

INTERNATIONAL  
STANDARD

ISO  
9623

First edition  
1997-02-15

---

---

**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*

This material is reproduced from ISO documents under International Organization for Standardization (ISO) Copyright License number IHS/ICC/1996. Not for resale. No part of these ISO documents may be reproduced in any form, electronic retrieval system or otherwise, except as allowed in the copyright law of the country of use, or with the prior written consent of ISO (Case postale 56, 1211 Geneva 20, Switzerland, Fax +41 22 734 10 79), IHS or the ISO Licensor's members.



Reference number  
ISO 9623:1997(E)

## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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*.

© ISO 1997

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

International Organization for Standardization  
Case postale 56 • CH-1211 Genève 20 • Switzerland  
Internet: central@isocs.iso.ch  
X.400: c=ch; a=400net; p=iso; o=isocs; s=central  
Printed in Switzerland

# 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:—<sup>1)</sup>, *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:—<sup>1)</sup>, *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:

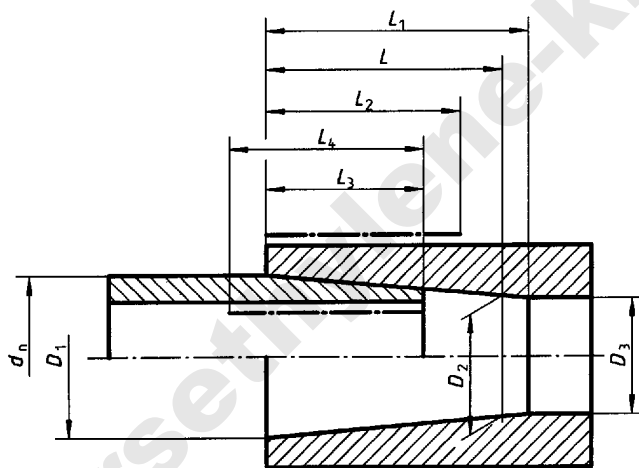


Figure 1 — Socket and pipe dimensions

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:

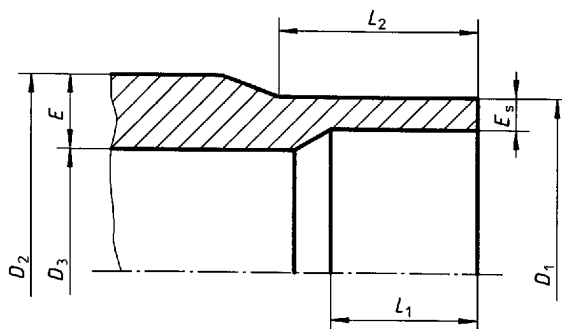


Figure 2 — Spigot fitting dimensions

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 <sup>1)</sup>	62,4 <sup>1)</sup>	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 <sup>1)</sup>							
	CT and NT min.	CT max.	NT max.			Class A <sup>2)</sup>	Class B <sup>3)</sup>	
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	Design length	Female connection <sup>1)</sup> (G)	Jointing thread <sup>2)</sup> male (R) female (Rp or Rc)
$d_n$	$z_d$ mm		
16	$3^{+1}_0$	3/4	3/8
20	$3^{+1}_0$	1	1/2
25	$3^{+1}_0$	1 1/4	3/4
32	$3^{+1}_0$	1 1/2	1
40	$3^{+1}_0$	2	1 1/4
50	$3^{+1}_0$	2 1/4	1 1/2
63	$3^{+1}_0$	2 3/4	2

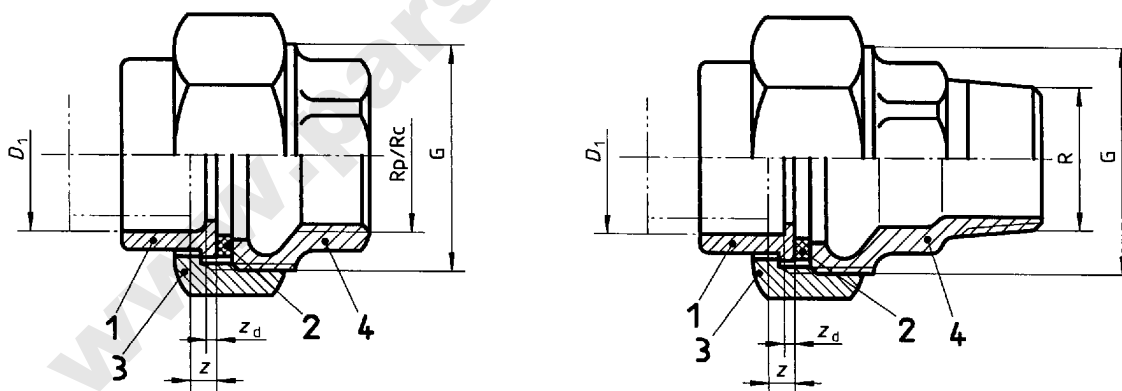
1) Fastening threads conforming to ISO 228-1. Optionally, the next-higher thread size may be used.  
2) Jointing threads conforming to ISO 7-1.

### 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: poyehtylene (PE) or polypropylene (PP)**

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

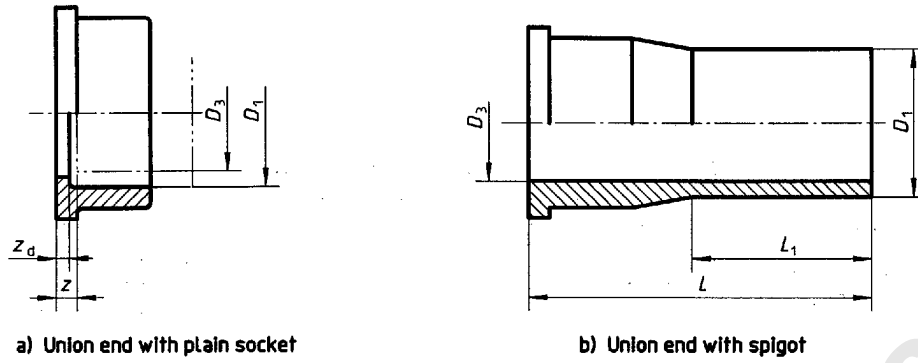


Figure 4 — Types of union end

www.parsethylene-kish.com



www.parsethylene-kish.com

---

---

**ICS 23.040.45**

**Descriptors:** plastics products, pipes (tubes), polyethylene, polypropylene, plastic tubes, pressure pipes, pipe fittings, spigot-and-socket joints, joining adaptors, dimensions, length, pipe threads, ISO metric threads.

Price based on 6 pages

---

---