

EN 10216-1 seamless steel tube

EN 10216-1 seamless steel tube from TPMC is manufactured by piercing solid billets using the advanced PQF process, ensuring a uniform, seamless structure with exceptional strength and reliability. Designed for pressure applications, the tube is ideal for welding or threading and suitable for conveying fluids such as water, gas, and air at room temperature.



- Certificate: ISO
- Standard: EN 10216-1 P235TR1/P235TR2
- Length: 6m / 5.8m / 11.8m / 12m / 20ft, etc.
- End: Plain: square cut
Beveled: 30° angle (+5°/-0°)
Roll/cut-grooved: per ISO 6182-12
Threaded (NPT): per ASME B1.20.1
Threaded (BSPT): per ISO 7-1 / BS 21
- Surface: FBE / polyester resin powder
Water-based red or black paint
Hot-dip galvanized / duplex coating
Plastic lining (PE, UPVC, etc.)

Available sizes for Medium series tube

Outside diameter			Wall thickness		Weight	Test pressure	Ref. No.
NPS	DN	OD (mm)	Preferred range	Selected T (mm)	kg/m	MPa	
1/2"	15	21.3	2.0 ~ 5.0	2.6	1.20	7.0	P2701-M (ISO)
3/4"	20	26.9	2.0 ~ 8.0	2.6	1.56	7.0	P2702-M (ISO)
1"	25	33.7	2.3 ~ 8.8	3.2	2.41	7.0	P2703-M (ISO)
1-1/4"	32	42.4	2.6 ~ 10.0	3.2	3.09	7.0	P2704-M (ISO)
1-1/2"	40	48.3	2.6 ~ 12.5	3.2	3.56	7.0	P2705-M (ISO)
2"	50	60.3	2.9 ~ 16.0	3.6	5.03	7.0	P2706-M (ISO)
2-1/2"	65	76.1	2.9 ~ 20.0	3.6	6.44	7.0	P2707-M (ISO)
3"	80	88.9	3.2 ~ 25.0	4.0	8.38	7.0	P2708-M (ISO)
4"	100	114.3	3.6 ~ 32.0	4.5	12.19	7.0	P2709-M (ISO)
5"	125	139.7	4.0 ~ 40.0	5.0	16.61	7.0	P2710-M (ISO)
6"	150	168.3	4.5 ~ 50.0	5.0	20.14	7.0	P2712-M (ISO)
8"	200	219.1	6.3 ~ 70.0	5.6	29.49	7.0	P2713-M (ISO)
10"	250	273.0	6.3 ~ 80.0	5.6	36.93	6.7	P2714-M (ISO)

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Available sizes for Medium series tube

Outside diameter			Wall thickness		Weight	Test pressure	Ref. No.
NPS	DN	OD (mm)	Preferred range	Selected T (mm)	kg/m	MPa	
12"	300	323.9	7.1 ~ 100.0	5.6	43.96	5.7	P2715-M (ISO)
14"	350	355.6	8.0 ~ 100.0	6.3	54.27	5.8	P2716-M (ISO)
16"	400	406.4	8.8 ~ 100.0	6.3	62.16	5.1	P2717-M (ISO)
18"	450	457.0	10.0 ~ 100.0	6.3	70.02	4.5	P2718-M (ISO)
20"	500	508.0	11.0 ~ 100.0	6.3	77.95	4.1	P2719-M (ISO)
24"	600	610.0	12.5 ~ 100.0	6.3	93.80	3.4	P2720-M (ISO)

Note:

- Dimensions follow preferred sizes in Table 7 of EN 10216-1:2013. TPMC selects one practical wall thickness per application, with reference to EN 10255 Medium series and ASME B36.10 SCH10.
- Hydrostatic leak tightness test is performed at the lower of 70 bar or $P = 20ST/D$, where S is the stress corresponding to 70% of the specified minimum yield strength (TPMC calculates it with P235TR1 grade).

Available sizes for Heavy series tube

Outside diameter			Wall thickness		Weight	Test pressure	Ref. No.
NPS	DN	OD (mm)	Preferred range	Selected T (mm)	kg/m	MPa	
1/2"	15	21.3	2.0 ~ 5.0	2.6	1.20	7.0	P2701-H (ISO)
3/4"	20	26.9	2.0 ~ 8.0	2.6	1.56	7.0	P2702-H (ISO)
1"	25	33.7	2.3 ~ 8.8	4.0	2.93	7.0	P2703-H (ISO)
1-1/4"	32	42.4	2.6 ~ 10.0	4.0	3.79	7.0	P2704-H (ISO)
1-1/2"	40	48.3	2.6 ~ 12.5	4.0	4.37	7.0	P2705-H (ISO)
2"	50	60.3	2.9 ~ 16.0	4.5	6.19	7.0	P2706-H (ISO)
2-1/2"	65	76.1	2.9 ~ 20.0	4.5	7.95	7.0	P2707-H (ISO)
3"	80	88.9	3.2 ~ 25.0	5.0	10.35	7.0	P2708-H (ISO)
4"	100	114.3	3.6 ~ 32.0	5.4	14.50	7.0	P2709-H (ISO)
5"	125	139.7	4.0 ~ 40.0	5.4	17.89	7.0	P2710-H (ISO)
6"	150	168.3	4.5 ~ 50.0	7.1	28.23	7.0	P2712-H (ISO)
8"	200	219.1	6.3 ~ 70.0	8.0	41.65	7.0	P2713-H (ISO)
10"	250	273.0	6.3 ~ 80.0	8.8	57.34	7.0	P2714-H (ISO)
12"	300	323.9	7.1 ~ 100.0	10.0	77.41	7.0	P2715-H (ISO)
14"	350	355.6	8.0 ~ 100.0	11.0	93.48	7.0	P2716-H (ISO)
16"	400	406.4	8.8 ~ 100.0	12.5	121.43	7.0	P2717-H (ISO)
18"	450	457.0	10.0 ~ 100.0	14.2	155.07	7.0	P2718-H (ISO)
20"	500	508.0	11.0 ~ 100.0	16.0	194.14	7.0	P2719-H (ISO)
24"	600	610.0	12.5 ~ 100.0	17.5	255.71	7.0	P2720-H (ISO)

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Note:

1. Dimensions follow preferred sizes in Table 7 of EN 10216-1:2013. TPMC selects one practical wall thickness per application, with reference to EN 10255 Heavy series and ASME B36.10 SCH40.
2. Hydrostatic leak tightness test is performed at the lower of 70 bar or $P = 20ST/D$, where S is the stress corresponding to 70% of the specified minimum yield strength (TPMC calculates it with P235TR1 grade).

Chemical composition (%) per EN 10216-1 P235TR1 and P235TR2

Grade	C	Si	Mn	P	S	Al	Cr+Cu+Mo+Ni
P235TR1	≤ 0.16	≤ 0.35	≤ 1.20	≤ 0.025	≤ 0.020	-	≤ 0.70
P235TR2	≤ 0.16	≤ 0.35	≤ 1.20	≤ 0.025	≤ 0.015	≥ 0.02	≤ 0.70

Note:

1. Elements not listed shall not be intentionally added without purchaser agreement. Measures shall be taken to prevent undesirable elements from scrap or other materials.
2. For TR1/TR2 with non-specific inspection, elements like Cr, Mo, Ni, Cu, Nb, Ti, V, and Cr+Cu+Mo+Ni need not be reported unless intentionally added.
3. For TR2: Aluminum ≥ 0.02 %; exceptions apply if Al/N ≥ 2 with nitrogen fixed by Nb/Ti/V (details reported). When using Ti, verify $(Al + Ti/2) \geq 0.020$ %.

Mechanical properties per EN 10216-1 P235TR1 and P235TR2

Grade	Upper yield strength ReH (MPa)	Tensile strength Rm (MPa)	Longitudinal elongation A (%)	Longitudinal impact properties KV ₂ (J)
P235TR1	≥ 235 (T ≤ 16 mm) ≥ 225 (16 < T ≤ 40 mm)	360 ~ 500	≥ 25	/
P235TR2	≥ 235 (T ≤ 16 mm) ≥ 225 (16 < T ≤ 40 mm)	360 ~ 500	≥ 25	≥ 40, at 0°C

Note:

1. TR1 quality tubes do not fulfil the essential safety requirements of EU Directive 2014/68/EU (PED) for pressure equipment.
2. TR2 quality tubes are designed to support PED essential requirements with specified room-temperature properties and mandatory impact testing (typically 0°C). For PED Categories II, III, and IV, TR2 grades require specific inspection and testing (e.g., EN 10204 3.1/3.2 certification).

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Standard requirements

- Delivery condition: As formed/normalized (TR1); normalized mandatory (TR2).
- Chemical analysis: Cast (ladle) analysis; TR2 requires minimum 0.02% total aluminum.
- Tensile test: Tensile, yield, and elongation tested per standard.
- Impact testing: Charpy V-notch at 0°C, mandatory only for TR2.
- Flattening test: Not required.



Leak tightness test

- Each tube is hydrostatically tested by default at the lower of 70 bar or $P = 20ST/D$.
- Pressure held ≥ 5 s ($D \leq 457$ mm) or ≥ 10 s ($D > 457$ mm); no leakage or visible deformation.
- At manufacturer's discretion, an electromagnetic test is alternative per EN ISO 10893-1 (eddy current or flux leakage).

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Hydrostatic test pressure formula

- The test pressure is the lower of 70 bar or the calculated value
 $P = 20ST/D$, whichever is lower.
- Where:
- P = Minimum hydrostatic test pressure (bar).
- S = Pipe wall stress = 70% of the specified minimum yield strength (MPa).
- T = Specified wall thickness (mm).
- D = Specified outside diameter (mm).



Dimensional tolerances

- Outside diameter: $\pm 1\%$ or ± 0.5 mm (greater).
- Wall thickness: $D \leq 219.1$ mm: 12.5% or ± 0.4 mm (greater);
 $D > 219.1$ mm: varies by T/D ratio.
- Cut length: if length 6 m, $+10/-0$ mm.
- Weight: Not separately stated. (agreed tolerances may apply).



Other quality assurance

- Straightness: $\leq 0.0015 \times L$ (over full length); ≤ 3 mm over any 1 m.
- Out-of-roundness: included in the OD tolerance.
- Coating inspection: DFT and adhesion (see TPMC PA11-PA51).
- Marking: Legibly marked per standard (see TPMC PA71).
- Packaging: End protection, bundling, and shipping marks (see TPMC PA81).
- Test certificate: Issued by TPMC with full traceability to MTC/MTR.