
International Standard



4145

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Non-alloy steel fittings threaded to ISO 7/1

Raccords en acier non allié, filetés suivant ISO 7/1

Second edition — 1986-07-15

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Descriptors : pipe fittings, steel products, unalloyed steels, pipe sockets, pipe nipples, pipe bends, pipe plugs, unions, ISO screw threads, designations, specifications, dimensions, symbols, proving pressure.

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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 4145 was prepared by Technical Committee ISO/TC 5, *Ferrous metal pipes and metallic fittings*.

This second edition cancels and replaces the first edition (ISO 4145-1979), table 6 of which has been technically revised.

Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

Non-alloy steel fittings threaded to ISO 7/1

1 Scope and field of application

This International Standard specifies requirements for non-alloy steel fittings for threaded connections in accordance with ISO 7/1, used mainly for industrial purposes.

2 References

ISO 7/1, *Pipe threads where pressure-tight joints are made on the threads — Part 1: Designation, dimensions and tolerances.*

ISO 228/1, *Pipe threads where pressure-tight joints are not made on the threads — Part 1: Designation, dimensions and tolerances.*

ISO 272, *Fasteners — Hexagon products — Widths across flats.*

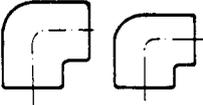
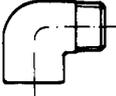
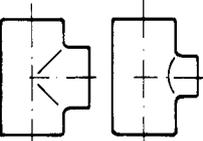
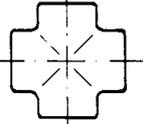
ISO 2546, *Seamless plain end tubes made from unalloyed steel and without quality requirements.*

ISO 2547, *Welded plain end tubes made from unalloyed steel and without quality requirements.*

3 Symbols

See table 1.

Table 1 – Types of fittings and their symbols

Diagram	Type	Symbol	Table
	Elbows, equal and reducing	A1	2 and 3
	Male and female elbows	A4	4
	Tees, equal and reducing	B1	2 and 3
	Crosses	C1	2
	Half sockets	M1	5
	Sockets, equal and reducing	M2	6 and 7
	Reducing bushes	N4	8
	Hexagon nipples	N8	9
	Caps	T2	10
	Plugs	T8	11
	Unions	U1 or U11	12

4 Materials

The fittings shall be made from rolled steel, forged steel, etc. having characteristics and properties at least equal to those of the steel TS.O specified in ISO 2546 and/or the steel TW.O specified in ISO 2547. Free-cutting steels can be used for machined parts.

5 Dimensions

Unspecified dimensions are at the discretion of the manufacturer.

The drawings are diagrammatic, without prejudice to the manufactured form.

6 Threads

6.1 Choice of thread

Fittings shall be threaded in accordance with ISO 7/1.

External threads are tapered 1 : 16; internal threads are normally parallel, but taper threads may be used.

Exceptions : Non-pressure-tight threads of union nuts and their mating threads shall be in accordance with ISO 228/1.

6.2 Alignment of threads

The axes of screw threads shall be accurate within $\pm 1/2^\circ$ of the specified angle.

6.3 Chamfering

The outlets of the fittings should be chamfered.

7 Widths across flats

Widths across flats, s , shall comply with ISO 272 except for caps and unions.

8 Hydraulic test pressure

The fittings shall be capable of withstanding a hydraulic test pressure of 50 bar¹⁾.

If tests are required, this shall be stated at the time of enquiry or order. The manufacturer may substitute for the hydraulic test other tests which ensure an equivalent leak-tightness.

9 Designation of fittings

The fittings complying with this International Standard shall be designated by the following particulars, in the sequence shown :

- a) type of fitting (see table 1);
- b) reference to this International Standard;
- c) symbol (see table 1);
- d) designation of the thread(s).

Designation examples :

- 1) Equal female elbow with run 2 :

Elbow ISO 4145-A1-2

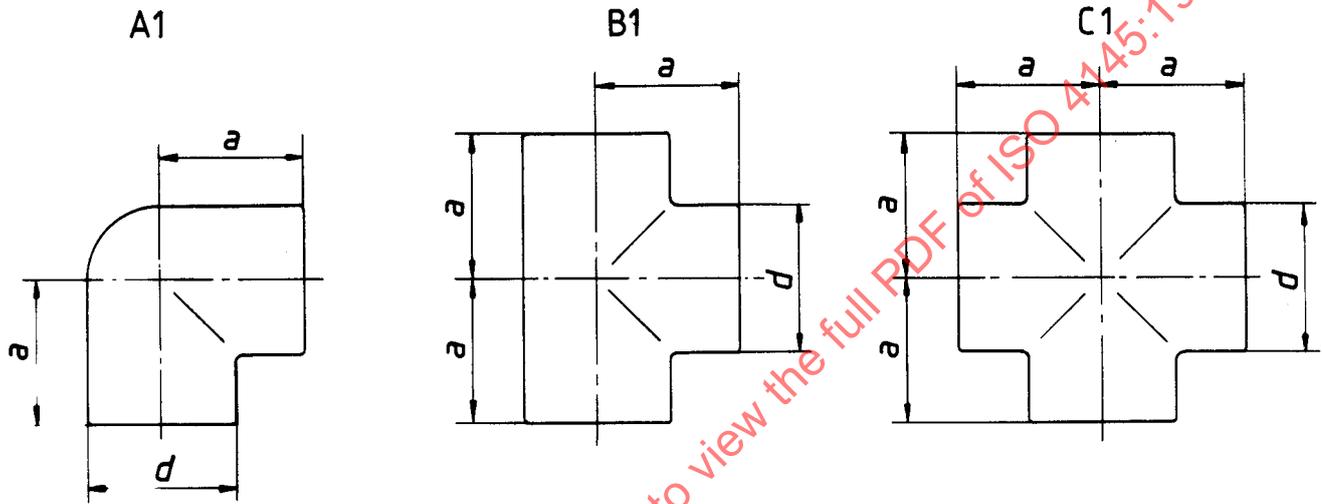
- 2) Reducing tee with run 2 and branch 1 :

Reducing tee ISO 4145-B1-2 × 1

1) 1 bar = 10^5 Pa = 10^5 N/m²

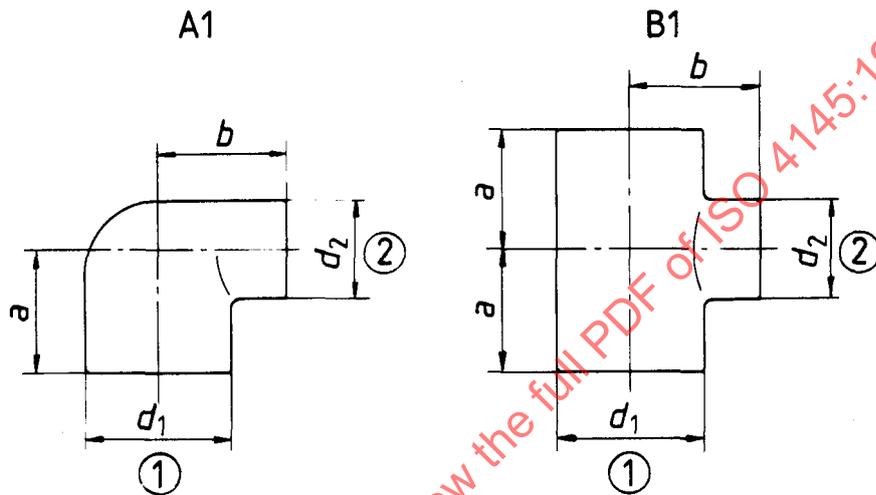
Table 2

Elbows A1
 Tees B1
 Crosses C1



Thread designation	Nominal size DN	d min.	a min.
		mm	mm
1/8	6	14,5	19
1/4	8	17,5	21
3/8	10	21,5	25
1/2	15	27	28
3/4	20	32,5	33
1	25	39,5	38
1 1/4	32	49	45
1 1/2	40	56	50
2	50	68	58
2 1/2	65	84	70
3	80	98	80
4	100	124	100

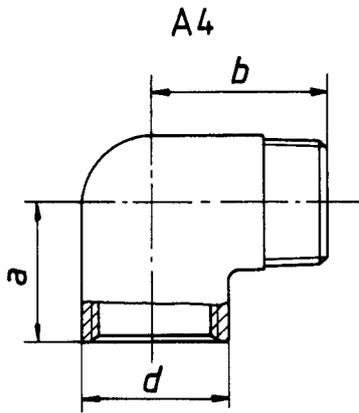
Table 3
Reducing elbows A1
Reducing tees B1



Thread designations		Nominal sizes		Elbows				Tees	
①	②	DN ₁	DN ₂	d ₁ min.	d ₂ min.	a min.	b min.	a min.	b min.
				mm	mm	mm	mm	mm	mm
3/8	1/4	10	8	21,5	17,5	23	23	23	23
1/2	1/4	15	8	27	21,5	26	26	26	26
	3/8	15	10	27	21,5	26	26	26	26
3/4	1/2	20	15	32,5	27	30	31	30	31
1	1/2	25	15	39,5	27	32	34	32	34
	3/4	25	20	39,5	32,5	35	36	35	36
1 1/4	1	32	25	49	39,5	40	42	40	42
1 1/2	1	40	25	56	39,5	—	—	42	46
	1 1/4	40	32	56	49	46	48	46	48
2	1	50	25	68	39,5	—	—	44	52
	1 1/2	50	40	68	56	52	55	52	55

Table 4

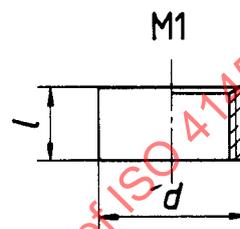
Male and female elbows A4



Thread designation	Nominal size DN	<i>d</i> min.	<i>a</i> min.	<i>b</i> min.
		mm	mm	mm
1/4	8	17,5	19	27
3/8	10	21,5	21	29
1/2	15	27	25	35
3/4	20	32,5	30	40
1	25	39,5	37	46
1 1/4	32	49	43	54
1 1/2	40	56	49	57
2	50	68	59	70

Table 5

Half sockets M1



Thread designation	Nominal size DN	<i>d</i> min.	<i>l</i> min.
		mm	mm
1/8	6	14	8
1/4	8	18,5	11
3/8	10	21,3	12
1/2	15	26,4	15
3/4	20	31,8	17
1	25	39,5	19,5
1 1/4	32	48,3	22
1 1/2	40	54,5	22
2	50	66,3	26
2 1/2	65	82	30,5
3	80	95	34
4	100	122	40

Table 6
Sockets M2

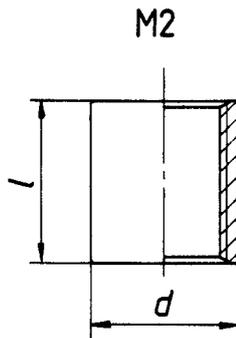
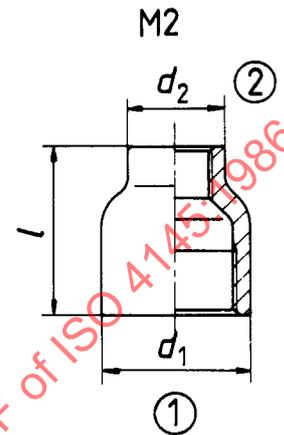


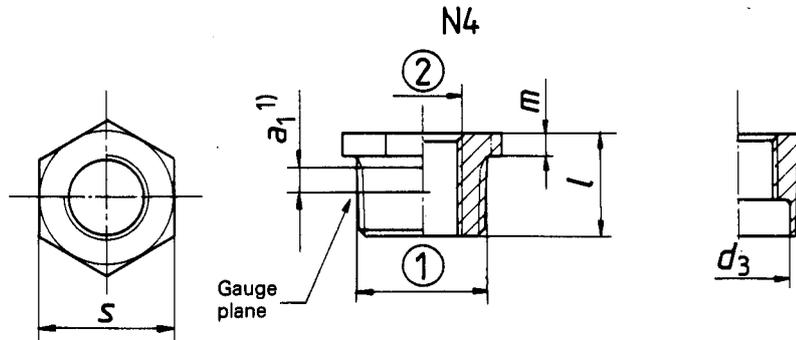
Table 7
Reducing sockets M2



Thread designation	Nominal size DN	d min.	l min.
		mm	mm
1/8	6	14	17
1/4	8	18,5	25
3/8	10	21,3	26
1/2	15	26,4	34
3/4	20	31,8	36
1	25	39,5	43
1 1/4	32	48,3	48
1 1/2	40	54,5	48
2	50	66,3	56
2 1/2	65	82	65
3	80	95	71
4	100	122	83
5	125	147	92
6	150	174	92

Thread designations		Nominal sizes		d_1 min.	d_2 min.	l min.
①	②	DN ₁	DN ₂	mm	mm	mm
1/4	1/8	8	6	17,5	14,5	27
3/8	1/4	10	8	21,5	17,5	30
1/2	1/4	15	8	27	17,5	36
	3/8		10	27	21,5	36
3/4	3/8	20	10	32,5	21,5	39
	1/2		15	32,5	27	39
1	1/2	25	15	39,5	27	45
	3/4		20	39,5	32,5	45
1 1/4	3/4	32	20	49	32,5	50
	1		25	49	39,5	50
1 1/2	3/4	40	20	56	32,5	55
			25	56	39,5	55
			32	56	49	55
2	1	50	25	68	39,5	65
			32	68	49	65
			40	68	56	65
2 1/2	2	65	50	84	68	74
3	2	80	50	98	68	80
4	3	100	80	124	98	94

Table 8
Reducing bushes N4



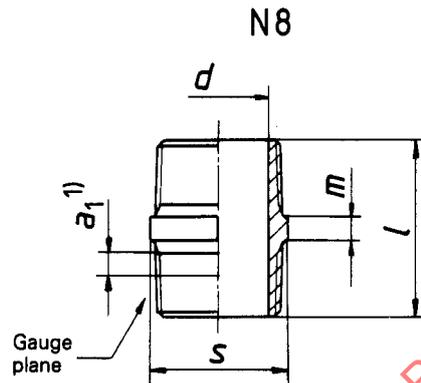
NOTE — Hexagonal shape for sizes up to 1, hexagonal or octagonal shape for sizes 1 1/4 to 4.

Thread designations		Nominal sizes		<i>l</i> min.	<i>m</i> min.	<i>d</i> ₃ max.	<i>s</i>	<i>a</i> ₁ ¹⁾ min.
①	②	DN ₁	DN ₂	mm	mm	mm	mm	mm
1/4	1/8	8	6	17	4,0	8,9	14	3,7
3/8	1/4	10	8	17,5	5,0	12,4	17 ²⁾	3,7
1/2	1/4	15	8	21	5,0	16,1	22	5,0
	3/8		10	21	5,0	16,1	22	5,0
3/4	3/8	20	10	24,5	5,5	21,6	27 ²⁾	5,0
	1/2		15	24,5	5,5	21,6	27 ²⁾	5,0
1	1/2	25	15	27,5	6,0	27,1	36	6,4
	3/4		20	27,5	6,0	27,1	36	6,4
1 1/4	1/2	32	15	32,5	6,5	35,8	46	6,4
	3/4		20	32,5	6,5	35,8	46	6,4
	1		25	32,5	6,5	35,8	46	6,4
1 1/2	3/4	40	20	32,5	6,5	41,7	50	6,4
	1		25	32,5	6,5	41,7	50	6,4
	1 1/4		32	32,5	6,5	41,7	50	6,4
2	1	50	25	40	7,0	52,9	65	7,5
	1 1/4		32	40	7,0	52,9	65	7,5
	1 1/2		40	40	7,0	52,9	65	7,5
2 1/2	1 1/4	65	32	46,5	7,0	68,7	80	9,2
	1 1/2		40	46,5	7,0	68,7	80	9,2
	2		50	46,5	7,0	68,7	80	9,2
3	1 1/2	80	40	51,5	7,5	81,0	90	9,2
	2		50	51,5	7,5	81,0	90	9,2
	2 1/2		65	51,5	7,5	81,0	90	9,2
4	2	100	50	61,5	8,0	105,6	115	10,4
	2 1/2		65	61,5	8,0	105,6	115	10,4
	3		80	61,5	8,0	105,6	115	10,4

1) These values comply with ISO 7/1.

2) The values 19 and 30 for across flats may be used. The manufacturer shall in all cases ensure that the threads are full form for the entire useful length of thread.

Table 9
Hexagon nipples N8



NOTE — Hexagonal shape for sizes up to 1, hexagonal or octagonal shape for sizes 1 1/4 to 4.

Thread designation	Nominal size DN	l	m	d	s	$a_1^{1)}$
		min. mm	min. mm	max. mm	mm	min. mm
1/8	6	21	4,0	6,0	12	2,5
1/4	8	28	4,0	8,9	14	3,7
3/8	10	29	5,0	12,4	17 ²⁾	3,7
1/2	15	36	5,0	16,1	22	5,0
3/4	20	41	5,5	21,6	27 ²⁾	5,0
1	25	46,5	6,0	27,1	36	6,4
1 1/4	32	54	6,5	35,8	46	6,4
1 1/2	40	54	6,5	41,7	50	6,4
2	50	65,5	7,0	52,9	65	7,5
2 1/2	65	76,5	7,0	68,7	80	9,2
3	80	85	7,5	81,0	90	9,2
4	100	101	8,0	105,6	115	10,4

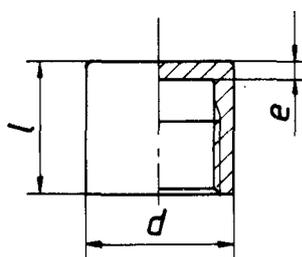
1) These values comply with ISO 7/1.

2) The values 19 and 30 for across flats may be used. The manufacturer shall in all cases ensure that the threads are full form for the entire useful length of thread.

Table 10

Caps T2

T2



NOTE — Caps may be round, hexagonal or octagonal at the discretion of the manufacturer. When hexagonal or octagonal, the widths across flats shall be in accordance with d min.

Thread designation	Nominal size DN	d min.	l min.	e min.
		mm	mm	mm
1/8	6	14,5	18	3,5
1/4	8	17,5	20	3,5
3/8	10	21,5	22	3,5
1/2	15	27	25	4
3/4	20	32,5	30	4
1	25	39,5	35	4,5
1 1/4	32	49	40	5
1 1/2	40	56	42	5,5
2	50	68	45	6
2 1/2	65	84	50	6
3	80	98	55	7
4	100	124	60	7