

Steel threaded pipe fittings

The European Standard EN 10241:2000 has the status of a British Standard

ICS 23.040.40

National foreword

This British Standard is the official English language version of EN 10241:2000. It supersedes BS 1740-1:1971 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee ISE/19, Ferrous pipe fittings (excluding cast iron), which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
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Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 31 and a back cover.

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English version

Steel threaded pipe fittings

Raccords filetés en acier

Stahlittings mit Gewinde

This European Standard was approved by CEN on 29 March 2000.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

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Foreword

This European Standard has been prepared by Technical Committee ECISS/TC 29, Steel tubes and fittings for steel tubes, the Secretariat of which is held by UNI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by October 2000, and conflicting national standards shall be withdrawn at the latest by October 2000.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This European Standard specifies requirements for threaded fittings of nominal sizes from DN 6 to DN 150 inclusive, made out of welded or seamless steel tubes, forging and rolled bars. It is applicable to those threaded steel pipe fittings that are used in the transportation and distribution of liquid or gas.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporate in it by amendments or revision. For undated references, the latest edition of the publication referred to applies (including amendments).

EN 10204, *Metallic products – Types of inspection documents.*

EN ISO 6708, *Pipework components – Definition and selection of DN (nominal size) (ISO 6708:1995).*

ISO 7-1¹⁾, *Pipe threads where pressure-tight joints are made on the threads – Part 1: Dimensions, tolerances and designation.*

ISO 7-2¹⁾, *Pipe threads where pressure-tight joints are made on the threads – Part 2: Verification by means of limit gauges.*

ISO 228-1, *Pipe threads where pressure-tight joints are not made on the threads – Part 1: Dimensions, tolerances and designation.*

ISO 228-2, *Pipe threads where pressure-tight joints are not made on the threads – Part 2: Verification by means of limit gauges.*

3 Terms and definitions

For the purposes of this standard, the following terms and definitions apply:

3.1 nominal size (DN)

DN: as defined in EN ISO 6708

NOTE The comparison between the thread size designation and the nominal size (DN) is given in Table A.1 for information only.

3.2 seamless fitting

fitting manufactured from seamless tube, forging or rolled bar

3.3 fabricated fitting

fitting manufactured either from a welded tube or where the welding forms part of the fabrication of the fitting

3.4 tubular

fitting manufactured from medium or heavy pipe as defined in Table 6. These fittings are defined in Tables 21 to 24

¹⁾ European Standards are under development (series EN 10226). When published, they may be agreed at the time of enquiry and/or order.

4 Designation

The fitting in accordance with this European Standard shall be designated by the following in the sequence shown:

- 1) type of fitting (see Tables 7 to 24);
- 2) reference to this European Standard (EN 10241);
- 3) either nominal size (DN), or thread size.

Fittings which have the same nominal sizes (DN) are designated only with that DN (see example 1).

EXAMPLE 1:

For an equal female elbow with DN 50 run, the designation will be:

Elbow - EN 10241 - DN 50

Fitting which has differing nominal sizes shall be shown as in the sequence 1-2 where 1 refers to the run and 2 refers to the branch or the reduction (see examples 2 and 3).

EXAMPLE 2:

For a reducing tee with DN 50 run and DN 25 branch, the designation will be:

Reducing tee - EN 10241 - DN 50 × DN 25

EXAMPLE 3:

For a bush with DN 40 and a reduction DN 25, the designation will be:

Bush - EN 10241 - DN 40 × DN 25

5 Information to be supplied by the purchaser

5.1 Mandatory information

The following information shall be supplied by the purchaser, at the time of enquiry and/or order:

- 1) the quantity to be delivered;
- 2) the designation (see clause 4).

5.2 Options

A number of options are specified in this European Standard and they are listed below.

In the event that the purchaser does not indicate a wish to implement any of these options at the time of enquiry and/or order, the fittings shall be supplied in accordance with the basic specification.

- 1) Taper internal thread type Rc conforming to ISO 7-1
- 2) Parallel external thread type GA or GB conforming to ISO 228-1
- 3) Parallel internal thread type G conforming to ISO 228-1
- 4) Zinc protective coating (see 8.2)

- 5) Leaktightness test (see 9.1)
- 6) Special packaging (see clause 11)
- 7) Inspection document 2.1 (see clause 12)

6 Technical requirements

6.1 Fitting manufacture

Dimensions and tolerances of differing types of fittings shall be as given in Tables 5 to 24.

6.2 Surface condition

The fitting shall have a smooth surface consistent with the manufacturing process and be free from burrs; surface marks may be ground. Unless otherwise specified in the Tables 11 and 12, the female thread entrance shall be chamfered.

Repairs by welding, other than the weld seam, are forbidden.

6.3 Material

6.3.1 Chemical composition

The fitting shall be manufactured from steel having the chemical composition indicated in Tables 1 and 2.

Table 1 - Chemical composition of seamless steel fittings

C max. %	S max. %	P max. %
0,25	0,35	0,09

Table 2 - Chemical composition of fabricated fittings and tubulars

C max. %	Mn max. %	P max. %	S max. %
0,25	1,40	0,045	0,045

6.3.2 Mechanical properties

The fitting shall be manufactured from base material having the mechanical properties indicated in Tables 3 and 4. These properties shall not be subject to verification on the fitting.

Table 3 - Mechanical properties of seamless steel fittings

Tensile strength min. N/mm ²	Elongation min. %
320	20

Table 4 - Mechanical properties of fabricated fittings and tubulars

Tensile strength min. N/mm ²	Yields strength min. N/mm ²	Elongation min. %
320	195	20

6.4 Threads

Internal threads shall be parallel and external threads shall be taper conforming to ISO 7-1, except for certain tubulars in Tables 21, 23 and 24 or when the purchaser specifies other types of thread (see 5.2, option 1 or 2 or 3); in this case the type of thread shall be identified.

7 Dimensions and tolerances

7.1 Dimensions

Fittings shall have the appropriate dimensions given in Tables 6 to 24.

7.2 Tolerances

When tolerances are not specified in Tables 5 to 24, dimensions are nominal and subjected to manufacturing tolerances.

7.2.1 Tolerances on length of fitting

The tolerances on the overall length of the fitting, centre to face, centre to centre and back to face dimensions are given in Table 5.

Table 5 - Tolerances

Dimensions in mm

Dimension	Up to and including 25	Over 25 to 40	Over 40 to 65	Over 65 to 75	Over 75 to 150	Over 150
Tolerance	+1,5 0	+3,0 0	+4,5 0	+6,0 0	+8,0 0	+10,0 0

7.2.2 Tolerances on diameters

Unless otherwise stated in tables, the tolerances on outside diameters are given in Table 6.

7.2.3 Tolerance on threads

The axis of screw threads shall be accurate within $\pm 0,5^\circ$ of the specified angle for fittings described in Tables 7 to 23 and $\pm 1,5^\circ$ for fittings described in Table 24.

8 Protection

8.1 General

The fitting shall be supplied black and shall be protected by a protective coating, e.g. light oil.

8.2 Zinc protective coating

When a zinc protective coating is specified by the purchaser (see 5.2, option 4), one of the methods given in 8.2.1 to 8.2.3 shall be applied, at the discretion of the manufacturer.

8.2.1 Hot dip zinc galvanizing

Galvanizing of fittings shall be performed before the thread cutting operation and shall be by means of the hot dip method. The minimum average coating thickness shall be $55 \mu\text{m}$ on the outside of the fitting, with a local average of $45 \mu\text{m}$ on 100 mm^2 .

The hot dip zinc bath shall contain not less than 98,5 % pure zinc.

8.2.2 Electro zinc plating

Electro zinc plating shall be performed on the finished black fitting. The minimum coating thickness on the outside of the fitting shall be $8 \mu\text{m}$.

8.2.3 Zinc flake

Zinc flake non-electrolytically applied cured coating shall be performed on the finished black fitting. The coating thickness on the outside of the fitting shall be between $5 \mu\text{m}$ to $10 \mu\text{m}$.

NOTE The zinc coating thickness can be checked with an electronic and/or magnetic appliance.

9 Inspection and testing

9.1 Leaktightness test

Each fitting, after being threaded, shall be capable of withstanding, without any signs of leakage, the hydrostatic or air test as specified in clauses 9.1.1 and 9.1.2. This test shall only be carried out when specified by the purchaser at the time of enquiry and/or order (see 5.2, option 5).

9.1.1 Hydrostatic test

Hydrostatic test, using water or light oil as a medium.

9.1.1.1 Tubulars

These shall be tested to a minimum internal pressure of 50 bar.

9.1.1.2 Fabricated fittings

These shall be tested to a minimum internal pressure of 75 bar.

9.1.1.3 Seamless fittings

These shall be tested to a minimum internal pressure of 150 bar.

9.1.2 Air test

Air test, with the fitting fully immersed in water or light oil as a medium.

Tubulars, fabricated fittings and seamless fittings shall be tested to a minimum internal air pressure of 7 bar.

9.2 Inspection of threads

9.2.1 Inspection method

Threads manufactured in accordance with ISO 7-1 shall be verified in accordance with ISO 7-2.

Threads manufactured in accordance with ISO 228-1 shall be verified in accordance with ISO 228-2.

9.2.2 Thread electro zinc plating

Where fittings have been electro zinc plating, this can result in the thread being covered in uneven particles of zinc; these particles may be removed with a plug or a brush.

10 Marking

The manufacturer's brand or logo shall, depending on the size of fittings, either be applied on a label attached on the packaging or be marked indelibly on each fitting.

11 Packaging

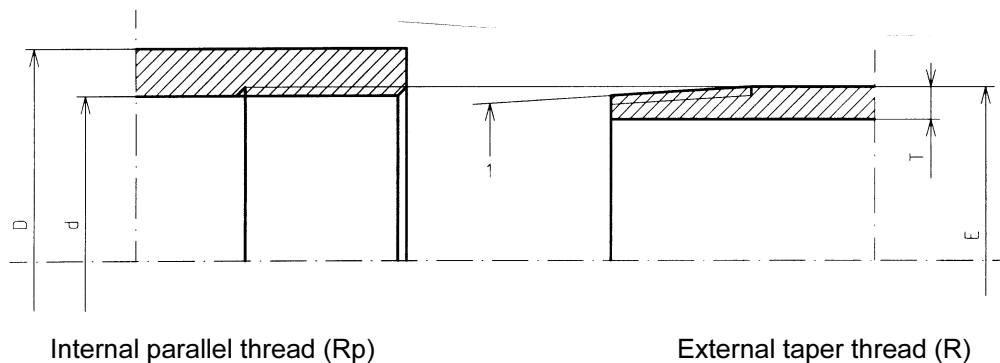
Unless special packaging is specified by the purchaser at the time of enquiry and/or order (see 5.2, option 6), fittings shall be supplied, either singly or in sacks or bags.

12 Inspection documents

Fittings shall be delivered without an inspection document.

At the request of purchaser (see 5.2, option 7), the manufacturer shall provide a certificate of compliance, in accordance with EN 10204 type 2.1.

Table 6 - Threaded ends of fitting

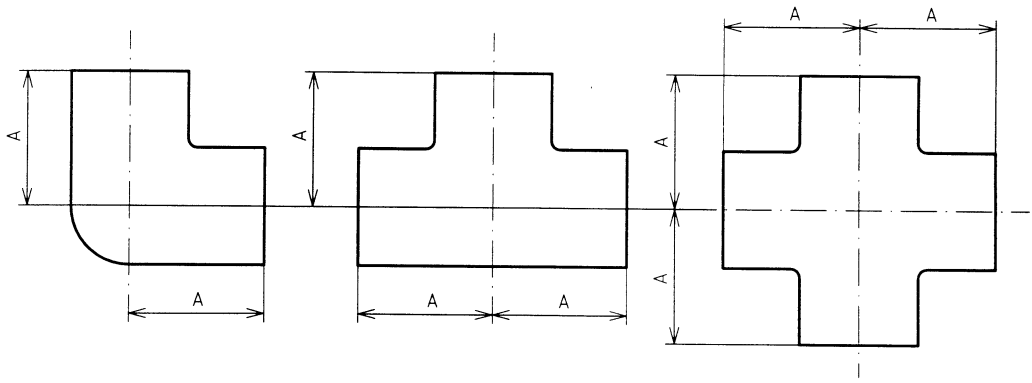


1 Taper is 1 in 16 on diameter.

Nominal size DN	Minimum outside diameter $D^{1)}$ mm	Outside diameter of body behind external thread $E^{2)}$ mm		Maximum inside diameter of body behind internal thread $d^{3)}$ mm	Pipe thickness $T^{4)}$ mm	
		min.	max.		Medium	Heavy
		6	15,0		9,8	10,6
8	18,5	13,2	14,0	11,4	2,3	2,9
10	22,0	16,7	17,5	15,0	2,3	2,9
15	27,0	21,0	21,8	18,6	2,6	3,2
20	32,5	26,5	27,3	24,1	2,6	3,2
25	39,5	33,3	34,2	30,3	3,2	4,0
32	49,0	42,0	42,9	39,0	3,2	4,0
40	56,0	47,9	48,8	44,8	3,2	4,0
50	68,0	59,7	60,8	56,5	3,6	4,5
65	84,0	75,3	76,6	72,2	3,6	4,5
80	98,0	88,0	89,5	84,9	4,0	5,0
100	124,0	113,1	115,0	110,1	4,5	5,4
125	151,0	138,5	140,8	135,5	5,0	5,4
150	178,0	163,9	166,5	160,9	5,0	5,4

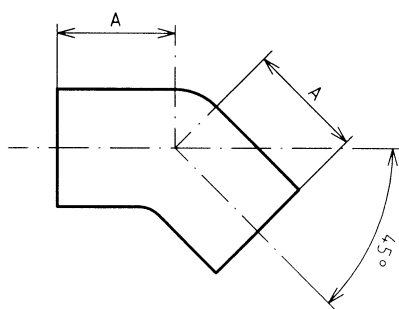
- 1) The outside diameter D is a minimum for all fittings except equal sizes of socket and half socket. The minimum outside diameters of equal sizes of socket and half socket are given in Tables 11 and 12.
- 2) E are minimum and maximum diameters for tubulars in Tables 21 to 24; for other fittings, only the minimum is applicable.
- 3) The value d is not applicable to bushes described in Table 15.
- 4) Wall thickness tolerances for tubulars shall be:
 - no limit in plus;
 - 12,5 % minus.

Table 7 - Elbow, tee and cross, equal



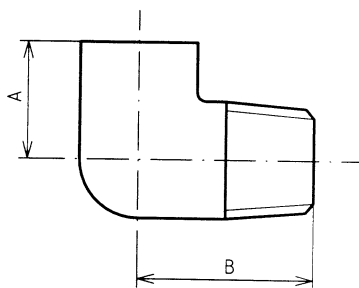
Elbow, equal		Tee, equal		Cross, equal	
Nominal size		Centre to face			
DN		A			
		mm			
6		16			
8		22			
10		24			
15		32			
20		35			
25		43			
32		51			
40		52			
50		64			
65		76			
80		89			
100		115			
125		140			
150		160			

Table 8 - Elbow, equal 45 degrees



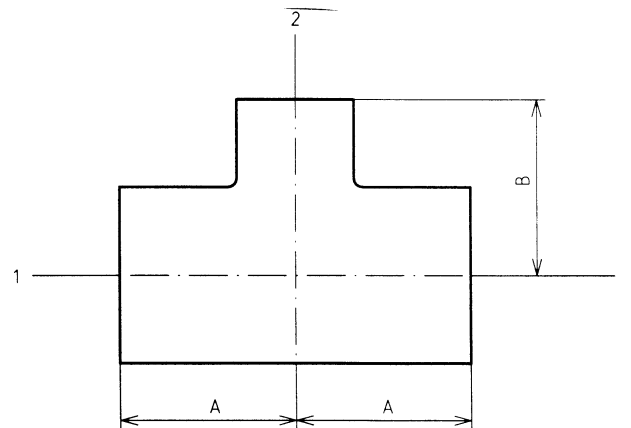
Nominal size DN	Centre to face A mm
10	19
15 20 25	22 27 33
32 40 50	38 44 51
65 80 100	59 66 77
125 150	87 92

Table 9 - Elbow, male and female, equal



Nominal size DN	Centre to face <i>A</i> mm	Centre to face <i>B</i> mm	Bore of male end mm	
			min.	max.
8 10	19 21	27 29	6,5 8,5	8,0 10,5
15 20 25	25 30 37	35 40 46	11,5 18,0 24,0	13,0 21,0 26,0
32 40 50	43 49 59	54 57 70	30,0 37,0 48,0	32,0 39,0 51,0
65 80 100	68 81 100	83 94 115	62,0 75,0 97,0	66,0 79,0 104,0

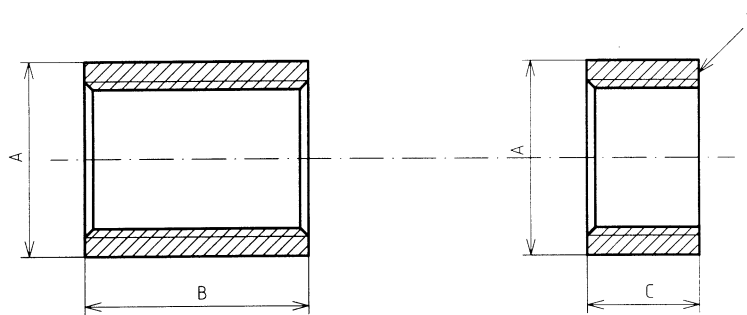
Table 10 - Tee, reducing on the branch



Nominal size DN 1 × DN 2	Centre to face <i>A</i> mm	Centre to face <i>B</i> mm	Nominal size DN 1 × DN 2	Centre to face <i>A</i> mm	Centre to face <i>B</i> mm
10 × 8 ¹⁾	22	24	50 × 15 ¹⁾	41	64
15 × 8	25	32	50 × 20 ¹⁾	44	64
15 × 10	27	32	50 × 25	48	64
20 × 8	27	35	50 × 32	52	64
20 × 10	29	35	50 × 40	56	64
20 × 15	32	35	65 × 25	54	76
25 × 8 ¹⁾	30	43	65 × 40	60	76
25 × 10 ¹⁾	32	43	65 × 50	67	76
25 × 15	35	43	80 × 25	60	89
25 × 20	38	43	80 × 32	64	89
32 × 15	38	51	80 × 40	67	89
32 × 20	41	51	80 × 50	73	89
32 × 25	44	51	80 × 65	79	89
40 × 15 ¹⁾	38	52	100 × 40	76	115
40 × 20	41	52	100 × 50	83	115
40 × 25	44	52	100 × 80	95	115
40 × 32	49	52	150 × 80	120	160
			150 × 100	135	160

1) Bushed tees may be supplied instead.

Table 11 - Socket and half socket, equal, type heavy



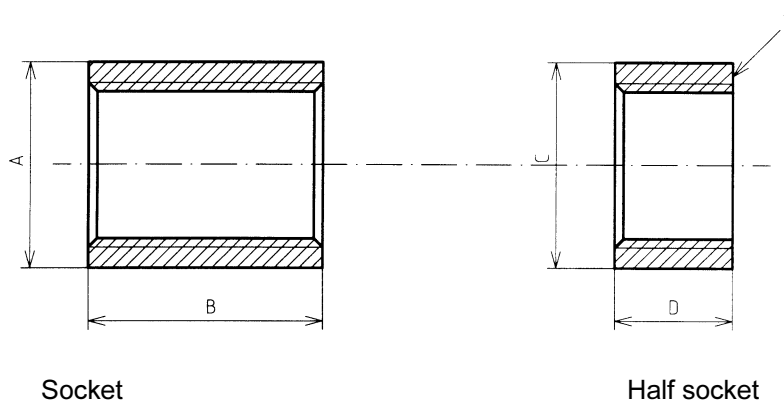
Socket

Half socket

1 Faced at right angle to axis of thread. No internal chamfer.

Nominal size DN	Minimum outside diameter A mm	Overall length of socket B mm	Overall length of half socket C mm
6	15,0	19	8
8	18,5	27	11
10	22,0	28	12
15	27,0	37	16
20	32,5	39	19
25	39,5	46	21
32	49,0	51	25
40	56,0	51	25
50	68,0	60	28
65	84,0	69	30
80	98,0	75	35
100	124,0	87	40
125	151,0	96	44
150	177,0	96	44

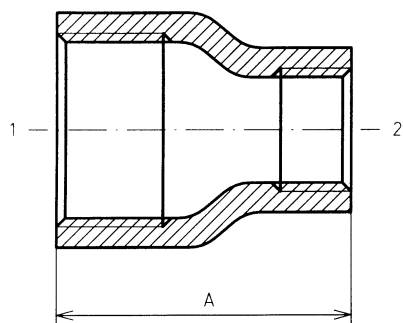
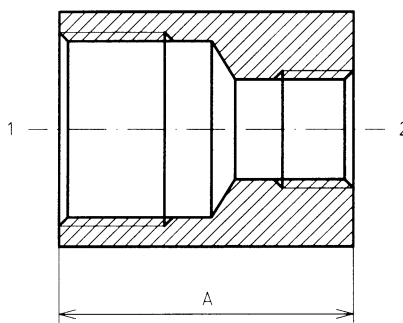
Table 12 - Socket and half socket, equal, type medium



1 Faced at right angle to axis of thread. No internal chamfer.

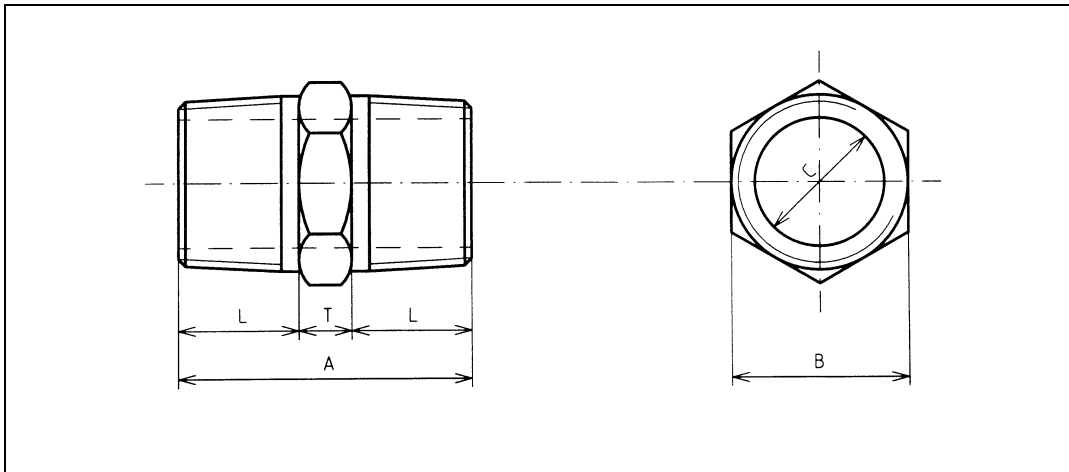
Nominal size	Minimum outside diameter of socket	Overall length of socket	Minimum outside diameter of half socket	Overall length of half socket
DN	A	B	C	D
	mm	mm	mm	mm
6	15,0	17	15,0	8
8	18,5	25	18,5	11
10	21,3	26	21,3	12
15	26,6	34	26,6	15
20	31,8	36	31,8	17
25	39,5	43	39,5	20
32	48,3	48	48,3	22
40	54,5	48	54,5	22
50	66,2	56	68,0	26
65	82,0	65	84,2	30
80	95,0	71	98,4	34
100	121,4	83	124,0	40
125	146,3	92	149,0	44
150	173,3	92	177,0	44

Table 13 - Reducing socket¹⁾

			
Nominal size DN 1 × DN 2	Overall length A mm	Nominal size DN 1 × DN 2	Overall length A mm
8 × 6	25	50 × 15	70
10 × 6	30	50 × 20	68
10 × 8	29	50 × 25	67
15 × 6	41	50 × 32	65
15 × 8	40	50 × 40	64
15 × 10	38	65 × 25	76
20 × 8	44	65 × 32	75
20 × 10	43	65 × 40	73
20 × 15	41	65 × 50	71
25 × 8	54	80 × 25	86
25 × 10	52	80 × 32	84
25 × 15	51	80 × 40	83
25 × 20	49	80 × 50	81
32 × 10	60	80 × 65	79
32 × 15	59	100 × 40	105
32 × 20	57	100 × 50	100
32 × 25	56	100 × 65	100
40 × 15	65	100 × 80	98
40 × 20	64	125 × 80	115
40 × 25	62	125 × 100	115
40 × 32	60	150 × 80	140
		150 × 100	140

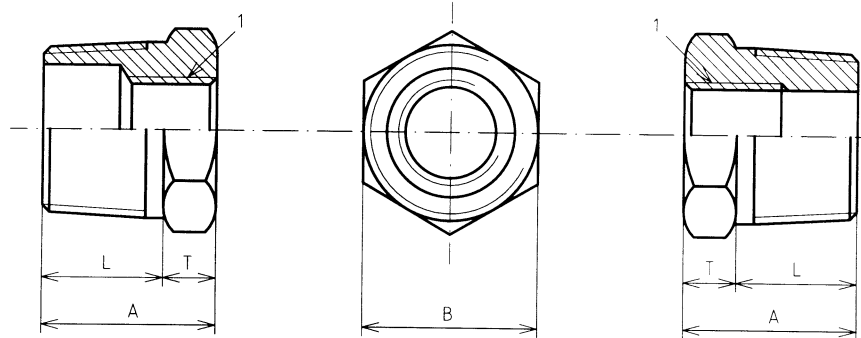
1) The shape of reducing socket shall be at the option of the manufacturer.

Table 14 - Hexagonal nipple, equal



Nominal size DN	Minimum length of thread for basic gauge length plus die clearance <i>L</i> mm	Thickness of hexagon <i>T</i> mm	Overall length <i>A</i> mm	Diameter of bore <i>C</i> mm		Width across flats of hexagon <i>B</i> mm
				min.	max.	
6	9,5	6	25	4,5	6,0	12,0
8	12,5	6	31	6,5	8,0	14,0
10	12,5	8	33	8,5	10,5	17,0
15	17,5	8	43	11,5	13,0	22,0
20	19,0	10	48	18,0	21,0	27,0
25	21,0	10	52	24,0	26,0	36,0
32	24,0	11	59	30,0	32,0	46,0
40	24,0	13	61	37,0	39,0	50,0
50	27,0	14	68	48,0	51,0	65,0
65	32,0	16	80	62,0	66,0	78,0
80	35,0	19	89	75,0	79,0	90,0
100	40,0	22	102	97,0	104,0	115,0
125	45,0	25	115	121,0	128,0	140,0
150	45,0	25	115	145,0	152,0	166,0

Table 15 - Hexagon bush



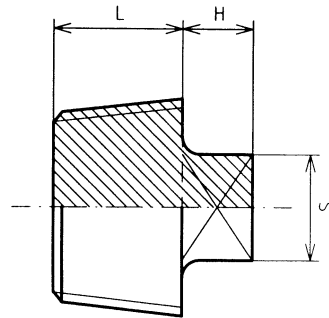
1 Thread length in accordance with ISO 7-1.

Nominal size DN ¹⁾	Minimum length of external thread for basic gauge length plus die clearance L mm	Thickness of hexagon T mm	Overall length A mm	Width across flats of hexagon B mm
8 10	12,5 12,5	6 8	18,5 20,5	14,0 17,0
15 20 25	17,5 19,0 21,0	8 10 10	25,5 29,0 31,0	22,0 27,0 36,0
32 40 50	24,0 24,0 27,0	11 13 14	35,0 37,0 41,0	46,0 50,0 65,0
65 80 100	32,0 35,0 40,0	16 19 22	48,0 54,0 62,0	78,0 90,0 115,0
125 150	45,0 45,0	25 25	70,0 70,0	140,0 166,0

1) Nominal sizes refer to the size of male end, i.e. the larger diameter of the bush. The smaller diameter of the bush is stated by the purchaser.

NOTE Two types of bush are illustrated, either of which can be supplied.

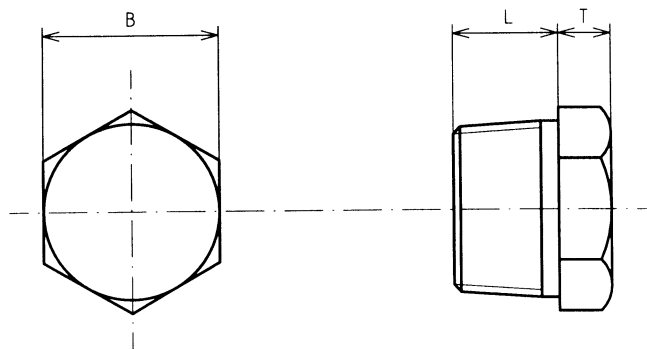
Table 16 - Square head plug



Nominal size	Minimum length of thread for basic gauge length	Size of square	Minimum height of square
DN	L	S	H
	mm	mm	mm
6	6,5	6	6
8	9,7	9	6
10	10,1	11	10
15	13,2	13	10
20	14,5	14	12
25	16,8	17	12
32	19,1	22	16
40	19,1	27	16
50	23,4	32	19
65	26,7	37	19
80	29,8	37	22
100	35,8	46	25
125	40,1	51	29
150	40,1	60	32

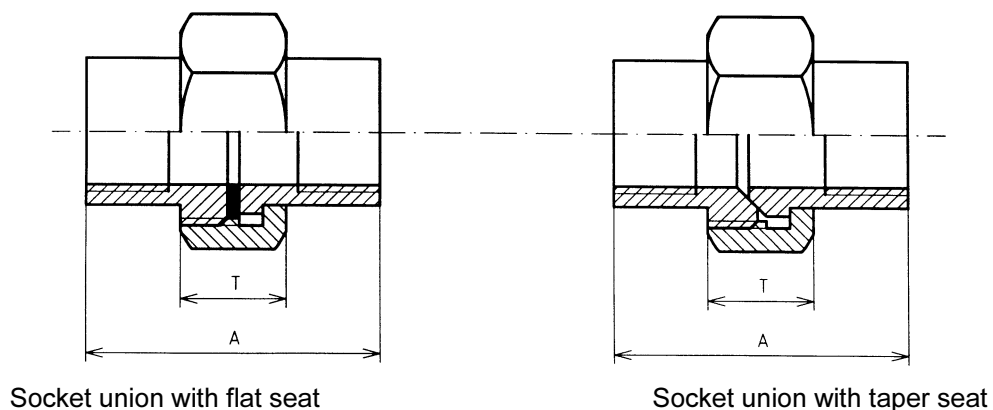
NOTE Plugs may be provided with a shallow concave recess in the base, so long as the essential solidity of the plug is maintained.

Table 17 - Hexagon head plug



Nominal size DN	Minimum length of thread for basic gauge length plus die clearance <i>L</i> mm	Size of hexagon <i>B</i> mm	Minimum height of hexagon <i>T</i> mm
6 8 10	9,5 12,5 12,5	12 14 17	6 6 8
15 20 25	17,5 19,0 21,0	22 27 36	8 10 10
32 40 50	24,0 24,0 27,0	46 50 65	11 13 14
65 80 100	32,0 35,0 40,0	78 90 115	16 19 22

Table 18 - Socket union



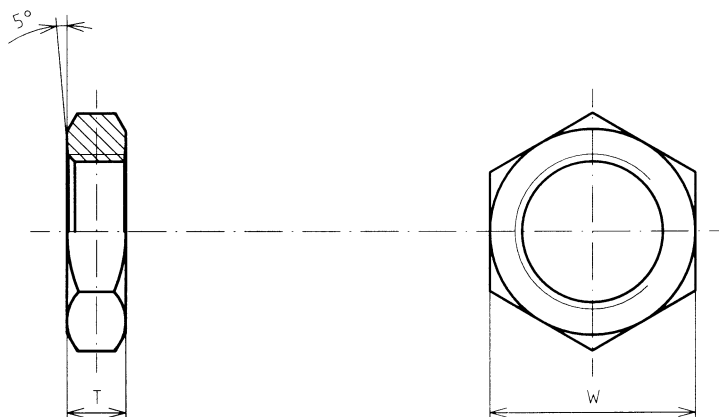
Nominal size DN	Overall length A mm	Length of nut T mm
6 8 10	37 40 46	15 15 16
15 20 25	51 57 64	18 20 22
32 40 50	70 79 89	24 25 27
65 80 100	102 107 118	30 31 34

CAUTION A socket union should only be used as complete assembly, because component parts of the union made by different manufacturers, or component parts of different types of union made by the same manufacturer, are not necessarily interchangeable.

NOTE Other external forms of nut and ends are permissible provided that the dimensions in tables are maintained.

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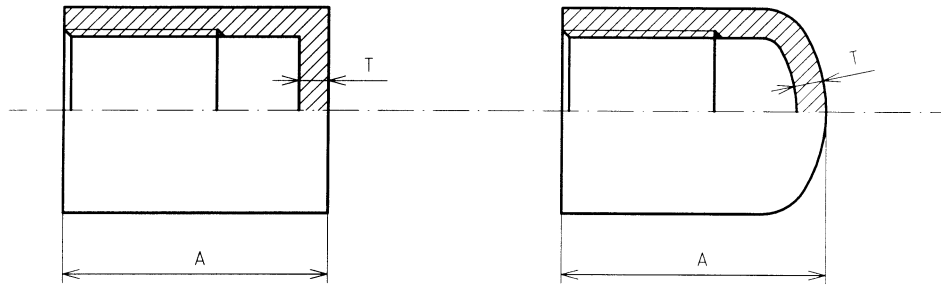
Table 19 - Hexagon backnut



Nominal size DN	Width across flats $W^{1)}$ mm	Thickness		
		T mm	Tolerance mm	
6 8 10	17,0 19,0 24,0	6,5 6,5 7,0	+1,5 0	
15 20 25	30,0 36,0 41,0	8,0 9,0 9,5		
32 40 50	50,0 60,0 70,0	11,0 12,0 13,0		
65 80 100	90,0 100,0 130,0	17,0 21,0 22,0		+3,0 0
125 150	160,0 190,0	24,0 25,0		

1) The tolerance on width across the flat (W) is $\pm 0,8$ mm.

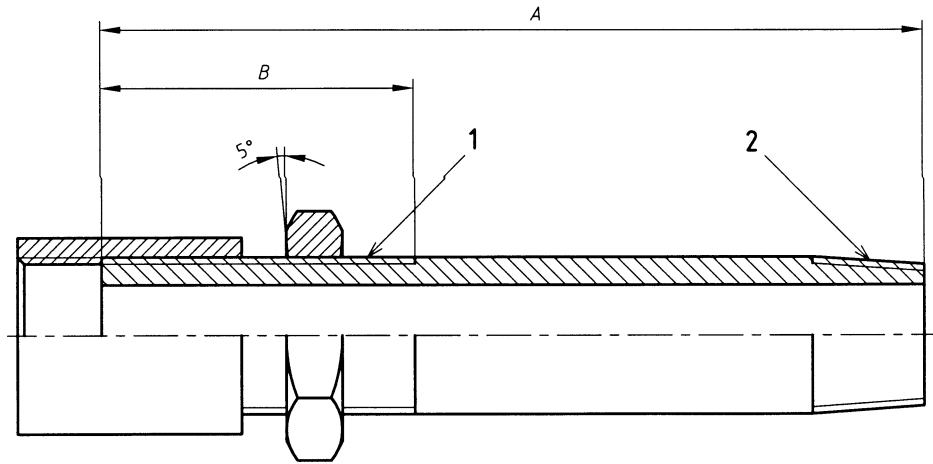
Table 20 - Cap



Nominal size DN	Overall length A mm	Minimum thickness T mm
6 8 10	19 24 27	3,5 3,5 3,5
15 20 25	37 38 44	4,0 4,0 4,5
32 40 50	51 54 60	5,0 5,5 6,0
65 80 100	67 73 86	6,0 7,0 7,0
125 150	98 98	7,5 8,5

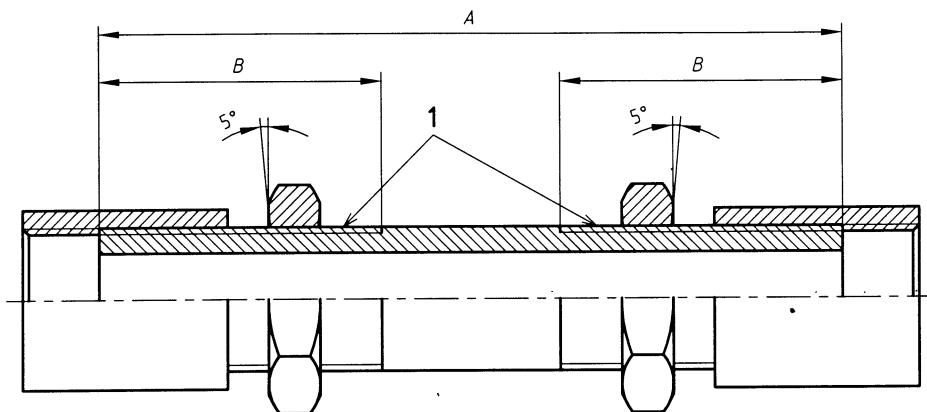
NOTE A flat or domed cap may be supplied at the option of the manufacturer.

Table 21 - Longscrew



- 1 Parallel thread in accordance with ISO 7-1.
- 2 Taper thread in accordance with ISO 7-1.

Single longscrew

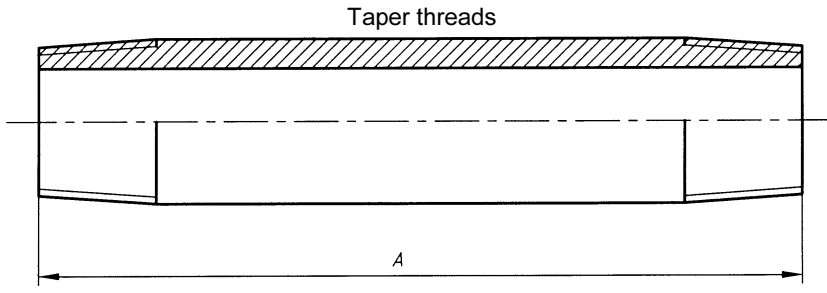


- 1 Parallel thread in accordance with ISO 7-1.

Double longscrew

(to be continued)

Table 22 - Pipe nipple



The diagram shows a cross-section of a pipe nipple with taper threads on both ends. A dimension line labeled 'A' indicates the overall length of the nipple.

Nominal Size DN	Overall length													
	A													
	mm													
6	30	40	50	60	80	100	120	150	180	200	250	300		
8	30	40	50	60	80	100	120	150	180	200	250	300		
10	30	40	50	60	80	100	120	150	180	200	250	300		
15		40	50	60	80	100	120	150	180	200	250	300		
20		40	50	60	80	100	120	150	180	200	250	300		
25			50	60	80	100	120	150	180	200	250	300		
32			50	60	80	100	120	150	180	200	250	300		
40			50	60	80	100	120	150	180	200	250	300		
50				60	80	100	120	150	180	200	250	300		
65					80	100	120	150	180	200	250	300	400	
80					80	100	120	150	180	200	250	300	400	
100						100	120	150	180	200	250	300	400	
125							120	150	180	200	250	300	400	500
150							120	150	180	200	250	300	400	500

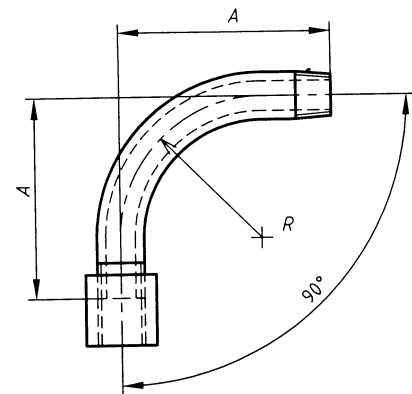
Table 23 - Running nipple, close nipple and barrel nipple

The technical drawings show three types of nipples:

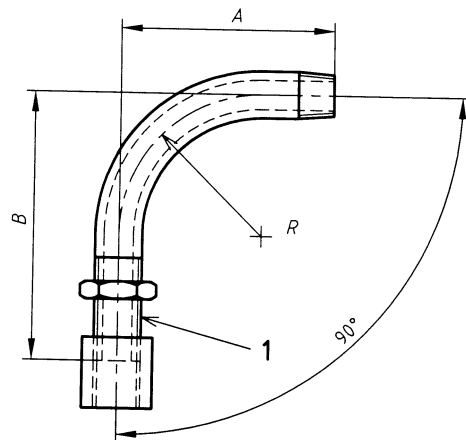
- Running nipple (parallel thread):** A cylindrical nipple with a parallel thread at the top. Dimension *A* is the overall length.
- Close nipple (taper thread both ends):** A cylindrical nipple with tapered threads at both ends. Dimension *B* is the overall length, and the two tapered sections are marked with '='.
- Barrel nipple (taper thread both ends):** A cylindrical nipple with tapered threads at both ends and a central barrel section. Dimension *C* is the overall length.

Nominal size DN	Overall length					
	Running nipple		Close nipple		Barrel nipple	
	<i>A</i> mm	Tolerance mm	<i>B</i> mm	Tolerance mm	<i>C</i> mm	Tolerance mm
8	19		27		38	+3
10	21		28		38	
15	27	+1,5	37	+1,5	51	+4,5
20	30		39		54	
25	33		46		60	
32	38		51		70	+6
40	38		51		70	
50	48		60		79	
65	51	+3	69	+3	89	+8
80	57		75		102	
100	70		87		114	
125	78		96		124	
150	78		96		127	

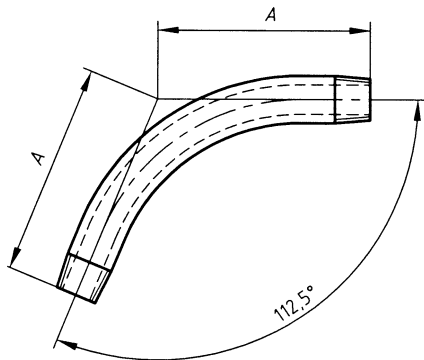
Table 24 - Bend and spring



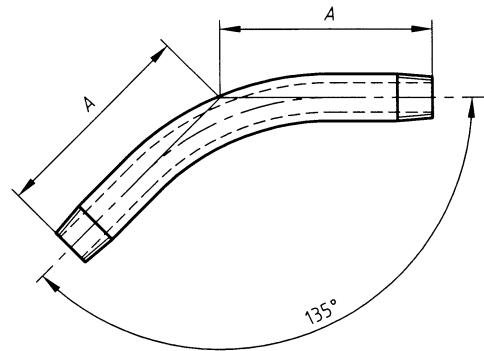
Type 1



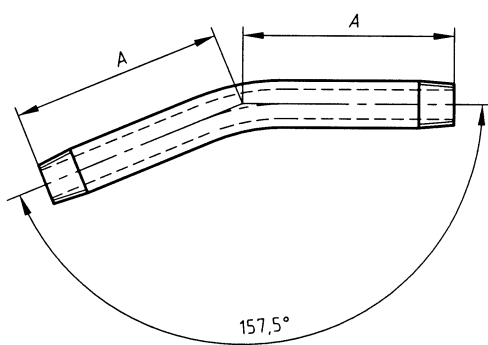
1 Parallel thread length as for long screw.
Type 1A



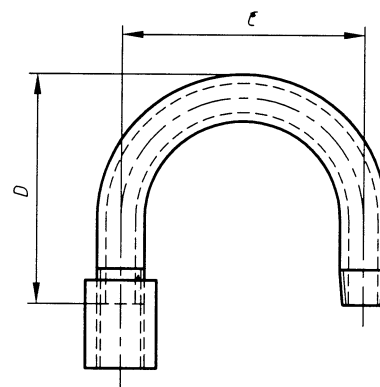
Type 2



Type 3



Type 4



Return bend

(to be continued)

Table 24 (continued)

Nominal Size	Bend			Spring			Return bend	
	90°			Centre to face			180°	
DN	Centre to face		Radius	A mm			Centre to centre	Back to face
	A mm	B mm	R mm	112,5°	135°	157,5°	C mm	D mm
8	64	92	41	60	57	54	51	64
10	73	105	48	67	64	60	64	70
15	86	127	57	79	76	73	89	102
20	102	143	73	92	89	86	102	121
25	121	168	89	108	105	102	114	140
32	146	197	108	133	127	124	127	152
40	165	219	127	149	143	140	165	178
50	203	264	159	181	175	168	190	210
65	248	321	197	222	213	206	305	292
80	292	371	232	260	248	241	356	330
100	381	467	308	340	324	318	457	400
125	540	632	380	476	457	444	762	578
150	622	718	440	572	540	527	914	692

NOTE 1 Type 1A bend shall only be made from heavy tube (see Table 6) and fitted with socket and backnut.

NOTE 2 The angular tolerance shall be as defined in 7.2.3.

NOTE 3 All threads are taper except where shown above.

NOTE 4 The end of type 1A bend with paralalled thread shall be manufactured in accordance with notes 1 and 2 of Table 21.

Annex A (informative)

Thread designation and nominal size

Table A.1 - Thread designation and nominal size

Nominal size DN	Designation of thread size/fitting size
6	1/8
8	1/4
10	3/8
15	1/2
20	3/4
25	1
32	1 1/4
40	1 1/2
50	2
65	2 1/2
80	3
100	4
125	5
150	6

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