Pipe Schedule Chart

NPS ⅛ to 24 inch and DN: outside diameter, wall thickness by schedule, inside diameter and mass per length

For: Pipe fitters, piping and process engineers, welders, plumbers and estimators

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KEY RELATIONSHIP
From NPS 14 up, NPS = outside diameter in inches. Below that, OD is fixed for each NPS and the schedule sets the wall

FORMULA
ID = OD − 2 × wall; mass (lb/ft) = 10.69 × (OD − wall) × wall

REVERSE
Wall = (OD − ID) ÷ 2

WORKED EXAMPLE
NPS 2 Sch 40: 2.375 − 2 × 0.154 = 2.067 in ID, 3.66 lb/ft

Inches as published (3 decimals); millimetres are inches × 25.4. Mass is plain-end carbon steel; stainless is about 2% heavier.

Wall thickness by schedule (inches)

STD = Sch 40 up to NPS 10, then 0.375 in. XS = Sch 80 up to NPS 8, then 0.500 in.

NPS	DN	OD (in)	Sch 5	Sch 10	Sch 40	STD	Sch 80	XS	Sch 160	XXS
1/8	6	0.405	0.035	0.049	0.068	0.068	0.095	0.095	—	—
1/4	8	0.540	0.049	0.065	0.088	0.088	0.119	0.119	—	—
3/8	10	0.675	0.049	0.065	0.091	0.091	0.126	0.126	—	—
1/2	15	0.840	0.065	0.083	0.109	0.109	0.147	0.147	0.188	0.294
3/4	20	1.050	0.065	0.083	0.113	0.113	0.154	0.154	0.219	0.308
1	25	1.315	0.065	0.109	0.133	0.133	0.179	0.179	0.250	0.358
1 1/4	32	1.660	0.065	0.109	0.140	0.140	0.191	0.191	0.250	0.382
1 1/2	40	1.900	0.065	0.109	0.145	0.145	0.200	0.200	0.281	0.400
2	50	2.375	0.065	0.109	0.154	0.154	0.218	0.218	0.344	0.436
2 1/2	65	2.875	0.083	0.120	0.203	0.203	0.276	0.276	0.375	0.552
3	80	3.500	0.083	0.120	0.216	0.216	0.300	0.300	0.438	0.600
3 1/2	90	4.000	0.083	0.120	0.226	0.226	0.318	0.318	—	0.636
4	100	4.500	0.083	0.120	0.237	0.237	0.337	0.337	0.531	0.674
5	125	5.563	0.109	0.134	0.258	0.258	0.375	0.375	0.625	0.750
6	150	6.625	0.109	0.134	0.280	0.280	0.432	0.432	0.719	0.864
8	200	8.625	0.109	0.148	0.322	0.322	0.500	0.500	0.906	0.875
10	250	10.750	0.134	0.165	0.365	0.365	0.594	0.500	1.125	—
12	300	12.750	0.156	0.180	0.406	0.375	0.688	0.500	1.312	—
14	350	14.000	0.156	0.250	0.438	0.375	0.750	0.500	1.406	—
16	400	16.000	0.165	0.250	0.500	0.375	0.844	0.500	1.594	—
18	450	18.000	0.165	0.250	0.562	0.375	0.938	0.500	1.781	—
20	500	20.000	0.188	0.250	0.594	0.375	1.031	0.500	1.969	—
24	600	24.000	0.218	0.250	0.688	0.375	1.219	0.500	2.344	—

Wall thickness by schedule (millimetres)

NPS	DN	OD (mm)	Sch 5	Sch 10	Sch 40	Sch 80	Sch 160	XXS
1/8	6	10.3	0.89	1.24	1.73	2.41	—	—
1/4	8	13.7	1.24	1.65	2.24	3.02	—	—
3/8	10	17.1	1.24	1.65	2.31	3.20	—	—
1/2	15	21.3	1.65	2.11	2.77	3.73	4.78	7.47
3/4	20	26.7	1.65	2.11	2.87	3.91	5.56	7.82
1	25	33.4	1.65	2.77	3.38	4.55	6.35	9.09

NPS	DN	OD (mm)	Sch 5	Sch 10	Sch 40	Sch 80	Sch 160	XXS
1 1/4	32	42.2	1.65	2.77	3.56	4.85	6.35	9.70
1 1/2	40	48.3	1.65	2.77	3.68	5.08	7.14	10.16
2	50	60.3	1.65	2.77	3.91	5.54	8.74	11.07
2 1/2	65	73.0	2.11	3.05	5.16	7.01	9.52	14.02
3	80	88.9	2.11	3.05	5.49	7.62	11.13	15.24
3 1/2	90	101.6	2.11	3.05	5.74	8.08	—	16.15
4	100	114.3	2.11	3.05	6.02	8.56	13.49	17.12
5	125	141.3	2.77	3.40	6.55	9.52	15.88	19.05
6	150	168.3	2.77	3.40	7.11	10.97	18.26	21.95
8	200	219.1	2.77	3.76	8.18	12.70	23.01	22.22
10	250	273.1	3.40	4.19	9.27	15.09	28.58	—
12	300	323.8	3.96	4.57	10.31	17.48	33.32	—
14	350	355.6	3.96	6.35	11.13	19.05	35.71	—
16	400	406.4	4.19	6.35	12.70	21.44	40.49	—
18	450	457.2	4.19	6.35	14.27	23.83	45.24	—
20	500	508.0	4.78	6.35	15.09	26.19	50.01	—
24	600	609.6	5.54	6.35	17.48	30.96	59.54	—

Schedule 40 pipe: inside diameter, flow area and mass

NPS	DN	OD (in)	Wall (in)	ID (in)	ID (mm)	Flow area (in²)	lb/ft	kg/m
1/8	6	0.405	0.068	0.269	6.8	0.057	0.24	0.36
1/4	8	0.540	0.088	0.364	9.2	0.104	0.43	0.63
3/8	10	0.675	0.091	0.493	12.5	0.191	0.57	0.85
1/2	15	0.840	0.109	0.622	15.8	0.304	0.85	1.27
3/4	20	1.050	0.113	0.824	20.9	0.533	1.13	1.68
1	25	1.315	0.133	1.049	26.6	0.864	1.68	2.50
1 1/4	32	1.660	0.140	1.380	35.1	1.496	2.27	3.39
1 1/2	40	1.900	0.145	1.610	40.9	2.036	2.72	4.05
2	50	2.375	0.154	2.067	52.5	3.356	3.66	5.44
2 1/2	65	2.875	0.203	2.469	62.7	4.788	5.80	8.63
3	80	3.500	0.216	3.068	77.9	7.393	7.58	11.29
3 1/2	90	4.000	0.226	3.548	90.1	9.887	9.12	13.57
4	100	4.500	0.237	4.026	102.3	12.730	10.80	16.07
5	125	5.563	0.258	5.047	128.2	20.006	14.63	21.78
6	150	6.625	0.280	6.065	154.1	28.890	18.99	28.27
8	200	8.625	0.322	7.981	202.7	50.027	28.58	42.54
10	250	10.750	0.365	10.020	254.5	78.854	40.52	60.31
12	300	12.750	0.406	11.938	303.2	111.932	53.57	79.74
14	350	14.000	0.438	13.124	333.3	135.276	63.50	94.51
16	400	16.000	0.500	15.000	381.0	176.715	82.85	123.31
18	450	18.000	0.562	16.876	428.7	223.681	104.76	155.93
20	500	20.000	0.594	18.812	477.8	277.946	123.23	183.40
24	600	24.000	0.688	22.624	574.6	402.002	171.45	255.18

Schedule 80 pipe: inside diameter, flow area and mass

NPS	DN	OD (in)	Wall (in)	ID (in)	ID (mm)	Flow area (in²)	lb/ft	kg/m
1/8	6	0.405	0.095	0.215	5.5	0.036	0.31	0.47
1/4	8	0.540	0.119	0.302	7.7	0.072	0.54	0.80

NPS	DN	OD (in)	Wall (in)	ID (in)	ID (mm)	Flow area (in²)	lb/ft	kg/m
3/8	10	0.675	0.126	0.423	10.7	0.141	0.74	1.10
1/2	15	0.840	0.147	0.546	13.9	0.234	1.09	1.62
3/4	20	1.050	0.154	0.742	18.8	0.432	1.48	2.20
1	25	1.315	0.179	0.957	24.3	0.719	2.17	3.24
1 1/4	32	1.660	0.191	1.278	32.5	1.283	3.00	4.46
1 1/2	40	1.900	0.200	1.500	38.1	1.767	3.63	5.41
2	50	2.375	0.218	1.939	49.3	2.953	5.03	7.48
2 1/2	65	2.875	0.276	2.323	59.0	4.238	7.67	11.41
3	80	3.500	0.300	2.900	73.7	6.605	10.26	15.27
3 1/2	90	4.000	0.318	3.364	85.4	8.888	12.52	18.63
4	100	4.500	0.337	3.826	97.2	11.497	15.00	22.32
5	125	5.563	0.375	4.813	122.3	18.194	20.80	30.95
6	150	6.625	0.432	5.761	146.3	26.067	28.60	42.57
8	200	8.625	0.500	7.625	193.7	45.664	43.43	64.64
10	250	10.750	0.594	9.562	242.9	71.810	64.49	95.98
12	300	12.750	0.688	11.374	288.9	101.605	88.71	132.04
14	350	14.000	0.750	12.500	317.5	122.718	106.23	158.11
16	400	16.000	0.844	14.312	363.5	160.876	136.74	203.52
18	450	18.000	0.938	16.124	409.5	204.190	171.08	254.64
20	500	20.000	1.031	17.938	455.6	252.719	209.06	311.16
24	600	24.000	1.219	21.562	547.7	365.147	296.86	441.84

Large-bore schedules 20 to 140 (inches)

NPS	DN	OD (in)	Sch 20	Sch 30	Sch 60	Sch 100	Sch 120	Sch 140
4	100	4.500	—	—	—	—	0.438	—
5	125	5.563	—	—	—	—	0.500	—
6	150	6.625	—	—	—	—	0.562	—
8	200	8.625	0.250	0.277	0.406	0.594	0.719	0.812
10	250	10.750	0.250	0.307	0.500	0.719	0.844	1.000
12	300	12.750	0.250	0.330	0.562	0.844	1.000	1.125
14	350	14.000	0.312	0.375	0.594	0.938	1.094	1.250
16	400	16.000	0.312	0.375	0.656	1.031	1.219	1.438
18	450	18.000	0.312	0.438	0.750	1.156	1.375	1.562
20	500	20.000	0.375	0.500	0.812	1.281	1.500	1.750
24	600	24.000	0.375	0.562	0.969	1.531	1.812	2.062

Stainless steel schedules 5S to 80S (ASME B36.19M, inches)

NPS	DN	OD (in)	5S	10S	40S	80S
1/8	6	0.405	0.035	0.049	0.068	0.095
1/4	8	0.540	0.049	0.065	0.088	0.119
3/8	10	0.675	0.049	0.065	0.091	0.126
1/2	15	0.840	0.065	0.083	0.109	0.147
3/4	20	1.050	0.065	0.083	0.113	0.154
1	25	1.315	0.065	0.109	0.133	0.179
1 1/4	32	1.660	0.065	0.109	0.140	0.191
1 1/2	40	1.900	0.065	0.109	0.145	0.200
2	50	2.375	0.065	0.109	0.154	0.218
2 1/2	65	2.875	0.083	0.120	0.203	0.276

NPS	DN	OD (in)	5S	10S	40S	80S
3	80	3.500	0.083	0.120	0.216	0.300
3 1/2	90	4.000	0.083	0.120	0.226	0.318
4	100	4.500	0.083	0.120	0.237	0.337
5	125	5.563	0.109	0.134	0.258	0.375
6	150	6.625	0.109	0.134	0.280	0.432
8	200	8.625	0.109	0.148	0.322	0.500
10	250	10.750	0.134	0.165	0.365	0.500
12	300	12.750	0.156	0.180	0.375	0.500

Sources and method

- **ASME B36.10M** — Welded and seamless wrought steel pipe: outside diameters, wall thicknesses and the plain-end mass formula
- **ASME B36.19M** — Stainless steel pipe: schedules 5S, 10S, 40S and 80S
- **ISO 6708** — Pipework components: definition and selection of DN (nominal size)
- **International Yard and Pound Agreement (1959)** — 1 in = 25.4 mm exactly

Outside diameters and wall thicknesses are transcribed from ASME B36.10M and B36.19M and cross-checked against a second published table; inside diameter, flow area and mass are calculated with the B36.10M formula. Interactive version, corrections and more charts: **allunitconversions.com/pipe-schedule-chart**