heated socket length		Penetration of pipe into socket	
	Mouth D_1		Root D_2					min. $L-2,5$	max. L	min. $L-3,5$	max. $L-1$
	min.	max.	min.	max.							
16	15,2	15,5	15,1	15,4	0,4	9	13,3	10,8	13,3	9,8	12,3
20	19,2	19,5	19,0	19,3	0,4	13	14,5	12,0	14,5	11,0	13,5
25	24,1	24,5	23,9	24,3	0,4	18	16	13,5	16,0	12,5	15,0
32	31,1	31,5	30,9	31,3	0,5	25	18,1	15,6	18,1	14,6	17,1
40	39,0	39,4	38,8	39,2	0,5	31	20,5	18,0	20,5	17,0	19,5
50	48,9	49,4	48,7	49,2	0,6	39	23,5	21,0	23,5	20,0	22,5
63	62,0 ¹⁾	62,4 ¹⁾	61,6	62,1	0,6	49	27,4	24,9	27,4	23,9	26,4

1) Where rerounding clamps are used, the maximum diameter of 62,4 mm may be increased by 0,1 mm to 62,5 mm. Conversely, where a peeling technique is used, the minimum diameter of 62,0 mm may be reduced by 0,1 mm to 61,9 mm.

Table 2 — Spigot dimensions

Dimensions in millimetres

Nominal diameter of fitting d_n	Mean outside diameter			Absolute out-of-roundness	Minimum bore D_3	Cut-back length L_1	Tubular length	
	D_1						min.	L_2 min.
	Type of fitting ¹⁾							
	CT and NT min.	CT max.	NT max.				Class A ²⁾	Class B ³⁾
20	20	20,3	20,3	0,3	13	25	25	37
25	25	25,3	25,3	0,4	18	25	25	40
32	32	32,2	32,2	0,5	25	25	25	44
40	40	40,4	40,4	0,6	31	25	25	49
50	50	50,4	50,5	0,8	39	25	25	55
63	63	63,4	63,6	0,9	49	25	25	63

1) CT = Close tolerance
NT = Normal tolerance

2) Class A fittings: $L_2 \geq L_1$

3) Class B fittings: $L_2 \geq 0,6d_n + 25$ mm

6.3 Metal components

The metal components shall conform to the requirements of ISO 49, with the threaded part of the fitting conforming to ISO 7-1 for jointing thread and to ISO 228-1 for fastening thread.

6.4 Design length z_d

The design length shall conform to the requirements given in table 3.

Table 3 — Design length and size of threads

Union end (PE) or (PP) (plain socket)		Union nut	Union bush
Nominal diameter of socket d_n	Design length z_d mm	Female connection ¹⁾ (G)	Jointing thread ²⁾ male (R) female (Rp or Rc)
16	$3 \begin{smallmatrix} +1 \\ 0 \end{smallmatrix}$	3/4	3/8
20	$3 \begin{smallmatrix} +1 \\ 0 \end{smallmatrix}$	1	1/2
25	$3 \begin{smallmatrix} +1 \\ 0 \end{smallmatrix}$	1 1/4	3/4
32	$3 \begin{smallmatrix} +1 \\ 0 \end{smallmatrix}$	1 1/2	1
40	$3 \begin{smallmatrix} +1 \\ 0 \end{smallmatrix}$	2	1 1/4
50	$3 \begin{smallmatrix} +1 \\ 0 \end{smallmatrix}$	2 1/4	1 1/2
63	$3 \begin{smallmatrix} +1 \\ 0 \end{smallmatrix}$	2 3/4	2

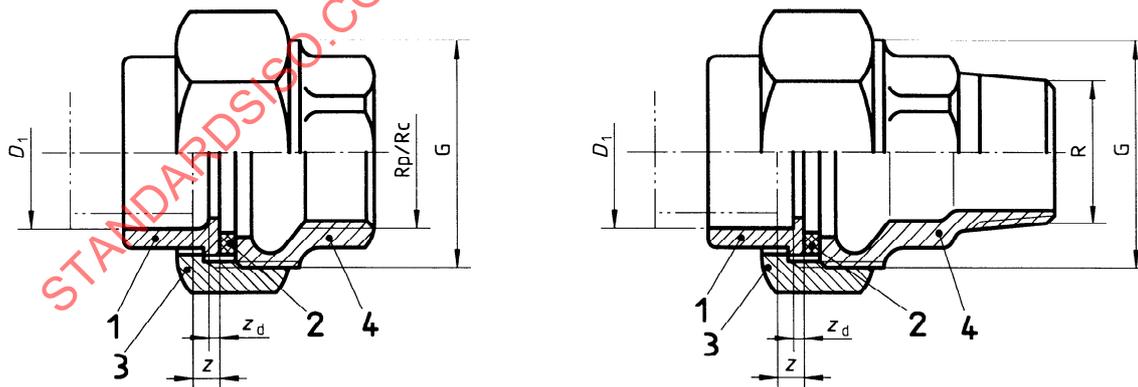
1) Fastening threads conforming to ISO 228-1. Optionally, the next-higher thread size may be used.
2) Jointing threads conforming to ISO 7-1.

6.5 Laying length z

The laying lengths shall be declared by the fitting manufacturer.

7 Adaptor unions (flat seal)

The types of adaptor union shall be as shown in figure 3.



a) Type 1 – Adaptor: PE or PP x Internal pipe thread in metal component

b) Type 2 – Adaptor: PE or PP x external pipe thread in metal component

Key

- 1 Union end (PE or PP) with plain socket or spigot
- 2 Gasket
- 3 Union nut (metal)
- 4 Union bush (metal internal thread)
- 5 Union bush (metal external thread)

Figure 3 — Types of adaptor union

8 Union ends: polyethylene (PE) or polypropylene (PP)

The types of union end shall be as shown in figure 4.

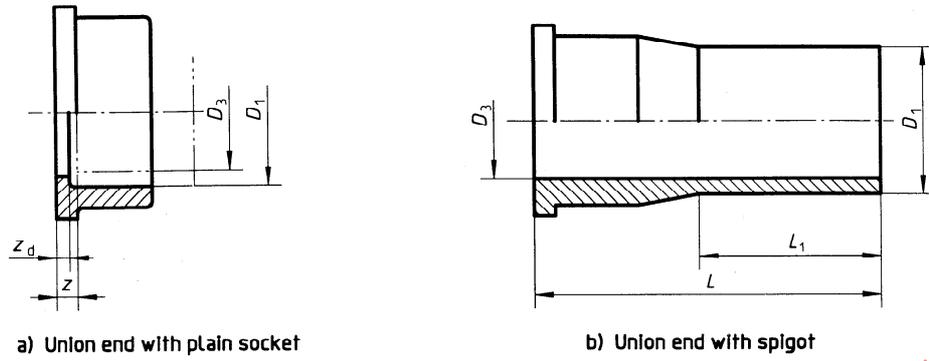


Figure 4 — Types of union end

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