

ASTM A106 seamless carbon steel pipe

ASTM A106 seamless carbon steel pipe from TPMC is engineered for high-temperature and high-pressure service. Manufactured using the advanced PQF process, it begins with killed steel solid billets pierced to form a uniform, seamless structure, delivering superior strength and reliability in sustained elevated temperatures thanks to enhanced heat resistance and creep properties.

Our TPMC pipe is widely used in power plants, refineries, petrochemical plants, high-pressure steam/heat transfer systems, and general process piping at elevated temperatures and pressures.



- Certificate: ISO
- Standard: ASTM A106 Grade B
- Length: 6m / 5.8m / 11.8m / 12m / 20ft, etc.
- End: Plain: square cut
Beveled: 37.5° angle per ASME B16.25
Roll/cut-grooved: per AWWA C606
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 Schedule 40 pipe

Outside diameter			Wall thickness		Weight	Test pressure	Ref. No.
NPS	DN	OD (mm)	Schedule No.	T (mm)	kg/m	MPa, min	
1/4"	8	13.7	SCH40 (STD)	2.24	0.63	17.0	P2301-SCH40 (ISO)
3/8"	10	17.1	SCH40 (STD)	2.31	0.84	17.0	P2302-SCH40 (ISO)
1/2"	15	21.3	SCH40 (STD)	2.77	1.27	17.0	P2303-SCH40 (ISO)
3/4"	20	26.7	SCH40 (STD)	2.87	1.69	17.0	P2304-SCH40 (ISO)
1"	25	33.4	SCH40 (STD)	3.38	2.50	17.0	P2305-SCH40 (ISO)
1-1/4"	32	42.2	SCH40 (STD)	3.56	3.39	17.0	P2306-SCH40 (ISO)
1-1/2"	40	48.3	SCH40 (STD)	3.68	4.05	17.0	P2307-SCH40 (ISO)
2"	50	60.3	SCH40 (STD)	3.91	5.44	17.0	P2308-SCH40 (ISO)
2-1/2"	65	73.0	SCH40 (STD)	5.16	8.63	17.0	P2309-SCH40 (ISO)
3"	80	88.9	SCH40 (STD)	5.49	11.29	17.0	P2310-SCH40 (ISO)
3-1/2"	90	101.6	SCH40 (STD)	5.74	13.57	16.0	P2311-SCH40 (ISO)
4"	100	114.3	SCH40 (STD)	6.02	16.08	15.0	P2312-SCH40 (ISO)
5"	125	141.3	SCH40 (STD)	6.55	21.77	14.0	P2313-SCH40 (ISO)

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Outside diameter			Wall thickness		Weight	Test pressure	Ref. No.
NPS	DN	OD (mm)	Schedule No.	T (mm)	kg/m	MPa, min	
6"	150	168.3	SCH40 (STD)	7.11	28.26	12.0	P2314-SCH40 (ISO)
8"	200	219.1	SCH40 (STD)	8.18	42.55	11.0	P2315-SCH40 (ISO)
10"	250	273.0	SCH40 (STD)	9.27	60.29	10.0	P2316-SCH40 (ISO)
12"	300	323.8	SCH40	10.31	79.71	9.0	P2317-SCH40 (ISO)
14"	350	355.6	SCH40	11.13	94.55	9.0	P2318-SCH40 (ISO)
16"	400	406.4	SCH40	12.70	123.31	9.0	P2319-SCH40 (ISO)
18"	450	457.2	SCH40	14.27	155.88	9.0	P2320-SCH40 (ISO)
20"	500	508.0	SCH40	15.09	183.43	9.0	P2321-SCH40 (ISO)
24"	600	609.6	SCH40	17.48	255.25	8.0	P2322-SCH40 (ISO)

Available sizes for Schedule 80 pipe

Outside diameter			Wall thickness		Weight	Test pressure	Ref. No.
NPS	DN	OD (mm)	Schedule No.	T (mm)	kg/m	MPa, min	
1/4"	8	13.7	SCH80 (XS)	3.02	0.80	17.0	P2301-SCH80 (ISO)
3/8"	10	17.1	SCH80 (XS)	3.20	1.10	17.0	P2302-SCH80 (ISO)
1/2"	15	21.3	SCH80 (XS)	3.73	1.62	17.0	P2303-SCH80 (ISO)
3/4"	20	26.7	SCH80 (XS)	3.91	2.20	17.0	P2304-SCH80 (ISO)
1"	25	33.4	SCH80 (XS)	4.55	3.24	17.0	P2305-SCH80 (ISO)
1-1/4"	32	42.2	SCH80 (XS)	4.85	4.47	17.0	P2306-SCH80 (ISO)
1-1/2"	40	48.3	SCH80 (XS)	5.08	5.41	17.0	P2307-SCH80 (ISO)
2"	50	60.3	SCH80 (XS)	5.54	7.48	17.0	P2308-SCH80 (ISO)
2-1/2"	65	73.0	SCH80 (XS)	7.01	11.41	17.0	P2309-SCH80 (ISO)
3"	80	88.9	SCH80 (XS)	7.62	15.27	17.0	P2310-SCH80 (ISO)
3-1/2"	90	101.6	SCH80 (XS)	8.08	18.64	19.0	P2311-SCH80 (ISO)
4"	100	114.3	SCH80 (XS)	8.56	22.32	19.0	P2312-SCH80 (ISO)
5"	125	141.3	SCH80 (XS)	9.52	30.94	19.0	P2313-SCH80 (ISO)
6"	150	168.3	SCH80 (XS)	10.97	42.56	19.0	P2314-SCH80 (ISO)
8"	200	219.1	SCH80	12.70	64.64	17.0	P2315-SCH80 (ISO)
10"	250	273.0	SCH80	15.09	95.98	16.0	P2316-SCH80 (ISO)
12"	300	323.8	SCH80	17.48	132.05	16.0	P2317-SCH80 (ISO)
14"	350	355.6	SCH80	19.05	158.11	15.0	P2318-SCH80 (ISO)
16"	400	406.4	SCH80	21.44	203.54	15.0	P2319-SCH80 (ISO)
18"	450	457.2	SCH80	23.83	254.68	15.0	P2320-SCH80 (ISO)
20"	500	508.0	SCH80	26.19	311.19	15.0	P2321-SCH80 (ISO)
24"	600	609.6	SCH80	30.96	441.80	15.0	P2322-SCH80 (ISO)

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Available sizes for Schedule 160 pipe

Outside diameter			Wall thickness		Weight	Test pressure	Ref. No.
NPS	DN	OD (mm)	Schedule No.	T (mm)	kg/m	MPa, min	
1/4"	8	13.7	SCH160	3.68	0.91	17.0	P2301-SCH160 (ISO)
3/8"	10	17.1	SCH160	4.01	1.29	17.0	P2302-SCH160 (ISO)
1/2"	15	21.3	SCH160	4.78	1.95	17.0	P2303-SCH160 (ISO)
3/4"	20	26.7	SCH160	5.56	2.90	17.0	P2304-SCH160 (ISO)
1"	25	33.4	SCH160	6.35	4.24	17.0	P2305-SCH160 (ISO)
1-1/4"	32	42.2	SCH160	6.35	5.61	17.0	P2306-SCH160 (ISO)
1-1/2"	40	48.3	SCH160	7.14	7.25	17.0	P2307-SCH160 (ISO)
2"	50	60.3	SCH160	8.74	11.11	17.0	P2308-SCH160 (ISO)
2-1/2"	65	73.0	SCH160	9.52	14.90	17.0	P2309-SCH160 (ISO)
3"	80	88.9	SCH160	11.13	21.35	17.0	P2310-SCH160 (ISO)
4"	100	114.3	SCH160	13.49	33.54	19.0	P2312-SCH160 (ISO)
5"	125	141.3	SCH160	15.88	49.12	19.0	P2313-SCH160 (ISO)
6"	150	168.3	SCH160	18.26	67.57	19.0	P2314-SCH160 (ISO)
8"	200	219.1	SCH160	23.01	111.27	19.0	P2315-SCH160 (ISO)
10"	250	273.0	SCH160	28.58	172.27	19.0	P2316-SCH160 (ISO)
12"	300	323.8	SCH160	33.32	238.69	19.0	P2317-SCH160 (ISO)
14"	350	355.6	SCH160	35.71	281.72	19.0	P2318-SCH160 (ISO)
16"	400	406.4	SCH160	40.49	365.38	19.0	P2319-SCH160 (ISO)
18"	450	457.2	SCH160	45.24	459.62	19.0	P2320-SCH160 (ISO)
20"	500	508.0	SCH160	50.01	564.85	19.0	P2321-SCH160 (ISO)
24"	600	609.6	SCH160	59.54	807.68	19.0	P2322-SCH160 (ISO)

Available sizes for standard (STD) pipe

Outside diameter			Wall thickness		Weight	Test pressure	Ref. No.
NPS	DN	OD (mm)	Schedule No.	T (mm)	kg/m	MPa, min	
12"	300	323.8	STD	9.52	73.79	9.0	P2317-STD (ISO)
14"	350	355.6	STD	9.52	81.25	8.0	P2318-STD (ISO)
16"	400	406.4	STD	9.52	93.18	7.0	P2319-STD (ISO)
18"	450	457.0	STD	9.52	105.06	6.0	P2320-STD (ISO)
20"	500	508.0	STD	9.52	117.03	5.5	P2321-STD (ISO)
24"	600	610.0	STD	9.52	140.98	4.5	P2322-STD (ISO)

Note: STD and SCH40 are identical for wall thickness up to NPS 10". For sizes larger than NPS 10", STD has a fixed wall thickness of 3/8" (9.52 mm).

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Available sizes for extra-strong (XS) pipe

Outside diameter			Wall thickness		Weight	Test pressure	Ref. No.
NPS	DN	OD (mm)	Schedule No.	T (mm)	kg/m	MPa, min	
10"	250	273.0	XS	12.70	81.53	13.0	P2316-XS (ISO)
12"	300	323.8	XS	12.70	97.44	11.0	P2317-XS (ISO)
14"	350	355.6	XS	12.70	107.40	10.0	P2318-XS (ISO)
16"	400	406.4	XS	12.70	123.31	9.0	P2319-XS (ISO)
18"	450	457.0	XS	12.70	139.16	8.0	P2320-XS (ISO)
20"	500	508.0	XS	12.70	155.13	7.0	P2321-XS (ISO)
24"	600	610.0	XS	12.70	187.07	6.0	P2322-XS (ISO)

Note: XS and SCH80 are identical for wall thickness up to NPS 8". For sizes larger than NPS 8", XS has a fixed wall thickness of 1/2" (12.70 mm).

Available sizes for double extra-strong (XXS) pipe

Outside diameter			Wall thickness		Weight	Test pressure	Ref. No.
NPS	DN	OD (mm)	Schedule No.	T (mm)	kg/m	MPa, min	
1/4"	8	13.7	XXS	6.05	1.14	17.0	P2301-XXS (ISO)
3/8"	10	17.1	XXS	6.40	1.69	17.0	P2302-XXS (ISO)
1/2"	15	21.3	XXS	7.47	2.55	17.0	P2303-XXS (ISO)
3/4"	20	26.7	XXS	7.82	3.64	17.0	P2304-XXS (ISO)
1"	25	33.4	XXS	9.09	5.45	17.0	P2305-XXS (ISO)
1-1/4"	32	42.2	XXS	9.70	7.77	17.0	P2306-XXS (ISO)
1-1/2"	40	48.3	XXS	10.16	9.56	17.0	P2307-XXS (ISO)
2"	50	60.3	XXS	11.07	13.44	17.0	P2308-XXS (ISO)
2-1/2"	65	73.0	XXS	14.02	20.39	17.0	P2309-XXS (ISO)
3"	80	88.9	XXS	15.24	27.68	17.0	P2310-XXS (ISO)
4"	100	114.3	XXS	17.12	41.03	19.0	P2312-XXS (ISO)
5"	125	141.3	XXS	19.05	57.43	19.0	P2313-XXS (ISO)
6"	150	168.3	XXS	21.95	79.22	19.0	P2314-XXS (ISO)
8"	200	219.1	XXS	22.22	107.89	19.0	P2315-XXS (ISO)
10"	250	273.0	XXS	25.40	155.10	19.0	P2316-XXS (ISO)
12"	300	323.8	XXS	25.40	186.92	19.0	P2317-XXS (ISO)

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Chemical composition (%) per ASTM A106 Grade B

C	Mn	P	S	Si	Cr	Cu	Mo	Ni	V
≤ 0.30	0.29 ~ 1.06	≤ 0.035	≤ 0.035	≥ 0.1	≤ 0.40	≤ 0.40	≤ 0.15	≤ 0.40	≤ 0.08

Note:

1. Carbon-Manganese adjustment: Unless otherwise specified by the purchaser, for each reduction of 0.01% below the specified carbon maximum, an increase of 0.06% manganese above the specified maximum is permitted, up to a maximum of 1.65%.
2. Residual elements limit: The combined content of Cr, Cu, Mo, Ni, and V shall not exceed 1.00%.

Mechanical properties per ASTM A106 Grade B

Tensile strength	Yield strength	Longitudinal elongation
≥ 60000 psi (415 MPa)	≥ 35000 psi (240 MPa)	20% ~ 30%

Note: Elongation conforms to the formula in Table 2 of ASTM A106-2018. As a reference, TPMC's typical longitudinal elongation values are ≥ 20 ~ 30%, meeting or exceeding the standard's requirements for all specified wall thicknesses.



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Standard requirements

- Heat treatment: Cold-drawn pipe shall be heat treated after the final cold draw pass at a temperature of 1200°F (650°C) or higher.
- Heat analysis: Chemical composition verified by heat analysis.
- Tensile test: Tensile, yield, and elongation tested per standard.
- Bending test: NPS ≤ 2", cold bent 90° around a 12 x OD mandrel, no cracks.
- Flattening test: Although not required for seamless pipe, pipe shall be capable of meeting flattening test requirements.



Hydrostatic test

- Each pipe is subjected to a hydrostatic test at the calculated minimum pressure (per ASTM A530), held for at least 5 seconds with no leakage.
- Test pressures meet specification minimums but do not exceed 2500 psi (17.0 MPa) for NPS ≤ 3" and 2800 psi (19.0 MPa) for larger sizes.



Hydrostatic test pressure formula

- The minimum hydrostatic test pressure is calculated using the formula

$$P = 2St/D$$

Where:

P = Minimum hydrostatic test pressure (psi or MPa).

S = Pipe wall stress = 60% of the specified minimum yield strength (psi or MPa).

t = Specified wall thickness (inch or mm).

D = Specified outside diameter (inch or mm).

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Nondestructive electric test (NDE)

- As an alternative to hydrostatic testing (when permitted), nondestructive electric test (NDE) may be performed for full-body inspection in accordance with any of the following Practices:

ASTM E213 (ultrasonic),
ASTM E309 (eddy current),
ASTM E570 (flux leakage).



Dimensional tolerances

- Outside diameter: $\pm 1/64$ " for NPS $\leq 1-1/2$ ", $\pm 1/32$ " for NPS 2" to 4", $+1/16$ " / $-1/32$ " for NPS 5" to 8", $+3/32$ " / $-1/32$ " for NPS 10" to 18", $+1/8$ " / $-1/32$ " for NPS 20" to 24".
- Wall thickness: Minimum at any point not more than 12.5% under nominal (no upper limit).
- Cut length: $+1/4$ " (6.4 mm) / -0 " per ASTM A530 (for specified length).
- Weight: $+10\%$ / -3.5% ; measured per bundle for NPS ≤ 4 ", per individual length for NPS > 4 ".



Other quality assurance

- Straightness: Reasonably straight.
- 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.