

WALL THICKNESS

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OUTSIDE DIAMETER

OUTSIDE DIAMETER	ASTM A 312		ASME B36.10		NPS		WALL THICKNESS	
	inch	mm	inch	mm	inch	mm	DIN mm	mm
1.0	1.315	33.40	33.7					33.7
	1.496		38.0					38.0
	1.575		40.0					40.0
1 1/4	1.660	42.16	42.4				25.0	42.4
	1.752		44.5					44.5
1 1/2	1.900	48.26	48.3					48.3
	2.008		51.0					51.0
	2.126		54.0					54.0
	2.244		57.0					57.0
2.0	2.375	60.33	60.3					60.3
	2.500		63.5					63.5
	2.756		70.0					70.0
2 1/2	2.875	73.03	76.1					76.1
3.0	3.500	88.90	88.9					88.9
3 1/2	4.000	101.60	101.6					101.6
	4.252		108.0					108.0
4.0	4.500	114.30	114.3					114.3
	5.236		133.0					133.0
	5.500		139.7					139.7
5.0	5.563	141.30	141.3					141.3
	6.260		159.0					159.0
6.0	6.625	168.28	168.3					168.3
	7.626		193.7					193.7
8.0	8.625	219.08	219.1					219.1
	9.000		228.6					228.6
	9.626		244.5					244.5

STANDARDS FOR SEAMLESS STAINLESS STEEL PIPES & TUBES

The manufacturing methods employed at SBER reflect state-of-the-art technology. Production of seamless stainless steel pipes and tubes is carried out according to all common international delivery and tolerance standards.

AMERICAN STANDARDS

ASTM A213: Standard Specification for Seamless Ferritic and Austenitic Alloy-Steel Boiler, Superheater, and Heat-Exchanger Tubes

ASTM A269: Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service

ASTM A312: Standard Specification for Seamless, Welded and Heavily Cold Worked Austenitic Stainless Steel Pipes

ASTM A450: Standard Specification for General Requirements for Carbon and Low Alloy Steel Tubes

ASTM A511: Standard Specification for Seamless Steel Mechanical Tubing

ASTM A530: Standard Specification for General Requirements for Specialized Carbon and Alloy Steel Pipe

ASTM A789: Standard Specification for Seamless and Welded Ferritic/Austenitic Stainless Steel Tubing for General Service

ASTM A790: Standard Specification for Seamless and Welded Ferritic/Austenitic and Stainless Steel Pipe

ASTM A999: Standard Specification for General Requirements for Alloy and Stainless Steel Pipe

ASTM A1016: Standard Specification for General Requirements for Ferritic Alloy Steel, Austenitic Alloy Steel, and Stainless Steel Tubes

ASTM B163: Standard Specification for Seamless Nickel and Nickel Alloy Condenser and Heat-Exchanger Tubes

ASTM B829: Standard Specification for General Requirements for Nickel and Nickel Alloys Seamless Pipe and Tube

ANSI B16.25: Buttwelding Ends

EUROPEAN-STANDARDS

EN ISO 1127: Stainless steel tubes – Dimensions, tolerances and conventional masses per unit length

EN ISO 9692-1: Welding and allied processes Recommendations for joint preparation
Part 1: Manual metalarc welding, gasshielded metalarc welding, gas welding, TIG welding and beam welding of steels

EN 10204: Metallic products – Types of inspection documents

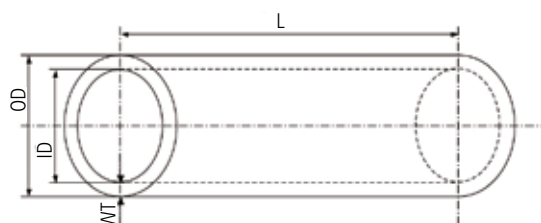
EN 10216-5: Seamless steel tubes for pressure purposes – Technical delivery conditions – Part 5: Stainless steel tubes

EN 10297-2: Seamless steel tubes for mechanical and general engineering purposes – Technical delivery conditions – Part 2: Stainless steel

EN 10305-1: Steel tubes for precision applications – Technical delivery conditions – Part 1: Seamless cold drawn tubes

GEOMETRIES

DIMENSION



OD ... Outside Diameter
ID ... Inside Diameter
WT ... Wall Thickness
L ... Length

If minimum wall thickness is required variations are allowed on the plus side only!

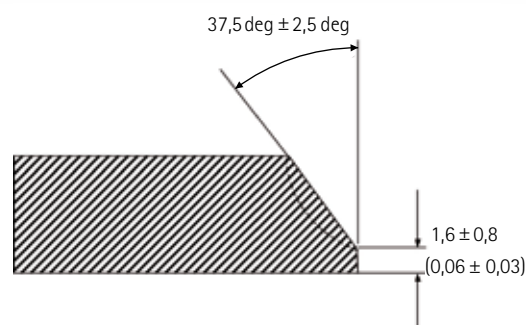
BUTTWELDING ENDS

ANSI / ASME B16.25-2007

Fig. 4 Weld Bevel Details for GTAW Root Pass
[WT > 3mm (0,12 in.) to 10mm (0,38 in.), Inclusive]

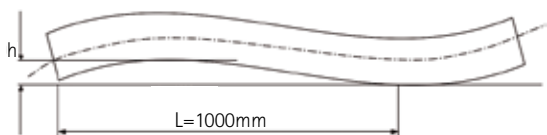
GENERAL NOTES:

- This detail applies for gas tungsten arc welding (GTAW) of the root pass where nominal thickness is over 3mm
- Linear dimensions are in millimeters with inch values in parentheses.



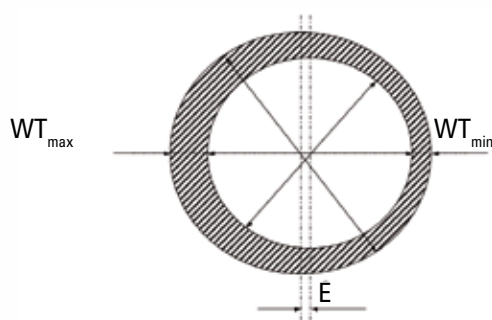
STRAIGHTNESS

Standard pipes and tubes are supplied straightened to the eye: for special applications the permissible deviation from the straight line may be agreed between purchaser and tube manufacturer; the maximum permissible deviation from the straight line related to the length of measurement L is to be indicated, e.g. 1mm/1000mm.



E is half of the difference between biggest and smallest wall thickness (WT) values in one cross section.

ECCENTRICITY

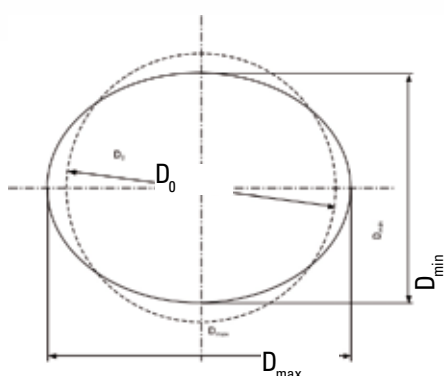


$$\text{In terms of mm: } E(\text{mm}) = \frac{WT_{\max} - WT_{\min}}{2}$$

However, eccentricity is expressed as a percentage of the mean wall thickness of this cross section

$$E(\%) = \frac{WT_{\max} - WT_{\min}}{WT_{\max} + WT_{\min}} \cdot 100$$

MEAN DIAMETER OUTSIDE OR INSIDE



D₀ is the arithmetic mean between the smallest and biggest tube diameter on any one tube circumference. If minimum wall thickness is required variations are allowed on the plus side only!

As a percentage of the mean diameter this is:

$$O(\text{mm}) = \frac{D_{\max} - D_{\min}}{D_{\max} + D_{\min}} \cdot 200$$

Ovality must not be confused with eccentricity.

$$O(\text{mm}) = D_{\max} - D_{\min}$$

TOLERANCES OF SEAMLESS STAINLESS STEEL PIPES & TUBES

TOLERANCES ACCORDING EN ISO 1127

Cold formed	Outside Diameter	Wall Thickness
D4 / T4	±0,5% however, min. ±0,1mm	±7,5% however, min. ±0,15mm
D3 / T3	±0,75% however, min. ±0,3mm	±10% however, min. ±0,2mm
Hot formed	Outside Diameter	Wall Thickness
D2 / T2	±1,0% however, min. ±0,5mm	±12,5% however, min. ±0,4mm
D1 / T1	±1,5% however, min. ±0,75mm	±15% however, min. ±0,6mm

TOLERANCES ACCORDING ASTM A312 / A999 (OD RANGE (MM))

Cold formed	Outside Diameter mm	Wall Thickness %
> 10,3		
	≤ 48,3	+0,4 / -0,8 -12,5 / --*
	> 48,3	+0,8 / -0,8 -12,5 / --*
Cold or hot formed	Outside Diameter mm	Wall Thickness %
	> 114,3	
	≤ 114,3	
	> 219,1	
	≤ 219,1	
Hot formed	Outside Diameter mm	Wall Thickness %
	(≤ 250)	+2,4 / -0,8 -12,5 / --*

TOLERANCES ACCORDING ASTM A213 / A1016 (OD RANGE MM)

Cold formed	Outside Diameter mm	Wall Thickness %
> 25,4		
	≤ 38,1	0 / +20
	> 38,1	+0,15 / -0,15
	≤ 50,8	0 / +22
	> 50,8	+0,20 / -0,20
	≤ 63,5	0 / +22
	> 63,5	+0,25 / -0,25
	≤ 76,2	0 / +22
	> 76,2	+0,30 / -0,30
	≤ 101,6	0 / +22
	> 101,6	+0,38 / -0,38
	≤ 190,5	0 / +22
	> 190,5	+0,38 / -0,64
	≤ 101,6	0 / +22
	> 101,6	+0,38 / -1,14
	≤ 190,5	0 / +22
	> 190,5	+0,38 / -1,14
Hot formed	Outside Diameter mm	Wall Thickness %
	≤ 101,6	+0,4 / -0,8
	≤ 190,5	+0,4 / -1,2
	≤ 228,6	+0,4 / -1,6
Hot formed	Wall Thickness %	
	≤ 2,4**	+40 / 0
	> 2,4	+35 / 0
	> 3,8	+33 / 0
	> 4,6	+28 / 0

OD Range mm

WT Range mm

NOMINAL PIPE SIZE METRIC SYSTEM

Weight for austenitic stainless steel tubes according ANSI/ASME B36.19 and ASME B36.10 dimensions / For min wall acc. ASTM A 213 add 10%

NOMINAL WALL THICKNESS - PIPE SCHEDULES

Pipe size	Outside diameter in mm	5S	10S	20	STD 40S	60	80S XS	100	120	140	160	XXS
		mm kg/m	mm kg/m	mm kg/m	mm kg/m	mm kg/m	mm kg/m	mm kg/m	mm kg/m	mm kg/m	mm kg/m	mm kg/m
1/8	10,3	0,89	1,24		1,73		2,41					
		0,21	0,28		0,37		0,48					
1/4	13,7	1,24	1,65		2,24		3,02					
		0,39	0,50		0,64		0,81					
3/8	17,2	1,24	1,65		2,31		3,20					
		0,49	0,64		0,86		1,12					
1/2	21,3	1,65	2,11		2,77		3,73				4,78	7,47
		0,81	1,02		1,29		1,64				1,98	2,59
3/4	26,7	1,65	2,11		2,87		3,91				5,56	7,82
		1,03	1,30		1,71		2,23				2,94	3,69
1	33,4	1,65	2,77		3,38		4,55				6,35	9,09
		1,31	2,12		2,54		3,29				4,30	5,53
1 1/4	42,2	1,65	2,77		3,56		4,85				6,35	9,70
		1,67	2,73		3,44		4,53				5,69	7,88
1 1/2	48,3	1,65	2,77		3,68		5,08				7,14	10,16
		1,93	3,16		4,11		5,49				7,35	9,69
2	60,3	1,65	2,77		3,91		5,54				8,74	11,07
		2,42	3,99		5,52		7,60				11,29	13,65
2 1/2	73,0	2,11	3,05		5,16		7,01				9,53	14,02
		3,75	5,34		8,77		11,59				15,15	20,72
3	88,9	2,11	3,05		5,49		7,62				11,13	15,24
		4,59	6,56		11,47		15,51				21,67	28,11
3 1/2	101,6	2,11	3,05		5,74		8,08					
		5,26	7,53		13,78		18,92					
4	114,3	2,11	3,05		6,02		8,56		11,13		13,49	17,12
		5,93	8,50		16,32		22,66		28,75		34,05	41,66
5	141,3	2,77	3,40		6,55		9,53		12,70		15,88	19,05
		9,61	11,74		22,10		31,44		40,90		49,87	58,31
6	168,3	2,77	3,40		7,11		10,97		14,27		18,26	21,95
		11,48	14,04		28,69		43,21		55,03		68,59	80,43
8	219,1	2,77	3,76	6,35	8,18	10,31	12,70	15,09	18,26	20,62	23,01	22,23
		15,00	20,27	33,82	43,20	53,90	65,63	77,08	91,82	102,47	112,97	109,57

NOMINAL PIPE SIZE IMPERIAL SYSTEM

Weight for austenitic stainless steel tubes according ANSI/ASME B36.19 and ASME B36.10 dimensions / For min wall acc. ASTM A 213 add 10%

NOMINAL WALL THICKNESS - PIPE SCHEDULES

Pipe size	Outside diameter in mm	5S	10S	20	STD 40S	60	80S XS	100	120	140	160	XXS
		inch	inch	inch	inch	inch	inch	inch	inch	inch	inch	inch
		lb/ft	lb/ft	lb/ft	lb/ft	lb/ft	lb/ft	lb/ft	lb/ft	lb/ft	lb/ft	lb/ft
1/8	10,3	0,035 0,141	0,049 0,189		0,068 0,249		0,095 0,319					
1/4	13,7	0,049 0,260	0,065 0,335		0,088 0,432		0,119 0,543					
3/8	17,2	0,049 0,332	0,065 0,430		0,091 0,576		0,126 0,750					
1/2	21,3	0,065 0,546	0,083 0,682		0,109 0,865		0,147 1,104				0,188 1,331	0,294 1,742
3/4	26,7	0,065 0,694	0,083 0,871		0,113 1,148		0,154 1,496				0,219 1,973	0,308 2,478
1	33,4	0,065 0,881	0,109 1,426		0,133 1,706		0,179 2,207				0,250 2,888	0,358 3,715
1 1/4	42,2	0,065 1,124	0,109 1,834		0,140 2,310		0,191 3,042				0,250 3,823	0,382 5,293
1 1/2	48,3	0,065 1,293	0,109 2,118		0,145 2,758		0,200 3,688				0,281 4,936	0,400 6,507
2	60,3	0,065 1,628	0,109 2,680		0,154 3,709		0,218 5,103				0,344 7,580	0,436 9,167
2 1/2	73,0	0,083 2,516	0,120 3,588		0,203 5,887		0,276 7,780				0,375 10,173	0,552 13,908
3	88,9	0,083 3,079	0,120 4,402		0,216 7,698		0,300 10,412				0,438 14,551	0,600 18,872
3 1/2	101,6	0,083 3,529	0,120 5,053		0,226 9,250		0,318 12,703					
4	114,3	0,083 3,980	0,120 5,704		0,237 10,958		0,337 15,216		0,438 19,304		0,531 22,862	0,674 27,969
5	141,3	0,109 6,451	0,134 7,882		0,258 14,838		0,375 21,111		0,500 27,456		0,625 33,482	0,750 39,151
6	168,3	0,109 7,707	0,134 9,424		0,280 19,264		0,432 29,011		0,562 36,946		0,718 45,985	0,864 53,996
8	219,1	0,109 10,073	0,148 13,610	0,250 22,709	0,322 29,002	0,406 36,184	0,500 44,062	0,593 51,653	0,719 61,646	0,812 68,795	0,906 75,844	0,875 73,565

SEAMLESS STAINLESS STEEL TUBES ACCORDING SWG

Weight for austenitic stainless steel according Imperial Standard Wire Gauge - SWG For min wall acc. ASTM A 213 add 10%

STANDARD WIRE GAUGE WALL-THICKNESS SWG

Outside diameter			20		18		16		14		12		11		10	
			inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm
			0,036	0,914	0,048	1,219	0,064	1,626	0,080	2,032	0,104	2,642	0,116	2,946	0,128	3,251
			lb/ft	kg/m	lb/ft	kg/m	lb/ft	kg/m	lb/ft	kg/m	lb/ft	kg/m	lb/ft	kg/m	lb/ft	kg/m
1/4	0,250	6,35	0,08	0,12	0,11	0,16	0,13	0,19								
5/16	0,313	7,95	0,11	0,16	0,14	0,21	0,17	0,26								
3/8	0,375	9,53	0,13	0,20	0,17	0,25	0,22	0,32	0,26	0,38						
1/2	0,500	12,70	0,18	0,27	0,24	0,35	0,30	0,45	0,36	0,54	0,45	0,67	0,48	0,72		
5/8	0,625	15,88	0,23	0,34	0,30	0,45	0,39	0,58	0,47	0,70	0,59	0,88	0,64	0,95		
3/4	0,750	19,05	0,28	0,42	0,37	0,54	0,48	0,71	0,58	0,87	0,73	1,09	0,80	1,19	0,86	1,29
7/8	0,875	22,23			0,43	0,64	0,56	0,84	0,69	1,03	0,87	1,30	0,96	1,42	1,04	1,54
1	1,000	25,40			0,50	0,74	0,65	0,97	0,80	1,19	1,01	1,51	1,11	1,66	1,21	1,80
1 1 /	1,250	31,75			0,63	0,93	0,82	1,23	1,02	1,51	1,29	1,93	1,43	2,13	1,56	2,32
1 1 /	1,500	38,10			0,76	1,13	1,00	1,48	1,23	1,84	1,58	2,35	1,74	2,59	1,91	2,84
1 3 /	1,750	44,45			0,89	1,32	1,17	1,74	1,45	2,16	1,86	2,77	2,06	3,06	2,25	3,35
2	2,000	50,80			1,02	1,51	1,35	2,00	1,67	2,48	2,14	3,19	2,37	3,53	2,60	3,87
3	3,000	76,20					2,04	3,04	2,54	3,77	3,27	4,87	3,63	5,40	3,99	5,94
3 1 /	3,500	88,90					2,39	3,55	2,97	4,42	3,83	5,71	4,26	6,34	4,69	6,97
4	4,000	101,60					2,73	4,07	3,40	5,07	4,40	6,55	4,89	7,28	5,38	8,01

SEAMLESS STAINLESS STEEL TUBES ACCORDING TO BWG

Weight for austenitic stainless steel according Birmingham Wire Gauge - BWG For min wall acc. ASTM A 213 add 10%

BIRMINGHAM WIRE GAUGE WALL-THICKNESS BWG

Outside diameter			20		18		16		15		14		13		12		11		10	
			inch	mm	lb/ft	kg/m	lb/ft	kg/m	lb/ft	kg/m	lb/ft	kg/m	lb/ft	kg/m	lb/ft	kg/m	lb/ft	kg/m	lb/ft	kg/m
1/4	0,250	6,35	0,035	0,889	0,049	1,245	0,065	1,651	0,072	1,829	0,083	2,108	0,095	2,413	0,109	2,769	0,120	3,048	0,134	3,404
31/99	0,313	7,95	0,11	0,16	0,14	0,21	0,17	0,26												
3/8	0,375	9,53	0,13	0,19	0,17	0,26	0,22	0,33	0,24	0,35	0,26	0,39								
1/2	0,500	12,70	0,18	0,26	0,24	0,36	0,31	0,46	0,33	0,50	0,38	0,56	0,42	0,62	0,46	0,69	0,50	0,74		
5/8	0,625	15,88	0,22	0,33	0,31	0,46	0,40	0,59	0,43	0,64	0,49	0,73	0,55	0,81	0,61	0,91	0,66	0,98		
3/4	0,750	19,05	0,27	0,40	0,37	0,55	0,48	0,72	0,53	0,79	0,60	0,89	0,68	1,01	0,76	1,13	0,82	1,22	0,90	1,33
7/8	0,875	22,23			0,44	0,65	0,57	0,85	0,63	0,93	0,71	1,06	0,80	1,20	0,91	1,35	0,98	1,46	1,08	1,60
1	1,000	25,40			0,51	0,75	0,66	0,98	0,73	1,08	0,83	1,23	0,93	1,39	1,05	1,57	1,15	1,71	1,26	1,87
1 1/8	1,125	28,58			0,57	0,85	0,75	1,11	0,82	1,22	0,94	1,40	1,06	1,58	1,20	1,79	1,31	1,95	1,44	2,15
1 1/4	1,250	31,75			0,64	0,95	0,84	1,24	0,92	1,37	1,05	1,56	1,19	1,77	1,35	2,01	1,47	2,19	1,62	2,42
1 3/4	1,375	34,93			0,71	1,05	0,92	1,38	1,02	1,52	1,16	1,73	1,32	1,96	1,50	2,23	1,63	2,43	1,81	2,69
1 1/2	1,500	38,10			0,77	1,15	1,01	1,51	1,12	1,66	1,28	1,90	1,45	2,16	1,65	2,45	1,80	2,68	1,99	2,96
1 3/4	1,750	44,45			0,90	1,35	1,19	1,77	1,31	1,95	1,50	2,24	1,71	2,54	1,94	2,89	2,12	3,16	2,35	3,50
2	2,000	50,80			1,04	1,54	1,37	2,03	1,51	2,24	1,73	2,57	1,96	2,92	2,24	3,33	2,45	3,64	2,71	4,04
2 1/4	2,250	57,15			1,17	1,74	1,54	2,29	1,70	2,53	1,95	2,91	2,22	3,31	2,53	3,77	2,77	4,13	3,08	4,58
2 3/8	2,375	60,33			1,24	1,84	1,63	2,43	1,80	2,68	2,07	3,07	2,35	3,50	2,68	3,99	2,94	4,37	3,26	4,85
2 1/2	2,500	63,50			1,30	1,94	1,72	2,56	1,90	2,82	2,18	3,24	2,48	3,69	2,83	4,21	3,10	4,61	3,44	5,12
2 7/8	2,875	73,03			1,50	2,24	1,98	2,95	2,19	3,26	2,52	3,74	2,87	4,27	3,27	4,87	3,59	5,34	3,99	5,93
3	3,000	76,20					2,07	3,08	2,29	3,41	2,63	3,91	3,00	4,46	3,42	5,09	3,75	5,58	4,17	6,20
3 1/2	3,500	88,90					2,42	3,61	2,68	3,99	3,08	4,58	3,51	5,23	4,01	5,97	4,40	6,55	4,90	7,29
4	4,000	101,60					2,78	4,13	3,07	4,57	3,53	5,25	4,03	5,99	4,60	6,85	5,05	7,52	5,62	8,37