

EN10216-1 seamless steel tube

Seamless steel tube (SMLS) is formed by drawing a solid billet over a piercing rod to create the hollow shell, without welding or seam. It is suitable for bending and cutting. The advantage of seamless steel tube is the ability of with standing higher pressure.

EN10216-1 specification covers non-alloy seamless steel tube for pressure purpose with specified room temperature properties. It is mainly used as boiler water tube, smoke tube, firefighting pipeline, etc.



- Certificate: ISO
- Standard: EN10216-1, P235TR1 / P235TR2
- Length: 6m / 5.8m / 11.8m / 12m / 20ft, etc.
- End: Plain (square cut) / beveled to 30° / roll groove as ISO 6182-12 / BSPT thread as ISO 7-1 / NPT thread as ANSI B1.20.1
- Surface: Fusion bonded epoxy (FBE) / polyester resin / hot dip galvanized / red paint / black paint, etc.

Available size

Size			Thickness							Test pressure	Ref. No.
Inch	DN	OD (mm)	T (mm)	T (mm)	T (mm)	T (mm)	T (mm)	T (mm)	T (mm)	MPa	
1/2"	15	21.3	2.0	2.3	2.6	2.9	3.2	3.6	4.0	7.0	P1501
3/4"	20	26.9	2.0	2.3	2.6	2.9	3.2	3.6	4.0	7.0	P1502
1"	25	33.7	/	2.3	2.6	2.9	3.2	3.6	4.0	7.0	P1503
1-1/4"	32	42.4	/	/	2.6	2.9	3.2	3.6	4.0	7.0	P1504
1-1/2"	40	48.3	/	/	2.6	2.9	3.2	3.6	4.0	7.0	P1505
2"	50	60.3	/	/	/	2.9	3.2	3.6	4.0	7.0	P1506
2-1/2"	65	76.1	/	/	/	2.9	3.2	3.6	4.0	7.0	P1507
3"	80	88.9	/	/	/	/	3.2	3.6	4.0	7.0	P1508
4"	100	114.3	/	/	/	/	/	3.6	4.0	7.0	P1509
5"	125	139.7	/	/	/	/	/	/	4.0	7.0	P1510
6"	150	168.3	/	/	/	/	/	/	/	7.0	P1511
8"	200	219.1	/	/	/	/	/	/	/	7.0	P1512
10"	250	273.0	/	/	/	/	/	/	/	7.0	P1513
12"	300	323.9	/	/	/	/	/	/	/	7.0	P1514
14"	350	355.6	/	/	/	/	/	/	/	7.0	P1515
16"	400	406.4	/	/	/	/	/	/	/	7.0	P1516
18"	450	457	/	/	/	/	/	/	/	7.0	P1517
20"	500	508	/	/	/	/	/	/	/	7.0	P1518
24"	600	610	/	/	/	/	/	/	/	7.0	P1519

Note:

1. The thickness follow preferred dimensions of Table 7 of EN 10216-1.
2. The hydrostatic test shall be carried out at a test pressure of 70 bar or at a value P calculated by the formula, whichever is lower.

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Size			Thickness							Test pressure	Ref. No.
Inch	DN	OD (mm)	T (mm)	T (mm)	T (mm)	T (mm)	T (mm)	T (mm)	T (mm)	MPa	
1/2"	15	21.3	4.5	5.0	/	/	/	/	/	7.0	P1521
3/4"	20	26.9	4.5	5.0	5.6	6.3	7.1	8.0	/	7.0	P1522
1"	25	33.7	4.5	5.0	5.6	6.3	7.1	8.0	8.8	7.0	P1523
1-1/4"	32	42.4	4.5	5.0	5.6	6.3	7.1	8.0	8.8	7.0	P1524
1-1/2"	40	48.3	4.5	5.0	5.6	6.3	7.1	8.0	8.8	7.0	P1525
2"	50	60.3	4.5	5.0	5.6	6.3	7.1	8.0	8.8	7.0	P1526
2-1/2"	65	76.1	4.5	5.0	5.6	6.3	7.1	8.0	8.8	7.0	P1527
3"	80	88.9	4.5	5.0	5.6	6.3	7.1	8.0	8.8	7.0	P1528
4"	100	114.3	4.5	5.0	5.6	6.3	7.1	8.0	8.8	7.0	P1529
5"	125	139.7	4.5	5.0	5.6	6.3	7.1	8.0	8.8	7.0	P1530
6"	150	168.3	4.5	5.0	5.6	6.3	7.1	8.0	8.8	7.0	P1531
8"	200	219.1	/	/	/	6.3	7.1	8.0	8.8	7.0	P1532
10"	250	273.0	/	/	/	6.3	7.1	8.0	8.8	7.0	P1533
12"	300	323.9	/	/	/	/	7.1	8.0	8.8	7.0	P1534
14"	350	355.6	/	/	/	/	/	8.0	8.8	7.0	P1535
16"	400	406.4	/	/	/	/	/	/	8.8	7.0	P1536
18"	450	457	/	/	/	/	/	/	/	7.0	P1537
20"	500	508	/	/	/	/	/	/	/	7.0	P1538
24"	600	610	/	/	/	/	/	/	/	7.0	P1539

Available size

Size			Thickness							Test pressure	Ref. No.
Inch	DN	OD (mm)	T (mm)	T (mm)	T (mm)	T (mm)	T (mm)	T (mm)	T (mm)	MPa	
1/2"	15	21.3	/	/	/	/	/	/	/	7.0	P1541
3/4"	20	26.9	/	/	/	/	/	/	/	7.0	P1542
1"	25	33.7	/	/	/	/	/	/	/	7.0	P1543
1-1/4"	32	42.4	10.0	/	/	/	/	/	/	7.0	P1544
1-1/2"	40	48.3	10.0	11.0	12.5	/	/	/	/	7.0	P1545
2"	50	60.3	10.0	11.0	12.5	14.2	16.0	/	/	7.0	P1546
2-1/2"	65	76.1	10.0	11.0	12.5	14.2	16.0	17.5	20.0	7.0	P1547
3"	80	88.9	10.0	11.0	12.5	14.2	16.0	17.5	20.0	7.0	P1548
4"	100	114.3	10.0	11.0	12.5	14.2	16.0	17.5	20.0	7.0	P1549
5"	125	139.7	10.0	11.0	12.5	14.2	16.0	17.5	20.0	7.0	P1550
6"	150	168.3	10.0	11.0	12.5	14.2	16.0	17.5	20.0	7.0	P1551
8"	200	219.1	10.0	11.0	12.5	14.2	16.0	17.5	20.0	7.0	P1552
10"	250	273.0	10.0	11.0	12.5	14.2	16.0	17.5	20.0	7.0	P1553
12"	300	323.9	10.0	11.0	12.5	14.2	16.0	17.5	20.0	7.0	P1554
14"	350	355.6	10.0	11.0	12.5	14.2	16.0	17.5	20.0	7.0	P1555
16"	400	406.4	10.0	11.0	12.5	14.2	16.0	17.5	20.0	7.0	P1556
18"	450	457	10.0	11.0	12.5	14.2	16.0	17.5	20.0	7.0	P1557
20"	500	508	/	11.0	12.5	14.2	16.0	17.5	20.0	7.0	P1558
24"	600	610	/	/	12.5	14.2	16.0	17.5	20.0	7.0	P1559

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Chemical compositions (%) and Mechanical properties

Grade	C	Si	Mn	P	S	Cr	Mo	Ni	Al	Others
P235TR1	≤ 0.16	≤ 0.35	≤ 1.20	≤ 0.025	≤ 0.020	≤ 0.30	≤ 0.08	≤ 0.30	-	...
P235TR2	≤ 0.16	≤ 0.35	≤ 1.20	≤ 0.025	≤ 0.015	≤ 0.30	≤ 0.08	≤ 0.30	≥ 0.02	...
Grade	Tensile strength (Mpa)		Upper yield strength, (Mpa)		Longitudinal elongation (%)		Longitudinal Impact properties at 0°C (KV ₂ J)			
P235TR1	360-500		≥ 235 / 225		≥ 25		-			
P235TR2	360-500		≥ 235 / 225		≥ 25		27			

* For Thickness T ≤ 16mm, the min upper yield strength is 235 MPa; for 16 < T ≤ 40, the min upper yield strength is 225 MPa.



Leak tightness test and electromagnetic test

- Each tube (before threading, if applicable) shall be tested for leak-tightness.
- The hydraulic test shall be applied at a pressure of 70 bar or at a pressure P calculated using the following equation, whichever is lower.
- The test pressure shall be held for not less than 5s for tubes with OD ≤ 457mm, and for not less than 10 s for OD > 457mm.
- An electro-magnetic test is alternative in accordance with EN 10246-1, including eddy current method, or flux leakage method.

Note: The equation of hydrostatic test pressure: $P = 20St/D$. P = Hydrostatic test pressure in bar. S = Tube wall stress in MPa, 70% of the minimum yield strength. t = Tube wall thickness in mm. D = Tube outside diameter in mm.



Other tests

- Tensile test. Impact test on the tube body for quality TR2 tube.
- Dimensional inspection: outer diameter, thickness, length.
- Straightness: The deviation of any tube length L shall not exceed 0.0015 L. Deviations over any one metre length shall not exceed 3 mm.
- Ovality (out of roundness): Out of roundness is included in the OD tolerance and eccentricity is included in the THS tolerance.
- Visual examination / coating test.
- Quantity and weight measurement.