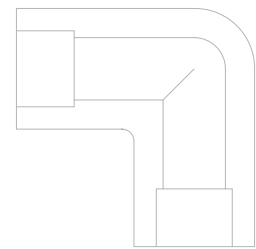
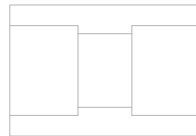
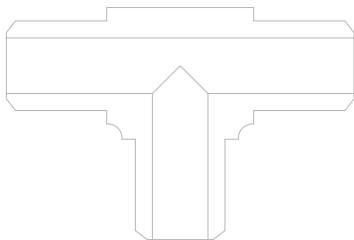
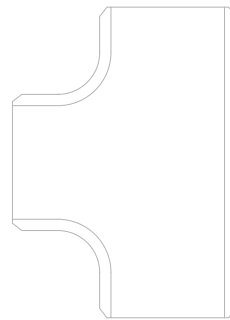


# Weld Fittings



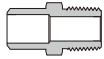
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Electromechanical  
Filtration  
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Hydraulics  
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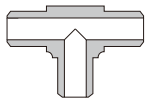
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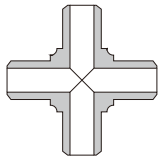
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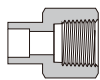
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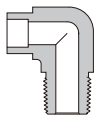
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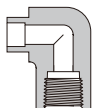
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### Male Elbows



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### Female Elbows



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## Unions



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### Reducing Unions



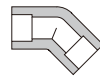
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### Union Elbows



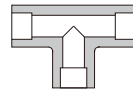
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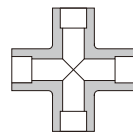
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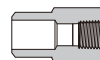
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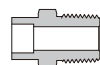
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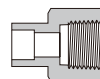
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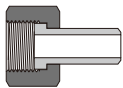
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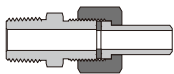
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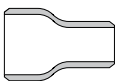
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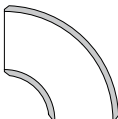
## Factory-made Wrought Butt weld Fittings F Series

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### 90° Long Radius Elbows



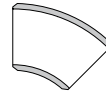
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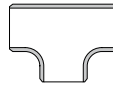
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## 45° Elbows



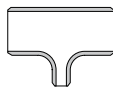
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## Straight Tees



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## Reducing Tees



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## Features

- ⊙ 316 stainless steel is standard material. Other materials are available upon request.
- ⊙ Straight fittings are manufactured from quality bar stock. Shaped fittings are made from forgings.
- ⊙ Quality machining of all ports ensures consistent welding.
- ⊙ Radius junction design with elbows provides smooth flow path.
- ⊙ All fittings are cleaned to remove oil, grease and loose particles.
- ⊙ Every fitting is stamped with size, material and heat code.

## Technical Data

- ⊙ Sizes range from 1/8" to 1" and 6 mm to 38 mm.
- ⊙ Working Temperatures:

Material	Minimum Temperature	Maximum Temperature
316 SS	-325°F (-198°C)	1000°F (538°C)
316L SS	-325°F (-198°C)	850°F (454°C)

- ⊙ Working Pressure:
  1. Catalog working pressures shown are based on ANSI/ASME B31.3 at ambient temperature, to determine working pressures in accordance with ANSI/ASME B31.1 multiply catalog working pressures shown by 0.94.
  2. Use the allowable working pressure at ambient temperature to multiply the elevated temperature factors to get the working pressure at elevated temperature. To know the elevated temperature factor, please refer to the related information of VFK 6 Series Tube Fittings.

## Materials

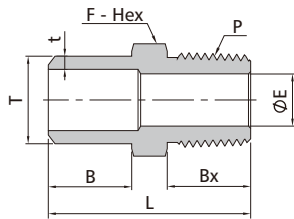
Material	Bar Stock	Forging	Designator
316 SS	ASTM A276, ASME SA479	ASTM A182, ASME SA182	SS
316L SS			6L

## Ordering Information

- ⊙ Add the material designator as a prefix to the basic ordering number to get the complete ordering number.
- Example:
1. Male connector with 1/4" fractional tube butt weld, 1/4 NPT thread and 316 stainless steel material, the complete ordering number is SS21-TB4N4.
  2. Male elbow with 1/4" fractional tube socket weld, 1/4 NPT thread and 316L stainless steel material, the complete ordering number is 6L22-TS4N4.
- ⊙ To order fittings with special cleaning and packaging, following ASTM G93 C standard, add -V2 as a suffix to the ordering number. Example: SS21-TB4N4-V2.
- 
- ⊙ Using the same materials to weld will ensure the same coefficients of expansion and good welding.
  - ⊙ Tungsten Inert Gas Welding (TIG) is recommended.

# Tube Butt Weld Fittings

## Male Connectors



### Fractional Tube

### NPT Thread

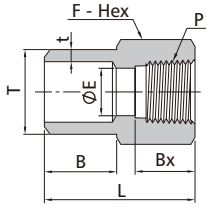
T-Tube O.D. (in.)	t-Wall Thickness (in.)	P-NPT Size	Basic Ordering Number	Dimension, mm					Working Pressure psig (bar)
				L	B	Bx	F	E	
1/4	0.065	1/4	21-TB4N4	29.7	9.7	14.2	14.3	7.1	8000 (551)
1/4	0.065	1/2	21-TB4N8	36.8	9.7	19.1	22.2	11.9	7700 (530)
3/8	0.095	1/4	21-TB6N4	29.7	9.7	14.2	14.3	7.1	8000 (551)
3/8	0.095	1/2	21-TB6N8	36.8	9.7	19.1	22.2	11.9	7700 (530)
1/2	0.095	1/4	21-TB8N4	34.3	14.2	14.2	14.3	7.1	6780 (468)
1/2	0.095	1/2	21-TB8N8	41.4	14.2	19.1	22.2	11.9	6780 (468)
5/8	0.109	1/4	21-TB10N4	34.8	14.2	14.2	17.5	7.1	5760 (397)
5/8	0.109	1/2	21-TB10N8	41.4	14.2	19.1	22.2	11.9	5760 (397)
3/4	0.120	1/4	21-TB12N4	40.1	19.1	14.2	20.6	7.1	5530 (381)
3/4	0.120	1/2	21-TB12N8	46.2	19.1	19.1	22.2	11.9	5530 (381)
1	0.134	1/4	21-TB16N4	42.9	19.1	14.2	27.0	7.1	4480 (309)
1	0.134	1/2	21-TB16N8	47.8	19.1	19.1	27.0	11.9	4480 (309)

### Metric Tube

### NPT Thread

T-Tube O.D. (mm)	t-Wall Thickness (mm)	P-NPT Size	Basic Ordering Number	Dimension, mm					Working Pressure psig (bar)
				L	B	Bx	F	E	
12	2.2	1/4	21-MTB12N4	34.3	14.2	14.2	14	7.1	6470 (446)
12	2.2	1/2	21-MTB12N8	41.1	14.2	19.1	22	11.9	6470 (446)
14	2.5	1/4	21-MTB14N4	34.3	14.2	14.2	15	7.1	6280 (433)
14	2.5	1/2	21-MTB14N8	41.4	14.2	19.1	22	11.9	6280 (433)
15	2.5	1/4	21-MTB15N4	34.8	14.2	14.2	16	7.1	5770 (398)
16	2.8	1/4	21-MTB16N4	35.6	14.2	14.2	18	7.1	6140 (423)
16	2.8	1/2	21-MTB16N8	41.1	14.2	19.1	22	11.9	6140 (423)
20	3.0	1/2	21-MTB20N8	46.2	19.1	19.1	22	11.9	5110 (352)
22	3.0	1/4	21-MTB22N4	41.2	19.1	14.2	24	7.1	4620 (319)
22	3.0	1/2	21-MTB22N8	46.1	19.1	19.1	24	11.9	4620 (319)
25	3.5	3/4	21-MTB25N12	47.8	19.1	19.1	27	15.7	4730 (326)
25	3.5	1	21-MTB25N16	54.9	19.1	23.9	35	22.4	4730 (326)
28	4.0	1/2	21-MTB28N8	54.2	21.4	19.1	30	11.9	4850 (335)

Female Connectors



Fractional Tube

T-Tube O.D. (in.)	t-Wall Thickness (in.)	P-NPT Size	Basic Ordering Number	Dimension, mm					Working Pressure psig (bar)
				L	B	Bx	F	E	
1/4	0.065	1/4	21-TB4FN4	27.9	9.7	15.0	19.1	3.0	6600 (454)
1/4	0.065	3/8	21-TB4FN6	29.5	9.7	15.0	22.2	3.0	5300 (365)
3/8	0.095	1/4	21-TB6FN4	27.9	9.7	15.0	19.1	4.7	6600 (454)
3/8	0.095	3/8	21-TB6FN6	29.5	9.7	15.0	22.2	4.7	5300 (365)
1/2	0.095	1/4	21-TB8FN4	26.7	14.2	15.0	19.1	7.9	6600 (454)
1/2	0.095	3/8	21-TB8FN6	34.0	14.2	15.0	22.2	7.9	5300 (365)
1/2	0.095	1/2	21-TB8FN8	38.9	14.2	19.8	27.0	7.9	4900 (337)

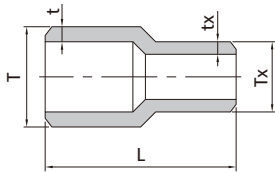
NPT Thread

Metric Tube

T-Tube O.D. (mm)	t-Wall Thickness (mm)	P-NPT Size	Basic Ordering Number	Dimension, mm					Working Pressure psig (bar)
				L	B	Bx	F	E	
14	2.5	1/4	21-MTB14FN4	33.0	14.2	15.0	19	9.0	6280 (433)
14	2.5	1/2	21-MTB14FN8	38.9	14.2	19.8	27	9.0	4900 (337)
20	3.0	1/2	21-MTB20FN8	43.7	19.1	19.8	27	14.0	4900 (337)
28	4.0	1/2	21-MTB28FN8	49.8	23.9	19.8	30	15.7	4850 (335)

NPT Thread

Reducing Unions



Fractional Tube

T-Tube O.D. (in.)	t-Wall Thickness (in.)	Tx-Tube O.D. (in.)	tx-Wall Thickness (in.)	Basic Ordering Number	L (mm)	Working Pressure psig (bar)
3/8	0.095	1/4	0.065	21-TB6TB4	38.1	9930 (685)
1/2	0.095	1/4	0.065	21-TB8TB4	38.1	6780 (468)
1/2	0.095	3/8	0.095	21-TB8TB6	38.1	6780 (468)
3/4	0.120	1/2	0.095	21-TB12TB8	38.1	5530 (381)
1	0.134	3/4	0.120	21-TB16TB12	38.1	4480 (309)

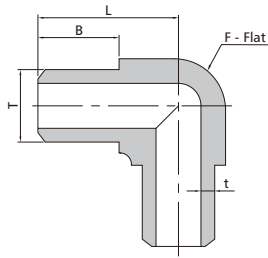
Fractional Tube

Metric Tube

T-Tube O.D. (mm)	t-Wall Thickness (mm)	Tx-Tube O.D. (mm)	tx-Wall Thickness (mm)	Basic Ordering Number	L (mm)	Working Pressure psig (bar)
20	3.0	14	2.5	21-MTB20MTB14	38.1	6470 (445)
22	3.0	14	2.5	21-MTB22MTB14	38.1	5780 (395)
22	3.0	18	2.8	21-MTB22MTB18	38.1	5780 (395)
25	3.5	22	3.0	21-MTB25MTB22	38.1	5780 (395)
38	5.0	25	3.5	21-MTB38MTB25	38.1	5540 (380)

Metric Tube

Union Elbows



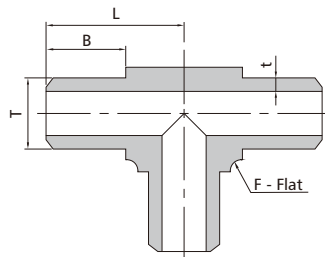
Fractional Tube

T-Tube O.D. (in.)	t-Wall Thickness (in.)	Basic Ordering Number	Dimension, mm			Working Pressure psig (bar)
			L	B	F	
1/4	0.065	22-TB4	16.3	9.7	9.5	10320 (712)
3/8	0.095	22-TB6	18.0	9.7	11.1	9930 (685)
1/2	0.095	22-TB8	24.4	14.2	14.3	6780 (468)
3/4	0.120	22-TB12	33.3	19.1	20.6	5530 (381)
1	0.134	22-TB16	37.1	19.1	27.0	4480 (309)

Metric Tube

T-Tube O.D. (mm)	t-Wall Thickness (mm)	Basic Ordering Number	Dimension, mm			Working Pressure psig (bar)
			L	B	F	
10	2.2	22-MTB10	18.0	9.7	11.1	8160 (563)
14	2.5	22-MTB14	25.4	14.2	15.9	6280 (433)
16	2.8	22-MTB16	26.2	14.2	17.5	6140 (423)
20	3.0	22-MTB20	33.3	19.1	20.6	5110 (352)
22	3.0	22-MTB22	35.3	19.1	23.8	4620 (319)
25	3.5	22-MTB25	37.1	19.1	27.0	4730 (326)

Union Tees



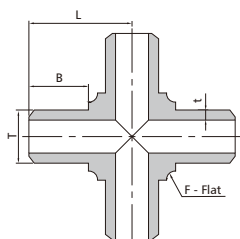
Fractional Tube

T-Tube O.D. (in.)	t-Wall Thickness (in.)	Basic Ordering Number	Dimension, mm			Working Pressure psig (bar)
			L	B	F	
1/4	0.065	22-TB4	16.3	9.7	9.5	10320 (712)
3/8	0.095	22-TB6	18.0	9.7	11.1	9930 (685)
1/2	0.095	22-TB8	24.4	14.2	14.3	6780 (468)
3/4	0.120	22-TB12	33.3	19.1	20.6	5530 (381)
1	0.134	22-TB16	37.1	19.1	27.0	4480 (309)

Metric Tube

T-Tube O.D. (mm)	t-Wall Thickness (mm)	Basic Ordering Number	Dimension, mm			Working Pressure psig (bar)
			L	B	F	
6	1.8	22-MTB6	16.3	9.7	9.5	12660 (873)
8	1.8	22-MTB8	16.3	9.7	9.5	8320 (574)
10	2.2	22-MTB10	18.0	9.7	11.1	8160 (563)
12	2.2	22-MTB12	24.4	14.2	14.3	6470 (446)
14	2.5	22-MTB14	25.4	14.2	15.9	6280 (433)
16	2.8	22-MTB16	26.2	14.2	17.5	6140 (423)
20	3.0	22-MTB20	33.3	19.1	20.6	5110 (352)
22	3.0	22-MTB22	35.3	19.1	23.8	4620 (319)
25	3.5	22-MTB25	37.1	19.1	27.0	4730 (326)
32	4.5	22-MTB32	49.3	23.9	34.9	4730 (326)

Union Crosses



Fractional Tube

T-Tube O.D. (in.)	t-Wall Thick- ness (in.)	Basic Ordering Number	Dimension, mm			Working Pressure psig (bar)
			L	B	F	
1/4	0.065	24-TB4	16.3	9.7	9.5	10320 (712)
3/8	0.095	24-TB6	18.0	9.7	11.1	9930 (685)
1/2	0.095	24-TB8	24.4	14.2	14.3	6780 (468)
3/4	0.120	24-TB12	33.3	19.1	20.6	5530 (381)
1	0.134	24-TB16	37.1	19.1	27.0	4480 (309)

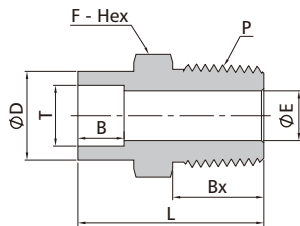
Metric Tube

T-Tube O.D. (mm)	t-Wall Thickness (mm)	Basic Ordering Number	Dimension, mm			Working Pressure psig (bar)
			L	B	F	
6	1.8	24-MTB6	16.3	9.7	9.5	12660 (873)
8	1.8	24-MTB8	16.3	9.7	9.5	8320 (574)
10	2.2	24-MTB10	18.0	9.7	11.1	8160 (563)



# Tube Socket Weld Fittings

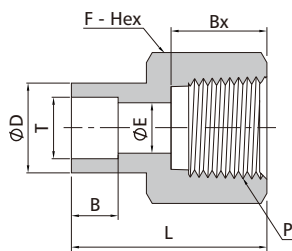
## Male Connectors



Fractional Tube			Dimension, mm							NPT Thread
T-Tube Size (in.)	P-NPT Size	Basic Ordering Number	L	D	B	Bx	F	E	Working Pressure psig (bar)	
1/4	1/4	21-TS4N4	29.2	12.2	7.1	14.2	14.3	4.8	8000 (551)	
3/8	1/4	21-TS6N4	31.8	15.2	7.9	14.2	15.9	7.1	8000 (551)	
3/8	3/8	21-TS6N6	31.8	15.2	7.9	14.2	17.5	7.1	7800 (537)	
3/8	1/2	21-TS6N8	37.3	15.2	7.9	19.1	22.2	7.1	7700 (530)	
1/2	1/4	21-TS8N4	33.3	18.5	9.7	14.2	19.1	7.1	6600 (454)	
1/2	3/8	21-TS8N6	33.3	18.5	9.7	14.2	19.1	9.6	6600 (454)	
1/2	1/2	21-TS8N8	38.9	18.5	9.7	19.1	22.2	10.4	6600 (454)	
3/4	3/4	21-TS12N12	45.1	26.4	11.2	19.1	27.0	15.7	5900 (406)	
1	1	21-TS16N16	53.6	34.5	15.7	23.9	34.9	22.4	5300 (365)	

Metric Tube			Dimension, mm							NPT Thread
T-Tube Size (mm)	P-NPT Size	Basic Ordering Number	L	D	B	Bx	F	E	Working Pressure psig (bar)	
6	1/4	21-MTS6N4	29.2	12.0	7.1	14.2	14	4.8	8000 (551)	
12	1/2	21-MTS12N8	38.9	17.6	9.7	19.1	22	9.5	6820 (470)	
14	1/4	21-MTS14N4	33.3	21.3	10.4	14.2	15	7.1	6930 (478)	
14	3/8	21-MTS14N6	35.0	21.6	10.4	14.2	18	9.6	6930 (478)	
14	1/2	21-MTS14N8	40.0	21.3	10.4	19.1	22	10.4	6930 (478)	
16	1/4	21-MTS16N4	35.0	23.3	10.4	14.2	18	7.1	6190 (426)	
16	1/2	21-MTS16N8	40.0	23.3	10.4	19.1	22	11.9	6190 (426)	
18	1/4	21-MTS18N4	40.4	26.0	11.2	14.2	19	7.1	6050 (417)	
28	3/4	21-MTS28N12	55.5	40.5	18.4	19.1	30	15.7	5040 (348)	
38	1 1/4	21-MTS38N20	68.3	52.5	26.9	23.9	46	28.6	5000 (344)	

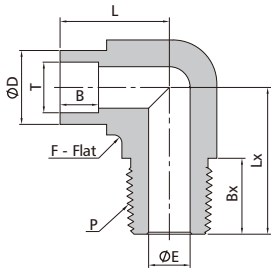
## Female Connectors



Fractional Tube			Dimension, mm							NPT Thread
T-Tube Size (in.)	P-NPT Size	Basic Ordering Number	L	D	B	Bx	F	E	Working Pressure psig (bar)	
1/8	1/8	21-TS2FN2	21.1	7.4	2.5	10.4	14.3	2.3	6500 (447)	
1/4	1/8	21-TS4FN2	26.7	12.2	7.1	10.4	14.3	4.8	6500 (447)	
1/4	1/4	21-TS4FN4	30.0	12.2	7.1	15.0	19.1	4.8	6600 (454)	
3/8	1/4	21-TS6FN4	31.5	15.2	7.9	15.0	19.1	7.1	6600 (454)	
1/2	3/8	21-TS8FN6	34.5	18.5	9.7	15.0	22.2	10.4	5300 (365)	
1/2	1/2	21-TS8FN8	40.4	18.5	9.7	19.8	27.0	10.4	4900 (337)	
3/4	3/4	21-TS12FN12	43.9	26.4	11.2	20.6	33.3	16.0	4600 (316)	
1	1	21-TS16FN16	54.1	34.5	15.7	25.4	41.3	22.4	4400 (303)	

Metric Tube			Dimension, mm							NPT Thread
T-Tube Size (mm)	P-NPT Size	Basic Ordering Number	L	D	B	Bx	F	E	Working Pressure psig (bar)	
8	1/4	21-MTS8FN4	27.0	13.7	7.5	15.0	19	4.8	6600 (454)	
10	1/4	21-MTS10FN4	29.0	19.5	9.5	15.0	19	7.1	6600 (454)	
14	1/4	21-MTS14FN4	32.0	22.1	10.4	15.0	22	9.5	6930 (478)	
28	3/4	21-MTS28FN12	54.1	40.5	18.4	20.6	35	19.8	4600 (316)	

Male Elbows

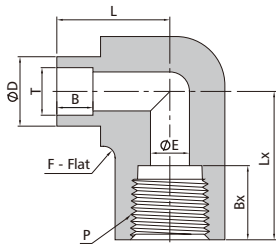


Fractional Tube

T-Tube Size (in.)	P-NPT Size	Basic Ordering Number	Dimension, mm							Working Pressure psig (bar)
			L	Lx	D	B	Bx	F	E	
1/4	1/4	22-TS4N4	20.1	26.7	14.7	7.1	14.2	12.7	4.8	8000 (551)
3/8	1/4	22-TS6N4	26.4	26.7	14.7	7.9	14.2	12.7	7.1	8000 (551)
3/8	3/8	22-TS6N6	24.6	29.7	20.2	7.9	14.2	17.5	7.1	7800 (537)
3/8	1/2	22-TS6N8	25.9	36.8	23.8	7.9	19.1	20.6	7.1	7700 (530)
1/2	1/2	22-TS8N8	27.4	36.8	23.8	9.7	19.1	20.6	10.4	6600 (454)
3/4	3/4	22-TS12N12	38.9	39.6	26.4	11.2	19.1	27.0	15.7	5900 (406)

NPT Thread

Female Elbows

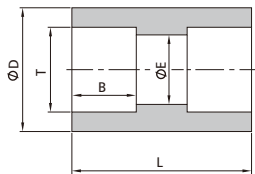


Fractional Tube

T-Tube Size (in.)	P-NPT Size	Basic Ordering Number	Dimension, mm							Working Pressure psig (bar)
			L	Lx	D	B	Bx	F	E	
1/4	1/4	22-TS4FN4	22.9	29.7	20.2	7.1	15.0	17.5	4.8	7400 (509)
3/8	1/4	22-TS6FN4	25.1	29.7	20.2	7.9	15.0	17.5	7.1	7400 (509)
3/8	1/2	22-TS6FN8	28.7	39.6	29.3	7.9	19.8	25.4	7.1	5700 (392)
1/2	1/2	22-TS8FN8	30.2	39.6	29.3	9.7	19.8	25.4	10.4	5700 (392)

NPT Thread

Unions



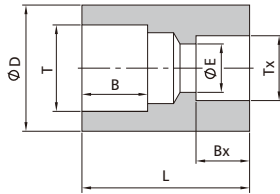
Fractional Tube

T-Tube Size (in.)	Basic Ordering Number	Dimension, mm				Working Pressure psig (bar)
		L	D	B	E	
1/4	21-TS4	19.1	12.2	7.1	4.8	10700 (737)
3/8	21-TS6	22.4	15.2	7.9	7.1	8100 (558)
1/2	21-TS8	26.9	18.5	9.7	10.4	6600 (454)
5/8	21-TS10	30.2	23.4	10.4	12.7	6200 (427)
3/4	21-TS12	33.3	26.4	11.2	16.0	5900 (406)
7/8	21-TS14	35.5	31.5	12.7	18.8	5730 (395)
1	21-TS16	36.6	34.5	15.7	22.4	5600 (385)

Metric Tube

T-Tube Size (mm)	Basic Ordering Number	Dimension, mm				Working Pressure psig (bar)
		L	D	B	E	
8	21-MTS8	22.4	14.3	7.9	6.4	9790 (675)
10	21-MTS10	23.6	16.5	7.9	7.4	8100 (558)
12	21-MTS12	26.9	20.2	9.7	9.5	6820 (470)
14	21-MTS14	28.0	23.8	10.0	10.4	6930 (478)
16	21-MTS16	30.2	23.8	10.4	12.7	6190 (426)
20	21-MTS20	28.0	27.0	11.2	17.0	5510 (380)

Reducing Unions



Fractional Tube

T-Tube Size (in.)	Tx-Tube Size (in.)	Basic Ordering Number	Dimension, mm					Working Pressure psig (bar)
			L	D	B	E	Bx	
3/8	1/4	21-TS6TS4	22.4	15.2	7.9	4.8	7.1	8100 (558)
1/2	1/4	21-TS8TS4	24.3	18.5	9.7	4.8	7.1	6600 (454)
1/2	3/8	21-TS8TS6	26.1	18.5	9.7	7.1	7.9	6600 (454)
3/4	3/8	21-TS12TS6	29.8	26.4	11.2	7.1	7.9	5900 (406)
3/4	1/2	21-TS12TS8	31.6	26.4	11.2	10.4	9.7	5900 (406)
1	3/4	21-TS16TS12	32.1	34.5	15.7	16.0	11.2	5600 (385)

Fractional Tube

Metric Tube

T-Tube Size (mm)	Tx-Tube Size (mm)	Basic Ordering Number	Dimension, mm					Working Pressure psig (bar)
			L	D	B	E	Bx	
14	10	21-MTS14MTS10	26.0	20.0	10.4	7.4	7.9	6930 (478)
25	14	21-MTS25MTS14	30.0	35.0	15.7	10.4	10.0	5450 (376)
25	22	21-MTS25MTS22	35.8	34.5	15.7	19.0	13.5	5450 (376)

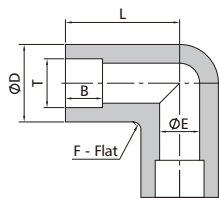
Metric Tube

Metric Tube

T-Tube Size (mm)	Tx-Tube Size (in.)	Basic Ordering Number	Dimension, mm					Working Pressure psig (bar)
			L	D	B	E	Bx	
20	3/4	21-MTS20TS12	28.0	27.0	11.2	15.7	11.2	5510 (380)
28	3/4	21-MTS28TS12	36.8	40.0	20.0	15.7	11.2	5040 (348)

Fractional Tube

Union Elbows



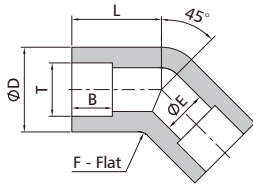
Fractional Tube

T-Tube Size (in.)	Basic Ordering Number	Dimension, mm					Working Pressure psig (bar)
		L	D	B	F	E	
1/8	21-TS2	15.0	11.0	2.5	9.5	2.3	12600 (863)
1/4	21-TS4	21.8	12.8	7.1	11.1	4.8	10700 (737)
3/8	21-TS6	26.4	14.7	7.9	12.7	7.1	8100 (558)
1/2	21-TS8	29.7	20.2	9.7	17.5	10.4	6600 (454)
5/8	21-TS10	36.1	23.8	10.4	20.6	12.7	6200 (427)
3/4	21-TS12	39.6	29.3	11.2	25.4	16.0	5900 (406)
1	21-TS16	48.8	36.7	15.7	31.8	22.4	5600 (385)

Metric Tube

T-Tube Size (mm)	Basic Ordering Number	Dimension, mm					Working Pressure psig (bar)
		L	D	B	F	E	
10	21-MTS10	24.6	16.5	7.9	14.3	7.4	8100 (558)
12	21-MTS12	29.7	20.2	9.7	17.5	9.5	6820 (470)
14	21-MTS14	36.0	23.8	10.0	20.6	10.4	6930 (478)
16	21-MTS16	36.0	23.8	10.4	20.6	12.7	6190 (426)

Union 45° Elbows



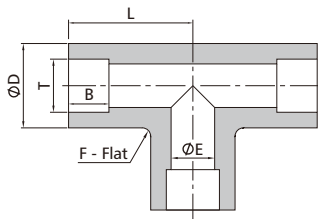
Fractional Tube

T-Tube Size (in.)	Basic Ordering Number	Dimension, mm					Working Pressure psig (bar)
		L	D	B	F	E	
1/4	25-TS4	15.0	14.7	7.1	12.7	4.8	10700 (737)
3/8	25-TS6	19.1	16.5	7.9	14.3	7.1	8100 (558)
1/2	25-TS8	21.3	20.2	9.7	17.5	10.4	6600 (454)
3/4	25-TS12	28.7	29.3	11.2	25.4	16.0	5900 (406)
1	25-TS16	31.8	36.7	15.7	31.8	22.4	5600 (385)

Metric Tube

T-Tube Size (mm)	Basic Ordering Number	Dimensions, mm					Working Pressure psig (bar)
		L	D	B	F	E	
8	25-MTS8	17.3	14.7	7.9	12.7	6.4	9790 (675)
10	25-MTS10	19.1	16.5	7.9	14.3	7.4	8100 (558)
12	25-MTS12	21.3	20.2	9.7	17.5	9.5	6820 (470)
14	25-MTS14	26.4	23.8	10.0	20.6	10.4	6930 (478)
16	25-MTS16	26.4	23.8	10.4	20.6	12.7	6190 (426)
20	25-MTS20	28.7	29.3	11.2	27.0	16.0	5510 (380)
22	25-MTS22	29.7	31.2	13.5	31.8	19.0	6850 (472)
25	25-MTS25	31.8	36.7	15.7	31.8	22.0	5450 (376)

Union Tees



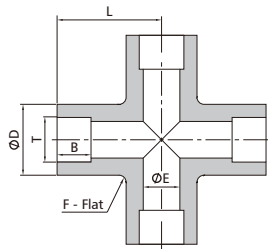
Fractional Tube

T-Tube Size (in.)	Basic Ordering Number	Dimension, mm					Working Pressure psig (bar)
		L	D	B	F	E	
1/8	23-TS2	15.0	12.8	2.5	9.5	2.3	12600 (868)
1/4	23-TS4	21.8	12.8	7.1	11.1	4.8	10700 (737)
3/8	23-TS6	26.4	14.7	7.9	12.7	7.1	8100 (558)
1/2	23-TS8	29.7	20.2	9.7	17.5	10.4	6600 (454)
5/8	23-TS10	36.1	23.8	10.4	20.6	12.7	6200 (428)
3/4	23-TS12	39.6	29.3	11.2	25.4	16.0	5900 (406)
1	23-TS16	48.8	36.7	15.7	31.8	22.4	5600 (385)

Metric Tube

T-Tube Size (mm)	Basic Ordering Number	Dimension, mm					Working Pressure psig (bar)
		L	D	B	F	E	
8	23-MTS8	18.5	14.7	7.9	12.7	6.4	9790 (675)
10	23-MTS10	24.6	16.5	7.9	14.3	7.4	8100 (558)
12	23-MTS12	29.7	20.2	9.7	17.5	9.5	6820 (470)
14	23-MTS14	36.0	23.8	10.0	20.6	10.4	6930 (478)
16	23-MTS16	36.0	23.8	10.4	20.6	12.7	6190 (426)
20	23-MTS20	39.6	29.3	11.2	25.4	17.0	5510 (380)
22	23-MTS22	41.3	31.2	13.5	27.0	19.0	6850 (472)
25	23-MTS25	48.8	36.7	15.7	31.8	22.0	5450 (376)

Union Crosses



Fractional Tube

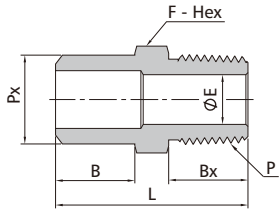
T-Tube Size (in.)	Basic Ordering Number	Dimension, mm					Working Pressure psig (bar)
		L	D	B	F	E	
1/8	24-TS2	15.0	11.0	2.5	9.5	2.3	12600 (863)
1/4	24-TS4	21.8	12.8	7.1	11.1	4.8	10700 (737)
3/8	24-TS6	26.4	14.7	7.9	12.7	7.1	8100 (558)
1/2	24-TS8	29.7	20.2	9.7	17.5	10.4	6600 (454)
5/8	24-TS10	36.1	23.8	10.4	20.6	12.7	6200 (428)
3/4	24-TS12	39.6	29.3	11.2	25.4	16.0	5900 (406)
1	24-TS16	48.8	36.7	15.7	31.8	22.4	5600 (385)

Metric Tube

T-Tube Size (mm)	Basic Ordering Number	Dimension, mm					Working Pressure psig (bar)
		L	D	B	F	E	
8	24-MTS8	18.5	14.7	7.9	12.7	5.9	9790 (675)
10	24-MTS10	24.6	16.5	7.9	14.3	7.1	8100 (558)
12	24-MTS12	29.7	20.2	9.7	17.5	9.5	6820 (470)
14	24-MTS14	36.0	23.8	9.7	20.6	10.4	6930 (478)
16	24-MTS16	36.0	23.8	10.0	20.6	12.7	6190 (426)
20	24-MTS20	39.6	29.3	11.2	25.4	17.0	5510 (380)
22	24-MTS22	41.3	31.2	13.5	27.0	19.0	6850 (472)
25	24-MTS25	48.8	36.7	15.7	31.8	22.0	5450 (376)

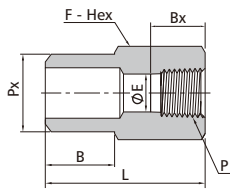
# Pipe Butt Weld Fittings

## Male Connectors



Pipe			Dimension, mm					NPT Thread	Working Pressure psig (bar)
Px-Sch80 Pipe Size	P-NPT Size	Basic Ordering Number	L	B	Bx	F	E		
1/4	1/4	21-PB4N4	34.3	14.2	14.2	14.3	7.1	8000 (551)	
1/4	1/2	21-PB4N8	41.3	14.2	19.1	22.2	7.7	7700 (537)	
3/8	1/4	21-PB6N4	34.8	14.2	14.2	17.5	7.1	6650 (459)	
3/8	1/2	21-PB6N8	41.3	14.2	19.1	22.2	10.7	6650 (459)	
1/2	1/4	21-PB8N4	41.3	19.1	14.2	22.2	7.1	6190 (427)	
1/2	1/2	21-PB8N8	46.2	19.1	19.1	22.2	11.9	6190 (427)	
3/4	1/4	21-PB12N4	42.9	19.1	14.2	27.0	7.1	5040 (348)	
3/4	1/2	21-PB12N8	47.8	19.1	19.1	27.0	11.9	5040 (348)	
1	1/4	21-PB16N4	50.0	23.9	14.2	34.9	7.1	4640 (320)	
1	1/2	21-PB16N8	54.9	23.9	19.1	34.9	11.9	4640 (320)	

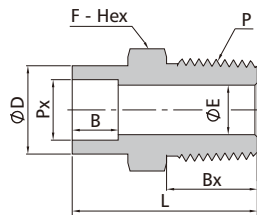
## Female Connectors



Pipe			Dimension, mm					NPT Thread	Working Pressure psig (bar)
Px-Sch80 Pipe Size	P-NPT Size	Basic Ordering Number	L	B	Bx	F	E		
1/4	1/2	21-PB4FN8	38.9	14.2	19.8	27.0	7.6	4900 (337)	
3/8	1/2	21-PB6FN8	38.9	14.2	19.8	27.0	10.7	4900 (337)	
1/2	1/4	21-PB8FN4	37.3	19.1	15.0	22.2	10.4	7500 (516)	
1/2	1/2	21-PB8FN8	43.7	19.1	19.8	27.0	13.9	4900 (337)	

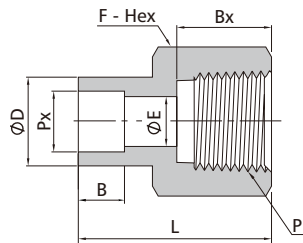
# Pipe Socket Weld Fittings

## Male Connectors



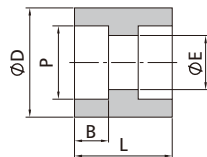
Pipe			Dimension, mm						NPT Thread	Working Pressure psig (bar)
Px-Pipe Size	P-NPT Size	Basic Ordering Number	L	D	B	Bx	F	E		
1/4	1/4	21-PS4N4	35.2	22.4	9.9	14.2	23.8	7.1	8000 (551)	
1/4	1/2	21-PS4N8	40.0	22.4	9.9	19.1	23.8	9.1	7700 (530)	
3/8	3/8	21-PS6N6	38.0	26.2	9.9	14.2	27.0	9.7	7100 (489)	
3/8	1/2	21-PS6N8	42.9	26.2	9.9	19.1	27.0	11.9	7100 (489)	
1/2	3/8	21-PS8N6	40.3	31.8	9.9	14.2	33.3	9.7	6800 (468)	
1/2	1/2	21-PS8N8	45.2	31.8	9.9	19.1	33.3	11.9	6800 (468)	
3/4	1/2	21-PS12N8	54.3	37.3	13.0	19.1	38.1	11.9	5800 (399)	
3/4	3/4	21-PS12N12	54.3	37.3	13.0	19.1	38.1	15.7	5800 (399)	
1	3/4	21-PS16N12	55.8	47.2	13.0	19.1	47.6	15.7	6100 (420)	
1	1	21-PS16N16	60.6	47.2	13.0	23.9	47.6	22.4	5300 (365)	

## Female Connectors



Pipe			Dimension, mm						NPT Thread	Working Pressure psig (bar)
Px-Pipe Size	P-NPT Size	Basic Ordering Number	L	D	B	Bx	F	E		
1/4	1/4	21-PS4FN4	33.5	22.4	9.9	15.0	23.8	9.1	8000 (551)	
1/4	3/8	21-PS4FN6	33.5	22.4	9.9	15.0	23.8	9.1	6790 (463)	
3/8	3/8	21-PS6FN6	34.1	26.2	9.9	15.0	27.0	12.4	7100 (489)	
3/8	1/2	21-PS6FN8	39.1	26.2	9.9	19.8	27.0	12.4	4900 (337)	
1/2	1/2	21-PS8FN8	40.0	31.8	9.9	19.8	33.3	15.7	6800 (468)	
1/2	3/4	21-PS8FN12	40.6	31.8	9.9	20.6	33.3	15.7	4600 (316)	
3/4	3/4	21-PS12FN12	53.2	37.3	13.0	20.6	38.1	20.8	5800 (399)	
3/4	1	21-PS12FN16	58.1	37.3	13.0	25.4	41.3	20.8	4400 (303)	

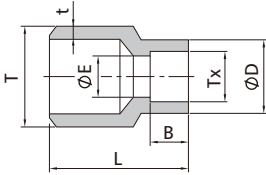
## Unions



Pipe		Dimension, mm				Working Pressure psig (bar)
P-Pipe Size	Basic Ordering Number	L	D	B	E	
1/8	21-PS2	25.7	17.1	9.9	7.0	8230(568)
1/4	21-PS4	26.9	22.4	9.9	9.1	8000(551)
3/8	21-PS6	28.4	26.2	9.9	12.4	7100(489)
1/2	21-PS8	28.4	31.8	9.9	15.7	6800(468)
3/4	21-PS12	44.5	37.3	13.0	20.8	5800(399)
1	21-PS16	44.5	47.2	13.0	26.7	6100(420)

## Weld Adapters

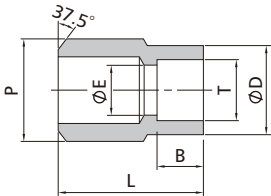
### Tube Butt Weld to Tube Socket Weld



#### Fractional Tube

T-Tube O.D. (in.)	t-Wall Thickness (in.)	Tx-Tube Size (in.)	Basic Ordering Number	Dimension, mm				Working Pressure psig (bar)
				L	B	D	E	
1/4	0.083	1/8	21-TB4TS2	14.2	2.5	8.0	2.3	12600 (868)
3/8	0.095	1/4	21-TB6TS4	19.1	7.1	12.2	4.8	8200 (564)
1/2	0.095	1/4	21-TB8TS4	22.4	7.1	12.7	4.8	7500 (516)
1/2	0.095	3/8	21-TB8TS6	22.4	7.9	15.2	8.3	7500 (516)
3/4	0.120	1/2	21-TB12TS8	28.4	9.7	18.5	10.4	6300 (434)
1	0.134	1/2	21-TB16TS8	35.1	9.7	18.5	10.4	5300 (365)
1	0.134	3/4	21-TB16TS12	38.1	11.2	26.4	16.0	5300 (365)

### Pipe Butt Weld to Tube Socket Weld



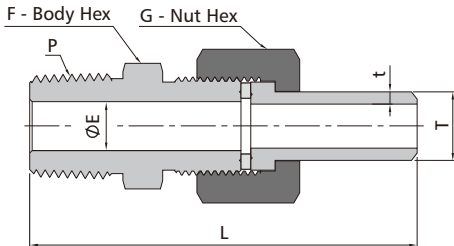
#### Pipe

#### Fractional Tube

P-Sch80 Pipe Size	T-Tube Size (in.)	Basic Ordering Number	Dimension, mm				Working Pressure psig (bar)
			L	B	D	E	
1/4	1/4	21-PB4TS4	22.4	7.1	12.2	4.8	10810 (744)
3/8	1/4	21-PB6TS4	26.2	7.9	12.2	4.8	8500 (586)
3/8	3/8	21-PB6TS6	26.2	7.9	15.2	7.1	8500 (586)
3/8	1/2	21-PB6TS8	25.4	9.7	18.5	10.4	6930 (476)
1/2	1/4	21-PB8TS4	28.4	7.1	12.2	4.8	8190 (563)
1/2	3/8	21-PB8TS6	28.4	7.9	15.2	7.1	8190 (563)
1/2	1/2	21-PB8TS8	30.2	9.7	18.5	10.4	6930 (476)
3/4	1/4	21-PB12TS4	38.1	7.1	12.2	4.8	6930 (476)
3/4	3/8	21-PB12TS6	38.1	7.9	15.2	7.1	6930 (476)
3/4	1/2	21-PB12TS8	38.1	9.7	18.5	10.4	6930 (476)
3/4	3/4	21-PB12TS12	38.1	11.2	26.4	16.0	6190 (483)
1	3/8	21-PB16TS6	35.1	7.9	15.2	7.1	6300 (434)
1	1/2	21-PB16TS8	39.6	11.2	18.5	10.4	6300 (434)

## Pipe to Weld Fittings

### Male Pipe to Tube Butt Weld



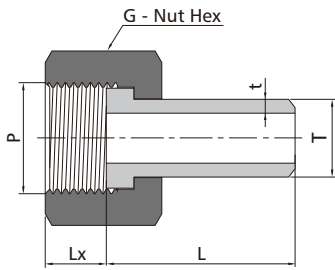
#### NPT Thread

#### Metric Tube

P-NPT Size	T-Tube O.D. (mm)	t-Wall Thickness (mm)	Basic Ordering Number	Dimension, mm				Working Pressure psig (bar)
				L	F	G	E	
1/8	14	2.5	MUW-N2MTB14	69	19	22	4.8	6280 (433)
1/4	6	1.8	MUW-N4MTB6	60	14	14	3	8240 (566)
1/4	8	1.8	MUW-N4MTB8	73.2	14	16	4	8240 (566)
1/4	10	2.2	MUW-N4MTB10	73.2	15	18	6	8160 (563)
1/4	12	2.2	MUW-N4MTB12	73.2	18	22	7	6470 (446)
1/4	14	2.5	MUW-N4MTB14	73.2	19	22	7.1	6280 (433)
1/4	16	2.8	MUW-N4MTB16	73.2	22	25	7.1	6140 (423)
1/4	18	2.8	MUW-N4MTB18	74.2	24	27	7.1	5670 (392)
3/8	14	2.5	MUW-N6MTB14	72.5	19	22	9.7	6280 (433)
1/2	12	2.2	MUW-N8MTB12	78	18	22	7	6470 (446)
1/2	14	2.5	MUW-N8MTB14	78	19	22	9	6280 (433)
1/2	16	2.8	MUW-N8MTB16	78	22	25	10	6140 (423)
1/2	22	3.0	MUW-N8MTB22	82	30	32	11.9	4620 (319)
1/2	25	2.8	MUW-N8MTB25	86	32	35	11.9	4730 (326)
1	25	3.5	MUW-N16MTB25	103	35	35	17	4730 (326)



Pipe to Tube Butt Weld



ISO Parallel Thread

P-ISO Thread Size	T-Tube O.D. (mm)	t-Wall Thickness (mm)	Basic Ordering Number	Dimension, mm			Metric Tube Working Pressure psig (bar)
				L	G	Lx	
1/2	12	2.2	PUW-FG8MTB12	30	27.0	9.2	6470 (446)
1/2	14	2.5	PUW-FG8MTB14	30	27.0	9.2	6280 (433)
1/2	16	2.8	PUW-FG8MTB16	34	27.0	9.2	6140 (423)

Metric Thread

P-Metric Thread Size	T-Tube O.D. (mm)	t-Wall Thickness (mm)	Basic Ordering Number	Dimension, mm			Metric Tube Working Pressure psig (bar)
				L	G	Lx	
M12 x 1.5	6	1.8	PUW-FM12MTB6	25	16	8	12660 (873)
M12 x 1.5	8	1.8	PUW-FM12MTB8	30	16	9	8320 (574)
M14 x 1.5	8	1.8	PUW-FM14MTB8	30	18	9	8320 (574)
M14 x 1.5	10	2.2	PUW-FM14MTB10	30	18	9	8160 (563)
M16 x 1.5	8	1.8	PUW-FM16MTB8	30	22	9	8320 (574)
M16 x 1.5	10	2.2	PUW-FM16MTB10	30	22	9	8160 (563)
M16 x 1.5	12	2.2	PUW-FM16MTB12	34	22	14	6470 (446)
M18 x 1.5	10	2.2	PUW-FM18MTB10	34	22	10	8160 (563)
M18 x 1.5	12	2.2	PUW-FM18MTB12	34	22	10	6470 (446)
M18 x 1.5	14	2.5	PUW-FM18MTB14	34	22	10	6280 (433)
M20 x 1.5	10	2.2	PUW-FM20MTB10	34	25	11	8160 (563)
M20 x 1.5	12	2.2	PUW-FM20MTB12	34	25	11	6470 (446)
M20 x 1.5	14	2.5	PUW-FM20MTB14	34	25	11	6280 (433)
M20 x 1.5	15	2.5	PUW-FM20MTB15	34	25	11	6160 (425)
M20 x 1.5	16	2.8	PUW-FM20MTB16	34	25	11	6140 (423)
M22 x 1.5	14	2.5	PUW-FM22MTB14	34	27	11	6280 (433)
M22 x 1.5	16	2.8	PUW-FM22MTB16	34	27	11	6140 (423)
M24 x 1.5	16	2.8	PUW-FM24MTB16	34	30	11	6140 (423)
M24 x 1.5	18	2.8	PUW-FM24MTB18	34	30	11	5670 (392)
M24 x 1.5	20	3.0	PUW-FM24MTB20	34	30	11	5110 (352)
M27 x 2	14	2.5	PUW-FM27MTB14	34	32	14	6280 (433)
M27 x 2	16	2.8	PUW-FM27MTB16	34	32	14	6140 (423)
M27 x 2	18	2.8	PUW-FM27MTB18	34	32	14	5670 (392)
M27 x 2	20	3.0	PUW-FM27MTB20	40	32	14	5110 (352)
M27 x 2	22	3.0	PUW-FM27MTB22	40	32	14	4620 (319)
M30 x 2	22	3.0	PUW-FM30MTB22	40	35	18	4620 (319)
M30 x 2	25	3.5	PUW-FM30MTB25	45	35	18	4730 (326)
M33 x 2	28	4.0	PUW-FM33MTB28	45	41	18	5160 (356)
M36 x 2	30	4.0	PUW-FM36MTB30	45	41	18	4760 (328)

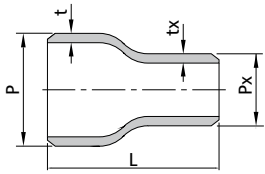
# Factory-made Wrought Buttwelding Fittings

## F Series

1. Comply with ASME B16.9.
2. Sizes range from NPS 1/2 to NPS 2.
3. 316L stainless steel material is standard, other materials are available upon request.
4. Wall thickness listed is Sch10S, other wall thickness are available upon request.

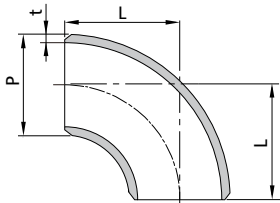


### Reducers



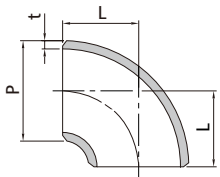
P-NPS	t-Wall Thickness (in.)	P <sub>x</sub> -NPS	t <sub>x</sub> -Wall Thickness (in.)	Basic Ordering Number	Dimension, mm		Working Pressure psig(bar)
					L		
3/4	0.083	3/8	0.065	214-PB12PB6	38.0		2540 (175)
3/4	0.083	1/2	0.083	214-PB12PB8	38.0		2540 (175)
1	0.109	1/2	0.083	214-PB16PB8	38.0		2710 (187)
1	0.109	3/4	0.083	214-PB16PB12	38.0		2540 (175)
1 1/2	0.109	1/2	0.083	214-PB24PB8	64.0		1830 (126)
1 1/2	0.109	3/4	0.083	214-PB24PB12	64.0		1830 (126)
1 1/2	0.109	1	0.109	214-PB24PB16	64.0		1830 (126)
2	0.109	1/2	0.083	214-PB32PB8	76.0		1450 (100)
2	0.109	3/4	0.083	214-PB32PB12	76.0		1450 (100)
2	0.109	1	0.109	214-PB32PB16	76.0		1450 (100)
2	0.109	1 1/2	0.109	214-PB32PB24	76.0		1450 (100)

### 90° Long Radius Elbows



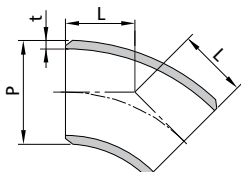
P-NPS	t-Wall Thickness (in.)	Basic Ordering Number	Dimension, mm		Working Pressure psig(bar)
			L	J	
1/2	0.083	224-PB8	38.0		3260 (225)
3/4	0.083	224-PB12	38.0		2540 (175)
1	0.109	224-PB16	38.0		2710 (187)
1 1/2	0.109	224-PB24	57.0		1830 (126)
2	0.109	224-PB32	76.0		1450 (100)

### 90° Short Radius Elbows



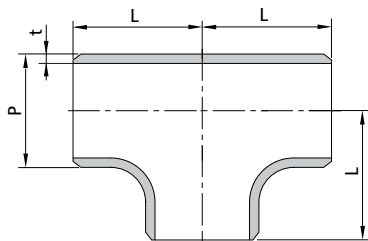
P-NPS	t-Wall Thickness (in.)	Basic Ordering Number	Dimension, mm		Working Pressure psig(bar)
			L	J	
1	0.109	224-PB16-SR	25.0		2710 (187)
1 1/2	0.109	224-PB24-SR	38.0		1830 (126)
1	0.109	224-PB32-SR	51.0		1450 (100)

### 45° Elbows



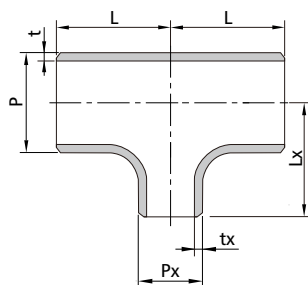
P-NPS	t-Wall Thickness (in.)	Basic Ordering Number	Dimension, mm		Working Pressure bar (psig)
			L	J	
1/2	0.083	254-PB8	16.0		3260 (225)
3/4	0.083	254-PB12	19.0		2540 (175)
1	0.109	254-PB16	22.0		2710 (187)
1 1/2	0.109	254-PB24	29.0		1830 (126)
2	0.109	254-PB32	35.0		1450 (100)

### Straight Tees



P-NPS	t-Wall Thickness (in.)	Basic Ordering Number	Dimension, mm		Working Pressure psig(bar)
			L		
1/2	0.083	234-PB8	25.0		3260 (225)
3/4	0.083	234-PB12	29.0		2540 (175)
1	0.109	234-PB16	38.0		2710 (187)
1 1/2	0.109	234-PB24	57.0		1830 (126)
2	0.109	234-PB32	64.0		1450 (100)

### Reducing Tees



P-NPS	t-Wall Thickness (in.)	Px-NPS	tx-Wall Thickness (in.)	Basic Ordering Number	Dimension, mm		Working Pressure psig(bar)
					L	Lx	
1/2	0.083	1/4	0.065	234-PB8PB8PB4	25.0	25.0	3260 (225)
1/2	0.083	3/8	0.065	234-PB8PB8PB6	25.0	25.0	3190 (220)
3/4	0.083	3/8	0.065	234-PB12PB12PB6	29.0	29.0	2540 (175)
3/4	0.083	1/2	0.083	234-PB12PB12PB8	29.0	29.0	2540 (175)
1	0.109	1/2	0.083	234-PB16PB16PB8	38.0	38.0	2710 (187)
1	0.109	3/4	0.083	234-PB16PB16PB12	38.0	38.0	2580 (178)
1 1/2	0.109	1/2	0.083	234-PB24PB24PB8	57.0	57.0	1830 (126)
1 1/2	0.109	3/4	0.083	234-PB24PB24PB12	57.0	57.0	1830 (126)
1 1/2	0.109	1	0.109	234-PB24PB24PB16	57.0	57.0	1830 (126)
2	0.109	3/4	0.083	234-PB32PB32PB12	64.0	44.0	1450 (100)
2	0.109	1	0.109	234-PB32PB32PB16	64.0	51.0	1450 (100)
2	0.109	1 1/2	0.109	234-PB32PB32PB24	64.0	60.0	1450 (100)

### Ordering Information - F Series

- ⦿ Add the material designator (6L, SS or S4 etc.) as a prefix, wall thickness designator (-5S, -40S, or -80S etc.) as a suffix to the basic ordering number to get the complete ordering number. Example: SS214-PB12-40S.
- ⦿ When the wall thickness is Sch 10S, no suffix is required.
- ⦿ To order fittings with special cleaning and packaging (VK-02), following ASTM G93 C standard, add -J2 as a suffix to the ordering number. Example: SS234-PB32-40S-J2.



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