

Flanges for US industry and data center cooling

Pipe schedule chart: wall, ID and weight per foot, NPS 1/2 to 24

The schedule is the part of a pipe order that sets its wall, its bore and its weight, and the bore of every weld neck flange on the line.

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In short

A pipe schedule sets the wall thickness of a pipe of a given nominal size. Each nominal pipe size (NPS) has one outside diameter, so a higher schedule means a thicker wall, a smaller inside diameter and more weight. The chart lists every schedule of ASME B36.10M (carbon steel) and ASME B36.19M (stainless steel, the S schedules) from NPS 1/2 to 24, with the wall, the inside diameter and the weight in carbon steel and in 316L stainless steel.

01

Pipe schedule chart, NPS 1/2 to 3

Table 1. Pipe schedules NPS 1/2 to 3 (DN 15 to 80): outside diameter, wall, inside diameter and weight, in (mm); weight lb/ft (kg/m)

NPS	Outside diameter	Schedule	Wall	Inside diameter	Weight carbon steel	Weight stainless 316L
1/2 DN 15	0.840 21.3	Sch 5S / Sch 5	0.065 1.65	0.710 18.0	0.54 0.80	0.55 0.82
		Sch 10S / Sch 10	0.083 2.11	0.674 17.1	0.67 1.00	0.68 1.02
		Sch 30	0.095 2.41	0.650 16.5	0.76 1.13	0.77 1.15
		Sch 40S / STD / Sch 40	0.109 2.77	0.622 15.8	0.85 1.27	0.87 1.29
		Sch 80S / XS / Sch 80	0.147 3.73	0.546 13.9	1.09 1.62	1.11 1.65
		Sch 160	0.188 4.78	0.464 11.8	1.31 1.95	1.34 1.99
		XXS	0.294 7.47	0.252 6.4	1.72 2.55	1.75 2.60
3/4 DN 20	1.050 26.7	Sch 5S / Sch 5	0.065 1.65	0.920 23.4	0.68 1.02	0.70 1.04
		Sch 10S / Sch 10	0.083 2.11	0.884 22.5	0.86 1.28	0.87 1.30
		Sch 30	0.095 2.41	0.860 21.8	0.97 1.44	0.99 1.47
		Sch 40S / STD / Sch 40	0.113 2.87	0.824 20.9	1.13 1.68	1.15 1.72
		Sch 80S / XS / Sch 80	0.154 3.91	0.742 18.8	1.48 2.20	1.50 2.24
		Sch 160	0.219 5.56	0.612 15.5	1.95 2.90	1.98 2.95
		XXS	0.308 7.82	0.434 11.0	2.44 3.64	2.49 3.71

NPS	Outside diameter	Schedule	Wall	Inside diameter	Weight carbon steel	Weight stainless 316L
1 DN 25	1.315 33.4	Sch 5S / Sch 5	0.065 1.65	1.185 30.1	0.87 1.29	0.89 1.32
		Sch 10S / Sch 10	0.109 2.77	1.097 27.9	1.41 2.09	1.43 2.13
		Sch 30	0.114 2.90	1.087 27.6	1.46 2.18	1.49 2.22
		Sch 40S / STD / Sch 40	0.133 3.38	1.049 26.6	1.68 2.50	1.71 2.55
		Sch 80S / XS / Sch 80	0.179 4.55	0.957 24.3	2.17 3.24	2.22 3.30
		Sch 160	0.250 6.35	0.815 20.7	2.85 4.24	2.90 4.32
		XXS	0.358 9.09	0.599 15.2	3.66 5.45	3.73 5.56
1-1/4 DN 32	1.660 42.2	Sch 5S / Sch 5	0.065 1.65	1.530 38.9	1.11 1.65	1.13 1.68
		Sch 10S / Sch 10	0.109 2.77	1.442 36.6	1.81 2.69	1.84 2.74
		Sch 30	0.117 2.97	1.426 36.2	1.93 2.87	1.97 2.93
		Sch 40S / STD / Sch 40	0.140 3.56	1.380 35.1	2.28 3.39	2.32 3.45
		Sch 80S / XS / Sch 80	0.191 4.85	1.278 32.5	3.00 4.46	3.06 4.55
		Sch 160	0.250 6.35	1.160 29.5	3.77 5.61	3.84 5.72
		XXS	0.382 9.70	0.896 22.8	5.22 7.77	5.32 7.92
1-1/2 DN 40	1.900 48.3	Sch 5S / Sch 5	0.065 1.65	1.770 45.0	1.28 1.90	1.30 1.93
		Sch 10S / Sch 10	0.109 2.77	1.682 42.7	2.09 3.11	2.13 3.17
		Sch 30	0.125 3.18	1.650 41.9	2.37 3.53	2.42 3.60
		Sch 40S / STD / Sch 40	0.145 3.68	1.610 40.9	2.72 4.05	2.77 4.13
		Sch 80S / XS / Sch 80	0.200 5.08	1.500 38.1	3.64 5.41	3.70 5.51
		Sch 160	0.281 7.14	1.338 34.0	4.86 7.24	4.96 7.38
		XXS	0.400 10.16	1.100 27.9	6.41 9.55	6.54 9.73

NPS	Outside diameter	Schedule	Wall	Inside diameter	Weight carbon steel	Weight stainless 316L
2 DN 50	2.375 60.3	Sch 5S / Sch 5	0.065 1.65	2.245 57.0	1.61 2.39	1.64 2.43
		Sch 10S / Sch 10	0.109 2.77	2.157 54.8	2.64 3.93	2.69 4.00
		Sch 30	0.125 3.18	2.125 54.0	3.01 4.47	3.06 4.56
		Sch 40S / STD / Sch 40	0.154 3.91	2.067 52.5	3.66 5.44	3.73 5.55
		Sch 80S / XS / Sch 80	0.218 5.54	1.939 49.3	5.03 7.48	5.12 7.62
		Sch 160	0.344 8.74	1.687 42.8	7.47 11.12	7.61 11.33
		XXS	0.436 11.07	1.503 38.2	9.04 13.45	9.21 13.71
2-1/2 DN 65	2.875 73.0	Sch 5S / Sch 5	0.083 2.11	2.709 68.8	2.48 3.69	2.52 3.76
		Sch 10S / Sch 10	0.120 3.05	2.635 66.9	3.53 5.26	3.60 5.36
		Sch 30	0.188 4.78	2.499 63.5	5.40 8.04	5.50 8.19
		Sch 40S / STD / Sch 40	0.203 5.16	2.469 62.7	5.80 8.63	5.91 8.80
		Sch 80S / XS / Sch 80	0.276 7.01	2.323 59.0	7.67 11.41	7.82 11.63
		Sch 160	0.375 9.53	2.125 54.0	10.02 14.92	10.21 15.20
		XXS	0.552 14.02	1.771 45.0	13.71 20.40	13.97 20.79
3 DN 80	3.500 88.9	Sch 5S / Sch 5	0.083 2.11	3.334 84.7	3.03 4.51	3.09 4.60
		Sch 10S / Sch 10	0.120 3.05	3.260 82.8	4.34 6.45	4.42 6.58
		Sch 30	0.188 4.78	3.124 79.3	6.66 9.91	6.78 10.10
		Sch 40S / STD / Sch 40	0.216 5.49	3.068 77.9	7.58 11.29	7.73 11.50
		Sch 80S / XS / Sch 80	0.300 7.62	2.900 73.7	10.26 15.27	10.46 15.57
		Sch 160	0.438 11.13	2.624 66.6	14.34 21.34	14.61 21.75
		XXS	0.600 15.24	2.300 58.4	18.60 27.68	18.96 28.21

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Pipe schedule chart, NPS 4 to 12

Table 2. Pipe schedules NPS 4 to 12 (DN 100 to 300): outside diameter, wall, inside diameter and weight, in (mm); weight lb/ft (kg/m)

NPS	Outside diameter	Schedule	Wall	Inside diameter	Weight carbon steel	Weight stainless 316L
4 DN 100	4.500 114.3	Sch 5S / Sch 5	0.083 2.11	4.334 110.1	3.92 5.83	3.99 5.94
		Sch 10S / Sch 10	0.120 3.05	4.260 108.2	5.62 8.36	5.73 8.52
		Sch 30	0.188 4.78	4.124 104.7	8.67 12.90	8.83 13.14
		Sch 40S / STD / Sch 40	0.237 6.02	4.026 102.3	10.80 16.07	11.01 16.38
		Sch 80S / XS / Sch 80	0.337 8.56	3.826 97.2	15.00 22.32	15.29 22.75
		Sch 120	0.438 11.13	3.624 92.0	19.02 28.31	19.39 28.85
		Sch 160	0.531 13.49	3.438 87.3	22.53 33.53	22.96 34.17
		XXS	0.674 17.12	3.152 80.1	27.57 41.03	28.10 41.81
5 DN 125	5.563 141.3	Sch 5S / Sch 5	0.109 2.77	5.345 135.8	6.36 9.46	6.48 9.64
		Sch 10S / Sch 10	0.134 3.40	5.295 134.5	7.78 11.57	7.93 11.80
		Sch 40S / STD / Sch 40	0.258 6.55	5.047 128.2	14.63 21.78	14.91 22.19
		Sch 80S / XS / Sch 80	0.375 9.53	4.813 122.3	20.80 30.95	21.20 31.55
		Sch 120	0.500 12.70	4.563 115.9	27.07 40.28	27.58 41.05
		Sch 160	0.625 15.88	4.313 109.6	33.00 49.10	33.63 50.04
		XXS	0.750 19.05	4.063 103.2	38.59 57.43	39.33 58.53

NPS	Outside diameter	Schedule	Wall	Inside diameter	Weight carbon steel	Weight stainless 316L
6 DN 150	6.625 168.3	Sch 5S / Sch 5	0.109 2.77	6.407 162.7	7.59 11.30	7.74 11.52
		Sch 10S / Sch 10	0.134 3.40	6.357 161.5	9.30 13.84	9.48 14.10
		Sch 40S / STD / Sch 40	0.280 7.11	6.065 154.1	18.99 28.27	19.36 28.81
		Sch 80S / XS / Sch 80	0.432 10.97	5.761 146.3	28.60 42.57	29.15 43.38
		Sch 120	0.562 14.27	5.501 139.7	36.43 54.21	37.13 55.25
		Sch 160	0.719 18.26	5.187 131.7	45.40 67.56	46.27 68.85
		XXS	0.864 21.95	4.897 124.4	53.22 79.20	54.23 80.71
8 DN 200	8.625 219.1	Sch 5S / Sch 5	0.109 2.77	8.407 213.5	9.92 14.77	10.11 15.05
		Sch 10S / Sch 10	0.148 3.76	8.329 211.6	13.41 19.96	13.67 20.34
		Sch 20	0.250 6.35	8.125 206.4	22.39 33.31	22.81 33.95
		Sch 30	0.277 7.04	8.071 205.0	24.72 36.79	25.20 37.49
		Sch 40S / STD / Sch 40	0.322 8.18	7.981 202.7	28.58 42.54	29.13 43.35
		Sch 60	0.406 10.31	7.813 198.5	35.68 53.09	36.36 54.11
		Sch 80S / XS / Sch 80	0.500 12.70	7.625 193.7	43.43 64.64	44.26 65.87
		Sch 100	0.594 15.09	7.437 188.9	51.00 75.90	51.98 77.35
		Sch 120	0.719 18.26	7.187 182.5	60.77 90.44	61.94 92.17
		Sch 140	0.812 20.62	7.001 177.8	67.83 100.94	69.12 102.87
		XXS	0.875 22.23	6.875 174.6	72.50 107.89	73.89 109.96
		Sch 160	0.906 23.01	6.813 173.1	74.77 111.27	76.20 113.40

NPS	Outside diameter	Schedule	Wall	Inside diameter	Weight carbon steel	Weight stainless 316L
10 DN 250	10.750 273.1	Sch 5S / Sch 5	0.134 3.40	10.482 266.2	15.21 22.63	15.50 23.07
		Sch 10S / Sch 10	0.165 4.19	10.420 264.7	18.67 27.79	19.03 28.32
		Sch 20	0.250 6.35	10.250 260.4	28.07 41.77	28.60 42.56
		Sch 30	0.307 7.80	10.136 257.5	34.28 51.01	34.93 51.98
		Sch 40S / STD / Sch 40	0.365 9.27	10.020 254.5	40.53 60.31	41.30 61.46
		Sch 60 / Sch 80S / XS	0.500 12.70	9.750 247.7	54.79 81.54	55.84 83.10
		Sch 80	0.594 15.09	9.562 242.9	64.50 95.98	65.73 97.82
		Sch 100	0.719 18.26	9.312 236.5	77.11 114.75	78.58 116.94
		Sch 120	0.844 21.44	9.062 230.2	89.39 133.02	91.10 135.57
		Sch 140 / XXS	1.000 25.40	8.750 222.3	104.24 155.13	106.23 158.09
		Sch 160	1.125 28.58	8.500 215.9	115.77 172.28	117.98 175.57

NPS	Outside diameter	Schedule	Wall	Inside diameter	Weight carbon steel	Weight stainless 316L
12 DN 300	12.750 323.9	Sch 5S / Sch 5	0.156 3.96	12.438 315.9	21.01 31.26	21.41 31.86
		Sch 10S / Sch 10	0.180 4.57	12.390 314.7	24.19 36.00	24.65 36.69
		Sch 20	0.250 6.35	12.250 311.2	33.41 49.72	34.05 50.67
		Sch 30	0.330 8.38	12.090 307.1	43.82 65.21	44.66 66.46
		Sch 40S / STD	0.375 9.53	12.000 304.8	49.61 73.84	50.56 75.25
		Sch 40	0.406 10.31	11.938 303.2	53.58 79.74	54.61 81.26
		Sch 80S / XS	0.500 12.70	11.750 298.5	65.49 97.45	66.74 99.31
		Sch 60	0.562 14.27	11.626 295.3	73.23 108.98	74.63 111.06
		Sch 80	0.688 17.48	11.374 288.9	88.72 132.04	90.42 134.56
		Sch 100	0.844 21.44	11.062 281.0	107.43 159.88	109.49 162.94
		Sch 120 / XXS	1.000 25.40	10.750 273.1	125.62 186.95	128.02 190.52
		Sch 140	1.125 28.58	10.500 266.7	139.82 208.08	142.50 212.06
		Sch 160	1.312 33.32	10.126 257.2	160.44 238.77	163.51 243.33

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Pipe schedule chart, NPS 14 to 24

Table 3. Pipe schedules NPS 14 to 24 (DN 350 to 600): outside diameter, wall, inside diameter and weight, in (mm); weight lb/ft (kg/m)

NPS	Outside diameter	Schedule	Wall	Inside diameter	Weight carbon steel	Weight stainless 316L
14 DN 350	14.000 355.6	Sch 5S / Sch 5	0.156 3.96	13.688 347.7	23.09 34.36	23.53 35.02
		Sch 10S	0.188 4.78	13.624 346.0	27.76 41.31	28.29 42.10
		Sch 10	0.250 6.35	13.500 342.9	36.75 54.69	37.45 55.74
		Sch 20	0.312 7.92	13.376 339.8	45.66 67.95	46.53 69.25
		Sch 30 / Sch 40S / STD	0.375 9.53	13.250 336.6	54.63 81.29	55.67 82.85
		Sch 40	0.438 11.13	13.124 333.3	63.51 94.51	64.72 96.32
		Sch 80S / XS	0.500 12.70	13.000 330.2	72.17 107.40	73.55 109.45
		Sch 60	0.594 15.09	12.812 325.4	85.14 126.70	86.76 129.12
		Sch 80	0.750 19.05	12.500 317.5	106.25 158.11	108.28 161.13
		Sch 100	0.938 23.83	12.124 307.9	130.99 194.94	133.50 198.66
		Sch 120	1.094 27.79	11.812 300.0	150.95 224.64	153.84 228.94
		Sch 140	1.250 31.75	11.500 292.1	170.39 253.58	173.65 258.42
		Sch 160	1.406 35.71	11.188 284.2	189.32 281.73	192.93 287.12

NPS	Outside diameter	Schedule	Wall	Inside diameter	Weight carbon steel	Weight stainless 316L
16 DN 400	16.000 406.4	Sch 5S / Sch 5	0.165 4.19	15.670 398.0	27.93 41.57	28.47 42.37
		Sch 10S	0.188 4.78	15.624 396.8	31.78 47.30	32.39 48.20
		Sch 10	0.250 6.35	15.500 393.7	42.10 62.65	42.90 63.85
		Sch 20	0.312 7.92	15.376 390.6	52.33 77.88	53.33 79.37
		Sch 30 / Sch 40S / STD	0.375 9.53	15.250 387.4	62.65 93.23	63.84 95.01
		Sch 40 / Sch 80S / XS	0.500 12.70	15.000 381.0	82.86 123.31	84.44 125.66
		Sch 60	0.656 16.66	14.688 373.1	107.62 160.15	109.67 163.21
		Sch 80	0.844 21.44	14.312 363.5	136.76 203.52	139.37 207.41
		Sch 100	1.031 26.19	13.938 354.0	165.00 245.55	168.15 250.24
		Sch 120	1.219 30.96	13.562 344.5	192.64 286.68	196.32 292.16
		Sch 140	1.438 36.53	13.124 333.3	223.88 333.17	228.16 339.54
		Sch 160	1.594 40.49	12.812 325.4	245.51 365.36	250.20 372.34

NPS	Outside diameter	Schedule	Wall	Inside diameter	Weight carbon steel	Weight stainless 316L
18 DN 450	18.000 457.2	Sch 5S / Sch 5	0.165 4.19	17.670 448.8	31.46 46.82	32.06 47.72
		Sch 10S	0.188 4.78	17.624 447.6	35.80 53.28	36.49 54.30
		Sch 10	0.250 6.35	17.500 444.5	47.44 70.60	48.35 71.95
		Sch 20	0.312 7.92	17.376 441.4	59.00 87.81	60.13 89.48
		Sch 40S / STD	0.375 9.53	17.250 438.2	70.66 105.16	72.01 107.17
		Sch 30	0.438 11.13	17.124 434.9	82.24 122.39	83.81 124.73
		Sch 80S / XS	0.500 12.70	17.000 431.8	93.55 139.22	95.34 141.88
		Sch 40	0.562 14.27	16.876 428.7	104.78 155.93	106.78 158.91
		Sch 60	0.750 19.05	16.500 419.1	138.32 205.84	140.96 209.78
		Sch 80	0.938 23.83	16.124 409.5	171.11 254.64	174.38 259.50
		Sch 100	1.156 29.36	15.688 398.5	208.18 309.81	212.16 315.73
		Sch 120	1.375 34.93	15.250 387.4	244.40 363.71	249.07 370.66
		Sch 140	1.562 39.67	14.876 377.9	274.52 408.52	279.76 416.33
		Sch 160	1.781 45.24	14.438 366.7	308.83 459.59	314.73 468.38

NPS	Outside diameter	Schedule	Wall	Inside diameter	Weight carbon steel	Weight stainless 316L
20 DN 500	20.000 508.0	Sch 5S / Sch 5	0.188 4.78	19.624 498.4	39.82 59.26	40.58 60.39
		Sch 10S	0.218 5.54	19.564 496.9	46.11 68.61	46.99 69.93
		Sch 10	0.250 6.35	19.500 495.3	52.79 78.56	53.80 80.06
		Sch 20 / Sch 40S / STD	0.375 9.53	19.250 489.0	78.68 117.09	80.19 119.33
		Sch 30 / Sch 80S / XS	0.500 12.70	19.000 482.6	104.24 155.13	106.23 158.09
		Sch 40	0.594 15.09	18.812 477.8	123.24 183.40	125.60 186.91
		Sch 60	0.812 20.62	18.376 466.8	166.58 247.90	169.76 252.63
		Sch 80	1.031 26.19	17.938 455.6	209.09 311.16	213.09 317.11
		Sch 100	1.281 32.54	17.438 442.9	256.37 381.52	261.27 388.81
		Sch 120	1.500 38.10	17.000 431.8	296.69 441.52	302.36 449.96
		Sch 140	1.750 44.45	16.500 419.1	341.46 508.15	347.98 517.86
		Sch 160	1.969 50.01	16.062 408.0	379.58 564.88	386.83 575.67

NPS	Outside diameter	Schedule	Wall	Inside diameter	Weight carbon steel	Weight stainless 316L
24 DN 600	24.000 609.6	Sch 5S / Sch 5	0.218 5.54	23.564 598.5	55.43 82.49	56.49 84.06
		Sch 10S / Sch 10	0.250 6.35	23.500 596.9	63.48 94.47	64.69 96.27
		Sch 20 / Sch 40S / STD	0.375 9.53	23.250 590.6	94.72 140.96	96.53 143.65
		Sch 80S / XS	0.500 12.70	23.000 584.2	125.62 186.95	128.02 190.52
		Sch 30	0.562 14.27	22.876 581.1	140.83 209.58	143.52 213.58
		Sch 40	0.688 17.48	22.624 574.6	171.48 255.18	174.75 260.06
		Sch 60	0.969 24.61	22.062 560.4	238.60 355.08	243.16 361.86
		Sch 80	1.219 30.96	21.562 547.7	296.90 441.84	302.57 450.28
		Sch 100	1.531 38.89	20.938 531.8	367.79 547.33	374.81 557.78
		Sch 120	1.812 46.02	20.376 517.6	429.85 639.68	438.06 651.90
		Sch 140	2.062 52.37	19.876 504.9	483.64 719.74	492.88 733.49
		Sch 160	2.344 59.54	19.312 490.5	542.72 807.65	553.09 823.08

04

What the schedule numbers mean

- **Schedules 5 to 160** come from ASME B36.10M, the standard for welded and seamless wrought steel pipe. A larger number is a thicker wall for the same size, but the walls are not proportional between sizes.
- **STD, XS and XXS** (standard, extra strong and double extra strong) are the older weight classes, also in B36.10M. STD is the same wall as Schedule 40 up to NPS 10 and is 0.375 in (9.53 mm) from NPS 12 up; XS is the same as Schedule 80 up to NPS 8 and is 0.500 in (12.70 mm) from NPS 8 up.
- **5S, 10S, 40S and 80S** are the stainless steel schedules of ASME B36.19M. 40S always equals STD and 80S always equals XS; 10S equals Schedule 10 up to NPS 12 and is thinner from NPS 14 to 20.
- **The outside diameter** is fixed for each size: up to NPS 12 it is larger than the nominal size (NPS 4 is 4.500 in (114.3 mm)), and from NPS 14 it equals the nominal size in inches. DN is the metric name of the same pipe, so DN 100 is NPS 4.

05

The schedule and the flange bore

A weld neck flange is bored to the inside diameter of the pipe it is welded to, so the purchase order names the schedule as well as the size and class. If the bore does not match, the two walls meet with a step inside the weld: a flange bored too small has to be taper bored to the pipe's inside diameter, and one bored too large leaves the pipe wall standing proud inside the joint, where it disturbs the flow and traps debris. Slip-on and socket weld flanges fit over the outside diameter, which every schedule shares, so their bore does not change with the schedule; a socket weld flange still has a bore matched to the schedule beyond the socket.

Our weld neck drawings give the bore for every schedule of each size, with the flange weight for each, in the flange drawing tool and in the PDF of every size and class. A line item reads, for example, *Weld neck flange, ASME B16.5, NPS 6, Class 150 RF, bore Sch 10S, ASTM A182 F316L*.

06

Schedules in data center cooling piping

Stainless technology cooling system piping is often Sch 10S, and sometimes 5S, since the pressure is low and stainless steel needs no corrosion allowance; carbon steel facility water mains are often standard wall, which is Schedule 40 up to NPS 10. Thin walls make light pipe, but the water inside weighs more than the pipe: NPS 6 Sch 10S in 316L weighs 9.5 lb/ft (14.1 kg/m), and the water it holds 13.8 lb/ft (20.5 kg/m), which the pipe supports carry together. Where the two systems meet, at a coolant distribution unit or a heat exchanger, flanges on each side are bored to their own schedule; the guide to FWS and TCS loops explains the two systems, and the ASME B31.9 guide the code that governs them.

Ordering pipe with the flanges

We supply pipe, fittings and flanges together as one package, with the certificates for each item. Name the pipe by size, schedule and ASTM specification and grade on the same request as its flanges.

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How the figures are worked out

Outside diameters and walls are those of ASME B36.10M and B36.19M. The inside diameter is the outside diameter less twice the wall. The weight is the steel in one length, π × (D – t) × t × density: 7.85 g/cm³ for carbon steel, which gives the B36.10M formulas of 10.69 × (D – t) × t lb/ft with D and t in inches and 0.0246615 × (D – t) × t kg/m in millimetres, and 8.0 g/cm³ for 316L, as for the weights on our flange drawings. For 304L, at 7.9 g/cm³, the calculator works it out; it is about 0.6% above carbon steel. The walls are nominal: ASTM A53, A106 and A312 allow the wall to be up to 12.5% under nominal at any point, so the weight of a delivered pipe varies a little from mill to mill.

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For US piping specifications

US project specifications name pipe by ASTM specification, grade and schedule: carbon steel to ASTM A53 Grade B or A106 Grade B, stainless steel to ASTM A312 TP304L or TP316L, usually in a table of schedules by size range in the hydronic piping section, CSI MasterFormat 23 21 13, or the process piping specification of a plant. The flanges on the same lines are listed with the bore to that schedule, and each item ships with its mill test report (MTR) showing the heat, the chemistry and the mechanical tests. Sizes in the US are always called by NPS and schedule; the millimetres in this chart are conversions. To buy flanges with the pipe and fittings for a US project, see ordering from India, and for high pressure lines with heavy walls, the Class 600 to 2500 flanges.

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Questions about pipe schedules

What is the difference between Schedule 40 and Schedule 40S?

Up to NPS 10 they are the same wall. From NPS 12, Schedule 40S stays at the standard weight wall of 0.375 in (9.53 mm), while Schedule 40 gets thicker: 0.406 in (10.31 mm) at NPS 12 and 0.688 in (17.48 mm) at NPS 24.

Is Schedule 80 the same as extra strong (XS)?

Up to NPS 8, yes. From NPS 10, Schedule 80 is thicker than XS, which stays at 0.500 in (12.70 mm); Schedule 80S always equals XS.

Does a higher schedule change the outside diameter?

No. Every schedule of one nominal size has the same outside diameter, so the same fittings, flanges and clamps fit the outside; the schedule only changes the wall and the inside diameter.

Which schedule should a line use?

The piping designer sets it from the pressure, temperature, corrosion allowance and the code for the system, ASME B31.9 for building services or B31.3 for process piping. The chart gives the wall and the weight; it does not rate the pipe.

About Rajendra Industrial Corporation

Rajendra Industrial Corporation (RIC) has made stainless steel and carbon steel flanges and forged fittings since 2000, at its works in Umbergaon, Gujarat, India. For US projects RIC supplies flanges to ASME and AWWA standards with mill test reports, for data center cooling and for industry.

Flanges	Weld neck, slip-on, blind, lap joint, socket weld, threaded and ring type joint flanges to ASME B16.5 (NPS 1/2 to 24, Class 150 to 2500), ASME B16.47 Series A and B, EN 1092-1 and AWWA C207 and C228
Materials	Stainless steel ASTM A182 F304, F304L, F316 and F316L; duplex UNS S32205 and super duplex UNS S32750; carbon steel ASTM A105 and A350 LF2
Works	Forging, heat treatment, pickling, machining on CNC lathes, vertical machining centers and conventional lathes, marking and testing in house at Umbergaon, Gujarat, India
Testing	Tensile, hardness, PMI, dye penetrant and dimensional checks in house; chemical, intergranular corrosion, impact and ultrasonic testing at outside laboratories
Documents	Mill test reports (MTRs) to EN 10204 3.1 or 3.2; third-party inspection by TÜV, Gulf Lloyds, IRClass, Bureau Veritas or SGS
Certificates	ISO 9001:2015, PED 2014/68/EU, NORSOK M-650, ISO 45001:2018, ISO 29001:2020

Ask for a quote or a drawing

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