

Pipe Fittings & Pipe

Identifying and Measuring Pipe Fittings & Pipe	2
Stainless Steel Pipe Fittings & Pipe	4
Brass and Bronze Pipe Fittings & Pipe	44
Aluminum Pipe Fittings & Pipe	64
Iron and Steel Pipe Fittings & Pipe	73
Plastic Pipe Fittings & Pipe	111
Pipe & Tube Couplings	134
Pipe & Tube Repair Clamps	137
Expansion Joints	140
Through-Wall & Tank Fittings	142
Rotating Joints	144



Tubing & Tube Fittings

Plastic & Rubber Tubing	146
Metal Tubing	176
Barbed Tube Fittings	190
Compression Tube Fittings	201
Yor-Lok Tube Fittings	212
Flared Tube Fittings	218
Push-to-Connect Tube Fittings	225
Quick-Disconnect Tube Couplings	250
Sanitary Tube Fittings	256
Ultra-High Vacuum Tube Fittings	264
Solder-Connect Copper Tube Fittings	267
Manifolds	271



Hose & Hose Fittings

Duct Hose	274
Air Hose	292
Water Hose	301
Fire-Fighting Hose & Adapters	308
High-Temperature Braided Hose	310
Coolant Hose	314
Chemical Hose	315
Petroleum Hose	321
Hydraulic Hose	323
Food & Beverage Hose	325
Natural & LP Gas Hose	328
Hose & Tube Clamps	330
Hose Fittings & Couplings	342
Quick-Disconnect Hose Couplings	354
Cam-and-Groove Hose Couplings	367
Hose Reels	378
Hose Nozzles	382

How to Identify and Measure Pipe Fittings & Pipe

Before making a connection you'll need to know the thread type and the pipe size or thread size. The thread types must be compatible, and the sizes must be the same in order for two components to mate properly.

Pipe Size and Thread Size

Pipe size is not an actual measured size, but rather an industry designation. People sometimes refer to pipe size as IPS or nominal size. Thread types that are measured by pipe size include NPT, BSP, and NPSM threads. Unthreaded fittings are also measured by pipe size.

Thread size is the actual measured diameter of the threads and the threads per inch (TPI) or thread pitch. Thread types that are measured by thread size include UN/UNF (SAE) and metric threads.

Thread Style

Tapered thread types include NPT, NPTF, and BSPT.

Straight thread types include BSPP, UN/UNF (SAE), NPSM, NPSL, NPSC, and metric straight threads. Male threads typically have an O-ring or gasket to make a seal.



Tapered

Straight

Thread Compatibility

Use this thread compatibility chart to see which threads will mate together. Metric threads, UN/UNF (SAE) threads, GHT (Garden Hose) threads, and NH/NST (National Hose/National Standard) threads are not compatible with any other thread types.

Thread Type (M = male; F = female)		NPT M F	NPTF M F	BSPT M F	JIS Taper M F	BSPP M F	JIS Straight M F	NPSM M F	NPSL M F	NPSC M F	NPSH M F
Tapered Threads	NPT —National Pipe Taper (Also known as MPT and FPT threads)	M F	✓	✓				✓	✓	✓	✓
	NPTF —National Pipe Taper Fuel (Also known as Dryseal threads)	M F	✓	✓				✓			✓
	BSPT —British Standard Pipe Taper (Also known as R threads and 55 Whitworth)	M F		✓	✓	✓					
	JIS Taper —Japanese Industrial Standard (Also known as PT threads)	M F		✓	✓	✓					
Straight Threads	BSPP —British Standard Pipe Parallel (Also known as G threads and 55 Whitworth)	M F		✓	✓	✓	✓				
	JIS Straight —Japanese Industrial Standard (Also known as PF threads)	M F				✓	✓	✓			
	NPSM —National Pipe Straight Mechanical	M F	✓	✓				✓	✓		✓
	NPSL —National Pipe Straight Locknut	M F	✓								
	NPSC —National Pipe Straight Coupling	M F	✓								
	NPSH —National Pipe Straight Hose	M F	✓	✓				✓			✓

Measuring Gauges and Kits

Accurately determine the size of your fittings and pipe with one of these kits. For more gauges, see pages 2324-2326.

Pipe Thread and Thread Pitch Identifiers

In addition to measuring male and female threads in NPT and BSPT pipe sizes $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$, and 2, use the two included gauges for measuring thread pitch.

5887T1 \$8.13

Thread Identifier Sets

Set includes calipers, four gauges, and an instruction book to identify male and female NPT, BSPT, BSPP, and metric threads.

7863K1 \$57.04

Pipe Size Measuring Kits

Kits contain 304 stainless steel 90° male x female elbows so you can determine the size of a fitting or pipe without measuring.

No. of Pieces

Pipe Size

NPT Kits

BSPT Kits

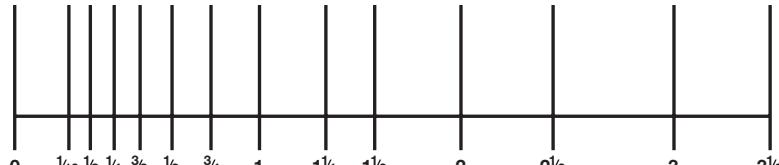
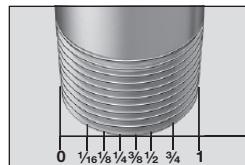
6	$\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1	7843K5 \$22.33	7843K7 \$24.14
9	$\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$, 2	7843K6 64.17	7843K8 69.31

How to Measure Pipe Size for NPT or BSP Threads

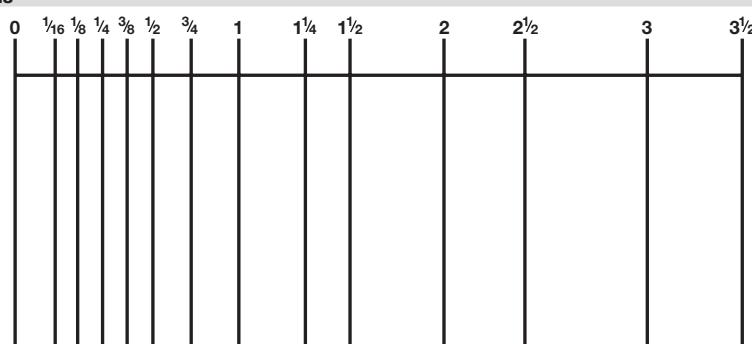
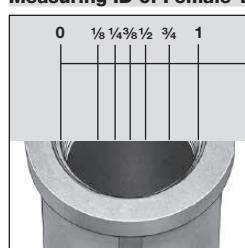
Align your pipe or fitting with the "0" line as shown below. The line on the opposite edge gives the pipe size.

i To measure larger pipe and fittings up to pipe size 8, go to mcmaster.com and search for **4464KAC**.

Measuring OD of Male Threads



Measuring ID of Female Threads



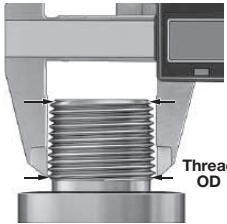
How to Identify and Measure Pipe Fittings & Pipe

Measure Your Thread OD or ID

Use a caliper to measure the OD of the male threads or the ID of the female threads.

First, measure the threads at the widest part. This measurement will be your thread OD or ID.

Next, measure the threads at the smallest part. If the two measurements differ, the thread is tapered. Some tapered threads may have a taper as slight as 0.01". If both measurements are the same, the thread is straight.

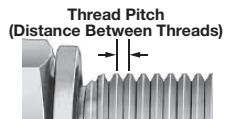
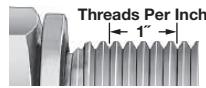


Threads Per Inch(TPI) and Thread Pitch

Threads per inch(TPI) is the number of threads within a one inch measurement. Thread types such as NPT, BSP, and UNF (SAE) are specified by threads per inch.

Thread pitch is the distance in millimeters between two threads. Metric sizes are specified by thread pitch.

Use a thread gauge to measure threads per inch and thread pitch. You'll know you've found the right size when the gauge lines up with the threads without any movement or space.



Identify Your Thread Type and Your Pipe Size or Thread Size

With your thread OD or ID and your threads per inch(TPI) or thread pitch, use the guide below to find your thread type and your pipe size or thread size. If your thread OD or ID does not exactly match the measurements listed in the table, round to the nearest OD or ID. For example, if you have tapered male threads with an OD of 1.290" and 11.5 threads per inch, the closest OD in the table would be 1.305". Your pipe size is 1 NPT.

Tapered Threads														
Actual OD (Male)	Actual ID (Female)	Threads Per Inch	Thread Type	Pipe Size	Actual OD (Male)	Actual ID (Female)	Threads Per Inch	Thread Type	Pipe Size	Actual OD (Male)	Actual ID (Female)	Threads Per Inch	Thread Type	Pipe Size
0.304"	0.258"	28	BSPT	1/16	0.835"	0.741"	14	BSPT	1/2	1.888"	1.730"	11.5	NPT/NPTF	1 1/2
0.308"	0.244"	27	NPT/NPTF	1/16	0.902"	0.811"	14	BSPT	5/8	2.347"	2.260"	11	BSPT	2
0.383"	0.337"	28	BSPT	1/8	1.041"	0.949"	14	BSPT	3/4	2.362"	2.300"	11.5	NPT/NPTF	2
0.401"	0.336"	27	NPT/NPTF	1/8	1.043"	0.914"	14	NPT/NPTF	3/4	2.875"	2.720"	8	NPT/NPTF	2 1/2
0.518"	0.451"	19	BSPT	1/4	1.305"	1.148"	11.5	NPT/NPTF	1	3.500"	3.340"	8	NPT/NPTF	3
0.533"	0.436"	18	NPT/NPTF	1/4	1.309"	1.193"	11	BSPT	1	4.500"	4.250"	8	NPT/NPTF	4
0.656"	0.589"	19	BSPT	3/8	1.649"	1.491"	11.5	NPT/NPTF	1 1/4	6.625"	6.425"	8	NPT/NPTF	6
0.668"	0.571"	18	NPT/NPTF	3/8	1.650"	1.534"	11	BSPT	1 1/4	8.625"	8.425"	8	NPT/NPTF	8
0.821"	0.718"	14	NPT/NPTF	1/2	1.822"	1.766"	11	BSPT	1 1/2					

Straight Threads														
Actual OD (Male)	Actual ID (Female)	Thread Pitch/ TPI	Thread Type	Pipe Size	Actual OD (Male)	Actual ID (Female)	Thread Pitch/ TPI	Thread Type	Pipe Size	Actual OD (Male)	Actual ID (Female)	Thread Pitch/ TPI	Thread Type	Pipe Size
0.180"	0.160"	0.5mm. Metric	M3		0.624"	0.587"	1.5mm. Metric	M16		1.125"	1.100"	14	UN/UNF(SAE)	1 1/8"-14
0.190"	0.180"	.32	UN/UNF(SAE)	10-32	0.625"	0.578"	18	UN/UNF(SAE)	5/8"-18	1.188"	1.115"	12	UN/UNF(SAE)	1 1/16"-12
0.220"	0.180"	0.8mm. Metric	M5		0.656"	0.589"	19	BSPP	3/8	1.250"	1.125"	11.5	NPSH	1
0.250"	0.230"	28	UN/UNF(SAE)	1/4"-28	0.658"	0.608"	18	NPSM	3/8	1.287"	1.206"	11.5	NPSM	1
0.260"	0.220"	1mm. Metric	M6		0.703"	0.666"	1.5mm. Metric	M18		1.292"	1.241"	2.0mm. Metric	M33	
0.304"	0.258"	28	BSPP	1/16	0.750"	0.707"	16	UN/UNF(SAE)	3/4"-16	1.309"	1.193"	11	BSPP	1
0.310"	0.286"	1mm. Metric	M8		0.781"	0.745"	1.5mm. Metric	M20		1.313"	1.212"	12	UN/UNF(SAE)	1 1/16"-12
0.313"	0.277"	24	UN/UNF(SAE)	5/16"-24	0.818"	0.753"	14	NPSM	1/2	1.375"	1.250"	8	NH/NST	3/4 or 1
0.375"	0.340"	24	UN/UNF(SAE)	3/8"-24	0.835"	0.741"	14	BSPP	1/2	1.411"	1.359"	1.5mm. Metric	M36	
0.383"	0.337"	28	BSPP	1/8	0.860"	0.824"	1.5mm. Metric	M22		1.625"	1.582"	12	UN/UNF(SAE)	1 1/8"-12
0.389"	0.356"	1mm. Metric	M10		0.875"	0.814"	14	UN/UNF(SAE)	7/8"-14	1.647"	1.598"	2.0mm. Metric	M42	
0.394"	0.361"	.27	NPSM		0.902"	0.811"	14	BSPP	5/8	1.875"	1.750"	11.5	NPSH	1 1/2
0.436"	0.395"	20	UN/UNF(SAE)	7/16"-20	1.000"	0.914"	14	UN/UNF(SAE)	1"-14	1.875"	1.803"	12	UN/UNF(SAE)	1 7/8"-12
0.467"	0.430"	1.5mm. Metric	M12		1.000"	1.000"	14	NPSH	3/4	2.000"	1.875"	9	NH/NST	1 1/2
0.468"	0.440"	.32	UN/UNF(SAE)	15/32"-32	1.018"	0.966"	1.5mm. Metric	M26		2.500"	2.428"	12	UN/UNF(SAE)	2 1/2"-12
0.500"	0.457"	20	UN/UNF(SAE)	1/2"-20	1.029"	0.964"	14	NPSM	3/4	2.875"	2.625"	8	NPSH	2 1/2
0.518"	0.451"	19	BSPP	1/4	1.041"	0.949"	14	BSPP	3/4	3.000"	3.062"	7.5	NH/NST	2 1/2
0.522"	0.474"	18	NPSM	1/4	1.056"	1.005"	2.0mm. Metric	M27		3.625"	3.500"	6	NH/NST	3
0.545"	0.509"	1.5mm. Metric	M14		1.062"	0.937"	11.5	GHT	3/4					
0.563"	0.515"	18	UN/UNF(SAE)	9/16"-18	1.063"	0.990"	12	UN/UNF(SAE)	1 1/16"-12					

Unthreaded Pipe Dimensions and Schedule

Metal pipe, plastic pipe, and plastic pipe fittings are generally rated by schedule, which refers to the wall thickness. As the schedule increases, the walls get thicker towards the center for any given pipe size.

Metal pipe fittings are not usually rated by schedule; they are instead rated by the amount of pressure (psi) they can withstand.



Pipe Size	Actual OD	Thin Wall (Schedule 10)		Standard Wall (Schedule 40)		Thick Wall (Schedule 80)		Extra-Thick Wall (Schedule 160)		Super-Thick Wall (Schedule XXH)	
		Actual ID	Wall Thick.	Actual ID	Wall Thick.	Actual ID	Wall Thick.	Actual ID	Wall Thick.	Actual ID	Wall Thick.
1/8	0.405"	0.307"	0.049"	0.269"	0.068"	0.215"	0.095"				
1/4	0.540"	0.410"	0.065"	0.364"	0.088"	0.302"	0.119"				
3/8	0.675"	0.545"	0.065"	0.493"	0.091"	0.423"	0.126"				
1/2	0.840"	0.674"	0.083"	0.622"	0.109"	0.546"	0.147"	0.464"	0.188"	0.252"	0.294"
5/8	1.050"	0.884"	0.083"	0.824"	0.113"	0.742"	0.154"	0.612"	0.219"	0.434"	0.308"
1	1.315"	1.097"	0.109"	1.049"	0.133"	0.957"	0.179"	0.815"	0.250"	0.599"	0.358"
1 1/4	1.660"	1.442"	0.109"	1.380"	0.140"	1.278"	0.191"	1.160"	0.250"		
1 1/2	1.900"	1.682"	0.109"	1.610"	0.145"	1.500"	0.200"	1.338"	0.281"	1.100"	0.400"
2	2.375"	2.157"	0.109"	2.067"	0.154"	1.939"	0.218"	1.687"	0.344"	1.503"	0.436"
2 1/2	2.875"	2.635"	0.120"	2.469"	0.203"	2.323"	0.276"	2.125"	0.375"		
3	3.500"	3.260"	0.120"	3.068"	0.216"	2.900"	0.300"	2.624"	0.438"		
4	4.500"	4.260"	0.120"	4.026"	0.237"	3.826"	0.337"	3.438"	0.531"		
5	5.563"	5.295"	0.134"	5.047"	0.258"	4.813"	0.375"	4.313"	0.625"		
6	6.625"	6.357"	0.134"	6.065"	0.280"	5.761"	0.432"	5.187"	0.719"		
8	8.625"	8.329"	0.148"	7.981"	0.322"	7.625"	0.500"	6.813"	0.906"		

(i) For a measuring guide for unthreaded pipe and fittings up to pipe size 8, go to mcmaster.com and search for 4347KAC.

Stainless Steel Pipe Fittings

For technical drawings and 3-D models, go to mcmaster.com.

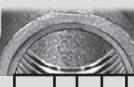


How to Measure Pipe Size for NPT Threads

Example shows pipe size 3/8. Pipe size is not an actual measured size, but rather an industry designation. Align your pipe or fitting with the "0" line as shown. The line on the opposite edge gives the pipe size. You can also measure the OD of male threads or the ID of female threads, then find the corresponding pipe size in the chart. If your measurement doesn't match an OD or ID listed, round to the nearest 1/8".



Pipe Size: 0
OD: 0



Pipe Size: 0
ID: 0

i To measure larger pipe sizes, go to mcmaster.com and search for 4464KAC. For information about fittings and pipe, see pages 2-3.

Low-Pressure Stainless Steel Threaded Pipe Fittings



- Pipe Nipples and Pipe: Use threaded Schedule 40 standard-wall stainless steel (see pages 10-13)
- Flanges: Use threaded Class 150 low-pressure stainless steel (see page 9)

Use these Class 150 fittings in a low-pressure pipe line. They are heat treated, except NPTI plugs. Fittings that meet ANSI/MSS SP-114 adhere to high-quality standards for heat treating, material thickness, and marking.

304 stainless steel fittings have very good corrosion resistance. **316 stainless steel** fittings have excellent corrosion resistance.

NPT Connectors, Adapters, and Caps

- Use with air, natural gas, oil, steam, water
- Maximum Pressure: 150 psi @ 72°F; 150 psi @ 360°F for steam

Meet ANSI/MSS SP-114 and ASTM A351, except 90° elbow unions, wyes, and male straights only meet ASTM A351.

Female x male 90° elbows are also known as street elbows.

Female x butt weld straights are also known as half couplings.

Unions separate into three pieces so you can access your line without unthreading pipe connections.



Pipe Size	90° Elbows	90° Elbows, Female x Male	90° Elbow Unions, Female x Male	45° Elbows	Wyes	Tees
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304 Stainless Steel

1/8	4464K11	\$4.90	4464K35	\$6.94	4464K23	\$6.48	4464K716	\$4.62	4464K47	\$6.91
1/4	4464K12	4.90	4464K36	6.94	4464K24	6.48	4464K726	5.56	4464K48	6.91
3/8	4464K13	6.00	4464K37	8.34	4464K25	7.63	4464K736	6.80	4464K49	8.83
1/2	4464K14	6.45	4464K38	11.98	4464K26	8.33	4464K746	9.70	4464K51	9.15
3/4	4464K15	9.21	4464K39	14.73	4464K27	12.23	4464K756	13.01	4464K52	14.66
1	4464K16	13.07	4464K41	22.78	4464K28	15.01	4464K766	20.90	4464K53	18.69
1 1/4	4464K17	24.32	4464K42	34.29	4464K29	23.98	4464K776	26.59	4464K54	37.14
1 1/2	4464K18	30.58	4464K43	40.53	4464K31	28.54	4464K786	29.75	4464K55	46.20
2	4464K19	38.70	4464K44	54.98	4464K32	40.12	4464K796	43.77	4464K56	59.29
2 1/2	4464K121	79.93	4464K127	105.16	4464K124	94.51	4464K141	109.01		
3	4464K122	101.83	4464K128	139.49	4464K125	130.25	4464K142	157.19		
4	4464K123	170.32	4464K129	203.72	4464K126	173.86	4464K143	212.88		

316 Stainless Steel

1/8	4452K411	5.99	4452K471	7.23	4452K371	14.92	4452K421	7.70	4452K831	5.16	4452K431	7.98
1/4	4452K412	6.13	4452K472	8.14	4452K372	17.52	4452K422	7.70	4452K832	6.40	4452K432	9.00
3/8	4452K413	7.38	4452K473	10.18	4452K373	21.08	4452K423	9.34	4452K833	7.84	4452K433	10.56
1/2	4452K414	8.16	4452K474	12.03	4452K374	31.08	4452K424	10.21	4452K834	11.24	4452K434	12.56
3/4	4452K415	11.88	4452K475	15.79	4452K375	33.32	4452K425	13.43	4452K835	15.24	4452K435	18.53
1	4452K416	14.85	4452K476	25.23	4452K376	49.74	4452K426	16.85	4452K836	24.52	4452K436	23.28
1 1/4	4452K417	25.40	4452K477	37.68	4452K377	84.04	4452K427	26.54	4452K837	36.48	4452K437	41.12
1 1/2	4452K418	33.89	4452K478	42.00	4452K378	94.56	4452K428	31.56	4452K838	38.46	4452K438	56.26
2	4452K419	42.84	4452K479	59.89	4452K379	124.50	4452K429	44.10	4452K839	57.04	4452K439	72.49
2 1/2	4452K611	101.55	4452K617	123.55	4452K614	115.53	4452K621	125.51				
3	4452K612	129.27	4452K618	160.16	4452K615	139.36	4452K622	188.59				
4	4452K613	189.73	4452K619	227.01	4452K616	207.17	4452K623	230.46				



Pipe Size	Crosses	Straights, Female	Straights, Male	Straights, Female x Butt Weld	Unions	Caps
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304 Stainless Steel

1/8	4464K311	\$11.98	4464K351	\$2.86	4464K711	\$2.48	4464K364	\$2.09	4464K483	\$13.57	4464K496	\$1.99
1/4	4464K312	11.98	4464K352	3.40	4464K721	4.60	4464K471	2.28	4464K484	15.92	4464K497	2.92
3/8	4464K313	14.26	4464K353	3.93	4464K731	6.00	4464K472	2.43	4464K485	14.87	4464K498	3.41
1/2	4464K314	17.68	4464K354	5.63	4464K741	8.44	4464K473	3.83	4464K486	14.93	4464K499	3.54
3/4	4464K315	30.22	4464K355	7.78	4464K751	12.72	4464K474	4.56	4464K487	18.98	4464K511	4.40
1	4464K316	40.67	4464K356	11.33	4464K761	15.72	4464K475	5.87	4464K488	28.58	4464K512	6.65
1 1/4	4464K317	52.95	4464K357	16.76	4464K771	23.24	4464K476	9.18	4464K489	49.59	4464K513	12.02
1 1/2	4464K318	65.57	4464K358	19.88	4464K781	26.47	4464K477	11.33	4464K491	56.08	4464K514	15.80
2	4464K319	80.50	4464K359	28.03	4464K791	31.17	4464K478	14.44	4464K492	70.69	4464K515	20.14
2 1/2	4464K320	173.47	4464K361	61.57	4464K792	43.86	4464K479	35.03	4464K493	164.63	4464K516	36.36
3	4464K321	187.39	4464K362	83.78	4464K793	56.11	4464K481	42.67	4464K494	206.69	4464K517	50.25
4	4464K322	270.60	4464K363	130.21	4464K794	82.86	4464K482	82.86	4464K495	286.43	4464K518	89.52

(Continued on following page)



Low-Pressure Stainless Steel Threaded Pipe Fittings (Continued from previous page)

NPT Connectors, Adapters, and Caps (Cont.)



Pipe Size	Crosses	Straights, Female	Straights, Male	Straights, Female x Butt Weld	Unions	Caps
316 Stainless Steel						
1/8	4452K481	\$14.45	4452K111	\$3.36	4452K841	\$2.92
1/4	4452K482	14.45	4452K112	4.27	4452K842	5.12
3/8	4452K483	16.94	4452K113	4.46	4452K843	6.80
1/2	4452K484	21.04	4452K114	6.50	4452K844	9.64
5/8	4452K485	41.44	4452K115	8.99	4452K845	12.64
1	4452K486	44.38	4452K116	11.98	4452K846	17.60
1 1/4	4452K487	64.26	4452K117	19.05	4452K847	27.88
1 1/2	4452K488	80.19	4452K118	22.62	4452K848	31.56
2	4452K489	110.41	4452K119	31.87	4452K849	39.40
2 1/2	4452K624	205.76	4452K135	78.79	4452K851	57.11
3	4452K625	224.08	4452K136	101.78	4452K852	73.06
4	4452K626	322.75	4452K137	134.69	4452K221	101.16
					4452K234	366.05
					4452K247	108.57

NPT Plugs

- Use with air, natural gas, oil, steam, water
- Maximum Pressure: 150 psi @ 72°F;
150 psi @ 360°F for steam

External Hex Drive and External Square Drive—Meet ANSI/MSS SP-114 and ASTM A351. Plugs are hollow, except 1/8-3/8 pipe sizes are solid.

Hex Drive—302 and 304 stainless steel plugs are solid; 316 stainless steel plugs are hollow, except 1/8-3/8 pipe sizes are solid.

Hex Drive with Magnet—Plugs attract metal debris that could otherwise damage your system. They are hollow.

NPTF (Dryseal) threads are compatible with NPT threads.



NPT External Hex Drive

NPT External Square Drive

NPTF Hex Drive

NPTF Hex Drive with Magnet

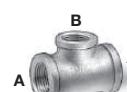
Pipe Size	304 Stainless Steel	316 Stainless Steel	304 Stainless Steel	316 Stainless Steel	Drive Size	304 Stainless Steel	316 Stainless Steel	316 Stainless Steel	
1/16					5/32"	4464K559★	\$1.00	4452K539	\$1.40
1/8	4464K251	\$2.00	4452K141	\$2.50	3/16"	4464K561★	.60	4452K541	.89
1/4	4464K252	2.00	4452K142	2.50	4464K232	1.92	4452K122	2.49	
3/8	4464K253	2.49	4452K143	2.83	4464K233	2.87	4452K123	3.29	
1/2	4464K254	3.92	4452K144	4.70	4464K234	4.12	4452K124	4.62	
5/8	4464K255	4.91	4452K145	5.94	4464K235	4.99	4452K125	5.65	
1	4464K256	8.49	4452K146	9.48	4464K236	6.32	4452K126	7.08	
1 1/4	4464K257	13.64	4452K147	16.35	4464K237	12.60	4452K127	16.72	
1 1/2	4464K258	14.93	4452K148	19.34	4464K238	15.02	4452K128	18.51	
2	4464K259	20.63	4452K149	27.96	4464K239	17.76	4452K129	25.51	
2 1/2	4464K244	36.98	4452K151	44.93	4464K241	33.86	4452K131	41.10	
3	4464K245	50.71	4452K152	57.66	4464K242	42.56	4452K132	49.96	
4	4464K246	106.12	4452K153	135.73	4464K243	92.39	4452K133	115.32	

* Plug is 302 stainless steel.

NPT Reducers

- Use with air, natural gas, oil, steam, water
- Maximum Pressure: 150 psi @ 72°F;
150 psi @ 360°F for steam

Meet ASTM A351. **Inline tees** are also known as branch tees.



90° Elbows

Inline Tees

Straights, Male

Pipe Size (A) (B)	304 Stainless Steel	316 Stainless Steel	304 Stainless Steel	316 Stainless Steel	304 Stainless Steel	316 Stainless Steel	
1/4	1/8	4464K911	\$5.12	4452K731	\$6.28	4464K913	\$6.84
3/8	1/8	4464K921	6.32	4452K732	7.64	4464K933	8.68
3/8	1/4	4464K921	6.32	4452K732	7.64	4464K923	8.68
1/2	1/8	4464K931	6.68	4452K733	8.49	4464K963	9.12
1/2	1/4	4464K931	6.68	4452K733	8.49	4464K953	9.12
1/2	3/8	4464K941	6.68	4452K734	8.49	4464K943	9.60
3/4	1/4	4464K961	9.68	4452K735	12.30	4464K993	14.56
3/4	3/8	4464K961	9.68	4452K735	12.30	4464K983	14.56
3/4	1/2	4464K951	9.68	4452K736	12.30	4464K973	14.56
1	1/4	4464K911	—	4452K731	—	4464K944	18.60
1	3/8	4464K981	13.72	4452K737	14.64	4464K934	18.60
1	1/2	4464K971	13.72	4452K738	16.52	4464K924	18.60
1	3/4	4464K971	13.72	4452K738	16.52	4464K914	18.60
1 1/4	3/4	4464K912	24.16	4452K739	25.11	4464K964	34.78
1 1/4	1	4464K991	24.16	4452K741	25.11	4464K954	34.78
1 1/2	3/4	4464K932	30.27	4452K742	35.23	4464K994	43.09
1 1/2	1 1/4	4464K922	30.27	4452K743	35.23	4464K984	43.09
2	1	4464K952	38.28	4452K744	44.56	4464K935	47.60
2	1 1/4	4464K942	38.28	4452K745	44.56	4464K925	47.60
2	1 1/2	4464K942	38.28	4452K745	44.56	4464K915	47.60

(Continued on following page)


How to Measure Pipe Size for NPT or BSP Threads—Example shows pipe size 3/8".

Pipe size is not an actual measured size, but rather an industry designation. Align your pipe or fitting with the "0" line as shown. The line on the opposite edge gives the pipe size. You can also measure the OD of male threads or the ID of female threads, then find the corresponding pipe size in the chart. If your measurement doesn't match an OD or ID listed, round to the nearest 1/8".



Pipe Size: 0 1/16 1/8 1/4 3/8 1/2 3/4 1" 1 1/4" 1 1/2"
OD: 0 1/4 3/8 1/2 5/8" 3/4" 1" 1 1/4" 1 1/2"



Pipe Size: 0 1/16 1/8 1/4 3/8 1/2 3/4 1" 1 1/4" 1 1/2"
ID: 0 1/4 3/8 1/2 5/8" 3/4" 1" 1 1/4" 1 1/2"

i To measure larger pipe sizes, go to mcmaster.com and search for 4464KAC. For information about fittings and pipe, see pages 2-3.

Low-Pressure Stainless Steel Threaded Pipe Fittings (Continued from previous page)



- Pipe Nipples and Pipe: Use threaded Schedule 40 standard-wall stainless steel (see pages 10-13)
- Flanges: Use threaded Class 150 low-pressure stainless steel (see page 9)

Use these fittings in a low-pressure pipe line. They are also known as Class 150 fittings and are heat treated, except through-wall fittings and fittings for tanks. Fittings that meet ANSI/MSS SP-114 adhere to high-quality standards for heat treating, material thickness, and marking.

304 stainless steel fittings have very good corrosion resistance. **316 stainless steel** fittings have excellent corrosion resistance.

NPT Reducers (Cont.)

- Use with air, natural gas, oil, steam, water
- Maximum Pressure: 150 psi @ 72°F; 150 psi @ 360°F for steam

Meet ANSI/MSS SP-114 and ASTM A351.


Strights, Female

Pipe Size		304 Stainless Steel	316 Stainless Steel	Pipe Size		304 Stainless Steel	316 Stainless Steel
(A)	(B)			(A)	(B)		
1/4	1/8	4464K519	\$4.21	4452K248	\$4.78	4464K543	\$20.79
3/8	1/8	4464K521	4.66	4452K249	5.28	4464K544	21.62
3/8	1/4	4464K522	4.83	4452K251	5.38	4464K545	22.52
1/2	1/8	4464K523	4.79	4452K252	6.39	4464K546	32.20
1/2	1/4	4464K524	4.99	4452K253	6.48	4464K547	33.39
1/2	3/8	4464K525	5.19	4452K254	6.60	4464K548	34.68
3/4	1/8	4464K526	6.70	4452K255	8.15	4464K549	36.06
3/4	1/4	4464K527	6.95	4452K256	8.30	4464K551	32.20
3/4	3/8	4464K528	7.21	4452K257	8.46	4464K552	70.27
3/4	1/2	4464K529	7.50	4452K258	8.62	4464K553	71.42
1	1/8	4464K531	9.16	4452K259	14.19	4464K554	72.61
1	1/4	4464K532	9.49	4452K261	12.79	4464K555	65.47
1	3/8	4464K533	9.86	4452K262	13.01	4464K556	100.07
1	1/2	4464K534	10.25	4452K263	13.24	4464K557	101.71
1	3/4	4464K535	10.68	4452K264	13.48	4464K558	103.40
1 1/4	3/8	4464K536	13.35	4452K265	18.52	4464K571	103.40
1 1/4	1/2	4464K537	13.85	4452K266	16.70	4464K572	103.40
1 1/4	3/4	4464K538	14.38	4452K267	16.99	4464K573	142.74
1 1/4	1	4464K539	14.96	4452K268	17.29	4464K574	145.82
1 1/2	3/8	4464K541	19.31	4452K269	24.70	4464K575	146.82
1 1/2	1/2	4464K542	20.02	4452K271	22.27		


Bushings, Male x Female

Pipe Size		304 Stainless Steel	316 Stainless Steel	Pipe Size		304 Stainless Steel	316 Stainless Steel
(A)	(B)			(A)	(B)		
1/4	1/8	4464K261	\$2.75	4452K161	\$3.09	4464K191	\$25.13
3/8	1/8	4464K262	3.00	4452K162	3.54	4464K159	25.13
3/8	1/4	4464K263	3.00	4452K163	3.54	4464K171	25.13
1/2	1/8	4464K264	3.79	4452K164	4.16	4464K172	25.13
1/2	1/4	4464K265	3.79	4452K165	4.16	4464K173	25.13
1/2	3/8	4464K266	3.79	4452K166	4.16	4464K174	25.13
3/4	1/8	4464K267	5.53	4452K167	6.16	4464K175	25.13
3/4	1/4	4464K268	5.53	4452K168	6.16	4464K814	38.90
3/4	3/8	4464K269	5.53	4452K169	6.16	4464K824	38.90
3/4	1/2	4464K271	5.53	4452K171	6.16	4464K834	38.90
1	1/8	4464K272	7.70	4452K293	9.28	4464K844	38.90
1	1/4	4464K273	7.70	4452K173	8.78	4464K192	43.10
1	3/8	4464K274	7.70	4452K174	8.78	4464K176	43.10
1	1/2	4464K275	7.70	4452K175	8.78	4464K854	59.62
1	3/4	4464K276	7.70	4452K176	8.78	4464K177	66.06
1 1/4	1/4	4464K278	13.76	4452K178	17.18	4464K864	59.62
1 1/4	3/8	4464K279	13.76	4452K294	18.09	4464K193	66.06
1 1/4	1/2	4464K281	13.76	4452K134	17.18	4464K178	66.06
1 1/4	3/4	4464K282	13.76	4452K181	17.18	4464K179	66.06
1 1/4	1	4464K151	15.53	4452K182	17.18	4464K874	135.56
1 1/2	1/4	4464K153	16.47	4452K184	20.34	4464K884	120.18
1 1/2	3/8	4464K154	16.47	4452K295	21.42	4464K894	120.18
1 1/2	1/2	4464K155	16.47	4452K186	20.34	4464K187	120.18
1 1/2	3/4	4464K156	16.47	4452K187	20.34	4464K815	120.18
1 1/2	1	4464K157	16.47	4452K188	20.34	4464K188	120.18
1 1/2	1 1/4	4464K158	16.47	4452K189	20.34	4452K155	142.82

(Continued on following page)



Low-Pressure Stainless Steel Threaded Pipe Fittings (Continued from previous page)



NPSL Locknuts

- Use with air, natural gas, oil, steam, water
- Maximum Pressure: 150 psi @ 72°F; 150 psi @ 360°F for steam

Locknuts thread onto the male end of a fitting to provide extra holding power so the fitting won't loosen from vibration. They have NPSL (National Pipe Straight Locknut) threads that are compatible with NPT threads. Meet ANSI/MSS SP-114 and ASTM A351.



Pipe Size	304 Stainless Steel	316 Stainless Steel	Pipe Size	304 Stainless Steel	316 Stainless Steel	Pipe Size	304 Stainless Steel	316 Stainless Steel
1/8	4464K581	\$5.44	4452K671	\$5.91		3/4	4464K585	\$6.60
1/4	4464K582	5.44	4452K672	5.91		1	4464K586	7.52
3/8	4464K583	5.44	4452K673	5.91		1 1/4	4464K587	15.53
1/2	4464K584	5.44	4452K674	5.91		1 1/2	4464K588	15.53

NPT Through-Wall Connectors

- Use with water
- Maximum Pressure: 150 psi @ 72°F

Also known as bulkhead couplings, these connectors mount through a wall or tank to create an inlet or outlet. When installing, the gasket should be on the inside of the tank. Connectors are 316 stainless steel with an EPDM gasket.



Straights, Female

Pipe Size	For Hole Dia.	For Max. Wall Thick.			
3/8	1"	5/16"	6696K58	\$93.57	
1/2	1 1/8"	1/2"	6696K59	124.03	
3/4	1 5/8"	3/4"	6696K61	145.26	
1	2 1/4"	1 3/8"	6696K62	176.87	
1 1/4	2 1/4"	1 3/8"	6696K63	176.87	
1 1/2	3"	1 3/8"	6696K64	222.15	
2	3"	1 3/8"	6696K65	222.15	
2	3 1/4"	1 3/4"	6696K66	234.47	
3	4 3/8"	1 11/16"	6696K67	359.26	

NPTF Adapters for Curved Tanks

- Use with diesel fuel, gasoline, oil, water
- Maximum Pressure: Not rated

Weld to the surface of a tank, pressure vessel, or drum to create a permanent inlet or outlet. Adapters are 316/316L stainless steel and have NPTF (Dryseal) threads that are compatible with NPT threads.

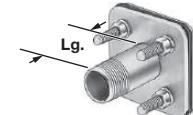
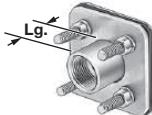


Pipe Size	For Tank OD	For Hole Dia.	OD	
3/4	20"	11/8"	23/8"	1698T31 \$9.52
1	20"	13/8"	25/16"	1698T32 10.12
1 1/2	21"	21/8"	31/4"	1698T33 18.98

NPT Through-Wall Adapters for Flat Tanks

- Use with air, coolant, water
- Maximum Pressure: Not rated

Tighten and adjust these adapters from the outside without draining your line. Also known as bulkhead couplings, they mount through a wall or tank to create an inlet or outlet. When installing, the gasket should be on the inside of the tank. Adapters are 316 stainless steel with an EPDM gasket and include four bolts.



Pipe Size	Wd.	Ht.	For Max. Wall Thick.	Female		Lg.	For Hole Dia.	Male
				Lg.	For Hole Dia.			
1/2	3 1/2"	3 1/2"	1"	13/16"	11/16"	3765K31	\$133.33	27/16"
3/4	3 1/2"	3 1/2"	1"	15/16"	1 1/4"	3765K32	140.00	11/16"
1	3 1/2"	3 1/2"	1"	11/16"	19/16"	3765K33	144.44	15/16"
1 1/2	4"	4"	1"	19/16"	23/16"	3765K34	171.11	15 1/16"
2	4 1/2"	4 1/2"	1"	15/8"	25/8"	3765K35	204.44	23/8"

BSPP (British Standard Pipe Parallel) Connectors

- Use with air, natural gas, oil, steam, water
- Maximum Pressure: 150 psi @ 72°F; 150 psi @ 360°F for steam

These 304 stainless steel fittings meet ANSI/MSS SP-114.

Unions separate into three pieces so you can access your line without unthreading pipe connections.

Pipe Size, BSPP	90° Elbows	45° Elbows	Tees	Straights	Unions	
1/2	4810T501	\$6.68	4810T507	\$8.24	4810T527	\$7.64
3/4	4810T502	9.60	4810T508	12.04	4810T528	11.04
1	4810T503	13.64	4810T509	14.72	4810T516	14.44
1 1/4	4810T504	23.88	4810T511	23.56	4810T517	35.56
1 1/2	4810T505	31.76	4810T512	28.04	4810T518	45.44
2	4810T506	40.28	4810T513	39.44	4810T519	58.40

(Continued on following page)

Stainless Steel Pipe Fittings

For technical drawings and 3-D models, go to mcmaster.com.



How to Measure Pipe Size for NPT or BSP Threads

Example shows pipe size $\frac{3}{8}$. Pipe size is not an actual measured size, but rather an industry designation. Align your pipe or fitting with the "0" line as shown. The line on the opposite edge gives the pipe size. You can also measure the OD of male threads or the ID of female threads, then find the corresponding pipe size in the chart. If your measurement doesn't match an OD or ID listed, round to the nearest $\frac{1}{8}$.



Pipe Size: 0
OD: 0



Pipe Size: 0
ID: 0

i To measure larger pipe sizes, go to mcmaster.com and search for 4464KAC. For information about fittings and pipe, see pages 2-3.

Low-Pressure Stainless Steel Threaded Pipe Fittings (Continued from previous page)



- Pipe Nipples and Pipe: Use threaded Schedule 40 standard-wall stainless steel (see pages 10-13)
- Flanges: Use threaded Class 150 low-pressure stainless steel (see page 9)

Use these Class 150 fittings in a low-pressure pipe line. They are heat treated, except BSPT x NPT thread adapters. Fittings that meet ANSI/MSS SP-114 adhere to high-quality standards for heat treating, material thickness, and marking.

304 stainless steel fittings have very good corrosion resistance. **316 stainless steel** fittings have excellent corrosion resistance.

BSPT (British Standard Pipe Taper) Connectors, Adapters, Caps, and Plugs

- Use with air, natural gas, oil, steam, water
- Maximum Pressure: 150 psi @ 72°F; 150 psi @ 360°F for steam

These 304 stainless steel fittings meet ANSI/MSS SP-114, except male straights.

Female x male 90° elbows are also known as street elbows.

Female x butt weld straights are also known as half couplings.

Unions separate into three pieces so you can access your line without unthreading pipe connections.

Plugs are hollow, except $\frac{1}{8}$ - $\frac{3}{8}$ pipe sizes are solid.



Pipe Size, BSPT	90° Elbows	90° Elbows, Female x Male	45° Elbows	Tees	Crosses	Straights, Female		
$\frac{1}{8}$	4810T111	\$5.52	4810T131	\$7.85	4810T121	\$6.94	4810T151	\$3.77
$\frac{1}{4}$	4810T112	5.77	4810T132	8.21	4810T142	7.25	4810T152	4.18
$\frac{3}{8}$	4810T113	7.15	4810T133	9.90	4810T123	8.52	4810T153	4.87
$\frac{1}{2}$	4810T114	7.62	4810T134	11.65	4810T124	9.37	4810T154	6.88
$\frac{5}{8}$	4810T115	10.91	4810T135	16.15	4810T125	13.71	4810T155	9.95
1	4810T116	15.46	4810T136	27.95	4810T126	16.73	4810T156	16.95
$\frac{1}{2}$	4810T118	36.16	4810T138	48.02	4810T128	31.93	4810T158	28.48
2	4810T229	43.86	4810T232	62.19	4810T231	42.90	4810T233	63.51
							4810T234	38.64



Pipe Size, BSPT	Straights, Male	Straights, Female x Butt Weld	Unions	Caps	Plugs with External Hex Drive	Plugs with External Square Drive	
$\frac{1}{8}$	4810T322	\$2.23	4810T241	\$2.43	4810T171	\$2.91	
$\frac{1}{4}$	4810T323	4.13	4810T242	2.69	4810T172	4.13	
$\frac{3}{8}$	4810T324	5.40	4810T243	2.89	4810T173	4.87	
$\frac{1}{2}$	4810T325	7.57	4810T244	4.05	4810T174	5.08	
$\frac{5}{8}$	4810T326	10.07	4810T245	5.37	4810T175	6.35	
1	4810T327	14.13	4810T246	6.88	4810T176	40.98	
$\frac{1}{2}$	4810T328	25.27	4810T247	14.43	4810T177	80.37	
2	4810T329	29.73	4810T248	19.75	4810T235	81.40	
					4810T237	27.60	
						4810T236	23.25

BSPT (British Standard Pipe Taper) Reducers

- Use with air, natural gas, oil, steam, water
- Maximum Pressure: 150 psi @ 72°F; 150 psi @ 360°F for steam

Reducers are 304 stainless steel.

Female straights and **male x female bushings** meet ANSI/MSS SP-114.



Pipe Size, BSPT (A)	Straights, Female (B)	Straights, Male (B)	Bushings, Male x Female (B)	Pipe Size, BSPT (A)	Straights, Female (B)	Straights, Male (B)	Bushings, Male x Female (B)	
$\frac{1}{4}$	$\frac{1}{8}$	4810T211	\$5.77	4810T339	\$4.53	4810T201	\$4.06	
$\frac{3}{8}$	$\frac{1}{8}$	4810T258	6.41	4810T341	5.93	4810T271	3.95	
$\frac{3}{8}$	$\frac{1}{4}$	4810T212	5.87	4810T342	5.93	4810T202	4.08	
$\frac{1}{2}$	$\frac{1}{8}$	4810T259	6.13	4810T343	8.30	4810T272	4.96	
$\frac{1}{2}$	$\frac{1}{4}$	4810T213	6.08	4810T344	8.30	4810T203	4.96	
$\frac{1}{2}$	$\frac{3}{8}$	4810T214	6.35	4810T345	8.30	4810T204	5.19	
$\frac{3}{4}$	$\frac{1}{4}$	4810T261	8.78	4810T346	11.13	4810T273	6.99	
$\frac{3}{4}$	$\frac{3}{8}$	4810T262	9.16	4810T347	11.13	4810T274	7.30	
$\frac{1}{2}$	$\frac{1}{2}$	4810T215	11.70			4810T205	7.57	
1	$\frac{1}{4}$	4810T263	11.55			4810T275	9.27	
1	$\frac{3}{8}$	4810T264	12.04	4810T348	15.53	4810T276	9.66	
				1	$\frac{1}{2}$	4810T265	\$12.56	
				1	$\frac{3}{4}$	4810T216	13.13	
				$\frac{1}{4}$	$\frac{3}{4}$	4810T352	24.40	
				$\frac{1}{4}$	1	4810T353	24.40	
				$\frac{1}{2}$	$\frac{3}{4}$	4810T266	25.33	
				$\frac{1}{2}$	1	4810T267	26.44	
				$\frac{1}{2}$	$\frac{1}{4}$	4810T355	27.77	
				$\frac{1}{2}$	$\frac{1}{4}$	4810T218	27.58	
				2	1	4810T356	27.77	
				2	$\frac{1}{4}$	4810T268	42.22	
				2	$\frac{1}{4}$	4810T357	32.70	
				2	$\frac{1}{4}$	4810T358	32.70	
				2	$\frac{1}{2}$	4810T269	44.06	
				2	$\frac{1}{2}$	4810T359	32.70	
							4810T282	32.92

(Continued on following page)



For technical drawings and
3-D models, go to mcmaster.com.

Stainless Steel Pipe Fittings & Flanges

Low-Pressure Stainless Steel Threaded Pipe Fittings (Continued from previous page)



Thread Adapters

- Use with air, natural gas, oil, steam, water
- Maximum Pressure: 150 psi @ 72°F; 150 psi @ 360°F for steam



BSPT x NPT Adapters

Pipe Size				
1/8	4810T221	\$4.02		
1/4	4810T222	6.99		
3/8	4810T223	9.11		
1/2	4810T224	13.34		
5/8	4810T225	17.58		
1	4810T226	23.03		
1 1/2	4810T228	34.90		
2	4810T239	49.58		

Thread adapters are 304 stainless steel.



BSPT x NPT Reducing Adapters

Pipe Size (A)	Pipe Size (B)						
1/4	1/8	4810T361	\$4.53	1	3/4	4810T372	\$15.53
3/8	1/8	4810T362	5.93	1 1/4	3/4	4810T373	24.40
3/8	1/4	4810T363	5.93	1 1/4	1	4810T374	24.40
1/2	1/8	4810T364	8.30	1 1/2	3/4	4810T375	27.77
1/2	1/4	4810T365	8.30	1 1/2	1	4810T376	27.77
1/2	3/8	4810T366	8.30	1 1/2	1 1/4	4810T377	27.77
3/4	1/4	4810T367	11.13	2	1	4810T378	32.70
3/4	3/8	4810T368	11.13	2	1 1/4	4810T379	32.70
1	3/8	4810T369	15.53	2	1 1/2	4810T381	32.70
1	1/2	4810T371	15.53				

Low-Pressure Stainless Steel Threaded Pipe Flanges



- Use with air, natural gas, oil, steam, water
- Maximum Pressure:
304 and 316 SS: 150 psi @ 72°F; 150 psi @ 360°F for steam
Alloy 20 SS: 290 psi @ 72°F; 200 psi @ 360°F for steam
- Pipe Nipples and Pipe: Use threaded Schedule 40 standard-wall stainless steel (see pages 10-13)
- Fittings: Use threaded Class 150 low-pressure stainless steel (see pages 4-9, 13)

Also known as Class 150 flanges, these are designed for low-pressure pipe applications. Bolt two flat-surface flanges or two raised-surface flanges of the same size together with a gasket (sold separately on pages 3619-3624) to create an access point within a line.

Forged—Flanges have better strength than cast flanges. They are also called ANSI flanges and meet ANSI/ASME B16.5 and ASTM A182, except Alloy 20 stainless steel flanges only meet ANSI/ASME B16.5. **Reducing** flanges allow you to transition your system to a smaller pipe size.

NPT Forged Flanges

Pipe Size	Flange OD	For Bolt Dia. (No.)	304/304L Stainless Steel	316/316L Stainless Steel	Alloy 20 Stainless Steel
1/2	3 1/2"	1/2" (4)	44685K11 \$29.51	44695K11 \$34.16	2698K61 \$65.00
3/4	3 7/8"	1/2" (4)	44685K12 35.82	44695K12 44.35	2698K62 91.67
1	4 1/4"	1/2" (4)	44685K13 38.82	44695K13 52.51	2698K63 111.67
1 1/4	4 5/8"	1/2" (4)	44685K14 50.02	44695K14 65.00	
1 1/2	5"	1/2" (4)	44685K15 51.35	44695K15 67.24	2698K64 177.42
2	6"	5/8" (4)	44685K16 67.50	44695K16 78.83	2698K65 266.15
2 1/2	7"	5/8" (4)	44685K17 108.69	44695K17 136.29	
3	7 1/2"	5/8" (4)	44685K18 105.01	44695K18 151.40	
4	9"	5/8" (8)	44685K19 145.25	44695K19 186.98	
6	11"	3/4" (8)	44685K21 244.00	44695K21 312.93	
8	13 1/2"	3/4" (8)	44685K321 438.11	44695K25 524.51	

NPT Forged Reducing Flanges

Flanged Pipe Size	Threaded	Flange OD	For Bolt Dia. (No.)	304/304L Stainless Steel	316/316L Stainless Steel
1	1/4	4 1/4"	1/2" (4)	44685K331 \$64.36	44695K26 \$67.02
1	1/2	4 1/4"	1/2" (4)	44685K141 64.36	44695K141 91.26
1	3/4	4 1/4"	1/2" (4)	44685K142 65.67	44695K142 91.26
1 1/4	1	4 5/8"	1/2" (4)	44685K332 83.08	44695K261 110.62
1 1/2	3/4	5"	1/2" (4)	44685K333 83.08	44695K262 110.62
1 1/2	1	5"	1/2" (4)	44685K143 83.08	44695K143 121.68
1 1/2	1 1/4	5"	1/2" (4)	44685K334 83.08	44695K263 110.62
2	1/2	6"	5/8" (4)	44685K335 108.82	44695K264 150.94
2	3/4	6"	5/8" (4)	44685K336 108.82	44695K265 150.94
2	1	6"	5/8" (4)	44685K144 108.82	44695K144 150.94
2	1 1/4	6"	5/8" (4)	44685K337 108.82	44695K266 150.94
2	1 1/2	6"	5/8" (4)	44685K338 108.82	44695K267 150.94
2 1/2	2	7"	1/2" (4)	44685K339 138.27	44695K268 177.45
3	2	7 1/2"	5/8" (4)	44685K145 159.12	44695K145 197.93
4	2	9"	5/8" (8)	44685K341 181.35	44695K269 252.00
4	3	9"	5/8" (8)	44685K342 181.35	44695K27 252.00
6	4	11"	5/8" (8)	44685K343 300.60	44695K271 414.00

NPT Cast Flanges

Pipe Size	Flange OD	For Bolt Dia. (No.)	304 Stainless Steel	316 Stainless Steel
1/2	3 1/2"	1/2" (4)	43505K351 \$26.12	43615K561 \$29.77
3/4	3 7/8"	1/2" (4)	43505K352 27.55	43615K562 33.97
1	4 1/4"	1/2" (4)	43505K353 36.80	43615K563 42.83
1 1/4	4 5/8"	1/2" (4)	43505K354 41.78	43615K564 48.68
1 1/2	5"	1/2" (4)	43505K355 51.39	43615K565 56.48
2	6"	5/8" (4)	43505K356 63.99	43615K566 74.02
2 1/2	7"	5/8" (4)	43505K357 81.64	43615K567 102.09
3	7 1/2"	5/8" (4)	43505K358 93.59	43615K568 117.07
4	9"	5/8" (8)	43505K359 149.03	43615K569 186.39

BSPT (British Standard Pipe Taper) Forged Flanges

Pipe Size, BSPT	Flange OD	For Bolt Dia. (No.)	304/304L Stainless Steel
1/2	3 1/2"	1/2" (4)	1384N11 \$67.78
3/4	3 7/8"	1/2" (4)	1384N12 71.84
1	4 1/4"	1/2" (4)	1384N13 75.91
1 1/2	5"	1/2" (4)	1384N14 85.40
2	6"	5/8" (4)	1384N15 102.62

Stainless Steel Pipe Nipples & Pipe

For technical drawings and 3-D models, go to mcmaster.com.



How to Measure Pipe Size for Male NPT or BSP Threads

Pipe size is not an actual measured size, but rather an industry designation. Align your pipe with the "0" line as shown. The line on the opposite edge gives the pipe size. You can also measure the OD, then find the corresponding pipe size in the chart. If your measurement doesn't match an OD listed, round to the nearest $\frac{1}{8}$ ".



Pipe Size:	0	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1"	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{3}{4}$	2"	$2\frac{1}{2}$	$2\frac{3}{4}$	3"
OD:	0	$\frac{1}{4}$ "	$\frac{3}{8}$ "	$\frac{1}{2}$ "	$\frac{5}{8}$ "	$\frac{3}{4}$ "	$1\frac{1}{4}$ "	$1\frac{1}{2}$ "	$1\frac{5}{8}$ "	$2\frac{1}{2}$ "	$2\frac{3}{4}$ "	$3\frac{1}{8}$ "	$3\frac{1}{4}$ "	$3\frac{3}{8}$ "	$3\frac{1}{2}$ "	$3\frac{5}{8}$ "	$3\frac{3}{4}$ "

i To measure larger pipe sizes, go to mcmaster.com and search for 4464KAC. For information about fittings and pipe, see pages 2-3.

Standard-Wall Stainless Steel Threaded Pipe Nipples and Pipe



Fully Threaded Threaded on Both Ends Threaded on One End

- Fittings: Use threaded Class 150 low-pressure stainless steel (see pages 4-9, 13)
- Flanges: Use threaded Class 150 low-pressure stainless steel (see page 9)

Designed for low-pressure flow applications, this pipe is also known as Schedule 40. Seamless pipe has a smooth interior for unrestricted flow and is stronger than welded pipe. Welded pipe has a weld bead on the inside.

304 stainless steel pipe offers very good corrosion resistance. 316 stainless steel pipe has excellent corrosion resistance. Alloy 20 stainless steel pipe has the best corrosion resistance of all the stainless steel pipe we offer. Alloy 20 stainless steel is also known as Carpenter 20 and resists cracking from stress and corrosion.

Fully threaded pipe is also known as a close nipple; it is threaded on each end to the center.

304/304L Stainless Steel

- Use with air, natural gas, oil, steam, water

NPT— $\frac{1}{8}$ - $\frac{3}{8}$ pipe sizes are seamless; $\frac{1}{2}$ -6 pipe sizes are welded. All meet ANSI/ASME B1.20.1, ASTM A312, and ASTM A733.

BSPT and **BSPTxNPT**—Pipe is welded and meets ASTM A312.

NPT Fully Threaded											
Pipe Size	Lg.	Pipe Size	Lg.	Pipe Size	Lg.	Pipe Size	Lg.	Pipe Size	Lg.	Pipe Size	Lg.
$\frac{1}{8}$ "	$\frac{3}{4}"$	4830K111	\$1.45	$\frac{1}{2}"$	$\frac{1}{8}"$	4830K171	\$2.39	$\frac{11}{16}"$	$\frac{15}{16}"$	4830K241	\$5.33
$\frac{1}{4}"$	$\frac{7}{8}"$	4830K131	1.65	$\frac{3}{4}"$	$\frac{19}{32}"$	4830K191	2.98	$\frac{13}{16}"$	$\frac{13}{16}"$	4830K261	6.16
$\frac{3}{8}"$	1"	4830K151	1.96	1	$\frac{11}{16}"$	4830K221	3.96	2	2"	4830K281	9.49

NPT Threaded on Both Ends												
Pipe Size	1½"	2"	2½"	3"	3½"	4"	4½"	5"	5½"	6"	6½"	7"
$\frac{1}{8}"$	4813K134	\$1.84	\$2.16	\$2.47	\$2.78	\$3.18	\$3.49	\$3.80	\$4.16	\$4.47	\$4.78	\$5.61
$\frac{1}{4}"$	4813K135	1.96	2.35	2.75	3.14	3.65	4.08	4.47	4.90	5.29	5.69	6.71
$\frac{3}{8}"$	4813K136	2.27	2.71	3.22	3.69	4.27	4.75	5.22	5.73	6.20	6.67	7.92
$\frac{1}{2}"$	4813K137	2.82	3.29	3.88	4.47	5.22	5.80	6.43	7.02	7.61	8.20	9.65
$\frac{5}{8}"$	4813K138	3.14	3.65	4.31	4.98	5.80	6.47	7.14	7.76	8.43	9.10	10.67
1"	4813K139	4.86	5.65	6.55	7.65	8.51	9.37	10.27	11.14	12.04	12.46	12.46
$\frac{1}{4}"$	4813K141	—	7.18	8.27	9.69	10.82	11.16	11.43	12.42	13.38	15.68	15.68
$\frac{1}{2}"$	4813K142	—	—	7.88	9.14	10.67	11.92	12.30	12.59	13.69	14.79	17.40
2"	4813K143	—	—	10.20	11.65	12.74	13.34	14.75	16.16	17.57	18.97	22.51
$\frac{3}{4}"$	4813K144	—	—	—	18.60	22.66	23.40	25.12	27.28	29.47	31.53	37.06
3"	4813K145	—	—	—	24.88	30.20	31.05	33.71	34.35	37.09	39.84	48.55
4"	4813K146	—	—	—	—	38.67	38.67	41.96	45.70	49.44	53.18	54.58
6"	4813K147	—	—	—	—	148.03	170.65	184.33	205.11	218.93	233.28	243.56

Pipe Size	7½"	8"	8½"	9"	9½"	10"	10½"	11"	11½"	12"	14"	16"
$\frac{1}{8}"$	4813K134	\$5.82	\$6.24	\$6.44	\$6.86	\$7.06	\$7.61	\$7.69	\$8.23	\$8.27	\$8.86	\$8.65
$\frac{1}{4}"$	4813K135	6.99	7.53	7.76	8.31	8.56	9.22	9.33	10.00	10.10	10.82	10.40
$\frac{3}{8}"$	4813K136	8.27	8.86	9.19	9.84	10.17	10.90	11.09	11.05	11.93	11.97	12.67
$\frac{1}{2}"$	4813K137	10.14	10.82	10.87	11.24	12.08	12.48	13.14	12.73	14.20	14.68	18.83
$\frac{5}{8}"$	4813K138	10.18	11.20	11.31	11.67	12.54	12.94	13.68	14.10	14.77	15.27	19.76
1"	4813K139	13.58	14.00	15.07	15.54	16.74	17.29	18.27	18.84	19.73	20.35	25.53
$\frac{1}{4}"$	4813K141	17.10	17.64	19.00	19.63	21.16	21.82	23.06	23.78	24.99	25.77	32.12
$\frac{1}{2}"$	4813K142	18.97	19.56	21.06	21.75	23.46	24.19	25.95	26.76	27.68	28.55	37.88
2"	4813K143	25.32	25.32	28.14	28.14	31.29	31.29	34.11	34.11	36.92	49.38	56.44
$\frac{3}{4}"$	4813K144	41.28	41.31	45.57	48.60	50.41	50.41	54.66	54.66	58.95	80.36	91.85
3"	4813K145	46.71	50.83	51.46	52.89	53.89	56.98	58.39	59.93	62.90	64.55	106.51
4"	4813K146	59.29	60.88	65.43	67.15	72.33	74.23	78.46	80.53	84.60	86.83	137.35
6"	4813K147	253.13	262.76	272.35	281.95	291.56	301.17	310.78	314.34	323.76	321.06	393.11

Pipe Size	18"	20"	22"	24"	30"	36"	42"	48"	54"	60"	72"	120"
$\frac{1}{8}"$	4813K134	\$11.19	\$12.39	\$13.62	\$14.86	\$18.60	\$22.30	\$26.04	\$29.78	\$33.49	\$37.16	\$44.64
$\frac{1}{4}"$	4813K135	13.31	14.85	16.75	17.84	22.20	26.80	31.09	35.69	39.97	44.61	53.53
$\frac{3}{8}"$	4813K136	16.26	18.09	19.90	21.69	27.07	32.46	37.88	43.30	48.69	54.15	65.02
$\frac{1}{2}"$	4813K137	21.14	23.54	25.90	28.24	35.34	42.38	49.44	56.44	63.58	70.58	84.68
$\frac{5}{8}"$	4813K138	25.46	28.24	31.09	33.90	42.41	50.92	59.36	67.87	76.31	84.85	101.81
1"	4813K139	32.84	36.44	40.08	43.71	58.30	65.61	81.65	87.53	104.97	109.35	131.25
$\frac{1}{4}"$	4813K141	41.28	45.88	50.47	55.07	68.87	82.59	96.38	110.18	123.94	137.76	165.21
$\frac{1}{2}"$	4813K142	48.69	54.15	59.57	64.99	81.18	97.41	113.64	129.87	146.10	162.33	183.33
2"	4813K143	63.44	70.55	77.58	84.65	105.82	126.96	148.13	169.30	174.11	188.06	203.07
$\frac{3}{4}"$	4813K144	103.31	114.78	126.27	137.73	145.02	165.33	192.86	220.42	247.98	275.52	293.92
3"	4813K145	137.01	143.22	153.03	166.96	182.62	219.16	255.67	292.18	305.78	324.69	350.66
4"	4813K146	166.19	174.43	181.78	188.39	209.30	282.60	293.02	334.94	376.98	362.30	452.18
6"	4813K147	472.12	512.99	552.93	563.18	685.45	754.41	879.66	920.98	—	—	—

(Continued on following page)

**Standard-Wall Stainless Steel Threaded Pipe Nipples and Pipe (Continued)**

304/304L Stainless Steel (Cont.)

NPT Threaded on One End

Pipe Size	1"	1 1/2"	2"	2 1/2"	3"	3 1/2"	4"	4 1/2"	5"	5 1/2"	6"	8"	10"	12"	
1/8	9157K161	\$1.65	\$1.65	\$1.92	\$2.20	\$2.47	\$2.85	\$3.10	\$3.38	\$3.68	\$3.95	\$4.25	\$5.54	\$6.73	\$7.88
1/4	9157K162	1.45	1.76	2.09	2.44	2.80	3.24	3.62	4.01	4.34	4.72	5.05	6.68	8.18	9.61
3/8	9157K163	1.73	2.03	2.42	2.83	3.27	3.82	4.23	4.64	5.08	5.52	5.93	7.88	9.69	11.36
1/2	9157K164	2.11	2.50	2.91	3.43	3.95	4.61	5.16	5.69	6.24	6.75	7.27	9.64	11.89	13.98
5/8	9157K165	2.64	2.80	3.24	3.84	4.42	5.14	5.74	6.35	6.92	7.50	8.07	10.65	13.12	15.48
1	9157K166	—	3.51	4.31	5.02	5.79	6.75	7.55	8.34	9.11	9.88	10.68	14.22	17.51	20.64
1 1/4	9157K167	—	4.72	5.46	6.37	7.36	8.60	9.61	10.63	11.62	12.61	13.59	17.93	22.18	26.17
1 1/2	9157K168	—	5.46	5.87	6.97	8.10	9.47	10.57	11.69	12.79	13.89	14.99	19.87	24.54	28.97
2	9157K169	—	—	8.43	9.06	10.32	12.13	13.53	14.96	16.39	17.82	19.24	25.69	31.79	37.50
2 1/2	9157K171	—	—	—	16.66	18.83	21.61	23.72	25.51	21.36	27.67	31.98	41.93	51.17	59.84
3	9157K172	—	—	—	22.84	25.23	28.75	31.51	32.06	34.84	37.64	40.08	54.84	66.68	77.82
4	9157K173	—	—	—	28.34	29.76	39.25	39.23	42.60	46.36	50.21	53.91	73.37	89.49	104.67
6	9157K174	—	—	—	—	170.26	196.23	207.72	245.34	256.82	268.29	314.25	360.19	406.13	

BSPT Fully Threaded

Pipe Size	Lg.	Pipe Size	Lg.	Pipe Size	Lg.	Pipe Size	Lg.
1/8	3/4"	2427K11	\$1.73	3/8	1"	2427K31	\$1.97
1/4	7/8"	2427K21	1.67	1/2	1 1/8"	2427K41	2.53

BSPT Threaded on Both Ends

Pipe Size	1 1/2"	2"	3"	4"	6"	12"	36"	
1/8	2427K901	\$2.30	\$3.23	\$3.50	\$4.77	\$6.30	\$10.77	\$26.56
1/4	2427K902	1.97	3.24	2.90	4.48	5.72	9.24	20.80
3/8	2427K903	2.30	3.68	3.43	5.28	6.76	11.36	24.38
1/2	2427K904	2.83	4.40	4.33	6.32	8.36	14.08	31.78
5/8	2427K905	3.50	5.28	5.40	7.76	10.40	17.76	40.44
1	2427K906	—	6.60	7.30	10.20	13.80	24.48	54.12
1 1/2	2427K907	—	9.96	11.73	16.00	22.08	40.20	90.09
2	2427K908	—	—	15.07	20.32	28.32	52.52	109.72

BSPT x NPT Fully Threaded

Pipe Size	Lg.	Pipe Size	Lg.	Pipe Size	Lg.	Pipe Size	Lg.
1/8	3/4"	2427K111	\$2.00	3/8	1"	2427K131	\$2.27
1/4	7/8"	2427K121	1.97	1/2	1 1/8"	2427K141	2.83

BSPT x NPT Threaded on Both Ends

Pipe Size	1 1/2"	2"	3"	4"	6"	12"	36"	
1/8	2427K911	\$2.60	\$3.23	\$3.80	\$4.77	\$6.30	\$10.77	\$28.88
1/4	2427K912	2.27	3.24	3.20	4.48	5.72	9.24	22.60
3/8	2427K913	2.60	3.68	3.73	5.28	6.76	11.36	47.50
1/2	2427K914	3.13	4.40	4.63	6.32	8.36	14.08	34.53
5/8	2427K915	3.80	5.28	5.70	7.76	10.40	17.76	43.97
1	2427K916	—	6.60	7.60	10.20	13.80	24.48	58.82
1 1/2	2427K917	—	9.96	12.63	16.00	22.08	40.20	97.91
2	2427K918	—	—	16.07	20.32	28.32	52.52	119.28

316/316L Stainless Steel

- Use with air, natural gas, oil, steam, water

1/8-3/8 pipe sizes are seamless; 1/2-6 pipe sizes are welded. All meet ANSI/ASME B1.20.1, ASTM A312, and ASTM A733.

NPT Fully Threaded

Pipe Size	Lg.	Pipe Size	Lg.	Pipe Size	Lg.	Pipe Size	Lg.
1/8	3/4"	4548K111	\$1.67	1/2	1 1/8"	4548K171	\$2.97
1/4	7/8"	4548K131	1.91	3/4	1 3/8"	4548K191	3.78
3/8	1"	4548K381	2.28	1	1 1/2"	4548K221	5.16

NPT Threaded on One End

Pipe Size	1"	1 1/2"	2"	2 1/2"	3"	3 1/2"	4"	4 1/2"	5"	5 1/2"	6"	8"	10"	12"	
1/8	9110T801	—	—	—	—	—	\$3.44	—	\$4.17	\$4.53	\$4.89	—	\$6.86	\$8.43	\$9.88
1/4	9110T802	\$1.62	\$2.03	\$2.44	\$2.85	\$3.29	3.84	\$4.34	4.78	5.22	5.65	\$6.07	8.07	9.94	11.67
3/8	9110T803	1.95	2.36	2.85	3.38	3.90	4.56	5.08	5.60	6.15	6.68	7.19	9.58	11.80	13.92
1/2	9110T804	2.55	3.05	3.65	4.34	5.02	5.91	6.62	7.33	8.02	8.71	9.42	12.52	15.48	18.28
5/8	9110T805	3.24	3.43	4.09	4.86	5.65	6.62	7.41	8.21	8.34	9.75	10.54	13.98	17.33	20.46
1	9110T806	—	4.42	5.46	6.45	7.49	8.82	9.88	10.96	12.00	13.07	14.08	18.78	23.28	27.50
1 1/4	9110T807	—	6.04	7.05	8.32	9.72	11.45	12.79	14.16	15.57	16.94	18.28	24.21	30.07	35.56
1 1/2	9110T808	—	7.14	7.80	9.36	10.90	12.88	14.41	15.98	17.54	19.11	20.61	27.43	34.04	40.28
2	9110T809	—	—	11.04	12.27	14.14	16.74	18.72	20.81	22.84	24.87	26.90	36.00	44.66	52.81
2 1/2	9110T811	—	—	—	—	28.86	—	34.75	37.88	41.01	—	58.22	71.56	84.13	
3	9110T812	—	—	—	30.03	33.05	38.16	42.14	43.98	48.01	52.05	56.03	75.82	92.97	109.14
4	9110T813	—	—	—	35.88	39.47	53.03	53.01	58.00	63.41	68.84	74.17	100.55	123.58	145.24
6	9110T814	—	—	—	—	205.72	235.37	251.77	294.24	310.62	327.01	392.51	458.04	523.55	

(Continued on following page)

Stainless Steel Pipe Nipples & Pipe

For technical drawings and 3-D models, go to mcmaster.com.

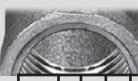


How to Measure Pipe Size for NPT or BSP Threads

Example shows pipe size 3/8". Pipe size is not an actual measured size, but rather an industry designation. Align your pipe or fitting with the "0" line as shown. The line on the opposite edge gives the pipe size. You can also measure the OD of male threads or the ID of female threads, then find the corresponding pipe size in the chart. If your measurement doesn't match an OD or ID listed, round to the nearest 1/8".



Pipe Size: 0
OD: 0
1/16 1/8 1/4 3/8 1/2 5/8 3/4 1" 1 1 1/4" 1 1/2" 1 1/4"



Pipe Size: 0
ID: 0
1/16 1/8 1/4 3/8 1/2 5/8 3/4 1" 1 1/4" 1 1/2" 1 1/4"

i To measure larger pipe sizes, go to mcmaster.com and search for 4464KAC. For information about fittings and pipe, see pages 2-3.

Standard-Wall Stainless Steel Threaded Pipe Nipples and Pipe (Continued)



Fully Threaded



Threaded on Both Ends

316/316L Stainless Steel (Cont.)

- Use with air, natural gas, oil, steam, water

Designed for low-pressure flow applications, this pipe is also known as Schedule 40. Seamless pipe has a smooth interior for unrestricted flow and is stronger than welded pipe. Welded pipe has a weld bead on the inside.

304 stainless steel pipe offers very good corrosion resistance. **316 stainless steel** pipe has excellent corrosion resistance. **Alloy 20 stainless steel** pipe has the best corrosion resistance of all the stainless steel pipe we offer. Alloy 20 stainless steel is also known as Carpenter 20 and resists cracking from stress and corrosion.

Fully threaded pipe is also known as a close nipple; it is threaded on each end to the center.

1/8-3/8 pipe sizes are seamless; 1/2-6 pipe sizes are welded. All meet ANSI/ASME B1.20.1, ASTM A312, and ASTM A733.

NPT Threaded on Both Ends

Pipe Size	1 1/2"	2"	2 1/2"	3"	3 1/2"	4"	4 1/2"	5"	5 1/2"	6"	6 1/2"	7"
1/8... 4816K134	\$2.20	\$2.64	\$3.05	\$3.50	\$3.99	\$4.43	\$4.84	\$5.29	\$5.69	\$6.14	\$7.20	\$7.20
1/4... 4816K135	2.36	2.85	3.33	3.86	4.51	5.04	5.57	6.06	6.59	7.12	8.38	8.38
3/8... 4816K136	2.77	3.33	3.94	4.55	5.33	5.94	6.55	7.16	7.77	8.38	9.96	9.96
1/2... 4816K137	3.58	4.27	5.08	5.90	6.91	7.73	8.58	9.39	10.21	11.02	11.68	12.08
5/8... 4816K138	4.03	4.76	5.69	6.59	7.73	8.66	9.56	10.49	11.39	12.32	13.03	13.03
1... 4816K139	—	6.38	7.52	8.74	10.29	10.75	11.49	12.59	12.87	13.90	16.44	16.44
1 1/4... 4816K141	—	—	9.72	11.35	12.00	12.63	13.97	14.44	16.68	18.05	21.14	21.14
1 1/2... 4816K142	—	—	—	10.94	11.89	12.66	14.21	14.82	15.75	18.80	20.35	23.95
2... 4816K143	—	—	—	12.92	13.97	16.47	18.46	20.48	22.51	24.50	26.52	31.43
2 1/2... 4816K144	—	—	—	—	24.57	28.45	31.53	34.24	37.33	40.42	43.51	51.16
3... 4816K145	—	—	—	—	32.60	37.57	41.55	43.30	47.28	51.26	55.24	61.02
4... 4816K146	—	—	—	—	—	45.60	52.26	57.13	58.81	61.99	65.03	74.43
6... 4816K147	—	—	—	—	—	172.01	204.69	223.39	241.37	259.72	273.42	287.04
												300.79

Pipe Size	7 1/2"	8"	8 1/2"	9"	9 1/2"	10"	10 1/2"	11"	11 1/2"	12"	14"	16"
1/8... 4816K134	\$7.73	\$8.05	\$8.58	\$8.91	\$9.49	\$9.84	\$9.96	\$10.31	\$11.13	\$11.55	\$11.07	\$12.67
1/4... 4816K135	9.06	9.39	10.04	10.41	10.79	11.18	11.34	11.74	12.27	12.68	12.11	13.83
3/8... 4816K136	10.78	11.18	11.55	11.96	12.20	12.41	12.47	12.66	13.31	13.72	15.06	17.22
1/2... 4816K137	11.26	13.14	13.69	14.60	14.77	15.23	15.63	16.61	17.47	17.98	19.70	22.53
5/8... 4816K138	12.58	13.76	14.40	15.30	15.59	17.02	16.97	18.56	18.42	20.11	22.96	26.29
1... 4816K139	16.91	18.53	18.82	20.59	21.57	22.92	23.54	25.01	27.07	27.11	31.28	35.73
1 1/4... 4816K141	22.44	23.85	25.00	26.56	27.87	29.61	30.42	32.32	35.03	35.03	40.06	45.80
1 1/2... 4816K142	24.69	27.04	27.51	30.09	31.55	33.52	34.46	36.61	37.33	39.67	47.25	53.99
2... 4816K143	34.37	35.44	38.26	39.46	42.66	43.99	45.18	48.00	48.96	52.05	62.30	71.21
2 1/2... 4816K144	52.42	54.00	56.49	58.10	59.38	60.98	62.92	64.58	69.78	82.90	96.91	110.74
3... 4816K145	59.76	62.90	66.13	69.61	73.26	77.15	79.66	83.85	86.00	90.53	122.21	139.66
4... 4816K146	79.22	83.42	87.76	92.41	97.37	102.52	103.32	105.90	104.04	111.67	164.21	187.70
6... 4816K147	297.34	316.04	323.23	336.19	349.14	362.08	375.04	387.99	400.93	413.87	465.67	517.46

Pipe Size	18"	20"	22"	24"	30"	36"	42"	48"	54"	60"	72"	120"
1/8... 4816K134	\$14.31	\$15.84	\$17.44	\$19.04	\$27.78	\$29.90	\$36.47	\$38.05	\$46.91	\$47.62	\$57.03	\$95.12
1/4... 4816K135	15.62	17.32	19.04	20.80	25.98	31.18	36.36	41.54	46.74	51.95	62.37	103.87
3/8... 4816K136	19.32	21.52	23.69	25.82	32.28	38.68	45.21	51.64	58.10	64.53	77.49	129.12
1/2... 4816K137	26.23	28.14	30.97	33.76	43.70	52.45	61.21	69.93	78.68	87.37	104.31	152.92
5/8... 4816K138	29.55	32.81	36.14	39.43	49.25	59.10	68.95	78.87	88.66	98.57	118.30	172.52
1... 4816K139	40.16	44.70	49.16	53.61	66.98	80.40	93.77	107.16	120.56	133.99	160.78	234.51
1 1/4... 4816K141	51.51	57.22	62.93	68.67	85.80	102.96	120.12	137.31	146.09	150.15	180.24	300.36
1 1/2... 4816K142	60.77	67.51	74.26	80.97	101.30	121.53	141.83	162.06	172.48	177.30	212.66	354.46
2... 4816K143	80.12	89.03	97.91	106.82	129.78	143.43	172.13	186.88	210.27	233.65	280.37	415.39
2 1/2... 4816K144	117.33	134.57	148.05	160.87	190.38	208.88	241.74	250.30	267.30	281.59	337.85	514.74
3... 4816K145	157.17	174.58	181.95	188.58	235.71	282.87	293.34	301.77	377.13	393.29	403.26	672.07
4... 4816K146	194.94	211.15	232.23	253.36	263.93	337.82	369.48	405.40	422.28	433.29	520.01	844.60
6... 4816K147	570.26	621.07	672.85	722.88	837.06	946.42	1,081.73	1,118.38	—	—	—	—

Alloy 20 Stainless Steel

- Use with air, steam, water

Pipe is seamless and meets ANSI/ASME B36.10, ANSI/ASME SB729, and ASTM B729.

NPT Fully Threaded	Pipe Size	NPT Threaded on Both Ends			
		2" Lengths	3" Lengths	4" Lengths	6" Lengths
1/2... 2698K55	1 1/8"	\$25.47	\$40.23	\$51.47	\$68.40
3/4... 2698K56	1 3/8"	31.13	47.58	55.21	91.26
1... 2698K57	1 1/2"	41.74	50.25	60.00	2698K51
1 1/4... 2698K58	1 3/4"	62.06	2698K41	82.74	113.86
2... 2698K59	2"	82.43	70.87	2698K42	99.55
			2698K43	119.32	2698K48
				128.48	2698K54
					189.91

**Standard-Wall Stainless Steel Threaded Pipe Nipples and Pipe with Sealant**

- Use with air, natural gas, oil, steam, water
- Fittings: Use threaded Class 150 low-pressure stainless steel (see pages 4-9, 13)
- Flanges: Use threaded Class 150 low-pressure stainless steel (see page 9)

The threads on this pipe have a PTFE sealant applied for extra leak protection in low-pressure applications. Pipe is also known as Schedule 40. It is seamless, which creates a smooth interior for unrestricted flow. Meets ANSI/ASME B1.20.1, ASTM A312, and ASTM A733.



Fully Threaded

304 stainless steel pipe has very good corrosion resistance.

316 stainless steel pipe has excellent corrosion resistance.

Fully threaded pipe is also known as a close nipple; it is threaded on each end to the center.



Threaded on Both Ends

304/304L Stainless Steel

NPT Fully Threaded											
Pipe Size	Lg.	Pipe Size	Lg.	Pipe Size							
1/8	3/4"	1455N111	\$3.34	1/2	1 1/8"	1455N114	\$4.90	1	1 1/2"	1455N116	\$10.51
1/4	7/8"	1455N112	3.61	3/4	1 3/8"	1455N115	5.88	1 1/4	1 5/8"	1455N117	12.90
3/8	1"	1455N113	4.00								

NPT Threaded on Both Ends

Pipe Size	Lg.										
1/8	1 1/2"	1455N121	\$3.72	3/8	2 1/2"	1455N147	\$5.26	3/4	3 1/2"	1455N174	\$8.71
1/8	2"	1455N122	4.04	3/8	3"	1455N148	5.72	3/4	4"	1455N175	9.38
1/8	2 1/2"	1455N123	4.35	3/8	3 1/2"	1455N149	6.31	3/4	5"	1455N176	10.66
1/8	3"	1455N124	4.67	3/8	4"	1455N151	6.79	3/4	6"	1455N177	12.00
1/8	3 1/2"	1455N125	5.06	3/8	5"	1455N152	7.76	3/4	8"	1455N178	13.91
1/8	4"	1455N126	5.37	3/8	6"	1455N153	8.71	3/4	10"	1455N179	15.47
1/8	5"	1455N127	6.04	3/8	8"	1455N154	10.90	3/4	12"	1455N181	17.81
1/8	6"	1455N128	6.66	3/8	10"	1455N155	12.95	1	2"	1455N182	11.41
1/8	8"	1455N129	8.11	3/8	12"	1455N156	13.87	1	2 1/2"	1455N183	12.20
1/8	10"	1455N131	9.49	1/2	1 1/2"	1455N157	5.34	1	3"	1455N184	13.10
1/8	12"	1455N132	10.75	1/2	2"	1455N158	5.81	1	3 1/2"	1455N185	14.20
1/4	1 1/2"	1455N133	3.92	1/2	2 1/2"	1455N159	6.39	1	4"	1455N186	15.05
1/4	2"	1455N134	4.32	1/2	3"	1455N161	6.98	1	5"	1455N187	16.82
1/4	2 1/2"	1455N135	4.71	1/2	3 1/2"	1455N162	7.73	1	6"	1455N188	18.59
1/4	3"	1455N136	5.09	1/2	4"	1455N163	8.31	1	8"	1455N189	22.56
1/4	3 1/2"	1455N137	5.61	1/2	5"	1455N164	9.53	1	10"	1455N191	24.56
1/4	4"	1455N138	6.04	1/2	6"	1455N165	10.71	1	12"	1455N192	26.08
1/4	5"	1455N139	6.86	1/2	8"	1455N166	12.44	1 1/4	2"	1455N193	13.72
1/4	6"	1455N141	7.64	1/2	10"	1455N167	13.90	1 1/4	2 1/2"	1455N194	14.74
1/4	8"	1455N142	9.49	1/2	12"	1455N168	15.96	1 1/4	3"	1455N195	15.84
1/4	10"	1455N143	11.18	3/4	1 1/2"	1455N169	6.04	1 1/4	3 1/2"	1455N196	17.25
1/4	12"	1455N144	11.94	3/4	2"	1455N171	6.54	1 1/4	4"	1455N197	18.39
3/8	1 1/2"	1455N145	4.32	3/4	2 1/2"	1455N172	7.21	1 1/4	5"	1455N198	20.63
3/8	2"	1455N146	4.74	3/4	3"	1455N173	7.88	1 1/4	6"	1455N199	22.86

316/316L Stainless Steel

NPT Fully Threaded											
Pipe Size	Lg.	Pipe Size	Lg.	Pipe Size							
1/8	3/4"	1443N111	\$3.62	1/2	1 1/8"	1443N114	\$4.87	1	1 1/2"	1443N116	\$11.96
1/4	7/8"	1443N112	3.94	3/4	1 3/8"	1443N115	6.80	1 1/4	1 5/8"	1443N117	14.89
3/8	1"	1443N113	4.39								

NPT Threaded on Both Ends

Pipe Size	Lg.										
1/8	1 1/2"	1443N121	\$4.15	3/8	2 1/2"	1443N147	\$6.06	3/4	3 1/2"	1443N174	\$10.74
1/8	2"	1443N122	4.60	3/8	3"	1443N148	6.66	3/4	4"	1443N175	11.67
1/8	2 1/2"	1443N123	5.01	3/8	3 1/2"	1443N149	7.44	3/4	5"	1443N176	12.16
1/8	3"	1443N124	5.45	3/8	4"	1443N151	8.05	3/4	6"	1443N177	13.80
1/8	3 1/2"	1443N125	5.94	3/8	5"	1443N152	9.27	3/4	8"	1443N178	17.38
1/8	4"	1443N126	6.38	3/8	6"	1443N153	10.50	3/4	10"	1443N179	20.86
1/8	5"	1443N127	7.24	3/8	8"	1443N154	11.97	3/4	12"	1443N181	24.16
1/8	6"	1443N128	8.09	3/8	10"	1443N155	14.31	1	2"	1443N182	11.86
1/8	8"	1443N129	10.00	3/8	12"	1443N156	16.55	1	2 1/2"	1443N183	12.88
1/8	10"	1443N131	11.79	1/2	1 1/2"	1443N157	6.18	1	3"	1443N184	13.98
1/8	12"	1443N132	13.51	1/2	2"	1443N158	6.87	1	3 1/2"	1443N185	15.37
1/4	1 1/2"	1443N133	4.39	1/2	2 1/2"	1443N159	7.69	1	4"	1443N186	16.50
1/4	2"	1443N134	4.87	1/2	3"	1443N161	8.50	1	5"	1443N187	18.70
1/4	2 1/2"	1443N135	5.37	1/2	3 1/2"	1443N162	9.52	1	6"	1443N188	19.63
1/4	3"	1443N136	5.90	1/2	4"	1443N163	10.33	1	8"	1443N189	24.25
1/4	3 1/2"	1443N137	6.54	1/2	5"	1443N164	12.00	1	10"	1443N191	28.65
1/4	4"	1443N138	7.07	1/2	6"	1443N165	12.27	1	12"	1443N192	32.84
1/4	5"	1443N139	8.09	1/2	8"	1443N166	15.48	1	2"	1443N193	15.45
1/4	6"	1443N141	9.15	1/2	10"	1443N167	18.59	1	2 1/2"	1443N194	15.81
1/4	8"	1443N142	11.43	1/2	12"	1443N168	21.52	1	3"	1443N195	17.27
1/4	10"	1443N143	13.63	3/4	1 1/2"	1443N169	7.04	1	3 1/2"	1443N196	19.07
1/4	12"	1443N144	15.66	3/4	2"	1443N171	7.76	1	4"	1443N197	20.53
3/8	1 1/2"	1443N145	4.87	3/4	2 1/2"	1443N172	8.71	1	5"	1443N198	21.96
3/8	2"	1443N146	5.45	3/4	3"	1443N173	9.60	1	6"	1443N199	24.67

Stainless Steel Pipe Fittings

For technical drawings and 3-D models, go to mcmaster.com.



How to Measure Pipe Size for NPT or BSP Threads

Example shows pipe size 3/8". Pipe size is not an actual measured size, but rather an industry designation. Align your pipe or fitting with the "0" line as shown. The line on the opposite edge gives the pipe size. You can also measure the OD of male threads or the ID of female threads, then find the corresponding pipe size in the chart. If your measurement doesn't match an OD or ID listed, round to the nearest 1/8".



Pipe Size: 0
OD: 0
1/16 1/8 1/4 3/8 1/2 5/8 3/4 1 1 1/4 1 1/2 1 1/4"



Pipe Size: 0
ID: 0
1/16 1/8 1/4 3/8 1/2 5/8 3/4 1 1 1/4 1 1/2 1 1/4"

To measure larger pipe sizes, go to mcmaster.com and search for 4464KAC. For information about fittings and pipe, see pages 2-3.

Medium-Pressure Stainless Steel Threaded Pipe Fittings



- Pipe Nipples and Pipe: Use threaded Schedule 40 standard-wall stainless steel (see pages 10-13)
- Flanges: Use threaded Class 150 low-pressure stainless steel (see page 9)

Choose these fittings when you want the same high-quality found in our low-pressure pipe fittings, but need more strength to handle higher pressures. Fittings that meet ANSI/MSS SP-114 adhere to high-quality standards for heat treating, material thickness, and marking.

304 stainless steel fittings have very good corrosion resistance. **316 stainless steel** fittings have excellent corrosion resistance. **Alloy 20 stainless steel** fittings have the best corrosion resistance of all the stainless steel fittings we offer. Alloy 20 stainless steel is also known as Carpenter 20 and resists cracking from stress and corrosion.

NPT Connectors, Adapters, and Caps—304 and 316 Stainless Steel

- Use with air, natural gas, oil, steam, water
- Maximum Pressure: 1,000 psi @ 72°F; 650 psi @ 350°F for steam

These Class 1000 fittings meet ANSI/MSS SP-114 and ASTM A182.

Femalebutt weld straights are also known as half couplings.

Unions separate into three pieces so you can access your line without unthreading pipe connections.



Straights



Straights,
Female x Butt Weld



Unions



Caps

Pipe
Size

304 Stainless Steel

1/8	4464K211	\$3.85	4464K221	\$2.26	4464K96	\$18.69	4464K84	\$3.86
1/4	4464K212	4.39	4464K222	2.75	4464K97	18.98	4464K85	3.89
3/8	4464K213	5.71	4464K223	3.09	4464K98	22.78	4464K86	5.26
1/2	4464K214	8.34	4464K224	4.29	4464K99	28.59	4464K87	5.38
5/8	4464K215	11.10	4464K225	5.82	4464K111	39.03	4464K88	7.81
1	4464K216	18.26	4464K226	9.85	4464K112	57.00	4464K89	11.45
1 1/4	4464K66	25.05	4464K78	13.69	4464K113	102.99	4464K91	27.17
1 1/2	4464K67	31.34	4464K79	18.78	4464K114	118.47	4464K92	33.90
2	4464K68	49.40	4464K81	25.22	4464K115	129.96	4464K93	41.08
2 1/2	4464K147	129.22	4464K161	79.59	4464K167	245.83	4464K164	83.76
3	4464K148	153.25	4464K227	98.37	4464K168	360.09	4464K165	132.38
4	4464K149	214.78	4464K228	153.28			4464K166	191.73

316 Stainless Steel

1/8	4452K441	5.07	4452K511	3.31	4452K461*	22.21	4452K451	5.42
1/4	4452K342	6.15	4452K512	3.89	4452K462*	23.75	4452K452	5.82
3/8	4452K343	7.10	4452K313	3.77	4452K463*	27.03	4452K453	7.25
1/2	4452K344	9.60	4452K314	5.42	4452K464*	33.98	4452K454	7.83
5/8	4452K345	12.50	4452K315	7.85	4452K465*	47.90	4452K455	11.46
1	4452K346	21.69	4452K316	12.79	4452K466*	69.10	4452K456	17.57
1 1/4	4452K447	32.95	4452K517	19.37	4452K467*	117.57	4452K457	51.97
1 1/2	4452K448	42.05	4452K518	25.89	4452K468*	137.66	4452K458	56.81
2	4452K449	60.14	4452K519	33.73	4452K469*	177.72	4452K459	67.37
2 1/2	4452K627	148.49	4452K631	102.23	4452K637*	283.55	4452K634	110.42
3	4452K628	184.99	4452K632	117.70	4452K638*	480.60	4452K635	142.88
4	4452K629	262.37	4452K633	184.59	4452K659*	697.74	4452K658	221.85

* Nut is 304 stainless steel.

NPT Connectors and Plugs—Alloy 20 Stainless Steel

These Class 150 fittings meet ANSI/ASME B1.20.1, ANSI/MSS SP-114, ASTM B351, and ASTM B473.

Unions separate into three pieces so you can access your line without unthreading pipe connections.



Pipe
Size

90° Elbows	Tees	Straights, Female	Straights, Male	Unions	Plugs
1/8 2698K66 \$93.33	2698K69 \$111.60	2698K73 \$53.73	2698K88 \$110.17	2698K82 \$120.98	2698K76 \$48.00
1/4 2698K67 93.33	2698K71 111.60	2698K74 53.73	2698K89 110.17	2698K83 120.98	2698K77 \$48.00
3/8 2698K68 93.33	2698K72 111.60	2698K75 53.73	2698K91 110.17	2698K84 120.98	2698K78 \$19.48
1/2 2698K11 62.74	2698K16 81.13	2698K22 48.00	2698K92 91.67	2698K85 120.98	2698K27 \$25.43
3/4 2698K12 84.51	2698K17 95.14	2698K23 69.17	2698K93 102.58	2698K86 158.33	2698K28 \$34.04
1 2698K13 91.87	2698K18 116.61	2698K24 97.32	2698K94 120.55	2698K87 208.33	2698K29 \$59.43
1 1/2 2698K14 123.50	2698K19 167.19	2698K25 143.02			2698K79 \$125.02
2 2698K15 167.19	2698K21 222.31	2698K26 175.02			2698K81 \$185.50

■ Not rated for maximum pressure. ▲ Maximum pressure is 1000 psi @ 72°F; 560 @ 360°F for steam.

(Continued on following page)



Medium-Pressure Stainless Steel Threaded Pipe Fittings (Cont. from previous page)

NPT Reducers—304 and 316 Stainless Steel

- Use with air, natural gas, oil, steam, water
- Maximum Pressure: 1,000 psi @ 72°F; 650 psi @ 350°F for steam

These Class 1000 fittings meet ANSI/MSS SP-114 and ASTM A182.



Pipe Size (A)	Pipe Size (B)	304 Stainless Steel	316 Stainless Steel		
1/4	1/8	4464K371	\$5.67	4452K581	\$8.38
3/8	1/8	4464K651	6.69	4452K811	9.97
3/8	1/4	4464K372	6.69	4452K582	9.97
1/2	1/8	4464K434	8.28	4452K591	13.57
1/2	1/4	4464K652	8.28	4452K812	13.57
1/2	3/8	4464K373	8.28	4452K583	13.57
3/4	1/8	4464K435	10.73	4452K592	16.18
3/4	1/4	4464K436	12.16	4452K813	16.18
3/4	3/8	4464K653	10.73	4452K814	17.31
3/4	1/2	4464K374	10.73	4452K584	17.31
1	1/8	4464K437	18.74	4452K594	28.68
1	1/4	4464K438	20.19	4452K815	28.68
1	3/8	4464K439	21.70	4452K816	26.80
1	1/2	4464K654	18.74	4452K817	28.68
1	3/4	4464K375	18.74	4452K585	28.68
1 1/4	1/8	4464K441	36.04		
1 1/4	1/4	4464K442	36.04	4452K596	45.07
1 1/4	3/8	4464K443	36.04	4452K597	45.07
1 1/4	1/2	4464K444	36.04	4452K819	48.22
1 1/4	3/4	4464K655	36.04	4452K598	45.07

NPT Reducers—Alloy 20 Stainless Steel

- Use with air, steam, water

• Max. pressure:

1/4-3/8 Pipe Size (A): Not Rated

1/2-1 Pipe Size (A): 300 psi @ 72°F;
150 psi @ 360°F for steam

These Class 150 fittings meet ANSI/ASME B1.20.1, ANSI/MSS SP-114, ASTM B351, and ASTM B473.



Bushings, Male x Female

Pipe Size (A)	Pipe Size (B)			
1/4	1/8	2698K96	\$36.10	
3/8	1/4	2698K95	36.10	
1/2	1/4	2698K31	34.06	
3/4	1/2	2698K32	42.15	
1	3/4	2698K33	70.98	

Thread Adapters, Female x Male—316 Stainless Steel

- Use with air, coolant, natural gas, oil, steam, water
- Maximum Pressure: 500 psi @ 72°F;

100 psi @ 350°F for steam

Also known as Class 150 fittings. They meet ASTM 314, ASTM 320, and ASTM A582.

BSPP male threads have a fluoroelastomer gasket to protect against leaks.



Pipe Size

NPT x BSPT

NPT x BSPP

BSPT x NPT

BSPP x NPT

1/16	1456N126	\$11.75	1456N134	\$13.00	1456N111	\$11.75	1456N118	\$11.75
1/8	1456N127	13.13	1456N135	14.38	1456N112	13.13	1456N119	13.13
1/4	1456N128	17.25	1456N136	18.50	1456N113	17.25	1456N121	17.25
3/8	1456N129	18.38	1456N137	19.63	1456N114	18.38	1456N122	18.38
1/2	1456N131	25.88	1456N138	27.13	1456N115	25.88	1456N123	25.88
3/4	1456N132	37.50	1456N139	38.75	1456N116	37.50	1456N124	37.50
1	1456N133	62.50	1456N141	63.75	1456N117	62.50	1456N125	62.50

Reducing Thread Adapters, Female x Male—316 Stainless Steel

- Use with air, coolant, natural gas, oil, steam, water
- Maximum Pressure: 500 psi @ 72°F;

100 psi @ 350°F for steam

Also known as Class 150 fittings. Fittings meet ASTM A314, ASTM A320, and ASTM A582.

BSPP male threads have a fluoroelastomer gasket to protect against leaks.



Pipe Size

NPT x BSPT

NPT x BSPP

BSPT x NPT

BSPP x NPT

1/16	1/8	1456N235	\$13.13	1456N282	\$14.38	1456N142	\$13.13	1456N188	\$13.13
1/16	1/4	1456N236	17.25	1456N283	18.50	1456N143	17.25	1456N189	17.25
1/16	3/8	1456N237	18.38	1456N284	19.63	1456N144	18.38	1456N191	18.38
1/16	1/2	1456N238	25.88	1456N285	27.13	1456N145	25.88	1456N192	25.88
1/16	3/4	1456N239	37.50	1456N286	38.75	1456N146	37.50	1456N193	37.50
1/16	1	1456N241	62.50	1456N287	63.75	1456N147	62.50	1456N194	62.50
1/8	1/16	1456N242	13.13	1456N288	14.38	1456N148	13.13	1456N195	13.13
1/8	1/4	1456N243	17.25	1456N289	18.50	1456N149	17.25	1456N196	17.25
1/8	3/8	1456N244	18.38	1456N291	19.63	1456N151	18.38	1456N197	18.38
1/8	1/2	1456N245	25.88	1456N292	27.13	1456N152	25.88	1456N198	25.88
1/8	3/4	1456N246	37.50	1456N293	38.75	1456N153	37.50	1456N199	37.50
1/8	1	1456N247	62.50	1456N294	63.75	1456N154	62.50	1456N201	62.50
1/4	1/16	1456N248	17.25	1456N295	18.50	1456N155	17.25	1456N202	17.25
1/4	1/8	1456N249	17.25	1456N296	18.50	1456N156	17.25	1456N203	17.25

(Continued on following page)

Stainless Steel Pipe Fittings

For technical drawings and 3-D models, go to mcmaster.com.

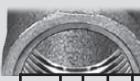


How to Measure Pipe Size for NPT or BSP Threads

Example shows pipe size 3/8. Pipe size is not an actual measured size, but rather an industry designation. Align your pipe or fitting with the "0" line as shown. The line on the opposite edge gives the pipe size. You can also measure the OD of male threads or the ID of female threads, then find the corresponding pipe size in the chart. If your measurement doesn't match an OD or ID listed, round to the nearest 1/8".



Pipe Size: 0
OD: 0
1/16 1/8 1/4 3/8 5/16 1/2 3/4 1" 1 1 1/4" 1 1/2" 1 1/4"



Pipe Size: 0
ID: 0
1/16 1/8 1/4 3/8 5/16 3/4 1" 1 1/4" 1 1/2" 1 1/4" 1 5/8" 1 3/4"

To measure larger pipe sizes, go to mcmaster.com and search for 4464KAC. For information about fittings and pipe, see pages 2-3.

Medium-Pressure Stainless Steel Threaded Pipe Fittings (Cont. from previous page)



- Pipe Nipples and Pipe: Use threaded Schedule 40 standard-wall stainless steel (see pages 10-13)
- Flanges: Use threaded Class 150 low-pressure stainless steel (see page 9)

Choose these fittings when you want the same high-quality found in our low-pressure pipe fittings, but need more strength to handle higher pressures.

304 stainless steel fittings have very good corrosion resistance. **316 stainless steel** fittings have excellent corrosion resistance. **Alloy 20 stainless steel** fittings have the best corrosion resistance of all the stainless steel fittings we offer. Alloy 20 stainless steel is also known as Carpenter 20 and resists cracking from stress and corrosion.

Reducing Thread Adapters, Female x Male—316 Stainless Steel (Cont.)



- Use with air, coolant, natural gas, oil, steam, water
- Maximum Pressure: 500 psi @ 72°F; 100 psi @ 350°F for steam

Also known as Class 150 fittings. Fittings meet ASTM A314, ASTM A320, and ASTM A582.

BSPP male threads have a fluoroelastomer gasket to protect against leaks.

Pipe Size (A)	(B)	NPT x BSPT	NPT x BSPP	BSPT x NPT	BSPP x NPT
1/4	3/8	1456N251	\$18.38	1456N297	\$19.63
1/4	1/2	1456N252	25.88	1456N298	27.13
1/4	3/4	1456N253	37.50	1456N299	38.75
1/4	1	1456N254	62.50	1456N301	63.75
3/8	1/16	1456N255	18.38	1456N302	19.63
3/8	1/8	1456N256	18.38	1456N303	19.63
3/8	1/4	1456N257	18.38	1456N304	19.63
3/8	1/2	1456N258	25.88	1456N305	27.13
3/8	3/4	1456N259	37.50	1456N306	38.75
3/8	1	1456N261	62.50	1456N307	63.75
1/2	1/16	1456N262	25.88	1456N308	27.13
1/2	1/8	1456N263	25.88	1456N309	27.13
1/2	1/4	1456N264	25.88	1456N311	27.13
1/2	3/8	1456N265	25.88	1456N312	27.13
1/2	3/4	1456N266	37.50	1456N313	38.75
1/2	1	1456N267	62.50	1456N314	63.75
3/4	1/16	1456N268	37.50	1456N315	38.75
3/4	1/8	1456N269	37.50	1456N316	38.75
3/4	1/4	1456N271	37.50	1456N317	38.75
3/4	3/8	1456N272	37.50	1456N318	38.75
3/4	1/2	1456N273	37.50	1456N319	38.75
3/4	1	1456N274	62.50	1456N321	63.75
1	1/16	1456N275	62.50	1456N322	63.75
1	1/8	1456N276	62.50	1456N323	63.75
1	1/4	1456N277	62.50	1456N324	63.75
1	3/8	1456N278	62.50	1456N325	63.75
1	1/2	1456N279	62.50	1456N326	63.75
1	3/4	1456N281	62.50	1456N327	63.75

Miniature Medium-Pressure Stainless Steel Threaded Pipe Fittings



- Use with air, natural gas, oil, steam, water
- Maximum Pressure: 500 psi @ 72°F; 100 psi @ 350°F for steam

When space is at a premium choose these compact fittings. Though small in size, they have the strength to handle medium-pressure applications. Fittings are 303 stainless steel for very good corrosion resistance. They meet ASTM A314, ASTM A320, and ASTM A582.

Female x male 90° elbows are also known as street elbows.

Metric and **UN/UNF (SAE)** male threads have a fluoroelastomer gasket to protect against leaks. UN/UNF (SAE) threads are also known as O-ring boss threads.

Reducers



Pipe Size (A) (B)	90° Elbows, Female x Male	Straights, Female x Male	Straights	Bushings, Male x Female
1/16 ... 1/8	2684K17 \$14.30	2684K111 \$13.27	—	—
1/16 ... 1/4	2684K474 16.00	2684K114 18.00	—	—
1/8 ... 1/16	2684K523 14.33	2684K21 9.93	2684K807 \$13.12	2684K671 \$10.30
1/8 ... 1/4	2684K524 16.00	2684K134 18.00	—	—
1/4 ... 1/16	2684K582 16.00	2684K164 14.80	2684K742 13.12	2684K685 12.80
1/4 ... 1/8	2684K585 16.00	2684K184 14.80	2684K818 13.12	2684K687 12.80

Thread Size (A) (B)	Bushings, Male x Female
1/4"-28 ... 10-32	2684K33 \$10.95

(Continued on following page)

**Miniature Medium-Pressure Stainless Steel Threaded Pipe Fittings (Continued)****Adapters, Female x Male—90° Elbows**

NPT		UN/UNF (SAE)		Metric	
Pipe Size	Thread Size	Pipe Size	Thread Size	Pipe Size	Thread Size
1/16	2684K47	\$14.33	1/4"-28	2684K13	\$15.00
1/8	2684K14	14.32			
1/4	2684K587	21.00			

**Thread Adapters, Female x Male—90° Elbows**

NPT x UN/UNF (SAE)					
Pipe Size	Thread Size	Pipe Size	Thread Size	Pipe Size	Thread Size
1/16	10-32	2684K46	\$15.00	1/8	10-32
1/16	1/4"-28	2684K469	15.00	1/8	1/4"-28
1/16	7/16"-20	2684K52	22.25	1/8	7/16"-20
1/16	9/16"-18	2684K511	22.25	1/8	9/16"-18



NPT x Metric					
Pipe Size	Thread Size	Pipe Size	Thread Size	Pipe Size	Thread Size
1/16	M3 x 0.5	2684K479	\$17.25	1/8	M3 x 0.5
1/16	M5 x 0.5	2684K483	15.00	1/8	M5 x 0.8
1/16	M6 x 1	2684K494	15.00	1/8	M6 x 1
1/16	M8 x 1	2684K495	15.00	1/8	M8 x 1
1/16	M10 x 1.25	2684K505	17.25	1/8	M10 x 1.25



UN/UNF (SAE) x NPT			UN/UNF (SAE) x Metric			Metric x UN/UNF (SAE)		
Thread Size	Pipe Size	Female Thread Size	Male Thread Size	Female Thread Size	Male Thread Size	Female Thread Size	Male Thread Size	Female Thread Size
10-32	1/8	2684K15	\$14.30	10-32	M5 x 0.8	2684K22	\$10.85	M6 x 1
1/4"-28	1/8	2684K16	14.30					10-32

**Thread Adapters, Female x Male—Straights**

NPT x UN/UNF (SAE)					
Pipe Size	Thread Size	Pipe Size	Thread Size	Pipe Size	Thread Size
1/16	10-32	2684K011	\$13.27	1/8	10-32
1/16	1/4"-28	2684K035	13.27	1/8	1/4"-28
1/16	7/16"-20	2684K103	25.95	1/8	7/16"-20
1/16	9/16"-18	2684K074	25.95	1/8	9/16"-18



NPT x Metric					
Pipe Size	Thread Size	Pipe Size	Thread Size	Pipe Size	Thread Size
1/16	M3 x 0.5	2684K042	\$16.05	1/8	M3 x 0.5
1/16	M5 x 0.5	2684K051	13.27	1/8	M5 x 0.8
1/16	M6 x 1	2684K052	13.27	1/8	M6 x 1
1/16	M8 x 1	2684K067	13.27	1/8	M8 x 1
1/16	M10 x 1.25	2684K073	15.77	1/8	M10 x 1.25



UN/UNF (SAE) x NPT						Metric x UN/UNF (SAE)		
Thread Size	Pipe Size	Thread Size	Pipe Size	Female Thread Size	Male Thread Size	Female Thread Size	Male Thread Size	Female Thread Size
10-32	1/8	2684K268	\$13.27	7/16"-20	1/16	2684K446	\$24.70	
10-32	1/8	2684K272	13.27	7/16"-20	1/8	2684K448	24.70	
10-32	1/4	2684K275	18.00	7/16"-20	1/4	2684K452	24.70	
1/4"-28	1/8	2684K323	13.27	9/16"-18	1/16	2684K429	24.70	
1/4"-28	1/8	2684K326	13.27	9/16"-18	1/8	2684K436	24.70	
1/4"-28	1/4	2684K333	18.00	9/16"-18	1/4	2684K442	24.70	



Metric x NPT					
Thread Size	Pipe Size	Thread Size	Pipe Size	Thread Size	Pipe Size
M3 x 0.5	1/16	2684K334	\$13.27	M5 x 0.5	1/4
M3 x 0.5	1/8	2684K337	13.27	M6 x 1	1/16
M3 x 0.5	1/4	2684K338	18.00	M6 x 1	1/8
M5 x 0.5	1/16	2684K355	13.27	M6 x 1	1/4
M5 x 0.5	1/8	2684K365	13.27	M8 x 1	1/16

**Thread Adapters, Male—Straights**

NPT x UN/UNF (SAE)					
Pipe Size	Thread Size	Pipe Size	Thread Size	Pipe Size	Thread Size
1/16	10-32	2684K734	\$14.38	1/8	10-32
1/16	1/4"-28	2684K736	14.38	1/8	1/4"-28
1/16	7/16"-20	2684K786	19.70	1/8	7/16"-20
1/16	9/16"-18	2684K785	19.70	1/8	9/16"-18



(Continued on following page)

Stainless Steel Pipe Fittings & Flanges

For technical drawings and 3-D models, go to mcmaster.com.



How to Measure Pipe Size for NPT Threads

Example shows pipe size $\frac{3}{8}$. Pipe size is not an actual measured size, but rather an industry designation. Align your pipe or fitting with the "0" line as shown. The line on the opposite edge gives the pipe size. You can also measure the OD of male threads or the ID of female threads, then find the corresponding pipe size in the chart. If your measurement doesn't match an OD or ID listed, round to the nearest $\frac{1}{8}$.



Pipe Size: 0
OD: 0
 $\frac{1}{16}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{2}$ $\frac{5}{8}$ $\frac{3}{4}$ $1"$ $1\frac{1}{4}"$ $1\frac{1}{2}"$



Pipe Size: 0
ID: 0
 $\frac{1}{16}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{2}$ $\frac{5}{8}$ $\frac{3}{4}$ $1"$ $1\frac{1}{4}"$ $1\frac{1}{2}"$

To measure larger pipe sizes, go to mcmaster.com and search for 4464KAC. For information about fittings and pipe, see pages 2-3.

Miniature Medium-Pressure Stainless Steel Threaded Pipe Fittings (Continued)



- Use with air, natural gas, oil, steam, water
- Maximum Pressure: 500 psi @ 72° F;
100 psi @ 350° F for steam

When space is at a premium choose these compact fittings. Though small in size, they have the strength to handle medium-pressure applications. Fittings are 303 stainless steel for very good corrosion resistance. They meet ASTM A314, ASTM A320, and ASTM A582.

Metric and **UN/UNF (SAE)** male threads have a fluoroelastomer gasket to protect against leaks. UN/UNF (SAE) threads are also known as O-ring boss threads.

Thread Adapters, Male—Straights (Cont.)



NPT x Metric							
Pipe Size	Thread Size	Pipe Size	Thread Size	Pipe Size	Thread Size		
1/16	M3 x 0.5	2684K748	\$15.95	1/8	M3 x 0.5	2684K821	\$15.95
1/16	M5 x 0.5	2684K757	14.38	1/8	M5 x 0.5	2684K831	14.38
1/16	M6 x 1	2684K772	14.38	1/8	M6 x 1	2684K842	14.38
1/16	M8 x 1	2684K774	14.38	1/8	M8 x 1	2684K853	14.38
1/16	M10 x 1.25	2684K782	15.95	1/8	M10 x 1.25	2684K858	15.95

Reducing Thread Adapters, Male x Female—Bushings



NPT x UN/UNF (SAE)						Metric x UN/UNF (SAE)					
Pipe Size (A)	Thread Size (B)	Pipe Size (A)	Thread Size (B)	Thread Size (A)	Thread Size (B)	Pipe Size (A)	Thread Size (B)	Thread Size (A)	Thread Size (B)	Metric x UN/UNF (SAE)	
1/16	10-32	2684K34	\$10.30	1/4	10-32	2684K36	\$12.80	M6 x 1	10-32	2684K31	\$10.95
1/8	10-32	2684K35	10.30	1/4	1/4"-28	2684K684	12.80	M8 x 1	10-32	2684K32	10.95
1/8	1/4"-28	2684K655	10.30								

NPT x Metric						Metric x UN/UNF (SAE)					
Pipe Size (A)	Thread Size (B)	Pipe Size (A)	Thread Size (B)	Pipe Size (A)	Thread Size (B)	Thread Size (A)	Thread Size (B)	Pipe Size (A)	Thread Size (B)	Metric x UN/UNF (SAE)	
1/16	M3 x 0.5	2684K637	\$10.30	1/8	M6 x 1	2684K677	\$10.30	1/4	M6 x 1	2684K719	\$12.80
1/16	M5 x 0.5	2684K642	10.30	1/8	M8 x 1	2684K681	10.30	1/4	M8 x 1	2684K723	12.80
1/8	M3 x 0.5	2684K673	10.30	1/4	M3 x 0.5	2684K695	12.80	1/4	M10 x 1.25	2684K731	15.30
1/8	M5 x 0.5	2684K676	10.30	1/4	M5 x 0.5	2684K704	12.80				

High-Pressure Stainless Steel Threaded Pipe Flanges



- Use with air, hydraulic fluid, natural gas, oil, steam, water
- Pipe Nipples and Pipe: Use threaded Schedule 80 thick-wall stainless steel (see pages 22-23)

Raised Surface on Back

Forged for high strength, these heavy duty flanges can handle high-pressure applications. They are also known as ANSI flanges. Bolt two same-size flanges together with a gasket (sold separately) to create an access point within a line. For gaskets, see pages 3621-3624. Flanges meet ASTM A182 and ANSI/ASME B16.5.

304 stainless steel flanges provide very good corrosion resistance. 316 stainless steel flanges have excellent corrosion resistance.

NPT Class 300 Forged Flanges

- Maximum Pressure: 300 psi @ 72° F;
300 psi @ 300° F for steam

Pipe Size	Flange OD	For Bolt Dia. (No.)	304/304L Stainless Steel	316/316L Stainless Steel
1/2	33/4"	1/2" (4)	7977K11	\$42.74
3/4	45/6"	5/8" (4)	7977K12	44.45
1	47/8"	5/8" (4)	7977K13	45.35
1 1/4	51/4"	5/8" (4)	7977K14	68.44
1 1/2	61/8"	3/4" (4)	7977K15	69.69
2	61/2"	5/8" (8)	7977K16	82.63
2 1/2	71/2"	3/4" (8)	7977K17	135.58
3	81/4"	3/4" (8)	7977K18	140.96
4	10"	3/4" (8)	7977K19	184.04
6	121/2"	3/4" (12)	7977K21	516.91
8	15"	7/8" (12)	7977K22	521.78

NPT Class 600 Forged Flanges

- Maximum Pressure: 1,200 psi @ 72° F;
840 psi @ 400° F for steam

Pipe Size	Flange OD	For Bolt Dia. (No.)	304/304L Stainless Steel	316/316L Stainless Steel
1/2	33/4"	1/2" (4)	1441N25	\$69.78
3/4	45/6"	5/8" (4)	1441N26	76.12
1	47/8"	5/8" (4)	1441N27	83.94
1 1/4	51/4"	5/8" (4)	1441N28	143.75
1 1/2	61/8"	3/4" (4)	1441N29	119.56
2	61/2"	5/8" (8)	1441N31	126.87
2 1/2	71/2"	3/4" (8)	1441N32	195.20
3	81/4"	3/4" (8)	1441N33	207.40
4	103/4"	7/8" (8)	1441N34	401.78

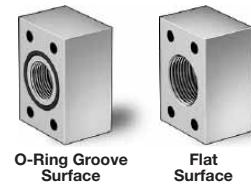


High-Pressure Stainless Steel Threaded SAE Pipe Flanges

- Use with hydraulic fluid
- Maximum Pressure:
See table

Also known as Code 61 SAE hydraulic flanges, these machined flanges let you create an access point in a high-pressure hydraulic line. To connect, bolt flanges to equipment, or bolt a flange with an O-ring groove surface to a flange with a flat surface of the same size. Flanges are 316/316L stainless steel for excellent corrosion resistance. They meet SAE J518 and ISO 6162.

Flanges with **O-ring groove surface** come with mounting hardware. O-ring is fluoroelastomer. Flanges with **flat surface** do not include mounting hardware. **NPTF** (Dryseal) threads are compatible with NPT threads. **UN/UNF (SAE)** threads are also known as O-ring boss threads.



NPTF Flanges

Pipe Size	SAE Flange Size	Max. psi @ 72°F	Flange Ht.	Wd.	For Bolt Dia. (No.)	O-Ring Groove Surface	Flat Surface
For Inch Bolts							
3/4	3/4	2,500	25/8"	1 3/4"	3/8" (4)	1723N15	\$159.77
1	1	2,000	25 3/4"	2"	3/8" (4)	1723N16	156.13
1 1/2	1 1/2	1,000	3 3/4"	2 3/4"	1/2" (4)	1723N17	209.15
2	2	1,000	4"	3 1/4"	1/2" (4)	1723N18	218.00
For Metric Bolts							
3/4	3/4	2,500	67 mm	44 mm	10 mm (4)	1723N19	159.77
1	1	2,000	72 mm	51 mm	10 mm (4)	1723N21	156.13
1 1/2	1 1/2	1,000	95 mm	70 mm	12 mm (4)	1723N22	209.15
2	2	1,000	102 mm	83 mm	12 mm (4)	1723N23	218.00

UN/UNF (SAE) Flanges

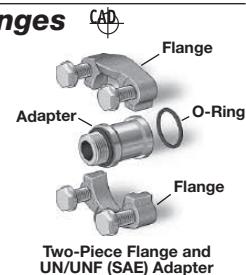
Thread Size	SAE Flange Size	Max. psi @ 72°F	Flange Ht.	Wd.	For Bolt Dia. (No.)	O-Ring Groove Surface	Flat Surface
For Inch Bolts							
11/16"-12	3/4	6,000	25/8"	1 3/4"	3/8" (4)	1723N28	\$133.33
15/16"-12	1	6,000	25 3/4"	2"	3/8" (4)	1723N29	159.11
17/8"-12	1 1/2	4,000	3 3/4"	2 3/4"	1/2" (4)	1723N31	211.86
2 1/2"-12	2	3,000	4"	3 1/4"	1/2" (4)	1723N32	228.83
For Metric Bolts							
11/16"-12	3/4	6,000	67 mm	44 mm	10 mm (4)	1723N33	133.33
15/16"-12	1	6,000	72 mm	51 mm	10 mm (4)	1723N34	159.11
17/8"-12	1 1/2	4,000	95 mm	70 mm	12 mm (4)	1723N35	211.86
2 1/2"-12	2	3,000	102 mm	83 mm	12 mm (4)	1723N36	228.83

High-Pressure Stainless Steel Threaded SAE Two-Piece Pipe Flanges

- Use with hydraulic fluid
- Maximum Pressure:
See table

Combine a two-piece pipe flange with an adapter (sold separately) to build a customized flange connection. Also known as Code 61 or Code 62 split flanges, the two halves of the flange clamp around the adapter and bolt to another Code 61 or Code 62 flange. Flanges are forged and adapters are machined; they are 316/316L stainless steel which has excellent corrosion resistance. O-ring is fluoroelastomer. All meet ISO 6162 and SAE J518. Mounting hardware is included.

NPTF (Dryseal) threads are female; they are compatible with NPT threads. **UN/UNF (SAE)** threads are male. They are also known as O-ring boss threads; they have a fluoroelastomer gasket to prevent leaks.



Two-Piece Flange and UN/UNF (SAE) Adapter

NPTF Flanges

Pipe Size	SAE Flange Size	Max. psi @ 72°F	Flange Ht.	Wd.	For Bolt Dia. (No.)	Two-Piece Flanges with O-Ring Groove Surface	Adapters
For Inch Bolts							
3/4	3/4	5,000	2 9/16"	2 1/16"	3/8" (4)	1723N37	\$86.27
1	1	4,600	2 3/4"	2 5/16"	3/8" (4)	1723N38	89.54
1 1/2	1 1/2	3,000	3 11/16"	3 1/4"	1/2" (4)	1723N39	122.08
2	2	3,000	4"	3 13/16"	1/2" (4)	1723N41	127.37
For Metric Bolts							
3/4	3/4	5,000	65 mm	52 mm	10 mm (4)	1723N42	86.27
1	1	4,600	70 mm	59 mm	10 mm (4)	1723N43	89.54
1 1/2	1 1/2	3,000	94 mm	83 mm	12 mm (4)	1723N44	122.08
2	2	3,000	102 mm	97 mm	12 mm (4)	1723N45	127.37

UN/UNF (SAE) Flanges

Thread Size	SAE Flange Size	Max. psi @ 72°F	Flange Ht.	Wd.	For Bolt Dia. (No.)	Two-Piece Flanges with O-Ring Groove Surface	Adapters
For Inch Bolts							
11/16"-12	3/4	5,000	2 9/16"	2 1/16"	3/8" (4)	1723N37	\$86.27
15/16"-12	1	4,600	2 3/4"	2 5/16"	3/8" (4)	1723N38	89.54
17/8"-12	1 1/2	3,000	3 11/16"	3 1/4"	1/2" (4)	1723N39	122.08
2 1/2"-12	2	3,000	4"	3 13/16"	1/2" (4)	1723N41	127.37
For Metric Bolts							
11/16"-12	3/4	5,000	65 mm	52 mm	10 mm (4)	1723N42	86.27
15/16"-12	1	4,600	70 mm	59 mm	10 mm (4)	1723N43	89.54
17/8"-12	1 1/2	3,000	94 mm	83 mm	12 mm (4)	1723N44	122.08
2 1/2"-12	2	3,000	102 mm	97 mm	12 mm (4)	1723N45	127.37

Stainless Steel Pipe Fittings

For technical drawings and
3-D models, go to mcmaster.com.



How to Measure Pipe Size for NPT Threads

Example shows pipe size $\frac{3}{8}$. Pipe size is not an actual measured size, but rather an industry designation. Align your pipe or fitting with the "0" line as shown. The line on the opposite edge gives the pipe size. You can also measure the OD of male threads or the ID of female threads, then find the corresponding pipe size in the chart. If your measurement doesn't match an OD or ID listed, round to the nearest $\frac{1}{8}$ ".



Pipe Size: 0
OD: 0
 $\frac{1}{16}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{2}$ $\frac{5}{8}$ $\frac{3}{4}$
 $1^{\prime\prime}$ $1\frac{1}{4}^{\prime\prime}$ $1\frac{1}{2}^{\prime\prime}$



Pipe Size: 0
ID: 0
 $\frac{1}{16}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{2}$ $\frac{5}{8}$ $\frac{3}{4}$
 $1^{\prime\prime}$ $1\frac{1}{4}^{\prime\prime}$ $1\frac{1}{2}^{\prime\prime}$

To measure larger pipe sizes, go to mcmaster.com and search for 4464KAC. For information about fittings and pipe, see pages 2-3.

High-Pressure Stainless Steel Threaded Pipe Fittings



- Pipe Nipples and Pipe: Use threaded Schedule 80 thick-wall stainless steel (see pages 22-23)

Use these heavy duty fittings in high-pressure flow applications. Fittings are forged and Class 3000, unless otherwise stated.

304 stainless steel fittings have very good corrosion resistance. **316 stainless steel** fittings have excellent corrosion resistance. **347 stainless steel** fittings have excellent corrosion resistance and can withstand prolonged heat exposure.

NPT Connectors, Adapters, Caps, and Plugs

- Use with air, hydraulic fluid, natural gas, oil, steam, water
- Maximum Pressure (unless noted):
304 SS: 2,500 psi @ 72°F;
1,900 psi @ 350°F for steam
316 SS: 3,000 psi @ 72°F;
2,800 psi @ 350°F for steam

They meet ANSI/ASME B16.11 and ASTM A182, except unions and plugs only meet ASTM A182.

Unions separate into three pieces so you can access your line without unthreading pipe connections.

Female x butt weld straights are also known as half couplings.

Female x male 90° elbows are also known as street elbows.

Plugs are solid.



Pipe Size	90° Elbows	90° Elbows, Female x Male	45° Elbows	Tees	Crosses	Unions*
304 Stainless Steel						
$\frac{1}{8}$	45525K511	\$13.54	45525K531	\$14.62	45525K521	\$22.10
$\frac{1}{4}$	45525K512	13.54	45525K532	17.26	45525K522	19.89
$\frac{3}{8}$	45525K513	19.15	45525K533	17.26	45525K523	19.89
$\frac{1}{2}$	45525K514	20.39	45525K534	21.31	45525K524	19.89
$\frac{5}{8}$	45525K515	29.47	45525K535	25.71	45525K525	27.11
$1^{\prime\prime}$	45525K516	45.12	45525K536	47.68	45525K526	37.38
$1\frac{1}{4}^{\prime\prime}$	45525K517	53.68	45525K537	84.98	45525K527	55.06
$1\frac{1}{2}^{\prime\prime}$	45525K518	78.36	45525K538	101.68	45525K528	73.12
2	45525K519	107.95		45525K529	83.14	45525K549
					109.45	45525K559
					231.29	45525K599
						143.46
316 Stainless Steel						
$\frac{1}{8}$	4443K611	16.82	4443K631	22.15	4443K621	30.40
$\frac{1}{4}$	4443K612	18.50	4443K632	22.17	4443K622	23.66
$\frac{3}{8}$	4443K613	18.70	4443K633	28.49	4443K623	23.40
$\frac{1}{2}$	4443K614	23.81	4443K634	37.38	4443K624	24.87
$\frac{5}{8}$	4443K615	35.50	4443K635	41.53	4443K625	32.08
1	4443K616	74.95	4443K636	66.73	4443K626	51.30
$1\frac{1}{4}^{\prime\prime}$	4443K617	88.18	4443K113	126.92	4443K627	55.35
$1\frac{1}{2}^{\prime\prime}$	4443K618	145.99		4443K628	89.42	4443K648
2	4443K619	252.34		4443K629	147.24	4443K649
					226.06	4443K659
					271.42	4443K699
						200.10

* Maximum pressure is 2,900 psi @ 72°F; 2,000 psi @ 350°F for steam.

Pipe Size	Straights	Straights, Female x Butt Weld	Caps	Plugs with External Hex Drive	Plugs with External Square Drive	
304 Stainless Steel						
$\frac{1}{8}$	45525K561	\$4.95	45525K571	\$4.19	45525K581	\$5.87
$\frac{1}{4}$	45525K562	5.42	45525K572	4.29	45525K582	6.02
$\frac{3}{8}$	45525K563	5.95	45525K573	5.11	45525K583	6.24
$\frac{1}{2}$	45525K564	7.61	45525K574	6.01	45525K584	8.12
$\frac{5}{8}$	45525K565	10.11	45525K575	8.20	45525K585	10.14
1	45525K566	17.16	45525K576	13.79	45525K586	19.07
$1\frac{1}{4}^{\prime\prime}$	45525K567	38.67	45525K577	22.17	45525K587	27.62
$1\frac{1}{2}^{\prime\prime}$	45525K568	44.99	45525K578	29.17	45525K588	34.69
2	45525K569	64.16	45525K579	41.18	45525K589	47.07
$2\frac{1}{2}^{\prime\prime}$	45525K161	134.76	45525K171	92.86	45525K181	95.17
3	45525K162	190.67	45525K172	131.37	45525K182	141.23
					107.94	
					4464K182	
					106.93	
316 Stainless Steel						
$\frac{1}{8}$	4443K661	5.40	4443K671	4.65	4443K681	7.91
$\frac{1}{4}$	4443K662	6.12	4443K672	4.88	4443K682	8.00
$\frac{3}{8}$	4443K663	6.57	4443K673	6.00	4443K683	8.51
$\frac{1}{2}$	4443K664	9.12	4443K674	7.11	4443K684	11.57
$\frac{5}{8}$	4443K665	13.40	4443K675	10.70	4443K685	15.03
1	4443K666	22.47	4443K676	16.91	4443K686	23.06
$1\frac{1}{4}^{\prime\prime}$	4443K667	46.80	4443K677	32.13	4443K687	34.52
$1\frac{1}{2}^{\prime\prime}$	4443K668	58.96	4443K678	42.86	4443K688	44.77
2	4443K669	72.75	4443K679	55.42	4443K689	70.00
$2\frac{1}{2}^{\prime\prime}$	4443K161	174.36	4443K171	116.15	4443K181	144.24
3	4443K162	240.19	4443K172	157.21	4443K182	175.52
					4443K222	
					164.29	
					4443K212	
					156.16	

(Continued on following page)



For technical drawings and
3-D models, go to mcmaster.com.

Stainless Steel Pipe Fittings

High-Pressure Stainless Steel Threaded Pipe Fittings (Continued from previous page)



NPT Plugs with Hex Drive

- Use with air, natural gas, oil, steam, water
- Maximum Pressure: 3,000 psi @ 72°F; 600 psi @ 220°F for steam

Plugs are hollow and made of 347 stainless steel. They meet MS-27769, SAE AS4842, and SAE AS71051.



Pipe Size	Drive Size		
1/16	5/32"	1725K11	\$2.87
1/8	3/16"	1725K12	3.60
1/4	1/4"	1725K13	4.50
3/8	5/16"	1725K14	12.27
1/2	3/8"	1725K15	23.14
5/8	9/16"	1725K16	53.00
1	5/8"	1725K17	120.00

NPT Connectors with Intermittent Swivel—90° Elbows

- Use with air, coolant, diesel fuel, oil, water
- Maximum Pressure: See table

Fittings rotate 360° as needed to allow movement in a rigid metal piping system. They are machined 316 stainless steel. Not rated for Class.



Pipe Size	Max. psi @ 72°F		
1/4	3,000	9393K65	\$133.08
3/8	3,000	9393K61	113.58
1/2	2,500	9393K62	113.58
5/8	1,200	9393K63	187.65

NPT Reducers

- Use with air, hydraulic fluid, natural gas, oil, steam, water
- Maximum Pressure:
- 304 SS: 2,500 psi @ 72°F;
- 1,900 psi @ 350°F for steam
- 316 SS: 3,000 psi @ 72°F;
- 2,800 psi @ 350°F for steam

Reducers meet ASTM A182.

Reducers also meet ANSI/ASME B16.11.



Straights

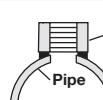
Pipe Size (A)	Pipe Size (B)	304		316	
		Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
1/4	1/8	45525K641	\$7.13	4443K741	\$11.12
3/8	1/8	45525K642	8.87	4443K771	10.85
3/8	1/4	45525K643	9.10	4443K742	10.85
1/2	1/8	45525K115	10.29	4443K116	13.28
1/2	1/4	45525K644	11.77	4443K772	14.47
1/2	3/8	45525K645	12.67	4443K743	14.47
3/4	1/4	45525K313	16.56	4443K313	19.77
3/4	3/8	45525K646	17.00	4443K774	20.02
3/4	1/2	45525K647	17.83	4443K744	20.28
1	1/4	45525K116	19.50	4443K117	30.17



Bushings, Male x Female

Pipe Size (A)	Pipe Size (B)	304		316	
		Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
1/4	1/8	4464K381	\$4.62	4443K731	\$5.03
3/8	1/8	4464K641	4.97	4443K751	5.51
3/8	1/4	4464K382	5.08	4443K732	5.79
1/2	1/8	4464K397	6.62	4443K411	7.43
1/2	1/4	4464K642	6.77	4443K752	7.62
1/2	3/8	4464K383	6.93	4443K733	7.81
3/4	1/8	4464K398	8.88	4443K412	9.83
3/4	1/4	4464K399	8.99	4443K413	9.94
3/4	3/8	4464K643	9.09	4443K754	10.06
3/4	1/2	4464K384	9.20	4443K734	10.17
1	1/8	4464K411	13.00	4443K414	14.24
1	1/4	4464K412	13.15	4443K415	14.47
1	3/8	4464K413	13.30	4443K416	14.63
1	1/2	4464K644	13.45	4443K757	14.96
1	3/4	4464K385	13.36	4443K735	15.31
1 1/4	1/8	4464K414	24.87	4443K441	33.31
1 1/4	1/4	4464K415	24.87	4443K417	32.58
1 1/4	3/8	4464K416	25.35	4443K418	32.94
1 1/4	1/2	4464K417	25.75	4443K419	33.31
1 1/4	3/4	4464K645	26.05	4443K759	33.31

Pipe Size (A)	Pipe Size (B)	304		316	
		Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
1 1/4	1	4464K386	\$26.37	4443K736	\$34.06
1 1/2	1/8	4464K418	32.60	4443K442	39.47
1 1/2	1/4	4464K419	32.98	4443K443	37.73
1 1/2	3/8	4464K421	33.37	4443K421	38.62
1 1/2	1/2	4464K422	33.76	4443K422	39.04
1 1/2	3/4	4464K648	34.16	4443K423	39.04
1 1/2	1	4464K646	34.58	4443K762	39.47
1 1/2	1 1/4	4464K387	35.00	4443K737	40.37
2	3/8	4464K425	45.55	4443K446	53.78
2	1/2	4464K426	46.07	4443K424	54.38
2	3/4	4464K427	46.61	4443K425	55.00
2	1	4464K649	47.16	4443K426	55.63
2	1 1/4	4464K647	47.72	4443K764	56.28
2	1 1/2	4464K388	48.30	4443K738	56.94
2 1/2	2	4464K391	86.33	4443K427	119.82
3	1	4464K431	154.61	4443K449	213.40
3	2	4464K392	154.61	4443K739	213.40
2 1/2	2 1/2	4464K432	154.61	4443K114	213.40
4	2	4464K433	243.20	4443K115	290.80
4	3	4464K393	243.20	4443K553	290.80



NPT Tee Outlets

- Use with air, natural gas, oil, steam, water
- Maximum Pressure:
- See table;
600 psi @ 220°F for steam

To Order: Please specify For Pipe Size within the range shown.

Pipe Size	For Pipe Size	Ht.	Max. psi @ 72°F	304/304L Stainless Steel	316/316L Stainless Steel
1/4	1/4 to 36	3/4"	3,000	4565T31	\$30.78
3/8	3/8 to 36	13/16"	3,000	4565T32	31.60
1/2	1/2 to 36	1"	3,000	4565T33	32.18
3/4	3/4 to 36	1 1/16"	3,000	4565T34	38.39
1	1 to 36	15/16"	3,000	4565T35	48.39
1 1/4	1 1/4 to 36	15/16"	3,000	4565T36	80.21
1 1/2	1 1/2 to 36	1 3/8"	2,800	4565T37	91.58
2	2 to 36	1 1/2"	2,500	4565T38	104.42

Stainless Steel Pipe Nipples & Pipe

For technical drawings and
3-D models, go to mcmaster.com.



How to Measure Pipe Size for NPT Threads

Example shows pipe size $\frac{3}{8}$. Pipe size is not an actual measured size, but rather an industry designation. Align your pipe or fitting with the "0" line as shown. The line on the opposite edge gives the pipe size. You can also measure the OD of male threads or the ID of female threads, then find the corresponding pipe size in the chart. If your measurement doesn't match an OD or ID listed, round to the nearest $\frac{1}{8}$.



Pipe Size: 0
OD: 0

$\frac{1}{16}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{2}$ $\frac{5}{8}$ $\frac{3}{4}$ $1"$ $1\frac{1}{4}"$ $1\frac{1}{2}"$



Pipe Size: 0
ID: 0

$\frac{1}{16}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{2}$ $\frac{5}{8}$ $\frac{3}{4}$ $1"$ $1\frac{1}{4}"$ $1\frac{1}{2}"$

i To measure larger pipe sizes, go to mcmaster.com and search for 4464KAC. For information about fittings and pipe, see pages 2-3.

Thick-Wall Stainless Steel Threaded Pipe Nipples and Pipe



Pipe, Fully Threaded



Pipe, Threaded on Both Ends



A Reducer

- Use with air, hydraulic fluid, natural gas, oil, steam, water
- Fittings: Use threaded Class 3000 high-pressure stainless steel (see pages 20-21)
- Flanges: Use threaded high-pressure Class 300 and Class 600 stainless steel (see page 18)

Thick walls, also known as Schedule 80, give this pipe the strength to handle high-pressure applications. It is seamless so it has a smooth interior for unrestricted flow.

304 stainless steel pipe has very good corrosion resistance. **316 stainless steel** pipe has excellent corrosion resistance.

Pipe—304/304L Stainless Steel

All meet ANSI/ASME B1.20.1, ASTM A312, and ASTM A733. **Fully threaded** pipe is also known as a close nipple; it is threaded on each end to the center.

NPT Fully Threaded		
Pipe Size	Lg.	
$\frac{1}{8}$	$\frac{3}{4}"$	46755K11 \$3.99
$\frac{1}{4}$	$\frac{7}{8}"$	46755K12 4.50
$\frac{3}{8}$	$1"$	46755K13 5.27
$\frac{1}{2}$	$1\frac{1}{8}"$	46755K14 6.51
$\frac{5}{8}$	$1\frac{3}{8}"$	46755K15 8.13
1	$1\frac{1}{2}"$	46755K16 10.80
$1\frac{1}{4}$	$1\frac{5}{8}"$	46755K17 13.55
$1\frac{1}{2}$	$1\frac{3}{4}"$	46755K18 15.68
2	$2"$	46755K19 24.22
3	$2\frac{5}{8}"$	46755K261 56.08
4	$2\frac{7}{8}"$	46755K271 72.09

NPT Threaded on Both Ends										
Pipe Size		$1\frac{1}{2}"$	$2"$	$2\frac{1}{2}"$	$3"$	$3\frac{1}{2}"$	$4"$	$5"$	$6"$	$8"$
$\frac{1}{8}$	48395K61	\$5.01	\$5.89	\$6.70	\$7.61	\$8.67	\$9.55	\$11.27	\$12.22	\$15.92
$\frac{1}{4}$	48395K62	5.38	6.41	7.47	8.56	9.92	11.13	12.49	14.51	19.18
$\frac{3}{8}$	48395K63	6.22	7.39	8.71	10.03	11.64	12.15	14.58	17.02	22.65
$\frac{1}{2}$	48395K64	7.65	8.93	10.54	12.15	13.28	14.86	17.88	20.90	27.66
$\frac{5}{8}$	48395K65	8.56	9.96	11.75	12.70	14.79	16.47	19.87	23.23	30.61
1	48395K66	—	12.35	14.45	16.68	19.49	21.72	26.21	30.71	40.87
$1\frac{1}{4}$	48395K67	—	15.75	18.29	21.17	24.77	27.62	33.35	39.08	51.47
$1\frac{1}{2}$	48395K68	—	16.92	20.11	23.26	27.24	30.44	36.78	43.13	57.10
2	48395K69	—	—	26.08	29.68	34.83	38.91	47.15	55.35	62.21
3	48395K81	—	—	—	61.17	69.58	76.31	84.34	97.87	117.31
4	48395K82	—	—	—	—	97.69	95.03	112.26	130.60	177.59

NPT Threaded on Both Ends											
Pipe Size		$10"$	$12"$	$14"$	$16"$	$18"$	$20"$	$22"$	$24"$	$36"$	$48"$
$\frac{1}{8}$	48395K61	\$19.39	\$22.61	\$24.26	\$26.09	\$27.03	\$29.97	\$32.95	\$36.02	\$54.02	\$72.08
$\frac{1}{4}$	48395K62	23.50	27.62	29.10	33.25	35.20	39.14	43.05	46.96	64.75	86.27
$\frac{3}{8}$	48395K63	27.83	32.70	35.31	40.39	45.43	47.47	52.25	55.34	72.71	96.87
$\frac{1}{2}$	48395K64	34.11	40.15	46.05	52.64	54.12	60.14	64.29	72.19	90.22	112.24
$\frac{5}{8}$	48395K65	37.78	44.50	55.28	63.20	54.27	52.68	61.78	75.84	113.84	151.83
1	48395K66	50.41	59.40	65.25	81.60	73.35	77.72	89.73	97.91	146.83	163.12
$1\frac{1}{4}$	48395K67	55.08	63.28	79.82	71.39	92.34	102.61	112.85	123.14	175.94	218.99
$1\frac{1}{2}$	48395K68	59.44	70.13	84.74	96.84	108.92	121.05	133.16	145.27	193.64	223.44
2	48395K69	76.89	90.70	110.43	126.19	135.18	150.24	165.25	180.28	233.68	245.78
3	48395K81	142.61	152.27	163.78	187.17	210.58	233.97	257.36	280.75	380.39	507.19
4	48395K82	216.59	253.35	220.31	251.78	283.26	314.73	346.20	377.67	566.53	755.37

Pipe—316/316L Stainless Steel

All meet ANSI/ASME B1.20.1, ASTM A312, and ASTM A733. **Fully threaded** pipe is also known as a close nipple; it is threaded on each end to the center.

NPT Threaded on Both Ends										
Pipe Size		$1\frac{1}{2}"$	$2"$	$2\frac{1}{2}"$	$3"$	$3\frac{1}{2}"$	$4"$	$5"$	$6"$	$8"$
$\frac{1}{8}$	68045K61	\$5.46	\$6.52	\$7.51	\$8.58	\$9.85	\$10.91	\$12.24	\$14.21	\$18.63
$\frac{1}{4}$	68045K62	5.83	7.00	8.27	9.50	11.08	12.46	14.08	16.47	21.80
$\frac{3}{8}$	68045K63	6.79	8.20	9.71	11.22	12.30	13.76	16.60	19.44	25.90
$\frac{1}{2}$	68045K64	8.78	10.47	12.49	13.63	15.99	17.92	21.70	25.48	33.81
$\frac{5}{8}$	68045K65	9.92	11.73	13.18	15.31	17.92	20.05	24.29	28.55	37.78
1	68045K66	—	14.79	17.44	20.31	23.87	26.74	32.42	38.14	50.83
$1\frac{1}{4}$	68045K67	—	19.12	22.57	26.29	30.94	34.65	42.08	49.51	58.60
$1\frac{1}{2}$	68045K68	—	21.12	25.32	29.55	34.81	39.01	47.44	55.84	64.70
2	68045K69	—	—	33.23	38.30	45.21	50.73	61.78	61.90	82.71
3	68045K81	—	—	—	76.09	87.70	96.98	110.38	119.96	162.17
4	68045K83	—	—	—	—	117.25	114.84	135.64	158.83	215.05

(Continued on following page)

**Thick-Wall Stainless Steel Threaded Pipe Nipples and Pipe (Continued)**

Pipe—316/316L Stainless Steel (Cont.)

All meet ANSI/ASME B1.20.1, ASTM A312, and ASTM A733.

NPT Threaded on Both Ends

Pipe Size		10"	12"	14"	16"	18"	20"	22"	24"	36"	48"	60"	72"	120"
1/8	68045K61	\$22.80	\$25.25	\$26.83	\$30.68	\$34.48	\$29.23	\$32.13	\$40.53	\$59.07	\$78.77	\$98.47	\$103.40	\$132.54
1/4	68045K62	26.84	28.23	30.28	26.82	29.00	37.27	40.99	41.85	62.80	83.72	104.68	118.96	144.89
3/8	68045K63	31.94	33.69	34.30	33.32	39.01	46.27	49.53	52.00	78.02	104.04	117.02	124.81	180.03
1/2	68045K64	41.85	49.41	53.36	61.04	68.34	76.27	83.89	91.55	126.98	150.50	162.84	195.42	282.26
5/8	68045K65	46.76	55.26	58.69	63.71	71.29	75.84	83.42	95.58	127.37	169.82	183.75	220.47	318.49
1	68045K66	62.97	63.22	75.76	86.60	96.93	103.08	113.41	115.44	149.83	199.79	231.91	259.73	432.85
1 1/4	68045K67	69.12	81.75	96.60	110.38	124.21	131.45	141.21	147.86	191.96	221.85	277.26	332.71	554.51
1 1/2	68045K68	78.26	92.59	114.86	130.31	136.33	144.77	159.23	167.13	226.50	261.78	327.22	392.68	604.12
2	68045K69	102.66	112.97	133.59	140.21	148.61	165.14	181.66	199.05	258.84	345.12	431.39	517.63	796.37
3	68045K81	198.89	233.44	249.53	285.17	320.84	356.48	392.12	427.76	572.90	725.03	822.64	_____	_____
4	68045K83	252.54	296.83	332.04	379.47	426.90	474.34	492.24	527.04	723.56	875.70	_____	_____	_____

Reducers—304/304L Stainless Steel

Reducers are also known as swage nipples. They meet ASTM A403/A403M and MSS SP-95.

NPT Threaded on Both Ends

Pipe Size		Lg.	Pipe Size		Lg.				
(A)	(B)		(A)	(B)					
3/8	1/4	2 1/2"	2161K28	\$33.05	1 1/4	1	4"	2161K17	\$68.19
1/2	1/4	2 3/4"	2161K11	24.75	1 1/2	1/2	4 1/2"	2161K18	75.05
1/2	3/8	2 9/16"	2161K12	26.96	1 1/2	3/4	4 1/2"	2161K19	75.05
3/4	1/4	3"	2161K13	29.80	1 1/2	1	4 1/2"	2161K21	73.20
3/4	3/8	3"	2161K29	32.20	2	1 1/4	4 1/2"	2161K22	73.20
3/4	1/2	3"	2161K14	29.80	2	1/2	6 1/2"	2161K23	181.09
1	1/4	3 1/2"	2161K32	40.89	2	3/4	6 1/2"	2161K24	181.09
1	3/8	3 1/2"	2161K33	40.89	2	1	6 1/2"	2161K25	171.85
1	1/2	3 1/2"	2161K15	37.88	2	1 1/4	6 1/2"	2161K26	174.76
1	3/4	3 1/2"	2161K16	37.88	2	1 1/2	6 1/2"	2161K27	177.78
1 1/4	3/4	4"	2161K34	75.05					

Extreme-Pressure Stainless Steel Threaded Pipe FittingsWith the strength to handle extreme pressures, these fittings can be used to connect equipment in hydraulic fluid lines. Fittings are 316 stainless steel and have excellent corrosion resistance. **NPTF** (Dryseal) threads are compatible with NPT threads.**NPT Connectors and Adapters**

- Use with hydraulic fluid, oil, steam, and water (unless noted)
- Maximum Pressure: See table;
rated for steam @ 300°F (unless noted)

Elbows, tees, and crosses meet ASTM A182, unless noted.
Female x male 90° elbow adapters are also known as street elbows.
Inline tees are also known as branch tees.
Right-angle tees are also known as run tees.
NPT straights meet SAE J514, unless noted.
NPTF straights meet ASTM A479.



Pipe Size	Thread Type	Max. psi @ 72°F	90° Elbows, Female	Max. psi @ 72°F	90° Elbows, Male	Max. psi @ 72°F	90° Elbows, Female x Male	Max. psi @ 72°F	45° Elbows, Female x Male	Max. psi @ 72°F
1/8	NPTF	5,000	51205K162	\$21.19	6,000	51205K113	\$33.73	5,000	51205K279	\$21.54
1/4	NPTF	5,000	51205K152	24.63	6,000	51205K112	18.67	5,000	51205K272	28.67
1/4	NPT	15,000	51205K701★	120.26						
3/8	NPTF	4,500	51205K154	34.08	6,000	51205K114	37.15	4,500	51205K274	34.75
3/8	NPT	15,000	51205K702★	164.19						
1/2	NPTF	3,000	51205K156	51.62	6,000	51205K115	43.25	3,000	51205K276	54.60
1/2	NPT	15,000	51205K703★	159.81						
3/4	NPTF	3,000	51205K158	85.12	4,000	51205K116	110.51	3,000	51205K278	99.25
1	NPTF	1,800	51205K159	134.65	3,000	51205K117	146.02	1,800	51205K282	163.73

★ Not for use with steam. Does not meet ASTM A182.



Pipe Size	Thread Type	Max. psi @ 72°F	Tees	Max. psi @ 72°F	Inline Tees, Female x Male x Female	Max. psi @ 72°F	Right-Angle Tees, Female x Female x Male	Max. psi @ 72°F	Crosses	
1/8	NPTF	5,000	51205K242	\$27.96	5,000	51205K165	\$38.31	5,000	51205K126	\$32.10
1/4	NPTF	5,000	51205K241	34.06	5,000	51205K166	33.15	5,000	51205K127	33.31
1/4	NPT	15,000	51205K704★	132.95						
3/8	NPTF	4,500	51205K243	47.15	4,500	51205K167	66.81	4,500	51205K128	54.19
3/8	NPT	15,000	51205K705★	165.53						
1/2	NPTF	3,000	51205K245	70.96	3,000	51205K168	79.79	3,000	51205K129	79.63
1/2	NPT	15,000	51205K706★	242.34						
3/4	NPTF	3,000	51205K247	120.22	3,000	51205K169	178.13	3,000	51205K131	176.52
1	NPTF	1,800	51205K244	176.24	1,800	51205K171	194.05	1,800	51205K164	188.25

★ Not for use with steam. Does not meet ASTM A182.

(Continued on following page)

Stainless Steel Pipe Fittings

For technical drawings and
3-D models, go to mcmaster.com.



How to Measure Pipe Size for NPT Threads

Example shows pipe size $\frac{3}{8}$.
Pipe size is not an actual measured size, but rather an industry designation. Align your pipe or fitting with the "0" line as shown. The line on the opposite edge gives the pipe size. You can also measure the OD of male threads or the ID of female threads, then find the corresponding pipe size in the chart. If your measurement doesn't match an OD or ID listed, round to the nearest $\frac{1}{8}$ ".



Pipe Size: 0 $\frac{1}{16}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{2}$ $\frac{3}{4}$ 1" 1" $1\frac{1}{4}$ " $1\frac{1}{2}$ "
OD: 0 $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{2}$ $\frac{5}{8}$ $\frac{3}{4}$ " 1" $1\frac{1}{4}$ " $1\frac{5}{8}$ " $1\frac{3}{4}$ "



Pipe Size: 0 $\frac{1}{16}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{2}$ $\frac{3}{4}$ 1" 1" $1\frac{1}{4}$ " $1\frac{1}{2}$ "
ID: 0 $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{2}$ $\frac{5}{8}$ $\frac{3}{4}$ " 1" $1\frac{1}{4}$ " $1\frac{5}{8}$ " $1\frac{3}{4}$ "

To measure larger pipe sizes, go to mcmaster.com and search for 4464KAC. For information about fittings and pipe, see pages 2-3.

Extreme-Pressure Stainless Steel Threaded Pipe Fittings (Continued)



With the strength to handle extreme pressures, these fittings can be used to connect equipment in hydraulic fluid lines. Fittings are 316 stainless steel and have excellent corrosion resistance, unless otherwise stated. **NPTF** (Dryseal) threads are compatible with NPT threads.

NPT Connectors and Adapters (Cont.)

- Use with hydraulic fluid, oil, steam, and water (unless noted)
- Maximum Pressure: See table; NPT: rated for steam @ 200° F (unless noted); NPTF: rated for steam @ 300° F

NPT straights meet SAE J514, unless noted.

NPTF straights meet ASTM A479.



Straights, Female			
Pipe Size	Thread Type	Max. psi @ 72°F	
1/8	NPTF	6,000	51205K182 \$12.23
1/4	NPTF	6,000	51205K212 13.04
1/4	NPT	15,000	51205K742 ■ 62.83
3/8	NPTF	6,000	51205K216 18.37
3/8	NPT	15,000	51205K743 ■ 68.07
1/2	NPTF	6,000	51205K223 25.13
1/2	NPT	15,000	51205K744 ■ 87.22
3/4	NPTF	4,800	51205K228 34.73
1	NPTF	3,600	51205K231 67.58
1 1/4	NPTF	3,000	51205K185 112.60
1 1/2	NPTF	2,400	51205K186 193.38
2	NPT	2,400	51205K623 179.59

■ Not for use with steam. Does not meet SAE J514.



Straights, Male			
Pipe Size	Lg.	Thread Type	Max. psi @ 72°F
1/8	1 1/16"	NPTF	7,200
1/8	2"	NPT	7,200
1/8	2 1/2"	NPT	7,200
1/8	3"	NPT	7,200
1/8	4"	NPT	7,200
1/4	1 17/16"	NPT	15,000
1/4	1 29/64"	NPTF	7,200
1/4	2"	NPT	7,200
1/4	2 1/2"	NPT	7,200
1/4	3"	NPT	7,200
1/4	4"	NPT	7,200
3/8	1 29/64"	NPTF	7,200
3/8	1 45/64"	NPT	15,000
3/8	2"	NPT	7,200
3/8	2 1/2"	NPT	7,200
3/8	3"	NPT	7,200
3/8	4"	NPT	7,200
1/2	1 57/64"	NPTF	7,200
1/2	2"	NPT	7,200
1/2	2 1/4"	NPT	15,000
1/2	2 1/2"	NPT	7,200
1/2	3"	NPT	7,200
1/2	4"	NPT	7,200
3/4	1 31/32"	NPTF	6,600
3/4	2"	NPT	7,200
3/4	3"	NPT	7,200
3/4	4"	NPT	7,200
1	1 13/16"	NPTF	5,400
1	3"	NPT	7,200
1	4"	NPT	7,200
1 1/4	2 31/64"	NPTF	3,600
1 1/2	2 39/64"	NPTF	3,600
1 1/2	4"	NPT	7,200
2	2 253/64"	NPT	3,000

■ Not for use with steam. Does not meet SAE J514.



Straights, Female x Male			
Pipe Size	Thread Type	Max. psi @ 72°F	
1/8	NPTF	6,500	51205K209 \$12.31
1/4	NPTF	6,000	51205K311 18.52
3/8	NPTF	5,300	51205K314 23.47
3/8	NPT	15,000	51205K741 ■ 53.52
1/2	NPTF	6,000	51205K321 25.67
1/2	NPT	15,000	51205K738 ■ 107.28
3/4	NPTF	4,600	51205K325 72.19
1	NPTF	4,400	51205K328 93.87
2	NPT	2,400	51205K623 206.15

■ Not for use with steam. Does not meet SAE J514.



Caps			
Pipe Size	Thread Type	Max. psi @ 72°F	
1/8	NPTF	6,000	51205K491 \$37.92
1/4	NPTF	6,000	51205K492 16.17
1/4	NPT	15,000	51205K481 66.66
3/8	NPTF	6,000	51205K493 42.00
3/8	NPT	15,000	51205K482 70.16
1/2	NPTF	6,000	51205K494 29.10
1/2	NPT	15,000	51205K483 73.84
3/4	NPTF	4,800	51205K495 36.21
1	NPTF	3,600	51205K496 42.96
1 1/4	NPTF	2,400	51205K497 76.48
1 1/2	NPTF	2,400	51205K498 105.19
2	NPTF	2,400	51205K499 167.90

Locknuts			
Thread Type	Max. psi @ 72°F		
NPT	10,000	5530K37	\$4.90
NPT	10,000	5530K38	6.32
NPT	10,000	5530K39	7.14
NPT	10,000	5530K44	11.80
NPT	5,000	5530K45	15.16
NPT	5,000	5530K46	26.08
NPT	5,000	5530K47	29.10
NPT	3,000	5530K48	38.88
NPT	3,000	5530K49	55.94



(Continued on following page)



Extreme-Pressure Stainless Steel Threaded Pipe Fittings (Continued)



NPTF Plugs

- Use with hydraulic fluid, oil, steam, and water
- Maximum Pressure: See table; rated for steam @ 300° F

Meet ASTM A479.

Plugs with **external hex drive** are hollow, unless noted.
Plugs with **hex drive** are solid.

Pipe Size	External Hex Drive			Hex Drive		
	Max. psi @ 72°F			Max. psi @ 72°F	Drive Size	
1/8	7,200	51205K392▲	\$5.46	7,200	3/16"	51205K176 \$7.15
1/4	7,200	51205K391	6.44	7,200	1/4"	51205K177 6.88
3/8	7,200	51205K393	8.37	7,200	5/16"	51205K178 9.04
1/2	7,200	51205K395	12.27	7,200	3/8"	51205K179 21.92
3/4	6,600	51205K396	18.85	6,600	9/16"	51205K181 33.27
1	5,400	51205K425	30.75	5,300	5/8"	51205K208 47.79

▲ Plug is solid.

NPT Reducers

- Use with hydraulic fluid, oil, steam, and water (unless noted)

• Maximum Pressure: See table;

NPT: rated for steam @ 200° F (unless noted);

NPTF: rated for steam @ 300° F

NPT fittings meet SAE J514, unless noted.

NPTF fittings meet ASTM A479.



Straights, Female			
Pipe Size (A) (B)	Thread Type	Max. psi @ 72°F	
1/4 1/8	NPTF	6,000	51205K183 \$13.90
3/8 1/8	NPTF	6,000	51205K184 33.04
3/8 1/8	NPT	15,000	51205K745■ 61.98
3/8 1/4	NPTF	6,000	51205K214 35.96
1/2 1/8	NPTF	6,000	51205K217 60.49
1/2 1/8	NPT	15,000	51205K746■ 70.50
1/2 1/4	NPTF	6,000	51205K218 28.35
1/2 3/8	NPTF	6,000	51205K221 43.87
1/2 3/8	NPT	15,000	51205K747■ 74.03
3/4 1/4	NPTF	4,800	51205K224 53.04
3/4 3/8	NPTF	4,800	51205K225 110.29
3/4 1/2	NPTF	4,800	51205K226 55.44
1 1/4	NPT	3,000	51205K619 53.83
1 3/8	NPTF	3,600	51205K229 110.29
1 1/2	NPTF	3,600	51205K232 87.25
1 3/4	NPTF	3,600	51205K233 64.58
1 1/4 1	NPTF	3,000	51205K234 123.80
1 1/2 1	NPT	2,400	51205K621 174.29
1 1/2 1 1/4	NPT	2,400	51205K622 175.24

■ Not for use with steam. Does not meet SAE J514.

Straights, Male			
Pipe Size (A) (B)	Thread Type	Max. psi @ 72°F	
1/4 1/8	NPTF	7,200	51205K191 \$10.12
3/8 1/8	NPTF	7,200	51205K192 30.37
3/8 1/4	NPTF	7,200	51205K133 12.94
1/2 1/8	NPTF	7,700	51205K136 23.55
1/2 1/4	NPTF	7,200	51205K139 17.35
1/2 3/8	NPTF	7,200	51205K137 16.98
1/2 3/8	NPT	15,000	51205K734■ 74.86
3/4 1/4	NPTF	6,600	51205K201 38.90
3/4 3/8	NPTF	7,300	51205K143 51.74
3/4 1/2	NPTF	6,600	51205K202 23.56
1 1/4	NPT	7,200	51205K581 46.34
1 3/8	NPTF	5,300	51205K147 77.37
1 1/2	NPTF	5,300	51205K149 88.28
1 3/4	NPTF	5,400	51205K204 77.98
1 1/4 1	NPTF	3,600	51205K206 146.22
1 1/2 1	NPT	3,600	51205K582 156.84
2 1 1/2	NPT	3,000	51205K584 175.90

■ Not for use with steam. Does not meet SAE J514.



Straights, Female x Male			
Pipe Size (A) (B)	Thread Type	Max. psi @ 72°F	
1/4 1/8	NPTF	6,000	51205K187 \$18.71
1/4 1/2	NPT	7,200	51205K624 13.15
1/4 1/2	NPT	15,000	51205K736■ 56.98
3/8 1/8	NPTF	5,300	51205K312 18.56
3/8 1/8	NPT	15,000	51205K739■ 52.81
3/8 1/4	NPTF	6,000	51205K313 19.23
3/8 1/2	NPT	15,000	51205K737■ 102.17
1/2 1/8	NPTF	6,000	51205K315 44.08
1/2 1/4	NPTF	6,000	51205K317 25.19
1/2 3/8	NPTF	6,000	51205K319 25.98
3/4 1/4	NPTF	4,800	51205K322 48.60
3/4 3/8	NPTF	4,600	51205K323 74.52
3/4 1/2	NPTF	4,800	51205K324 35.23
1 1/4	NPT	3,600	51205K625 42.56
1 3/8	NPTF	4,400	51205K326 138.57
1 1/2	NPTF	3,600	51205K188 97.25
1 3/4	NPTF	3,600	51205K327 71.81
1 1/4 3/4	NPT	3,600	51205K626 103.29
1 1/4 1	NPTF	3,000	51205K189 147.45
1 1/2 3/4	NPT	2,400	51205K627 182.40
1 1/2 1	NPT	2,400	51205K628 171.17
1 1/2 1 1/4	NPT	2,400	51205K629 184.07
2 1	NPT	2,400	51205K632 214.57
2 1 1/4	NPT	2,400	51205K633 225.28

■ Not for use with steam. Does not meet SAE J514.

Bushings, Male x Female			
Pipe Size (A) (B)	Thread Type	Max. psi @ 72°F	
1/4 1/8	NPTF	6,000	51205K342 \$10.98
3/8 1/8	NPTF	6,000	51205K344 11.98
3/8 1/4	NPTF	6,000	51205K346 13.19
1/2 1/8	NPTF	6,000	51205K348 14.81
1/2 1/4	NPTF	6,000	51205K351 11.54
1/2 3/8	NPTF	6,000	51205K353 15.02
3/4 1/8	NPT	4,800	51205K634 48.83
3/4 1/4	NPTF	6,000	51205K355 20.23
3/4 3/8	NPTF	6,000	51205K357 21.19
3/4 1/2	NPTF	6,000	51205K359 23.02
1 1/8	NPT	4,800	51205K635 45.98
1 1/4	NPTF	5,400	51205K251 79.37
1 3/8	NPTF	5,400	51205K198 71.77
1 1/2	NPTF	5,400	51205K363 32.60
1 3/4	NPTF	4,800	51205K365 37.58
1 1/4 1/2	NPT	3,000	51205K636 156.50
1 1/4 3/4	NPT	3,000	51205K637 78.25
1 1/4 1	NPTF	3,600	51205K199 110.36
1 1/2 1/4	NPT	2,400	51205K638 137.71
1 1/2 3/8	NPT	2,400	51205K639 160.87
1 1/2 1/2	NPT	2,400	51205K641 162.75
1 1/2 3/4	NPT	2,400	51205K642 128.33
1 1/2 1	NPTF	3,600	51205K252 168.71
1 1/2 1 1/4	NPT	2,400	51205K643 140.21
2 1	NPT	2,400	51205K644 122.06
2 1 1/4	NPT	2,400	51205K645 125.19
2 1 1/2	NPT	2,400	51205K646 125.19

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Stainless Steel Pipe Fittings

For technical drawings and
3-D models, go to mcmaster.com.

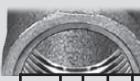


How to Measure Pipe Size for BSP Threads

Example shows pipe size $\frac{3}{8}$.
Pipe size is not an actual measured size, but rather an industry designation. Align your pipe or fitting with the "0" line as shown. The line on the opposite edge gives the pipe size. You can also measure the OD of male threads or the ID of female threads, then find the corresponding pipe size in the chart. If your measurement doesn't match an OD or ID listed, round to the nearest $\frac{1}{8}$.



Pipe Size: 0 1/16 1/8 1/4 3/8 1/2 3/4 1" 1 1/4" 1 1/2"
OD: 0 1/16 3/32 1/2 5/16 3/4" 1" 1 1/4" 1 5/8" 1 3/4"



Pipe Size: 0 1/16 1/8 1/4 3/8 1/2 3/4 1" 1 1/4" 1 1/2"
ID: 0 1/16 3/32 1/2 5/16 3/4" 1" 1 1/4" 1 5/8" 1 3/4"

To measure larger pipe sizes, go to mcmaster.com and search for 4464KAC. For information about fittings and pipe, see pages 2-3.

Extreme-Pressure Stainless Steel Threaded Pipe Fittings (Continued)



With the strength to handle extreme pressures, these fittings can be used to connect equipment in hydraulic fluid lines. Fittings are 316 stainless steel and have excellent corrosion resistance.

BSPT (British Standard Pipe Taper) Connectors and Plugs

- Use with hydraulic fluid, oil, and water
- Maximum Pressure: See table

Straights meet DIN EN 10226 and ISO 7.1.

Plugs are solid and meet ISO 1179 and ISO 8434-6.



Pipe Size, BSPT	Max. psi @ 72°F	Straights	
		Max. psi @ 72°F	
1/8	2,900	4822T239	\$19.62
1/4	2,900	4822T241	22.02
3/8	2,900	4822T242	24.10
1/2	2,900	4822T243	25.00
5/8	2,900	4822T244	35.98
1	2,900	4822T245	58.33
1 1/4	2,900	4822T246	94.04
1 1/2	2,900	4822T247	121.06
2	2,900	4822T248	184.28



Plugs with External Hex Drive

BSPT (British Standard Pipe Taper) Reducers

- Use with hydraulic fluid, oil, and water
- Maximum Pressure: 2,900 psi @ 72°F

Reducers meet DIN EN 10226 and ISO 7.1.



Pipe Size, BSPT

(A)	(B)		
1/4	1/8	4822T249	\$21.63
3/8	1/8	4822T251	23.56
3/8	1/4	4822T252	23.56
1/2	1/4	4822T253	27.56
1/2	3/8	4822T254	27.56
3/4	1/4	4822T255	37.37
3/4	3/8	4822T256	39.23
3/4	1/2	4822T257	41.10
1	3/8	4822T258	58.33
1	1/2	4822T259	58.33
1	3/4	4822T261	59.98
1 1/4	1	4822T262	100.17
1 1/2	3/4	4822T263	124.58
1 1/2	1	4822T264	124.58
1 1/2	1 1/4	4822T265	129.21
2	1 1/2	4822T266	193.16

BSPP (British Standard Pipe Parallel) Connectors, Adapters, Caps, and Plugs

- Use with hydraulic fluid, oil, and water
- Maximum Pressure: See table

Fittings meet ISO 1179 and ISO 8434-6, except female straights.

To prevent leaks, male threads on *straights and plugs with external hex drive* have a Buna-N gasket and 316 stainless steel washer; *plugs with hex drive* have a fluoroelastomer gasket. For replacement washers, see page 31.

Plugs with external hex drive are hollow.

Plugs with hex drive are solid.



Pipe Size, BSPP	Max. psi @ 72°F	Straights, Female	
		Max. psi @ 72°F	
1/8	6,000	51205K748	\$30.12
1/4	6,000	51205K749	29.25
3/8	6,000	51205K751	29.81
1/2	5,000	51205K752	53.17
5/8			4,500
1	3,000	51205K753	73.74
1 1/4			2,300
1 1/2			1,800
2			1,200



Max. psi @ 72°F	Straights, Male	
6,000	4822T11	\$34.52
6,000	4822T12	34.36
6,000	4822T13	35.92
5,000	4822T14	43.31
4,500	4822T55	62.31
3,500	4822T16	85.27
3,500	4822T101	122.98
1,800	4822T102	150.81
1,200	4822T103	259.75



Max. psi @ 72°F	Straights, Female x Male	
2,900	4822T361	\$48.46
2,900	4822T365	34.08
2,900	4822T369	37.42
2,900	4822T373	44.13
2,900	4822T376	60.63
2,900	4822T379	98.58
2,300	4822T382	169.17
2,300	4822T383	187.36
2,300	4822T384	274.92



Pipe Size, BSPP	Max. psi @ 72°F	Caps	
		Max. psi @ 72°F	
1/8	5,000	4822T328	\$19.29
1/4	5,000	4822T329	21.37
3/8	5,000	4822T331	29.85
1/2	4,500	4822T332	32.50
3/4	3,600	4822T334	45.96
1	2,900	4822T335	80.85
1 1/4			2,300
1 1/2			1,800
2			1,200



Max. psi @ 72°F	Plugs with External Hex Drive	
	Max. psi @ 72°F	
5,000	4822T297	\$13.38
5,000	4822T298	17.98
5,000	4822T299	20.19
4,500	4822T301	24.10
3,600	4822T302	32.52
2,900	4822T303	57.98
2,300	4822T304	120.92
1,800	4822T305	125.73
1,200	4822T306	188.57



Max. psi @ 72°F	Plugs with Hex Drive	
	Drive Size, mm	
5,800	14	4822T267 \$18.37
5,800	19	4822T268 20.65
5,800	22	4822T269 23.90
5,800	27	4822T271 34.33
5,800	32	4822T272 47.02
5,800	40	4822T273 73.58
4,500	50	4822T274 87.60
4,500	55	4822T275 95.38

(Continued on following page)



Extreme-Pressure Stainless Steel Threaded Pipe Fittings (Continued)



BSPP (British Standard Pipe Parallel) Reducers

- Use with hydraulic fluid, oil, and water
- Maximum Pressure: See table

Female			
Pipe Size, BSPP (A)	(B)	Max. psi @ 72°F	
1/4	1/8	6,000	51205K754
3/8	1/4	6,000	51205K756
1/2	3/8	5,000	51205K757
			\$66.62
			30.62
			33.83



Female x Male			
Pipe Size, BSPP (A)	(B)	Max. psi @ 72°F	
1/8	1/4	2,900	4822T364
1/4	1/8	2,900	4822T362
1/4	3/8	2,900	4822T368
3/8	1/8	2,900	4822T363
3/8	1/4	2,900	4822T366
3/8	1/2	2,900	4822T372
1/2	1/4	2,900	4822T367
1/2	3/8	2,900	4822T371
1/2	3/4	2,900	4822T375
3/4	1/2	2,900	4822T374
3/4	1	2,900	4822T378
1	3/4	2,900	4822T377
1 1/4	1	2,300	4822T381
			113.50
			112.50
			163.29



Reducers meet ISO 1179 and ISO 8434-6, except female reducers. Male threads have a Buna-N gasket and a 316 stainless steel washer to prevent leaks. For replacement washers see page 31.



Pipe Size, BSPP (A)	(B)	Max. psi @ 72°F	
1/4	1/8	5,000	4822T104
3/8	1/8	5,000	4822T105
3/8	1/4	5,000	4822T106
1/2	1/8	4,500	4822T107
1/2	1/4	4,500	4822T108
1/2	3/8	4,500	4822T109
3/4	1/4	3,600	4822T112
3/4	3/8	3,600	4822T113
3/4	1/2	3,600	4822T114
1	1/4	2,900	4822T115
1	3/8	2,900	4822T116
1	1/2	2,900	4822T117
1	3/4	2,900	4822T118
1 1/4	1	2,300	4822T119
1 1/2	3/4	1,800	4822T121
1 1/2	1	1,800	4822T122
1 1/2	1 1/4	1,800	4822T123
2	1 1/2	1,200	4822T124
			106.92
			104.38
			84.13
			88.37
			125.25
			181.38
			147.40
			144.62
			239.25

Pipe Size, BSPP	Max. psi @ 72°F	For Max. Wall Thick., mm
1/8	5,000	8
1/4	5,000	8
3/8	5,000	8
1/2	4,500	8
3/4	3,600	8
1	2,900	8



BSPP (British Standard Pipe Parallel) Through-Wall Connectors

- Use with hydraulic fluid, oil, and water
- Maximum Pressure: See table

Also known as bulkhead couplings, these connectors mount through a wall or tank to create an inlet or outlet. When installing, the gasket should be on the inside of the tank. Threads have a Buna-N gasket and a 316 stainless steel washer to prevent leaks. For replacement washers see page 31. Fittings meet ISO 1179 and ISO 8434-6.

UN/UNF (SAE) threads are also known as O-ring boss threads; the male threads have a gasket to prevent leaks.

Straights have a Buna-N gasket. Meet SAE J514.

Plugs have a fluoroelastomer gasket and are hollow. Meet ASTM A479.

UN/UNF (SAE) Connectors, Adapters, and Plugs

- Use with hydraulic fluid (petroleum base), oil, water; straights can also be used with steam
- Maximum Pressure: See table; straights: rated for steam @ 200°F

Straights, Female			
Thread Size	Max. psi @ 72°F		
7/16"-20	7,200	51205K559	\$38.81
9/16"-18	7,200	51205K561	46.34
3/4"-16	6,000	51205K562	51.96
7/8"-14	4,800	51205K563	91.38
1 1/16"-12	4,800	51205K564	96.37



Thread Size	Max. psi @ 72°F	
7/16"-20	5,400	51205K527
9/16"-18	5,400	51205K531



Thread Size	Max. psi @ 72°F	
3/8"-24	9,000	51205K286
7/16"-20	9,000	51205K287
1/2"-20	7,200	51205K288
9/16"-18	7,200	51205K289
3/4"-16	7,200	51205K291
7/8"-14	7,200	51205K292
1 1/16"-12	7,200	51205K293
1 5/16"-12	6,600	51205K294
		51.73



UN/UNF (SAE) Reducers, Female x Male

- Use with hydraulic fluid, oil, steam, and water
- Maximum Pressure: See table; rated for steam @ 200°F

Thread Size	Max. psi @ 72°F	
(A)	(B)	
7/16"-20	9/16"-18	5,400
7/16"-20	3/4"-16	5,400
7/16"-20	7/8"-14	5,400
7/16"-20	11/16"-12	5,400
9/16"-18	7/16"-20	5,400
9/16"-18	3/4"-16	5,400
9/16"-18	7/8"-14	5,400
9/16"-18	11/16"-12	5,400
		51205K529
		51205K533
		51205K536
		51205K541
		51205K528
		51205K534
		51205K537
		51205K542



Thread Size	Max. psi @ 72°F	
(A)	(B)	
3/4"-16	9/16"-18	4,800
3/4"-16	7/8"-14	4,800
3/4"-16	11/16"-12	5,400
7/8"-14	3/4"-16	3,600
7/8"-14	7/8"-14	3,600
11/16"-12	3/4"-16	4,200
11/16"-12	7/8"-14	2,400
11/16"-12	11/16"-12	2,400

(Continued on following page)

Stainless Steel Pipe Fittings

For technical drawings and
3-D models, go to mcmaster.com.



How to Measure Pipe Size for NPT or BSP Threads

Example shows pipe size $\frac{3}{8}$. Pipe size is not an actual measured size, but rather an industry designation. Align your pipe or fitting with the "0" line as shown. The line on the opposite edge gives the pipe size. You can also measure the OD of male threads or the ID of female threads, then find the corresponding pipe size in the chart. If your measurement doesn't match an OD or ID listed, round to the nearest $\frac{1}{8}$.



Pipe Size: 0
OD: 0



Pipe Size: 0
ID: 0

i To measure larger pipe sizes, go to mcmaster.com and search for 4464KAC. For information about fittings and pipe, see pages 2-3.

Extreme-Pressure Stainless Steel Threaded Pipe Fittings (Continued)



With the strength to handle extreme pressures, these fittings can be used to connect equipment in hydraulic fluid lines. Fittings are 316 stainless steel and have excellent corrosion resistance. **NPTF** (Dryseal) threads are compatible with NPT threads.

Metric Plugs with Hex Drive



- Use with hydraulic fluid, oil, and water
 - Maximum Pressure: 5,800 psi @ 72°F
- Plugs have a fluoroelastomer gasket to prevent leaks. They are solid and meet DIN 7631 and ISO 9974.

Thread Size	Drive Size, mm		
M10x1	14	4822T276	\$20.44
M12x1.5	17	4822T277	21.75
M14x1.5	19	4822T278	23.10
M16x1.5	22	4822T279	27.08
M18x1.5	24	4822T281	28.87

Thread Size	Drive Size, mm		
M20x1.5	26	4822T282	\$31.04
M22x1.5	27	4822T283	37.42
M26x1.5	32	4822T284	49.90
M27x2	32	4822T285	53.56
M33x2	40	4822T286	80.48

Thread Adapters, Female



- Use with hydraulic fluid, oil, and water
- Maximum Pressure: 15,000 psi @ 72°F

UN/UNF (SAE) threads are also known as O-ring boss threads.

Pipe Size	Thread Size		
1/4	9/16"-18	51205K721	\$54.55
1/4	3/4"-16	51205K726	67.71
1/4	11/8"-12	51205K729	87.00
3/8	9/16"-18	51205K722	65.86
3/8	3/4"-16	51205K727	74.48

NPT x UN/UNF (SAE)

Pipe Size	Thread Size		
3/8	11/8"-12	51205K725	\$95.05
1/2	9/16"-18	51205K723	69.33
1/2	3/4"-16	51205K724	76.43
1/2	11/8"-12	51205K731	95.71

Thread Adapters, Male



- Use with hydraulic fluid (petroleum base), oil, and water (unless noted)
- Maximum Pressure: See table

BSPP and **metric** threads have a Buna-N gasket and 316 stainless steel washer to prevent leaks. For replacement washers see page 31. **UN/UNF (SAE)** threads have a Buna-N gasket to prevent leaks, unless noted. Also known as O-ring boss threads.

Pipe Size	Max. psi @ 72°F		
1/4	6,000	4822T234	\$27.35
3/8	5,500	4822T235	25.62
1/2	4,500	4822T236	30.27

NPT x BSPT

Pipe Size	Max. psi @ 72°F		
3/4	3,500	4822T237	\$57.83
1	3,000	4822T238	77.92

Pipe Size	Max. psi @ 72°F		
1/8	6,000	4822T21	\$25.86
1/4	6,000	4822T22	23.47
3/8	6,000	4822T23	26.79
1/2	5,000	4822T24	34.19
3/4	4,500	4822T65	47.71

NPT x BSPP

Pipe Size	Max. psi @ 72°F		
1	3,500	4822T66	\$67.71
1 1/4	2,500	4822T225	115.75
1 1/2	2,000	4822T229	168.12
2	2,000	4822T233	229.47

Pipe Size	Thread Size	Max. psi @ 72°F	
1/8	7/16"-20	6,000	51205K521♣ \$29.57
1/4	1 1/2"-20	6,000	51205K522♦ 30.75
1/4	9/16"-18	6,000	51205K256♦ 68.12
3/8	9/16"-18	6,000	51205K257♦ 42.87
3/8	3/4"-16	6,000	51205K258♦ 97.87
1/2	3/4"-16	6,000	51205K259♦ 43.23

NPTF x UN/UNF (SAE)

Pipe Size	Thread Size	Max. psi @ 72°F	
1/2	7/8"-14	5,400	51205K523♣ \$36.62
3/4	11/16"-12	6,000	51205K262♦ 105.33
3/4	15/16"-12	3,600	51205K524♦ 49.49
1	15/16"-12	5,400	51205K263♦ 90.27
1 1/4	15/16"-12	3,000	51205K525♣ 166.43
1 1/4	17/8"-12	2,400	51205K526♦ 177.98

♣ Also for use with steam. Rated for steam @ 200°F. ♦ Gasket is fluoroelastomer.

Pipe Size	Max. psi @ 72°F	
1/8	2,900	4822T125 \$25.71
1/4	2,900	4822T128 32.33
3/8	2,900	4822T134 34.42
1/2	2,900	4822T139 47.38
3/4	2,900	4822T146 58.88

BSPP x BSPT

Pipe Size	Max. psi @ 72°F	
1	2,900	4822T151 \$77.67
1 1/4	2,300	4822T155 115.75
1 1/2	1,800	4822T159 137.96
2	1,200	4822T163 218.00

(Continued on following page)



Extreme-Pressure Stainless Steel Threaded Pipe Fittings (Continued)



Thread Adapters, Male (Cont.)

- Use with hydraulic fluid (petroleum base), oil, and water (unless noted)
- Maximum Pressure: See table

BSPP and **metric** threads have either a Buna-N gasket or a Buna-N gasket and 316 stainless steel washer to prevent leaks. For replacement washers see page 31.

UN/UNF (SAE) threads have a Buna-N gasket to prevent leaks, unless noted. Also known as O-ring boss threads.



BSPP x Metric				
Pipe Size	Thread Size	Max. psi @ 72°F		
1/8	M12x1.5	5,000	4822T164	\$50.65
1/8	M14x1.5	5,000	4822T165	51.62
1/4	M12x1.5	5,000	4822T166	51.31
1/4	M14x1.5	5,000	4822T167	51.31
1/4	M16x1.5	5,000	4822T168	60.15
1/4	M18x1.5	5,000	4822T169	91.02
3/8	M16x1.5	5,000	4822T171	61.25
3/8	M18x1.5	5,000	4822T172	74.19
3/8	M20x1.5	5,000	4822T173	83.42
1/2	M16x1.5	4,500	4822T174	72.60

UN/UNF (SAE) x BSPP				
Thread Size	Pipe Size	Max. psi @ 72°F		
7/16"-20	1/4	5,000	4822T185	\$48.85
7/16"-20	3/8	5,000	4822T186	57.52
9/16"-18	1/4	5,000	4822T187	57.27
9/16"-18	3/8	5,000	4822T188	55.92
9/16"-18	1/2	4,500	4822T189	71.63
3/4"-16	3/8	4,500	4822T191	58.96
3/4"-16	1/2	4,500	4822T192	66.42

Thread Size					Pipe Size	Max. psi @ 72°F	
3/4"-16	3/4	3,600	4822T193	\$87.19			
7/8"-14	1/2	3,500	4822T194	76.23			
11/16"-12	1/2	3,500	4822T195	82.83			
11/16"-12	3/4	3,500	4822T196	83.67			
11/16"-12	1	2,900	4822T197	123.10			
15/16"-12	3/4	3,500	4822T198	122.31			
15/16"-12	1	2,900	4822T199	127.58			

Thread Adapters, Female x Male

- Use with hydraulic fluid (petroleum base), oil, and water (unless noted)
- Maximum Pressure: See table

BSPP and **metric** male threads have a Buna-N gasket and 316 stainless steel washer to prevent leaks, unless noted. For replacement washers see page 31. **UN/UNF (SAE)** threads are also known as O-ring boss threads; the male threads have a Buna-N gasket to prevent leaks, unless noted.



NPT x BSPP				
Pipe Size	Max. psi @ 72°F			
1/8	2,900	4822T336	\$15.87	
1/4	2,900	4822T339	17.13	
3/8	2,900	4822T344	23.62	
1/2	2,900	4822T348	33.63	
3/4	2,900	4822T352	60.15	

NPTF x UN/UNF (SAE)				
Pipe Size	Thread Size	Max. psi @ 72°F		
1/8	5/16"-24	7,200	51205K546♦	\$30.90
1/8	7/16"-20	7,200	51205K547♦	31.04
1/8	3/4"-16	7,200	51205K549♦	73.79
1/4	7/16"-20	6,000	51205K265♦	76.92
1/4	9/16"-18	6,000	51205K266♦	49.81
1/4	3/4"-16	6,000	51205K268♦	65.85
1/4	7/8"-14	6,600	51205K551♣	35.13
1/4	11/16"-12	6,000	51205K555♦	39.83
3/8	9/16"-18	6,000	51205K267♦	66.33

♦ Also for use with steam. Rated for steam @ 200° F. ♣ Gasket is fluoroelastomer.

NPT x Metric				
Pipe Size	Thread Size	Max. psi @ 72°F		
1/8	M10x1	5,000	4822T392	\$45.23
1/4	M12x1.5	5,000	4822T393	34.23
1/4	M14x1.5	5,000	4822T394	51.17
3/8	M16x1.5	4,500	4822T395	49.85

BSPP x NPT				
Pipe Size	Thread Size	Max. psi @ 72°F		
1/2	5,000	4822T79	\$26.50	
3/4	4,500	4822T81	45.24	
1	3,500	4822T82	79.20	

BSPP x UN/UNF (SAE)				
Pipe Size	Thread Size	Max. psi @ 72°F		
1/8	7/16"-20	6,000	51205K77	\$31.15
1/4	7/16"-20	6,000	51205K771	34.06
1/4	9/16"-18	6,000	51205K772	34.88
1/4	3/4"-16	6,000	51205K774	43.02
3/8	9/16"-18	6,000	51205K773	35.69

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Stainless Steel Pipe Fittings

For technical drawings and
3-D models, go to mcmaster.com.

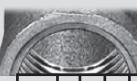


How to Measure Pipe Size for NPT or BSP Threads

Example shows pipe size $\frac{3}{8}$.
Pipe size is not an actual measured size, but rather an industry designation. Align your pipe or fitting with the "0" line as shown. The line on the opposite edge gives the pipe size. You can also measure the OD of male threads or the ID of female threads, then find the corresponding pipe size in the chart. If your measurement doesn't match an OD or ID listed, round to the nearest $\frac{1}{8}$.



Pipe Size: 0
OD: 0



Pipe Size: 0
ID: 0

i To measure larger pipe sizes, go to mcmaster.com and search for 4464KAC. For information about fittings and pipe, see pages 2-3.

Extreme-Pressure Stainless Steel Threaded Pipe Fittings (Continued)



With the strength to handle extreme pressures, these fittings can be used to connect equipment in hydraulic fluid lines. Fittings are 316 stainless steel and have excellent corrosion resistance.

Thread Adapters, Female×Male (Cont.)



- Use with hydraulic fluid (petroleum base), oil, and water
- Maximum Pressure: See table

BSPP and metric male threads have a Buna-N gasket to prevent leaks.
UN/UNF (SAE) threads are also known as O-ring boss threads; the male threads have a Buna-N gasket to prevent leaks.

UN/UNF (SAE) × NPT									
Thread Size	Pipe Size	Max. psi @ 72°F		Thread Size	Pipe Size				
9/16"-18	1/4	15,000	51205K711	\$50.81	3/4"-16	3/8	15,000	51205K715	\$64.84
9/16"-18	3/8	15,000	51205K712	58.52	3/4"-16	1/2	15,000	51205K716	66.38
9/16"-18	1/2	15,000	51205K713	61.69	1 1/8"-12	1/4	15,000	51205K717	97.71
3/4"-16	1/4	15,000	51205K714	63.45	1 1/8"-12	1/2	15,000	51205K718	107.62

UN/UNF (SAE) × BSPT									
Thread Size	Pipe Size	Max. psi @ 72°F		Thread Size	Pipe Size				
7/16"-20	1/8	6,000	51205K822	\$30.31	7/8"-14	1/2	4,500	51205K826	\$43.65
1/2"-20	1/8	6,000	51205K823	31.75	1 1/16"-12	3/4	4,500	51205K827	61.31
9/16"-18	1/4	6,000	51205K824	34.15	1 5/16"-12	1	3,500	51205K828	48.92
3/4"-16	3/8	5,000	51205K825	35.87					

UN/UNF (SAE) × BSPP									
Thread Size	Pipe Size	Max. psi @ 72°F		Thread Size	Pipe Size				
7/16"-20	1/8	5,000	51205K811	\$87.73	9/16"-18	3/8	5,000	51205K816	\$39.60
7/16"-20	1/4	5,000	51205K812	35.27	3/4"-16	3/8	5,000	51205K817	41.37
7/16"-20	3/8	5,000	51205K814	40.79	7/8"-14	1/2	3,500	51205K818	49.56
1/2"-20	3/8	5,000	51205K815	40.44	1 1/16"-12	3/4	3,500	51205K819	55.92
9/16"-18	1/4	5,000	51205K813	41.02	1 5/16"-12	1	3,500	51205K821	89.94

UN/UNF (SAE) × Metric									
Thread Size	Female	Male	Max. psi @ 72°F	Thread Size	Female	Male	Max. psi @ 72°F		
7/16"-20	M10×1	5,000	51205K781	\$33.44	7/8"-14	M22×1.5	3,500	51205K786	\$50.50
9/16"-18	M10×1	5,000	51205K782	50.02	1 1/16"-12	M27×2	3,500	51205K787	60.65
9/16"-18	M14×1.5	5,000	51205K783	48.25	15/16"-12	M33×2	3,000	51205K788	79.54
3/4"-16	M16×1.5	5,000	51205K784	47.21	1 5/16"-12	M42×2	2,000	51205K789	60.08
3/4"-16	M18×1.5	3,500	51205K785	58.46					

Metric × UN/UNF (SAE)									
Thread Size	Female	Male	Max. psi @ 72°F	Thread Size	Female	Male	Max. psi @ 72°F		
M10×1	7/16"-20	6,000	51205K761	\$30.83	11/16"-12	M22×1.5	3,500	51205K766	\$36.73
M12×1.5	7/16"-20	6,000	51205K762	31.13	15/16"-12	M27×2	3,500	51205K767	73.67
M14×1.5	9/16"-18	6,000	51205K763	32.81	1 1/16"-12	M33×2	2,000	51205K768	69.40
M16×1.5	9/16"-18	6,000	51205K764	38.19	1 5/16"-12	M42×2	5,000	51205K769	67.87
M16×1.5	3/4"-16	6,000	51205K765	37.50					

Reducing Thread Adapters, Male



- Use with hydraulic fluid, oil, and water
- Maximum Pressure: See table

BSPP threads have a Buna-N gasket and a 316 stainless steel washer to prevent leaks. For replacement washers see page 31.

NPT × BSPP									
Pipe Size	(A)	(B)	Max. psi @ 72°F	Pipe Size	(A)	(B)	Max. psi @ 72°F		
1/4	1/8	5,000	4822T201	31.25	1	1/2	3,000	4822T214	\$95.52
3/8	1/8	5,500	4822T202	26.83	1	3/4	3,000	4822T217	83.29
3/8	1/4	5,500	4822T204	30.13	1 1/4	1	2,500	4822T221	116.27
1/2	1/4	4,500	4822T205	36.96	1 1/2	1	2,000	4822T223	181.69
1/2	3/8	4,500	4822T208	32.62	1 1/2	1 1/4	2,000	4822T226	155.46
3/4	3/8	3,500	4822T209	78.79	2	1 1/2	2,000	4822T231	211.68
3/4	1/2	3,500	4822T213	56.83					

(Continued on following page)



For technical drawings and
3-D models, go to mcmaster.com.

Stainless Steel Pipe Fittings

Extreme-Pressure Stainless Steel Threaded Pipe Fittings (Continued)

Reducing Thread Adapters, Male (Cont.)



BSPT x BSPP			
Pipe Size		Max. psi @ 72°F	
(A)	(B)		
1/4	1/8	2,900	4822T126 \$31.25
3/8	1/4	2,900	4822T129 30.13
1/2	1/4	2,900	4822T131 38.62
1/2	3/8	2,900	4822T135 32.62
3/4	3/8	2,900	4822T136 78.79
3/4	1/2	2,900	4822T141 56.83

BSPP x NPT			
Pipe Size		Max. psi @ 72°F	
(A)	(B)		
1/4	1/8	5,000	4822T203 \$27.75
3/8	1/8	5,000	4822T206 45.63
3/8	1/4	5,500	4822T207 31.98
1/2	1/4	4,500	4822T211 48.08
1/2	3/8	4,500	4822T212 37.48
3/4	1/4	3,500	4822T215 84.10
3/4	1/2	3,500	4822T216 64.96

BSPP x BSPT			
Pipe Size		Max. psi @ 72°F	
(A)	(B)		
1/4	1/8	2,900	4822T127 \$27.75
3/8	1/8	2,900	4822T132 45.63
3/8	1/4	2,900	4822T133 31.98
1/2	1/4	2,900	4822T137 48.08
1/2	3/8	2,900	4822T138 37.48
3/4	1/4	2,900	4822T144 84.10
3/4	1/2	2,900	4822T145 64.96

Reducing Thread Adapters, Female x Male

- Use with hydraulic fluid, oil, and water
- Maximum Pressure: See table

BSPP male threads have a Buna-N gasket and a 316 stainless steel washer to prevent leaks. For replacement washers see below.



NPT x BSPP			
Pipe Size		Max. psi @ 72°F	
(A)	(B)		
1/8	1/4	2,900	4822T338 \$17.13
1/4	1/8	2,900	4822T337 39.81
1/4	3/8	2,900	4822T343 22.85
1/4	1/2	2,900	4822T346 41.17
3/8	1/4	2,900	4822T341 43.00
3/8	1/2	2,900	4822T347 34.90
1/2	1/4	2,900	4822T342 53.15

BSPP x BSPT			
Pipe Size		Max. psi @ 72°F	
(A)	(B)		
1/8	1/4	3,000	4822T307 \$13.60
1/8	3/8	3,000	4822T308 15.50
1/4	3/8	3,000	4822T309 15.75
1/4	1/2	3,000	4822T311 18.29
1/4	3/4	3,000	4822T313 24.79
3/8	1/2	3,000	4822T312 18.52
3/8	3/4	3,000	4822T314 25.02
3/8	1	3,000	4822T316 36.12
1/2	3/4	3,000	4822T315 25.27
1/2	1	3,000	4822T317 36.37

Replacement Washers

Washers are 316 stainless steel and have a Buna-N gasket to prevent leaks.



For BSPP Fittings		
For Pipe Size		
1/8	4822T401	\$3.96
1/4	4822T402	4.40
3/8	4822T403	4.80
1/2	4822T404	4.80
3/4	4822T406	7.42
1	4822T407	11.10
1 1/4	4822T408	19.48
1 1/2	4822T409	24.28
2	4822T411	46.88

For Metric Fittings		
For Thread Size		
M10	4822T414	\$4.38
M12	4822T415	6.00
M14	4822T416	6.69
M16	4822T417	5.16
M18	4822T418	9.09
M20	4822T419	9.71
M22	4822T421	9.82

Stainless Steel Pipe Fittings

For technical drawings and
3-D models, go to mcmaster.com.



How to Measure Pipe Size for NPT or BSP Threads

Example shows pipe size 3/8". Pipe size is not an actual measured size, but rather an industry designation. Align your pipe or fitting with the "0" line as shown. The line on the opposite edge gives the pipe size. You can also measure the OD of male threads or the ID of female threads, then find the corresponding pipe size in the chart. If your measurement doesn't match an OD or ID listed, round to the nearest 1/8".



Pipe Size: 0
OD: 0
1/16 1/8 1/4 3/8 5/16 1/2 3/4 1" 1 1/4" 1 1/2" 1 3/4"



Pipe Size: 0
ID: 0
1/16 1/8 1/4 3/8 5/16 1/2 3/4 1" 1 1/4" 1 1/2" 1 3/4"

To measure larger pipe sizes, go to mcmaster.com and search for 4464KAC. For information about fittings and pipe, see pages 2-3.

Precision Extreme-Pressure Stainless Steel Threaded Pipe Fittings



- Use with hydraulic fluid, liquid nitrogen, natural gas, steam, and water (unless noted)
- Maximum Pressure: See table; rated for steam @ 300°F (unless noted)

Made to tighter tolerances than other stainless steel pipe fittings, these are also known as instrumentation fittings. The male threads are rolled for extra strength in extreme-pressure applications. Fittings are commonly used to connect equipment in gas lines. They are 316 stainless steel for excellent corrosion resistance. Meet ANSI/ASME B1.20.1, ANSI/ASME B31.1, and ANSI/ASME B31.3.

NPT Connectors, Adapters, Caps, and Plugs

Female x male 90° elbows are also known as street elbows. Inline tees are also known as branch tees. Right-angle tees are also known as run tees. Plugs with external hex drive are solid, unless noted. Plugs with hex drive are hollow.



Pipe Size	90° Elbows, Female	Max. psi @ 72°F	90° Elbows, Male	Max. psi @ 72°F	90° Elbows, Female x Male	Max. psi @ 72°F	45° Elbows, Female x Male	Max. psi @ 72°F	
1/16	7,000	\$48805K121	\$39.16	7,000	\$48805K122	\$44.49	7,000	\$48805K182	\$35.46
1/8	5,500	\$48805K92	24.37	9,100	\$48805K96	\$20.18	5,500	\$48805K18	42.90
1/4	5,600	\$48805K351	27.82	7,500	\$48805K41	21.45	5,600	\$48805K172	77.82
3/8	5,000	\$48805K37	39.09	7,200	\$48805K431	31.09	5,000	\$48805K19	108.91
1/2	4,500	\$48805K391	63.64	5,800	\$48805K451	50.91	4,500	\$48805K211	60.96
3/4	4,600	\$48805K713	60.54	—	—	—	4,600	\$48805K797	—
1	4,400	\$48805K716	82.24	—	—	—	4,400	\$48805K813	—



Pipe Size	Tees, Female	Max. psi @ 72°F	Tees, Male	Max. psi @ 72°F	Inline Tees, Female x Male x Female	Max. psi @ 72°F	Right-Angle Tees, Female x Female x Male	Max. psi @ 72°F	
1/16	7,000	\$48805K171	\$51.83	10,000	\$48805K123	\$79.85	7,000	\$48805K145	\$60.67
1/8	5,500	\$48805K97	31.81	9,700	\$48805K124	26.18	5,500	\$48805K98	35.09
1/4	5,600	\$48805K471	34.73	8,000	\$48805K125	39.83	5,600	\$48805K571	36.36
3/8	5,000	\$48805K49	65.27	7,600	\$48805K127	54.55	5,000	\$48805K59	66.91
1/2	4,500	\$48805K511	84.00	6,200	\$48805K129	77.09	4,500	\$48805K611	88.91
3/4	7,300	\$48805K737	76.97	—	—	—	—	—	—
1	5,300	\$48805K74	111.77	—	—	—	—	—	—



Pipe Size	Crosses	Max. psi @ 72°F	Caps	Max. psi @ 72°F	Plugs with External Hex Drive	Max. psi @ 72°F	Plugs with Hex Drive	Drive Size	
1/16	7,000	\$48805K147	\$80.33	7,500	\$48805K148	\$22.66	10,000	\$48805K149	\$5.63
1/8	5,500	\$48805K62	46.00	6,400	\$48805K93	7.63	9,700	\$48805K94	6.37
1/4	5,600	\$48805K631	60.00	6,600	\$48805K22	11.27	8,000	\$48805K28	7.27
3/8	5,000	\$48805K65	86.55	5,300	\$48805K24	13.27	7,600	\$48805K32	9.82
1/2	4,500	\$48805K671	106.73	5,200	\$48805K26	20.00	7,000	\$48805K341	13.64
3/4	4,600	\$48805K743	131.85	4,600	\$48805K725	19.07	7,300	\$48805K731	12.43
1	4,400	\$48805K746	208.40	4,400	\$48805K728	25.34	5,300	\$48805K734	20.82

★ Plug is hollow.



Pipe Size	Straights, Female	Max. psi @ 72°F	Straights, Female x Male	Max. psi @ 72°F	Straights, Male	Max. psi @ 72°F
1/16	7,500	\$48805K151	\$35.50	—	—	10,000
1/8	6,400	\$48805K72	11.64	6,400	\$48805K128	\$9.63
1/4	6,600	\$48805K69	14.91	6,600	\$48805K36	13.09
3/8	5,300	\$48805K73	20.55	5,300	\$48805K42	17.64
1/2	5,200	\$48805K79	29.64	5,200	\$48805K48	26.55
3/4	4,600	\$48805K719	23.14	4,600	\$48805K855	20.57
1	4,400	\$48805K722	37.76	4,400	\$48805K867	55.22

(Continued on following page)



Precision Extreme-Pressure Stainless Steel Threaded Pipe Fittings (Continued)

NPT Connectors, Adapters, Caps, and Plugs (Cont.)



Hex Straights, Male

Pipe Size	Lg.	Max. psi @ 72°F	Pipe Size	Lg.	Max. psi @ 72°F	Pipe Size	Lg.	Max. psi @ 72°F	
1/16	1 1/16"	10,000	48805K271	\$34.50	1/4	2"	7,500	48805K23	\$12.18
1/16	2"	10,000	48805K163	36.33	1/4	2 1/2"	7,500	48805K25	15.82
1/16	2 1/2"	10,000	48805K164	36.33	1/4	3"	7,500	48805K27	17.82
1/16	3"	10,000	48805K165	40.17	1/4	4"	7,500	48805K29	21.09
1/16	4"	10,000	48805K166	46.33	3/8	17/16"	7,200	48805K851	12.91
1/8	1 1/16"	9,100	48805K88	7.27	3/8	2"	7,200	48805K136	16.18
1/8	2"	9,100	48805K135	12.00	3/8	2 1/2"	7,200	48805K138	48.33
1/8	2 1/2"	9,100	48805K137	12.91	3/8	3"	7,200	48805K142	18.91
1/8	3"	9,100	48805K141	13.63	3/8	4"	7,200	48805K143	32.73
1/8	4"	9,100	48805K157	47.41	1/2	1 7/8"	6,600	48805K911	18.18
1/4	1 1/16"	7,500	48805K81	8.91	1/2	2"	6,600	48805K311	21.82

NPT Reducers



90° Elbows, Female x Male

Pipe Size (A) (B)	Max. psi @ 72°F		
1/16 1/8	7,000	48805K111	\$66.00
1/16 1/4	7,000	48805K112	66.00
1/16 3/8	7,000	48805K114	72.55
1/8 1/16	6,500	48805K782	24.72
1/4 1/8	5,500	48805K113	34.55
3/8 1/8	5,500	48805K115	67.27
3/8 1/4	5,600	48805K116	79.27
1/2 1/8	5,500	48805K117	83.45
1/2 1/4	5,600	48805K118	89.82
1/2 3/8	5,000	48805K119	92.36

Straights, Female

Pipe Size (A) (B)	Max. psi @ 72°F		
1/8 1/16	6,400	48805K261	\$37.01
1/4 1/8	6,600	48805K263	15.01
3/8 1/8	5,300	48805K264	42.66
3/8 1/4	5,300	48805K71	20.55
1/2 1/8	5,200	48805K265	32.00
1/2 1/4	5,200	48805K75	31.82
1/2 3/8	5,200	48805K77	30.91
3/4 1/4	4,600	48805K816	24.35
3/4 1/2	4,600	48805K819	24.13
1 1/2	4,400	48805K822	42.98
1 3/4	4,400	48805K825	39.44

Straights, Female x Male

Pipe Size (A) (B)	Max. psi @ 72°F		
1/8 1/16	6,400	48805K126	\$11.45
1/4 1/8	6,600	48805K252	13.82
3/8 1/8	5,300	48805K253	19.63
3/8 1/4	5,300	48805K38	18.36
1/2 1/8	5,200	48805K254	27.66
1/2 1/4	5,200	48805K44	26.73
1/2 3/8	5,200	48805K46	26.73
3/4 1/4	4,600	48805K846	23.85
3/4 1/2	4,600	48805K849	23.63
1 1/2	4,600	48805K852	20.18
1 1/4	4,400	48805K858	35.55
1 1/2	4,400	48805K861	34.40
1 3/4	4,400	48805K864	29.59



Straights, Male

Pipe Size (A) (B)	Max. psi @ 72°F		
1/8 1/16	9,100	48805K272	\$7.82
1/4 1/8	7,500	48805K86	9.63
3/8 1/8	7,200	48805K82	13.46
3/8 1/4	7,200	48805K831	12.73
1/2 1/8	6,600	48805K84	22.91
1/2 1/4	6,600	48805K871	19.27
1/2 3/8	6,600	48805K891	19.09
3/4 1/4	7,300	48805K828	14.84
3/4 1/2	7,300	48805K834	14.74
1 1/2	5,300	48805K837	26.56
1 3/4	5,300	48805K843	26.47

Bushings, Male x Female

Pipe Size (A) (B)	Max. psi @ 72°F		
1/8 1/16	6,400	48805K522	\$7.45
1/4 1/16	7,500	48805K241	36.99
1/4 1/8	6,000	48805K523	8.54
3/8 1/8	6,400	48805K524	10.36
3/8 1/4	5,300	48805K525	11.28
1/2 1/8	6,600	48805K526	16.54
1/2 1/4	6,400	48805K527	16.36
1/2 3/8	4,600	48805K528	17.09
3/4 1/4	6,400	48805K242	20.91
3/4 3/8	5,300	48805K749	11.92

Bushings, Male x Female

Pipe Size (A) (B)	Max. psi @ 72°F		
1/2 1/2	4,900	48805K243	\$22.91
1 1/4	5,300	48805K752	17.15
1 3/8	5,300	48805K755	17.46
1 1/2 1/2	4,900	48805K758	19.14
1 3/4 1/2	4,600	48805K761	22.06
1 1/4 1	4,400	48805K764	59.79
1 1/2 1	4,400	48805K767	69.39
1 1/2 1 1/4	5,000	48805K773	92.44
2 1	3,900	48805K776	124.66
2 1 1/2	3,900	48805K779	113.08

Thread Adapters, Male

BSPP threads have a fluoroelastomer gasket and a 316 stainless steel washer to prevent leaks.



NPT x BSPT

Pipe Size	Max. psi @ 72°F	Pipe Size	Max. psi @ 72°F
1/8	9,100	4092K81	\$8.18
1/4	7,500	4092K32	10.90
3/8	7,200	4092K83	14.55

NPT x BSPP ■

Pipe Size	Max. psi @ 72°F	Pipe Size	Max. psi @ 72°F
1/8	5,300	4092K911	\$10.61
1/4	5,500	4092K912	13.41
3/8	4,400	4092K913	17.98

■ Not for use with hydraulic fluid, liquid nitrogen, or steam.

Thread Adapters, Female x Male

BSPP male threads have a fluoroelastomer gasket and a 316 stainless steel washer to prevent leaks.



NPT x BSPT

Pipe Size	Max. psi @ 72°F	Pipe Size	Max. psi @ 72°F
1/8	6,100	4092K11	\$10.55
1/4	6,200	4092K12	14.54
3/8	5,000	4092K13	20.36
1/2	4,600	4092K14	29.82
3/4	4,300	4092K15	51.39
1	4,100	4092K16	98.18

NPT x BSPP ■

Pipe Size	Max. psi @ 72°F	Pipe Size	Max. psi @ 72°F
1/8	5,300	4092K711	\$14.51
1/4	5,500	4092K712	19.04
3/8	4,400	4092K713	24.46
1/2	4,000	4092K714	37.64
3/4	3,700	4092K715	73.13
1	2,800	4092K716	106.90

■ Not for use with hydraulic fluid, liquid nitrogen, or steam.

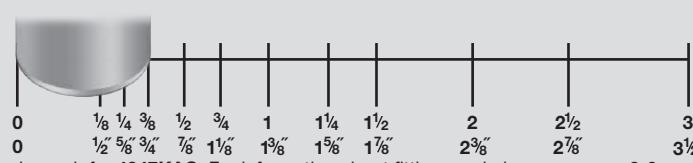
Stainless Steel Pipe Fittings

For technical drawings and 3-D models, go to mcmaster.com.



How to Measure Pipe Size for Unthreaded Pipe and Fittings

Example shows pipe size 3/8". Pipe size is not an actual measured size, but rather an industry designation. Align your pipe or butt-weld fitting with the "0" line as shown. The line on the opposite edge gives the pipe size. You can also measure the OD, then find the corresponding pipe size in the chart. If your measurement doesn't match an OD listed, round to the nearest 1/8".



i To measure larger pipe sizes, go to mcmaster.com and search for 4347KAC. For information about fittings and pipe, see pages 2-3.

Thin-Wall Butt-Weld Stainless Steel Unthreaded Pipe Fittings



- Use with air, natural gas, oil, water
- Pipe: Use unthreaded Schedule 10 thin-wall stainless steel (see page 35)

Also known as Schedule 10 fittings, these are thin and lightweight. They have beveled ends that, when flush to pipe, create a trough for a strong weld that permits maximum flow. Fittings meet ANSI/ASME B16.9, ASTM A403/A403M, and MSS SP-43.

304 stainless steel fittings have very good corrosion resistance. 316 stainless steel fittings have excellent corrosion resistance.

Stub ends are used with flanges. Slide a flange onto the stub end and weld the stub end to pipe (not the flange). Since the flange isn't welded to the pipe, it can be disconnected easily, which creates an access point for frequent cleaning and inspecting.

Inline tees are also known as branch tees.

Offset straights are also known as eccentric reducers; they connect one pipe to another smaller-diameter pipe and have the centers offset so your line can drain.

Connectors



Pipe Size	Wall Thick.	Long 90° Elbows	Short 90° Elbows	45° Elbows	Tees
304/304L Stainless Steel					

1/2	0.083"	1 1/2"	45735K211	\$5.33	45735K231	\$6.83	45735K251	\$18.83
3/4	0.083"	1 1/8"	45735K214	5.44	45735K232	6.96	45735K252	19.01
1	0.109"	1 1/2"	45735K213	6.09	45735K233	7.68	45735K253	19.20
1 1/4	0.109"	1 7/8"	45735K217	9.36	45735K237	12.84	45735K257	29.59
1 1/2	0.109"	2 1/4"	45735K215	7.62	45735K235	7.83	45735K255	19.39
2	0.109"	3"	45735K216	9.17	45735K234	37.43	45735K256	20.89
2 1/2	0.12"	3 3/4"	45735K221	16.54	45735K241	14.80	45735K261	54.40
3	0.12"	4 1/2"	45735K218	19.58	45735K236	58.75	45735K258	38.30
4	0.12"	6"	45735K219	32.64	45735K237	74.85	45735K259	57.45
6	0.134"	9"	45735K222	87.04	45735K242	58.75	45735K262	131.31
8	0.148"	12"	45735K111	144.16	45735K244	135.06	45735K264	268.73
10	0.165"	15"	45735K611	358.72	45735K245	570.20	45735K615	335.56
12	0.18"	18"	45735K612	552.74	45735K246	712.84	45735K616	392.98

316/316L Stainless Steel

1/2	0.083"	1 1/2"	43645K311	6.79	43645K331	8.53	43645K351	23.94
3/4	0.083"	1 1/8"	43645K312	6.79	43645K332	8.70	43645K352	23.94
1	0.109"	1 1/2"	43645K313	7.83	43645K333	9.79	43645K353	23.94
1 1/4	0.109"	1 7/8"	43645K111	13.28	43645K125	54.88	43645K119	41.34
1 1/2	0.109"	2 1/4"	43645K315	9.57	43645K126	56.56	43645K355	26.11
2	0.109"	3"	43645K316	11.97	43645K127	49.74	43645K356	26.98
2 1/2	0.12"	3 3/4"	43645K112	20.88	43645K128	84.96	43645K121	67.44
3	0.12"	4 1/2"	43645K318	25.68	43645K129	79.20	43645K358	49.74
4	0.12"	6"	43645K319	41.34	43645K131	92.38	43645K359	73.11
6	0.134"	9"	43645K113	104.70	43645K132	178.04	43645K122	180.02
8	0.148"	12"	43645K114	194.47	43645K133	250.12	43645K118	132.23
10	0.165"	15"	43645K411	466.78	43645K423	680.04	43645K435	319.16
12	0.18"	18"	43645K412	700.12	43645K424	921.10	43645K436	515.64

Caps and Stub Ends



Pipe Size	Wall Thick.	Caps		Pipe Size	Wall Thick.	Stub Ends	
		304/304L Stainless Steel	316/316L Stainless Steel			304/304L Stainless Steel	316/316L Stainless Steel
1/2	0.083"	45735K271	\$10.88	43645K371	\$15.67	45735K291	\$13.67
3/4	0.083"	45735K272	14.80	43645K372	20.89	45735K292	14.81
1	0.109"	45735K273	16.10	43645K373	22.63	45735K293	15.95
1 1/4	0.109"	45735K277	40.47	43645K147	56.58	45735K297	35.32
1 1/2	0.109"	45735K275	17.41	43645K375	24.81	45735K295	15.38
2	0.109"	45735K276	15.23	43645K376	19.58	45735K296	18.80
2 1/2	0.12"	45735K281	21.76	43645K148	24.80	45735K311	39.87
3	0.12"	45735K278	18.71	43645K378	26.11	45735K298	26.20
4	0.12"	45735K279	23.94	43645K379	31.33	45735K299	35.32
6	0.134"	45735K282	39.17	43645K149	52.22	45735K312	71.20
8	0.148"	45735K115	73.78	43645K151	86.74	45735K116	112.93
10	0.165"	45735K619	94.14	43645K458	122.68	45735K622	336.06
12	0.18"	45735K621	122.68	43645K459	164.40	45735K623	427.00

(Continued on following page)



Thin-Wall Butt-Weld Stainless Steel Unthreaded Pipe Fittings (Continued)



Reducers



Inline Tees

Pipe Size (A) (B)	Pipe Size (A) (B)	304/304L Stainless Steel	316/316L Stainless Steel
1.....1/2.....45735K644	\$39.16	1.....1/2.....43645K623	\$50.04
1.....3/4.....45735K645	39.16	1.....3/4.....43645K624	50.04
11/2.....3/4.....45735K646	60.92	11/2.....3/4.....43645K625	78.34
11/2.....1.....45735K647	43.52	11/2.....1.....43645K626	56.58
2.....1.....45735K648	43.52	2.....1.....43645K627	56.58
2.....11/2.....45735K649	39.16	2.....11/2.....43645K628	54.40
21/2.....11/2.....45735K651	143.62	21/2.....11/2.....43645K629	184.96
21/2.....2.....45735K652	108.80	21/2.....2.....43645K631	141.44
3.....11/2.....45735K653	73.98	3.....11/2.....43645K632	102.28
3.....2.....45735K654	60.92	3.....2.....43645K633	78.34
3.....21/2.....45735K655	119.68	3.....21/2.....43645K634	156.68
4.....2.....45735K656	137.08	4.....2.....43645K635	174.08
4.....21/2.....45735K657	245.88	4.....21/2.....43645K636	174.08
4.....3.....45735K658	104.44	4.....3.....43645K637	141.44
6.....4.....45735K659	221.96	6.....4.....43645K638	289.40



Offset Straights

Pipe Size (A) (B)	Pipe Size (A) (B)	304/304L Stainless Steel	316/316L Stainless Steel
1.....1/2.....45735K629	\$41.34	1.....1/2.....43645K488	\$54.40
1.....3/4.....45735K631	37.86	1.....3/4.....43645K489	50.04
11/2.....1.....45735K632	35.68	11/2.....1.....43645K491	50.04
2.....1.....45735K633	54.40	2.....1.....43645K492	71.80
2.....11/2.....45735K634	29.60	2.....11/2.....43645K493	37.00
21/2.....2.....45735K635	58.76	21/2.....2.....43645K494	71.80
3.....11/2.....45735K636	69.64	3.....11/2.....43645K495	93.56
3.....2.....45735K637	54.40	3.....2.....43645K496	71.80
3.....21/2.....45735K638	58.76	3.....21/2.....43645K497	76.16
4.....2.....45735K639	108.80	4.....2.....43645K498	141.44
4.....21/2.....45735K641	128.38	4.....21/2.....43645K499	169.72
4.....3.....45735K642	54.40	4.....3.....43645K611	71.80
6.....4.....45735K643	113.16	6.....4.....43645K612	152.32



Straights

Pipe Size (A) (B)	Pipe Size (A) (B)	Pipe Size (A) (B)	Pipe Size (A) (B)
304/304L Stainless Steel	304/304L Stainless Steel (Cont.)	316/316L Stainless Steel	316/316L Stainless Steel (Cont.)
3/4.....1/2.....45735K411	\$11.75	3.....11/4.....45735K125	\$58.76
1.....1/2.....45735K117	16.54	3.....2.....45735K432	14.80
1.....3/4.....45735K413	14.36	4.....11/2.....45735K126	37.00
11/4.....1.....45735K414	24.81	4.....3.....45735K437	15.67
11/2.....1.....45735K418	9.14	6.....2.....45735K127	124.34
11/2.....11/4.....45735K118	12.62	6.....4.....45735K438	26.11
2.....1/2.....45735K119	44.82	8.....4.....45735K128	95.82
2.....3/4.....45735K121	31.76	8.....6.....45735K129	78.70
2.....1.....45735K423	10.88	10.....6.....45735K624	196.48
2.....11/4.....45735K122	15.24	10.....8.....45735K625	130.16
2.....11/2.....45735K425	10.44	12.....6.....45735K626	324.50
21/2.....1.....45735K123	60.92	12.....8.....45735K627	251.04
21/2.....11/2.....45735K424	47.87	12.....10.....45735K628	184.36
21/2.....2.....45735K124	32.64		



Thin-Wall Stainless Steel Unthreaded Pipe



- Use with air, natural gas, oil, water
- Fittings: Use butt-weld Schedule 10 thin-wall stainless steel (see page 34 and above)

Also known as Schedule 10, this pipe is thin and lightweight. Weld it to fittings and additional lengths of pipe. Welded connections are stronger than threaded connections and less likely to leak. Pipe has a welded construction, so there is a weld bead on the inside. Meets ANSI/ASME B36.19 and ASTM A312.

304 stainless steel pipe has very good corrosion resistance. 316 stainless steel pipe has excellent corrosion resistance.

Pipe Size	1-ft. Lengths	3-ft. Lengths	6-ft. Lengths
304/304L Stainless Steel			
1/2.....	4347K311.....\$12.57	4347K312.....\$25.54	4347K54.....\$39.29
3/4.....	4347K321.....15.00	4347K322.....30.47	4347K55.....46.88
1.....	4347K331.....20.07	4347K332.....45.15	4347K56.....71.67
11/4.....	4347K341.....23.15	4347K342.....52.08	4347K57.....82.67
11/2.....	4347K351.....24.19	4347K352.....57.67	4347K58.....93.02
2.....	4347K361.....29.82	4347K362.....71.11	4347K59.....114.69
21/2.....	4347K371.....36.89	4347K372.....90.01	4347K61.....147.56
3.....	4347K381.....45.22	4347K382.....110.34	4347K62.....180.88
4.....	4347K391.....48.87	4347K392.....128.83	4347K63.....222.12
6.....	4347K411.....77.75	4347K412.....204.97	4347K65.....353.40
8.....	4347K421.....61.51	4347K422.....178.60	4347K423.....278.76
10.....	4347K431.....82.84	4347K432.....240.53	4347K433.....375.44
12.....	4347K441.....115.82	4347K442.....336.24	4347K443.....524.82
316/316L Stainless Steel			
1/2.....	4378K511.....15.55	4378K512.....32.15	4378K74.....51.85
3/4.....	4378K521.....18.83	4378K522.....39.55	4378K75.....62.78
1.....	4378K531.....24.23	4378K532.....56.85	4378K76.....93.20
11/4.....	4378K541.....31.39	4378K542.....73.65	4378K77.....120.73
11/2.....	4378K551.....32.29	4378K552.....80.72	4378K78.....134.53
2.....	4378K561.....39.75	4378K562.....99.37	4378K79.....165.62
21/2.....	4378K571.....49.25	4378K572.....126.35	4378K81.....214.15
3.....	4378K581.....58.71	4378K582.....150.60	4378K82.....255.26
4.....	4378K591.....64.96	4378K592.....181.88	4378K83.....324.78
6.....	4378K611.....96.66	4378K612.....270.64	4378K85.....483.29
8.....	4378K621.....88.22	4378K622.....256.13	4378K623.....399.78
10.....	4378K631.....101.38	4378K632.....294.31	4378K633.....459.36
12.....	4378K641.....141.71	4378K642.....411.40	4378K643.....642.13

Stainless Steel Pipe Fittings

For technical drawings and 3-D models, go to mcmaster.com.



How to Measure Pipe Size for Unthreaded Pipe and Fittings

Example shows pipe size 3/8". Pipe size is not an actual measured size, but rather an industry designation. Align your pipe or fitting with the "0" line. The line on the opposite edge gives the pipe size. You can also measure the OD of your pipe and butt-weld fitting or the ID of your socket-connect fitting and slip-on weld flange, then find the corresponding pipe size in the chart. If your measurement doesn't match an OD or ID listed, round to the nearest 1/8".



Pipe Size: 0
OD: 0

1/8 1/4 3/8 1/2 5/8 3/4 1 1/8 1 1/4 1 1/2



Pipe Size: 0
ID: 0

1/8 1/4 3/8 1/2 5/8 3/4 7/8 1 1/8 1 1/4 1 1/2

To measure larger pipe sizes, go to mcmaster.com and search for 4347KAC. For information about fittings and pipe, see pages 2-3.

Standard-Wall Butt-Weld Stainless Steel Unthreaded Pipe Fittings



- Use with air, natural gas, oil, water
- Pipe Nipples and Pipe: Use unthreaded Schedule 40 standard-wall stainless steel (see page 39)
- Flanges: Use unthreaded Class 150 low-pressure stainless steel (see pages 37-38)



Connectors

Pipe Size	Wall Thick.	Long 90° Elbows		Short 90° Elbows		45° Elbows		Tees			
		Lg.		Lg.		Lg.		Lg.			
304/304L Stainless Steel											
1/2	0.109"	1 1/2"	45605K511	\$5.95	—	—	45605K551	\$8.21	45605K621	\$19.71	
3/4	0.113"	1 1/2"	45605K512	6.07	—	—	45605K552	8.29	45605K622	19.89	
1	0.133"	1 1/2"	45605K513	6.91	1"	45605K211	\$31.39	45605K553	8.37	45605K623	20.09
1 1/4	0.14"	1 7/8"	45605K514	10.26	—	—	45605K554	12.13	45605K624	33.47	
1 1/2	0.145"	2 1/4"	45605K515	8.16	1 1/2"	45605K213	35.99	45605K555	9.42	45605K625	20.28
2	0.154"	3"	45605K516	11.29	2"	45605K214	43.94	45605K556	11.71	45605K626	21.76
2 1/2	0.203"	3 3/4"	45605K517	23.85	—	—	45605K557	23.85	45605K627	54.40	
3	0.216"	4 1/2"	45605K521	30.34	3"	45605K216	56.49	45605K561	21.97	45605K631	43.94
4	0.237"	6"	45605K523	56.49	4"	45605K217	89.97	45605K563	39.59	45605K633	62.77
6	0.28"	9"	45605K525	154.13	—	—	45605K565	98.91	45605K635	141.44	
8	0.322"	12"	45605K526	279.24	—	—	45605K527	194.78	45605K528	413.04	
316/316L Stainless Steel											
1/2	0.109"	1 1/2"	45555K511	7.36	—	—	45555K551	9.93	45555K621	22.91	
3/4	0.113"	1 1/2"	45555K512	7.45	—	—	45555K552	10.01	45555K622	23.11	
1	0.133"	1 1/2"	45555K513	8.33	1"	45555K211	40.68	45555K553	10.07	45555K623	23.24
1 1/4	0.14"	1 7/8"	45555K514	12.59	—	—	45555K554	14.13	45555K624	40.68	
1 1/2	0.145"	2 1/4"	45555K515	9.88	1 1/2"	45555K213	45.71	45555K555	11.43	45555K625	23.52
2	0.154"	3"	45555K516	13.95	2"	45555K214	60.68	45555K556	14.13	45555K626	25.19
2 1/2	0.203"	3 3/4"	45555K517	28.86	—	—	45555K557	31.18	45555K627	62.99	
3	0.216"	4 1/2"	45555K521	37.39	3"	45555K216	71.67	45555K561	26.54	45555K631	50.36
4	0.237"	6"	45555K523	68.97	4"	45555K217	114.28	45555K563	48.42	45555K633	75.56
6	0.28"	9"	45555K525	197.65	—	—	45555K565	117.87	45555K635	190.40	
8	0.322"	12"	45555K611	333.26	—	—	45555K612	223.12	45555K613	495.25	

Caps and Stub Ends



Pipe Size	Wall Thick.	Caps		Stub Ends		Reducers	
		(A)	(B)	(A)	(B)	(A)	(B)
304/304L Stainless Steel							
1/2	0.109"	45605K581	\$11.71	45605K651	\$13.04	45605K711	\$13.39
3/4	0.113"	45605K582	13.39	45605K652	14.08	45605K711	19.67
1	0.133"	45605K583	16.74	45605K653	17.73	45605K716	15.48
1 1/4	0.14"	45605K584	31.39	45605K654	39.12	45605K712	46.04
1 1/2	0.145"	45605K585	20.92	45605K655	18.25	45605K726	22.18
2	0.154"	45605K586	14.22	45605K656	19.30	45605K113	38.92
2 1/2	0.203"	45605K587	25.94	45605K657	39.64	45605K725	10.05
3	0.216"	45605K591	19.25	45605K661	27.64	45605K114	15.90
4	0.237"	45605K593	27.20	45605K663	39.12	45605K115	37.65
6	0.28"	45605K595	62.77	45605K665	80.84	45605K741	14.64
8	0.322"	45605K597	101.41	45605K531	120.34	45605K745	11.71
316/316L Stainless Steel							
1/2	0.109"	45555K581	14.34	45555K651	16.04	45605K116	66.96
3/4	0.113"	45555K582	18.21	45555K652	19.30	45605K746	52.31
1	0.133"	45555K583	20.93	45555K653	22.43	45605K117	46.04
1 1/4	0.14"	45555K584	38.75	45555K654	49.55	45605K118	66.96
1 1/2	0.145"	45555K585	26.54	45555K655	23.47	45605K119	20.92
2	0.154"	45555K586	18.40	45555K656	24.51	45605K762	18.83
2 1/2	0.203"	45555K587	32.93	45555K657	50.59	45605K121	48.12
3	0.216"	45555K591	24.41	45555K661	34.42	45605K122	27.19
4	0.237"	45555K593	34.87	45555K663	49.02	45605K783	20.92
6	0.28"	45555K595	75.56	45555K665	93.69	45605K786	54.40
8	0.322"	45555K614	135.18	45555K615	153.73	45605K532	122.95



A

B



Low-Pressure Socket-Connect Stainless Steel Unthreaded Pipe Fittings



- Use with air, natural gas, oil, water
- Maximum Pressure: 150 psi @ 72°F
- Pipe Nipples and Pipe: Use unthreaded Schedule 40 standard-wall stainless steel (see page 39)
- Flanges: Use unthreaded Class 150 low-pressure stainless steel (see below and page 38)

The highest-quality socket-connect fittings available, these meet ANSI/MSS SP-114 standards for heat treating, material thickness, and marking. Also known as Class 150 fittings, they are designed for low-pressure applications. Socket-connect fittings are easier to weld than butt-weld fittings because the fitting doesn't need to align perfectly to the pipe. Slide pipe into the socket and weld for a strong, permanent connection.

304 stainless steel fittings have very good corrosion resistance. **316 stainless steel** fittings have excellent corrosion resistance.

Unions separate into three pieces for access to your line.

Pipe Size



90° Elbows



45° Elbows



Tees



Straights



Unions

304 Stainless Steel

1/2	4335T32	\$8.79	4335T42	\$10.81	4335T52	\$11.88	4335T62	\$7.93	4335T72	\$24.71
3/4	4335T33	12.58	4335T43	15.82	4335T53	18.90	4335T63	11.47	4335T73	31.28
1	4335T34	17.84	4335T44	19.30	4335T54	24.11	4335T64	17.38	4335T74	47.20
1 1/4	4335T35	31.28	4335T45	30.88	4335T55	47.91	4335T65	27.64	4335T75	70.95
1 1/2	4335T36	41.64	4335T46	36.74	4335T56	59.58	4335T66	32.85	4335T76	80.23
2	4335T37	52.81	4335T47	51.70	4335T57	71.04	4335T67	46.29	4335T77	96.05

316 Stainless Steel

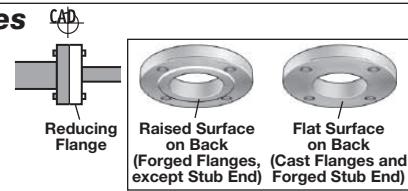
1/2	43685K12	11.37	43685K22	13.54	43685K32	14.76	43685K52	9.15	43685K62	28.05
3/4	43685K13	16.52	43685K23	17.84	43685K33	21.78	43685K53	13.24	43685K63	35.58
1	43685K14	20.72	43685K24	22.34	43685K34	27.34	43685K54	19.76	43685K64	53.67
1 1/4	43685K17	35.53	43685K27	35.12	43685K37	54.43	43685K57	31.43	43685K67	80.45
1 1/2	43685K15	47.40	43685K25	41.74	43685K35	66.00	43685K55	37.34	43685K65	91.32
2	43685K16	59.93	43685K26	58.37	43685K36	81.90	43685K56	52.56	43685K66	108.88

Low-Pressure Stainless Steel Unthreaded Pipe Flanges

Bolt two flat-surface flanges or two raised-surface flanges of the same size together with a gasket (sold separately on pages 3619-3624) to create an access point in a pipe line.

304 stainless steel flanges offer very good corrosion resistance, and **316 stainless steel** flanges have excellent corrosion resistance.

Butt-weld flanges are also known as weld-neck flanges; the flange neck has a beveled end that, when flush to pipe, creates a trough for a strong weld. **Slip-on weld** flanges have no internal stop; slide a pipe through the flange and weld on both sides. **Socket-connect** flanges have an internal stop that supports the pipe when welding and prevents the pipe from sliding all the way through. **Stub-end** flanges are also known as lap-joint flanges; use them with a stub-end fitting (not included). The stub-end fitting slides into the flange and welds to pipe (not the flange). Since the flange isn't welded to the pipe, it can be disconnected easily for frequent cleaning and inspecting. **Cap** flanges are also known as blind flanges.



Class 150 Forged Flanges

- Use with air, natural gas, oil, water
- Maximum Pressure: 150 psi @ 72°F
- Pipe Nipples and Pipe: Use unthreaded Schedule 40 standard-wall stainless steel (see page 39)
- Fittings: Use butt-weld Schedule 40 standard-wall stainless steel (see page 36)

Forged flanges have better strength than cast flanges. All include a material certificate with traceable lot number and test report. Flanges meet ASTM A182 and ANSI/ASME B16.5, unless noted.

Pipe Size Flange OD For Bolt Dia. (No.)



Butt Weld



Slip-On Weld



Socket Connect



Stub End



Cap

304/304L Stainless Steel

1/2	31/2"	1/2" (4)	44685K211	\$34.41	44685K178	\$29.58	44685K189	\$31.36	44685K311	\$31.17	44685K162	\$30.00
3/4	37/8"	1/2" (4)	44685K212	41.64	44685K179	32.16	44685K191	37.12	44685K312	32.30	44685K163	32.96
1	41/4"	1/2" (4)	44685K222	45.27	44685K181	34.20	44685K192	38.82	44685K313	37.21	44685K164	34.98
1 1/4	45/8"	1/2" (4)	44685K223	72.44	44685K182	48.06	44685K193	52.03	44685K314	60.24	44685K165	48.06
1 1/2	5"	1/2" (4)	44685K224	63.38	44685K183	48.15	44685K194	54.93	44685K315	51.65	44685K166	50.35
2	6"	5/8" (4)	44685K225	67.80	44685K184	60.32	44685K195	71.98	44685K316	62.53	44685K167	61.04
2 1/2	7"	5/8" (4)	44685K226	108.42	44685K185	87.91	44685K196	108.82	44685K317	104.09	44685K168	91.31
3	71/2"	5/8" (4)	44685K227	111.13	44685K186	91.02	44685K197	107.75	44685K318	94.33	44685K169	100.15
4	9"	5/8" (8)	44685K228	168.87	44685K187	123.55	44685K198	149.35	44685K319	126.40	44685K171	139.22
6	11"	3/4" (8)	44685K229	242.07	44685K188	189.68	44685K199	258.35	44685K320	195.88	44685K172	203.22
8	131/2"	3/4" (8)	44685K175	433.84	44685K173	320.17	44685K174	458.68	44685K176	357.62	44685K177	366.17
10	16"	7/8" (12)	44685K324	479.88	44685K322	356.05			44685K326	388.62	44685K328	458.94
12	19"	7/8" (12)	44685K325	604.17	44685K323	484.17			44685K327	566.58	44685K329	579.48

316/316L Stainless Steel

1/2	31/2"	1/2" (4)	44695K191	39.58	44695K168	32.28	44695K179	36.79	44695K212	38.22	44695K152	33.18
3/4	37/8"	1/2" (4)	44695K192	50.88	44695K169	45.66	44695K181	43.88	44695K213	47.27	44695K153	44.45
1	41/4"	1/2" (4)	44695K193	59.25	44695K171	45.57	44695K182	54.09	44695K214	48.65	44695K154	51.39
1 1/4	45/8"	1/2" (4)	44695K194	84.12	44695K172	55.31	44695K183	69.91	44695K215	67.64	44695K155	54.92
1 1/2	5"	1/2" (4)	44695K195	78.07	44695K173	60.32	44695K184	72.62	44695K216	63.38	44695K156	59.47
2	6"	5/8" (4)	44695K196	91.84	44695K174	78.07	44695K185	91.49	44695K217	80.11	44695K157	97.73
2 1/2	7"	5/8" (4)	44695K197	123.61	44695K175	108.82	44695K186	120.15	44695K218	121.67	44695K158	124.87
3	71/2"	5/8" (4)	44695K198	160.92	44695K176	130.58	44695K187	139.23	44695K219	135.36	44695K159	132.65
4	9"	5/8" (8)	44695K199	198.40	44695K177	167.72	44695K188	189.73	44695K220	173.50	44695K161	183.00
6	11"	3/4" (8)	44695K211	305.77	44695K178	237.22	44695K189	349.53	44695K221	227.32	44695K162	265.42
8	131/2"	3/4" (8)	44695K165	530.03	44695K163	441.83	44695K164	620.59	44695K222	458.57	44695K167	526.30
10	16"	7/8" (12)	44695K253	593.71	44695K251	470.28			44695K255	523.25	44695K257	525.75
12	19"	7/8" (12)	44695K254	844.72	44695K252	628.40			44695K256	704.32	44695K258	741.71

■ Does not meet ANSI/ASME B16.5.

(Continued on following page)

Stainless Steel Pipe Flanges

For technical drawings and 3-D models, go to mcmaster.com.



How to Measure Pipe Size for Unthreaded Pipe and Fittings

Example shows pipe size 3/8 for pipe and pipe size 1/2 for flanges. Pipe size is not an actual measured size, but rather an industry designation. Align your pipe or fitting with the "0" line as shown. The line on the opposite edge gives the pipe size. You can also measure the OD of your pipe and butt-weld fitting or the ID of your slip-on weld flange, then find the corresponding pipe size in the chart. If your measurement doesn't match an OD or ID listed, round to the nearest 1/8".



Pipe Size: 0
OD: 0

1/8 1/4 3/8 1/2 5/8 3/4 7/8 1 1/8 1 1/4 1 1/2

1/2" 5/8" 3/4" 7/8" 1 1/8" 1 1/4" 1 1/2"



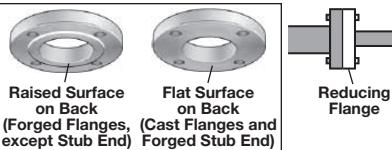
Pipe Size: 0
ID: 0

1/8 1/4 3/8 1/2 5/8 3/4 7/8 1 1/8 1 1/4 1 1/2

1/2" 5/8" 3/4" 7/8" 1 1/8" 1 1/4" 1 1/2"

i To measure larger pipe sizes, go to mcmaster.com and search for 4347KAC. For information about fittings and pipe, see pages 2-3.

Low-Pressure Stainless Steel Unthreaded Pipe Flanges (Cont. from previous page)



Bolt two flat-surface flanges or two raised-surface flanges of the same size together with a gasket (sold separately on pages 3619-3624) to create an access point in a pipe line.

304 stainless steel flanges offer very good corrosion resistance, and **316 stainless steel** flanges have excellent corrosion resistance.

Butt-weld flanges are also known as weld-neck flanges; the flange neck has a beveled end that, when flush to pipe, creates a trough for a strong weld. **Slip-on weld** flanges have no internal stop; slide a pipe through the flange and weld on both sides. **Cap** flanges are also known as blind flanges.

Class 150 Forged Reducing Flanges

- Use with air, natural gas, oil, steam, water
- Maximum Pressure: 150 psi @ 72°F; 150 psi @ 360°F for steam
- Pipe Nipples and Pipe: Use unthreaded Schedule 40 standard-wall stainless steel (see page 39)
- Fittings: Use butt-weld Schedule 40 standard-wall stainless steel (see page 36)

Forged flanges have better strength than cast flanges. Reducing flanges let you transition your piping system to a smaller pipe size. All meet ANSI/ASME B16.5.

Pipe Size					
Slip-On Weld	Flanged	Flange OD	For Bolt Dia. (No.)	Slip-On Weld	
304/304L Stainless Steel					
3/4	1	4 1/4"	1/2" (4)	44685K344	\$52.66
1	1 1/2	5"	1/2" (4)	44685K345	71.38
1	2	6"	5/8" (4)	44685K131	92.44
1 1/2	2	6"	5/8" (4)	44685K346	92.44
2	3	7 1/2"	5/8" (4)	44685K132	139.24
2	4	9"	5/8" (8)	44685K347	172.31
3	4	9"	5/8" (8)	44685K133	189.54
4	6	11"	3/4" (8)	44685K134	277.88
6	8	13 1/2"	3/4" (8)	44685K135	496.73
316/316L Stainless Steel					
3/4	1	4 1/4"	1/2" (4)	44695K272	71.27
1	1 1/2	5"	1/2" (4)	44695K273	90.42
1	2	6"	5/8" (4)	44695K131	125.20
1 1/2	2	6"	5/8" (4)	44695K274	104.33
2	3	7 1/2"	5/8" (4)	44695K132	198.90
2	4	9"	5/8" (8)	44695K275	210.60
3	4	9"	5/8" (8)	44695K133	263.25
4	6	11"	3/4" (8)	44695K134	376.53
6	8	13 1/2"	3/4" (8)	44695K135	601.20

Metric Forged Flanges

- Use with air, natural gas, oil, steam, water
- Maximum Pressure: 230 psi @ 72°F;
- 304/304L SS: 125 psi @ 300°F for steam
- 316/316L SS: 145 psi @ 300°F for steam

Class 150 Cast Flanges

- Use with air, natural gas, oil, water
- Maximum Pressure: 150 psi @ 72°F
- Pipe Nipples and Pipe: Use unthreaded Schedule 40 standard-wall stainless steel (see page 39)
- Fittings: Use butt-weld Schedule 40 standard-wall stainless steel (see page 36)

Cast flanges are also called MSS flanges. All meet ASTM A341. Slip-on weld flanges meet MSS SP-51. Cap flanges meet MSS SP-42.

Pipe Size	Flange OD	For Bolt Dia. (No.)	Slip-On Weld	Cap
304 Stainless Steel				
1/2	3 1/2"	1/2" (4)	43505K341	\$29.02
3/4	3 7/8"	1/2" (4)	43505K342	30.63
1	4 1/4"	1/2" (4)	43505K343	40.86
1 1/4	4 9/8"	1/2" (4)	43505K344	46.40
1 1/2	5"	1/2" (4)	43505K345	57.10
2	6"	5/8" (4)	43505K346	68.13
2 1/2	7"	5/8" (4)	43505K347	92.70
3	7 1/2"	5/8" (4)	43505K348	99.74
316 Stainless Steel				
1/2	3 1/2"	1/2" (4)	43615K551	35.56
3/4	3 7/8"	1/2" (4)	43615K552	40.59
1	4 1/4"	1/2" (4)	43615K553	51.15
1 1/4	4 9/8"	1/2" (4)	43615K554	58.14
1 1/2	5"	1/2" (4)	43615K555	67.47
2	6"	5/8" (4)	43615K556	87.37
2 1/2	7"	5/8" (4)	43615K557	111.46
3	7 1/2"	5/8" (4)	43615K558	128.08

Meet DIN EN 1092-1.

Pipe Size	Flange OD, mm	For Bolt Dia. (No.), mm
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Pipe Size	Flange OD, mm	For Bolt Dia. (No.), mm	
304/304L Stainless Steel			
1	115	12 (4)	1442N16
2	165	16 (4)	1442N17
3	200	16 (8)	1442N18
4	220	16 (8)	1442N19
6	285	20 (8)	1442N21
316/316L Stainless Steel			
1	115	12 (4)	1458N16
2	165	16 (4)	1458N17
3	200	16 (8)	1458N18
4	220	16 (8)	1458N19
6	285	20 (8)	1458N21

Butt Weld	Slip-On Weld	Cap
-----------	--------------	-----

1442N16	\$102.22	1442N22	\$84.44
1442N17	162.22	1442N23	124.44
1442N18	229.09	1442N24	236.00
1442N19	272.73	1442N25	250.00
1442N21	570.91	1442N26	527.27
1442N11	\$80.00	1458N22	106.00
1442N12	133.33	1458N23	150.00
1442N13	236.00	1458N24	314.55
1442N14	262.00	1458N25	354.55
1442N15	530.00	1458N26	615.38
1458N11	96.00	1458N27	
1458N12	174.00	1458N28	
1458N13	310.91	1458N29	
1458N14	350.91	1458N30	
1458N15	603.33	1458N31	

**Standard-Wall Stainless Steel Unthreaded Pipe Nipples and Pipe**

Stainless Steel Pipe Fittings

For technical drawings and 3-D models, go to mcmaster.com.



How to Measure Pipe Size for Unthreaded Pipe and Fittings

Example shows pipe size 3/8". Pipe size is not an actual measured size, but rather an industry designation. Align your pipe or fitting with the "0" line as shown. The line on the opposite edge gives the pipe size. You can also measure the OD of your pipe or butt-weld fitting or the ID of your socket-connect fitting, then find the corresponding pipe size in the chart. If your measurement doesn't match an OD or ID listed, round to the nearest 1/8".



Pipe Size: 0
OD: 0



Pipe Size: 0
ID: 0

To measure larger pipe sizes, go to mcmaster.com and search for 4347KAC. For information about fittings and pipe, see pages 2-3.

Thick-Wall Butt-Weld Stainless Steel Unthreaded Pipe Fittings (Continued)

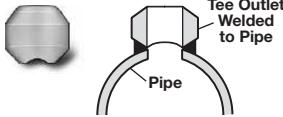


- Use with air, natural gas, oil, steam, water
- Pipe: Use unthreaded Schedule 80 thick-wall stainless steel (see page 41)

With a thicker wall than our standard-wall butt-weld pipe fittings, these offer high strength while providing a smooth connection for maximum flow. They have beveled ends that, when flush to pipe, create a trough for a leak-resistant, permanent weld.

304 stainless steel fittings have very good corrosion resistance. **316 stainless steel** fittings have excellent corrosion resistance.

Tee Outlets



- Maximum Pressure: See table; 600 psi @ 220° F for steam

Tee outlets allow you to create a tap anywhere along a pipe. They are also known as branch connectors and are comparable to Weldolet. To install, drill a hole in your pipe to match the fitting's pipe size and weld in place. Outlets meet ANSI/ASME B16.11 and MSS SP-97.

To Order: Please specify For Pipe Size within the range shown.

Pipe Size	For Pipe Size	Ht.	Max. psi @ 72° F	304/304L Stainless Steel	316/316L Stainless Steel
1/4	1/4 to 36	5/8"	3,000	4565T11	\$25.78
3/8	3/8 to 36	3/4"	3,000	4565T12	26.36
1/2	1/2 to 36	3/4"	3,000	4565T13	26.95
3/4	3/4 to 36	7/8"	3,000	4565T14	32.02
1	1 to 36	1 1/16"	3,000	4565T15	41.35
1 1/4	1 1/4 to 36	1 1/4"	3,000	4565T16	65.44
1 1/2	1 1/2 to 36	1 5/16"	2,800	4565T17	75.21
2	2 to 36	1 1/2"	2,500	4565T18	99.02

High-Pressure Socket-Connect Stainless Steel Unthreaded Pipe Fittings



- Use with air, hydraulic fluid, natural gas, oil, steam, water, except tee outlets are not for use with hydraulic fluid
- Pipe: Use unthreaded Schedule 80 thick-wall stainless steel (see page 41)

Forged for excellent strength, these heavy duty socket-connect fittings stand up to high-pressure applications. Also known as Class 3000 fittings, except tee outlets. Fittings are easier to weld than butt-weld fittings because the fitting doesn't need to align perfectly to the pipe. Slide pipe into the socket and weld for a strong, permanent connection.

304 stainless steel fittings have very good corrosion resistance. **316 stainless steel** fittings have excellent corrosion resistance.

Connectors

- Maximum Pressure (unless noted):
304/304L SS: 2,500 psi @ 72° F; 1,900 psi @ 350° F for steam
316/316L SS: 3,000 psi @ 72° F; 1,900 psi @ 350° F for steam

Connectors meet ANSI/ASME B16.11 and ASTM A182, except unions only meet ASTM A182.

Unions separate into three pieces for access to your line.



Pipe Size	90° Elbows	45° Elbows	Tees	Crosses	Straights	Unions *						
304/304L Stainless Steel												
1/8	44965K411	\$8.48	44965K421	\$12.34	44965K431	\$11.38	44965K441	\$26.46	44965K451	\$7.73	44965K471	\$40.28
1/4	44965K412	8.69	44965K422	12.04	44965K432	11.66	44965K442	20.01	44965K452	8.57	44965K472	40.28
3/8	44965K413	11.30	44965K423	12.19	44965K433	13.92	44965K443	24.64	44965K453	8.40	44965K473	43.08
1/2	44965K414	12.41	44965K424	12.34	44965K434	19.18	44965K444	26.14	44965K454	9.64	44965K474	44.15
3/4	44965K415	15.63	44965K425	14.26	44965K435	21.73	44965K445	33.13	44965K455	12.17	44965K475	56.43
1	44965K416	23.58	44965K426	20.64	44965K436	29.22	44965K446	55.19	44965K456	18.18	44965K476	85.10
1 1/2	44965K418	52.73	44965K428	40.56	44965K438	62.08	44965K448	73.02	44965K458	41.52	44965K478	141.60
2	44965K419	75.66	44965K429	65.51	44965K439	81.88	44965K449	223.67	44965K459	61.86	44965K479	176.88
3	44965K420	189.58	44965K430	202.21	44965K450	223.27			44965K460	185.92	44965K480	461.29
316/316L Stainless Steel												
1/8	45515K111	11.41	45515K131	14.64	45515K151	14.87	45515K171	45.12	45515K191	9.90	45515K241	43.68
1/4	45515K112	11.69	45515K132	14.64	45515K152	11.98	45515K172	28.95	45515K192	10.44	45515K242	45.39
3/8	45515K113	13.66	45515K133	14.64	45515K153	14.58	45515K173	33.10	45515K193	12.34	45515K243	52.57
1/2	45515K114	17.90	45515K134	14.64	45515K154	19.77	45515K174	43.89	45515K194	11.84	45515K244	52.65
3/4	45515K115	18.96	45515K135	19.82	45515K155	30.35	45515K175	57.59	45515K195	15.44	45515K245	68.65
1	45515K116	35.02	45515K136	24.93	45515K156	37.34	45515K176	76.98	45515K196	21.96	45515K246	104.21
1 1/2	45515K118	71.77	45515K138	56.98	45515K158	62.69	45515K178	127.08	45515K198	61.22	45515K248	189.35
2	45515K119	120.61	45515K139	75.55	45515K159	150.20	45515K179	311.59	45515K199	83.58	45515K249	216.67
3	45515K120	230.96	45515K140	212.45	45515K160	256.47			45515K201	211.93	45515K250	532.00

* Maximum pressure is 2,900 psi @ 72° F.

(Continued on following page)

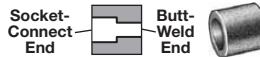


High-Pressure Socket-Connect Stainless Steel Unthreaded Pipe Fittings (Cont.)



Adapters and Caps

- Maximum Pressure:
304/304L SS: 2,500 psi @ 72°F; 1,900 psi @ 350°F for steam
316/316L SS: 3,000 psi @ 72°F; 1,900 psi @ 350°F for steam



Socket connect x butt weld straights are also known as half couplings. Adapters and caps meet ANSI/ASME B16.11 and ASTM A182.



Caps

304/304L

Stainless Steel

Pipe Size	ID	Straights, Socket Connect x Butt Weld	
		304/304L Stainless Steel	316/316L Stainless Steel
1/8	0.25"	44965K311	\$7.73
1/4	0.375"	44965K312	7.92
3/8	0.5"	44965K313	8.12
1/2	0.625"	44965K314	10.40
3/4	0.813"	44965K315	13.15
1	1.063"	44965K316	19.60
1 1/2	1.625"	44965K318	37.56
2	2.063"	44965K319	57.46
		45515K411	\$10.07
		45515K412	11.04
		45515K413	12.34
		45515K414	13.02
		45515K415	17.69
		45515K416	28.09
		45515K418	68.02
		45515K419	92.87

Pipe Size	Caps	
	304/304L Stainless Steel	316/316L Stainless Steel
1/8	44965K461	\$7.67
1/4	44965K462	7.59
3/8	44965K463	9.33
1/2	44965K464	13.04
3/4	44965K465	15.49
1	44965K466	18.10
1 1/2	44965K468	31.67
2	44965K469	48.28
3	44965K47	131.85
	45515K221	\$8.47
	45515K222	8.60
	45515K223	10.49
	45515K224	13.13
	45515K225	16.26
	45515K226	22.38
	45515K228	43.36
	45515K229	70.28
	45515K23	192.00

Reducers

- Maximum Pressure:
304/304L SS: 2,500 psi @ 72°F; 1,900 psi @ 350°F for steam
316/316L SS: 3,000 psi @ 72°F; 1,900 psi @ 350°F for steam

Reducers meet ANSI/ASME B16.11 and ASTM A182.



Straights, Socket Connect x Socket Connect

Pipe Size (A)	Size (B)	Straights, Socket Connect x Socket Connect	
		304/304L Stainless Steel	316/316L Stainless Steel
1/4	1/8	44965K482	\$10.06
3/8	1/4	44965K483	10.65
1/2	1/4	44965K481	13.73
1/2	3/8	44965K484	13.73
3/4	1/2	44965K485	18.06
1	3/4	44965K486	29.04
1 1/2	1 1/4	44965K488	52.86
2	1 1/2	44965K489	77.86
		45515K282	\$12.79
		45515K283	13.12
		45515K281	17.95
		45515K284	17.95
		45515K285	24.35
		45515K286	31.00
		45515K288	78.40
		45515K289	123.37

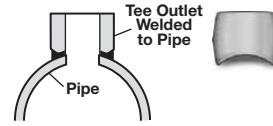
Straights, Butt Weld x Socket Connect

Pipe Size (A)	Size (B)	Straights, Butt Weld x Socket Connect	
		304/304L Stainless Steel	316/316L Stainless Steel
1/4	1/8	44965K492	\$8.51
3/8	1/4	44965K493	8.94
1/2	1/4	44965K491	11.52
1/2	3/8	44965K494	11.52
3/4	1/2	44965K495	12.94
1	3/4	44965K496	17.13
1 1/2	1 1/4	44965K498	33.24
2	1 1/2	44965K499	47.91
		45515K332	\$9.57
		45515K333	12.35
		45515K331	15.63
		45515K334	15.96
		45515K335	20.27
		45515K336	29.37

Tee Outlets

- Maximum Pressure:
304/304L SS: 2,900 psi @ 72°F;
2,400 psi @ 212°F for steam
316/316L SS: 2,900 psi @ 72°F;
2,480 psi @ 212°F for steam

Tee outlets allow you to create a tap anywhere along a pipe. They are also known as branch connectors and are comparable to Weldolet. To install, drill a hole in your pipe to match the fitting's pipe size and weld in place. **304 stainless steel** outlets meet ASTM A182 and UNS S30403. **316 stainless steel** outlets meet ASTM A182 and UNS S31603.



Pipe Size	For Pipe Size	304/304L		316/316L		
		Ht.	Stainless Steel	Ht.	Stainless Steel	
1/4	1/4 to 3/8	3/4"	1424N11	\$38.27	1424N35	\$44.62
1/4	1/2 to 36	3/4"	1424N12	32.06	1424N36	40.03
3/8	3/8 to 1/2	13/16"	1424N13	38.27	1424N37	44.62
3/8	3/4 to 36	13/16"	1424N14	32.06	1424N38	38.43
1/2	1/2	1"	1424N15	38.27	1424N39	44.62
1/2	3/4 to 36	1"	1424N16	32.06	1424N41	38.43
3/4	3/4 to 1 1/4	11/16"	1424N17	47.73	1424N42	52.46
3/4	1 1/2 to 36	11/16"	1424N18	40.11	1424N43	45.32
1	1 1/2 to 36	15/16"	1424N19	60.16	1424N44	68.08
1	1 1/4 to 2 1/2	15/16"	1424N21	50.30	1424N45	59.16
1	3 to 36	15/16"	1424N22	50.30	1424N46	59.16

Pipe Size	For Pipe Size	304/304L		316/316L		
		Ht.	Stainless Steel	Ht.	Stainless Steel	
1/4	1/4 to 1 1/2	15/16"	1424N23	\$91.67	1424N47	\$96.73
1/4	2 to 3 1/2	15/16"	1424N24	84.89	1424N48	96.73
1/4	4 to 36	15/16"	1424N25	84.89	1424N49	96.73
1/2	1 1/2	13/8"	1424N26	102.23	1424N51	106.84
1/2	2 to 2 1/2	13/8"	1424N27	97.57	1424N52	96.56
1/2	3 to 5	13/8"	1424N28	97.57	1424N53	96.56
1/2	6 to 36	13/8"	1424N29	97.57	1424N54	96.56
2	2	11/2"	1424N31	124.31	1424N55	130.09
2	2 1/2 to 3 1/2	11/2"	1424N32	128.46	1424N56	117.13
2	4 to 6	11/2"	1424N33	128.46	1424N57	117.13
2	8 to 36	11/2"	1424N34	128.46	1424N58	117.13

Thick-Wall Stainless Steel Unthreaded Pipe



- Use with air, hydraulic fluid, natural gas, oil, steam, water
- Fittings: Use butt-weld Schedule 80 thick-wall stainless steel (see pages 39-40) and socket-connect Class 3000 high-pressure stainless steel (see page 40 and above)
- Flanges: Use Class 300 and 600 high-pressure stainless steel (see page 42)

Also known as Schedule 80, this pipe provides an extra-strong connection. Weld it to fittings and additional lengths of pipe. Welded connections are stronger than threaded connections and less likely to leak. Pipe is seamless with a smooth interior for unrestricted flow. Meets ASTM A312. **304 stainless steel** pipe has very good corrosion resistance. **316 stainless steel** pipe has excellent corrosion resistance.

Pipe Size	304/304L Stainless Steel			316/316L Stainless Steel		
	1-ft. Lengths	3-ft. Lengths	6-ft. Lengths	1-ft. Lengths	3-ft. Lengths	6-ft. Lengths
1/4	4804T111	\$33.15	4804T112	\$70.31	4804T113	\$100.44
3/8	4804T121	39.06	4804T122	91.14	4804T123	130.20
1/2	4804T131	39.83	4804T132	95.59	4804T133	159.32
3/4	4804T141	40.09	4804T142	99.42	4804T143	160.36
1	4804T151	51.97	4804T152	127.94	4804T153	199.90
1 1/2	4804T171	74.31	4804T172	185.77	4804T173	309.62
2	4804T181	98.73	4804T182	227.83	4804T183	379.72
3	4804T191	123.92	4804T192	326.69	4804T193	563.25
4	4804T211	152.12	4804T212	401.04	4804T213	691.45
6	4804T221	270.63	4804T222	713.49	4804T223	1,230.15
	4815T111		4815T112		4815T113	\$95.62
	4815T121		4815T122		4815T123	119.33
	4815T131		4815T132		4815T133	128.42
	4815T141		4815T142		4815T143	128.55
	4815T151		4815T152		4815T153	158.40
	4815T171		4815T172		4815T173	225.83
	4815T181		4815T182		4815T183	276.21
	4815T191		4815T192		4815T193	384.97
	4815T211		4815T212		4815T213	508.76
	4815T221		4815T222		4815T223	919.93
	4815T231		4815T232		4815T233	1,586.09

Stainless Steel Pipe Flanges

For technical drawings and 3-D models, go to mcmaster.com.



How to Measure Pipe Size for Unthreaded Pipe and Fittings

Example shows pipe size 3/8". Pipe size is not an actual measured size, but rather an industry designation. Align your pipe or fitting with the "0" line. The line on the opposite edge gives the pipe size. You can also measure the OD of your pipe and butt-weld fitting or the ID of your socket-connect fitting and slip-on weld flange, then find the corresponding pipe size in the chart. If your measurement doesn't match an OD or ID listed, round to the nearest 1/8".



Pipe Size: 0
OD: 0



Pipe Size: 0
ID: 0

To measure larger pipe sizes, go to mcmaster.com and search for 4347KAC. For information about fittings and pipe, see pages 2-3.

High-Pressure Stainless Steel Unthreaded Pipe Flanges



- Use with air, hydraulic fluid, natural gas, oil, steam, water (unless noted)
- Maximum Pressure (unless noted):
 - Class 300: 300 psi @ 72°F
 - 300 psi @ 360°F for steam
 - Class 600: 1,200 psi @ 72°F; 840 psi @ 400°F for steam
- Pipe: Use unthreaded Schedule 40 standard-wall stainless steel (see page 39)
- Fittings: Use butt-weld Schedule 40 standard-wall stainless steel (see page 36)

Use these heavy duty forged flanges for high-pressure applications. Bolt two flat-surface flanges or two raised-surface flanges of same size together with a gasket (sold separately on pages 3619-3624) to create an access point in a pipe line.

Flanges come with a material certificate with traceable lot number and test report. They meet ASTM A182 and ANSI/ASME B16.5, unless noted. Class 300 flanges also meet MSS SP-6 and SP-25.

304 stainless steel flanges offer very good corrosion resistance. 316 stainless steel flanges have excellent corrosion resistance.

Butt-weld flanges are also known as weld-neck flanges; the flange neck has a beveled end that, when flush to pipe, creates a trough for a strong weld. Slip-on weld flanges have no internal stop; slide a pipe through the flange and weld on both sides. Socket-connect flanges have an internal stop that supports the pipe when welding and prevents the pipe from sliding all the way through. Stub-end flanges are also known as lap-joint flanges; use them with a stub-end fitting (not included). The stub-end fitting slides into the flange and welds to pipe (not the flange). Since the flange isn't welded to the pipe, it can be disconnected easily for frequent cleaning and inspecting. Cap flanges are also known as blind flanges.



Pipe Size	Flange OD	For Bolt Dia. (No.)
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Class 300 Forged Flanges

304/304L Stainless Steel

1/2"	33/4"	1/2" (4)	4448T286	\$55.96	4448T251	\$43.01	4448T264	\$50.80	4448T297	\$48.65	4448T275	\$40.18
3/4"	45/8"	5/8" (4)	4448T287	51.78	4448T252	44.43	4448T265	44.43	4448T298	48.65	4448T276	47.68
1"	47/8"	5/8" (4)	4448T288	55.12	4448T253	54.95	4448T266	54.01	4448T299	52.80	4448T277	52.43
1 1/4"	51/4"	5/8" (4)	4448T289	89.80	4448T254	75.71	4448T267	84.67	4448T311	85.37	4448T278	79.44
1 1/2"	61/8"	3/4" (4)	4448T291	91.84	4448T255	89.87	4448T268	79.87	4448T312	98.13	4448T279	83.69
2"	61/2"	5/8" (8)	4448T292	103.69	4448T256	89.36	4448T269	111.02	4448T313	113.22	4448T281	101.24
2 1/2"	71/2"	3/4" (8)	4448T293	165.33	4448T257	171.55	4448T271	178.23	4448T314	183.24	4448T282	148.22
3"	81/4"	3/4" (8)	4448T294	148.95	4448T258	159.38	4448T272	175.08	4448T315	168.98	4448T283	130.13
4"	10"	3/4" (8)	4448T295	214.48	4448T259	209.33	4448T273	267.18	4448T262	217.30	4448T284	203.63
6"	121/2"	3/4" (12)	4448T296	451.56	4448T261	361.82	4448T274	493.80	4448T263	394.02	4448T285	352.04
8"	15"	7/8" (12)	4448T445	477.69	4448T43	417.22			4448T47	474.72	4448T48	481.22
10"	171/2"	1" (16)	4448T46	649.76	4448T44	602.64					4448T49	673.14

316/316L Stainless Steel

1/2"	33/4"	1/2" (4)	4452T296	55.73	4452T261	55.44	4452T274	57.71	4452T317	53.70	4452T285	47.40
3/4"	45/8"	5/8" (4)	4452T297	67.42	4452T262	57.96	4452T275	59.55	4452T318	60.38	4452T286	58.23
1"	47/8"	5/8" (4)	4452T298	74.11	4452T263	70.82	4452T276	62.39	4452T319	65.87	4452T287	60.14
1 1/4"	51/4"	5/8" (4)	4452T299	117.13	4452T264	95.92	4452T277	95.78	4452T321	90.87	4452T288	107.96
1 1/2"	61/8"	3/4" (4)	4452T311	108.89	4452T265	97.42	4452T278	110.55	4452T322	102.31	4452T289	88.67
2"	61/2"	5/8" (8)	4452T312	133.00	4452T266	121.56	4452T279	121.57	4452T323	122.55	4452T291	91.85
2 1/2"	71/2"	3/4" (8)	4452T313	204.37	4452T267	213.26	4452T281	197.77	4452T324	202.81	4452T292	183.73
3"	81/4"	3/4" (8)	4452T314	197.10	4452T268	191.32	4452T282	234.82	4452T325	201.92	4452T293	209.09
4"	10"	3/4" (8)	4452T315	321.18	4452T269	273.48	4452T283	328.94	4452T272	284.31	4452T294	263.35
6"	121/2"	3/4" (12)	4452T316	536.31	4452T271	532.67	4452T284	530.65	4452T273	546.48	4452T295	520.34
8"	15"	7/8" (12)	4452T113	613.44	4452T111	491.05			4452T115	559.60	4452T116	545.24
10"	171/2"	1" (16)	4452T114	841.79	4452T112	754.10					4452T117	860.91

Class 600 Forged Flanges

304/304L Stainless Steel

1/2"	33/4"	1/2" (4)	1538N55	70.92	1538N15	59.64	1538N35	70.30	1538N75	66.96	1538N91	60.26
3/4"	45/8"	5/8" (4)	1538N56	72.46	1538N16	64.48	1538N36	74.16	1538N76	73.66	1538N92	71.92
1"	47/8"	5/8" (4)	1538N57	77.00	1538N17	69.56	1538N37	80.60	1538N77	77.38	1538N93	80.36
1 1/4"	51/4"	5/8" (4)	1538N58	153.76	1538N18	137.98	1538N38	143.62	1538N78	152.18	1538N94	155.35
1 1/2"	61/8"	3/4" (4)	1538N59	115.32	1538N19	101.56	1538N39	118.04	1538N79	111.10	1538N95	111.22
2"	61/2"	5/8" (8)	1538N61	123.88	1538N21	107.14	1538N41	130.58	1538N81	121.64	1538N96	125.74
2 1/2"	71/2"	3/4" (8)	1538N62	183.18	1538N22	175.85	1538N42	194.91	1538N82	205.16	1538N97	215.42
3"	81/4"	3/4" (8)	1538N63	191.75	1538N23	187.80	1538N43	221.85	1538N83	202.69	1538N98	207.07
4"	103/4"	7/8" (8)	1538N64	362.50	1538N24	326.43			1538N84	355.47	1538N99	376.65

316/316L Stainless Steel

1/2"	33/4"	1/2" (4)	1503N31	74.64	1503N11	65.48	1503N21	74.16	1503N41	73.66	1503N51	70.30
3/4"	45/8"	5/8" (4)	1503N32	83.82	1503N12	71.42	1503N22	78.98	1503N42	83.32	1503N52	76.38
1"	47/8"	5/8" (4)	1503N33	92.00	1503N13	78.98	1503N23	86.80	1503N43	90.28	1503N53	86.80
1 1/4"	51/4"	5/8" (4)	1503N34	159.73	1503N14	151.51	1503N24	152.18	1503N44	158.27	1503N54	163.45
1 1/2"	61/8"	3/4" (4)	1503N35	129.42	1503N15	108.44	1503N25	121.53	1503N45	133.92	1503N55	130.58
2"	61/2"	5/8" (8)	1503N36	139.22	1503N16	117.24	1503N26	147.89	1503N46	156.24	1503N56	140.62
2 1/2"	71/2"	3/4" (8)	1503N37	221.33	1503N17	167.92	1503N27	279.00	1503N47	197.47	1503N57	205.22
3"	81/4"	3/4" (8)	1503N38	223.20	1503N18	204.18	1503N28	295.53	1503N48	251.10	1503N58	245.93
4"	103/4"	7/8" (8)	1503N39	450.02	1503N19	448.47			1503N49	491.87	1503N59	460.35

▲ Not for use with steam. Does not meet ANSI/ASME B16.5.



For technical drawings and
3-D models, go to mcmaster.com.

Stainless Steel Flanges, Fittings & Pipe

High-Pressure Stainless Steel Unthreaded SAE Pipe Flanges



- Use with hydraulic fluid
- Maximum Pressure: See table



Socket-Connect Flange with
O-Ring Groove Surface



Socket-Connect Flange
with Flat Surface



Cap Flange with
O-Ring Groove Surface



Cap Flange with
Flat Surface

Create an access point in a high-pressure hydraulic fluid line with these machined flanges. They are also known as Code 61 SAE hydraulic flanges. To connect, bolt a flange with an O-ring groove surface to a flange with a flat surface of the same size. Flanges are 316/316L stainless steel for excellent corrosion resistance and they meet ISO 6162 and SAE J518.

Flanges with **O-ring groove surface** come with mounting hardware. O-ring is fluoroelastomer. Flanges with **flat surface** do not include mounting hardware.

Socket-connect flanges weld to pipe for a strong, permanent connection. **Cap** flanges are also known as blind flanges.

Socket-Connect Flanges

Pipe Size	SAE Flange Size	Max. psi @ 72°F	Flange Ht.	Wd.	For Bolt Dia. (No.)	O-Ring Groove Surface	Flat Surface
For Inch Bolts							
9/4	3/4	5,000	25/8"	1 3/4"	3/8" (4)	1431N015	\$90.94
1	1	5,000	25 3/4"	2"	3/8" (4)	1431N016	97.38
1 1/2	1 1/2	3,000	3 3/4"	2 3/4"	1/2" (4)	1431N017	136.50
2	2	3,000	4"	3 1/4"	1/2" (4)	1431N018	150.87
For Metric Bolts							
3/4	3/4	5,000	67 mm	44 mm	10 mm (4)	1431N019	90.94
1	1	5,000	72 mm	51 mm	10 mm (4)	1431N021	97.38
1 1/2	1 1/2	3,000	95 mm	70 mm	12 mm (4)	1431N022	136.50
2	2	3,000	102 mm	83 mm	12 mm (4)	1431N023	150.87

Cap Flanges

SAE Flange Size	Max. psi @ 72°F	Flange Ht.	Wd.	For Bolt Dia. (No.)	O-Ring Groove Surface	Flat Surface
For Inch Bolts						
9/4	5,000	25/8"	1 3/4"	3/8" (4)	1431N028	\$116.38
1	4,600	25 3/4"	2"	3/8" (4)	1431N029	115.60
1 1/2	3,000	3 3/4"	2 3/4"	1/2" (4)	1431N031	182.60
2	3,000	4"	3 1/4"	1/2" (4)	1431N032	202.04
For Metric Bolts						
3/4	5,000	67 mm	44 mm	10 mm (4)	1431N033	116.38
1	4,600	72 mm	51 mm	10 mm (4)	1431N034	115.60
1 1/2	3,000	95 mm	70 mm	12 mm (4)	1431N035	182.60
2	3,000	102 mm	83 mm	12 mm (4)	1431N036	202.04

Extreme-Pressure Socket-Connect Stainless Steel Unthreaded Pipe Fittings



- Use with air, natural gas, oil, steam, water
- Maximum Pressure: See table
- Pipe: Use unthreaded Schedule 160 extra-thick-wall stainless steel (see below)



90° Elbows



45° Elbows



Tees



Straights



Caps

304/304L Stainless Steel

Pipe Size	Max. psi @ 72°F	Max. psi @ 220°F for Steam	90° Elbows	45° Elbows	Tees	Straights	Caps	
1/2	7,700	6,500	2064K11	\$49.98	2064K22	\$69.35	2064K27	\$24.35
3/4	7,100	5,900	2064K12	60.22	2064K23	78.73	2064K28	34.29
1	6,400	5,300	2064K13	90.82	2064K24	113.92	2064K29	47.16
1 1/2	4,800	4,000	2064K14	181.12	2064K25	177.65	2064K31	97.43
2	4,700	3,900	2064K15	276.36	2064K26	305.38	2064K32	140.46

316/316L Stainless Steel

Pipe Size	Max. psi @ 72°F	Max. psi @ 220°F for Steam	90° Elbows	45° Elbows	Tees	Straights	Caps	
1/2	7,700	6,400	2077K11	63.55	2077K22	91.12	2077K27	33.73
3/4	7,100	5,900	2077K12	83.69	2077K23	101.04	2077K28	44.06
1	6,400	5,300	2077K13	118.88	2077K24	143.65	2077K29	62.71
1 1/2	4,800	3,900	2077K14	213.20	2077K25	218.00	2077K31	149.65
2	4,700	3,800	2077K15	306.95	2077K26	325.16	2077K32	204.38

Extra-Thick-Wall Stainless Steel Unthreaded Pipe



- Use with air, hydraulic fluid, natural gas, oil, steam, water
- Fittings: Use socket-connect Class 6000 extreme-pressure stainless steel (see above)

With an extra-thick wall, this Schedule 160 pipe is the strongest stainless steel pipe we offer. Weld it to fittings and addditional lengths of pipe. Welded connections are stronger than threaded connections and less likely to leak. Pipe is seamless, which provides a smooth interior for unrestricted flow. Meets ASTM A312.

304 stainless steel pipe has very good corrosion resistance.

316 stainless steel pipe has excellent corrosion resistance.



Pipe Size	1-ft. Lengths	304 Stainless Steel 3-ft. Lengths	6-ft. Lengths	1-ft. Lengths	316 Stainless Steel 3-ft. Lengths	6-ft. Lengths
1/2	2053K11	\$24.19	2053K16	\$60.47	2053K22	\$100.78
3/4	2053K12	42.01	2053K17	105.04	2053K23	175.06
1	2053K13	54.29	2053K18	135.72	2053K24	226.20
1 1/2	2053K14	74.67	2053K19	196.86	2053K25	339.42
2	2053K15	102.39	2053K21	269.95	2053K26	465.43

Brass Pipe Fittings

For technical drawings and
3-D models, go to mcmaster.com.



How to Measure Pipe Size for NPT Threads

Example shows pipe size $\frac{3}{8}$. Pipe size is not an actual measured size, but rather an industry designation. Align your pipe or fitting with the "0" line as shown. The line on the opposite edge gives the pipe size. You can also measure the OD of male threads or the ID of female threads, then find the corresponding pipe size in the chart. If your measurement doesn't match an OD or ID listed, round to the nearest $\frac{1}{8}$ ".



Pipe Size: 0
OD: 0
 $\frac{1}{16}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{2}$ $\frac{5}{8}$ $\frac{3}{4}$ 1" 1 $\frac{1}{4}$ " 1 $\frac{1}{2}$ " 1 $\frac{3}{4}$ "



Pipe Size: 0
ID: 0
 $\frac{1}{16}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{2}$ $\frac{5}{8}$ $\frac{3}{4}$ 1" 1 $\frac{1}{4}$ " 1 $\frac{1}{2}$ " 1 $\frac{5}{8}$ " 1 $\frac{3}{4}$ "

To measure larger pipe sizes, go to mcmaster.com and search for 4464KAC. For information about fittings and pipe, see pages 2-3.

Low-Pressure Brass Threaded Pipe Fittings



Use these Class 125 fittings in low-pressure flow applications. They have good corrosion resistance. Fittings meet ANSI/ASME B1.20.1 and B16.15, unless noted. Locknuts meet ANSI/ASME B16.15. All meet NSF/ANSI Standard 61 for drinking water, unless noted.

NPT Connectors, Adapters, Caps, Plugs, and NPSL Locknuts

Female x male 90° elbows are also known as street elbows. **Right-angle tees** are also known as run tees. **Unions** separate into three pieces so you can access your line without unthreading pipe connections. **Locknuts** have NPSL (National Pipe Straight Locknut) threads that are compatible with NPT threads. They thread onto the male end of a fitting to provide extra holding power so the fitting won't loosen from vibration.



Pipe Size	90° Elbows	90° Elbows with Mounting Holes	90° Elbows, Female x Male	45° Elbows	45° Elbows, Female x Male	45° Wyes
1/8	4429K169	\$7.17	4429K159	\$9.53	4429K269	\$8.76
1/4	4429K161	7.13	4429K483	\$28.61	4429K151	9.54
3/8	4429K162	7.13	4429K484	28.61	4429K152	9.54
1/2	4429K163	7.13	4429K485	28.61	4429K153	9.54
5/8	4429K164	9.53			4429K154	13.10
1	4429K165	15.52			4429K155	21.47
1 1/4	4429K166	25.11			4429K156	39.37
1 1/2	4429K167	31.08			4429K157	41.55
2	4429K168	48.48			4429K158	70.46
2 1/2	4429K431	117.24			4429K437	132.92
3	4429K432	179.08			4429K438	195.11
4	4429K433	362.55			4429K435	193.36



Pipe Size	Tees	Right-Angle Tees, Female x Female x Male	Crosses	Straights	Straights, Female x Male	Unions		
1/8	4429K259	\$8.36		4429K359	\$17.56	4429K119	\$5.97	
1/4	4429K251	8.36		4429K351	17.56	4429K111	5.97	
3/8	4429K252	8.36	4429K325	\$17.50	4429K352	17.56	4429K211	\$16.02
1/2	4429K253	8.36	4429K326	22.90	4429K353	17.56	4429K212	20.34
5/8	4429K254	11.90	4429K327	29.92	4429K354	25.07	4429K213	20.34
1	4429K255	21.52	4429K328	44.83	4429K355	41.39	4429K214	20.34
1 1/4	4429K256	36.96	4429K329	64.60	4429K356	67.54	4429K215	27.90
1 1/2	4429K257	40.43			4429K357	79.79	4429K216	42.25
2	4429K258	66.99	4429K331	150.87	4429K358	159.56	4429K217	58.07
2 1/2	4429K447	159.52			4429K451	339.02	4429K218	69.17
3	4429K448	243.89			4429K452	482.59	4429K219	94.54
4	4429K449	596.12			4429K453	1,021.78	4429K221	167.51

* Does not meet ANSI/ASME B16.15.



Pipe Size	Caps	Hollow Plugs with External Square Drive	Solid Plugs with External Square Drive	Solid Plugs with Square Drive	Locknuts
1/8	4429K149	\$4.74		4429K311	\$1.19
1/4	4429K171	4.74		4429K312	2.24
3/8	4429K142	4.74	4429K281	\$3.48	
1/2	4429K143	4.74	4429K282	3.48	
5/8	4429K144	5.97	4429K283	4.02	
1	4429K145	10.84	4429K316	7.15	
1 1/4	4429K146	19.09	4429K317	10.64	
1 1/2	4429K147	25.07	4429K318	13.56	
2	4429K148	41.54	4429K319	21.37	
2 1/2	4429K457	79.74	4429K284	34.13	
3	4429K458	123.31	4429K285	54.25	
4	4429K459	226.57	4429K286	101.53	

■ Does not meet NSF/ANSI Standard 61 for drinking water.

(Continued on following page)



Low-Pressure Brass Threaded Pipe Fittings (Continued from previous page)

NPT Reducers

Inline tees are also known as branch tees. Right-angle tees are also known as run tees.



Pipe Size		90° Elbows		Straights	
(A)	(B)				
1/4	1/8	4429K131	\$10.65	4429K731	\$7.13
3/8	1/8	4429K132	10.65	4429K349	7.42
3/8	1/4	4429K133	10.65	4429K732	7.13
1/2	1/8			4429K733	8.82
1/2	1/4	4429K134	11.47	4429K734	7.13
1/2	3/8	4429K135	11.47	4429K736	7.13
3/4	1/4	4429K136	13.63	4429K738	9.53
3/4	3/8	4429K137	13.63	4429K735	9.53
3/4	1/2	4429K138	13.63	4429K737	9.53
1	1/4	4429K817	32.43	4429K371	16.95
1	3/8	4429K818	32.43	4429K751	17.80
1	1/2	4429K139	23.89	4429K741	15.50
1	3/4	4429K141	23.89	4429K742	15.50
1 1/4	1/2	4429K819	41.73	4429K372	34.52
1 1/4	3/4	4429K172	36.32	4429K761	33.93
1 1/4	1	4429K173	36.32	4429K743	33.99
1 1/2	1/2	4429K821	53.19	4429K752	43.12
1 1/2	3/4	4429K174	44.07	4429K746	43.11
1 1/2	1	4429K175	44.07	4429K744	39.37
1 1/2	1 1/4	4429K176	44.07	4429K745	39.37
2	1/2	4429K822	91.69	4429K373	65.70
2	3/4	4429K823	79.93	4429K749	66.67
2	1	4429K177	78.58	4429K762	66.67
2	1 1/4	4429K178	78.58	4429K763	61.12
2	1 1/2	4429K179	78.58	4429K748	61.12
2 1/2	1 1/4			4429K764	112.19
2 1/2	1 1/2	4429K824	159.87	4429K374	102.38
2 1/2	2	4429K181	139.35	4429K747	102.88
3	1			4429K816	160.98
3	2	4429K182	214.33	4429K765	131.79
3	2 1/2	4429K825	245.90	4429K766	131.79
4	2			4429K376	303.57
4	3			4429K375	303.57



Hex Bushings, Male x Female

Pipe Size		Pipe Size	
(A)	(B)	(A)	(B)
1/4	1/8	4429K411	\$1.82
3/8	1/8	4429K471	1.77
3/8	1/4	4429K412	2.11
1/2	1/8	4429K421	2.82
1/2	1/4	4429K422	2.58
1/2	3/8	4429K413	3.53
3/4	1/8	4429K439	6.96
3/4	1/4	4429K423	5.02
3/4	3/8	4429K418	4.33
3/4	1/2	4429K414	4.62
1	1/8	4429K271	9.61
1	1/4	4429K461	9.46
1	3/8	4429K272	9.61
1	1/2	4429K424	8.36
1	3/4	4429K415	8.36
1 1/4	1/8	4429K295	14.15
1 1/4	1/4	4429K292	14.15
1 1/4	3/8	4429K273	17.93
1 1/4	1/2	4429K462	15.64
1 1/4	3/4	4429K472	14.31
1 1/4	1	4429K416	14.28
1 1/2	1/8	4429K293	16.56
1 1/2	1/4	4429K429	19.93
1 1/2	3/8	4429K294	14.24
1 1/2	1/2	4429K436	17.88
1 1/2	3/4	4429K425	20.30
1 1/2	1	4429K426	20.30

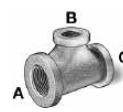
Inline Tees

Pipe Size		Pipe Size	
(A)	(B)	(A)	(B)
1/4	1/8	4429K223	\$12.46
1/4	3/8	4429K826	15.46
3/8	1/8	4429K827	14.65
3/8	1/4	4429K224	12.46
3/8	1/2	4429K225	14.73
1/2	1/4	4429K226	12.46
1/2	3/8	4429K377	11.87
1/2	1/2	4429K228	16.00
1/2	1	4429K829	42.96
3/4	1/4	4429K229	14.98
3/4	3/8	4429K333	14.27
3/4	1/2	4429K230	14.98
3/4	1	4429K234	34.57
3/4	1 1/2	4429K833	88.46
1	1/4	4429K235	32.45
1	3/8	4429K837	37.40
1	1/2	4429K236	32.45
1	3/4	4429K238	32.46
1	1 1/4	4429K838	58.18
1	1 1/2	4429K347	287.97
1 1/4	1/2	4429K242	44.26



Right-Angle Tees

Pipe Size		Pipe Size	
(A)	(B)	(A)	(B)
3/8	1/4	4429K828	\$15.46
1/2	1/4	4429K227	13.41
1/2	3/8	4429K332	11.87
1/2	1/2	4429K231	15.94
3/4	1/2	4429K233	14.98
3/4	1	4429K237	34.57
3/4	1 1/4	4429K382	51.96
1	1/2	4429K239	35.01
1	3/4	4429K241	33.90
1	1 1/2	4429K385	75.82
1 1/4	1/2	4429K383	54.52



Dual Tees

Pipe Size		Pipe Size		
(A)	(B)	(C)		
3/4	1/2	3/8	4429K831	\$19.81
1	1/2	3/4	4429K835	39.82
1	3/4	1/2	4429K834	39.82
1 1/4	1/2	1	4429K841	62.75
1 1/4	3/4	1	4429K842	62.75
1 1/2	1 1/4	1	4429K844	91.56



Bushings, Male x Female

Pipe Size		Pipe Size	
(A)	(B)	(A)	(B)
1/4	1/8	4429K521	\$3.69
3/8	1/4	4429K522	3.36
1/2	3/8	4429K524	3.62
3/4	1/2	4429K527	4.69

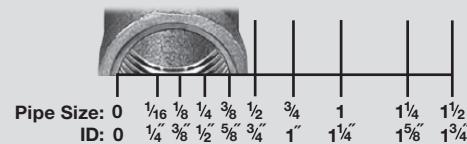
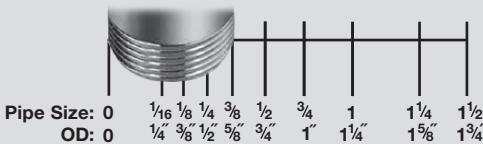
Brass and Bronze Pipe Fittings & Flanges

For technical drawings and 3-D models, go to mcmaster.com.



How to Measure Pipe Size for NPT or BSP Threads

Example shows pipe size 3/8". Pipe size is not an actual measured size, but rather an industry designation. Align your pipe or fitting with the "0" line as shown. The line on the opposite edge gives the pipe size. You can also measure the OD of male threads or the ID of female threads, then find the corresponding pipe size in the chart. If your measurement doesn't match an OD or ID listed, round to the nearest 1/8".



i To measure larger pipe sizes, go to mcmaster.com and search for 4464KAC. For information about fittings and pipe, see pages 2-3.

British Standard Low-Pressure Bronze Threaded Pipe Fittings



- Use with air, natural gas, oil, steam, water
- Maximum Pressure: 200 psi @ 72°F; 125 psi @ 400°F for steam
- Pipe Nipples and Pipe: Use threaded Schedule 40 standard-wall brass (see page 47-48)
- Flanges: Use threaded Class 150 low-pressure bronze (see below)

Use these Class 125 fittings in low-pressure flow applications. They have good corrosion resistance. Fittings meet ANSI/ASME B16.15, ASTM B584, and BS21, except unions only meet ASTM B584 and BS21.

BSPT (British Standard Pipe Taper) Connectors and Caps

Unions separate into three pieces so you can access your line without unthreading pipe connections.

Pipe Size, BSPT	90° Elbows	45° Elbows	Tees	Straights	Unions	Caps
1/8	4978K101	\$7.06	4978K111	\$7.81	4978K121	\$9.87
1/4	4978K102	7.06	4978K112	7.81	4978K122	9.87
3/8	4978K103	7.06	4978K113	7.81	4978K123	9.87
1/2	4978K104	10.74	4978K114	9.87	4978K124	12.40
5/8	4978K105	14.47	4978K115	14.47	4978K125	17.80
1	4978K106	22.35	4978K116	24.50	4978K126	31.69
1 1/4	4978K107	35.53	4978K117	39.14	4978K127	44.40
1 1/2	4978K108	44.40	4978K118	49.05	4978K128	61.10
2	4978K109	66.72	4978K119	73.44	4978K129	92.41

BSPT (British Standard Pipe Taper) Reducers



Straights

Bushings, Male x Female

Pipe Size, BSPT (A)	Pipe Size, BSPT (B)	Pipe Size, BSPT (A)	Pipe Size, BSPT (B)	Pipe Size, BSPT (A)	Pipe Size, BSPT (B)
1/4	1/8	4978K211	\$7.58	1	3/4
3/8	1/4	4978K212	7.58	1 1/4	3/4
1/2	1/8	4978K213	10.95	1 1/4	1
1/2	4/8	4978K214	9.51	1 1/2	3/4
1/2	3/8	4978K215	9.51	1 1/2	1
3/4	1/4	4978K216	15.64	1 1/2	1 1/4
3/4	3/8	4978K217	14.08	2	1
3/4	1/2	4978K218	14.08	2	1 1/4
1	1/2	4978K219	23.46	2	1 1/2

Low-Pressure Brass and Bronze Threaded Pipe Flanges



- Pipe Nipples and Pipe: Use threaded Schedule 40 standard-wall brass (see pages 47-48)

Also known as Class 150 flanges, these are designed for low-pressure applications. Bolt two same-size flanges together with a gasket (sold separately on pages 3619-3620) to create an access point within a line. Flanges have good corrosion resistance.

NPT Flanges—Brass

- Use with air, drinking water, natural gas, oil
- Maximum Pressure: 200 psi @ 72°F
- Fittings: Use threaded Class 125 low-pressure brass (see pages 44-45 and 48)

Flanges meet ANSI/ASME B1.20.1 and B16.24, ASTM B584, and NSF/ANSI Standard 61 for drinking water.

Pipe Size	Flange OD	For Bolt Dia. (No.)	Pipe Size, BSPT	Flange OD	For Bolt Dia. (No.)				
1/2	3 1/2"	1/2" (4)	4429K551	\$63.00	1/2	3 1/2"	1/2" (4)	4978K194	\$59.88
3/4	3 7/8"	1/2" (4)	4429K552	95.02	3/4	3 7/8"	1/2" (4)	4978K195	80.07
1	4 1/4"	1/2" (4)	4429K553	83.00	1	4 1/4"	1/2" (4)	4978K196	105.60
1 1/4	45/8"	1/2" (4)	4429K554	102.93	1 1/4	45/8"	1/2" (4)	4978K197	138.94
1 1/2	5"	1/2" (4)	4429K555	117.56	1 1/2	5"	1/2" (4)	4978K198	160.28
2	6"	5/8" (4)	4429K556	143.61	2	6"	5/8" (4)	4978K199	233.34
2 1/2	7"	5/8" (4)	4429K557	195.86					
3	7 1/2"	5/8" (4)	4429K558	232.95					
4	9"	5/8" (8)	4429K559	309.46					

**Standard-Wall Brass Threaded Pipe Nipples and Pipe**

- Use with air, water, drinking water, natural gas, oil, steam (unless noted)
- Fittings: Use threaded Class 125 low-pressure brass or bronze (see pages 44-46 and 48)
- Flanges: Use threaded Class 150 low-pressure brass or bronze (see page 46)

Also known as Schedule 40, this pipe is for use in low-pressure flow applications. It is brass, which offers good corrosion resistance. Pipe is seamless and has a smooth interior for unrestricted flow. Meets ASTM B687 and NSF/ANSI Standard 61 for drinking water, unless noted.

BSPT pipe meets ASTM BS21. **BSPTxNPT** pipe also meets ANSI/ASME B1.20.1.

Fully threaded pipe is also known as a close nipple; it is threaded on each end to the center.



Fully Threaded



Threaded on One End



Threaded on Both Ends

NPT Fully Threaded

Pipe Size	Lg.										
1/8	3/4"	4568K111	\$1.41								
1/4	7/8"	4568K131	1.66								
3/8	1"	4568K151	1.72								
1/2	1 1/8"	4568K171	2.29								
3/4	1 3/8"	4568K191	3.32								
1	1 1/2"	4568K221	4.89								
1 1/4	1 5/8"	4568K241	7.17								
1 1/2	1 3/4"	4568K261	9.56								
2	2"	4568K281	14.56								
2 1/2	2 1/2"	4568K301	35.41								
3	2 5/8"	4568K311	48.16								
4	2 7/8"	4568K321	72.43								

NPT Threaded on One End

Pipe Size	1" Lengths	1 1/2" Lengths	2" Lengths	3" Lengths	4" Lengths	
1/4	9580K11	\$2.02	9580K21	\$2.32	9580K41	\$3.35
3/8	9580K12	2.08	9580K22	2.47	9580K42	3.98
1/2	9580K13	2.77	9580K23	3.23	9580K43	5.28
3/4		9580K24	4.28	9580K44	5.07	9580K45
1			9580K35	7.30	9580K46	6.76
1 1/4			9580K36	10.19	9580K47	13.66
1 1/2			9580K37	12.52	9580K48	17.22
2			9580K38	17.70	9580K49	22.05

NPT Threaded on Both Ends

Pipe Size	1 1/2"	2"	2 1/2"	3"	3 1/2"	4"	4 1/2"	5"	5 1/2"	6"	6 1/2"	7"	8"
1/8	4512K45		\$1.60	\$1.71	\$1.96	\$2.11	\$2.27	\$2.56	\$2.89	\$3.14	\$3.38	\$3.61	\$4.32
1/4	4512K46		1.93	2.17	2.35	2.77	3.02	3.53	3.83	4.20	4.52	5.09	5.83
3/8	4512K85		2.02	2.47	2.68	3.29	3.53	4.22	4.49	4.92	5.34	5.80	7.03
1/2	4512K48		2.65	3.13	3.71	4.34	4.97	5.70	6.18	7.48	8.29	9.61	10.76
3/4	4512K49		3.52	4.16	4.82	5.57	6.24	7.27	7.90	8.72	9.53	10.61	12.42
1	4512K75			6.01	7.03	8.08	9.35	10.53	11.73	12.96	14.21	15.50	18.09
1 1/4	4512K76			8.41	9.49	11.24	13.15	14.80	16.41	18.09	19.78	21.58	25.48
1 1/2	4512K77			10.28	12.32	14.17	16.28	18.45	20.75	22.95	25.08	27.26	29.35
2	4512K78				15.71	18.15	20.90	23.72	26.47	29.35	29.66	32.27	37.77
2 1/2	4512K79					37.02	41.93	46.63	49.74	55.01	59.24	64.87	73.90
3	4568K901					49.74	56.60	63.73	70.07	77.09	83.76	91.06	106.25
4	4568K902					73.57	82.59	94.20	101.75	109.51	113.84	125.71	144.31

Pipe

Pipe Size	9"	10"	11"	12"	14"	16"	18"	20"	22"	24"	36"	48"	60"	72"
1/8	4512K45	\$5.81	\$6.40	\$6.93	\$7.35	\$8.07	\$9.22	\$10.10	\$11.51	\$12.69	\$13.43	\$20.21	\$26.99	\$33.61
1/4	4512K46	7.08	7.78	8.47	9.20	10.06	11.49	12.58	14.35	15.81	16.75	25.17	33.56	41.97
3/8	4512K85	9.31	9.37	10.22	11.10	12.15	13.88	15.12	17.38	19.09	20.26	30.34	40.52	50.71
1/2	4512K48	11.95	13.21	14.44	15.70	17.21	19.68	21.50	24.58	27.06	28.73	43.11	57.41	71.87
3/4	4512K49	15.50	17.09	18.63	20.32	22.28	25.44	27.83	31.80	34.97	37.15	55.77	74.35	92.92
1	4512K75	23.04	25.57	27.59	30.48	33.37	38.15	41.84	47.68	52.44	55.77	83.50	111.44	123.85
1 1/4	4512K76	31.52	32.88	37.63	39.32	46.76	53.42	58.60	66.79	73.45	78.07	117.03	138.74	173.42
1 1/2	4512K77	37.32	41.30	45.29	49.27	58.56	66.93	73.32	83.65	92.05	97.75	130.39	173.84	217.27
2	4512K78	48.02	53.32	57.62	63.62	75.61	86.42	94.69	97.21	106.92	112.19	168.33	224.45	252.47
2 1/2	4512K79	94.20	101.42	112.17	116.90	131.66	150.46	162.59	188.08	206.88	216.81	293.08	390.78	569.16
3	4568K901	125.92	139.70	151.91	167.32									
4	4568K902	183.07	202.46	221.88	238.87									

BSPT Fully Threaded

Pipe Size	Lg.										
1/8	3/4"	4824K111	\$2.50								
1/4	7/8"	4824K112	2.93								
3/8	1"	4824K113	3.01								
1/2	1 1/8"	4824K114	4.03								
3/4	1 3/8"	4824K115	5.82								
1	1 1/2"	4824K116	8.56								
1 1/4	1 5/8"	4824K117	12.94								
1 1/2	1 3/4"	4824K118	16.81								
2	2"	4824K119	25.60								

BSPT Threaded on Both Ends

Pipe Size	1 1/2" Lengths	2" Lengths	3" Lengths	4" Lengths	6" Lengths	
1/8	4824K121	\$2.81	4824K131	\$3.05	4824K151	\$3.71
1/4	4824K122	3.36	4824K132	3.83	4824K152	4.85
3/8	4824K123	3.60	4824K133	4.34	4824K153	5.75
1/2	4824K124	4.65	4824K134	5.47	4824K154	7.66
3/4	4824K125	6.18	4824K135	7.31	4824K155	9.77
1		4824K136	10.55	4824K156	14.19	4824K176
1 1/4		4824K137	14.77	4824K157	19.78	4824K177
1 1/2		4824K138	18.10	4824K158	24.90	4824K178
2		4824K159	31.89	4824K179	41.74	4824K199

BSPT x NPT**Fully Threaded**

Pipe Size	Lg.									
1/8	3/4"	5832T111	\$2.79							
1/4	7/8"	5832T112	3.26							
3/8	1"	5832T113	3.38							
1/2	1 1/8"	5832T114	4.51							
3/4	1 3/8"	5832T115	6.48							
1	1 1/2"	5832T116	9.57							

BSPT x NPT**Threaded on Both Ends**

Pipe Size	1 1/2" Lengths	2" Lengths	3" Lengths	4" Lengths	6" Lengths	
1/8	5832T121	\$3.14	5832T131	\$3.38	5832T141	\$4.14
1/4	5832T122	3.77	5832T132	4.27	5832T142	5.43
3/8	5832T123	3.99	5832T133	4.67	5832T143	6.44
1/2	5832T124	5.22	5832T134	6.13	5832T144	8.56
3/4	5832T125	6.92	5832T135	8.18	5832T145	10.93
1		5832T136	11.81	5832T146	15.86	5832T156

■ Does not meet NSF/ANSI Standard 61 for drinking water.

Brass Pipe Fittings, Nipples & Pipe

For technical drawings and 3-D models, go to mcmaster.com.

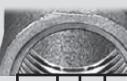


How to Measure Pipe Size for NPT Threads

Example shows pipe size 3/8". Pipe size is not an actual measured size, but rather an industry designation. Align your pipe or fitting with the "0" line as shown. The line on the opposite edge gives the pipe size. You can also measure the OD of male threads or the ID of female threads, then find the corresponding pipe size in the chart. If your measurement doesn't match an OD or ID listed, round to the nearest 1/8".



Pipe Size: 0
OD: 0
1/16 1/8 1/4 3/8 1/2 5/8 3/4 1" 1 1/4" 1 1/2" 1 3/4"



Pipe Size: 0
ID: 0
1/16 1/8 1/4 3/8 1/2 5/8 3/4 1" 1 1/4" 1 1/2" 1 3/4"

i To measure larger pipe sizes, go to mcmaster.com and search for 4464KAC. For information about fittings and pipe, see pages 2-3.

Low-Pressure Brass Threaded Pipe Fittings with Sealant



- Use with air, natural gas, oil, water
- Maximum Pressure: 200 psi @ 72°F
- Pipe Nipples and Pipe: Use threaded Schedule 40 standard-wall brass (see page 47 and below)
- Flanges: Use threaded Class 150 low-pressure brass (see page 46)

The male threads on these fittings have an acrylic sealant applied for extra protection against leaks. Also known as Class 125 fittings, they are built for use in low-pressure applications. They are brass for good corrosion resistance. All meet ANSI/ASME B1.20.1 and B16.15.

NPT Adapters and Plugs

Female x male 90° elbows are also known as street elbows. Right-angle tees are also known as run tees. Plugs are solid.



Pipe Size	90° Elbows, Female x Male	45° Elbows, Female x Male	Right-Angle Tees, Female x Female x Male	Straights, Female x Male	Plugs with External Square Drive	Plugs with Square Drive
1/8	2725K11	\$13.65			2725K85	\$3.98
1/4	2725K12	13.65	2725K19	\$15.35	2725K86	4.15
3/8	2725K13	13.65	2725K21	15.35	2725K87	3.68
1/2	2725K14	13.65	2725K22	15.35	2725K38	5.30
5/8	2725K15	18.77	2725K23	22.13	2725K34	53.40
1	2725K16	30.75	2725K24	37.42	2725K35	69.18
1 1/2	2725K17	61.44	2725K25	74.88	2725K41	17.72
2	2725K18	99.15	2725K26	114.57	2725K36	132.92
			2725K32	183.72	2725K42	41.47
					2725K43	65.73
					2725K48	52.02

NPT Reducers



Bushings, Male x Female

Pipe Size (A) (B)							
1/4	1/8	2725K49	\$1.89	3/4	3/8	2725K58	\$4.85
3/8	1/8	2725K51	2.32	3/4	1/2	2725K59	5.08
3/8	1/4	2725K52	2.23	1	1/8	2725K61	13.05
1/2	1/8	2725K53	3.34	1	1/4	2725K62	13.05
1/2	1/4	2725K54	3.18	1	3/8	2725K63	13.05
1/2	3/8	2725K55	3.54	1	1/2	2725K64	11.97
3/4	1/8	2725K56	6.45	1	3/4	2725K65	11.97
3/4	1/4	2725K57	5.32	1 1/4	3/8	2725K77	24.33

Standard-Wall Brass Threaded Pipe Nipples and Pipe with Sealant



- Use with air, natural gas, oil, water
- Fittings: Use threaded Class 125 low-pressure brass (see pages 44-45 and above)
- Flanges: Use threaded Class 150 low-pressure brass (see page 46)

The threads on this Schedule 40 pipe have an acrylic sealant applied for extra leak protection in low-pressure applications. Pipe is brass, which offers good corrosion resistance. It is seamless and has a smooth interior for unrestricted flow. All meet ASTM B687.

Fully threaded pipe is also known as a close nipple; it is threaded on each end to the center.

Threaded on Both Ends

NPT Fully Threaded

Pipe Size	Lg.	
1/8	3/4"	2729K11
1/4	7/8"	2729K12
3/8	1"	2729K13
1/2	1 1/8"	2729K14
5/8	1 1/4"	2729K15
1	1 1/2"	2729K16
1 1/2	1 3/4"	2729K17
2	2"	2729K18

Pipe Size	1 1/2" Lengths	2" Lengths	2 1/2" Lengths	3" Lengths	3 1/2" Lengths	
1/8	2729K19	\$2.30	2729K25	\$2.38	2729K33	\$2.36
1/4	2729K21	2.52	2729K26	2.70	2729K34	2.82
3/8	2729K22	2.60	2729K27	2.73	2729K35	2.96
1/2	2729K23	3.04	2729K28	3.44	2729K36	4.08
5/8	2729K24	3.87	2729K29	4.58	2729K37	5.30
1	2729K31	6.61	2729K38	7.73	2729K47	8.89
1 1/2	2729K32	11.31	2729K39	13.55	2729K48	15.59
2	2729K41	17.28	2729K49	19.97	2729K51	22.99

NPT Threaded on Both Ends

Pipe Size	4" Lengths	5" Lengths	6" Lengths	8" Lengths	10" Lengths	12" Lengths
1/8	2729K51	\$2.98	2729K59	\$3.45	2729K68	\$4.04
1/4	2729K52	3.88	2729K61	4.62	2729K69	5.60
3/8	2729K53	4.64	2729K62	5.41	2729K71	6.38
1/2	2729K54	6.27	2729K63	7.50	2729K72	9.12
5/8	2729K55	8.00	2729K64	9.59	2729K73	11.67
1	2729K56	11.58	2729K65	14.26	2729K74	17.05
1 1/2	2729K57	20.30	2729K66	25.25	2729K75	29.99
2	2729K58	26.09	2729K67	32.29	2729K76	35.50



Miniature Low-Pressure Brass Threaded Pipe Fittings



- Use with air, water
- Maximum Pressure: 150 psi @ 72°F

Less than an inch in length, these miniature fittings work well in low-pressure pipe lines that are tight on space. They are brass, which has good corrosion resistance. Nickel-plated brass fittings offer better corrosion resistance than unplated brass. UN/UNF (SAE) threads are also known as O-ring boss threads; the male threads have a Buna-N gasket to protect against leaks.

Adapters

Female x male 90° elbows are also known as street elbows. **Inline tees** are also known as branch tees. Fittings with **intermittent swivel** rotate 360° as needed to allow movement in a rigid metal piping system.



Female Pipe/Thread Size	Male Thread Size	Pkg. Qty.	90° Elbows, Female x Male	Pkg.	Inline Tees, Female x Male x Female	Pkg.	Straights with Intermittent Swivel, Female x Male	Pkg.
Brass								
1/8 NPT	10-32 UN/UNF (SAE)	5					5454K69	\$14.13
10-32 UN/UNF (SAE)	10-32 UN/UNF (SAE)	5	5454K78	\$14.05	5454K79	\$13.59	5454K68	12.64
Nickel-Plated Brass								
1/8 NPT	10-32 UN/UNF (SAE)	5					5483T22	15.92
10-32 UN/UNF (SAE)	10-32 UN/UNF (SAE)	5	5483T11	14.46	5483T12	13.73	5483T21	13.15
Replacement Gaskets (Pkg. of 25)							5454K21	1.91

Connectors and Plugs

Plugs are solid.



Thread Size	Pkg. Qty.	Straights, Female	Pkg.	Straights, Male	Pkg.	Plugs with Slotted Hex Drive	Pkg.
Brass							
10-32 UN/UNF (SAE)	10	5454K71	\$5.65	5454K72	\$7.25	5454K81	\$3.96
Nickel-Plated Brass							
10-32 UN/UNF (SAE)	10	5483T31	6.68	5483T32	8.98	5483T15	6.07
Replacement Gaskets (Pkg. of 25)						5454K21	1.91

Low-Pressure Chrome-Plated Brass Threaded Pipe Fittings



- Use with air, natural gas, oil, steam, water
- Maximum Pressure: 200 psi @ 72°F; 125 psi @ 400°F for steam
- Pipe Nipples and Pipe: Use threaded Schedule 40 standard-wall chrome-plated brass (see page 50)

The polished chrome plating not only has a shiny appearance, but also improves corrosion resistance. Also known as Class 125 fittings, these are for use in low-pressure pipe lines. Meet ANSI/ASME B16.15 and ASTM B456, except unions and locknuts only meet ASTM B456.

NPT Connectors, Adapters, Caps, Plugs, and Locknuts

Female x male 90° elbows are also known as street elbows. **Unions** separate into three pieces so you can access your line without unthreading pipe connections. **Plugs** are solid. **Locknuts** thread onto the male end of a fitting to provide extra holding power so the fitting won't loosen from vibration.



Pipe Size	90° Elbows	90° Elbows, Female x Male	45° Elbows	45° Elbows, Female x Male	Tees	Crosses
1/8	9162K111	\$15.57	9162K131	\$20.85	9162K211	\$23.06
1/4	9162K112	15.83	9162K132	21.20	9162K212	23.42
3/8	9162K113	16.10	9162K133	21.57	9162K213	23.80
1/2	9162K114	16.39	9162K134	21.95	9162K214	24.19
3/4	9162K115	20.37	9162K135	28.02	9162K215	33.26
1	9162K116	33.14	9162K136	37.83	9162K216	46.12



Pipe Size	Straights	Unions	Caps	Plugs with External Square Drive	Locknuts	
1/8	9162K311	\$13.01	9162K471	\$33.50	9162K191	\$8.68
1/4	9162K312	13.23	9162K472	33.95	9162K192	8.77
3/8	9162K313	13.46	9162K473	34.41	9162K193	8.87
1/2	9162K314	13.70	9162K474	34.88	9162K194	13.46
3/4	9162K315	19.05	9162K475	47.06	9162K195	16.20
1	9162K316	30.51	9162K476	62.10	9162K196	22.01

NPT Reducers



Pipe Size (A) (B)	Straights	Hex Bushings, Male x Female	Bushings, Male x Female	
Pipe Size (A) (B)		Pipe Size (A) (B)	Pipe Size (A) (B)	
1/4... 1/8	9162K261	\$16.10	9162K232	\$13.18
3/8... 1/4	9162K263	16.39	9162K225	13.86
1/2... 1/8	9162K262	17.27	9162K226	14.10
1/2... 1/4	9162K267	15.07	9162K233	17.71
1/2... 3/8	9162K264	16.20	9162K234	18.00
3/4... 1/4	9162K271	23.13	9162K229	19.05
3/4... 3/8	9162K265	20.37		
3/4... 1/2	9162K266	20.37		
1... 1/2	9162K272	37.55		
1... 3/4	9162K269	37.92		

Brass and Bronze Pipe Fittings & Pipe

For technical drawings and 3-D models, go to mcmaster.com.

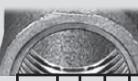


How to Measure Pipe Size for NPT or BSP Threads

Example shows pipe size 3/8". Pipe size is not an actual measured size, but rather an industry designation. Align your pipe or fitting with the "0" line as shown. The line on the opposite edge gives the pipe size. You can also measure the OD of male threads or the ID of female threads, then find the corresponding pipe size in the chart. If your measurement doesn't match an OD or ID listed, round to the nearest 1/8".



Pipe Size: 0
OD: 0
1/16 1/8 1/4 3/8 5/16 1/2 3/4 1" 1 1/4" 1 1/2" 1 3/4"



Pipe Size: 0
ID: 0
1/16 1/8 1/4 3/8 5/16 1/2 3/4 1" 1 1/4" 1 1/2" 1 3/4"

i To measure larger pipe sizes, go to mcmaster.com and search for 4464KAC. For information about fittings and pipe, see pages 2-3.

Standard-Wall Chrome-Plated Brass Threaded Pipe Nipples and Pipe



Fully Threaded



Threaded on Both Ends

NPT Fully Threaded

Pipe Size Lg.						
1/8...	3/4"	9176K111	\$4.35			
1/4...	7/8"	9176K112	4.89			
3/8...	1"	9176K113	3.84			
1/2...	1 1/8"	9176K114	4.73			
3/4...	1 3/8"	9176K115	9.37			
1...	1 1/2"	9176K116	13.81			

NPT Threaded on Both Ends

Pipe Size	1 1/2" Lengths	2" Lengths	3" Lengths	3 1/2" Lengths	4" Lengths	
1/8...	9176K121	\$4.89	9176K131	\$5.24	9176K141	\$6.43
1/4...	9176K122	5.66	9176K132	6.36	9176K142	8.09
3/8...	9176K123	4.32	9176K133	5.15	9176K143	6.91
1/2...	9176K124	5.44	9176K134	6.49	9176K144	9.05
3/4...	9176K125	9.91	9176K135	11.89	9176K145	15.83
1...	9176K136	16.95	9176K136	16.95	9176K146	22.54

NPT Threaded on Both Ends

Pipe Size	4 1/2" Lengths	5" Lengths	6" Lengths	8" Lengths	10" Lengths	12" Lengths
1/8...	9176K231	\$8.82	9176K161	\$9.56	9176K171	\$11.06
1/4...	9176K232	11.73	9176K162	12.79	9176K172	14.93
3/8...	9176K233	10.04	9176K163	11.00	9176K173	12.95
1/2...	9176K234	13.08	9176K164	14.42	9176K174	17.11
3/4...	9176K235	22.99	9176K165	25.35	9176K175	30.05
1...	9176K236	32.64	9176K166	36.03	9176K176	42.91

Medium-Pressure Brass and Bronze Threaded Pipe Fittings



- Use with air, natural gas, oil, water, except connectors with intermittent swivel are only for use with water
- Pipe Nipples and Pipe: Use threaded Schedule 80 thick-wall brass (see pages 51-52)

NPT Connectors and Caps—Brass

- Maximum Pressure: 400 psi @ 72°F

All meet ASTM B584, as well as ANSI/ASME B.16.15 and B1.20.1. **Unions** separate into three pieces so you can access your line without unthreading pipe connections.



Pipe Size

Pipe Size	90° Elbows	45° Elbows	Tees	Crosses	Straights	Unions	Caps	
1/4...	9152K11	\$18.20	9152K76	\$28.52	9152K51	\$22.43	9152K61	\$41.67
3/8...	9152K12	18.20	9152K31	28.52	9152K52	22.43	9152K62	47.62
1/2...	9152K13	26.70	9152K32	32.17	9152K77	\$54.92	9152K53	26.80
3/4...	9152K14	36.00	9152K21	\$37.98	9152K33	52.35	9152K41	80.03
1...	9152K15	53.58	9152K22	66.53	9152K34	71.42	9152K42	125.55
1 1/4...	9152K16	96.03	9152K23	100.72	9152K35	132.21	9152K43	161.34
1 1/2...	9152K17	129.66	9152K24	138.09	9152K36	172.77	9152K44	249.30
2...	9152K18	215.93	9152K25	225.23	9152K37	250.98	9152K45	403.06

NPT Connectors with Intermittent Swivel—Bronze

- Maximum Pressure: 300 psi @ 72°F

Fittings rotate 360° as needed to allow movement in a rigid metal piping system.

Thread Adapters, Male—Brass

- Maximum Pressure: 250 psi @ 72°F

NPTF (Dryseal) threads are compatible with NPT threads.



Pipe Size

Pipe Size	90° Elbows	Straights	Pipe Size	NPSM x NPTF
1...	53845K54	\$255.77	1/4	4685T11 \$1.54
1 1/2...	53845K56	271.15	3/8	4685T12 2.44
2...	53845K58	413.46	1/2	4685T13 3.17

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