

NPS (Nominal Pipe Size)

Nominal Pipe Size (NPS) is a set of standard pipe sizes used for pressure piping in North America. The same pipe dimensions are used with different names in Europe

Pipe size is specified with two non-dimensional numbers: a Nominal Pipe Size (NPS) and a schedule (SCH). The relationship of these numbers to the actual pipe dimensions is a bit strange. The NPS is very loosely related to the inside diameter in inches, but only for NPS 1/8 to NPS 12. For NPS 14 and larger, the NPS is equal to the outside diameter (OD) in inches. For a given NPS, the OD stays constant and the wall thickness increases with larger SCH. For a given SCH, the OD increases with increasing NPS while the wall thickness increases or stays constant. Pipe sizes are documented by a number of standards, including API 5L, ANSI/ASME B36.10M in the US, BS 1600 and BS EN 10255 in the United Kingdom and Europe, and ISO 65 internationally.

For NPS of 5 and larger, the DN is equal to the NPS multiplied by **25** (not 25.4).

The most commonly used schedules today are 40, 80, and 160. There is a commonly held belief that the schedule number is an indicator of the service pressure that the pipe can take. For example, the McGraw Hill Piping Handbook says the schedule number can be converted to pressure by dividing the schedule by 1000 and multiplying by the allowable stress of the material. However, this is not true Pressure rating actually goes down with increasing NPS and constant schedule.

The various standards for pipe schedule are not identical. Frequently some sizes—or even entire schedules—are present in some standards but not others. When different standards do overlap, they usually have the same dimensions. For this reason, the source of the schedules is not distinguished in the table below. Beyond NPS 8, however, there are differing version of schedules 5, 10, 40, and 80. One variation is the presence or absence of an 'S' suffix after the schedule number. Generally, 'S' indicates Stainless Steel Schedule.

Some specifications use pipe schedules called Standard Wall (STD), Extra Strong (XS), and Double Extra Strong (XXS), although these actually belong to an older system called Iron Pipe Size (IPS). The IPS number is the same as the NPS number.

STD is identical to SCH 40S, and 40S is identical to 40 for NPS 1/8 to NPS 10, inclusive. XS is identical to SCH 80S, and 80S is identical to 80 for NPS 1/8 to NPS 8, inclusive. Different definitions exist for XXS, but it is generally thicker than schedule 160.

18 to NPS 3-1/2

NPS	DN	OD (inches)	Wall Thickness (inches)						
			SCH 5	SCH 10	SCH 30	SCH 40	SCH 80	SCH 120	SCH 160
1/8	6	0.405	0.035	0.049	0.057	0.068	0.095	?	?
3/16	7	?	?	?	?	?	?	?	?
1/4	8	0.540	0.049	0.065	.073	.088	.119	?	?
3/8	10	0.675	.049	.065	.073	.091	.126	?	?
1/2	15	0.840	.065	.083	.095	.109	.147	.170	.188
5/8	18	?	?	?	?	?	?	?	?
3/4	20	1.050	.065	.083	.095	.113	.154	.170	.219
1	25	1.315	.065	.109	.114	.133	.179	.200	.250
1-1/4	32	1.660	.065	.109	.117	.140	.191	.215	.250
1-1/2	40	1.900	.065	.109	.125	.145	.200	.225	.281
2	50	2.375	.065	.109	?	.154	.218	.250	.344
2-1/2	65	2.875	.083	.120	?	.203	.276	.300	.375
3	80	3.500	.083	.120	?	.216	.300	.350	.438
3-1/2	90	4.000	.083	.120	?	.226	.318	?	?

NPS 4 to NPS 8

NPS	DN	OD (inches)	Wall Thickness (inches)										
			SCH 5	SCH 10	SCH 20	SCH 30	SCH 40	SCH 60	SCH 80	SCH 100	SCH 120	SCH 140	SCH 160
4	100	4.500	.083	.120	?	?	.237	.281	.337	?	.437	?	.531
4-1/2	115	5.000	?	?	?	?	.247	?	.355	?	?	?	?
5	125	5.563	.109	.134	?	?	.258	?	.375	?	.500	?	.625
6	150	6.625	.109	.134	?	?	.280	?	.432	?	.562	?	.719
8	200	8.625	.109	.148	.250	.277	.322	.406	.500	.593	.718	.812	.906

NPS 10 to NPS 24

NPS	DN	OD (inches)	SCH	SCH	SCH	SCH	SCH	SCH	SCH	SCH	SCH	SCH	SCH	SCH	SCH
			5s	5	10s	10	20	30	40s	40	60	80s	80	100	120
10	250	10.75	.134	.134	.165	.165	.250	.307	.365	.365	.500	.500	.593	.718	.843
12	300	12.75	.156	.165	.180	.180	.250	.330	.375	.406	.500	.500	.687	.843	1.000
14	350	14.00	.156		.188	.250	.312	.375	.375	.437	.593	.500	.750	.937	1.093
16	400	16.00	.165		.188	.250	.312	.375	.375	.500	.656	.500	.843	1.031	1.218
18	450	18.00	.165		.188	.250	.312	.437	.375	.562	.750	.500	.937	1.156	1.375
20	500	20.00	.188		.218	.250	.375	.500	.375	.593	.812	.500	1.031	1.280	1.500
24	600	24.00	.218		.250	.250	.375	.562	.375	.687	.968	.500	1.218	1.531	1.812