
INTERNATIONAL STANDARD



3418

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

**Steel tubes — Butt-welding bends, types 3D and 5D
(45°, 90° and 180°), without quality requirements**

Tubes en acier — Courbes à souder, modèles 3D et 5D (45°, 90° et 180°), sans prescriptions de qualité

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FOREWORD

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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 3418 was drawn up by Technical Committee ISO/TC 5, *Metal pipes and fittings*, and circulated to the Member Bodies in August 1974.

It has been approved by the Member Bodies of the following countries :

Australia	India	Sweden
Austria	Ireland	Switzerland
Belgium	Israel	Turkey
Chile	Italy	United Kingdom
Finland	Netherlands	U.S.A.
France	Romania	U.S.S.R.
Germany	South Africa, Rep. of	Yugoslavia
Hungary	Spain	

No Member expressed disapproval of the document.

Steel tubes – Butt-welding bends, types 3D and 5D (45°, 90° and 180°), without quality requirements

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies the dimensions, tolerances and generally used materials of butt-welding bends, types 3D and 5D (45°, 90° and 180°), mandrel hot formed from seamless or welded steel tubes, without quality requirements and used for piping work.

NOTE – Bends fabricated from plate material will be the subject of other International Standards.

2 REFERENCES

ISO 134, *Plain end steel tubes for general purposes.*

ISO/R 404, *General technical delivery requirements for steel.*

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 DESIGNATION

The bends shall be designated by the type, the angle, the outside diameter and, if necessary, the process of manufacture of the tube followed by a reference to this International Standard. If the purchaser does not specify the method of manufacture of the tube, the choice shall be left to the manufacturer.

Example of designation :

Butt-welding bend 3D-90-60,3 ISO 3418

4 MATERIALS

The bends shall be manufactured from tubes, previously tested, in steel grade TS.O (ISO 2546) or TW.O (ISO 2547).

5 DIMENSIONS AND TOLERANCES

5.1 Dimensions

The dimensions are specified in tables 1 and 2; the outside diameters and thicknesses are taken from ISO 134 (Normal series) except in respect of outside diameter 419 mm.

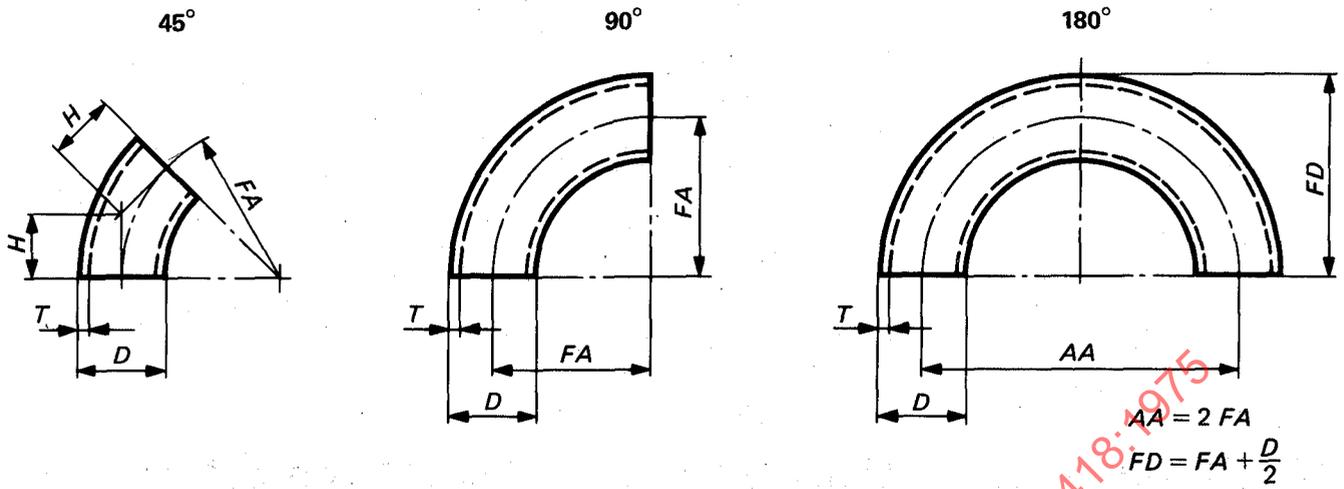


TABLE 1 – Dimensions of bends 3D

Dimensions in millimetres

Masses in kilograms

Outside diameter ¹⁾ D	Thickness T	Dimensions and tolerances							Theoretical mass ²⁾			
		FA	Tol.	FD	Tol.	AA	Tol.	H	Tol.	45°	90°	180°
26,9	2	29		43		58		14		0,028	0,056	0,113
(30)	2,3	34		49		68		14		0,048	0,085	0,170
33,7	2,3	38		56		76		22		0,054	0,106	0,214
(38)	2,6	45	± 2,5	64		90	± 8	24	± 2,5	0,080	0,162	0,324
42,4	2,6	48		69		96		25		0,097	0,194	0,388
(44,5)	2,6	51		73		102		26		0,108	0,216	0,433
48,3	2,6	57		81		114		29		0,132	0,264	0,528
(54)	2,6	69		96		138		32		0,180	0,360	0,720
(57)	2,9	72		100		144		33		0,221	0,441	0,882
60,3	2,9	76		106	± 6	152		35		0,247	0,494	0,988
(70)	2,9	92		127		184		42		0,349	0,698	1,40
76,1	2,9	95	± 3	133		190	± 10	44	± 3	0,394	0,788	1,58
88,9	3,2	114		159		228		51		0,610	1,22	2,44
101,6	3,6	133		184		266		57		0,915	1,83	3,66
(108)	3,6	143		197		286		64		1,11	2,23	4,46
114,3	3,6	152		210		304		64		1,18	2,37	4,73
(133)	4	181		247		362		75		1,82	3,64	7,28
139,7	4	190		260		380		79		2,02	4,03	8,06
(159)	4,5	216		295		432		90		2,90	5,80	11,6
168,3	4,5	229	± 4	313		458	± 14	95	± 4	3,26	6,51	13,0
(193,7)	5,4	270		367		540		112		5,30	10,6	21,2
219,1	5,9	305		414		610		127		7,43	14,9	29,7
(244,5)	6,3	340		462		680		141		9,91	19,8	39,6
273	6,3	381	± 5	518		762	± 16	159	± 5	12,4	24,9	49,8
323,9	7,1	457		619	± 12	904		190		20,0	39,9	79,8
355,6	8	533		711		1 066		222		28,5	57,2	114
(368)	8	533	± 10	717		1 066	± 20	222	± 10	29,6	59,3	119
406,4	8,8	610		813		1 220		254		41,2	82,3	165
(419)	10	610	± 15	819		1 220	± 30	254	± 15	48,3	96,5	193
457	10	686		914		1 372		286		59,3	119	237
508	11	762	± 35	1 016	± 18	1 524	± 70	318	± 35	80,8	162	323
(559)	12,5	838		1 118		1 676		343		112	224	448
610	12,5	914	± 50	1 219	± 25	1 828	± 100	381	± 50	133	266	531

1) Diameters in parentheses are to be studied and may be deleted at the next revision of this International Standard.

2) For information only.

TABLE 2 – Dimensions of bands 5D

Dimensions in millimetres

Masses in kilograms

Outside diameter ¹⁾ <i>D</i>	Thickness <i>T</i>	Dimensions and tolerances								Theoretical masses ²⁾		
		<i>FA</i>	Tol.	<i>FD</i>	Tol.	<i>AA</i>	Tol.	<i>H</i>	Tol.	45°	90°	180°
26,9	2	57		70		114		24		0,055	0,110	0,220
(30)	2,3	62		77		124		27		0,077	0,154	0,308
33,7	2,3	72		89		144		30		0,101	0,202	0,404
(38)	2,6	82		101		164		34		0,147	0,294	0,588
42,4	2,6	93		114		186		38		0,187	0,374	0,748
(44,5)	2,6	98		120		196		40		0,208	0,416	0,832
48,3	2,6	108	± 2,5	132	± 8	216	± 8	45	± 2,5	0,250	0,500	1,000
(54)	2,6	123		150		246		51		0,321	0,642	1,28
(57)	2,9	128		156		256		54		0,392	0,784	1,57
60,3	2,9	135		165		270		57		0,439	0,878	1,76
(70)	2,9	160		195		320		66		0,605	1,21	2,43
76,1	2,9	175		213		350		73		0,725	1,45	2,90
88,9	3,2	205		249		410		86		1,095	2,19	4,38
101,6	3,6	237		288		474		97		1,63	3,26	6,52
(108)	3,6	252		306		506		105		1,845	3,69	7,38
114,3	3,6	270	± 5	327	± 12	540	± 12	112	± 5	2,1	4,20	8,40
(133)	4	312		378		624		129		3,135	6,27	12,5
139,7	4	330		400		660		137		3,5	7,00	14,0
(159)	4,5	375		454		750		155		5,05	10,1	20,1
168,3	4,5	390	± 10	474	± 20	780	± 20	162	± 10	5,505	11,1	22,2
(193,7)	5,4	455		552		910		189		8,95	17,9	35,7
219,1	5,9	510	± 12,5	620	± 25	1 020	± 25	213	± 12,5	12,4	24,8	50,0
(244,5)	6,3	580		702		1 160		240		16,9	33,8	67,6
273	6,3	650	± 15	786	± 30	1 300	± 30	269	± 15	21,25	42,5	84,9
323,9	7,1	775		937		1 550		319		33,85	67,7	135
355,6	8	850	± 20	1 028	± 40	1 700	± 40	352	± 20	45,6	91,2	182
(368)	8	880		1 064		1 760		365		48,95	97,9	196
406,4	8,8	970		1 173		1 940		402		65,5	131	262
(419)	10	1 000	± 25	1 210	± 50	2 000	± 50	414	± 25	79,2	158	317
457	10	1 122		1 350		2 244		464		97	194	388
508	11	1 245	± 40	1 499	± 80	2 490	± 80	515	± 40	132	264	528
(559)	12,5	1 325		1 604		2 650		548		177	354	708
610	12,5	1 500	± 50	1 805	± 25	3 000	± 100	621	± 50	218	436	872

1) Diameters in parentheses are to be studied and may be deleted at the next revision of this International Standard.

2) For information only.

5.2 Other tolerances

The tolerances given in table 3 are applicable to all types of bends.

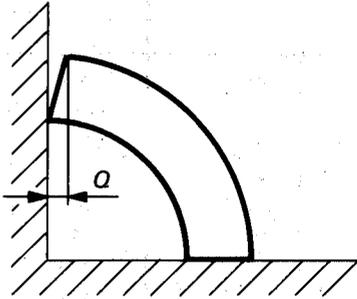


TABLE 3 – Other tolerances

Outside diameter D	Tolerances on dimension		Q
	D^*	T	
mm	mm	%	mm
$D \leq 57$	+ 1,6 - 0,8	- 15	± 1
$57 < D \leq 76,1$			
$76,1 < D \leq 114,3$	$\pm 1,6$		5 (max.)
$114,3 < D \leq 219,1$	+ 2,4 - 1,6		
$219,1 < D \leq 508$	+ 4 - 3,2		
$D > 508$	+ 6,4 - 4,8		

* at the ends of the bend.

6 ENDS OF BENDS

The ends of the bends shall be cut perpendicular to the axes of the bends within the tolerances given in table 3.

7 CERTIFICATE

7.1 When required by the purchaser, the manufacturer shall supply a certificate stating that the items supplied comply with this International Standard.

7.2 This certificate shall comply with the requirements of 4.1.1 of ISO/R 404.

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