

## METRIC INSTRUMENTATION

Size	304/L	321	316/L
6 x 0.5	●	●	●
6 x 1	●	●	●
6 x 1.5	●	●	●
8 x 0.8	●	●	●
8 x 1	●	●	●
8 x 1.5	●	●	●
8 x 2	●	●	●
10 x 1	●	●	●
10 x 1.5	●	●	●
10 x 2	●	●	●
11 x 2	●	●	●
12 x 1	●	●	●
12 x 1.5	●	●	●
12 x 2	●	●	●
14 x 2	●	●	●
15 x 1	●	●	●
15 x 1.5	●	●	●
15 x 2	●	●	●
16 x 1	●	●	●
16 x 1.5	●	●	●
16 x 2	●	●	●
16 x 3	●	●	●

Tolerances and delivery to ASTM A269/A213. Bright annealed, hardness RB80 maximum. Lengths available: 5m-7m in randoms or fixed.

## METRIC HYDRAULIC/GENERAL TUBE

Size	304/L	321	316/L
18 x 1.5	●	●	●
18 x 2	●	●	●
20 x 1.5	●	●	●
20 x 2	●	●	●
20 x 2.5	●	●	●
20 x 3	●	●	●
22 x 1.5	●	●	●
22 x 2	●	●	●
25 x 1.5	●	●	●
25 x 2	●	●	●
25 x 2.5	●	●	●
25 x 3	●	●	●
28 x 1.5	●	●	●
28 x 2	●	●	●
30 x 1.5	●	●	●
30 x 3	●	●	●
35 x 2	●	●	●
38 x 3	●	●	●
38 x 4	●	●	●
38 x 5	●	●	●
42 x 2	●	●	●

Tolerances and delivery to ASTM A269/A213. Bright annealed. Lengths available: 5m-7m in randoms or fixed.

## HEAT EXCHANGER TUBE

OD Weight	mm	321	316/L
3/4" x 16 Bwg	(19.05 x 1.65)	●	●
3/4" x 14 Bwg	(19.05 x 2.11)	●	●
1" x 16 Bwg	(25.40 x 1.65)	●	●
1" x 14 Bwg	(25.40 x 2.11)	●	●

Seamless Stainless Steel Tube to ASTM A213. Cold finished, softened and descaled. In 12/13 metre random lengths supplied in average and minimum wall. Cut lengths available on request.

# TUBE & PIPING

## ASTM Standards and Tolerances (Latest Edition)

Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service  
Designation: A269/A269M – Latest Edition  
Tolerances to ASTM A1016

**TABLE 2 Permitted Variations in Wall Thickness <sup>A</sup>**  
Wall Thickness, %

Outside Diameter in. (mm)	0.095 [2.4] and Under		Over 0.095 to 0.150 [2.4 to 3.8], incl		Over 0.150 to 0.180 [3.8 to 4.6], incl		Over 0.180 [4.6]	
	Over	Under	Over	Under	Over	Under	Over	Under
<b>Seamless, Hot-Finished Tubes</b>								
4 [100] and under	40	0	35	0	33	0	28	0
Over 4 [100]	...	...	35	0	33	0	28	0
<b>Seamless, Cold-Finished Tubes</b>								
1 ½ [38.1] and under	20	0						
Over 1 ½ [38.1]	22	0						
<b>Welded Tubes</b>								
All sizes	18	0						

<sup>A</sup> These permitted variations in wall thickness apply only to tubes, except internal-upset tubes, as rolled or cold-finished, and before swaging, expanding, bending, polishing, or other fabricating operations.

**TABLE 3 Permitted Variations in Outside Diameter <sup>A</sup>**

Outside Diameter in. (mm)	Permitted Variations, in. [mm]	
	Over	Under
<b>Hot-Finished Seamless Tubes</b>		
4 [100] or under	1/64 [0.4]	1/32 [0.8]
Over 4 to 7 ½ [100 to 200], incl	1/64 [0.4]	3/64 [1.2]
Over 7 ½ to 9 [200 to 225], incl	1/64 [0.4]	1/16 [1.6]
<b>Welded Tubes and Cold-Finished Seamless Tubes</b>		
Under 1 [25]	0.004 [0.1]	0.004 [0.11]
1 to 1 ½ [25 to 40], incl	0.006 [0.15]	0.006 [0.15]
Over 1 ½ to 2 [40 to 50], excl	0.008 [0.2]	0.008 [0.2]
2 to 2 ½ [50 to 65], excl	0.010 [0.2]	0.010 [0.25]
2 ½ to 3 [65 to 75], excl	0.012 [0.3]	0.012 [0.3]
3 to 4 [75 to 100], incl	0.015 [0.38]	0.015 [0.38]
Over 4 to 7 ½ [100 to 200], incl	0.015 [0.38]	0.025 [0.64]
Over 7 ½ to 9 [200 to 225], incl	0.015 [0.38]	0.045 [1.14]

<sup>A</sup> Except as provided in 10.2 and 10.3, these permitted variations include out-of-roundness. These permitted variations in outside diameter apply to hot-finished seamless, welded and cold-finished seamless tubes before other fabricating operation such as upsetting, swaging, expanding, bending, or polishing.

Our UK facility is accredited with ISO certifications 9001, 14001, 18001 and AS9120, so you can be rest assured that the services provided are of the highest quality.

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