
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

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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 institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up 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.

International Standard ISO 4145 was developed by Technical Committee ISO/TC 5, *Metal pipes and fittings*, and was circulated to the member bodies in January 1978.

It has been approved by the member bodies of the following countries:

Belgium	Ireland	Poland
Czechoslovakia	Israel	Romania
Denmark	Italy	Spain
Egypt, Arab Rep. of	Korea, Rep. of	Sweden
Finland	Mexico	Switzerland
Germany, F. R.	Netherlands	Turkey
Hungary	New Zealand	United Kingdom
India	Norway	

The member bodies of the following countries expressed disapproval of the document on technical grounds:

Australia	Japan
France	South Africa, Rep. of

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 50, *Metal pipes — Steel sockets screwed according to ISO 7/1.*

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

ISO 272, *Fasteners — Width across flats for hexagon products*

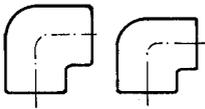
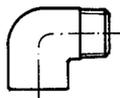
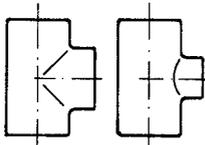
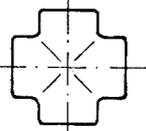
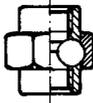
ISO 2546, *Seamless plain end tubes made from unalloyed steel and without quality requirements.*

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 respectively. 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 bar.*

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 are designated by the following particulars, in the sequence shown :

Type of fitting

Designation of the thread(s)

Symbol (see table 1)

ISO 4145.

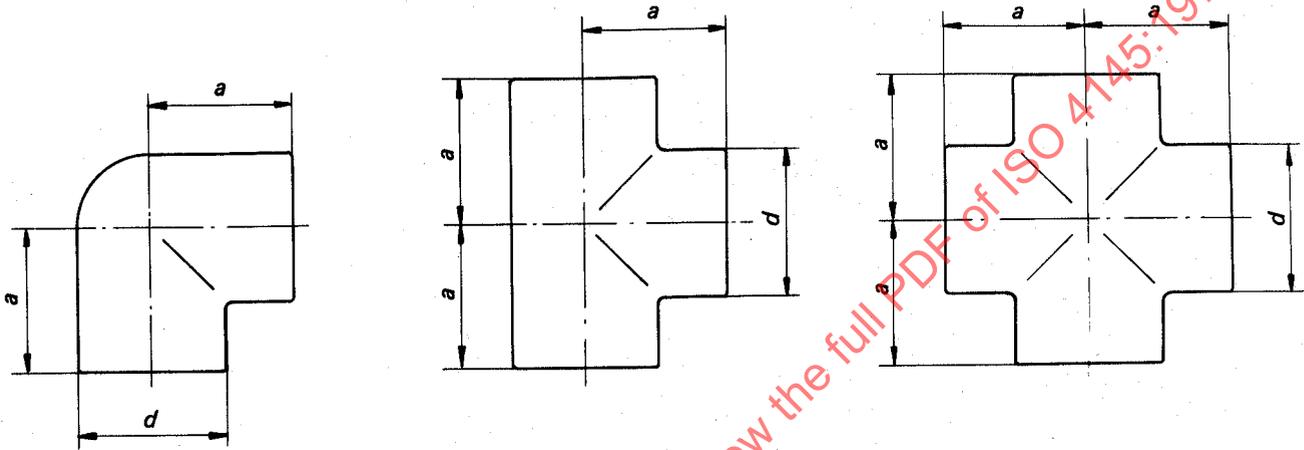
Examples of designation :

1) Equal female elbow 2 :
Elbow 2 A1 ISO 4145.

2) Reduced tee with run 2 and branch 1 :
Reduced tee 2 × 1 B1 ISO 4145.

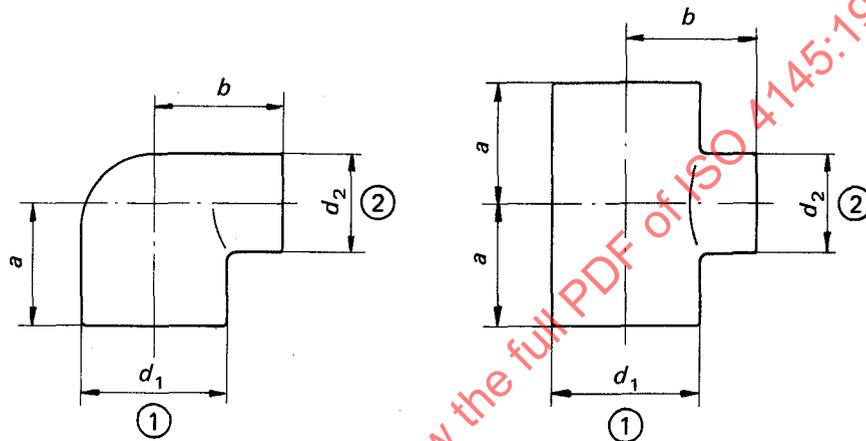
* 1 bar = 10^5 Pa = 10^5 N/m²

Table 2 – Elbows A1, Tees B1 and Crosses C1



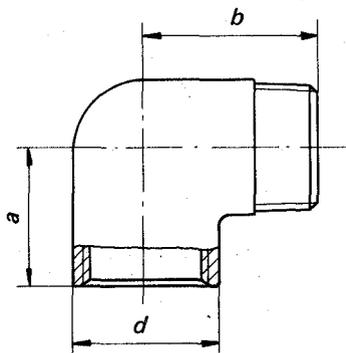
Thread designation	Nominal size DN	d min. mm	a min. mm
1/8	6	14,5	19
1/4	8	17,5	21
3/8	10	21,5	25
1/2	15	27	28
3/4	20	32,5	33
1	25	39,5	38
1 1/4	32	49	45
1 1/2	40	56	50
2	50	68	58
2 1/2	65	84	70
3	80	98	80
4	100	124	100

Table 3 – Reducing elbows A1 and Reducing tees B1



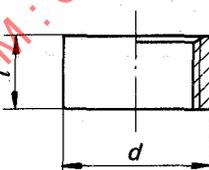
Thread designations		Nominal sizes		Elbows				Tees	
①	②	DN ₁	DN ₂	d_1 min. mm	d_2 min. mm	a min. mm	b min. mm	a min. mm	b min. mm
3/8	1/4	10	8	21,5	17,5	23	23	23	23
1/2	1/4	15	8	27	21,5	26	26	26	26
	3/8	15	10	27	21,5	26	26	26	26
3/4	1/2	20	15	32,5	27	30	31	30	31
	1/2	25	15	39,5	27	32	34	32	34
	3/4	25	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	d min. mm	a min. mm	b min. 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	d min. mm	l min. 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

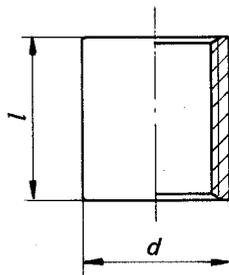
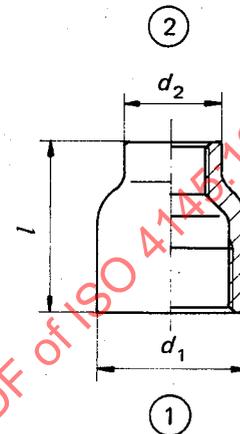


Table 7 – Reducing sockets M2

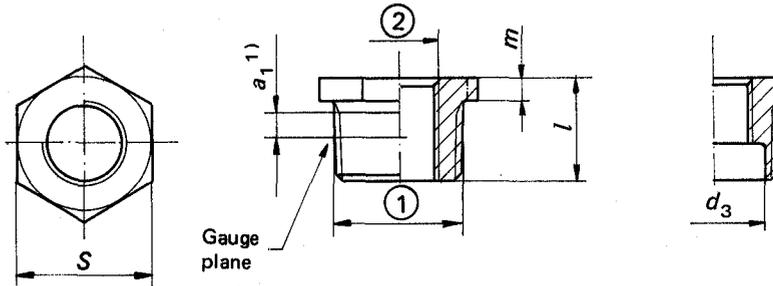


Thread designation	Nominal size DN	d min. mm	l min. mm
1/8	6	14	17
1/4	8	18,5	25
3/8	10	21,3	26
1/2	15	26,4	34
3/4	20	31,8	36
1	25	39,5	43
1 1/4	32	48,3	48
1 1/2	40	54,5	48
2	50	66,3	56
2 1/2	65	82	65
3	80	95	71
4	100	122	83

The values shown in this table correspond to ISO 50.

Thread designations		Nominal sizes		d_1 min. mm	d_2 min. mm	l min. mm
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
	3/8		10			
1/2	1/4	15	8	27	17,5	36
	3/8		10			
3/4	3/8	20	10	32,5	21,5	39
	1/2		15			
1	1/2	25	15	39,5	27	45
	3/4		20			
1 1/4	3/4	32	20	49	32,5	50
	1		25			
1 1/2	3/4	40	20	56	32,5	55
	1		25			
	1 1/4		32			
2	1	50	25	68	39,5	65
	1 1/4		32			
	1 1/2		40			
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



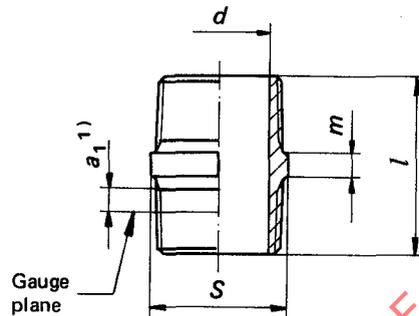
Hexagonal shape for sizes up to 1, hexagonal or octagonal shape for sizes 1 1/4 to 4.

Thread designations		Nominal sizes		l min.	m min.	d_3 max.	S	a_1 min. ¹⁾
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



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

Thread designation	Nominal size DN	l min. mm	m min. mm	d max. mm	S mm	a_1 min. ¹⁾ 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.