

# Ductile Iron Grooved Fittings and Couplings

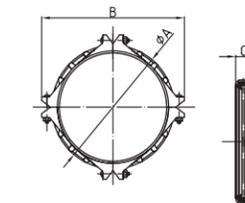
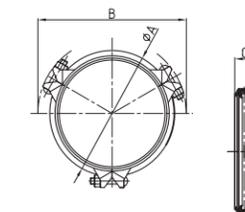
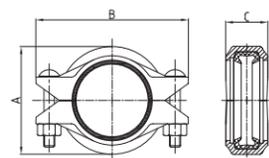
Material: ASTM A536, GRADE 65-45-12, QT450-10  
 Threads: ASME B1.20.1, ISO 7-1, GB 7306  
 Size Available: 1"-24"

Surface Treatment:  
 P: Painted E: Electroplated  
 B: Black S: Epoxy G: Hot-dip Galvanized

 <b>1N</b> Standard Flexible Coupling	 <b>1N</b> Standard Flexible Coupling	 <b>1N</b> Standard Reducing Flexible Coupling	 <b>1NS</b> Light-duty Flexible Coupling	 <b>1NH</b> Heavy-duty Flexible Coupling	 <b>3L</b> U-Bolt Mechanical Tee	 <b>3G</b> Mechanical Tee Grooved Outlet	 <b>3GS</b> Light-duty Mechanical Tee Grooved Outlet	 <b>3J</b> Mechanical Tee Threaded Outlet	 <b>3JS</b> Light-duty Mechanical Tee Threaded Outlet
 <b>1G</b> Standard Rigid Coupling	 <b>1GS</b> Light-duty Rigid Coupling	 <b>1GK</b> Angle Pad Coupling	 <b>H305</b> HDPE Coupling	 <b>H307</b> HDPE Transition Coupling	 <b>4G</b> Mechanical Cross Grooved Outlet	 <b>4GS</b> Light-duty Mechanical Cross Grooved Outlet	 <b>4J</b> Mechanical Cross Threaded Outlet	 <b>4JS</b> Light-duty Mechanical Cross Threaded Outlet	 <b>230</b> Grooved Eccentric Reducer
 <b>90</b> 90° Elbow	 <b>90R</b> 90° Reducing Elbow	 <b>90S</b> Light-duty 90° Elbow	 <b>105</b> 11.25° Elbow	 <b>110</b> 22.5° Elbow	 <b>230N</b> Grooved Eccentric Reducer with Female Thread	 <b>240</b> Grooved Concentric Reducer	 <b>240N</b> Grooved Concentric Reducer with Female Thread	 <b>240W</b> Grooved Concentric Reducer with Male Thread	 <b>300</b> Cap
 <b>120</b> 45° Elbow	 <b>130</b> Tee	 <b>130S</b> Light-duty Tee	 <b>130R</b> Reducing Tee	 <b>130R</b> Reducing Tee	 <b>300</b> Cap with Concentric Hole	 <b>300PX</b> Cap with Eccentric Hole	 <b>321</b> Grooved Flange	 <b>321G</b> Adaptor Flange	
 <b>131R</b> Reducing Tee with Female Thread	 <b>131R</b> Reducing Tee with Female Thread	 <b>180</b> Cross	 <b>180R</b> Reducing Cross	 <b>181</b> Reducing Cross with Female Thread	 <b>Red</b>	 <b>Orange</b>	 <b>Galvanized</b>	 <b>White</b>	 <b>Blue</b>

# 1N

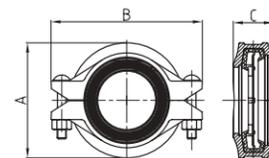
## Standard Flexible Coupling



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Max. End Load kN/Lbs	Pipe End Separation mm/in	Dimensions			Bolt Size No.-Size mm	Certificate
					A mm/in	B mm/in	C mm/in		
25 1	33.7 1.327	500 3.45	3.0/680	0-1.6 0-0.06	55 2.16	92 3.62	42 1.65	2-3/8X55 2-M10X57	UL FM VdS LPCB
32 1 1/4	42.4 1.669	300 2.07	2.9/650	0-1.6 0-0.06	65 2.56	104 4.14	44 1.74	2-3/8X55 2-M10X57	UL FM VdS LPCB
40 1 1/2	48.3 1.900	300 2.07	3.8/850	0-3.2 0-0.13	70 2.75	110 4.33	44 1.74	2-3/8X55 2-M10X57	UL FM VdS LPCB
50 2	60.3 2.375	300 2.07	5.9/1330	0-3.2 0-0.13	83 3.27	125 4.92	44 1.74	2-3/8X55 2-M10X57	UL FM VdS LPCB
65 2 1/2	73.0 2.875	300 2.07	8.7/1950	0-3.2 0-0.13	96 3.78	143 5.63	45 1.78	2-3/8X55 2-M10X57	UL FM LPCB
65 2 1/2	76.1 3.000	300 2.07	9.4/2120	0-3.2 0-0.13	100 3.94	145 5.71	45 1.78	2-3/8X55 2-M10X57	UL FM VdS LPCB
80 3	88.9 3.500	300 2.07	12.8/2885	0-3.2 0-0.13	115 4.53	160 6.30	45 1.78	2-1/2X70 2-M12X70	UL FM VdS LPCB
100 4	108.0 4.250	500 3.45	31.5/7100	0-3.2 0-0.13	138 5.43	190 7.48	50 1.97	2-1/2X70 2-M12X70	UL FM LPCB
100 4	114.3 4.500	300 2.07	21.2/4770	0-3.2 0-0.13	145 5.71	198 7.80	50 1.97	2-1/2X70 2-M12X70	UL FM VdS LPCB
125 5	133 5.250	300 2.07	28.7/6460	0-3.2 0-0.13	162 6.38	225 8.86	51.0 2.01	2-5/8X80 2-M16X85	UL FM LPCB
125 5	139.7 5.500	450 3.10	47.5/10680	0-3.2 0-0.13	169 6.65	230 9.06	52 2.05	2-5/8X80 2-M16X85	UL FM VdS LPCB
125 5	141.3 5.563	300 2.07	32.4/7290	0-3.2 0-0.13	170 6.69	232 9.13	51 2.01	2-5/8X80 2-M16X85	UL FM LPCB
150 6	159.0 6.250	300 2.07	41.0/9240	0-3.2 0-0.13	190 7.48	256 10.08	52 2.05	2-5/8X85 2-M16X85	UL FM LPCB
150 6	165.1 6.500	300 2.07	44.3/9960	0-3.2 0-0.13	196 7.72	260 10.24	52 2.05	2-5/8X85 2-M16X85	UL FM LPCB
150 6	168.3 6.625	300 2.07	46.0/10340	0-3.2 0-0.13	200 7.87	265 10.43	52 2.05	2-5/8X85 2-M16X85	UL FM VdS LPCB
200 8	219.1 8.625	450 3.10	116.9/26280	0-3.2 0-0.13	258 10.24	350 13.78	60 2.37	2-3/4X115 2-M20X115	UL FM VdS LPCB
250 10	273.0 10.750	300 2.07	121.0/27210	0-3.2 0-0.13	337 13.27	406 16.00	65 2.56	2-7/8X140 2-M22X140	UL FM VdS
300 12	323.9 12.750	300 2.07	170.3/38280	0-3.2 0-0.13	378 14.96	465 18.31	65 2.56	2-7/8X140 2-M22X140	UL FM
350 14	355.6 14.000	300 2.07	205.5/46220	0-3.2 0-0.13	402 15.83	493 19.41	72 2.83	3-7/8X140 3-M22X140	—
400 16	406.4 16.000	300 2.07	268.4/60370	0-3.2 0-0.13	458 18.03	547 21.54	72 2.85	3-7/8X140 3-M22X140	—
450 18	457.2 18.000	300 2.07	262.5/59060	0-3.2 0-0.13	505 19.88	598 23.54	78 3.07	3-7/8X140 3-M22X140	—
500 20	508.0 20.000	300 2.07	324.1/72910	0-3.2 0-0.13	550 21.65	648 25.51	78 3.07	4-7/8X140 4-M22X140	—
600 24	609.6 24.000	300 2.07	466.7/104990	0-3.2 0-0.13	660 25.98	760 29.92	78 3.07	4-1X140	—

# 1N

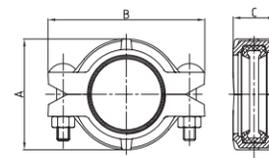
## Standard Reducing Flexible Coupling



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Max. End Load kN/Lbs	Pipe End Separation mm/in	Dimensions			Bolt Size No.-Size mm	Certificate
					A mm/in	B mm/in	C mm/in		
50X40 2X1 1/2	60.3X48.3 2.375X1.900	300 2.07	5.9/1330	0-3.2 0-0.13	86 3.39	125 4.93	44 1.74	2-3/8X55 2-M10X57	UL FM LPCB
65 x 25 2 1/2 x 1	73.0X33.7 2.875 x 1.327	300 2.07	8.7/1950	0-3.2 0-0.13	100 3.94	138 5.44	45 1.78	2-3/8X55 2-M10X57	UL FM
65 x 50 2 1/2 x 2	73.0X60.3 2.875 x 2.375	300 2.07	8.7/1950	0-3.2 0-0.13	100 3.94	138 5.43	45 1.78	2-3/8X55 2-M10X57	UL FM LPCB
65 x 25 2 1/2 x 1	76.1X33.7 3.000 x 1.327	300 2.07	9.4/2120	0-3.2 0-0.13	102 4.02	140 5.51	45 1.78	2-3/8X55 2-M10X57	UL FM
65 x 40 2 1/2 x 1 1/2	76.1X48.3 3.000 x 1.900	300 2.07	9.4/2120	0-3.2 0-0.13	102 4.02	140 5.51	45 1.78	2-3/8X55 2-M10X57	UL FM LPCB
65 x 50 2 1/2 x 2	76.1X60.3 2.875 x 2.375	300 2.07	9.4/2120	0-3.2 0-0.13	102 4.02	144 5.67	45 1.78	2-3/8X55 2-M10X57	UL FM VdS LPCB
80 x 25 3 x 1	88.9X33.7 3.500 x 1.327	300 2.07	12.8/2885	0-3.2 0-0.13	115 4.53	168 6.61	46 1.81	2-1/2X70 2-M12X70	UL FM
80 x 50 3 x 2	88.9X60.3 3.500 x 2.375	300 2.07	12.8/2885	0-3.2 0-0.13	115 4.53	168 6.61	46 1.81	2-1/2X70 2-M12X70	UL FM VdS LPCB
80 x 65 3 x 2 1/2	88.9X73.0 3.500 x 2.875	300 2.07	12.8/2885	0-3.2 0-0.13	115 4.53	168 6.61	46 1.81	2-1/2X70 2-M12X70	UL FM LPCB
80 x 65 3 x 2 1/2	88.9X76.1 3.500 x 3.000	300 2.07	12.8/2885	0-3.2 0-0.13	115 4.53	172 6.77	46 1.81	2-1/2X70 2-M12X70	UL FM VdS LPCB
100 x 25 4 x 1	114.3 x 33.7 4.500 x 1.327	300 2.07	21.2/4770	0-3.2 0-0.13	144 5.67	198 7.80	50 1.97	2-1/2X70 2-M12X70	UL FM
100 x 50 4 x 2	114.3 x 60.3 4.500 x 2.375	300 2.07	21.2/4770	0-3.2 0-0.13	144 5.67	198 7.80	50 1.97	2-1/2X70 2-M12X70	UL FM VdS LPCB
100 x 65 4 x 2 1/2	114.3 x 73.0 4.500 x 2.875	300 2.07	21.2/4770	0-3.2 0-0.13	144 5.67	198 7.80	50 1.97	2-1/2X70 2-M12X70	UL FM LPCB
100 x 65 4 x 2 1/2	114.3 x 76.1 4.500 x 3.000	300 2.07	21.2/4770	0-3.2 0-0.13	144 5.67	202 7.95	50 1.97	2-1/2X70 2-M12X70	UL FM VdS LPCB
100 x 80 4 x 3	114.3 x 88.9 4.500 x 3.500	300 2.07	21.2/4770	0-3.2 0-0.13	148 5.83	198 7.80	50 1.97	2-1/2X70 2-M12X70	UL FM VdS LPCB
150 X 80 6X3	165.1 X 88.9 6.500 x 3.500	300 2.07	44.3/9960	0-3.2 0-0.13	200 7.87	260 10.24	51 2.01	2-3/4X115 2-M20X115	—
150 x 100 6 x 4	165.1 x 114.3 6.500 x 4.500	300 2.07	44.3/9960	0-3.2 0-0.13	197 7.75	260 10.24	51 2.01	2-5/8X85 2-M16X85	UL FM LPCB
150 x 80 6 x 3	168.3 x 88.9 6.625 x 3.500	300 2.07	46.0/10340	0-3.2 0-0.13	200 7.87	268 10.55	51 2.01	2-5/8X85 2-M16X85	UL FM
150 x 100 6 x 4	168.3 x 114.3 6.625 x 4.500	300 2.07	46.0/10340	0-3.2 0-0.13	202.5 7.97	268 10.55	52.5 2.07	2-5/8X85 2-M16X85	UL FM VdS LPCB
200 x 150 8 x 6	219.1 x 165.1 8.625 x 6.500	300 2.07	77.8/17500	0-3.2 0-0.13	257 10.12	335 13.19	60 2.36	2-3/4X115 2-M20X115	UL FM LPCB
200 x 150 8 x 6	219.1 x 168.3 8.625 x 6.625	300 2.07	77.8/17500	0-3.2 0-0.13	260 10.24	338 13.31	60 2.36	2-3/4X115 2-M20X115	UL FM LPCB

# 1NH

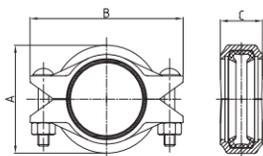
## Heavy-duty Flexible Coupling



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Max. End Load kN/Lbs	Pipe End Separation mm/in	Dimensions			Bolt Size No.-Size mm	Certificate
					A mm/in	B mm/in	C mm/in		
50 2	60.3 2.375	500 3.45	9.8/2210	0-3.2 0-0.13	90 3.54	134 5.28	45 1.77	2-1/2X75 2-M12X75	UL FM
65 2 1/2	73.0 2.875	500 3.45	14.4/3240	0-3.2 0-0.13	100 3.94	150 5.91	45 1.77	2-1/2X75 2-M12X75	UL FM
65 2 1/2	76.1 3.000	500 3.45	15.7/3530	0-3.2 0-0.13	102 4.02	154 6.06	45 1.77	2-1/2X75 2-M12X75	UL FM
80 3	88.9 3.500	500 3.45	21.4/4800	0-3.2 0-0.13	121 4.76	172 6.78	45 1.77	2-1/2X75 2-M12X75	UL FM
100 4	114.3 4.500	500 3.45	35.4/7950	0-3.2 0-0.13	151 5.95	214 8.43	50 1.97	2-5/8X85 2-M16X85	UL FM
125 5	141.3 5.563	500 3.45	54.0/12160	0-3.2 0-0.13	180 7.09	248 9.76	51 2.00	2-3/4X115 2-M20X115	UL FM
150 6	165.1 6.500	500 3.45	73.8/16610	0-3.2 0-0.13	205 8.07	278 10.95	51 2.00	2-3/4X115 2-M20X115	UL FM
150 6	168.3 6.625	500 3.45	76.7/17250	0-3.2 0-0.13	208 8.20	284 11.18	51 2.00	2-3/4X115 2-M20X115	UL FM
200 8	219.1 8.625	500 3.45	130/29240	0-3.2 0-0.13	268 10.56	354 13.94	61 2.40	2-7/8X140 2-M22X140	UL FM

# 1NS

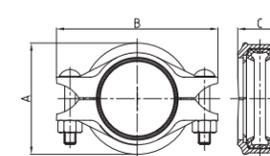
Light-duty Flexible Coupling



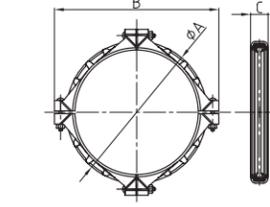
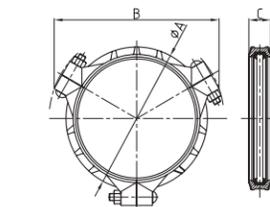
Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Max. End Load kN/Lbs	Pipe End Separation mm/in	Dimensions			Bolt Size No.-Size mm	Certificate
					A mm/in	B mm/in	C mm/in		
100 4	114.3 4.500	300 2.07	21.2/4770	0-3.2 0-0.13	139 5.47	182 7.16	50 1.97	2-3/8X55 2-M10X57	UL FM
125 5	139.7 5.500	450 3.10	47.5/10680	0-3.2 0-0.13	168 6.61	228 8.98	51 2.01	2-5/8X80 2-M16X85	UL FM
165 6	165.1 6.500	300 2.07	44.3/9960	0-3.2 0-0.13	192 7.56	244 9.61	51 2.01	2-1/2X75 2-M12X76	UL FM
165 6	168.3 6.625	300 2.07	46.0/10340	0-3.2 0-0.13	200 7.87	266 10.47	52 2.05	2-5/8X85 2-M16X85	UL FM
250 10	273.0 10.750	300 2.07	121.0/27210	0-3.2 0-0.13	320 12.60	398.0 15.67	64 2.52	2-3/4X120 2-M20X115	UL FM

# 1G

Standard Rigid Coupling

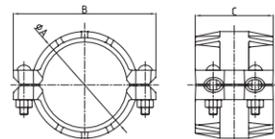


Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Max. End Load kN/Lbs	Pipe End Separation mm/in	Dimensions			Bolt Size No.-Size mm	Certificate
					A mm/in	B mm/in	C mm/in		
25 1	33.7 1.327	500 3.45	3.0/680	0-1.6 0-0.06	59 2.33	100 3.94	44 1.74	2-3/8X55 2-M10X57	UL FM VdS LPCB
32 1 1/4	42.4 1.669	500 3.45	4.8/1080	0-1.6 0-0.06	66 2.60	109.5 4.31	45 1.78	2-3/8X55 2-M10X57	UL FM VdS LPCB
40 1 1/2	48.3 1.900	500 3.45	6.3/1420	0-3.2 0-0.13	72 2.84	115 4.53	45 1.78	2-3/8X55 2-M10X57	UL FM VdS LPCB
50 2	60.3 2.375	300 2.07	5.9/1330	0-3.2 0-0.13	85 3.35	131 5.16	45 1.78	2-3/8X55 2-M10X57	UL FM VdS LPCB
65 2 1/2	73.0 2.875	500 3.45	14.4/3240	0-3.2 0-0.13	98 3.86	145 5.71	45 1.78	2-3/8X55 2-M10X57	UL FM LPCB
65 2 1/2	76.1 3.000	300 2.07	9.4/2120	0-3.2 0-0.13	101 3.98	147 5.78	45 1.77	2-3/8X55 2-M10X57	UL FM VdS LPCB
80 3	88.9 3.500	300 2.07	12.8/2885	0-3.2 0-0.13	115.0 4.53	170 6.69	46 1.82	2-1/2X70 2-M12X70	UL FM VdS LPCB
100 4	108.0 4.250	500 3.45	31.5/7100	0-3.2 0-0.13	140 5.51	197 7.76	52 2.05	2-1/2X70 2-M12X70	UL FM LPCB
100 4	114.3 4.500	300 2.07	21.2/4770	0-3.2 0-0.13	146 5.75	200 7.88	52 2.05	2-1/2X70 2-M12X70	UL FM VdS LPCB
125 5	133 5.250	300 2.07	28.7/6460	0-3.2 0-0.13	165 6.50	232 9.13	52 2.05	2-5/8X85 2-M16X85	UL FM LPCB
125 5	139.7 5.500	450 3.10	47.5/10680	0-3.2 0-0.13	170 6.69	238 9.37	52 2.05	2-5/8X85 2-M16X85	UL FM VdS LPCB
125 5	141.3 5.563	300 2.07	32.4/7290	0-3.2 0-0.13	172 6.77	236.5 9.31	52 2.05	2-5/8X85 2-M16X85	UL FM LPCB
150 6	159.0 6.250	300 2.07	41.0/9240	0-3.2 0-0.13	190 7.48	258 10.16	52 2.05	2-5/8X85 2-M16X85	UL FM LPCB
150 6	165.1 6.500	300 2.07	44.3/9960	0-3.2 0-0.13	198 7.80	266 10.47	52 2.05	2-5/8X85 2-M16X85	UL FM LPCB
150 6	168.3 6.625	300 2.07	46.0/10340	0-3.2 0-0.13	202.0 7.95	270 10.63	52 2.05	2-5/8X85 2-M16X85	UL FM VdS LPCB
200 8	219.1 8.625	450 3.10	116.9/26280	0-3.2 0-0.13	260.0 10.24	346 13.625	62 2.44	2-3/4X115 2-M20X115	UL FM VdS LPCB
250A 10	267.4 10.528	300 2.07	116/26130	0-3.2 0-0.13	318 12.52	396 15.60	63 2.48	2-3/4X120 2-M20X115	UL FM
250 10	273.0 10.750	300 2.07	121.0/27210	0-3.2 0-0.13	327 12.88	420 16.54	63 2.48	2-7/8X125 2-M22X125	UL FM VdS
300A 12	318.5 12.539	300 2.07	164.8/37080	0-3.2 0-0.13	364 14.33	456 17.95	63 2.48	2-7/8X140 2-M22X140	UL FM
300 12	323.9 12.750	300 2.07	170.3/38280	0-3.2 0-0.13	378 14.88	466 18.35	63 2.48	2-7/8X140 2-M22X140	UL FM
350 14	355.6 14.000	300 2.07	205.5/46220	0-3.2 0-0.13	415 16.34	510 20.08	72 2.84	3-7/8X140 3-M22X140	UL FM
400 16	406.4 16.000	300 2.07	268.4/60370	0-3.2 0-0.13	468 18.43	575 22.64	72 2.84	3-7/8X140 3-M22X140	UL FM
450 18	457.2 18.000	225 1.6	262.5/59060	0-3.2 0-0.13	508 20	608 23.94	78 3.07	3-7/8X140 3-M22X140	—
500 20	508.0 20.0	225 1.6	324.1/72910	0-3.2 0-0.13	563 22.17	660 25.98	78 3.07	4-7/8X140 4-M22X140	—
600 24	609.6 24.000	225 1.6	466.7/104990	0-3.2 0-0.13	668 26.30	772 30.40	78 3.07	4-1X140	—



# H305

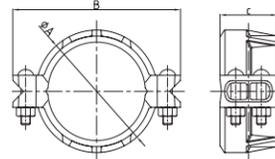
HDPE Coupling



Nominal Size mm/in	Pipe O.D mm/in	Dimensions			Bolt Size No.-Size mm
		A mm/in	B mm/in	C mm/in	
50 2	60.3 2.375	86.5 3.406	133 5.24	116 4.567	4-1/2X70
80 3	88.9 3.5	118 4.65	165 6.5	165 4.567	4-1/2X75
100 4	114.3 4.5	148 5.827	202 7.953	146 5.75	4-1/2X75
150 6	168.3 6.625	203 7.99	273 10.75	149 5.87	4-5/8X85
200 8	219.1 8.625	263 10.35	333 13.11	152 5.98	4-5/8X85
250 10	273.0 10.75	321 12.65	399 15.709	165 6.496	4-3/4X120
300 12	323.9 12.75	372 14.656	452 17.795	185 7.28	4-3/4X120

# H307

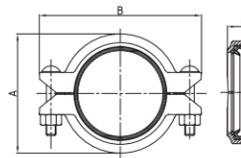
HDPE Transition Coupling



Nominal Size mm/in	Pipe O.D mm/in	Dimensions			Bolt Size No.-Size mm
		A mm/in	B mm/in	C mm/in	
50 2	60.3 2.375	86.5 3.406	147 5.787	79 3.11	4-1/2X70
80 3	88.9 3.5	116 4.567	176 6.929	79 3.11	4-1/2X75
100 4	114.3 4.5	148 5.827	209 8.228	95 3.75	4-1/2X75
150 6	168.3 6.625	202 7.95	280 11.02	95 3.74	4-5/8X85
200 8	219.1 8.625	264 10.39	342 13.46	107.5 4.23	4-5/8X85
250 10	273.0 10.75	321 12.65	424 16.693	127 5	4-3/4X120
300 12	323.9 12.75	372 14.656	483 19.016	127 5	4-3/4X120

# 1GS

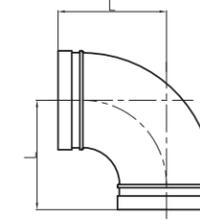
Light-duty  
Rigid Coupling



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Max. End Load kN/Lbs	Pipe End Separation mm/in	Dimensions			Bolt Size No.-Size mm	Certificate
					A mm/in	B mm/in	C mm/in		
80 3	88.9 3.500	300 2.07	12.8/2885	0-3.2 0-0.13	114 4.50	160 6.30	45 1.78	2-3/8X55 2-M10X57	UL FM VdS LPCB
100 4	108.0 4.250	300 2.07	18.9/4260	0-3.2 0-0.13	135 5.30	185 7.28	50 1.97	2-1/2X70 2-M12X70	UL FM LPCB
100 4	114.3 4.500	300 2.07	21.2/4770	0-3.2 0-0.13	140 5.51	192 7.56	50 1.97	2-1/2X70 2-M12X70	UL FM VdS LPCB
125 5	139.7 5.500	300 2.07	31.7/7130	0-3.2 0-0.13	168 6.62	225 8.86	50 1.97	2-1/2X75 2-M12X76	UL FM LPCB
125 5	141.3 5.563	300 2.07	32.4/7290	0-3.2 0-0.13	170 6.69	225 8.86	50 1.97	2-1/2X75 2-M12X76	UL FM LPCB
150 6	159.0 6.250	300 2.07	41.0/9240	0-3.2 0-0.13	190 7.48	252 9.92	50 1.97	2-5/8X80 2-M16X85	UL FM LPCB
150 6	165.1 6.500	300 2.07	44.3/9960	0-3.2 0-0.13	195 7.68	250 9.84	50 1.97	2-1/2X75 2-M12X76	UL FM LPCB
150 6	168.3 6.625	300 2.07	46.0/10340	0-3.2 0-0.13	200 7.87	255 10.04	50 1.97	2-1/2X75 2-M12X76	UL FM LPCB
200A 8	216.3 8.516	300 2.07	76.0/17100	0-3.2 0-0.13	255 10.04	320 12.60	58 2.28	2-5/8X85 2-M16X85	UL FM
200 8	219.1 8.625	300 2.07	77.8/17500	0-3.2 0-0.13	255 10.05	324 12.76	58 2.28	2-5/8X85 2-M16X85	UL FM LPCB
250 10	273.0 10.750	300 2.07	121.0/27210	0-3.2 0-0.13	318 12.52	410 16.14	63 2.48	2-3/4X120 2-M20X115	UL FM

# 90

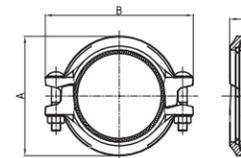
90° Elbow



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Dimensions L mm/in	Certificate
25 1	33.7 1.315	500 3.45	57 2.24	UL FM VdS LPCB
32 1¼	42.4 1.660	500 3.45	70 2.75	UL FM VdS LPCB
40 1½	48.3 1.900	500 3.45	70 2.75	UL FM VdS LPCB
50 2	60.3 2.375	500 3.45	82.5 3.25	UL FM VdS LPCB
65 2½	73.0 2.875	500 3.45	95 3.74	UL FM
65 2½	76.1 3.000	500 3.45	95 3.74	UL FM VdS LPCB
80 3	88.9 3.500	500 3.45	108 4.25	UL FM VdS LPCB
100 4	114.3 4.500	500 3.45	127 5.00	UL FM VdS LPCB
125 5	133.0 5.250	500 3.45	122 4.80	UL FM
125 5	139.7 5.500	500 3.45	140 5.50	UL FM VdS LPCB
125 5	141.3 5.563	500 3.45	140 5.50	UL FM
150 6	165.1 6.500	500 3.45	165 6.50	UL FM LPCB
150 6	168.3 6.625	500 3.45	165 6.50	UL FM VdS LPCB
200 8	219.1 8.625	500 3.45	197 7.75	UL FM VdS LPCB
250 10	267.4 10.528	500 3.45	229 9.00	UL FM
250 10	273.0 10.750	500 3.45	229 9.00	UL FM VdS
300 12	318.5 12.539	500 3.45	254 10.00	UL FM
300 12	323.9 12.750	500 3.45	254 10.00	UL FM VdS
350 14	355.6 14.000	300 2.07	280 11.02	—
400 16	406.4 16.000	300 2.07	305 12.00	—
450 18	457.2 18.000	300 2.07	394 15.50	—
500 20	508.0 20.000	300 2.07	438 17.25	—
600 24	609.6 24.000	300 2.07	508 20.00	—

# 1GK

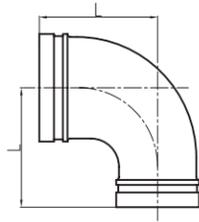
Angle Pad Coupling



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Max. End Load kN/Lbs	Pipe End Separation mm/in	Dimensions			Bolt Size No.-Size mm	Certificate
					A mm/in	B mm/in	C mm/in		
32 1¼	42.4 1.669	500 3.45	4.8/1080	0-1.6 0-0.06	64 2.52	99 3.90	46.5 1.83	2-M10X55	UL FM
40 1½	48.3 1.900	500 3.45	6.3/1420	0-3.2 0-0.13	70 2.76	105 4.13	46.5 1.83	2-M10X55	UL FM
50 2	60.3 2.375	500 3.45	9.8/2210	0-3.2 0-0.13	85 3.35	121 4.76	46.5 1.83	2-M10X55	UL FM
65 2½	73.0 2.875	300 2.07	8.7/1950	0-3.2 0-0.13	99 3.90	134 5.28	47.5 1.87	2-M10X63	UL FM
65 2½	76.1 3.000	300 2.07	9.4/2120	0-3.2 0-0.13	102 4.02	137 5.39	47.5 1.87	2-M10X63	UL FM
80 3	88.9 3.500	300 2.07	12.8/2885	0-3.2 0-0.13	115 4.53	150 5.91	47.5 1.87	2-M10X60	UL FM
100 4	114.3 4.500	300 2.07	21.2/4770	0-3.2 0-0.13	142 5.59	180 7.09	52 2.05	2-M10X65	UL FM
125 5	139.7 5.500	300 2.07	31.7/7130	0-3.2 0-0.13	171 6.73	214 8.43	52.5 2.07	2-M12X75	UL FM
150 6	165.1 6.500	300 2.07	44.3/9960	0-3.2 0-0.13	198 7.80	242 9.53	52.5 2.07	2-M12X75	UL FM
150 6	168.3 6.625	300 2.07	46.0/10340	0-3.2 0-0.13	201 7.91	245 9.65	52.5 2.07	2-M12X75	UL FM
200 8	219.1 8.625	300 2.07	77.8/17500	0-3.2 0-0.13	258 10.16	331 13.03	63.5 2.50	2-M20X110	UL FM
250 10	273.0 10.750	300 2.07	121.0/27210	0-3.2 0-0.13	321 12.64	406 15.98	64.5 2.54	2-M22X140	—

# 90R

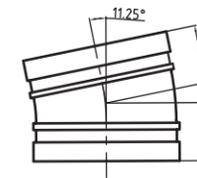
90° Reducing Elbow



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Dimensions L mm/in	Certificate
80X65 3X2 1/2	88.9X76.1 3.500X3.000	500 3.45	108 4.25	UL FM
100X65 4X2 1/2	114.3X76.1 4.500X3.000	500 3.45	127 5.00	UL FM
100X80 4X3	114.3X88.9 4.500X3.500	500 3.45	127 5.00	UL FM
150X100 6X4	165.1X114.3 6.500X4.500	500 3.45	165 6.50	UL FM
150X100 6X4	168.3X114.3 6.625X4.500	500 3.45	165 6.50	UL FM

# 105

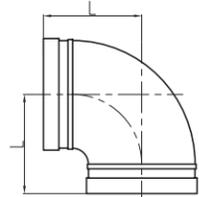
11.25° Elbow



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Dimensions L mm/in	Certificate
32 1 1/4	42.4 1.660	500 3.45	35 1.38	UL FM
40 1 1/2	48.3 1.900	500 3.45	35 1.38	UL FM
50 2	60.3 2.375	500 3.45	35 1.38	UL FM VdS LPCB
65 2 1/2	73.0 2.875	500 3.45	38 1.506	UL FM
65 2 1/2	76.1 3.000	500 3.45	38 1.506	UL FM VdS LPCB
80 3	88.9 3.500	500 3.45	38 1.50	UL FM VdS LPCB
100 4	108.0 4.250	500 3.45	44 1.73	UL FM
100 4	114.3 4.500	500 3.45	44 1.73	UL FM VdS LPCB
125 5	139.7 5.500	500 3.45	51 2.00	UL FM VdS LPCB
150 6	159.0 6.250	500 3.45	51 2.00	UL FM
150 6	165.1 6.500	500 3.45	51 2.00	UL FM LPCB
150 6	168.3 6.625	500 3.45	51 2.00	UL FM VdS
200 8	219.1 8.625	500 3.45	51 2.00	UL FM VdS LPCB

# 90S

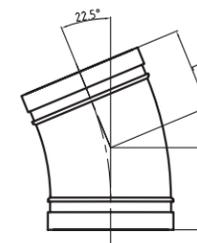
Light-duty 90° Elbow



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Dimensions L mm/in	Certificate
50 2	60.3 2.375	300 2.07	70 2.75	UL FM VdS LPCB
65 2 1/2	73.0 2.875	300 2.07	76 3.00	UL FM
65 2 1/2	76.1 3.000	300 2.07	76 3.00	UL FM VdS LPCB
80 3	88.9 3.500	300 2.07	85.5 3.37	UL FM VdS LPCB
100 4	108.0 4.500	300 2.07	101 3.98	UL FM
100 4	114.3 4.500	300 2.07	101 3.98	UL FM VdS LPCB
125 5	139.7 5.500	300 2.07	124 4.88	UL FM VdS LPCB
150 6	159.0 6.500	300 2.07	140 5.50	UL FM
150 6	165.1 6.500	300 2.07	140 5.50	UL FM LPCB
150 6	168.3 6.625	300 2.07	140 5.50	UL FM VdS LPCB
200 8	216.3 8.625	300 2.07	175 6.89	UL FM
200 8	219.1 8.625	300 2.07	165 6.50	UL FM VdS LPCB

# 110

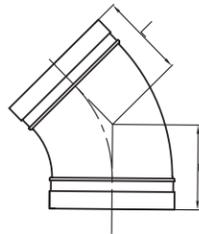
22.5° Elbow



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Dimensions L mm/in	Certificate
32 1 1/4	42.4 1.660	500 3.45	45 1.77	UL FM
40 1 1/2	48.3 1.900	500 3.45	45 1.77	UL FM
50 2	60.3 2.375	500 3.45	48 1.89	UL FM
65 2 1/2	73.0 2.875	500 3.45	51 2.00	UL FM
65 2 1/2	76.1 3.000	500 3.45	51 2.00	UL FM VdS LPCB
80 3	88.9 3.500	500 3.45	57 2.24	UL FM VdS LPCB
100 4	108.0 4.250	500 3.45	73 2.87	UL FM
100 4	114.3 4.500	500 3.45	73 2.87	UL FM VdS LPCB
125 5	139.7 5.500	500 3.45	73 2.87	UL FM VdS LPCB
150 6	159.0 6.250	500 3.45	79 3.11	UL FM
150 6	165.1 6.500	500 3.45	79 3.11	UL FM LPCB
150 6	168.3 6.625	500 3.45	79 3.11	UL FM VdS
200 8	219.1 8.625	500 3.45	98 3.86	UL FM VdS LPCB

# 120

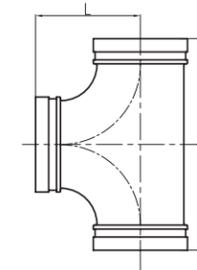
45° Elbow



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Dimensions L mm/in	Certificate
25 1	33.7 1.315	500 3.45	44.5 1.75	UL FM VdS LPCB
32 1¼	42.4 1.660	500 3.45	44.5 1.75	UL FM VdS LPCB
40 1½	48.3 1.900	500 3.45	44.5 1.75	UL FM VdS LPCB
50 2	60.3 2.375	500 3.45	51 2.00	UL FM VdS LPCB
65 2½	73.0 2.875	500 3.45	57 2.24	UL FM
65 2½	76.1 3.000	500 3.45	57 2.24	UL FM VdS LPCB
80 3	88.9 3.500	500 3.45	63.5 2.50	UL FM VdS LPCB
100 4	108.0 4.250	500 3.45	76 3.00	UL FM
100 4	114.3 4.500	500 3.45	76 3.00	UL FM VdS LPCB
125 5	133.0 5.250	500 3.45	82.5 3.25	—
125 5	139.7 5.500	500 3.45	82.5 3.25	UL FM VdS LPCB
125 5	141.3 5.563	500 3.45	82.5 3.25	UL FM
150 6	159.0 6.250	500 3.45	89 3.50	UL FM
150 6	165.1 6.500	500 3.45	89 3.50	UL FM LPCB
150 6	168.3 6.625	500 3.45	89 3.50	UL FM VdS LPCB
200 8	216.3 8.516	500 3.45	108 4.25	UL FM
200 8	219.1 8.625	500 3.45	108 4.25	UL FM VdS LPCB
250 10	267.4 10.528	300 2.07	120.5 4.75	UL FM
250 10	273.0 10.750	500 3.45	120.5 4.75	UL FM VdS
300 12	318.5 12.750	300 2.07	133 5.25	UL FM
300 12	323.9 12.750	500 3.45	133 5.25	UL FM VdS
300 12	377 12.750	300 2.07	122 4.80	—
350 14	355.6 14.000	300 2.07	152 6.00	—
400 16	406.4 16.000	300 2.07	184 7.25	—
450 18	457.2 18.000	300 2.07	203 8.00	—
500 20	508.0 20.000	300 2.07	229 9.00	—
600 24	609.6 24.000	300 2.07	280 11.00	—

# 130

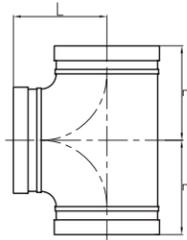
Tee



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Dimensions L mm/in	Certificate
25 1	33.7 1.315	500 3.45	57 2.24	UL FM VdS LPCB
32 1¼	42.4 1.660	500 3.45	70 2.75	UL FM VdS LPCB
40 1½	48.3 1.900	500 3.45	70 2.75	UL FM VdS LPCB
50 2	60.3 2.375	500 3.45	82.5 3.25	UL FM VdS LPCB
65 2½	73.0 2.875	500 3.45	95 3.74	UL FM
65 2½	76.1 3.000	500 3.45	95 3.74	UL FM VdS LPCB
80 3	88.9 3.500	500 3.45	108 4.25	UL FM VdS LPCB
100 4	114.3 4.500	500 3.45	127 5.00	UL FM VdS LPCB
125 5	133.0 5.250	500 3.45	122 4.80	UL FM
125 5	139.7 5.500	500 3.45	140 5.50	UL FM VdS LPCB
125 5	141.3 5.563	500 3.45	140 5.50	UL FM
150 6	165.1 6.500	500 3.45	165 6.50	UL FM LPCB
150 6	168.3 6.625	500 3.45	165 6.50	UL FM VdS LPCB
200 8	219.1 8.625	500 3.45	197 7.75	UL FM VdS LPCB
250 10	267.4 10.528	500 3.45	229 9.00	UL FM
250 10	273.0 10.750	500 3.45	229 9.00	UL FM VdS
300 12	318.5 12.539	500 3.45	254 10.00	—
300 12	323.9 12.750	500 3.45	254 10.00	UL FM VdS
350 14	355.6 14.000	300 2.07	280 11.02	—
400 16	406.4 16.000	300 2.07	305 12.00	—
450 18	457.2 18.000	300 2.07	394 15.50	—
500 20	508.0 20.000	300 2.07	438 17.25	—
600 24	609.6 24.000	300 2.07	508 20.00	—

# 130S

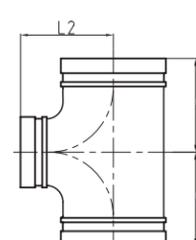
Light-duty Tee



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Dimensions L mm/in	Certificate
50 2	60.3 2.375	300 2.07	70 2.75	UL FM VdS LPCB
65 2½	73.0 2.875	300 2.07	76 3.00	UL FM
65 2½	76.1 3.000	300 2.07	76 3.00	UL FM VdS LPCB
80 3	88.9 3.500	300 2.07	85.5 3.37	UL FM VdS LPCB
100 4	108.0 4.500	300 2.07	101 3.98	UL FM
100 4	114.3 4.500	300 2.07	101 3.98	UL FM VdS LPCB
125 5	139.7 5.500	300 2.07	124 4.88	UL FM VdS LPCB
150 6	159.0 6.500	300 2.07	140 5.50	UL FM
150 6	165.1 6.500	300 2.07	140 5.50	UL FM LPCB
150 6	168.3 6.625	300 2.07	140 5.50	UL FM VdS LPCB
200 8	216.3 8.625	300 2.07	175 6.89	UL FM
200 8	219.1 8.625	300 2.07	175 6.89	UL FM VdS LPCB

# 130R

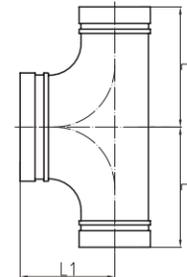
Reducing Tee



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Dimensions L 1 mm/in	Dimensions L 2 mm/in	Certificate
50 × 25 2 × 1	60.3 × 33.7 2.375 × 1.315	500 3.45	70 2.75	70 2.75	UL FM VdS LPCB
50 × 40 2 × 1½	60.3 × 48.3 2.375 × 1.900	500 3.45	70 2.75	70 2.75	UL FM VdS LPCB
65 × 40 2½ × 1½	73.0 × 48.3 2.875 × 1.900	500 3.45	76 3.00	76 3.00	UL FM
65 × 50 2½ × 2	73.0 × 60.3 2.875 × 2.375	500 3.45	69 2.72	69 2.72	UL FM
65 × 32 2½ × 1¼	76.1 × 42.4 3.000 × 1.660	500 3.45	76 3.00	76 3.00	UL FM
65 × 40 2½ × 1½	76.1 × 48.3 3.000 × 1.900	500 3.45	76 3.00	76 3.00	UL FM VdS LPCB
65 × 50 2½ × 2	76.1 × 60.3 3.000 × 2.375	500 3.45	69 2.72	69 2.72	UL FM VdS LPCB
80 × 32 3 × 1	88.9 × 33.7 3.500 × 1.315	500 3.45	108 4.25	108 4.25	UL FM VdS LPCB
80 × 32 3 × 1¼	88.9 × 42.4 3.500 × 1.660	500 3.45	85.5 3.37	85.5 3.37	UL FM
80 × 40 3 × 1½	88.9 × 48.3 3.500 × 1.900	500 3.45	85.5 3.37	85.5 3.37	UL FM VdS LPCB
80 × 50 3 × 2	88.9 × 60.3 3.500 × 2.375	500 3.45	85.5 3.37	85.5 3.37	UL FM VdS LPCB
80 × 65 3 × 2½	88.9 × 73.0 3.500 × 2.875	500 3.45	85.5 3.37	85.5 3.37	UL FM
80 × 65 3 × 2¾	88.9 × 76.1 3.500 × 3.000	500 3.45	85.5 3.37	85.5 3.37	UL FM VdS LPCB
100 × 50 4 × 2	108.0 × 60.3 4.250 × 2.375	500 3.45	101 3.98	101 3.98	UL FM
100 × 80 4 × 3	108.0 × 88.9 4.250 × 3.500	500 3.45	101 3.98	101 3.98	UL FM
100 × 25 4 × 1	114.3 × 33.7 4.500 × 1.315	500 3.45	101 3.98	101 3.98	UL FM VdS LPCB
100 × 40 4 × 1½	114.3 × 48.3 4.500 × 1.900	500 3.45	101 3.98	101 3.98	UL FM VdS LPCB
100 × 50 4 × 2	114.3 × 60.3 4.500 × 2.375	500 3.45	101 3.98	101 3.98	UL FM VdS LPCB
100 × 65 4 × 2½	114.3 × 73.0 4.500 × 2.875	500 3.45	101 3.98	101 3.98	UL FM
100 × 65 4 × 2¾	114.3 × 76.1 4.500 × 3.000	500 3.45	101 3.98	101 3.98	UL FM VdS LPCB
100 × 80 4 × 3	114.3 × 88.9 4.500 × 3.500	500 3.45	101 3.98	101 3.98	UL FM VdS LPCB
125 × 50 5 × 2	133.0 × 60.3 5.250 × 2.375	500 3.45	124 4.88	124 4.88	UL FM
125 × 65 5 × 2½	133.0 × 76.1 5.250 × 3.000	500 3.45	124 4.88	124 4.88	UL FM
125 × 100 5 × 4	133.0 × 108.0 5.250 × 4.250	500 3.45	124 4.88	124 4.88	UL FM
125 × 100 5 × 4	133.0 × 114.3 5.250 × 4.500	500 3.45	124 4.88	124 4.88	UL FM
125 × 40 5 × 1½	139.7 × 48.3 5.500 × 1.900	500 3.45	124 4.88	124 4.88	UL FM
125 × 50 5 × 2	139.7 × 60.3 5.500 × 2.375	500 3.45	124 4.88	124 4.88	UL FM
125 × 65 5 × 2½	139.7 × 76.1 5.500 × 3.000	500 3.45	124 4.88	124 4.88	UL FM
125 × 80 5 × 3	139.7 × 88.9 5.500 × 3.500	500 3.45	124 4.88	124 4.88	UL FM
125 × 100 5 × 4	139.7 × 114.3 5.500 × 4.500	500 3.45	124 4.88	124 4.88	UL FM VdS LPCB
125 × 50 5 × 2	141.3 × 60.3 5.563 × 2.375	500 3.45	124 4.88	124 4.88	UL FM
125 × 80 5 × 3	141.3 × 88.9 5.563 × 3.500	500 3.45	124 4.88	124 4.88	UL FM
125 × 100 5 × 4	141.3 × 114.3 5.563 × 4.500	500 3.45	124 4.88	124 4.88	UL FM
150 × 60 6 × 2	159.0 × 60.3 6.250 × 2.375	500 3.45	140 5.50	140 5.50	UL FM
150 × 65 6X2½	159.0 × 76.1 6.250 × 3.000	500 3.45	140 5.50	140 5.50	UL FM

# 130R

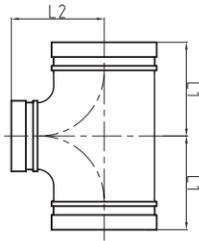
Reducing Tee



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Dimensions L mm/in	Dimensions L 1 mm/in	Certificate
65 × 65 × 80 2½ × 2½ × 3	76.1 × 76.1 × 88.9 3.000 × 3.000 × 3.500	500 3.45	108 4.25	95 3.74	—
65 × 65 × 100 2½ × 2½ × 4	76.1 × 76.1 × 114.3 3.000 × 3.000 × 4.500	500 3.45	127 5.00	102 4.02	—
80 × 80 × 100 3 × 3 × 4	88.9 × 88.9 × 114 3.500 × 3.500 × 4.500	500 3.45	127 5.00	102 4.02	—

# 130R

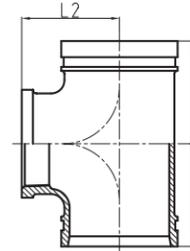
Reducing Tee



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Dimensions L 1 mm/in	Dimensions L 2 mm/in	Certificate
150 × 80 6 × 3	159.0 × 88.9 6.250 × 3.500	500 3.45	140 5.50	140 5.50	UL FM
150 × 100 6 × 4	159.0 × 108.0 6.250 × 4.250	500 3.45	140 5.50	140 5.50	UL FM
150 × 100 6 × 4	159.0 × 114.3 6.250 × 4.500	500 3.45	140 5.50	140 5.50	UL FM
150 × 125 6 × 5	159.0 × 133.0 6.250 × 5.250	500 3.45	140 5.50	140 5.50	UL FM
150 × 50 6 × 2	165.1 × 60.3 6.500 × 2.375	300 2.07	140 5.50	140 5.50	UL FM
150 × 65 6 × 2½	165.1 × 76.1 6.500 × 3.000	300 2.07	140 5.50	140 5.50	UL FM
150 × 80 6 × 3	165.1 × 88.9 6.500 × 3.500	300 2.07	140 5.50	140 5.50	UL FM LPCB
150 × 100 6 × 4	165.1 × 114.3 6.500 × 4.500	300 2.07	140 5.50	140 5.50	UL FM LPCB
150 × 125 6 × 5	165.1 × 139.7 6.500 × 5.500	300 2.07	140 5.50	140 5.50	UL FM LPCB
150 × 50 6 × 2	168.3 × 60.3 6.625 × 2.375	500 3.45	140 5.50	140 5.50	UL FM VdS LPCB
150 × 65 6 × 2½	168.3 × 76.1 6.625 × 2.875	500 3.45	140 5.50	140 5.50	UL FM
150 × 65 6 × 2½	168.3 × 76.1 6.625 × 3.000	500 3.45	140 5.50	140 5.50	UL FM VdS LPCB
150 × 80 6 × 3	168.3 × 88.9 6.625 × 3.500	500 3.45	140 5.50	140 5.50	UL FM VdS LPCB
150 × 100 6 × 4	168.3 × 114.3 6.625 × 4.500	500 3.45	140 5.50	140 5.50	UL FM VdS LPCB
150 × 125 6 × 5	168.3 × 139.7 6.625 × 5.500	300 2.07	140 5.50	140 5.50	UL FM VdS LPCB
150 × 125 6 × 5	168.3 × 141.3 6.625 × 5.563	300 2.07	140 5.50	140 5.50	UL FM
200 × 150 8 × 6	216.3 × 165.1 8.516 × 6.500	300 2.07	175 6.89	175 6.89	UL FM
200 × 50 8 × 2	219.1 × 60.3 8.625 × 2.375	500 3.45	175 6.89	175 6.89	UL FM VdS LPCB
200 × 65 8 × 2½	219.1 × 76.1 8.625 × 3.000	300 2.07	175 6.89	175 6.89	UL FM
200 × 80 8 × 3	219.1 × 88.9 8.625 × 3.500	500 3.45	175 6.89	175 6.89	UL FM VdS LPCB
200 × 100 8 × 4	219.1 × 108.0 8.625 × 4.250	500 3.45	175 6.89	175 6.89	UL FM
200 × 100 8 × 4	219.1 × 114.3 8.625 × 4.500	500 3.45	175 6.89	175 6.89	UL FM VdS LPCB
200 × 125 8 × 5	219.1 × 133.0 8.625 × 5.250	300 2.07	175 6.89	175 6.89	UL FM
200 × 125 8 × 5	219.1 × 139.7 8.625 × 5.500	300 2.07	175 6.89	175 6.89	UL FM
200 × 150 8 × 6	219.1 × 159.0 8.625 × 6.250	300 2.07	175 6.89	175 6.89	UL FM
200 × 150 8 × 6	219.1 × 165.1 8.625 × 6.500	300 2.07	175 6.89	175 6.89	UL FM
200 × 150 8 × 6	219.1 × 168.3 8.625 × 6.625	500 3.45	175 6.89	175 6.89	UL FM VdS LPCB
250 × 150 10 × 6	273.0 × 159.0 10.750 × 6.250	500 3.45	229 9.00	229 9.00	UL FM
250 × 150 10 × 6	273.0 × 165.1 10.750 × 6.500	300 2.07	229 9.00	229 9.00	UL FM
250 × 150 10 × 6	273.0 × 168.3 10.750 × 6.625	300 2.07	229 9.00	229 9.00	UL FM VdS
250 × 200 10 × 8	273.0 × 219.1 10.750 × 8.625	300 2.07	229 9.00	229 9.00	UL FM VdS
300 × 150 12 × 6	323.9 × 165.1 12.750 × 6.500	300 2.07	254 10	254 10	UL FM
300 × 200 12 × 8	323.9 × 219.1 12.750 × 8.625	300 2.07	254 10	254 10	UL FM VdS
300 × 250 12 × 10	323.9 × 273.0 12.750 × 10.750	300 2.07	254 10	254 10	UL FM VdS
350 × 200 14 × 8	355.6 × 219.1 14.00 × 8.625	300 2.07	280 11.02	280 11.02	—

# 131R

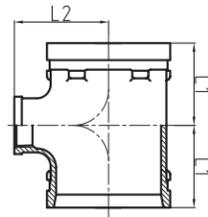
Reducing Tee with Female Thread



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Dimensions L 1 mm/in	Dimensions L 2 mm/in	Certificate
50 × 25 2 × 1	60.3 × 33.7 2.375 × 1.315	500 3.45	70 2.75	70 2.75	UL FM
50 × 32 2 × 1¼	60.3 × 42.4 2.375 × 1.660	500 3.45	70 2.75	70 2.75	—
50 × 40 2 × 1½	60.3 × 48.3 2.375 × 1.900	500 3.45	70 2.75	70 2.75	UL FM
65 × 25 2½ × 1	73.0 × 33.7 2.875 × 1.315	500 3.45	76 3.00	76 3.00	UL FM
65 × 32 2½ × 1¼	73.0 × 42.4 2.875 × 1.660	500 3.45	76 3.00	76 3.00	UL FM
65 × 25 2½ × 1	76.1 × 33.7 3.000 × 1.315	500 3.45	76 3.00	76 3.00	UL FM
65 × 32 2½ × 1¼	76.1 × 42.4 3.000 × 1.660	500 3.45	76 3.00	76 3.00	UL FM
65 × 40 2½ × 1½	76.1 × 48.3 3.000 × 1.900	500 3.45	76 3.00	76 3.00	UL FM
65 × 50 2½ × 2	76.1 × 60.3 3.000 × 2.375	500 3.45	76 3.00	76 3.00	UL FM
80 × 25 3 × 1	88.9 × 33.7 3.500 × 1.315	500 3.45	85.5 3.37	85.5 3.37	UL FM
80 × 32 3 × 1¼	88.9 × 42.4 3.500 × 1.660	500 3.45	85.5 3.37	85.5 3.37	UL FM
80 × 40 3 × 1½	88.9 × 48.3 3.500 × 1.900	500 3.45	85.5 3.37	85.5 3.37	UL FM
80 × 50 3 × 2	88.9 × 60.3 3.500 × 2.375	500 3.45	85.5 3.37	85.5 3.37	UL FM
80 × 65 3 × 2½	88.9 × 76.1 3.500 × 3.000	500 3.45	85.5 3.37	85.5 3.37	UL FM
100 × 65 4 × 2½	108.0 × 76.1 4.250 × 3.000	300 2.07	100 3.94	96 3.78	UL FM
100 × 80 4 × 3	108.0 × 88.9 4.250 × 3.500	300 2.07	100 3.94	96 3.78	UL FM
100 × 65 4 × 2½	114.3 × 76.1 4.500 × 3.000	300 2.07	100 3.94	96 3.78	UL FM
100 × 80 4 × 3	114.3 × 88.9 4.500 × 3.500	300 2.07	100 3.94	96 3.78	UL FM
200 × 50 8 × 2	219.1 × 60.3 8.625 × 2.375	300 2.07	175 6.89	175 6.89	FM
200 × 65 8 × 2½	219.1 × 76.1 8.625 × 3.000	300 2.07	175 6.89	175 6.89	FM
200 × 80 8 × 3	219.1 × 88.9 8.625 × 3.500	300 2.07	175 6.89	175 6.89	FM

# 131R

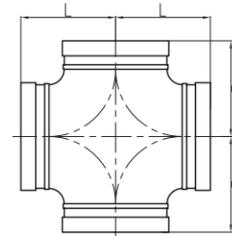
Reducing Tee  
with Female Thread



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Dimensions L 1 mm/in	Dimensions L 2 mm/in	Certificate
100 × 25 4 × 1	114.3 × 33.7 4.500 × 1.315	300 2.07	76 2.99	88 3.47	UL FM
100 × 32 4 × 1¼	114.3 × 42.4 4.500 × 1.660	300 2.07	76 2.99	88 3.47	UL FM
100 × 40 4 × 1½	114.3 × 48.3 4.500 × 1.900	300 2.07	85 3.35	91 3.58	UL FM
100 × 50 4 × 2	108.0 × 60.3 4.250 × 2.375	300 2.07	85 3.35	91 3.58	UL FM
100 × 50 4 × 2	114.3 × 60.3 4.500 × 2.375	300 2.07	85 3.35	91 3.58	UL FM
125 × 50 5 × 2	133.0 × 60.3 5.250 × 2.375	300 2.07	86 3.39	106 4.17	UL FM
125 × 65 5 × 2½	133.0 × 76.1 5.250 × 3.000	300 2.07	102 4.02	111 4.37	UL FM
125 × 80 5 × 3	133.0 × 88.9 5.250 × 3.500	300 2.07	102 4.02	111 4.37	UL FM
125 × 25 5 × 1	139.7 × 33.7 5.500 × 1.315	300 2.07	78 3.07	103 4.06	UL FM
125 × 32 5 × 1¼	139.7 × 42.4 5.500 × 1.660	300 2.07	78 3.07	103 4.06	UL FM
125 × 40 5 × 1½	139.7 × 48.3 5.500 × 1.900	300 2.07	86 3.39	106 4.17	UL FM
125 × 50 5 × 2	139.7 × 60.3 5.500 × 2.375	300 2.07	86 3.39	106 4.17	UL FM
125 × 65 5 × 2½	139.7 × 76.1 5.500 × 3.000	300 2.07	102 4.02	111 4.37	UL FM
125 × 80 5 × 3	139.7 × 88.9 5.500 × 3.500	300 2.07	102 4.02	111 4.37	UL FM
150 × 60 6 × 2	159.0 × 60.3 6.250 × 2.375	300 2.07	92 3.62	124 4.88	UL FM
150 × 65 6 × 2½	159.0 × 76.1 6.250 × 3.000	300 2.07	107 4.21	129 5.08	UL FM
150 × 80 6 × 3	159.0 × 88.9 6.250 × 3.500	300 2.07	107 4.21	129 5.08	UL FM
150 × 25 6 × 1	165.1 × 33.7 6.500 × 1.315	300 2.07	83 3.27	121 4.76	UL FM
150 × 32 6 × 1¼	165.1 × 42.4 6.500 × 1.660	300 2.07	83 3.27	121 4.76	UL FM
150 × 40 6 × 1½	165.1 × 48.3 6.500 × 1.900	300 2.07	92 3.62	124 4.88	UL FM
150 × 50 6 × 2	165.1 × 60.3 6.500 × 2.375	300 2.07	92 3.62	124 4.88	UL FM
150 × 65 6 × 2½	165.1 × 76.1 6.500 × 3.000	300 2.07	107 4.21	129 5.08	UL FM
150 × 80 6 × 3	165.1 × 88.9 6.500 × 3.500	300 2.07	107 4.21	129 5.08	UL FM
150 × 100 6 × 4	165.1 × 114.3 6.500 × 4.500	300 2.07	121 4.76	132 5.20	UL FM
150 × 50 6 × 2	168.3 × 60.3 6.625 × 2.375	300 2.07	92 3.62	124 4.88	UL FM
150 × 65 6 × 2½	168.3 × 76.1 6.625 × 3.000	300 2.07	107 4.21	129 5.08	UL FM

# 180

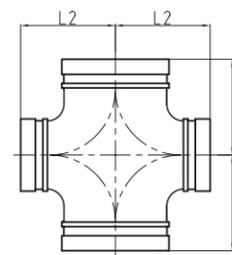
Cross



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Dimensions L mm/in	Certificate
32 1¼	42.4 1.660	500 3.45	70 2.75	UL FM VdS LPCB
40 1½	48.3 1.900	500 3.45	70 2.75	UL FM VdS LPCB
50 2	60.3 2.375	500 3.45	70 2.75	UL FM VdS LPCB
65 2½	73.0 2.875	500 3.45	76 3.00	UL FM
65 2½	76.1 3.000	500 3.45	76 3.00	UL FM VdS LPCB
80 3	88.9 3.500	500 3.45	85.5 3.37	UL FM VdS LPCB
100 4	108.0 4.250	500 3.45	101 3.98	UL FM
100 4	114.3 4.500	500 3.45	101 3.98	UL FM VdS LPCB
125 5	139.7 5.500	500 3.45	124 4.88	UL FM VdS LPCB
125 5	141.3 5.563	500 3.45	124 4.88	UL FM
150 6	159.0 6.250	500 3.45	140 5.50	UL FM
150 6	165.1 6.500	500 3.45	140 5.50	UL FM LPCB
150 6	168.3 6.625	500 3.45	140 5.50	UL FM VdS LPCB
200 8	219.1 8.625	500 3.45	175 6.89	UL FM VdS LPCB
250 10	273.0 10.750	500 3.45	229 9.00	UL FM VdS
300 12	323.9 12.750	500 3.45	254 10.00	UL FM VdS

# 180R

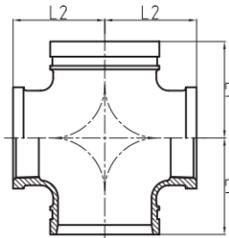
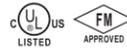
Reducing Cross



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Dimensions L 1 mm/in	Dimensions L 2 mm/in	Certificate
65 × 50 2½ × 2	76.1 × 60.3 3.000 × 2.375	500 3.45	76 3.00	76 3.00	—
80 × 50 3 × 2	88.9 × 60.3 3.500 × 2.375	500 3.45	85.5 3.37	85.5 3.37	UL FM
100 × 50 4 × 2	114.3 × 60.3 4.500 × 2.375	500 3.45	101 3.98	101 3.98	UL FM
100 × 80 4 × 3	114.3 × 88.9 4.500 × 3.500	500 3.45	101 3.98	101 3.98	UL FM
125 × 100 5 × 4	139.7 × 114.3 5.500 × 4.500	500 3.45	124 4.88	124 4.88	UL FM
150 × 50 6 × 2	165.1 × 60.3 6.500 × 2.375	500 3.45	140 5.50	140 5.50	UL FM
150 × 65 6 × 2½	165.1 × 76.1 6.500 × 3.000	500 3.45	140 5.50	140 5.50	UL FM
150 × 80 6 × 3	165.1 × 88.9 6.500 × 3.500	500 3.45	140 5.50	140 5.50	UL FM
150 × 100 6 × 4	165.1 × 114.3 6.500 × 4.500	500 3.45	140 5.50	140 5.50	UL FM
150 × 50 6 × 2	168X60.3 6.625X2.375	500 3.45	140 5.50	140 5.50	—
200 × 50 8 × 2	219.1 × 60.3 8.625 × 2.375	500 3.45	197 7.75	197 7.75	UL FM
200 × 100 8 × 4	219.1 × 114.3 8.625 × 4.500	500 3.45	175 6.89	175 6.89	UL FM
200 × 125 8 × 5	219.1 × 139.7 8.625 × 5.500	300 2.07	175 6.89	175 6.89	UL FM
200 × 150 8 × 6	219.1 × 159.0 8.625 × 6.250	300 2.07	175 6.89	175 6.89	UL FM
200 × 150 8 × 6	219.1 × 165.1 8.625 × 6.500	300 2.07	175 6.89	175 6.89	UL FM

# 181

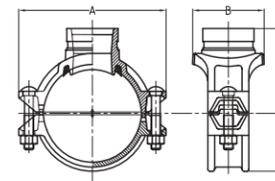
Reducing Cross with Female Thread



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Dimensions		Certificate
			L 1 mm/in	L 2 mm/in	
65 x 50 2½ x 2	76.1 x 60.3 3.000 x 2.375	300 2.07	76 3.00	76 3.00	—
80 x 32 3 x 1¼	88.9 x 42.4 3.500 x 1.660	300 2.07	108 4.25	108 4.25	—
80 x 40 3 x 1½	88.9 x 48.3 3.500 x 1.900	300 2.07	85.5 3.37	85.5 3.37	—
80 x 50 3 x 2	88.9 x 60.3 3.500 x 2.375	300 2.07	85.5 3.37	85.5 3.37	—
100 x 25 4 x 1	114.3 x 33.7 4.500 x 1.315	300 2.07	76 2.99	88 3.47	UL FM
100 x 32 4 x 1¼	114.3 x 42.4 4.500 x 1.660	300 2.07	76 2.99	88 3.47	UL FM
100 x 40 4 x 1½	114.3 x 48.3 4.500 x 1.900	300 2.07	85 3.35	91 3.58	UL FM
100 x 50 4 x 2	114.3 x 60.3 4.500 x 2.375	300 2.07	85 3.35	91 3.58	UL FM
100 x 65 4 x 2½	114.3 x 76.1 4.500 x 3.000	300 2.07	101 3.98	96 3.78	—
100 x 80 4 x 3	114.3 x 88.9 4.500 x 3.500	300 2.07	101 3.98	96 3.78	—
150 x 32 6 x 1¼	165.1 x 42.4 6.500 x 1.660	300 2.07	92 3.62	124 4.88	—
150 x 40 6 x 1½	165.1 x 48.3 6.500 x 1.900	300 2.07	92 3.62	124 4.88	—
150 x 50 6 x 2	165.1 x 60.3 6.500 x 2.375	300 2.07	92 3.62	124 4.88	UL FM
150 x 65 6 x 2½	165.1 x 76.1 6.500 x 3.000	300 2.07	140 5.50	140 5.50	—
150 x 80 6 x 3	165.1 x 88.9 6.500 x 3.500	300 2.07	140 5.50	140 5.50	—
200 x 80 8 x 3	219.1 x 88.9 8.625 x 3.500	300 2.07	175 6.89	175 6.89	—

# 3G

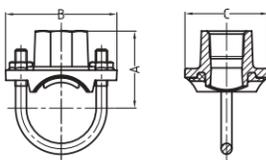
Mechanical Tee Grooved Outlet



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Hole Dia mm/in +1.6,0/+0.063,0	Dimensions				Bolt Size mm/in	Certificate
				A mm/in	B mm/in	C mm/in	D mm/in		
50 x 32 2 x 1¼	60.3 x 42.4 2.375 x 1.660	300 2.07	45 1.75	116 4.57	76 2.99	69.5 2.74	39 1.54	3/8 x 55 M10X57	UL FM VdS
50 x 40 2 x 1½	60.3 x 48.3 2.375 x 1.900	300 2.07	45 1.75	116 4.57	76 2.99	69.5 2.74	39 1.54	3/8 x 55 M10X57	UL FM VdS
65 x 25 2½ x 1	73.0 x 33.7 2.875 x 1.315	300 2.07	38 1.50	137 5.39	71 2.80	78 3.07	49 1.93	1/2 x 70 M12X70	—
65 x 32 2½ x 1¼	73.0 x 42.4 2.875 x 1.660	300 2.07	51 2.00	137 5.39	84.5 3.33	78 3.07	49 1.93	1/2 x 70 M12X70	UL FM
65 x 40 2½ x 1½	73.0 x 48.3 2.875 x 1.900	300 2.07	51 2.00	137 5.39	84.5 3.33	78 3.07	49 1.93	1/2 x 70 M12X70	UL FM
65 x 25 76.1 x 1	76.1 x 33.7 3.000 x 1.315	300 2.07	38 1.50	137 5.39	71 2.80	78 3.07	49.5 1.95	1/2 x 70 M12X70	UL FM VdS
65 x 32 76.1 x 1¼	76.1 x 42.4 3.000 x 1.660	300 2.07	51 2.00	137 5.39	84.5 3.33	78 3.07	49.5 1.95	1/2 x 70 M12X70	UL FM VdS
65 x 40 76.1 x 1½	76.1 x 48.3 3.000 x 1.900	300 2.07	51 2.00	137 5.39	84.5 3.33	78 3.07	49.5 1.95	1/2 x 70 M12X70	UL FM VdS
80 x 25 3 x 1	88.9 x 33.7 3.500 x 1.315	300 2.07	38 1.50	152 5.98	72.5 2.85	84.5 3.33	56.5 2.22	1/2 x 75 M12X76	UL FM VdS
80 x 32 3 x 1¼	88.9 x 42.4 3.500 x 1.660	300 2.07	51 2.00	152 5.98	85.5 3.37	84.5 3.33	56.5 2.22	1/2 x 75 M12X76	UL FM VdS
80 x 40 3 x 1½	88.9 x 48.3 3.500 x 1.900	300 2.07	51 2.00	152 5.98	85.5 3.37	84.5 3.33	56.5 2.22	1/2 x 75 M12X76	UL FM VdS
80 x 50 3 x 2	88.9 x 60.3 3.500 x 2.375	300 2.07	64 2.50	152 5.98	98 3.86	84.5 3.33	56.5 2.22	1/2 x 75 M12X76	UL FM VdS
100 x 25 4 x 1	114.3 x 33.7 4.500 x 1.315	300 2.07	38 1.50	188 7.40	78.4 3.09	102 4.02	70 2.76	1/2 x 75 M12X76	UL FM VdS
100 x 32 4 x 1¼	114.3 x 42.4 4.500 x 1.660	300 2.07	51 2.00	188 7.40	89 3.50	102 4.02	70 2.76	1/2 x 75 M12X76	UL FM VdS
100 x 40 4 x 1½	114.3 x 48.3 4.500 x 1.900	300 2.07	51 2.00	188 7.40	89 3.50	102 4.02	70 2.76	1/2 x 75 M12X76	UL FM VdS
100 x 50 4 x 2	114.3 x 60.3 4.500 x 2.375	300 2.07	64 2.5	188 7.40	104.5 4.11	102 4.02	70 2.76	1/2 x 75 M12X76	UL FM VdS
100 x 65 4 x 2½	114.3 x 73.0 4.500 x 2.875	300 2.07	70 2.75	188 7.40	104.5 4.11	102 4.02	70 2.76	1/2 x 75 M12X76	UL FM
100 x 65 4 x 76.1	114.3 x 76.1 4.500 x 3.000	300 2.07	70 2.75	188 7.40	104.5 4.11	102 4.02	70 2.76	1/2 x 75 M12X76	VdS LPCB
100 x 80 4 x 3	114.3 x 88.9 4.500 x 3.500	300 2.07	89 3.50	188 7.40	128 5.03	102 4.02	70 2.76	1/2 x 75 M12X76	UL FM VdS LPCB
125 x 80 133.0 x 3	133.0 x 88.9 5.250 x 3.500	300 2.07	89 3.50	209 8.23	132 5.20	109.5 4.31	77 3.03	5/8 x 85 M16X85	UL FM
125 x 32 139.7 x 1¼	139.7 x 42.4 5.500 x 1.660	300 2.07	51 2.00	221.5 8.72	95 3.74	118 4.65	84 3.31	5/8 x 85 M16X85	UL FM
125 x 40 139.7 x 1½	139.7 x 48.3 5.500 x 1.900	300 2.07	51 2.00	221.5 8.72	95 3.74	118 4.65	84 3.31	5/8 x 85 M16X85	UL FM
125 x 50 139.7 x 2	139.7 x 60.3 5.500 x 2.375	300 2.07	64 2.5	221.5 8.72	112.5 4.43	118 4.65	84 3.31	5/8 x 85 M16X85	UL FM VdS
125 x 65 139.7 x 76.1	139.7 x 76.1 5.500 x 3.000	300 2.07	70 2.75	221.5 8.72	112.5 4.43	118 4.65	84 3.31	5/8 x 85 M16X85	UL FM VdS LPCB
125 x 80 139.7 x 3	139.7 x 88.9 5.500 x 3.500	300 2.07	89 3.50	221.5 8.720	132 5.20	118 4.65	84 3.31	5/8 x 85 M16X85	UL FM VdS LPCB
125 x 100 139.7 x 4	139.7 x 114.3 5.500 x 4.500	300 2.07	114 4.50	221.5 8.720	160 6.30	125 4.92	84 3.31	5/8 x 85 M16X85	UL FM VdS LPCB
150 x 50 159.0 x 2	159.1 x 60.3 6.250 x 2.375	300 2.07	64 2.5	244 9.60	112.5 4.43	125 4.92	94 3.70	5/8 x 105 M16X108	—
150 x 100 159.0 x 108.0	159.1 x 108.0 6.250 x 4.250	300 2.07	114 4.50	244 9.60	154 6.06	133 5.24	94 3.70	5/8 x 105 M16X108	UL FM
150 x 100 159.0 x 4	159.1 x 114.3 6.250 x 4.500	300 2.07	114 4.50	244 9.60	159 6.26	125 4.92	94 3.70	5/8 x 105 M16X108	UL FM
150 x 50 165.1 x 2	165.1 x 60.3 6.500 x 2.375	300 2.07	64 2.5	244 9.60	112.5 4.43	127 5.00	97.5 3.84	5/8 x 105 M16X108	UL FM
150 x 65 165.1 x 76.1	165.1 x 76.1 6.500 x 3.000	300 2.07	70 2.75	244 9.60	112.5 4.43	130 5.12	97.5 3.84	5/8 x 105 M16X108	UL FM LPCB
150 x 80 6½ O.D x 3	165.1 x 88.9 6.500 x 3.500	300 2.07	89 3.50	244 9.60	132 5.20	130 5.12	97.5 3.84	5/8 x 105 M16X108	UL FM LPCB
150 x 100 6½ O.D x 4	165.1 x 114.3 6.500 x 4.500	300 2.07	114 4.50	244 9.60	154 6.06	135 5.32	97.5 3.84	5/8 x 105 M16X108	UL FM LPCB
150 x 40 6 x 1½	168.3 x 48.3 6.500 x 1.900	300 2.07	51 2.00	247 9.72	95 3.74	128 5.04	98.5 3.88	5/8 x 105 M16X108	UL FM VdS
150 x 50 6 x 2	168.3 x 60.3 6.625 x 2.375	300 2.07	64 2.5	247 9.72	114 4.49	134 5.28	98.5 3.88	5/8 x 105 M16X108	UL FM VdS

# 3L

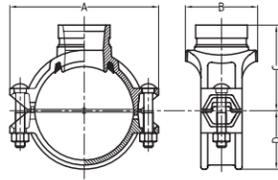
U-Bolt Mechanical Tee



Nominal Size mm/in	Hole Dia mm/in +1.6,0/+0.063,0	Working Pressure PSI/MPa	Dimensions			U Bolt Size mm/in	Certificate
			A mm/in	B mm/in	C mm/in		
32X15 1¼X1/2	30 1.18	300 2.07	54.4 2.14	88.9 3.50	57.2 2.25	3/8X73 M10X73	UL FM
32X20 1¼X3/4	30 1.18	300 2.07	54.4 2.14	88.9 3.50	57.2 2.25	3/8X73 M10X73	UL FM
32X25 1¼X1	30 1.18	300 2.07	57.7 2.27	88.9 3.50	57.2 2.25	3/8X73 M10X73	UL FM
40X15 1½X1/2	30 1.18	300 2.07	43 1.69	88.9 3.50	57.2 2.25	3/8X73 M10X73	UL FM
40X20 1½X3/4	30 1.18	300 2.07	51 2.0	88.9 3.50	57.2 2.25	3/8X73 M10X73	UL FM
40X25 1½X1	30 1.18	300 2.07	60.8 2.39	88.9 3.50	57.2 2.25	3/8X73 M10X73	UL FM
50X15 2X1/2	30 1.18	300 2.07	63.3 2.49	95.3 3.75	57.2 2.25	3/8X90 M10X90	UL FM VdS
50X20 2X3/4	30 1.18	300 2.07	63.3 2.49	95.3 3.75	57.2 2.25	3/8X90 M10X90	UL FM VdS
50X25 2X1	30 1.18	300 2.07	66.6 2.62	95.3 3.75	57.2 2.25	3/8X90 M10X90	UL FM VdS
50X32 2X1¼	45 1.75	300 2.07	66.6 2.62	4.72 120	3.00 76	1/2X52	—
65X15 2½X1/2	30 1.18	300 2.07	69.9 2.75	108.0 4.25	57.2 2.250	3/8X105 M10X105	UL FM
65X20 2½X3/4	30 1.18	300 2.07	69.9 2.75	108.0 4.25	57.2 2.250	3/8X105 M10X105	UL FM
65X25 2½X1	30 1.18	300 2.07	73.2 2.88	108.0 4.25	57.2 2.25	3/8X105 M10X105	UL FM
65X15 76.1X1/2	30 1.18	300 2.07	69.9 2.75	108.0 4.25	57.2 2.250	3/8X105 M10X105	UL FM VdS
65X20 76.1X3/4	30 1.18	300 2.07	69.9 2.75	108.0 4.25	57.2 2.250	3/8X105 M10X105	UL FM VdS
65X25 76.1X1	30 1.18	300 2.07	73.2 2.88	108.0 4.25	57.2 2.25	3/8X105 M10X105	UL FM VdS
80X25 88.9X1	38 1.5	300 2.07	79 3.11	145 5.70	73 2.87	1/2X58	UL FM VdS

### 3G

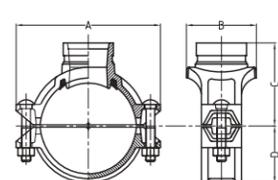
Mechanical Tee  
Grooved Outlet



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Hole Dia mm/in +1.6,0/+0.063,0	Dimensions				Bolt Size mm/in	Certificate
				A mm/in	B mm/in	C mm/in	D mm/in		
150 × 65 6 × 2½	168.3 × 73.0 6.625 × 2.875	300 2.07	70 2.75	247 9.72	112.5 4.43	135 5.32	98.5 3.88	5/8 × 105 M16X108	UL FM
150 × 65 6 × 2½	168.3 × 76.1 6.625 × 3.000	300 2.07	70 2.75	247 9.72	112.5 4.43	135 5.32	98.5 3.88	5/8 × 105 M16X108	VdS LPCB
150 × 80 6 × 3	168.3 × 88.9 6.625 × 3.500	300 2.07	89 3.50	247 9.72	132 5.20	141 5.55	98.5 3.88	5/8 × 105 M16X108	UL FM VdS LPCB
150 × 100 6 × 4	168.3 × 114.3 6.625 × 4.500	300 2.07	114 4.50	247 9.72	160 6.30	138 5.43	98.5 3.88	5/8 × 105 M16X108	UL FM VdS LPCB
200 × 50 8 × 2	219.1 × 60.3 8.625 × 2.375	300 2.07	64 2.5	320 12.60	118 4.65	158 6.22	125 4.92	3/4 × 115 M20X115	UL FM VdS
200 × 65 8 × 2½	219.1 × 73.0 8.625 × 2.875	300 2.07	70 2.75	320 12.60	118 4.65	158 6.22	125 4.92	3/4 × 115 M20X115	UL FM VdS LPCB
200 × 65 8 × 2½	219.1 × 76.1 8.625 × 3.000	300 2.07	70 2.75	320 12.60	118 4.65	158 6.22	125 4.92	3/4 × 115 M20X115	UL FM VdS LPCB
200 × 80 8 × 3	219.1 × 88.9 8.625 × 3.500	300 2.07	89 3.50	320 12.60	136.5 5.37	161 6.34	125 4.92	3/4 × 115 M20X115	UL FM VdS LPCB
200 × 100 8 × 4	219.1 × 108.0 8.625 × 4.250	300 2.07	114 4.50	320 12.60	162 6.38	161 6.34	125 4.92	3/4 × 115 M20X115	UL FM
200 × 100 8 × 4	219.1 × 114.3 8.625 × 4.500	300 2.07	114 4.50	320 12.60	162 6.38	161 6.34	125 4.92	3/4 × 115 M20X115	UL FM VdS LPCB
250 × 65 10 × 2½	273.0 × 76.1 10.75 × 3.000	300 2.07	70 2.75	376 14.80	118 4.65	189 7.44	155 6.10	3/4 × 120 M20X115	—
250 × 80 10 × 3	273.0 × 88.9 10.75 × 3.500	300 2.07	89 3.50	376 14.80	136.5 5.37	189 7.44	155 6.10	3/4 × 120 M20X115	—
250 × 100 10 × 4	273.0 × 108 10.75 × 4.250	300 2.07	114 4.50	376 14.80	164 6.46	189 7.44	155 6.10	3/4 × 120 M20X115	UL FM
250 × 100 10 × 4	273.0 × 114.3 10.75 × 4.500	300 2.07	114 4.50	376 14.80	164 6.46	189 7.44	155 6.10	3/4 × 120 M20X115	UL FM VdS

### 3GS

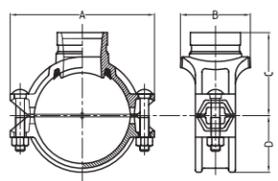
Light-duty  
Mechanical Tee  
Grooved Outlet



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Hole Dia mm/in +1.6,0/+0.063,0	Dimensions				Bolt Size mm/in	Certificate
				A mm/in	B mm/in	C mm/in	D mm/in		
125 × 80 133.0 × 3	133.0 × 88.9 5.250 × 3.500	300 2.07	89 3.50	203 7.99	132 5.12	110 4.33	77.5 3.05	5/8 × 85 M16X85	UL FM
125 × 32 139.7 × 1¼	139.7 × 42.4 5.500 × 1.660	300 2.07	51 2.00	210 8.27	91 3.58	113 4.45	82 3.23	5/8 × 85 M16X85	UL FM
125 × 40 139.7 × 1½	139.7 × 48.3 5.500 × 1.900	300 2.07	51 2.00	210 8.27	91 3.58	113 4.45	82 3.23	5/8 × 85 M16X85	UL FM
125 × 50 139.7 × 2	139.7 × 60.3 5.500 × 2.375	300 2.07	64 2.50	210 8.27	110 4.33	113 4.45	82 3.23	5/8 × 85 M16X85	UL FM
125 × 65 139.7 × 2½	139.7 × 76.1 5.500 × 3.000	300 2.07	70 2.75	210 8.27	110 4.33	113 4.45	82 3.23	5/8 × 85 M16X85	UL FM
125 × 80 139.7 × 3	139.7 × 88.9 5.500 × 3.500	300 2.07	89 3.50	210 8.27	130 5.12	113 4.45	82 3.23	5/8 × 85 M16X85	UL FM
125 × 6 139.7 × 4	139.7 × 114.3 5.500 × 4.500	175 1.21	114 4.50	210 8.27	153 6.02	115 4.52	82 3.23	5/8 × 85 M16X85	UL FM
150 × 65 159.0 × 2½	159.1 × 76.1 6.250 × 3.000	300 2.07	70 2.75	227 8.94	110 4.33	122.5 4.83	91 3.58	5/8 × 105 M16X108	UL FM
150 × 80 159.0 × 88.9	159.1 × 88.9 6.250 × 3.500	300 2.07	89 3.50	227 8.94	130 5.11	122.5 4.83	91 3.58	5/8 × 105 M16X108	UL FM
150 × 100 159.0 × 108.0	159.1 × 108.0 6.250 × 4.250	300 2.07	114 4.50	227 8.94	155 6.10	122.5 4.83	91 3.58	5/8 × 105 M16X108	UL FM
150 × 100 159.0 × 108.0	159.1 × 114.3 6.250 × 4.500	300 2.07	114 4.50	227 8.94	155 6.10	122.5 4.83	91 3.58	5/8 × 105 M16X108	UL FM
150 × 32 165.1 × 1¼	165.1 × 42.4 6.500 × 1.900	300 2.07	51 2.00	235 9.25	92.5 3.64	124.5 4.90	94.5 3.72	5/8 × 105 M16X108	UL FM
150 × 50 165.1 × 2	165.1 × 60.3 6.500 × 2.375	300 2.07	64 2.50	235 9.25	110 4.33	124.5 4.90	94.5 3.72	5/8 × 105 M16X108	UL FM
150 × 65 165.1 × 2½	165.1 × 76.1 6.500 × 3.000	300 2.07	70 2.75	235 9.25	110 4.33	124.5 4.90	94.5 3.72	5/8 × 105 M16X108	UL FM
150 × 80 165.1 × 3	165.1 × 88.9 6.500 × 3.500	300 2.07	89 3.50	235 9.25	130 5.12	124.5 4.90	94.5 3.72	5/8 × 105 M16X108	UL FM
150 × 100 165.1 × 4	165.1 × 108 6.500 × 4.250	300 2.07	114 4.50	235 9.25	155 6.10	126 4.96	94.5 3.72	5/8 × 105 M16X108	—
150 × 100 165.1 × 4	165.1 × 114.3 6.500 × 4.500	300 2.07	114 4.50	235 9.25	155 6.10	126 4.96	94.5 3.72	5/8 × 105 M16X108	UL FM
150 × 32 6 × 1¼	168.3 × 42.4 6.500 × 1.660	300 2.07	51 2.00	240 9.45	92.5 3.64	126 4.96	96.5 3.80	5/8 × 105 M16X108	UL FM
150 × 40 6 × 1½	168.3 × 48.3 6.500 × 1.900	300 2.07	51 2.00	240 9.45	92.5 3.64	126 4.96	96.5 3.80	5/8 × 105 M16X108	UL FM
150 × 50 6 × 2	168.3 × 60.3 6.625 × 2.375	300 2.07	64 2.50	240 9.45	110 4.33	126 4.96	96.5 3.80	5/8 × 105 M16X108	UL FM
150 × 65 6 × 2½	168.3 × 73.0 6.625 × 2.875	300 2.07	70 2.75	240 9.45	110 4.33	126 4.96	96.5 3.80	5/8 × 105 M16X108	UL FM
150 × 65 6 × 2½	168.3 × 76.1 6.625 × 3	300 2.07	70 2.75	240 9.45	110 4.33	126 4.96	96.5 3.80	5/8 × 105 M16X108	UL FM
150 × 80 6 × 3	168.3 × 88.9 6.625 × 3.500	300 2.07	89 3.50	240 9.45	130 5.12	126 4.96	96.5 3.80	5/8 × 105 M16X108	UL FM
150 × 100 6 × 4	168.3 × 114.3 6.625 × 4.500	300 2.07	114 4.50	240 9.45	155 6.10	128 5.04	96.5 3.80	5/8 × 105 M16X108	UL FM
200 × 50 8 × 2	219.1 × 60.3 8.625 × 2.375	300 2.07	64 2.50	300 11.81	117 4.60	155 6.10	123 4.84	5/8 × 105 M16X108	UL FM
200 × 65 8 × 2½	219.1 × 73 8.625 × 2.875	300 2.07	70 2.75	300 11.81	117 4.60	155 6.10	123 4.84	5/8 × 105 M16X108	UL FM
200 × 65 8 × 2½	219.1 × 76.1 8.625 × 3.000	300 2.07	70 2.75	300 11.81	117 4.60	155 6.10	123 4.84	5/8 × 105 M16X108	UL FM
200 × 80 8 × 3	219.1 × 88.9 8.625 × 3.500	300 2.07	89 3.50	300 11.81	135.5 5.33	155 6.10	123 4.84	5/8 × 105 M16X108	UL FM
200 × 100 8 × 4	219.1 × 114.3 8.625 × 4.500	300 2.07	114 4.50	300 11.81	164 6.46	160 6.30	123 4.84	5/8 × 105 M16X108	UL FM

### 3GS

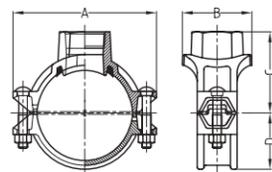
Light-duty  
Mechanical Tee  
Grooved Outlet



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Hole Dia mm/in +1.6,0/+0.063,0	Dimensions				Bolt Size mm/in	Certificate
				A mm/in	B mm/in	C mm/in	D mm/in		
65 × 25 76.1 × 1	76.1 × 33.7 3.000 × 1.315	300 2.07	38 1.50	137 5.39	71 2.80	78 3.07	49.5 1.95	1/2 × 70 M12X70	UL FM
65 × 32 76.1 × 1¼	76.1 × 42.4 3.000 × 1.660	300 2.07	51 2.00	137 5.39	84.5 3.33	78 3.07	49.5 1.95	1/2 × 70 M12X70	UL FM
65 × 40 76.1 × 1½	76.1 × 48.3 3.000 × 1.900	300 2.07	51 2.00	137 5.39	84.5 3.33	78 3.07	49.5 1.95	1/2 × 70 M12X70	UL FM
80 × 25 3 × 1	88.9 × 33.7 3.500 × 1.315	300 2.07	38 1.50	150 5.91	71.0 2.80	84 3.31	55.5 2.19	1/2 × 75 M12X76	UL FM
80 × 32 3 × 1¼	88.9 × 42.4 3.500 × 1.660	300 2.07	51 2.00	150 5.91	84.5 3.33	84 3.31	55.5 2.19	1/2 × 75 M12X76	UL FM
80 × 40 3 × 1½	88.9 × 48.3 3.500 × 1.900	300 2.07	51 2.00	150 5.91	84.5 3.33	84 3.31	55.5 2.19	1/2 × 75 M12X76	UL FM
80 × 50 3 × 2	88.9 × 60.3 3.500 × 2.375	300 2.07	64 2.50	150 5.91	98 3.86	84 3.31	55.5 2.19	1/2 × 75 M12X76	UL FM
100 × 25 4 × 1	114.3 × 33.7 4.500 × 1.315	300 2.07	38 1.50	178 7.01	77.5 3.05	98 3.86	67.5 2.66	1/2 × 75 M12X76	UL FM
100 × 40 4 × 1½	114.3 × 48.3 4.500 × 1.900	300 2.07	51 2.00	178 7.01	88 3.46	98 3.86	67.5 2.66	1/2 × 75 M12X76	UL FM
100 × 50 4 × 2	114.3 × 60.3 4.500 × 2.375	300 2.07	64 2.50	178 7.01	103.5 4.07	98 3.86	67.5 2.66	1/2 × 75 M12X76	UL FM
100 × 65 4 × 2½	114.3 × 73.0 4.500 × 2.875	300 2.07	70 2.75	178 7.01	103.5 4.07	98 3.86	67.5 2.66	1/2 × 75 M12X76	UL FM
100 × 65 4 × 2½	114.3 × 76.1 4.500 × 3.000	300 2.07	70 2.75	178 7.01	103.5 4.07	98 3.86	67.5 2.66	1/2 × 75 M12X76	UL FM
100 × 80 4 × 3	114.3 × 88.9 4.500 × 3.500	300 2.07	89 3.50	178 7.01	124 4.88	98 3.86	67.5 2.66	1/2 × 75 M12X76	UL FM

# 3J

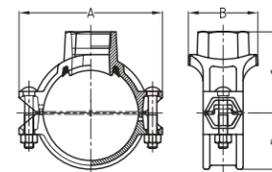
## Mechanical Tee Threaded Outlet



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Hole Dia mm/in +1.6,0/+0.063,0	Dimensions				Bolt Size mm/in	Certificate
				A mm/in	B mm/in	C mm/in	D mm/in		
25X10 1X3/8	33.7X17.2 1.315X0.677	300 2.07	23.5 0.92	86 3.38	46 1.81	26 1.02	24.5 0.96	M8X30	—
25X15 1X1/2	33.7X21.3 1.315X0.825	300 2.07	23.5 0.92	86 3.38	46 1.81	26 1.02	24.5 0.96	M8X30	—
25X20 1X3/4	33.7X26.9 1.315X1.050	300 2.07	23.5 0.92	86 3.38	52 2.05	41 1.61	24.5 0.96	M8X30	—
25X25 1X1	33.7X33.7 1.315X1.315	300 2.07	23.5 0.92	86 3.38	57 2.24	45 1.77	24.5 0.96	M8X30	—
32X10 11/4X3/8	42.4X17.2 1.660X0.677	300 2.07	30 1.18	95.5 3.76	53 2.09	32 1.26	29 1.14	M10X35	—
32X15 11/4X1/2	42.4X21.3 1.660X0.825	300 2.07	30 1.18	95.5 3.76	57 2.24	32 1.26	29 1.14	M10X35	—
32X20 11/4X3/4	42.4X26.9 1.660X1.050	300 2.07	30 1.18	95.5 3.76	57 2.24	44 1.73	29 1.14	M10X35	—
32X25 11/4X1	42.4X33.7 1.660X1.315	300 2.07	30 1.18	95.5 3.76	57 2.24	53 2.09	29 1.14	M10X35	—
40X10 11/2X3/8	48.3X17.2 1.900X0.677	300 2.07	30 1.18	101.5 3.99	53 2.09	34 1.34	32.5 1.28	M10X35	—
40X15 11/2X1/2	48.3X21.3 1.900X0.825	300 2.07	30 1.18	101.5 3.99	57 2.24	35.5 1.40	32.5 1.28	M10X35	—
40X20 11/2X3/4	48.3X26.9 1.900X1.050	300 2.07	30 1.18	101.5 3.99	57 2.24	47.5 1.87	32.5 1.28	M10X35	—
40X25 11/2X1	48.3X33.7 1.900X1.315	300 2.07	30 1.18	101.5 3.99	57 2.24	56 2.20	32.5 1.28	M10X35	—
50 x 10 2 x 3/8	60.3 x 17.2 2.375 x 0.677	300 2.07	38 1.50	116 4.57	68 2.68	44 1.73	39 1.54	3/8 x 55 M10X57	—
50 x 15 2 x 1/2	60.3 x 21.3 2.375 x 0.825	300 2.07	38 1.50	116 4.57	68 2.68	60 2.36	39 1.54	3/8 x 55 M10X57	UL FM VdS
50 x 20 2 x 3/4	60.3 x 26.9 2.375 x 1.050	300 2.07	38 1.50	116 4.57	68 2.68	60 2.36	39 1.54	3/8 x 55 M10X57	UL FM VdS
50 x 25 2 x 1	60.3 x 33.7 2.375 x 1.315	300 2.07	38 1.50	116 4.57	68 2.68	60 2.36	39 1.54	3/8 x 55 M10X57	UL FM VdS
50 x 32 2 x 1 1/4	60.3 x 42.4 2.375 x 1.660	300 2.07	45 1.75	116 4.57	76 2.99	65 2.56	39 1.54	3/8 x 55 M10X57	UL FM
50 x 40 2 x 1 1/2	60.3 x 48.3 2.375 x 1.900	300 2.07	45 1.75	116 4.57	76 2.99	65 2.56	39 1.54	3/8 x 55 M10X57	UL FM
65 x 20 2 1/2 x 3/4	73.0 x 26.9 2.875 x 1.050	300 2.07	38 1.50	137 5.39	71 2.76	68 2.67	49 1.93	1/2 x 70 M12X70	UL FM
65 x 25 2 1/2 x 1	73.0 x 33.7 2.875 x 1.315	300 2.07	38 1.50	137 5.39	71 2.76	70 2.75	49 1.93	1/2 x 70 M12X70	UL FM
65 x 32 2 1/2 x 1 1/4	73.0 x 42.4 2.875 x 1.660	300 2.07	51 2.00	137 5.397	84.5 3.33	73 2.87	49 1.93	1/2 x 70 M12X70	UL FM
65 x 40 2 1/2 x 1 1/2	73.0 x 48.3 2.875 x 1.900	300 2.07	51 2.00	137 5.39	84.5 3.33	73 2.87	49 1.93	1/2 x 70 M12X70	UL FM
65 x 15 76.1 x 1/2	76.1 x 21.3 3.000 x 0.825	300 2.07	38 1.50	137 5.39	71 2.80	61.5 2.42	49.5 1.95	1/2 x 70 M12X70	UL FM VdS
65 x 20 76.1 x 3/4	76.1 x 26.9 3.000 x 1.050	300 2.07	38 1.50	137 5.39	71 2.80	75 3.05	49.5 1.95	1/2 x 70 M12X70	UL FM VdS
65 x 25 76.1 x 1	76.1 x 33.7 3.000 x 1.315	300 2.07	38 1.50	137 5.39	71 2.80	75 3.05	49.5 1.95	1/2 x 70 M12X70	UL FM VdS
65 x 32 76.1 x 1 1/4	76.1 x 42.4 3.000 x 1.660	300 2.07	51 2.00	137 5.39	84.5 3.33	75 3.05	49.5 1.95	1/2 x 70 M12X70	UL FM VdS
65 x 40 76.1 x 1 1/2	76.1 x 48.3 3.000 x 1.900	300 2.07	51 2.00	137 5.39	84.5 3.33	61.5 2.42	49.5 1.95	1/2 x 70 M12X70	UL FM VdS
80 x 25 3 x 1/2	88.9 x 21.3 3.500 x 0.825	300 2.07	38 1.50	152 5.98	72.5 2.85	71.5 2.81	56.5 2.22	1/2 x 75 M12X76	UL FM VdS
80 x 30 3 x 3/4	88.9 x 26.9 3.500 x 1.050	300 2.07	38 1.50	152 5.98	72.5 2.85	71.5 2.81	56.5 2.22	1/2 x 75 M12X76	UL FM VdS
80 x 25 3 x 1	88.9 x 33.7 3.500 x 1.315	300 2.07	38 1.50	152 5.98	72.5 2.85	80 3.15	56.5 2.22	1/2 x 75 M12X76	UL FM VdS
80 x 32 3 x 1 1/4	88.9 x 42.4 3.500 x 1.660	300 2.07	51 2.00	152 5.98	85.5 3.37	80 3.15	56.5 2.22	1/2 x 75 M12X76	UL FM VdS
80 x 40 3 x 1 1/2	88.9 x 48.3 3.500 x 1.900	300 2.07	51 2.00	152 5.98	85.5 3.37	80 3.15	56.5 2.22	1/2 x 75 M12X76	UL FM VdS
80 x 50 3 x 2	88.9 x 60.3 3.500 x 2.375	300 2.07	64 2.50	152 5.98	98 3.86	80 3.15	56.5 2.22	1/2 x 75 M12X76	UL FM VdS
100 x 15 108.0 x 1/2	108.1 x 21.3 4.250 x 0.825	300 2.07	38 1.50	172 6.77	78.5 3.09	87 3.43	64.5 2.54	1/2 x 75 M12X76	UL FM

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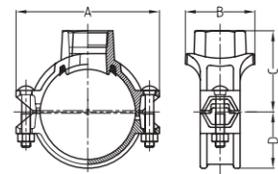
## Mechanical Tee Threaded Outlet



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Hole Dia mm/in +1.6,0/+0.063,0	Dimensions				Bolt Size mm/in	Certificate
				A mm/in	B mm/in	C mm/in	D mm/in		
100 x 20 108.0 x 3/4	108.1 x 26.9 4.250 x 1.050	300 2.07	38 1.50	172 6.77	78.5 3.09	87 3.43	64.5 2.54	1/2 x 75 M12X76	UL FM
100 x 25 108.0 x 1	108.1 x 33.7 4.250 x 1.315	300 2.07	38 1.50	172 6.77	78.5 3.09	87 3.43	64.5 2.54	1/2 x 75 M12X76	UL FM
100 x 32 108.0 x 1 1/4	108.1 x 42.4 4.250 x 1.660	300 2.07	51 2.00	172 6.77	89 3.50	87 3.43	64.5 2.54	1/2 x 75 M12X76	UL FM
100 x 40 108.0 x 1 1/2	108.0 x 48.3 4.250 x 1.900	300 2.07	51 2.00	172 6.77	89 3.50	87 3.43	64.5 2.54	1/2 x 75 M12X76	UL FM
100 x 50 108.0 x 2	108.0 x 60.3 4.250 x 2.375	300 2.07	64 2.50	172 6.77	106.5 4.19	92 3.62	64.5 2.54	1/2 x 75 M12X76	UL FM
100 x 65 108.0 x 76.1	108.0 x 76.1 4.250 x 3.000	300 2.07	70 2.75	172 6.77	106.5 4.19	100 3.94	64.5 2.54	1/2 x 75 M12X76	UL FM
100 x 15 4 x 1/2	114.3 x 21.3 4.500 x 0.825	300 2.07	38 1.50	188 7.40	78.5 3.09	90 3.54	70 2.76	1/2 x 75 M12X76	UL FM VdS
100 x 20 4 x 3/4	114.3 x 26.9 4.500 x 1.050	300 2.07	38 1.50	188 7.40	78.5 3.09	90 3.54	70 2.76	1/2 x 75 M12X76	UL FM VdS
100 x 25 4 x 1	114.3 x 33.7 4.500 x 1.315	300 2.07	38 1.50	188 7.40	78.5 3.09	93 3.66	70 2.76	1/2 x 75 M12X76	UL FM VdS
100 x 32 4 x 1 1/4	114.3 x 42.4 4.500 x 1.660	300 2.07	51 2.00	188 7.40	89 3.50	95 3.74	70 2.76	1/2 x 75 M12X76	UL FM VdS
100 x 40 4 x 1 1/2	114.3 x 48.3 4.500 x 1.900	300 2.07	51 2.00	188 7.40	89 3.50	97 3.82	70 2.76	1/2 x 75 M12X76	UL FM VdS
100 x 50 4 x 2	114.3 x 60.3 4.500 x 2.375	300 2.07	64 2.50	188 7.40	104.5 4.11	100 3.94	70 2.76	1/2 x 75 M12X76	UL FM VdS
100 x 65 4 x 2 1/2	114.3 x 73.0 4.500 x 2.875	300 2.07	70 2.75	188 7.40	104.5 4.11	102 4.02	70 2.76	1/2 x 7 M12X765	UL FM
100 x 65 4 x 76.1	114.3 x 76.1 4.500 x 3.000	300 2.07	70 2.75	188 7.40	104.5 4.11	102 4.02	70 2.76	1/2 x 75 M12X76	UL FM VdS LPCB
100 x 80 4 x 3	114.3 x 88.9 4.500 x 3.500	300 2.07	89 3.50	188 7.40	128 5.039	102 4.02	70 2.76	1/2 x 75 M12X76	UL FM VdS LPCB
125 x 25 133.0 x 1	133.0 x 33.7 5.250 x 1.315	300 2.07	38 1.50	209 8.23	78 3.07	105 4.13	77 3.03	5/8 x 85 M16X85	UL FM
125 x 32 133.0 x 1.25	133.0 x 42.4 5.250 x 1.660	300 2.07	51 2.00	209 8.23	93 3.66	105 4.13	77 3.03	5/8 x 85 M16X85	UL FM
125 x 40 133.0 x 1 1/2	133.0 x 48.3 5.250 x 1.900	300 2.07	51 2.00	209 8.23	93 3.66	105 4.13	77 3.03	5/8 x 85 M16X85	UL FM
125 x 50 133.0 x 2	133.0 x 60.3 5.250 x 2.375	300 2.07	64 2.50	209 8.23	112.5 4.43	110 4.33	77 3.03	5/8 x 85 M16X85	UL FM
125 x 65 133.0 x 76.1	133.0 x 76.1 5.250 x 3.000	300 2.07	70 2.75	209 8.23	112.5 4.43	115 4.53	77 3.03	5/8 x 85 M16X85	UL FM
125 x 80 133.0 x 3	133.0 x 88.9 5.250 x 3.500	300 2.07	89 3.50	209 8.23	132 5.20	118 4.65	77 3.03	5/8 x 85 M16X85	UL FM
125 x 15 139.7 x 1/2	139.7 x 21.3 5.500 x 0.825	300 2.07	38 1.50	221.5 8.72	78 3.07	110 4.33	84 3.31	5/8 x 85 M16X85	UL FM VdS
125 x 20 139.7 x 3/4	139.7 x 26.9 5.500 x 1.050	300 2.07	38 1.50	221.5 8.72	78 3.07	110 4.33	84 3.31	5/8 x 85 M16X85	UL FM VdS
125 x 25 139.7 x 1	139.7 x 33.7 5.500 x 1.315	300 2.07	38 1.50	221.5 8.72	78 3.07	110 4.33	84 3.31	5/8 x 85 M16X85	UL FM VdS
125 x 32 139.7 x 1 1/4	139.7 x 42.4 5.500 x 1.660	300 2.07	51 2.00	221.5 8.72	95 3.74	112 4.41	84 3.31	5/8 x 85 M16X85	UL FM VdS
125 x 40 139.7 x 1 1/2	139.7 x 48.3 5.500 x 1.900	300 2.07	51 2.00	221.5 8.72	95 3.74	112 4.41	84 3.31	5/8 x 85 M16X85	UL FM VdS
125 x 50 139.7 x 2	139.7 x 60.3 5.500 x 2.375	300 2.07	64 2.50	221.5 8.72	112.5 4.43	115 4.53	84 3.31	5/8 x 85 M16X85	UL FM VdS
125 x 65 139.7 x 76.1	139.7 x 76.1 5.500 x 3.000	300 2.07	70 2.75	221.5 8.72	112.5 4.43	115 4.53	84 3.31	5/8 x 85 M16X85	UL FM VdS LPCB
125 x 80 139.7 x 3	139.7 x 88.9 5.500 x 3.500	300 2.07	89 3.50	221.5 8.72	132 5.20	120 4.72	84 3.31	5/8 x 85 M16X85	UL FM VdS LPCB
125 x 100 139.7 x 4	139.7 x 114.3 5.500 x 4.500	300 2.07	114 4.50	221.5 8.72	156 6.30	125 4.92	84 3.31	5/8 x 85 M16X85	UL FM VdS LPCB
150 x 15 159.0 x 1/2	159.0 x 21.3 6.250 x 0.825	300 2.07	38 1.50	244 9.60	78 3.07	116 4.57	94 3.70	5/8 x 105 M16X108	UL FM
150 x 25 159.0 x 1	159.0 x 33.7 6.250 x 1.315	300 2.07	38 1.50	244 9.60	78 3.07	116 4.57	94 3.70	5/8 x 105 M16X108	UL FM
150 x 32 159.0 x 1 1/4	159.0 x 42.4 6.250 x 1.660	300 2.07	51 2.00	244 9.60	93 3.66	118 4.65	94 3.70	5/8 x 105 M16X108	UL FM
150 x 40 159.0 x 1 1/2	159.0 x 48.3 6.250 x 1.900	300 2.07	51 2.00	244 9.60	93 3.66	118 4.65	94 3.70	5/8 x 105 M16X108	UL FM

### 3J

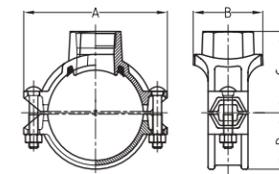
#### Mechanical Tee Threaded Outlet



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Hole Dia mm/in +1.6,0/+0.063,0	Dimensions				Bolt Size mm/in	Certificate
				A mm/in	B mm/in	C mm/in	D mm/in		
150 × 50 159.0 × 2	159.0 × 60.3 6.250 × 2.375	300 2.07	64 2.50	244 9.60	112.5 4.43	125 4.92	94 3.70	5/8 × 105 M16X108	UL FM
150 × 65 159.0 × 76.1	159.0 × 76.1 6.250 × 3.000	300 2.07	70 2.75	244 9.60	112.5 4.43	125 4.92	94 3.70	5/8 × 105 M16X108	UL FM
150 × 80 159.0 × 3	159.0 × 88.9 6.250 × 3.500	300 2.07	89 3.50	244 9.60	133 5.20	125 4.92	94 3.70	5/8 × 105 M16X108	UL FM
150 × 100 159.0 × 4	159.1 × 114.3 6.250 × 4.500	175 1.20	114 4.50	244 9.60	156.5 6.16	130 5.12	94 3.70	5/8 × 105 M16X108	UL FM
150 × 15 165.1 × 1/2	165.1 × 21.3 6.500 × 0.825	300 2.07	38 1.50	244 9.60	78 3.07	110 4.33	97.5 3.84	5/8 × 105 M16X108	UL FM
125 × 20 165.1 × 3/4	165.1 × 26.9 6.500 × 1.050	300 2.07	38 1.50	244 9.60	78 3.07	110 4.33	97.5 3.84	5/8 × 105 M16X108	UL FM
150 × 25 165.1 × 1	165.1 × 33.7 6.500 × 1.315	300 2.07	38 1.50	244 9.60	78 3.07	118 4.65	97.5 3.84	5/8 × 105 M16X108	UL FM
150 × 32 165.1 × 1/4	165.1 × 42.4 6.500 × 1.660	300 2.07	51 2.00	244 9.60	93 3.66	118 4.65	97.5 3.84	5/8 × 105 M16X108	UL FM
150 × 40 165.1 × 1/2	165.1 × 48.3 6.500 × 1.900	300 2.07	51 2.00	244 9.60	93 3.66	118 4.65	97.5 3.84	5/8 × 105 M16X108	UL FM
150 × 50 165.1 × 2	165.1 × 60.3 6.500 × 2.375	300 2.07	64 2.50	244 9.60	112.5 4.43	128.5 5.43	97.5 3.84	5/8 × 105 M16X108	UL FM
150 × 65 165.1 × 76.1	165.1 × 76.1 6.500 × 3.000	300 2.07	70 2.75	244 9.60	112.5 4.43	128.5 5.43	97.5 3.84	5/8 × 105 M16X108	UL FM LPCB
150 × 80 165.1 × 3	165.1 × 88.9 6.500 × 3.500	300 2.07	89 3.50	244 9.60	132 5.20	128.5 5.06	97.5 3.84	5/8 × 105 M16X108	UL FM LPCB
150 × 100 165.1 × 4	165.1 × 114.3 6.500 × 4.500	225 1.6	114 4.50	244 9.60	154 6.18	135 5.32	97.5 3.84	5/8 × 105 M16X108	UL FM LPCB
150 × 32 6 × 1/4	168.3 × 42.4 6.500 × 1.660	300 2.07	51 2.00	247 9.72	95 3.74	122 4.80	98.5 3.88	5/8 × 105 M16X108	UL FM VdS
150 × 40 6 × 1/2	168.3 × 48.3 6.500 × 1.900	300 2.07	51 2.00	247 9.72	95 3.74	122 4.80	98.5 3.88	5/8 × 105 M16X108	UL FM VdS
150 × 50 6 × 2	168.3 × 60.3 6.625 × 2.375	300 2.07	64 2.50	247 9.72	112.5 4.43	132 5.20	98.5 3.88	5/8 × 105 M16X108	UL FM VdS
150 × 65 6 × 2/2	168.3 × 73.0 6.625 × 2.875	300 2.07	70 2.75	247 9.72	112.5 4.43	132 5.20	98.5 3.88	5/8 × 105 M16X108	UL FM
150 × 65 6 × 76.1	168.3 × 76.1 6.625 × 3.000	300 2.07	70 2.75	247 9.72	112.5 4.43	132 5.20	98.5 3.88	5/8 × 105 M16X108	UL FM VdS LPCB
150 × 80 6 × 3	168.3 × 88.9 6.625 × 3.500	300 2.07	89 3.50	247 9.72	132 5.20	140 5.51	98.5 3.88	5/8 × 105 M16X108	UL FM VdS LPCB
150 × 100 6 × 4	168.3 × 114.3 6.625 × 4.500	300 2.07	114 4.50	247 9.72	160 6.30	140 5.51	98.5 3.88	5/8 × 105 M16X108	UL FM VdS LPCB
200 × 25 8 × 1	219.0 × 33.7 8.625 × 1.315	300 2.07	38 1.50	320 12.60	79.5 3.13	150 5.91	125 4.92	3/4 × 115 M20X115	UL FM VdS
200 × 32 8 × 1/4	219.1 × 42.4 8.625 × 1.660	300 2.07	51 2.00	320 12.60	96.5 3.80	150 5.91	125 4.92	3/4 × 115 M20X115	UL FM VdS
200 × 40 8 × 1/2	219.1 × 48.3 8.625 × 1.900	300 2.07	51 2.00	320 12.60	96.5 3.80	150 5.91	125 4.92	3/4 × 115 M20X115	UL FM VdS
200 × 50 8 × 2	219.1 × 60.3 8.625 × 2.375	300 2.07	64 2.50	320 12.60	117 4.61	160 6.30	125 4.92	3/4 × 115 M20X115	UL FM VdS
200 × 65 8 × 2/2	219.1 × 73.0 8.625 × 2.875	300 2.07	70 2.75	320 12.60	118 4.65	160 6.30	125 4.92	3/4 × 115 M20X115	UL FM
200 × 65 8 × 76.1	219.1 × 76.1 8.625 × 3.000	300 2.07	70 2.75	320 12.60	118 4.65	160 6.30	125 4.92	3/4 × 115 M20X115	UL FM VdS LPCB
200 × 80 8 × 3	219.1 × 88.9 8.625 × 3.500	300 2.07	89 3.50	320 12.60	136.5 5.37	160 6.30	125 4.92	3/4 × 115 M20X115	UL FM VdS LPCB
200 × 100 8 × 4	219.1 × 114.3 8.625 × 4.500	300 2.07	114 4.50	320 12.60	164 6.46	160 6.30	125 4.92	3/4 × 115 M20X115	UL FM VdS LPCB
250 × 40 10 × 1/4	273.0 × 48.3 10.750 × 1.900	300 2.07	51 2.00	376 14.80	95.5 3.76	180 7.09	155 6.10	3/4 × 120 M20X115	UL FM
250 × 50 10 × 2	273.0 × 60.3 10.750 × 2.375	300 2.07	64 2.50	376 14.80	118 4.65	185 7.28	155 6.10	3/4 × 120 M20X115	UL FM VdS
250 × 65 10 × 76.1	273.0 × 76.1 10.750 × 3.000	300 2.07	70 2.75	376 14.80	118 4.65	190 7.48	155 6.10	3/4 × 120 M20X115	UL FM VdS
250 × 80 10 × 3	273.0 × 88.9 10.750 × 3.500	300 2.07	89 3.50	376 14.80	136.5 5.37	190 7.48	155 6.10	3/4 × 120 M20X115	UL FM VdS
250 × 100 10 × 4	273.0 × 114.3 10.750 × 4.500	300 2.07	114 4.50	376 14.80	164 6.46	190 7.48	155 6.10	3/4 × 120 M20X115	UL FM VdS

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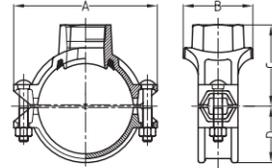
#### Light-duty Mechanical Tee Threaded Outlet



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Hole Dia mm/in +1.6,0/+0.063,0	Dimensions				Bolt Size mm/in	Certificate
				A mm/in	B mm/in	C mm/in	D mm/in		
65 × 15 76.1 × 1/2	76.1 × 21.3 3.000 × 0.825	300 2.07	38 1.50	137 5.39	71 2.80	75 3.05	49.5 1.95	1/2 × 70 M12X70	UL FM
65 × 20 76.1 × 3/4	76.1 × 26.9 3.000 × 1.050	300 2.07	38 1.50	137 5.39	71 2.80	75 3.05	49.5 1.95	1/2 × 70 M12X70	UL FM
65 × 25 76.1 × 1	76.1 × 33.7 3.000 × 1.315	300 2.07	38 1.50	137 5.39	71 2.80	75 3.05	49.5 1.95	1/2 × 70 M12X70	UL FM
65 × 32 76.1 × 1/4	76.1 × 42.4 3.000 × 1.660	300 2.07	51 2.00	137 5.39	84.5 3.33	75 3.05	49.5 1.95	1/2 × 70 M12X70	UL FM
65 × 40 76.1 × 1/2	76.1 × 48.3 3.000 × 1.900	300 2.07	51 2.00	137 5.39	84.5 3.33	75 3.05	49.5 1.95	1/2 × 70 M12X70	UL FM
80 × 15 3 × 1/2	88.9 × 21.3 3.500 × 0.825	300 2.07	38 1.50	150 5.91	71.0 2.80	68 2.68	55.5 2.19	1/2 × 75 M12X76	UL FM
80 × 20 3 × 3/4	88.9 × 26.9 3.500 × 1.050	300 2.07	38 1.50	150 5.91	71.0 2.80	68 2.68	55.5 2.19	1/2 × 75 M12X76	UL FM
80 × 25 3 × 1	88.9 × 33.7 3.500 × 1.315	300 2.07	38 1.50	150 5.91	71.0 2.80	71.0 2.80	55.5 2.19	1/2 × 75 M12X76	UL FM
80 × 32 3 × 1/4	88.9 × 42.4 3.500 × 1.660	300 2.07	51 2.00	150 5.91	84.5 3.33	74 2.91	55.5 2.19	1/2 × 75 M12X76	UL FM
80 × 40 3 × 1/2	88.9 × 48.3 3.500 × 1.900	300 2.07	51 2.00	150 5.91	84.5 3.33	74 2.91	55.5 2.19	1/2 × 75 M12X76	UL FM
80 × 50 3 × 2	88.9 × 60.3 3.500 × 2.375	300 2.07	64 2.50	150 5.91	98 3.86	77 3.03	55.5 2.19	1/2 × 75 M12X76	UL FM
100 × 15 108.0 × 1/2	108.1 × 21.3 4.250 × 0.825	300 2.07	38 1.50	172 6.77	77.5 3.05	85 3.35	64.5 2.54	1/2 × 75 M12X76	UL FM
100 × 25 108.0 × 1	108.1 × 33.7 4.250 × 1.315	300 2.07	38 1.50	172 6.77	77.5 3.05	85 3.35	64.5 2.54	1/2 × 75 M12X76	UL FM
100 × 32 108.0 × 1/4	108.1 × 42.4 4.250 × 1.660	300 2.07	51 2.00	172 6.77	88 3.46	85 3.35	64.5 2.54	1/2 × 75 M12X76	UL FM
100 × 40 108.0 × 1/2	108.0 × 48.3 4.250 × 1.900	300 2.07	51 2.00	172 6.77	88 3.46	85 3.35	64.5 2.54	1/2 × 75 M12X76	UL FM
100 × 50 108.0 × 2	108.0 × 60.3 4.250 × 2.375	300 2.07	64 2.50	172 6.77	103.5 4.19	90.5 3.56	64.5 2.54	1/2 × 75 M12X76	UL FM
100 × 65 108.0 × 76.1	108.0 × 76.1 4.250 × 3.000	300 2.07	70 2.75	172 6.77	103.5 4.07	97.5 3.84	64.5 2.54	1/2 × 75 M12X76	UL FM
100 × 15 4 × 1/2	114.3 × 21.3 4.500 × 0.825	300 2.07	38 1.50	178 7.01	77.5 3.05	82 3.23	67.5 2.66	1/2 × 75 M12X76	UL FM
100 × 20 4 × 3/4	114.3 × 26.9 4.500 × 1.050	300 2.07	38 1.50	178 7.01	77.5 3.05	82 3.23	67.5 2.66	1/2 × 75 M12X76	UL FM
100 × 25 4 × 1	114.3 × 33.7 4.500 × 1.315	300 2.07	38 1.50	178 7.01	77.5 3.05	89.5 3.52	67.5 2.66	1/2 × 75 M12X76	UL FM
100 × 32 4 × 1/4	114.3 × 42.4 4.500 × 1.660	300 2.07	51 2.00	178 7.01	88 3.46	89.5 3.53	67.5 2.66	1/2 × 75 M12X76	UL FM
100 × 40 4 × 1/2	114.3 × 48.3 4.500 × 1.900	300 2.07	51 2.00	178 7.01	88 3.46	89.5 3.53	67.5 2.66	1/2 × 75 M12X76	UL FM
100 × 50 4 × 2	114.3 × 60.3 4.500 × 2.375	300 2.07	64 2.50	178 7.01	103.5 4.07	92 3.62	67.5 2.66	1/2 × 75 M12X76	UL FM
100 × 65 4 × 2/2	114.3 × 73.0 4.500 × 2.875	300 2.07	70 2.75	178 7.01	103.5 4.07	98 3.86	67.5 2.66	1/2 × 75 M12X76	UL FM
100 × 65 4 × 76.1	114.3 × 76.1 4.500 × 3.000	300 2.07	70 2.75	178 7.01	103.5 4.07	98 3.86	67.5 2.66	1/2 × 75 M12X76	UL FM
100 × 80 4 × 3	114.3 × 88.9 4.500 × 3.500	300 2.07	89 3.50	178 7.01	103.5 4.07	98 3.86	67.5 2.66	1/2 × 75 M12X76	UL FM
125 × 25 133.0 × 1	133.0 × 33.7 5.250 × 1.315	300 2.07	38 1.50	203 7.99	77 3.03	98 3.86	77.5 3.05	5/8 × 85	UL FM
125 × 32 133.0 × 1.25	133.0 × 42.4 5.250 × 1.660	300 2.07	51 2.00	203 7.99	91 3.58	102 4.01	77.5 3.05	5/8 × 85	UL FM
125 × 40 133.0 × 1/2	133.0 × 48.3 5.250 × 1.900	300 2.07	51 2.00	203 7.99	91 3.58	102 4.01	77.5 3.05	5/8 × 85	UL FM
125 × 50 133.0 × 2	133.0 × 60.3 5.250 × 2.375	300 2.07	64 2.50	203 7.99	110 4.33	105 4.13	77.5 3.05	5/8 × 85	UL FM
125 × 65 133.0 × 76.1	133.0 × 76.1 5.250 × 3.000	300 2.07	70 2.75	203 7.99	110 4.33	113 4.45	77.5 3.05	5/8 × 85	UL FM
125 × 80 133.0 × 3	133.0 × 88.9 5.250 × 3.500	300 2.07	89 3.50	203 7.99	132 5.12	110 4.33	77.5 3.05	5/8 × 85	UL FM
125 × 25 139.7 × 1	139.7 × 33.7 5.500 × 1.315	300 2.07	38 1.50	210 8.27	77 3.03	100 3.94	82 3.23	5/8 × 85 M16X85	UL FM
125 × 32 139.7 × 1/4	139.7 × 42.4 5.500 × 1.660	300 2.07	51 2.00	210 8.27	91 3.58	105 4.13	82 3.23	5/8 × 85 M16X85	UL FM
125 × 40 139.7 × 1/2	139.7 × 48.3 5.500 × 1.900	300 2.07	51 2.00	210 8.27	91 3.58	10			

# 3JS

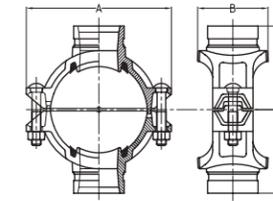
Light-duty  
Mechanical Tee  
Threaded Outlet



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Hole Dia mm/in +1.6, 0/+0.063, 0	Dimensions				Bolt Size mm/in	Certificate
				A mm/in	B mm/in	C mm/in	D mm/in		
125 × 65 139.7 × 76.1	139.7 × 76.1 5.500 × 3.000	300 2.07	70 2.75	210 8.27	110 4.33	115 4.53	82 3.23	5/8 × 85 M16X85	UL FM
125 × 80 139.7 × 88.9	139.7 × 88.9 5.500 × 3.500	300 2.07	89 3.50	210 8.27	130 5.12	115 4.53	82 3.23	5/8 × 85 M16X85	UL FM
125 × 100 139.7 × 114.3	139.7 × 114.3 5.500 × 4.500	300 2.07	114 4.50	210 8.27	153 6.02	118 4.65	82 3.23	5/8 × 85 M16X85	UL FM
150 × 25 159.0 × 1	159.0 × 33.7 6.250 × 1.315	300 2.07	38 1.50	227 8.94	77 3.03	110 4.33	91 3.58	5/8 × 85 M16X85	UL FM
150 × 32 159.0 × 1¼	159.0 × 42.4 6.250 × 1.660	300 2.07	51 2.00	227 8.94	92.5 3.64	112 4.41	91 3.58	5/8 × 105 M16X108	UL FM
150 × 40 159.0 × 1½	159.0 × 48.3 6.250 × 1.900	300 2.07	51 2.00	227 8.94	92.5 3.64	112 4.41	91 3.58	5/8 × 105 M16X108	UL FM
150 × 50 159.0 × 2	159.0 × 60.3 6.250 × 2.375	300 2.07	64 2.50	227 8.94	110 4.33	116.5 4.59	91 3.58	5/8 × 105 M16X108	UL FM
150 × 65 159.0 × 2½	159.0 × 76.1 6.250 × 3.000	300 2.07	70 2.75	227 8.94	110 4.33	121.5 4.78	91 3.58	5/8 × 105 M16X108	UL FM
150 × 80 159.0 × 3	159.0 × 88.9 6.250 × 3.500	300 2.07	89 3.50	227 8.94	130 5.12	123.5 4.86	91 3.58	5/8 × 105 M16X108	UL FM
150 × 100 159.0 × 4	159.1 × 114.3 6.250 × 4.500	300 2.07	114 4.50	227 8.94	155 6.10	127 5.00	91 3.58	5/8 × 105 M16X108	UL FM
150 × 15 165.1 × ½	165.1 × 21.3 6.500 × 0.825	300 2.07	38 1.50	235 9.25	77 3.03	115 4.53	94.5 3.72	5/8 × 105 M16X108	UL FM
125 × 20 165.1 × ¾	165.1 × 26.9 6.500 × 1.050	300 2.07	38 1.50	235 9.25	77 3.03	115 4.53	94.5 3.72	5/8 × 105 M16X108	UL FM
150 × 25 165.1 × 1	165.1 × 33.7 6.500 × 1.315	300 2.07	38 1.50	235 9.25	77 3.03	115 4.53	94.5 3.72	5/8 × 105 M16X108	UL FM
150 × 32 165.1 × 1¼	165.1 × 42.4 6.500 × 1.660	300 2.07	51 2.00	235 9.25	92.5 3.64	115 4.53	94.5 3.72	5/8 × 105 M16X108	UL FM
150 × 40 165.1 × 1½	165.1 × 48.3 6.500 × 1.900	300 2.07	51 2.00	235 9.25	92.5 3.64	115 4.53	94.5 3.72	5/8 × 105 M16X108	UL FM
150 × 50 165.1 × 2	165.1 × 60.3 6.500 × 2.375	300 2.07	64 2.50	235 9.25	110 4.33	120 4.72	94.5 3.72	5/8 × 105 M16X108	UL FM
150 × 65 165.1 × 2½	165.1 × 76.1 6.500 × 3.000	300 2.07	70 2.75	235 9.25	110 4.33	125 4.92	94.5 3.72	5/8 × 105 M16X108	UL FM
150 × 80 165.1 × 3	165.1 × 88.9 6.500 × 3.500	300 2.07	89 3.50	235 9.25	130 5.12	125 4.92	94.5 3.72	5/8 × 105 M16X108	UL FM
150 × 100 165.1 × 4	165.1 × 114.3 6.500 × 4.500	300 2.07	114 4.50	240 9.45	155 6.10	130 5.12	94.5 3.72	5/8 × 105 M16X108	UL FM
150 × 25 6 × 1	168.3 × 33.7 6.500 × 1.315	300 2.07	38 1.50	240 9.45	77 3.03	115 4.53	96.5 3.80	5/8 × 105 M16X108	UL FM
150 × 32 6 × 1¼	168.3 × 42.4 6.500 × 1.660	300 2.07	51 2.00	240 9.45	92.5 3.64	115 4.53	96.5 3.80	5/8 × 105 M16X108	UL FM
150 × 40 6 × 1½	168.3 × 48.3 6.500 × 1.900	300 2.07	51 2.00	240 9.45	92.5 3.64	115 4.53	96.5 3.80	5/8 × 105 M16X108	UL FM
150 × 50 6 × 2	168.3 × 60.3 6.625 × 2.375	300 2.07	64 2.50	240 9.45	110 4.33	121 4.76	96.5 3.80	5/8 × 105 M16X108	UL FM
150 × 65 6 × 2½	168.3 × 73.0 6.625 × 2.875	300 2.07	70 2.75	240 9.45	110 4.33	127 5.00	96.5 3.80	5/8 × 105 M16X108	UL FM
150 × 65 6 × 2½	168.3 × 76.0 6.625 × 3.000	300 2.07	70 2.75	240 9.45	110 4.33	127 5.00	96.5 3.80	5/8 × 105 M16X108	—
150 × 80 6 × 3	168.3 × 88.9 6.625 × 3.500	300 2.07	89 3.50	240 9.45	130 5.12	127 5.00	96.5 3.80	5/8 × 105 M16X108	UL FM
150 × 100 6 × 4	168.3 × 114.3 6.625 × 4.500	300 2.07	114 4.50	240 9.45	155 6.10	130 5.12	96.5 3.80	5/8 × 105 M16X108	UL FM
200 × 25 8 × 1	219.0 × 33.7 8.625 × 1.315	300 2.07	38 1.50	300 11.81	78 3.07	140 5.51	123 4.84	5/8 × 105 M16X108	UL FM
200 × 32 8 × 1¼	219.1 × 42.4 8.625 × 1.660	300 2.07	51 2.00	300 11.81	96.5 3.80	140 5.51	123 4.84	5/8 × 105 M16X108	UL FM
200 × 40 8 × 1½	219.1 × 48.3 8.625 × 1.900	300 2.07	51 2.00	300 11.81	96.5 3.80	143 5.63	123 4.84	5/8 × 105 M16X108	UL FM
200 × 50 8 × 2	219.1 × 60.3 8.625 × 2.375	300 2.07	64 2.50	300 11.81	117 4.61	149 5.87	123 4.84	5/8 × 105 M16X108	UL FM
200 × 65 8 × 2½	219.1 × 73.0 8.625 × 2.875	300 2.07	70 2.75	300 11.81	117 4.61	155 6.10	123 4.84	5/8 × 105 M16X108	UL FM
200 × 65 8 × 76.1	219.1 × 76.1 8.625 × 3.000	300 2.07	70 2.75	300 11.81	117 4.61	155 6.10	123 4.84	5/8 × 105 M16X108	UL FM
200 × 80 8 × 3	219.1 × 88.9 8.625 × 3.500	300 2.07	89 3.50	300 11.81	133.5 5.25	155 6.10	123 4.84	5/8 × 105 M16X108	UL FM
200 × 100 8 × 4	219.1 × 114.3 8.625 × 4.500	300 2.07	114 4.50	300 11.81	164 6.45	160 6.30	123 4.84	5/8 × 105 M16X108	UL FM

# 4G

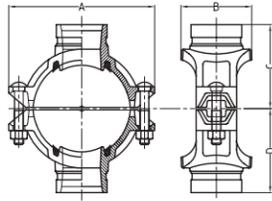
Mechanical Cross  
Grooved Outlet



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Hole Dia mm/in +1.6, 0/+0.063, 0	Dimensions				Bolt Size mm/in
				A mm/in	B mm/in	C mm/in	D mm/in	
65 × 32 2½ × 1¼	73.0 × 42.4 2.875 × 1.669	300 2.07	51 2	144 5.67	84.5 3.33	75 2.95	75 2.95	1/2 × 70 M12X70
65 × 25 2½ × 1	76.1 × 33.7 3.000 × 1.327	300 2.07	38 1.5	137 5.39	71 2.8	78 3.07	78 3.07	1/2 × 70 M12X70
65 × 32 2½ × 1¼	76.1 × 42.4 3.000 × 1.669	300 2.07	51 2	137 5.39	84.5 3.33	78 3.07	78 3.07	1/2 × 70 M12X70
80 × 25 3 × 1	88.9 × 33.7 3.500 × 1.327	300 2.07	38 1.5	152 5.98	72.5 2.85	84.5 3.33	84.5 3.33	1/2 × 75 M12X76
80 × 32 3 × 1¼	88.9 × 42.4 3.500 × 1.669	300 2.07	51 2	152 5.98	85.5 3.37	84.5 3.33	84.5 3.33	1/2 × 75 M12X76
80 × 40 3 × 1½	88.9 × 48.3 3.500 × 1.900	300 2.07	51 2	152 5.98	85.5 3.37	84.5 3.33	84.5 3.33	1/2 × 75 M12X76
100 × 25 4 × 1	114.3 × 33.7 4.500 × 1.327	300 2.07	38 1.5	188 7.4	78.4 3.09	102 4.02	102 4.02	1/2 × 75 M12X76
100 × 40 4 × 1½	114.3 × 48.3 4.500 × 1.900	300 2.07	51 2	188 7.4	89 3.5	102 4.02	102 4.02	1/2 × 75 M12X76
100 × 50 4 × 2	114.3 × 60.3 4.500 × 2.375	300 2.07	64 2.5	188 7.4	104.5 4.11	102 4.02	102 4.02	1/2 × 75 M12X76
125 × 50 5 × 2	139.7 × 60.3 5.500 × 2.375	300 2.07	64 2.5	221.5 8.72	112.5 4.43	118 4.65	118 4.65	5/8X85 M16X85
125 × 65 5 × 2½	139.7 × 76.1 5.500 × 3.000	300 2.07	70 2.75	221.5 8.72	112.5 4.43	118 4.65	118 4.65	5/8X85 M16X85
150 × 50 6 × 2	165.1 × 60.3 6.500 × 2.375	300 2.07	64 2.5	244 9.6	112.5 4.43	127 5	127 5	5/8X105
150 × 65 6 × 2½	165.1 × 76.1 6.500 × 3.000	300 2.07	70 2.75	244 9.6	112.5 4.43	127 5	127 5	5/8X105 M16X108
150 × 80 6 × 3	165.1 × 88.9 6.500 × 3.500	300 2.07	89 3.5	244 9.6	132 5.2	141 5.55	141 5.55	5/8X105 M16X108
150 × 40 6 × 1½	168.3 × 48.3 6.625 × 1.900	300 2.07	51 2	247 9.72	95 3.74	128 5.04	128 5.04	5/8X105 M16X108
150 × 50 6 × 2	168.3 × 60.3 6.625 × 2.375	300 2.07	64 2.5	247 9.72	114 4.49	134 5.28	134 5.28	5/8X105 M16X108
150 × 65 6 × 2½	168.3 × 73.0 6.625 × 2.875	300 2.07	70 2.75	247 9.72	115 4.53	134 5.28	134 5.28	5/8X105 M16X108
150 × 80 6 × 3	168.3 × 88.9 6.625 × 3.500	300 2.07	89 3.5	247 9.72	132 5.2	141 5.55	141 5.55	5/8X105 M16X108
200 × 50 8 × 2	219.1 × 60.3 8.625 × 2.375	300 2.07	64 2.5	320 12.6	118 4.65	158 6.22	158 6.22	3/4X115 M20X115
200 × 65 8 × 2½	219.1 × 76.1 8.625 × 3.000	300 2.07	70 2.75	320 12.6	118 4.65	158 6.22	158 6.22	3/4X115 M20X115
200 × 80 8 × 3	219.1 × 88.9 8.625 × 3.500	300 2.07	89 3.5	320 12.6	136.5 5.37	161 6.34	161 6.34	3/4X115 M20X115
200 × 100 8 × 4	219.1 × 114.3 8.625 × 4.500	300 2.07	114 4.5	320 12.6	162 6.38	161 6.34	161 6.34	3/4X115 M20X115
250 × 100 10 × 2½	273.0 × 76.1 10.750 × 3.000	300 2.07	70 2.75	376 14.8	118 4.65	189 7.44	189 7.44	3/4X120 M20X115
250 × 100 10 × 3	273.0 × 88.9 10.750 × 3.500	300 2.07	89 3.5	376 14.8	136.5 5.37	189 7.44	189 7.44	3/4X120 M20X115
250 × 100 10 × 4	273.0 × 114.3 10.750 × 4.500	300 2.07	114 4.5	376 14.8	164 6.46	189 7.44	189 7.44	3/4X120 M20X115

# 4GS

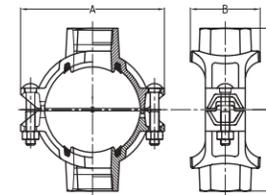
Light-duty  
Mechanical Cross  
Grooved Outlet



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Hole Dia mm/in +1.6,0/+0.063,0	Dimensions				Bolt Size mm/in
				A mm/in	B mm/in	C mm/in	D mm/in	
65 × 25 76.1 × 1	76.1 × 33.7 3.000 × 1.315	300 2.07	38 1.50	137 5.39	71 2.80	78 3.07	78 3.07	1/2 × 70 M12X70
65 × 32 76.1 × 1¼	76.1 × 42.4 3.000 × 1.660	300 2.07	51 2.00	137 5.39	84.5 3.33	78 3.07	78 3.07	1/2 × 70 M12X70
80 × 25 3 × 1	88.9 × 33.7 3.500 × 1.315	300 2.07	38 1.50	150 5.91	71.0 2.80	84 3.31	84 3.31	1/2 × 70 M12X76
80 × 32 3 × 1¼	88.9 × 42.4 3.500 × 1.660	300 2.07	51 2.00	150 5.91	84.5 3.33	84 3.31	84 3.31	1/2 × 70 M12X76
80 × 40 3 × 1½	88.9 × 48.3 3.500 × 1.900	300 2.07	51 2.00	150 5.91	84.5 3.33	84 3.31	84 3.31	1/2 × 70 M12X76
100 × 25 4 × 1	114.3 × 33.7 4.500 × 1.315	300 2.07	38 1.50	178 7.01	77.5 3.05	98 3.86	98 3.86	1/2 × 70 M12X76
100 × 40 4 × 1½	114.3 × 48.3 4.500 × 1.900	300 2.07	51 2.00	178 7.01	88 3.46	98 3.86	98 3.86	1/2 × 70 M12X76
100 × 50 4 × 2	114.3 × 60.3 4.500 × 2.375	300 2.07	64 2.50	178 7.01	103.5 4.07	98 3.86	98 3.86	1/2 × 70 M12X76
125 × 50 139.7 × 2	139.7 × 60.3 5.500 × 2.375	300 2.07	64 2.50	210 8.27	110 4.33	113 4.45	113 4.45	5/8 × 85 M16X85
125 × 65 139.7 × 76.1	139.7 × 76.1 5.500 × 3.000	300 2.07	70 2.75	210 8.27	110 4.33	113 4.45	113 4.45	5/8 × 85 M16X85
150 × 50 165.1 × 2	165.1 × 60.3 6.500 × 2.375	300 2.07	64 2.50	235 9.25	110 4.33	124.5 4.90	124.5 4.90	5/8 × 105 M16X108
150 × 65 165.1 × 76.1	165.1 × 76.1 6.500 × 3.000	300 2.07	70 2.75	235 9.25	110 4.33	124.5 4.90	124.5 4.90	5/8 × 105 M16X108
150 × 80 165.1 × 3	165.1 × 88.9 6.500 × 3.500	300 2.07	89 3.50	235 9.25	130 5.12	124.5 4.90	124.5 4.90	5/8 × 105 M16X108
150 × 32 6 × 1¼	168.3 × 42.4 6.500 × 1.660	300 2.07	51 2.00	240 9.45	92.5 3.64	126 4.96	126 4.96	5/8 × 105 M16X108
150 × 40 6 × 1½	168.3 × 48.3 6.500 × 1.900	300 2.07	51 2.00	240 9.45	92.5 3.64	126 4.96	126 4.96	5/8 × 105 M16X108
150 × 50 6 × 2	168.3 × 60.3 6.625 × 2.375	300 2.07	64 2.50	240 9.45	110 4.33	126 4.96	126 4.96	5/8 × 105 M16X108
150 × 65 6 × 2½	168.3 × 73.0 6.625 × 2.875	300 2.07	70 2.75	240 9.45	110 4.33	126 4.96	126 4.96	5/8 × 105 M16X108
150 × 80 6 × 3	168.3 × 88.9 6.625 × 3.500	300 2.07	89 3.50	240 9.45	130 5.12	126 4.96	126 4.96	5/8 × 105 M16X108
200 × 50 8 × 2	219.1 × 60.3 8.625 × 2.375	300 2.07	64 2.50	300 11.81	115 4.53	155 6.10	155 6.10	5/8 × 105 M16X108
200 × 65 8 × 76.1	219.1 × 76.1 8.625 × 3.000	300 2.07	70 2.75	300 11.81	115 4.53	155 6.10	155 6.10	5/8 × 105 M16X108
200 × 80 8 × 3	219.1 × 88.9 8.625 × 3.500	300 2.07	89 3.50	300 11.81	133.5 5.25	155 6.10	155 6.10	5/8 × 105 M16X108
200 × 100 8 × 4	219.1 × 114.3 8.625 × 4.500	300 2.07	114 4.50	300 11.81	159.5 6.29	160 6.30	160 6.30	5/8 × 105 M16X108

# 4J

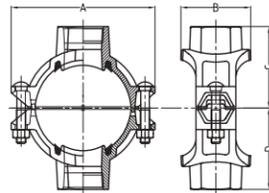
Mechanical Cross  
Threaded Outlet



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Hole Dia mm/in +1.6,0/+0.063,0	Dimensions				Bolt Size mm/in
				A mm/in	B mm/in	C mm/in	D mm/in	
65 × 20 2½ × ¾	73.0 × 26.9 2.875 × 1.050	300 2.07	38 1.50	137 5.39	71 2.80	68 2.68	68 2.68	1/2 × 70 M12X70
65 × 25 2½ × 1	73.0 × 33.7 2.875 × 1.315	300 2.07	38 1.50	137 5.39	71 2.80	70 2.76	70 2.76	1/2 × 70 M12X70
65 × 32 2½ × 1¼	73.0 × 42.4 2.875 × 1.660	300 2.07	51 2.00	137 5.39	84.5 3.33	73 2.87	73 2.87	1/2 × 70 M12X70
65 × 15 2½ × ½	76.1 × 21.3 3.000 × 0.825	300 2.07	38 1.5	137 5.39	71 2.8	61.5 2.42	61.5 2.42	1/2X70 M12X70
65 × 20 2½ × ¾	76.1 × 26.9 3.000 × 1.059	300 2.07	38 1.5	137 5.39	71 2.8	75 3.05	75 3.05	1/2X70 M12X70
65 × 25 2½ × 1	76.1 × 33.7 3.000 × 1.327	300 2.07	38 1.5	137 5.39	71 2.8	75 3.05	75 3.05	1/2X70 M12X70
65 × 32 2½ × 1¼	76.1 × 42.4 3.000 × 1.669	300 2.07	51 2	137 5.39	84.5 3.33	75 3.05	75 3.05	1/2X70 M12X70
80 × 15 3 × ½	88.9 × 21.3 3.500 × 0.825	300 2.07	38 1.5	152 5.98	72.5 2.85	71.5 2.81	71.5 2.81	1/2X75 M12X76
80X20 3 × ¾	88.9 × 26.9 3.500 × 1.059	300 2.07	38 1.5	152 5.98	72.5 2.85	71.5 2.81	71.5 2.81	1/2X75 M12X76
80 × 25 3 × 1	88.9 × 33.7 3.500 × 1.327	300 2.07	38 1.5	152 5.98	72.5 2.85	80 3.15	80 3.15	1/2X75 M12X76
80 × 32 3 × 1¼	88.9 × 42.4 3.500 × 1.669	300 2.07	51 2	152 5.98	85.5 3.37	80 3.15	80 3.15	1/2X75 M12X76
80 × 40 3 × 1½	88.9 × 48.3 3.500 × 1.900	300 2.07	51 2	152 5.98	85.5 3.37	80 3.15	80 3.15	1/2X75 M12X76
100 × 32 108.0 × 1¼	108.1 × 42.4 4.250 × 1.660	300 2.07	51 2.00	172 6.77	89 3.50	87 3.43	87 3.43	1/2 × 75 M12X76
100 × 40 108.0 × 1½	108.0 × 48.3 4.250 × 1.900	300 2.07	51 2.00	172 6.77	89 3.50	87 3.43	87 3.43	1/2 × 75 M12X76
100 × 50 108.0 × 2	108.0 × 60.3 4.250 × 2.375	300 2.07	64 2.50	172 6.77	106.5 4.19	92 3.62	92 3.62	1/2 × 75 M12X76
100 × 15 4 × ½	114.3 × 21.3 4.500 × 0.825	300 2.07	38 1.5	188 7.4	78.5 3.09	90 3.54	90 3.54	1/2X75 M12X76
100 × 20 4 × ¾	114.3 × 26.9 4.500 × 1.059	300 2.07	38 1.5	188 7.4	78.5 3.09	90 3.54	90 3.54	1/2X75 M12X76
100 × 25 4 × 1	114.3 × 33.7 4.500 × 1.327	300 2.07	38 1.5	188 7.4	78.5 3.09	93 3.66	93 3.66	1/2X75 M12X76
100 × 32 4 × 1¼	114.3 × 42.4 4.500 × 1.669	300 2.07	51 2	188 7.4	89 3.5	95 3.74	95 3.74	1/2X75 M12X76
100 × 40 4 × 1½	114.3 × 48.3 4.500 × 1.900	300 2.07	51 2	188 7.4	89 3.5	97 3.82	97 3.82	1/2X75 M12X76
100 × 50 4 × 2	114.3 × 60.3 4.500 × 2.375	300 2.07	64 2.5	188 7.4	104.5 4.11	100 3.94	100 3.94	1/2X75 M12X76
125 × 50 133.0 × 2	133.0 × 60.3 5.250 × 2.375	300 2.07	64 2.50	209 8.23	112.5 4.43	110 4.33	110 4.33	5/8 × 85 M16X85
125 × 25 5 × 1	139.7 × 33.7 5.500 × 1.327	300 2.07	38 1.5	221.5 8.72	78 3.07	110 4.33	110 4.33	5/8X85 M16X85
125 × 32 5 × 1¼	139.7 × 42.4 5.500 × 1.669	300 2.07	51 2	221.5 8.72	95 3.74	112 4.41	112 4.41	5/8X85 M16X85
125 × 40 5 × 1½	139.7 × 48.3 5.500 × 1.900	300 2.07	51 2	221.5 8.72	95 3.74	112 4.41	112 4.41	5/8X85 M16X85
125 × 50 5 × 2	139.7 × 60.3 5.500 × 2.375	300 2.07	64 2.5	221.5 8.72	112.5 4.43	115 4.53	115 4.53	5/8X85 M16X85
125 × 65 5 × 2½	139.7 × 76.1 5.500 × 3.000	300 2.07	70 2.75	221.5 8.72	112.5 4.43	115 4.53	115 4.53	5/8X85 M16X85
150 × 32 159.0 × 1¼	159.0 × 42.4 6.250 × 1.660	300 2.07	51 2.00	244 9.60	93 3.66	118 4.65	118 4.65	5/8 × 105 M16X108

# 4J

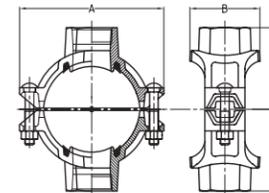
Mechanical Cross Threaded Outlet



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Hole Dia mm/in +1.6,0/+0.063,0	Dimensions				Bolt Size mm/in
				A mm/in	B mm/in	C mm/in	D mm/in	
150 × 40 159.0 × 1½	159.0 × 48.3 6.250 × 1.900	300 2.07	51 2.00	244 9.60	93 3.66	118 4.65	118 4.65	5/8 × 105 M16X108
150 × 50 159.0 × 2	159.0 × 60.3 6.250 × 2.375	300 2.07	64 2.50	244 9.60	112.5 4.43	125 4.92	125 4.92	5/8 × 105 M16X108
150 × 65 159.0 × 76.1	159.0 × 76.1 6.250 × 3.000	300 2.07	70 2.75	244 9.60	112.5 4.43	125 4.92	125 4.92	5/8 × 105 M16X108
150 × 15 6 × ½	165.1 × 21.3 6.500 × 0.825	300 2.07	38 1.5	244 9.6	78 3.07	110 4.33	110 4.33	5/8X105 M16X108
150 × 20 6 × ¾	165.1 × 26.9 6.500 × 1.059	300 2.07	38 1.5	244 9.6	78 3.07	110 4.33	110 4.33	5/8X105 M16X108
150 × 25 6 × 1	165.1 × 33.7 6.500 × 1.327	300 2.07	38 1.5	244 9.6	78 3.07	118 4.65	118 4.65	5/8X105 M16X108
150 × 32 6 × 1¼	165.1 × 42.4 6.500 × 1.669	300 2.07	51 2	244 9.6	93 3.66	118 4.65	118 4.65	5/8X105 M16X108
150 × 40 6 × 2	165.1 × 48.3 6.500 × 1.900	300 2.07	51 2	244 9.6	93 3.66	118 4.65	118 4.65	5/8X105 M16X108
150 × 50 6 × 2	165.1 × 60.3 6.500 × 2.375	300 2.07	64 2.5	244 9.6	112.5 4.43	128.5 5.43	128.5 5.43	5/8X105 M16X108
150 × 65 6 × 2½	165.1 × 76.1 6.500 × 3.000	300 2.07	70 2.75	244 9.6	112.5 4.43	128.5 5.43	128.5 5.43	5/8X105 M16X108
150 × 80 6 × 3	165.1 × 88.9 6.500 × 3.500	300 2.07	89 3.5	244 9.6	132 5.2	128.5 5.06	128.5 5.06	5/8X105 M16X108
150 × 32 6 × 1¼	168.3 × 42.4 6.500 × 1.669	300 2.07	51 2	247 9.72	95 3.74	130 5.12	130 5.12	5/8X105 M16X108
150 × 40 6 × 1½	168.3 × 48.3 6.500 × 1.900	300 2.07	51 2	247 9.72	95 3.74	122 4.8	122 4.8	5/8X105 M16X108
150 × 50 6 × 2	168.3 × 60.3 6.625 × 2.375	300 2.07	64 2.5	247 9.72	112.5 4.43	132 5.2	132 5.2	5/8X105 M16X108
150 × 65 6 × 2½	168.3 × 73.0 6.625 × 2.875	300 2.07	70 2.75	247 9.72	112.5 4.43	132 5.2	132 5.2	5/8X105 M16X108
150 × 80 6 × 3	168.3 × 88.9 6.625 × 3.500	300 2.07	89 3.5	247 9.72	132 5.2	140 5.51	140 5.51	5/8X105 M16X108
200 × 25 8 × 1	219.0 × 33.7 8.625 × 1.327	300 2.07	38 1.5	320 12.60	79.5 3.13	150 5.91	150 5.91	3/4X115 M20X115
200 × 32 8 × 1¼	219.1 × 42.4 8.625 × 1.669	300 2.07	51 2	320 12.60	96.5 3.8	150 5.91	150 5.91	3/4X115 M20X115
200 × 40 8 × 1½	219.1 × 48.3 8.625 × 1.900	300 2.07	51 2	320 12.60	96.5 3.8	150 5.91	150 5.91	3/4X115 M20X115
200 × 50 8 × 2	219.1 × 60.3 8.625 × 2.375	300 2.07	64 2.5	320 12.60	117 4.61	160 6.3	160 6.3	3/4X115 M20X115
200 × 65 8 × 2½	219.1 × 76.1 8.625 × 3.000	300 2.07	70 2.75	320 12.60	118 4.65	158.5 6.24	158.5 6.24	3/4X115 M20X115
200 × 80 8 × 3	219.1 × 88.9 8.625 × 3.500	300 2.07	89 3.5	320 12.60	136.5 5.37	160 6.3	160 6.3	3/4X115 M20X115
200 × 100 8 × 4	219.1 × 114.3 8.625 × 4.500	300 2.07	114 4.5	320 12.60	164 6.46	160 6.3	160 6.3	3/4X115 M20X115
250 × 40 10 × 1½	273.0 × 48.3 10.750 × 1.900	300 2.07	51 2	376 14.8	95.5 3.76	180 7.09	180 7.09	3/4X120 M20X115
250 × 50 10 × 2	273.0 × 60.3 10.750 × 2.375	300 2.07	64 2.5	376 14.8	118 4.65	185 7.28	185 7.28	3/4X120 M20X115
250 × 65 10 × 2½	273.0 × 76.1 10.750 × 3.000	300 2.07	70 2.75	376 14.8	118 4.65	190 7.48	190 7.48	3/4X120 M20X115
250 × 80 10 × 3	273.0 × 88.9 10.750 × 3.500	300 2.07	89 3.5	376 14.8	136.5 5.37	190 7.48	190 7.48	3/4X120 M20X115
250 × 100 10 × 4	273.0 × 114.3 10.750 × 4.500	300 2.07	114 4.5	376 14.8	164 6.46	190 7.48	190 7.48	3/4X120 M20X115

# 4JS

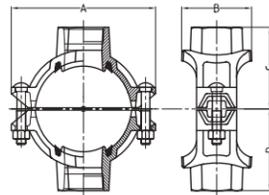
Light-duty Mechanical Cross Threaded Outlet



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Hole Dia mm/in +1.6,0/+0.063,0	Dimensionsmm/in				Bolt Size mm/in
				A mm/in	B mm/in	C mm/in	D mm/in	
65 × 15 76.1 × ½	76.1 × 21.3 3.000 × 0.825	300 2.07	38 1.50	137 5.39	71 2.80	75 3.05	75 3.05	1/2 × 70 M12X70
65 × 20 76.1 × ¾	76.1 × 26.9 3.000 × 1.050	300 2.07	38 1.50	137 5.39	71 2.80	75 3.05	75 3.05	1/2 × 70 M12X70
65 × 25 76.1 × 1	76.1 × 33.7 3.000 × 1.315	300 2.07	38 1.50	137 5.39	71 2.80	75 3.05	75 3.05	1/2 × 70 M12X70
65 × 32 76.1 × 1¼	76.1 × 42.4 3.000 × 1.660	300 2.07	51 2.00	137 5.39	84.5 3.33	75 3.05	75 3.05	1/2 × 70 M12X70
80 × 15 3 × ½	88.9 × 21.3 3.500 × 0.825	300 2.07	38 1.50	150 5.91	71.0 2.80	68 2.68	68 2.68	1/2 × 75 M12X76
80 × 20 3 × ¾	88.9 × 26.9 3.500 × 1.050	300 2.07	38 1.50	150 5.91	71.0 2.80	68 2.68	68 2.68	1/2 × 75 M12X76
80 × 25 3 × 1	88.9 × 33.7 3.500 × 1.315	300 2.07	38 1.50	150 5.91	71.0 2.80	71.0 2.80	71.0 2.80	1/2 × 75 M12X76
80 × 32 3 × 1¼	88.9 × 42.4 3.500 × 1.660	300 2.07	51 2.00	150 5.91	84.5 3.33	74 2.91	74 2.91	1/2 × 75 M12X76
80 × 40 3 × 1½	88.9 × 48.3 3.500 × 1.900	300 2.07	51 2.00	150 5.91	84.5 3.33	74 2.91	74 2.91	1/2 × 75 M12X76
100 × 25 108.0 × 1	108.1 × 33.7 4.250 × 1.315	300 2.07	38 1.50	172 6.77	77.5 3.05	85 3.35	85 3.35	1/2 × 75 M12X76
100 × 32 108.0 × 1¼	108.1 × 42.4 4.250 × 1.660	300 2.07	51 2.00	172 6.77	88 3.46	85 3.35	85 3.35	1/2 × 75 M12X76
100 × 40 108.0 × 1½	108.0 × 48.3 4.250 × 1.900	300 2.07	51 2.00	172 6.77	88 3.46	85 3.35	85 3.35	1/2 × 75 M12X76
100 × 50 108.0 × 2	108.0 × 60.3 4.250 × 2.375	300 2.07	64 2.50	172 6.77	103.5 4.19	89 3.50	89 3.50	1/2 × 75 M12X76
100 × 15 4 × ½	114.3 × 21.3 4.500 × 0.825	300 2.07	38 1.50	178 7.01	77.5 3.05	82 3.23	82 3.23	1/2 × 75 M12X76
100 × 20 4 × ¾	114.3 × 26.9 4.500 × 1.050	300 2.07	38 1.50	178 7.01	77.5 3.05	82 3.23	82 3.23	1/2 × 75 M12X76
100 × 25 4 × 1	114.3 × 33.7 4.500 × 1.315	300 2.07	38 1.50	178 7.01	77.5 3.05	82 3.23	82 3.23	1/2 × 75 M12X76
100 × 32 4 × 1¼	114.3 × 42.4 4.500 × 1.660	300 2.07	51 2.00	178 7.01	88 3.46	89.5 3.53	89.5 3.53	1/2 × 75 M12X76
100 × 40 4 × 1½	114.3 × 48.3 4.500 × 1.900	300 2.07	51 2.00	178 7.01	88 3.46	89.5 3.53	89.5 3.53	1/2 × 75 M12X76
100 × 50 4 × 2	114.3 × 60.3 4.500 × 2.375	300 2.07	64 2.50	178 7.01	103.5 4.07	92 3.62	92 3.62	1/2 × 75 M12X76
125 × 25 133.0 × 1	133.0 × 33.7 5.250 × 1.315	300 2.07	38 1.50	203 7.99	77 3.03	98 3.86	98 3.86	5/8 × 85 M16X85
125 × 32 133.0 × 1.25	133.0 × 42.4 5.250 × 1.660	300 2.07	51 2.00	203 7.99	91 3.58	102 4.01	102 4.01	5/8 × 85 M16X85
125 × 40 133.0 × 1½	133.0 × 48.3 5.250 × 1.900	300 2.07	51 2.00	203 7.99	91 3.58	102 4.01	102 4.01	5/8 × 85 M16X85
125 × 50 133.0 × 2	133.0 × 60.3 5.250 × 2.375	300 2.07	64 2.50	203 7.99	110 4.33	105 4.13	105 4.13	5/8 × 85 M16X85
125 × 65 133.0 × 76.1	133.0 × 76.1 5.250 × 3.000	300 2.07	70 2.75	203 7.99	110 4.33	110 4.33	110 4.33	5/8 × 85 M16X85
125 × 25 139.7 × 1	139.7 × 33.7 5.500 × 1.315	300 2.07	38 1.50	210 8.27	77 3.03	100 3.94	100 3.94	5/8 × 85 M16X85
125 × 32 139.7 × 1¼	139.7 × 42.4 5.500 × 1.660	300 2.07	51 2.00	210 8.27	91 3.58	105 4.13	105 4.13	5/8 × 85 M16X85
125 × 40 139.7 × 1½	139.7 × 48.3 5.500 × 1.900	300 2.07	51 2.00	210 8.27	91 3.58	105 4.13	105 4.13	5/8 × 85 M16X85
125 × 50 139.7 × 2	139.7 × 60.3 5.500 × 2.375	300 2.07	64 2.50	210 8.27	110 4.33	108 4.25	108 4.25	5/8 × 85 M16X85

# 4JS

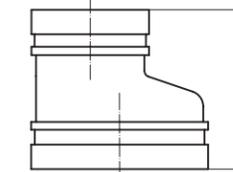
Light-duty  
Mechanical Cross  
Threaded Outlet



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Hole Dia mm/in +1.6,0/+0.063,0	Dimensionsmm/in				Bolt Size mm/in
				A mm/in	B mm/in	C mm/in	D mm/in	
125 × 65 139.7 × 76.1	139.7 × 76.1 5.500 × 3.000	300 2.07	70 2.75	210 8.27	110 4.33	115 4.53	115 4.53	5/8 × 85 M16X85
150 × 25 159.0 × 1	159.0 × 33.7 6.250 × 1.315	300 2.07	38 1.50	227 8.94	77 3.03	110 4.33	110 4.33	5/8 × 85 M16X85
150 × 32 159.0 × 1¼	159.0 × 42.4 6.250 × 1.660	300 2.07	51 2.00	227 8.94	92.5 3.64	112 4.41	112 4.41	5/8 × 85 M16X85
150 × 40 159.0 × 1½	159.0 × 48.3 6.250 × 1.900	300 2.07	51 2.00	227 8.94	92.5 3.64	112 4.41	112 4.41	5/8 × 105 M16X108
150 × 50 159.0 × 2	159.0 × 60.3 6.250 × 2.375	300 2.07	64 2.50	227 8.94	110 4.33	116.5 4.59	116.5 4.59	5/8 × 105 M16X108
150 × 65 159.0 × 76.1	159.0 × 76.1 6.250 × 3.000	300 2.07	70 2.75	227 8.94	110 4.33	121.5 4.78	121.5 4.78	5/8 × 105 M16X108
150 × 80 159.0 × 3	159.0 × 88.9 6.250 × 3.500	300 2.07	89 3.50	227 8.94	130 5.12	123.5 4.86	123.5 4.86	5/8 × 105 M16X108
150 × 15 165.1 × ½	165.1 × 21.3 6.500 × 0.825	300 2.07	38 1.50	235 9.25	77 3.03	115 4.53	115 4.53	5/8 × 105 M16X108
125 × 20 165.1 × ¾	165.1 × 26.9 6.500 × 1.050	300 2.07	38 1.50	235 9.25	77 3.03	115 4.53	115 4.53	5/8 × 105 M16X108
150 × 25 165.1 × 1	165.1 × 33.7 6.500 × 1.315	300 2.07	38 1.50	235 9.25	77 3.03	115 4.53	115 4.53	5/8 × 105 M16X108
150 × 32 165.1 × 1¼	165.1 × 42.4 6.500 × 1.660	300 2.07	51 2.00	235 9.25	92.5 3.64	115 4.53	115 4.53	5/8 × 105 M16X108
150 × 40 165.1 × 1½	165.1 × 48.3 6.500 × 1.900	300 2.07	51 2.00	235 9.25	92.5 3.64	115 4.53	115 4.53	5/8 × 105 M16X108
150 × 50 165.1 × 2	165.1 × 60.3 6.500 × 2.375	300 2.07	64 2.50	235 9.25	110 4.33	120 4.72	120 4.72	5/8 × 105 M16X108
150 × 65 165.1 × 76.1	165.1 × 76.1 6.500 × 3.000	300 2.07	70 2.75	235 9.25	110 4.33	125 4.92	125 4.92	5/8 × 105 M16X108
150 × 80 165.1 × 3	165.1 × 88.9 6.500 × 3.500	300 2.07	89 3.50	235 9.25	130 5.12	125 4.92	125 4.92	5/8 × 105 M16X108
150 × 25 6 × 1	168.3 × 33.7 6.500 × 1.315	300 2.07	38 1.50	240 9.45	77 3.03	115 4.53	115 4.53	5/8 × 105 M16X108
150 × 32 6 × 1¼	168.3 × 42.4 6.500 × 1.660	300 2.07	51 2.00	240 9.45	92.5 3.64	115 4.53	115 4.53	5/8 × 105 M16X108
150 × 40 6 × 1½	168.3 × 48.3 6.500 × 1.900	300 2.07	51 2.00	240 9.45	92.5 3.64	115 4.53	115 4.53	5/8 × 105 M16X108
150 × 50 6 × 2	168.3 × 60.3 6.625 × 2.375	300 2.07	64 2.50	240 9.45	110 4.33	121 4.76	121 4.76	5/8 × 105 M16X108
150 × 65 6 × 2½	168.3 × 73.0 6.625 × 2.875	300 2.07	70 2.75	240 9.45	110 4.33	127 5.00	127 5.00	5/8 × 105 M16X108
150 × 80 6 × 3	168.3 × 88.9 6.625 × 3.500	300 2.07	89 3.50	240 9.45	130 5.12	127 5.00	127 5.00	5/8 × 105 M16X108
200 × 25 8 × 1	219.0 × 33.7 8.625 × 1.315	300 2.07	38 1.50	300 11.81	78 3.07	140 5.51	140 5.51	5/8 × 105 M16X108
200 × 32 8 × 1¼	219.1 × 42.4 8.625 × 1.660	300 2.07	51 2.00	300 11.81	93 3.66	140 5.51	140 5.51	5/8 × 105 M16X108
200 × 40 8 × 1½	219.1 × 48.3 8.625 × 1.900	300 2.07	51 2.00	300 11.81	93 3.66	143 5.63	143 5.63	5/8 × 105 M16X108
200 × 50 8 × 2	219.1 × 60.3 8.625 × 2.375	300 2.07	64 2.50	300 11.81	115 4.53	149 5.87	149 5.87	5/8 × 105 M16X108
200 × 65 8 × 76.1	219.1 × 76.1 8.625 × 3.000	300 2.07	70 2.75	300 11.81	115 4.53	155 6.10	155 6.10	5/8 × 105 M16X108
200 × 80 8 × 3	219.1 × 88.9 8.625 × 3.500	300 2.07	89 3.50	300 11.81	133.5 5.25	155 6.10	155 6.10	5/8 × 105 M16X108
200 × 100 8 × 4	219.1 × 114.3 8.625 × 4.500	300 2.07	114 4.50	300 11.81	159.5 6.29	160 6.30	160 6.30	5/8 × 105 M16X108

# 230

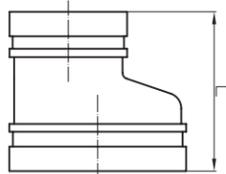
Grooved Eccentric  
Reducer



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Dimensions L mm/in	Certificate
80X50 3X2	88.9X60.3 3.500X2.375	500 3.45	89 3.50	UL FM
100X65 4X2½	108.0X76.1 4.250X3.000	500 3.45	102 4.00	UL FM
100X80 4X3	108.0X88.9 4.250X3.500	500 3.45	102 4.00	UL FM
100X65 4X2½	114.3X60.3 4.500X2.000	500 3.45	102 4.00	UL FM
100X65 4X2½	114.3X76.1 4.500X3.000	300 2.07	102 4.00	UL FM
100X80 4X3	114.3X88.9 4.500X3.500	500 3.45	102 4.00	UL FM
125X100 5X4	139.7X114.3 5.500X4.500	300 2.07	127 5.00	UL FM
150X100 6X4	159.0X108.0 6.250X4.250	300 2.07	140 5.50	UL FM
150X100 6X4	159.0X114.3 6.250X4.500	300 2.07	140 5.50	UL FM
150X80 6X3	165.1X88.9 6.500X3.500	300 2.07	140 5.50	UL FM
150X100 6X4	165.1X114.3 6.500X4.500	300 2.07	140 5.50	UL FM
150X125 6X5	165.1X139.7 6.500X5.500	300 2.07	140 5.50	UL FM
150X80 6X3	168.3X88.9 6.625X3.500	300 2.07	140 5.50	UL FM
150X100 6X4	168.3X114.3 6.625X4.500	300 2.07	140 5.50	UL FM
150X125 6X5	168.3X139.7 6.625X5.500	300 2.07	140 5.50	UL FM
200X100 8X4	219.1X114.3 8.625X4.500	300 2.07	215 8.50	UL FM
200X100 8X6	219.1X165.1 8.625X6.500	300 2.07	215 8.50	—
200X100 8X6	219.1X168.3 8.625X6.625	300 2.07	215 8.50	—
200X100 10X8	273.0X219.1 10.750X8.625	300 2.07	215 8.50	UL FM
350X200 14X8	355.6X219.1 14.000X8.625	300 2.07	318 12.50	—
350X250 14X10	355.6X273.0 14.000X10.750	300 2.07	318 12.50	—
350X300 14X12	355.6X323.9 14.000X12.750	300 2.07	318 12.50	—
400X200 16X8	406.4X219.1 16.000X8.625	300 2.07	318 12.50	—
400X250 16X10	406.4X273.0 16.000X10.750	300 2.07	318 12.50	—
400X300 16X12	406.4X323.9 16.000X12.750	300 2.07	318 12.50	—
400X350 16X14	406.4X355.6 16.000X14.000	300 2.07	318 12.50	—
450X300 18X12	457.2X323.9 18.000X12.750	300 2.07	330 13.00	—
450X350 18X14	457.2X355.6 18.000X14.000	300 2.07	330 13.00	—
450X400 18X16	457.2X406.4 18.000X16.000	300 2.07	330 13.00	—

## 230

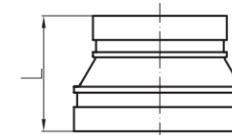
### Grooved Eccentric Reducer



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Dimensions L mm/in	Certificate
500X300 20X12	508.0X323.9 20.000X12.750	300 2.07	356 14.00	—
500X350 20X14	508.0X355.6 20.000X14.000	300 2.07	356 14.00	—
500X400 20X16	508.0X406.4 20.000X16.000	300 2.07	356 14.00	—
500X450 20X18	508.0X457.2 20.000X18.000	300 2.07	356 14.00	—
600X200 24X8	609.6X219.1 24.000X8.625	300 2.07	381 15.00	—
600X250 24X10	609.6X273.0 24.000X10.750	300 2.07	381 15.00	—
600X300 24X12	609.6X323.9 24.000X12.750	300 2.07	381 15.00	—
600X350 24X14	609.6X355.6 24.000X14.000	300 2.07	381 15.00	—
600X400 24X16	609.6X406.4 24.000X16.000	300 2.07	381 15.00	—
600X450 24X18	609.6X457.2 24.000X18.000	300 2.07	381 15.00	—
600X500 24X20	609.6X508.0 24.000X20.000	300 2.07	381 15.00	—

## 240

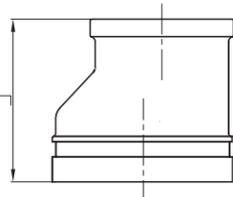
### Grooved Concentric Reducer



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Dimensions L mm/in	Certificate
32X25 1 1/4 X1	42.4X33.7 1.660X1.315	500 3.45	64 2.50	UL FM VdS LPCB
40X25 1 1/2 X1	48.3X33.7 1.900X1.315	500 3.45	64 2.50	UL FM VdS LPCB
40X32 1 1/2 X1 1/4	48.3X42.4 1.900X1.660	500 3.45	64 2.50	UL FM VdS LPCB
50X25 2 X1	60.3X33.7 2.375X1.315	500 3.45	64 2.50	UL FM VdS LPCB
50X32 2 X1 1/4	60.3X42.4 2.375X1.660	500 3.45	64 2.50	UL FM VdS LPCB
50X40 2 X1 1/2	60.3X48.3 2.375X1.900	500 3.45	64 2.50	UL FM VdS LPCB
65X25 2 1/2 X1	73.0X33.7 2.875X1.315	500 3.45	64 2.50	UL FM
65X32 2 1/2 X1 1/4	73.0X42.4 2.875X1.660	500 3.45	64 2.50	UL FM
65X40 2 1/2 X1 1/2	73.0X48.3 2.875X1.900	500 3.45	64 2.50	UL FM
65X50 2 1/2 X2	73.0X60.3 2.875X2.375	500 3.45	64 2.50	UL FM
65X25 2 1/2 X1	76.1 X33.7 3.000X1.315	500 3.45	64 2.50	—
65X32 2 1/2 X1 1/4	76.1X42.4 3.000X1.660	500 3.45	64 2.50	UL FM VdS LPCB
65X40 2 1/2 X1 1/2	76.1X48.3 3.000X1.900	500 3.45	64 2.50	UL FM VdS LPCB
65X50 2 1/2 X2	76.1X60.3 3.000X2.375	500 3.45	64 2.50	UL FM VdS LPCB
80X25 3 X1	88.9X33.7 3.500X1.315	500 3.45	64 2.50	UL FM VdS
80X32 3 X1 1/4	88.9X42.4 3.500X1.660	500 3.45	64 2.50	UL FM
80X40 3 X1 1/2	88.9X48.3 3.500X1.900	500 3.45	64 2.50	UL FM VdS
80X50 3 X2	88.9X60.3 3.500X2.375	500 3.45	64 2.50	UL FM VdS LPCB
80X65 3 X2 1/2	88.9X73.0 3.500X2.875	500 3.45	64 2.50	UL FM
80X65 3 X2 1/2	88.9X76.1 3.500X3.000	500 3.45	64 2.50	UL FM VdS LPCB
100X50 4 X2	108.0X60.3 4.250X2.375	500 3.45	76 3.00	UL FM
100X65 4 X2 1/2	108.0X73.0 4.250X2.875	500 3.45	76 3.00	UL FM
100X65 4 X2 1/2	108.0X76.1 4.250X3.000	500 3.45	76 3.00	UL FM
100X80 4 X3	108.0X88.9 4.250X3.500	500 3.45	76 3.00	UL FM
100X32 4 X1 1/4	114.3X42.4 4.500X1.660	500 3.45	76 3.00	UL FM VdS
100X40 4 X1 1/2	114.3X48.3 4.500X1.900	500 3.45	76 3.00	UL FM VdS LPCB
100X50 4 X2	114.3X60.3 4.500X2.375	500 3.45	76 3.00	UL FM VdS LPCB
100X65 4 X2 1/2	114.3X73.0 4.500X2.875	500 3.45	76 3.00	UL FM
100X65 4 X2 1/2	114.3X76.1 4.500X3.000	500 3.45	76 3.00	UL FM VdS LPCB
100X80 4 X3	114.3X88.9 4.500X3.500	500 3.45	76 3.00	UL FM VdS LPCB
125X100 5 X4	133.0X108.0 5.250X4.250	500 3.45	89 3.50	UL FM
125X100 5 X4	133.0X114.3 5.250X4.500	500 3.45	89 3.50	UL FM
125X50 5 X2	139.7X60.3 5.500X2.375	500 3.45	89 3.50	UL FM
125X65 5 X2 1/2	139.7X76.1 5.500X3.000	500 3.45	89 3.50	UL FM VdS
125X80 5 X3	139.7X88.9 5.500X3.500	500 3.45	89 3.50	UL FM VdS
125X100 5 X4	139.7X114.3 5.500X4.500	500 3.45	89 3.50	UL FM VdS LPCB
125X65 5 X2 1/2	141.3X73.0 5.563X2.875	500 3.45	89 3.50	UL FM
125X80 5 X3	141.3X88.9 5.563X3.500	500 3.45	89 3.50	UL FM

## 230N

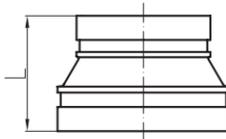
### Grooved Eccentric Reducer with Female Thread



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Dimensions L mm/in	Certificate
100X65 108.0X2 1/2	108.0X76.1 4.250X3.000	500 3.45	102 4.00	UL FM
100X65 4X2 1/2	114.3X76.1 4.500X3.000	500 3.45	102 4.00	UL FM
125X80 5X3	139.7X88.9 5.500X3.500	500 3.45	127 5.00	UL FM
150X80 6X3	165.1X88.9 6.500X3.500	500 3.45	140 5.50	UL FM

# 240

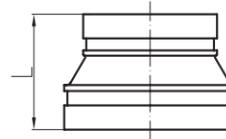
## Grooved Concentric Reducer



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Dimensions L mm/in	Certificate
125X100 5X4	141.3X114.3 5.563X4.500	500 3.45	89 3.50	UL FM
150X50 6X2	159.0X60.3 6.250X2.375	500 3.45	102 4.00	UL FM
150X65 159.0X2 1/2	159.0X76.1 6.250X3.000	500 3.45	102 4.00	UL FM
150X80 6X3	159.0X88.9 6.250X3.500	500 3.45	102 4.00	UL FM
150X100 6X4	159.0X108 6.250X4.250	500 3.45	102 4.00	UL FM
150X100 6X4	159.0X114.3 6.250X4.500	500 3.45	102 4.00	UL FM
150X125 6X5	159.0X133.0 6.250X5.250	500 3.45	102 4.00	UL FM
150X50 6X2	165.1X60.3 6.500X2.375	500 3.45	102 4.00	UL FM
150X65 6X2 1/2	165.1X76.1 6.500X3.000	500 3.45	102 4.00	UL FM
150X80 6X3	165.1X88.9 6.500X3.500	500 3.45	102 4.00	UL FM LPCB
150X100 6X4	165.1X114.3 6.500X4.500	500 3.45	102 4.00	UL FM LPCB
150X125 6X5	165.1X139.7 6.500X5.500	500 3.45	102 4.00	UL FM LPCB
150X125 6X5	165.1X141.3 6.500X5.563	500 3.45	102 4.00	—
150X50 6X2	168.3X60.3 6.625X2.375	500 3.45	102 4.00	UL FM VdS
150X65 6X2 1/2	168.3X73.0 6.625X2.875	500 3.45	102 4.00	UL FM
150X65 6X2 1/2	168.3X76.1 6.625X3.000	500 3.45	102 4.00	UL FM VdS
150X80 6X3	168.3X88.9 6.625X3.500	500 3.45	102 4.00	UL FM VdS
150X100 6X4	168.3X114.3 6.625X4.500	500 3.45	102 4.00	UL FM VdS LPCB
150X125 6X5	168.3X139.7 6.625X5.500	500 3.45	102 4.00	UL FM VdS LPCB
150X125 6X5	168.3X141.3 6.625X5.563	500 3.45	102 4.00	UL FM
200X100 8X4	216.3X114.3 8.516X4.500	500 3.45	127 5.00	UL FM
200X150 8X6	216.3X165.1 8.516X6.500	500 3.45	127 5.00	UL FM
200X65 8X2 1/2	219.1X73.0 8.625X2.875	500 3.45	127 5.00	UL FM
200X80 8X3	219.1X88.9 8.625X3.500	500 3.45	127 5.00	UL FM VdS LPCB
200X100 8X4	219.1X108.0 8.625X4.250	500 3.45	127 5.00	UL FM
200X100 8X4	219.1X114.3 8.625X4.500	500 3.45	127 5.00	UL FM VdS LPCB
200X125 8X5	219.1X139.7 8.625X5.500	500 3.45	127 5.00	UL FM VdS LPCB
200X125 8X5	219.1X141.3 8.625X5.563	500 3.45	127 5.00	UL FM
200X150 8X6	219.1X159.0 8.625X6.250	300 2.07	127 5.00	UL FM
200X150 8X6	219.1X165.1 8.625X6.500	300 2.07	127 5.00	UL FM
200X150 8X6	219.1X168.3 8.625X6.625	500 3.45	127 5.00	UL FM VdS LPCB
250X150 10X6	273.0X159.0 10.750X6.250	300 2.07	152 6.00	UL FM
250X150 10X6	273.0X165.1 10.750X6.500	300 2.075	152 6.00	UL FM
250X150 10X6	273.0X168.3 10.750X6.625	300 2.07	152 6.00	UL FM VdS
250X200 10X8	273.0X219.1 10.750X8.625	300 2.07	152 6.00	UL FM VdS
300X200 12X8	323.9X219.1 12.750X8.625	300 2.07	178 7.00	UL FM VdS
300X250 12X10	323.9X273.0 12.750X10.750	300 2.07	178 7.00	UL FM VdS

# 240

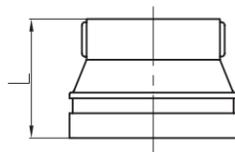
## Grooved Concentric Reducer



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Dimensions L mm/in	Certificate
350X200 14X8	355.6X219.1 14.000X8.625	300 2.07	203 7.99	—
350X250 14X10	355.6X273.0 14.000X10.750	300 2.07	203 7.99	—
350X300 14X12	355.6X323.9 14.000X12.750	300 2.07	203 7.99	—
400X200 16X8	406.4X219.1 16.000X8.625	300 2.07	229 9.00	—
400X250 16X10	406.4X273.0 16.000X10.750	300 2.07	229 9.00	—
400X300 16X12	406.4X323.9 16.000X12.750	300 2.07	229 9.00	—
400X350 16X14	406.4X355.6 16.000X14.000	300 2.07	229 9.00	—
450X300 18X12	457.2X323.9 18.000X12.750	300 2.07	241 9.50	—
450X350 18X14	457.2X355.6 18.000X14.000	300 2.07	241 9.50	—
450X400 18X16	457.2X406.4 18.000X16.000	300 2.07	241 9.50	—
500X300 20X12	508.0X323.9 20.000X12.750	300 2.07	254 10.00	—
500X350 20X14	508.0X355.6 20.000X14.000	300 2.07	254 10.00	—
500X400 20X16	508.0X406.4 20.000X16.000	300 2.07	254 10.00	—
500X450 20X18	508.0X457.2 20.000X18.000	300 2.07	254 10.00	—
600X200 24X8	609.6X219.1 24.000X8.625	300 2.07	305 12.00	—
600X250 24X10	609.6X273.0 24.000X10.750	300 2.07	305 12.00	—
600X300 24X12	609.6X323.9 24.000X12.750	300 2.07	305 12.00	—
600X350 24X14	609.6X355.6 24.000X14.000	300 2.07	305 12.00	—
600X400 24X16	609.6X406.4 24.000X16.000	300 2.07	305 12.00	—
600X450 24X18	609.6X457.2 24.000X18.000	300 2.07	305 12.00	—
600X500 24X20	609.6X508.0 24.000X20.000	300 2.07	305 12.00	—

# 240N

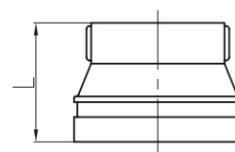
Grooved Concentric Reducer with Female Thread



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Dimensions L mm/in	Certificate
50X15	60.3X21.3	500	64	VdS
2X1/2	2.375X0.825	3.45	2.50	
50X20	60.3X26.9	500	64	UL FM VdS LPCB
2X3/4	2.375X1.05	3.45	2.50	
50X25	60.3X33.7	500	64	UL FM VdS LPCB
2X1	2.375X1.315	3.45	2.50	
50X32	60.3X42.4	500	64	UL FM VdS LPCB
2X1 1/4	2.375X1.660	3.45	2.50	
50X40	60.3X48.3	500	64	UL FM VdS LPCB
2X1 1/2	2.375X1.900	3.45	2.50	
65X25	73.0X33.7	500	64	UL FM
2 1/2X1	2.875X1.315	3.45	2.50	
65X25	73.0X42.4	500	64	UL FM
2 1/2X1 1/4	2.875X1.660	3.45	2.50	
65X40	73.0X48.3	500	64	UL FM
2 1/2X1 1/2	2.875X1.900	3.45	2.50	
65X50	73.0X60.3	500	64	UL FM
2 1/2X2	2.875X2.375	3.45	2.50	
65X15	76.1X21.3	500	64	UL FM VdS
2 1/2X1/2	3.000X0.825	3.45	2.50	
65X20	76.1X26.9	500	64	UL FM VdS
2 1/2X3/4	3.000X1.05	3.45	2.50	
65X25	76.1X33.7	500	64	UL FM VdS
2 1/2X1	3.000X1.315	3.45	2.50	
65X32	76.1X42.4	500	64	UL FM VdS LPCB
2 1/2X1 1/4	3.000X1.660	3.45	2.50	
65X40	76.1X48.3	500	64	FM VdS LPCB
2 1/2X1 1/2	3.000X1.900	3.45	2.50	
65X50	76.1X60.3	500	64	UL FM VdS LPCB
2 1/2X2	3.000X2.375	3.45	2.50	
80X15	88.9X21.3	500	64	VdS
3X1/2	3.500X0.825	3.45	2.50	
80X20	88.9X26.9	500	64	UL FM VdS
3X3/4	3.500X1.05	3.45	2.50	
80X25	88.9X33.7	500	64	UL FM VdS
3X1	3.500X1.315	3.45	2.50	
80X32	88.9X42.4	500	64	VdS
3X1 1/4	3.500X1.660	3.45	2.50	
80X40	88.9X48.3	500	64	UL FM VdS
3X1 1/2	3.500X1.900	3.45	2.50	
80X50	88.9X60.3	500	64	UL FM VdS
3X2	3.500X2.375	3.45	2.50	
80X65	88.9X73.0	500	64	UL FM
3X2 1/2	3.500X2.875	3.45	2.50	
80X65	88.9X76.1	500	64	UL FM VdS LPCB
3X2 1/2	3.500X3.000	3.45	2.50	
100X25	108.0X33.7	500	76	UL FM
4X1	4.250X1.315	3.45	3.00	
100X32	108.0X42.4	500	76	UL FM
4X1 1/4	4.250X1.660	3.45	3.00	
100X40	108.0X48.3	500	76	UL FM
4X1 1/2	4.250X1.900	3.45	3.00	
100X50	108.0X60.3	500	76	UL FM
4X2	4.250X2.375	3.45	3.00	
100X65	108.0X76.1	500	76	UL FM
4X2 1/2	4.250X3.000	3.45	3.00	
100X80	108.0X88.9	500	76	UL FM
4X3	4.250X3.500	3.45	3.00	
100X15	114.3X21.3	500	76	UL FM VdS
4X1/2	4.500X0.825	3.45	3.00	
100X20	114.3X26.9	500	76	UL FM VdS
4X3/4	4.500X1.05	3.45	3.00	
100X25	114.3X33.7	500	76	UL FM VdS
4X1	4.500X1.315	3.45	3.00	
100X32	114.3X42.4	500	76	UL FM VdS
4X1 1/4	4.500X1.660	3.45	3.00	
100X40	114.3X48.3	500	76	UL FM VdS LPCB
4X1 1/2	4.500X1.900	3.45	3.00	
100X50	114.3X60.3	500	76	UL FM VdS LPCB
4X2	4.500X2.375	3.45	3.00	
100X65	114.3X73.0	500	76	UL FM
4X2 1/2	4.500X2.875	3.45	3.00	
100X65	114.3X76.1	500	76	UL FM VdS LPCB
4X2 1/2	4.500X3.000	3.45	3.00	
100X80	114.3X88.9	500	76	UL FM VdS LPCB
4X3	4.500X3.500	3.45	3.00	
125X40	133.0X48.3	500	89	UL FM
5X1 1/2	5.250X1.900	3.45	3.50	

# 240N

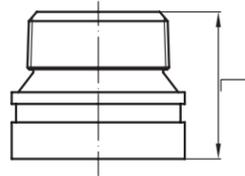
Grooved Concentric Reducer with Female Thread



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Dimensions L mm/in	Certificate
125X40	133.0X60.3	500	89	
5X2	5.250X2.375	3.45	3.50	
125X65	133.0X76.1	500	89	UL FM
5X2 1/2	5.250X3.000	3.45	3.50	
125X65	133.0X88.9	500	89	
5X3	5.250X3.500	3.45	3.50	
125X25	139.7X33.7	500	89	UL FM VdS
5X1	5.500X1.315	3.45	3.50	
125X32	139.7X42.4	500	89	UL FM VdS
5X1 1/4	5.500X1.660	3.45	3.50	
125X40	139.7X48.3	500	89	UL FM VdS
5X1 1/2	5.500X1.900	3.45	3.50	
125X50	139.7X60.3	500	89	UL FM VdS
5X2	5.500X2.375	3.45	3.50	
125X65	139.7X76.1	500	89	UL FM VdS
5X2 1/2	5.500X3.000	3.45	3.50	
125X80	139.7X88.9	500	89	UL FM VdS
5X3	5.500X3.500	3.45	3.50	
125X100	139.7X114.3	500	89	UL FM VdS LPCB
5X4	5.500X4.500	3.45	3.50	
125X100	141.3X114.3	500	89	UL FM
5X4	5.563X4.500	3.45	3.50	
150X20	159.0X26.9	500	102	UL FM
6X3/4	6.250X1.05	3.45	4.00	
150X25	159.0X33.7	500	102	UL FM
6X1	6.250X1.315	3.45	4.00	
150X32	159.0X42.4	500	102	UL FM
6X1 1/4	6.250X1.660	3.45	4.00	
150X40	159.0X48.3	500	102	UL FM
6X1 1/2	6.250X1.900	3.45	4.00	
150X50	159.0X60.3	500	102	UL FM
6X2	6.250X2.375	3.45	4.00	
150X65	159.0X76.1	500	102	UL FM
6X2 1/2	6.250X3.000	3.45	4.00	
150X80	159.0X88.9	500	102	UL FM
6X3	6.250X3.500	3.45	4.00	
150X100	159.0X114.3	500	102	UL FM
6X4	6.250X4.500	3.45	4.00	
150X15	165.1X21.3	500	102	UL FM
6X1/2	6.500X0.825	3.45	4.00	
150X20	165.1X26.9	500	102	UL FM
6X3/4	6.500X1.05	3.45	4.00	
150X25	165.1X33.7	500	102	UL FM
6X1	6.500X1.315	3.45	4.00	
150X32	165.1X42.4	500	102	UL FM
6X1 1/4	6.500X1.660	3.45	4.00	
150X40	165.1X48.3	500	102	UL FM
6X1 1/2	6.500X1.900	3.45	4.00	
150X50	165.1X60.3	500	102	UL FM
6X2	6.500X2.375	3.45	4.00	
150X65	165.1X76.1	500	102	UL FM
6X2 1/2	6.500X3.000	3.45	4.00	
150X80	165.1X88.9	500	102	UL FM LPCB
6X3	6.500X3.500	3.45	4.00	
150X100	165.1X114.3	500	102	UL FM
6X4	6.500X4.500	3.45	4.00	
150X25	168.3X33.7	500	102	UL FM
6X1	6.625X1.315	3.45	4.00	
150X50	168.3X60.3	500	102	UL FM VdS
6X2	6.625X2.375	3.45	4.00	
150X125	168.3X141.3	500	102	UL FM
6X5	6.625X5.563	3.45	4.00	
200X40	219.1X48.3	500	127	UL FM
8X1 1/2	8.625X1.900	3.45	5.00	
200X50	219.1X60.3	500	127	UL FM VdS
8X2	8.625X2.375	3.45	5.00	
200X65	219.1X73.0	500	127	UL FM
8X2 1/2	8.625X2.875	3.45	5.00	
200X65	219.1X76.1	500	127	UL FM VdS
8X2 1/2	8.625X3.000	3.45	5.00	
200X80	219.1X88.9	500	127	UL FM VdS LPCB
8X3	8.625X3.500	3.45	5.00	
200X100	219.1X114.3	500	127	UL FM
8X4	8.625X4.500	3.45	5.00	
200X100	219.1X168.3	500	127	UL FM
8X6	8.625X6.625	3.45	5.00	

## 240W

Grooved Concentric Reducer with Male Thread



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Dimensions L mm/in	Certificate
65X50 2 1/2 X 2	73.0X60.3 2.875X2.375	500 3.45	64 2.50	UL FM
65X50 2 1/2 X 2	76.1X60.3 3.000X2.375	500 3.45	64 2.50	UL FM
80X25 3 X 1	88.9X33.7 3.500X1.315	500 3.45	64 2.50	UL FM
100X50 4 X 2	114.3X60.3 4.500X2.375	500 3.45	76 3.00	UL FM

## 300

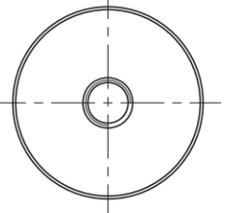
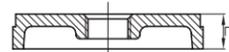
Cap



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Dimensions L mm/in	Certificate
25	33.7	500	22.1	UL FM VdS LPCB
1	1.315	3.45	0.87	
32	42.4	500	23.5	UL FM VdS LPCB
1 1/4	1.660	3.45	0.93	
40	48.3	500	23.5	UL FM VdS LPCB
1 1/2	1.900	3.45	0.93	
50	60.3	500	23.5	UL FM VdS LPCB
2	2.375	3.45	0.93	
65	73.0	500	23.5	UL FM
2 1/2	2.875	3.45	0.93	
65	76.1	500	24.5	UL FM VdS LPCB
2 1/2	3.000	3.45	0.96	
80	88.9	500	24	UL FM VdS LPCB
3	3.500	3.45	0.94	
100	108.0	500	27	UL FM
4	4.250	3.45	1.06	
100	114.3	500	27	UL FM VdS LPCB
4	4.500	3.45	1.06	
25	133.0	500	25.5	UL FM
5	5.250	3.45	1.00	
125	139.7	500	25.5	UL FM VdS LPCB
5	5.500	3.45	1.00	
125	141.3	500	25.5	UL FM
5	5.563	3.45	1.00	
150	159.0	500	27	UL FM
6	6.250	3.45	1.06	
150	165.1	500	27	UL FM LPCB
6	6.500	3.45	1.06	
150	168.3	500	24.5	UL FM VdS LPCB
6	6.625	3.45	0.97	
200	216.3	500	30	UL FM
8	8.516	3.45	1.18	
200	219.1	500	30	UL FM VdS LPCB
8	8.625	3.45	1.18	
250	273.0	500	32	UL FM VdS LPCB
10	10.750	3.45	1.26	
300	323.9	500	32	UL FM VdS LPCB
12	12.750	3.45	1.26	
350	355.6	300	102	
14	14.000	2.07	4.00	
400	406.4	300	102	
16	16.000	2.07	4.00	
450	457.2	300	127	
18	18.000	2.07	5.00	
500	508.0	300	152	
20	20.000	2.07	6.00	
600	609.6	300	152	
24	24.000	2.07	6.00	

## 300

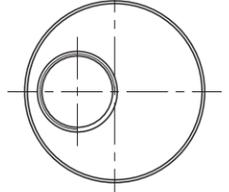
Cap with Concentric Hole



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Dimensions L mm/in	Certificate
50X25 2 X 1	60.3X33.7 2.375X1.315	500 3.45	23.5 0.93	—
50X40 2 X 1 1/2	60.3X48.3 2.375X1.900	500 3.45	23.5 0.93	—
65X50 2 1/2 X 2	73.0X60.3 2.875X2.375	500 3.45	23.5 0.93	—
65X25 2 1/2 X 1	76.1X33.7 3.000X1.315	500 3.45	24.5 0.96	—
65 X 40 2 1/2 X 1 1/2	76.1 X 48.3 3.000 X 1.900	500 3.45	23.5 0.925	UL FM
65X50 2 1/2 X 2	76.1X60.3 3.000X2.375	500 3.45	24 0.94	—
80X15 3 X 1/2	88.9X21.3 3.500X0.825	500 3.45	25.4 1.00	UL FM
80X25 3 X 1	88.9X33.7 3.500X1.315	500 3.45	24 0.94	UL FM
80X40 3 X 1 1/2	88.9X48.3 3.500X1.900	500 3.45	23.5 0.925	UL FM
80 X 50 3 X 2	88.9 X 60.3 3.500 X 2.375	500 3.45	23.5 0.925	UL FM
100 X 15 4 X 1/2	114.3 X 21.3 4.500 X 0.825	500 3.45	27.0 1.06	UL FM
100 X 25 4 X 1	114.3 X 33.7 4.500 X 1.315	500 3.45	27.0 1.06	UL FM
100X40 4 X 1 1/2	114.3X48.3 4.500X1.900	500 3.45	25.4 1.00	UL FM
100 X 50 4 X 2	114.3 X 60.3 4.500 X 2.375	500 3.45	25.4 1.00	—
125 X 50 5 X 2	139.7 X 60.3 5.500 X 2.375	500 3.45	27 1.06	UL FM
150 X 15 6 X 1/2	165.1 X 21.3 6.500 X 0.825	500 3.45	27 1.06	UL FM
150 X 25 6 X 1	165.1 X 33.7 6.500 X 1.315	500 3.45	27 1.06	UL FM
150 X 40 6 X 1 1/2	165.1 X 48.3 6.500 X 1.900	500 3.45	25.4 1.00	—
150 X 50 6 X 2	165.1 X 60.3 6.500 X 2.375	500 3.45	27 1.06	UL FM
150X40 6 X 1 1/2	168.3X48.3 6.625X1.900	500 3.45	27 1.06	—
150 X 50 6 X 2	168.3 X 60.3 6.625 X 2.375	500 3.45	27 1.06	—
200X25 8 X 1	219.1X33.7 8.625X1.315	500 3.45	30 1.18	—

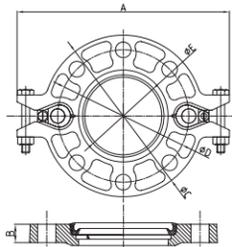
## 300PX

Cap with Eccentric Hole



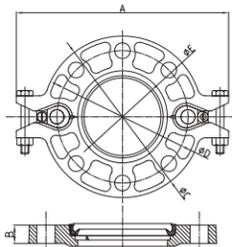
Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Dimensions L mm/in	Certificate
65X25 2 1/2 X 1	76.1X33.7 3.000X1.315	500 3.45	23.5 0.925	—
65X40 2 1/2 X 1 1/2	76.1X48.3 3.000X1.900	500 3.45	23.5 0.925	—
80X25 3 X 1	88.9X33.7 3.500X1.315	500 3.45	23.5 0.925	—
80X40 3 X 1 1/2	88.9X48.3 3.500X1.900	500 3.45	23.5 0.925	UL FM
80 X 50 3 X 2	88.9 X 60.3 3.500 X 2.375	500 3.45	23.5 0.925	UL FM
100X25 4 X 1	114.3X33.7 4.500X1.315	500 3.45	27 1.06	—
100X40 4 X 1 1/2	114.3X48.3 4.500X1.900	500 3.45	25.4 1.00	UL FM
100 X 50 4 X 2	114.3 X 60.3 4.500 X 2.375	500 3.45	25.4 1.00	UL FM
125 X 40 5 X 1 1/2	139.7 X 48.3 5.500 X 1.900	500 3.45	25.4 1.00	UL FM
125 X 50 5 X 2	139.7 X 60.3 5.500 X 2.375	500 3.45	25.4 1.00	UL FM
150 X 40 6 X 1 1/2	165.1 X 48.3 6.500 X 1.900	500 3.45	25.4 1.00	UL FM
150 X 40 6 X 1 1/2	168.3 X 48.3 6.625 X 1.900	500 3.45	25.4 1.00	UL FM
150 X 50 6 X 2	168.3 X 60.3 6.625 X 2.375	500 3.45	25.4 1.00	UL FM
200 X 40 8 X 1 1/2	219.1 X 48.3 8.625 X 1.900	500 3.45	30.2 1.19	UL FM
200 X 50 8 X 2	219.1 X 60.3 8.625 X 2.375	500 3.45	30.2 1.19	UL FM

### 321 PN16 Grooved Flange



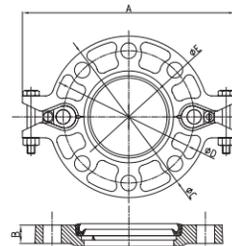
Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Dimensions					Bolt/Nut		Certificate
			A mm/in	B mm/in	C mm/in	D mm/in	E mm/in	No.-SIZE mm		
40 1½	48.3 1.900	225 1.6	195 7.68	18.5 0.73	150 5.90	110 4.33	45.4 1.78	2-M10X50	4-M16	UL FM VdS
50	60.3 2.375	225 1.6	220 8.66	18.5 0.73	165 6.50	125 4.92	57.5 2.26	2-M10X50	4-M16	UL FM VdS
65	76.1 3.000	225 1.6	235 9.25	18.5 0.73	185 7.28	145 5.71	72.7 2.86	2-M10X50	4-M16	UL FM VdS
80	88.9 3.500	225 1.6	255 10.04	18.5 0.73	195 7.68	160 6.30	85.5 3.37	2-M10X50	8-M16	UL FM VdS
100	108.0 4.250	225 1.6	279 10.98	18.5 0.73	220 8.66	180 7.09	104.5 4.11	2-M10X50	8-M16	UL FM
100	114.3 4.500	225 1.6	279 10.98	18.5 0.73	224 8.82	180 7.09	110.5 4.35	2-M10X50	8-M16	UL FM VdS
125	133.0 5.250	225 1.6	312 12.28	21.5 0.85	250 9.84	210 8.27	129.2 5.08	2-M12X65	8-M16	UL FM
125	139.7 5.500	225 1.6	320 12.60	23 0.91	250 9.84	210 8.27	135.5 5.33	2-M12X65	8-M16	UL FM
150	159.0 6.25	225 1.6	346 13.62	21.5 0.85	280 11.00	240 9.45	154.8 6.10	2-M12X65	8-M20	UL FM
150	165.1 6.500	225 1.6	346 13.62	21.5 0.85	280 11.00	240 9.45	160.8 6.33	2-M12X65	8-M20	UL FM
150	168.3 6.625	225 1.6	346 13.62	24 0.94	280 11.00	240 9.45	164.3 6.47	2-M12X65	8-M20	UL FM
200	219.1 8.625	225 1.6	414.3 16.31	30 1.18	340 13.39	295 11.61	214.9 8.46	2-3/8X70 2-M10X70	12-M20	UL FM VdS
250	273.0 10.750	225 1.6	480 18.90	25.5 1.00	405 15.94	355 13.98	268.9 10.59	2-3/8X70 2-M10X70	12-M24	UL FM VdS
300	323.9 12.750	225 1.6	530.5 20.88	25.5 1.00	460 18.11	410 16.14	318.9 12.56	2-3/8X70 2-M10X70	12-M24	UL FM
350	355.6 14	225 1.6	580 22.83	30 1.18	520 20.47	470 18.50	350.6 13.80	—	16-M24	—
400	406.4 16	225 1.6	630 24.80	32 1.26	580 22.83	525 20.67	401.5 15.81	—	16-M27	—
450	457.2 18	225 1.6	693 27.28	36 1.42	640 25.20	585 23.03	452.2 17.80	—	20-M27	—
500	508.0 20	225 1.6	770 30.31	36 1.42	715 28.15	650 25.59	503 19.80	—	20-M30	—
600	609.6 24	225 1.6	895 35.24	40 1.57	840 33.07	770 30.31	601.6 23.69	—	20-M33	—

### 321H PN25 Grooved Flange



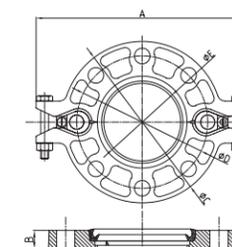
Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Dimensions					Bolt/Nut		Certificate
			A mm/in	B mm/in	C mm/in	D mm/in	E mm/in	No.-SIZE mm		
100 108.0	108.0 4.250	362 2.5	280 11.02	25.5 1.00	220 8.66	180 7.09	104.5 4.11	2-M12X55	8-M16	UL FM
150 165.1	165.1 6.500	362 2.5	346 13.62	25.5 1.00	280 11.00	240 9.45	160.8 6.33	2-M12X65	8-M20	UL FM

### 321A ANSI 125/150 Grooved Flange



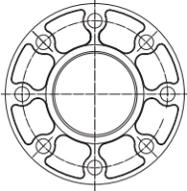
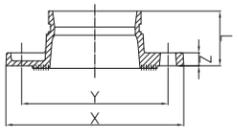
Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Dimensions					Bolt/Nut		Certificate
			A mm/in	B mm/in	C mm/in	D mm/in	E mm/in	No.-SIZE mm		
50 2	60.3 2.375	300 2.07	206 8.11	19 0.75	152 5.98	121 4.76	57.5 2.26	2-M10X50	4-5/8	UL FM
65 2½	73.0 2.875	300 2.07	230 9.05	19 0.75	178 7.00	140 5.51	69.8 2.74	2-M10X50	4-5/8	UL FM
80 3	88.9 3.500	300 2.07	246 9.68	19 0.75	191 7.52	152 5.98	85.5 3.37	2-M10X50	4-5/8	UL FM
100 4	114.3 4.500	300 2.07	280 11.02	19 0.75	229 9.00	191 7.52	110.5 4.35	2-M12X55	8-5/8	UL FM
125 5	141.3 5.563	300 2.07	320 12.60	22 0.87	254 10.00	216 8.50	137.4 5.41	2-M12X65	8-3/4	UL FM
150 6	168.3 6.625	300 2.07	346 13.62	22 0.87	280 11.00	241.3 9.50	164.3 6.47	2-M12X65	8-3/4	UL FM
200 8	219.1 8.625	300 2.07	414.3 16.31	30 1.18	341.4 13.44	298.5 11.75	214.9 8.46	2-3/8X70 2-M10X70	8-3/4	UL FM
250 10	273.0 10.750	300 2.07	481.2 18.94	30.3 1.19	405.6 15.97	361.95 14.25	268.9 10.59	2-3/8X70 2-M10X70	12-7/8	UL FM
300 12	323.9 12.750	300 2.07	553.3 21.78	30.4 1.20	482.6 19.00	431.8 17.00	318.9 12.56	2-3/8X70 2-M10X70	12-7/8	UL FM
350 14	355.6 14	300 2.0	590 23.22	37 1.44	535 21.00	476.3 18.75	350.6 13.80	—	12-1	—
400 16	406.4 16.000	300 2.0	650 25.59	37 1.44	595 23.50	539.8 21.25	401.5 15.81	—	16-1	—
450 18	457.2 18.000	300 2.0	690 27.17	40 1.56	635 25.80	577.8 22.75	452.2 17.80	—	16-11/8	—
500 20	508.0 20.000	300 2.0	765 30.12	43 1.69	700 27.50	635 25.00	503 19.80	—	20-11/8	—
600 24	609.6 24.000	300 2.0	875 34.45	49 1.94	815 32.00	749.3 29.50	601.6 23.69	—	20-11/4	—

### 321E BS. TABLE 'E' Grooved Flange



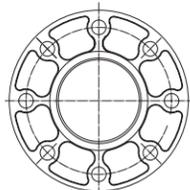
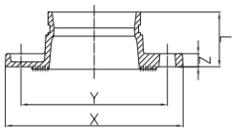
Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Dimensions					Bolt/Nut		Certificate
			A mm/in	B mm/in	C mm/in	D mm/in	E mm/in	No.-SIZE mm		
50 2	60.3 2.375	300 2.07	211 8.31	18.5 0.73	150 5.91	114 4.49	57.5 2.26	2-M10X50	4-M16	—
80 3	88.9 3.500	300 2.07	241 9.49	18.5 0.73	185 7.28	146 5.75	85.5 3.37	2-M10X50	4-M16	—
100 4	114.3 4.500	300 2.07	270 10.63	18.5 0.73	216 8.50	178 7.00	110.5 4.35	2-M10X50	8-M16	—
150 6	165.1 6.500	300 2.07	346 13.62	21.5 0.85	280 11.02	235 9.25	160.8 6.33	2-M12X65	8-M20	—
200 8	219.1 8.625	300 2.07	408 16.06	24 0.94	335 13.19	292 11.50	214.9 8.46	2-3/8X70	12-M20	—
250 10	273.0 10.750	200 1.4	480 18.90	25.5 1.00	406 16.00	356 14.00	268.9 10.59	—	12-3/4	—
300 12	323.9 12.750	200 1.4	530.5 20.88	25.5 1.00	457 18.00	406 16.00	318.9 12.56	—	12-7/8	—
350 14	355.6 14	200 1.4	580 22.83	32 1.26	527 20.75	470 18.50	350.6 13.80	—	12-7/8	—
400 16	406.4 16.000	200 1.4	630 24.80	32 1.26	578 22.76	521 20.51	401.5 15.81	—	12-7/8	—
450 18	457.2 18.000	200 1.4	693 27.28	36 1.42	641 25.24	584 23.00	452.2 17.80	—	16-7/8	—
500 20	508.0 20.000	200 1.4	770 30.31	38 1.50	705 27.76	641 25.24	503 19.80	—	16-7/8	—
600 24	609.6 24.000	200 1.4	880 34.65	42 1.65	826 32.52	756 29.76	601.6 23.69	—	16-11/8	—

### 321G PN16 Adaptor Flange



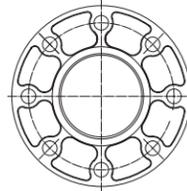
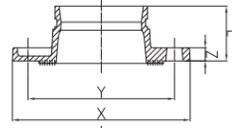
Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Dimensions				Bolt/Nut No.-SIZE mm	Certificate
			L mm/in	X mm/in	Y mm/in	Z mm/in		
25 1	33.7 1.327	225 1.6	60.5 2.382	115 4.53	85 3.35	16 0.63	4-M12	UL FM VdS LPCB
32 1¼	42.4 1.669	225 1.6	60.5 2.382	140 5.51	100 3.94	16 0.63	4-M16	UL FM VdS LPCB
40 1½	48.3 1.902	225 1.6	60.5 2.382	150 6.91	110 4.33	16 0.63	4-M16	UL FM VdS LPCB
50 2	60.3 2.375	225 1.6	65 2.559	165 6.50	125 4.92	16 0.63	4-M16	UL FM VdS LPCB
65 76.1	76.1 3.000	225 1.6	65 2.559	185 7.28	145 5.70	16 0.63	4-M16	UL FM VdS LPCB
80 3	88.9 3.500	225 1.6	65 2.559	200 7.87	160 6.30	16 0.63	8-M16	UL FM VdS LPCB
100 108.0	108.0 4.250	225 1.6	70 2.756	220 8.66	180 7.09	16 0.63	8-M16	UL FM
100 4	114.3 4.500	225 1.6	70 2.756	220 8.66	180 7.09	16 0.63	8-M16	UL FM VdS LPCB
125 133.0	133 5.250	225 1.6	70 2.756	250 9.84	210 8.27	18 0.71	8-M16	UL FM
125 139.7	139.7 5.500	225 1.6	70 2.756	250 9.84	210 8.27	18 0.71	8-M16	UL FM VdS LPCB
150 159.1	159.0 6.250	225 1.6	70 2.756	285 11.22	240 9.45	18 0.71	8-M20	UL FM
150 165.1	165.1 6.500	225 1.6	70 2.756	285 11.22	240 9.45	18 0.71	8-M20	UL FM LPCB
150 6	168.3 6.625	225 1.6	70 2.756	285 11.22	240 9.45	18 0.71	8-M20	UL FM VdS LPCB
200 8	219.1 8.625	225 1.6	80 3.150	340 13.39	295 11.61	19 0.75	12-M20	UL FM VdS LPCB
250 10	273.0 10.750	225 1.6	85 3.346	405 15.94	355 13.98	21 0.83	12-M24	UL FM VdS
300 12	323.9 12.750	225 1.6	90 3.543	460 18.11	410 16.14	24 0.94	12-M24	UL FM VdS
350 14	377.0 12.843	225 1.6	100 3.937	520 20.47	470 18.50	25 1.00	16-M24	UL FM
400 16	426.0 16.772	225 1.6	110 4.331	580 22.83	525 20.67	27 1.06	16-M27	UL FM
450 18	480 18.897	225 1.6	115 4.528	640 25.196	585 23.03	20 0.787	20-M27	—

### 321GH PN25 Adaptor Flange



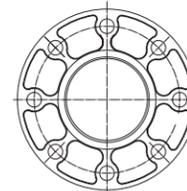
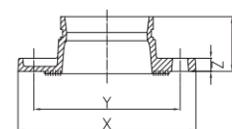
Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Dimensions				Bolt/Nut No.-SIZE mm	Certificate
			L mm/in	X mm/in	Y mm/in	Z mm/in		
100 108.0	108.0 4.250	362 2.5	70 2.756	230 9.05	190 7.48	18 0.71	8-M20	UL FM
100 4	114.3 4.500	362 2.5	70 2.756	235 9.25	190 7.48	16 0.63	8-M20	UL FM
150 159.0	159.0 6.250	362 2.5	70 2.756	300 11.80	250 9.85	20 0.79	8-M24	UL FM
150 165.1	165.1 6.500	362 2.5	70 2.756	300 11.80	250 9.84	18 0.71	8-M24	UL FM
200 8	219.1 8.625	362 2.5	80 3.150	360 14.17	310 12.20	19 0.75	12-M24	UL FM

### 321GA ANSI 125/150 Adaptor Flange Class 125/150



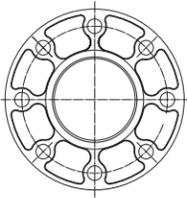
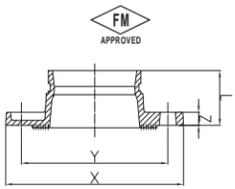
Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Dimensions				Bolt/Nut No.-SIZE mm	Certificate
			L mm/in	X mm/in	Y mm/in	Z mm/in		
50 2	60.3 2.375	300 2.07	65 2.559	152 6.0	120.5 4.74	16 0.63	4-5/8	UL FM
65 2½	73.0 2.875	300 2.07	65 2.559	185 7.28	139.7 5.50	16 0.63	4-5/8	UL FM
80 3	88.9 3.500	300 2.07	65 2.559	200 7.87	152.4 6.00	16 0.63	8-5/8	UL FM
100 4	114.3 4.500	300 2.07	70 2.756	229 9.01	190.5 7.50	16 0.63	8-5/8	UL FM
150 6	168.3 6.625	300 2.07	70 2.756	282 11.10	241.3 9.50	18 0.71	8-3/4	UL FM
200 8	219.1 8.625	300 2.07	80 3.150	340 13.39	298.5 11.75	19 0.75	8-3/4	UL FM
250 10	273.0 10.75	300 2.07	85 3.35	406 15.98	362 14.25	21 0.826	12-7/8	UL FM
350 14	355.6 12.750	300 2.0	127 5.00	535 21.00	476.3 18.75	37 1.44	12-1	—
400 16	406.4 16.000	300 2.0	127 5.00	595 23.50	539.8 21.25	37 1.44	16-1	—
450 18	457.2 18.000	300 2.0	140 5.50	635 25.80	577.8 22.75	40 1.56	16-11/8	—
500 20	508.0 20.000	300 2.0	152 6.00	700 27.50	635 25.00	43 1.69	20-11/8	—
600 24	609.6 24.000	300 2.0	152 6.00	815 32.00	749.3 29.50	49 1.94	20-11/4	—

### 321GL PN10 Adaptor Flange



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Dimensions				Bolt/Nut No.-SIZE mm	Certificate
			L mm/in	X mm/in	Y mm/in	Z mm/in		
200 8	219.1 8.625	145 1.0	80 3.150	340 13.39	295 11.61	19 0.75	8-M20	UL FM
250 10	273.0 10.750	145 1.0	85 3.346	405 15.94	350 13.78	21 0.83	12-M20	UL FM
300 12	323.9 12.750	145 1.0	90 3.543	460 18.11	400 15.75	24 0.94	12-M20	UL FM

### 321G BS. TABLE 'E' Adaptor Flange



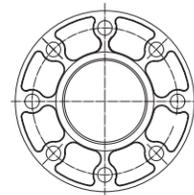
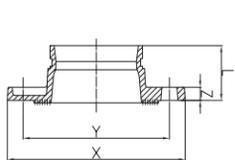
Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Dimensions				Bolt/Nut No.-SIZE mm	Certificate
			L mm/in	X mm/in	Y mm/in	Z mm/in		
65 2 1/2	76.1 3.000	225 1.6	70 2.756	165 6.50	127 5.00	16 0.63	4-M16	—
80 3	88.9 3.500	225 1.6	70 2.756	184 7.24	146 5.75	16 0.63	4-M16	—
100 4	114.3 4.500	225 1.6	70 2.756	216 8.50	178 7.00	16 0.63	8-M16	FM
150 165.1	165.1 6.500	225 1.6	70 2.756	280 11.02	235 9.25	21 0.71	8-M20	FM
200 8	219.1 8.625	225 1.6	102 4.02	337 13.27	292 11.50	19 0.75	8-M20	—
250 10	273.0 10.75	225 1.6	85 3.35	405 15.94	356 14.02	25 0.98	12-M20	—
300 12	323.9 10.750	200 1.4	102 4.02	457 18.00	406 16.00	25.5 1.00	12-7/8	—
350 14	355.6 12.750	200 1.4	127 5.00	527 20.75	470 18.50	32 1.26	12-7/8	—
400 16	406.4 16.000	200 1.4	127 5.00	578 22.76	521 20.51	32 1.26	12-7/8	—
450 18	457.2 18.000	200 1.4	140 5.50	641 25.24	584 23.00	36 1.42	16-7/8	—

### Gasket Data



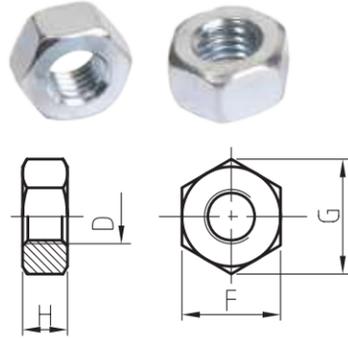
Gasket	Name	Temperature Range	General Service Recommendations	Color Mark
E	EPDM	-34~+110°C (-30~+230° F)	Recommended for hot water service within the specified temperature range plus a variety of dilute acids,oil-free air and many chemical services.UL classified in accordance with ANSI/NSF 61or cold+86° F(+30° )and hot +180° F(+82°C) potable water service.Not recommended for petroleum service.	Black Green Strip
D	NBR	-29~+82°C (-20~+180° F)	Recommended for petroleum products, air with oil vapors,vegetable and mineral oils within the specified temperature range.Not recommended for hot water services.	Orange Strip
S	Silicone	-40~+177°C (-40~+350° F)	Recommended for high temperature dry air and some high temperature chemical products.	White

### 321GJ JIS 10K Adaptor Flange



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Dimensions				Bolt/Nut No.-SIZE mm	Certificate
			L mm/in	X mm/in	Y mm/in	Z mm/in		
65 2 1/2	76.3 3.00	145 1.0	65 2.559	175 6.89	140 5.51	18 0.71	4-M16	—
80 3	89.1 3.50	145 1.0	65 2.559	185 7.28	150 5.91	18 0.71	8-M16	—
100 4	114.3 4.50	145 1.0	70 2.756	210 8.27	175 6.89	18 0.71	8-M16	—
125 5	139.8 5.50	145 1.0	70 2.756	250 9.84	210 8.27	20 0.79	8-M20	—
150 6	165.2 6.50	145 1.0	70 2.756	280 11.02	240 9.45	20 0.79	8-M20	—

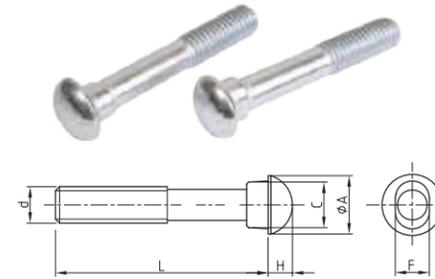
## ANSI Heavy Hex Nut



1. Material: SAE J995 2.
2. Thread: ANSI B 1.1-1982, class 2B.
3. Surface Treatment: Zinc electroplated per ASTM B633 CLASS FE/ZN5 TYPE III, thickness  $\geq 5 \mu\text{m}$  per class SC1.

d	F		G		H	
	Min	Max	Min	Max	Min	Max
3/8-16UNC	16.99	17.47	19.38	20.17	8.66	9.57
1/2-13UNC	21.59	22.22	24.61	25.65	11.78	12.80
5/8-11UNC	26.19	26.97	29.85	31.16	14.90	16.02
3/4-10UNC	30.78	31.75	35.10	36.65	18.03	19.25
7/8-9UNC	35.41	36.53	40.36	42.16	21.16	22.48

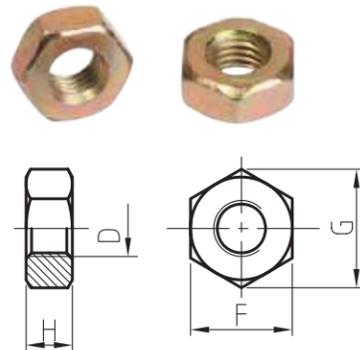
## ANSI Oval Neck Track Bolt



1. Material: SAE J429 5.
2. Thread: UNC thread per ANSI B 1.1 Class 2A.
3. Surface Treatment: Silver chromate electroplated per ASTM B633 CLASS FE/ZN5 TYPE III, thickness  $\geq 5 \mu\text{m}$  per class SC1.

d	A	C	F	H	L
3/8-16UNC	19	13.9	9.50	6.0	55/70
1/2-13UNC	22.5	16	12.70	8.0	70/75
5/8-11UNC	27.4	19.8	15.90	10.0	80/85/105
3/4-10UNC	32.5	26.2	19.05	12.0	115/120
7/8-9UNC	37.7	28.8	22.20	14.0	125/140

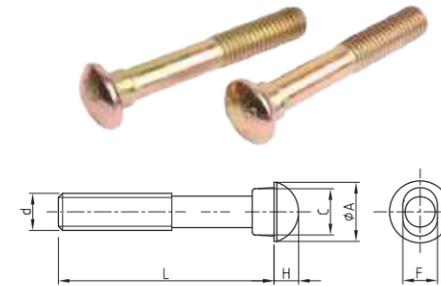
## Metric Heavy Hex Nut



1. Material: ISO 898-2:1992 \ GB/T3098.2-2000 Class 8.
2. Thread: ISO 261, tolerance 6h for M10& M12, 7h for M16 and above.
3. Surface Treatment: Zinc Electroplated followed by a yellow chromate dip per ISO 2081 FE/ZN5, ISO4520 CLASS 1A.

d	F		G	H	
	Min	Max	Min	Min	Max
M10	15.73	16.0	17.7	8.0	8.4
M12	21.16	22.0	23.9	9.34	10.0
M16	23.16	24.0	26.17	14.1	15.9
M20	29.16	30.0	32.95	16.9	19.0
M22	33.0	34.0	37.29	18.1	20.2

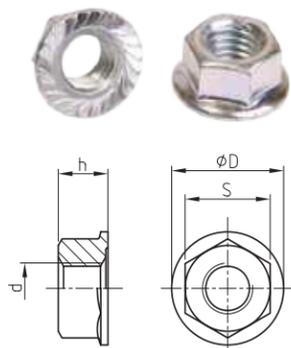
## Metric Oval Neck Track Bolt



1. Material: ISO 898-1:1992 \ GB/T3098.1-2000 Class 8.8.
2. Thread: ISO metric thread per ISO 261, tolerance 6h.
3. Surface Treatment: Yellow chromate electroplated per ISO 2081 FE/ZN5, ISO4520 CLASS 1A.

d	A	C	F	H	L
M10	18.5	13.5	9.5	5	50/57/63/70/89
M12	23.5	17.5	12.3	8	70/76/82/89/108
M16	29.5	20.5	15.7	10	85/89/95/108
M20	38	27	18.3	12.5	110/115
M22	42.2	31	21.4	14	125/140/150

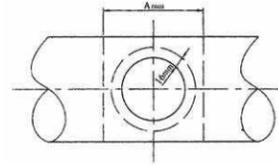
## Hexagon Flange Nut



Dimension according to DIN6923.

d	S		D	h	
	Min	Max	Max	Min	Max
M8	12.3	13	17.9	7.6	8
M10	14.73	15.0	21.8	9.64	10
M12	17.73	18.0	26.0	11.57	12.0

## Hole Diameter of pipe

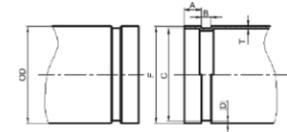


Hole-cutting Machine

Run Nominal Size mm/in	Outlet Nominal Size mm/in	Hole Dia. +3.2,0+0.13,0 mm/in	Run Nominal Size mm/in	Outlet Nominal Size mm/in	Hole Dia. +3.2,0+0.13,0 mm/in	Run Nominal Size mm/in	Outlet Nominal Size mm/in	Hole Dia. +3.2,0+0.13,0 mm/in
50 2"/60.3	15 1/2	38 1.50 A89	100 108.0 4"/114.3	15 1/2	38 1.50 A89	150 159.0 6"/168.3	15 1/2	38 1.50 A89
	20 3/4			20 3/4			20 3/4	
	25 1			25 1			25 1	
	32 1 1/4	45 1.75 A102		32 1 1/4	51 2.00 A102		32 1 1/4	51 2.00 A102
	40 1 1/2			40 1 1/2	40 1 1/2		40 1 1/2	
65 2 1/2"/ 73.0 76.1	15 1/2	38 1.50 A89	125 133.0 139.7 5"/141.3	50 2	64 2.50 A114	200 8"/219.1 250 10"/273.0	50 2	64 2.50 A114
	20 3/4			65 2 1/2/76.1	70 2.75 A120		65 2 1/2/76.1	70 2.75 A120
	25 1			80 3	89 3.50 A140		80 3	89 3.50 A140
	32 1 1/4	51 2.00 A102		15 1/2	38 1.50 A89		100 108.0/4	114 4.50 A165
	40 1 1/2			20 3/4	25 1		25 1	38 1.50 A89
80 3"/88.9	15 1/2	38 1.50 A89	125 133.0 139.7 5"/141.3	32 1 1/4	51 2.00 A102	200 8"/219.1 250 10"/273.0	32 1 1/4	51 2.00 A102
	20 3/4			40 1 1/2	51 2.00 A102		40 1 1/2	51 2.00 A102
	25 1			50 2	64 2.50 A114		50 2	64 2.50 A114
	32 1 1/4	51 2.00 A102		65 2 1/2/76.1	70 2.75 A120		65 2 1/2/76.1	70 2.75 A120
	40 1 1/2			80 3	89 3.50 A140		80 3	89 3.50 A140
	50 2	64 2.50 A114					100 108.0/4	114 4.50 A165

The outside surface of the pipe within 16mm from the hole must be clean and smooth.

## Roll Groove Dimensions



Roll Grooving Machine

Nominal Size mm/in	Pipe OD		Gasket seat A ±0.76/±0.03 mm/in	Groove Width B ±0.76/±0.03 mm/in	Groove Dia C		Groove Depth D(ref) mm/in	Max Allow Flare Dia F mm/in	Min. Allow wall thickness T mm/in
	Basic mm/in	Tolerance mm/in			Basic mm/in	Tolerance mm/in			
25 1	33.7 1.327	+0.41 -0.026	15.88 0.625	7.14 0.281	30.23 1.190	-0.38 -0.015	1.60 0.063	34.5 1.358	1.8 0.071
32 1 1/4	42.4 1.669	+0.50 +0.020	15.88 0.625	7.14 0.281	38.99 1.535	-0.38 -0.015	1.60 0.063	43.3 1.705	1.8 0.071
40 1 1/2	48.3 1.900	+0.44 +0.017	15.88 0.625	7.14 0.281	45.09 1.779	-0.38 -0.015	1.60 0.063	49.4 1.945	1.8 0.071
50 2	60.3 2.375	+0.61 +0.024	15.88 0.625	8.74 0.344	57.15 2.250	-0.38 -0.015	1.60 0.063	62.2 2.449	1.8 0.071
65 2 1/2	73.0 2.875	+0.74 +0.029	15.88 0.625	8.74 0.344	69.09 2.720	-0.46 -0.018	1.98 0.078	75.2 2.961	2.3 0.091
80 3	88.9 3.500	+0.76 +0.030	15.88 0.625	8.74 0.344	72.26 2.845	-0.46 -0.018	1.99 0.078	77.7 3.059	2.3 0.091
100 4	108.0 4.250	+0.89 +0.035	15.88 0.625	8.74 0.344	84.94 3.344	-0.46 -0.018	1.98 0.078	90.6 3.567	2.3 0.091
100 4	114.3 4.500	+1.07 +0.042	15.88 0.625	8.74 0.344	103.73 4.084	-0.51 -0.020	2.11 0.083	109.7 4.319	2.3 0.091
125 5	133.0 5.250	+1.14 +0.045	15.88 0.625	8.74 0.344	110.08 4.334	-0.51 -0.020	2.11 0.083	116.2 4.575	2.3 0.091
125 5	139.7 5.500	+1.32 +0.052	15.88 0.625	8.74 0.344	129.13 5.084	-0.51 -0.020	2.11 0.083	134.9 5.311	2.9 0.114
125 5	141.3 5.563	+1.40 +0.055	15.88 0.625	8.74 0.344	135.48 5.334	-0.51 -0.020	2.11 0.083	141.7 5.579	2.9 0.114
125 5	141.3 5.563	+1.42 +0.056	15.88 0.625	8.74 0.344	137.03 5.395	-0.56 -0.022	2.13 0.084	143.5 5.650	2.9 0.114
150 6	159.0 6.250	+1.60 +0.063	15.88 0.625	8.74 0.344	154.50 6.083	-0.56 -0.022	2.16 0.085	161.0 6.339	2.9 0.114
150 6	165.1 6.500	+1.60 +0.063	15.88 0.625	8.74 0.344	160.8 6.330	-0.56 -0.022	2.16 0.085	167.1 6.579	2.9 0.114
150 6	168.3 6.625	+1.60 +0.063	15.88 0.625	8.74 0.344	163.96 6.455	-0.56 -0.022	2.16 0.085	170.7 6.720	2.9 0.114
200A 8	216.3 8.516	+1.60 +0.063	19.05 0.750	11.91 0.469	211.60 8.331	-0.64 -0.025	2.35 0.093	219.8 8.653	2.9 0.114
200 8	219.1 8.625	+1.60 +0.063	19.05 0.750	11.91 0.469	214.40 8.441	-0.64 -0.025	2.34 0.092	221.5 8.720	2.9 0.114
250A 10	267.4 10.528	+1.60 +0.063	19.05 0.750	11.91 0.469	262.60 10.339	-0.69 -0.027	2.40 0.095	270.9 10.665	3.6 0.142
250 10	273.0 10.750	+1.60 +0.063	19.05 0.750	11.91 0.469	268.28 10.562	-0.69 -0.027	2.39 0.094	275.4 10.842	3.6 0.142
300A 12	318.5 12.539	+1.60 +0.063	19.05 0.750	11.91 0.469	312.90 12.319	-0.76 -0.030	2.77 0.109	322.0 12.677	4.0 0.158
300 12	323.9 12.750	+1.60 +0.063	19.05 0.750	11.91 0.469	318.29 12.531	-0.76 -0.030	2.77 0.109	326.2 12.842	4.0 0.158
350 14	377.0 14.842	+1.60 +0.063	23.83 0.938	11.91 0.469	371.44 14.623	-0.76 -0.030	2.77 0.109	379.5 14.941	4.5 0.177
400 16	426.0 16.772	+1.60 +0.063	23.83 0.938	11.91 0.469	420.46 16.553	-0.76 -0.030	2.77 0.109	428.5 16.870	4.5 0.177
500 20	529.0 20.827	+1.60 +0.063	25.40 1.000	11.91 0.469	523.46 20.608	-0.76 -0.030	2.77 0.109	533.0 20.984	5.0 0.197

### Pressure Ratings and End Loads for Mech Couplings on Steel Pipe



1G Rigid



1GS L/Duty Rigid



1N Reducing

Nom. Size	Pipe O.D	Pipe Sched	Wall Thick.	1G		1GS		1NR	
				Roll Grooved		Roll Grooved		Roll Grooved	
				Max.Work Press.	Max.End Load	Max.Work Press.	Max.End Load	Max.Work Press.	Max.End Load
DN/in	mm	(Sch)	mm	Bar/Psi	kN/Lbs	Bar/Psi	kN/Lbs	Bar/Psi	kN/Lbs
25	33.7	40	3.38	35/500	3.0/680	--	--	20/300	1.8/410
		10	2.77	35/500	3.0/680	--	--	20/300	1.8/410
32	42.4	40	3.56	35/500	4.8/1080	--	--	20/300	2.9/650
		10	2.77	35/500	4.8/1080	--	--	20/300	2.9/650
40	48.3	40	3.68	35/500	6.3/1420	--	--	20/300	3.8/850
		10	2.77	35/500	6.3/1420	--	--	20/300	3.8/850
50	60.3	40	3.91	35/500	9.8/2210	--	--	20/300	5.9/1330
		10	2.77	35/500	9.8/2210	--	--	20/300	5.9/1330
65	73	40	5.16	35/500	14.4/3240	--	--	20/300	8.7/1950
		10	3.05	35/500	14.4/3240	--	--	20/300	8.7/1950
65	76.1	--	6.35	--	--	--	--	--	--
		--	5.08	35/500	15.7/3530	20/300	9.4/2120	20/300	9.4/2120
		--	3.81	35/500	15.7/3530	20/300	9.4/2120	20/300	9.4/2120
80	88.9	40	5.49	35/500	21.4/4800	20/300	12.8/2885	20/300	12.8/2885
		10	3.05	35/500	21.4/4800	20/300	12.8/2885	20/300	12.8/2885
100	114.3	40	6.02	35/500	35.4/7950	20/300	21.2/4770	20/300	21.2/4770
		10	3.05	35/500	35.4/7950	20/300	21.2/4770	20/300	21.2/4770
125	141.3	40	6.55	31/450	48.6/10930	20/300	32.4/7290	20/300	32.4/7290
		10	3.4	31/450	48.6/10930	20/300	32.4/7290	20/300	32.4/7290
150	165.1	--	6.35	31/450	66.4/14930	20/300	44.3/9960	20/300	44.3/9960
		--	5.08	31/450	66.4/14930	20/300	44.3/9960	20/300	44.3/9960
150	168.3	40	7.11	31/450	68.9/15500	20/300	46.0/10340	20/300	46.0/10340
		10	3.4	31/450	68.9/15500	20/300	46.0/10340	20/300	46.0/10340
200	219.1	40	8.18	31/450	116.9/26280	20/300	77.8/17500	--	--
		30	7.04	31/450	116.9/26280	20/300	77.8/17500	--	--
		10	4.77	20/300	77.8/17500	20/300	77.8/17500	--	--
250	273	40	9.27	20/300	121.0/27210	--	--	--	--
		30	7.8	20/300	121.0/27210	--	--	--	--
		10	4.77	20/300	121.0/27210	--	--	--	--
300	323.9	40	10.31	20/300	170.3/38280	--	--	--	--
		STD	9.53	20/300	170.3/38280	--	--	--	--
		30	6.35	20/300	170.3/38280	--	--	--	--
		10	4.77	20/300	170.3/38280	--	--	--	--

### Pressure Ratings and End Loads for Mech Couplings on Steel Pipe



1N Flexible



1NH Heavy Duty Flexible



321 Flange

Nom. Size	Pipe O.D	Pipe Sched	Wall Thick.	1N		1NH		321	
				Roll Grooved		Roll Grooved		Roll Grooved	
				Max.Work Press.	Max.End Load	Max.Work Press.	Max.End Load	Max.Work Press.	Max.End Load
DN/in	mm	(Sch)	mm	Bar/Psi	kN/Lbs	Bar/Psi	kN/Lbs	Bar/Psi	kN/Lbs
25	33.7	40	3.38	35/500	3.0/680	--	--	--	--
		10	2.77	35/500	3.0/680	--	--	--	--
32	42.4	40	3.56	35/500	4.8/1080	--	--	--	--
		10	2.77	35/500	4.8/1080	--	--	--	--
40	48.3	40	3.56	35/500	6.3/1420	--	--	16/225	3.2/710
		10	2.77	35/500	6.3/1420	--	--	16/225	3.2/710
50	60.3	40	3.91	35/500	9.8/2210	52/750	14.8/3320	16/225	4.4/1000
		10	2.77	35/500	9.8/2210	52/750	14.8/3320	16/225	4.4/1000
65	73	40	5.16	35/500	14.4/3240	52/750	21.7/4870	20/300	5.9/1330
		10	3.05	35/500	14.4/3240	41/600	17.3/3900	20/300	5.9/1330
65	76.1	--	6.35	--	--	--	--	--	--
		--	5.08	35/500	15.7/3530	52/750	23.6/5300	16/225	7.1/1590
		--	3.81	35/500	15.7/3530	41/600	18.9/4240	16/225	7.1/1590
80	88.9	40	5.49	35/500	21.4/4800	52/750	32.1/7210	16/225	9.6/2165
		10	3.05	35/500	21.4/4800	41/600	25.6/5760	16/225	9.6/2165
100	114.3	40	6.02	35/500	35.4/7950	52/750	53.0/11920	16/225	15.9/3580
		10	3.05	35/500	35.4/7950	41/600	42.4/9540	16/225	15.9/3580
125	141.3	40	6.55	31/450	48.6/10930	48/700	75.7/17010	20/300	31.3/7035
		10	3.4	31/450	48.6/10930	31/450	48.6/10930	20/300	31.3/7035
150	165.1	--	6.35	31/450	66.4/14930	48/700	102.7/23090	16/225	33.2/7460
		--	5.08	31/450	66.4/14930	31/450	66.4/14930	16/225	33.2/7460
150	168.3	40	7.11	31/450	68.9/15500	48/700	107.3/24120	16/225	34.5/7750
		10	3.4	31/450	68.9/15500	31/450	68.9/15500	16/225	34.5/7750
200	219.1	40	8.18	31/450	116.9/26280	41/600	155.7/35000	16/225	58.4/13140
		30	7.04	31/450	116.9/26280	41/600	155.7/35000	16/225	58.4/13140
		10	3.76	20/300	77.8/17500	20/300	77.8/17500	16/225	58.4/13140
250	273	40	9.27	20/300	121.0/27210	--	--	16/225	90.8/20410
		30	6.35	20/300	121.0/27210	--	--	16/225	90.8/20410
		10	4.19	20/300	121.0/27210	--	--	16/225	90.8/20410
300	323.9	40	10.31	20/300	170.3/38280	--	--	16/225	127.7/28710
		STD	9.53	20/300	170.3/38280	--	--	16/225	127.7/28710
		20	6.35	20/300	170.3/38280	--	--	16/225	127.7/28710
		10	4.57	20/300	170.3/38280	--	--	16/225	127.7/28710

## Installation Instruction For Rigid & Flexible Coupling



### 1. Pipe preparation

Check pipe end for proper groove dimensions and to assure that pipe end is free of indentations and projections that would prevent proper sealing.



### 2. Lubricate gasket

Check gasket to be sure it's compatible for the intended service. Apply thin lubricant to the outside and sealing lips of the gasket.



### 3. Gasket installation

Slip the gasket over one pipe, making sure the gasket lip does not over-hang the pipe end.



### 4. Alignment

After aligning two pipe ends together, pull the gasket into position, centering between the grooves on each pipe. The gasket should not extend into the groove on either pipe.



### 5. Housing installation

Remove one bolt & nut and loosen the other nut. Place one housing over the gasket, making sure the housing keys fit into the pipe grooves. Swing the other housing over the gasket and into the grooves on both pipes. Re-insert the bolt and connect two housings.



### 6. Tighten nuts

Firstly hand tighten nuts and make sure oval neck bolt completely fits into bolt hole. Then securely tighten nuts alternatively and equally to the specified bolt torque by using spanner.



### 7 a. Assembly completed- Rigid Coupling

For Rigid Coupling, keep the gaps at bolt pads evenly spaced. Gaskets can't be seen visually.



### 7 b. Assembly completed- Flexible Coupling

For Flexible Coupling, two housings should be iron to iron connected. Gaskets can't be seen visually.

Caution
Proper torquing of bolts is required to obtain specified performance.
- Over torquing the bolts may result in damage to the bolt and / or casting which could result in pipe joint separation.
- Under torquing the bolts may result in lower pressure retention capabilities, lower bend load capabilities, joint leakage and pipe joint separation. Pipe joint separation may result in significant property damage and serious injury.

Specified Bolt Torque		
ANSI BOLTS		
Bolt Size	Specified Bolt Torque	
	Inch	Specified Bolt Torque
	Lbs-Ft.	N.m
3/8	30-45	40-60
1/2	80-100	110-135
5/8	100-130	135-175
3/4	130-180	175-245
7/8	180-240	245-325

## Installation Instruction For Threaded & Grooved Mechanical Tee



### 1. Pipe preparation

Clean the gasket sealing surface within 16mm of the hole and visually inspect the sealing surface for defects that may prevent proper sealing of the gasket. Don't drill the hole on weld line.



### 2. Remove burrs

If any burrs or slug exists at the pipe hole, please remove them before assembly, to protect the gasket and avoid leakage.



### 3. Gasket installation

Insert the gasket into outlet housing making sure the tab in the gasket line up with the tab recesses in the housing. Align outlet housing over the pipe hole making sure that the locating collar is in the pipe hole.



### 4. Alignment

Align the strap around the pipe, insert the bolts and tighten the nuts finger tight.



### 5. Tighten nuts

Alternatively and evenly tighten the nuts to the specified bolt torque.



### 6. Assembly completed

There should be even gaps on two sides between upper and lower housings.

Caution
Proper torquing of bolts is required to obtain specified performance.
- Over torquing the bolts may result in damage to the bolt and / or casting which could result in pipe joint separation.
- Under torquing the bolts may result in lower pressure retention capabilities, lower bend load capabilities, joint leakage and pipe joint separation. Pipe joint separation may result in significant property damage and serious injury.

Specified Bolt Torque		
ANSI BOLTS		
Bolt Size	Specified Bolt Torque	
	Inch	Specified Bolt Torque
	Lbs-Ft.	N.m
3/8	30-45	40-60
1/2	80-100	110-135
5/8	100-130	135-175
3/4	—	—
7/8	—	—

## Installation Instruction For U-Bolt Mechanical Tee



### 1. Pipe preparation

Clean the gasket sealing surface within 16mm of the hole and visually inspect the sealing surface for defects that may prevent proper sealing of the gasket. Don't drill the hole on weld line.



### 2. Remove burrs

If any burrs or slug exists at the pipe hole, please remove them before assembly, to protect the gasket and avoid leakage.



### 3. Gasket installation

Insert the gasket into outlet housing properly. Align outlet housing over the pipe hole making sure that the locating collar is in the pipe hole.



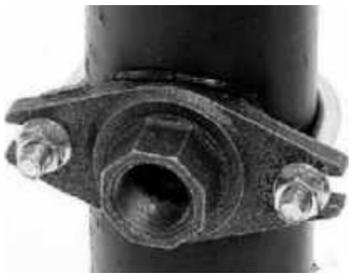
### 4. Alignment

Attach the U-bolt from the other side and tighten the nuts finger tight.



### 5. Tighten nuts

Alternatively and evenly tighten the nuts to the specified bolt torque.



### 6. Assembly completed

Assembly completed.

#### Caution

Proper torquing of bolts is required to obtain specified performance.

- Over torquing the bolts may result in damage to the bolt and / or casting which could result in pipe joint separation.
- Under torquing the bolts may result in lower pressure retention capabilities, lower bend load capabilities, joint leakage and pipe joint separation. Pipe joint separation may result in significant property damage and serious injury.

#### Specified Bolt Torque

ANSI BOLTS		
Bolt Size	Specified Bolt Torque	
	Lbs-Ft.	N.m
3/8	30-45	40-60
1/2	80-100	110-135
5/8	100-130	135-175
3/4	—	—
7/8	—	—

## Installation Instruction For Grooved Flange



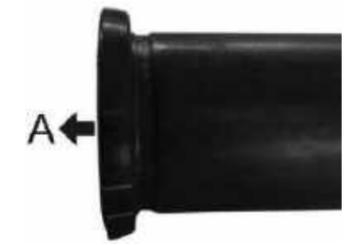
### 1. Pipe preparation

Check pipe end for proper groove dimensions and to assure that pipe end is free of indentations and projections that would prevent proper sealing.



### 2. Lubricate gasket

Check gasket to be sure it's compatible for the intended service. Apply thin lubricant to the outside and sealing lips of the gasket.



### 3. Gasket installation

Slip the gasket over pipe end, with the gasket opening side towards "A". Make sure the gasket sealing lip is even with pipe end.



### 4. Housing installation

Remove bolts and nuts, place two housings over the gasket, making sure the housing keys fit into the pipe grooves. Re-insert the bolts and hand tighten the nuts.



### 5. Tighten nuts

Securely tighten nuts alternatively and equally to the specified bolt torque by using spanner.



### 6. Connect mating flange

Align flange bolt holes with mating flange (or valve) bolt holes. Insert a standard flange bolt through bolt hole and hand tighten a nut. Insert another bolt opposite the first and hand tighten a nut. Continue this until all bolt holes are fitted. Tighten nuts evenly to specified bolt torque, so flange faces remain parallel. Assembly completed.

#### Caution

Proper torquing of bolts is required to obtain specified performance.

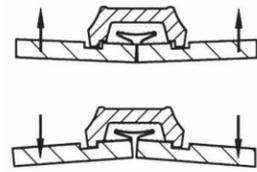
- Over torquing the bolts may result in damage to the bolt and / or casting which could result in pipe joint separation.
- Under torquing the bolts may result in lower pressure retention capabilities, lower bend load capabilities, joint leakage and pipe joint separation. Pipe joint separation may result in significant property damage and serious injury.

#### Specified Bolt Torque

ANSI BOLTS		
Bolt Size	Specified Bolt Torque	
	Lbs-Ft.	N.m
Inch	30-45	40-60
M10	30-45	40-60
M12	80-100	110-135
M16	—	—
M20	—	—
M22	—	—
M24	—	—

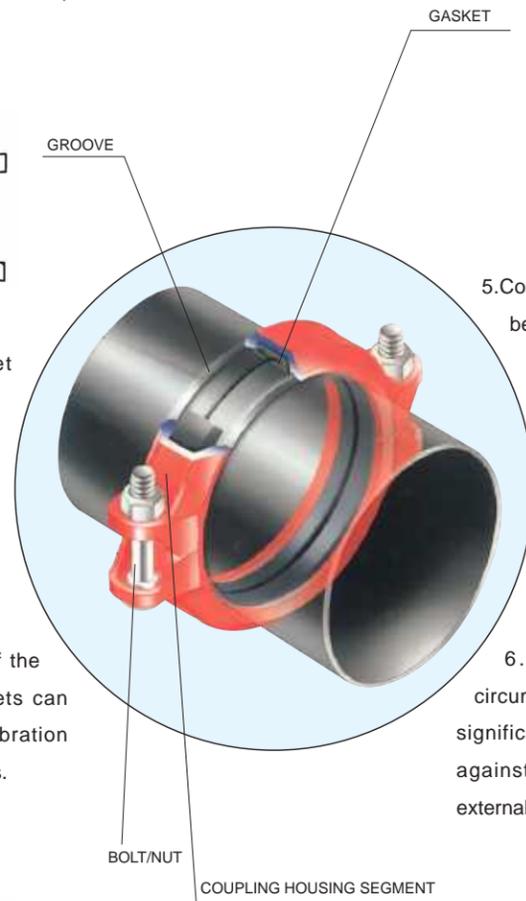
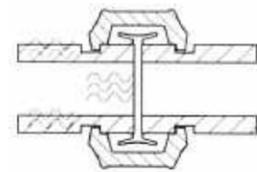
## Flexible Coupling

1. A flexible coupling accommodates pipe deflection and or non-alignment as below:  
 If nominal diameter <math><DN200</math>, deflection angle is  $\geq 1^\circ$  ; If nominal diameter  $\geq DN200$ , deflection angle is  $\geq 0.5^\circ$  but  $< 1^\circ$  .

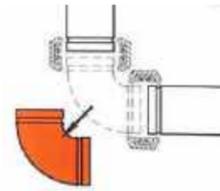


2. The C-shaped rubber gasket provides excellent self-sealing capabilities in both low and high pressure service as well as under certain vacuum conditions.

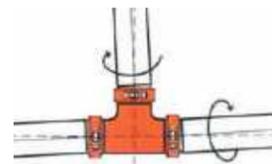
3. The design and construction of the coupling with elastomeric gaskets can provide significant noise and vibration absorption as well as seismic stress.



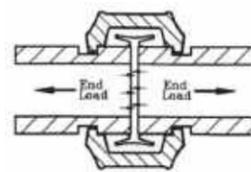
4. With the removal of just a few bolts you can easily access the system for cleaning, maintenance, changes or system expansion.



5. Couplings are non-directional and pipe can be rotated 360° during installation.



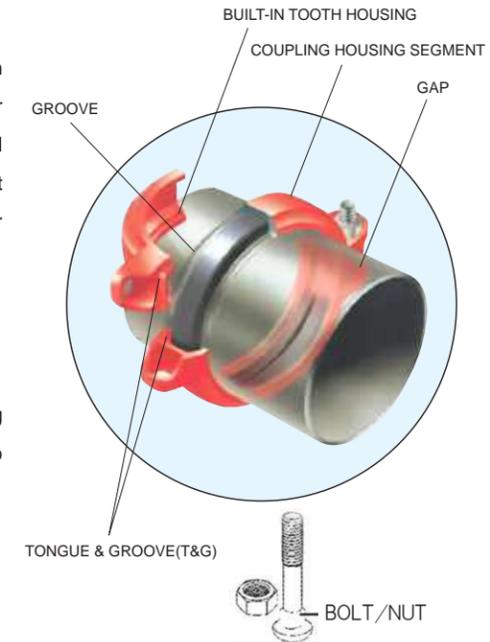
6. Coupling keys engage the full circumference of the grooves and provide significant pressure and end load restraint against pipe movement from internal and external forces.



## Rigid Coupling

1. The T&G mechanism in combination with a slightly shortened key diameter provides a mechanical and frictional interlock resulting in a rigid joint which reduces undesired angular movement.

2. The built-in teeth on the coupling grip the groove shoulder and serve to reduce linear movement.

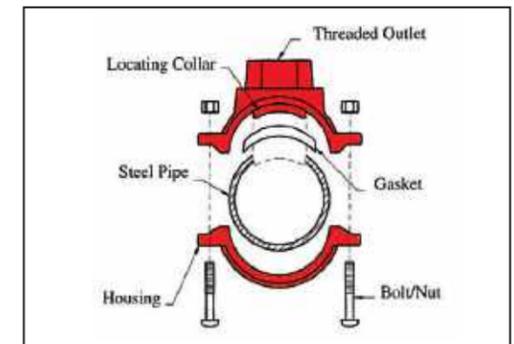


3. The T&G mechanism features a slight offset at the foot of the coupling halves which serve to protect the gasket from exposure.

4. With the T&G style coupling no metal-to-metal contact of the bolt pads is required. You will normally see a 1/16" - 1/8" (1.6mm to 3.2mm) gap between the bolt pads when installed.

## Mechanical Tee Connection

The Mechanical Tee (3J, 3G, 3L) provide for a fast and easy grooved or threaded branch outlet and eliminate the need for welding or the use of a reducing tee and couplings. Simply cut a hole to the specified size at the expected location and fasten the mechanical tee to the pipe with the nuts and bolts provided. As the housing bolts are tightened, the pressure responsive gasket forms a leak-tight seal.

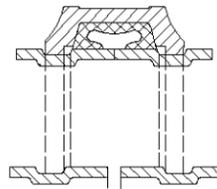


## Movement

Each flexible design coupling can provide for pipe system movement up to the design maximum for the specific size and type coupling being utilized. Movement is possible in the coupling due to two factors: (1) designed-in clearance between the key of the coupling and the groove diameter and groove width, and (2) the gap between pipe ends joined by the coupling.

### 1.Linear Movement

Linear movement is accommodated within the coupling by allowing the pipe ends to move together or apart in response to pressure thrusts and temperature changes. The available linear movement provided by couplings is shown below:

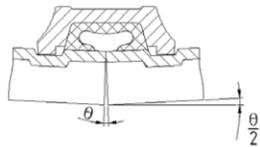


size	1-1¼ (25-32MM)	1½-12 (40-300MM)
movement	0-4.0MM	0-6.4MM

### 2.Angular Movement

Designed-in clearances allow limited deflection of the pipe joint within the coupling, without introducing eccentric loads into the coupling joint.

The maximum available angular movement of coupling joints is shown in the performance data for each coupling type. The amount of angular flexibility varies for each coupling size and type. For design purposes the published figures should be reduced by the below listed factors to account for pipe, groove and coupling tolerances.



size	1-3(IN)	4-12(IN)
Design factor	Reduce to 50%	Reduce to 75%

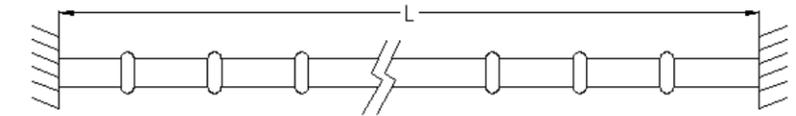
## Flexible Couplings: Linear Movement and Angular Movement

Size		Cut			Roll Groove		
		Linear Movement	Angular Movement		Linear Movement	Angular Movement	
Inch	mm	mm	Degree	mm	mm	Degree	mm
1	33.7	2	2°-45'	48	1	1°-22'	24
1 1/4	42.4	2	2°-10'	38	1	1°-05'	19
1 1/2	48.3	3.2	1°-54'	33	1.6	0°-57'	16.5
2	60.3	3.2	1°-31'	26	1.6	0°-45'	13
2 1/2	73	3.2	1°-27'	25	1.6	0°-43'	12.5
2 1/2	76.1	3.2	1°-12'	21	1.6	0°-36'	10.5
3	88.9	3.2	1°-02'	18	1.6	0°-31'	9
4	108	3.2	1°-51'	32	1.6	0°-55'	16
4	114.3	3.2	1°-36'	28	1.6	0°-48'	14
5	133	3.2	1°-41'	30	1.6	0°-50'	15
5	139.7	3.2	1°-19'	23	1.6	0°-37'	11.5
5	141.3	3.2	1°-03'	18	1.6	0°-30'	9
6	159	3.2	1°-18'	23	1.6	0°-39'	11.5
6	165.1	3.2	1°-05'	20	1.6	0°-35'	10
6	168.3	3.2	1°-05'	19	1.6	0°-32'	9.5
8	219.1	3.2	0°-50'	15	1.6	0°-25'	7.5
10	273	3.2	0°-40'	12	1.6	0°-20'	6
12	323.9	3.2	0°-34'	10	1.6	0°-18'	5

## Movement -Application

### • Thermal stress

Thermal stress is caused by changes in temperature, resulting in either expansion or contraction. When designing a system you must allow for this thermal movement. To determine the appropriate number of flexible couplings to allow for this thermal movement please refer to the following.



Example:

- 4" straight steel pipe, 30m long
- Anchored on both ends
- Minimum temperature (during installation) = 5°C
- Maximum working temperature = 55°C

From the thermal expansion table, we know the overall pipeline length will increase by 18mm (0.71"). You can also use Formula 1 or Table 3 to find the amount of thermal expansion. We want to know the number of couplings that are required to address this thermal movement problem.

The allowed movement of a 4" flexible coupling is :

Movement range x Adjustment = Allowed movement

$$4.3\text{mm} \times 75\% = 3.2\text{mm}$$

The appropriate number of coupling is:

Thermal expansion / Allowed movement = Number of couplings

$$18\text{mm} / 3.2\text{mm} = 5.6$$

Conclusion:

The appropriate number of coupling is 6.

### • Thermal Expansion

Temperature difference (°C)	Pipe length (m)					
	1	5	10	20	30	40
1	0.012	0.06	0.12	0.24	0.36	0.48
5	0.06	0.3	0.6	1.2	1.8	2.4
10	0.12	0.6	1.2	2.4	3.6	4.8
20	0.24	1.2	2.4	4.8	7.2	9.6
30	0.36	1.8	3.6	7.2	11	15
40	0.48	2.4	4.8	9.6	14	20
50	0.6	3	6	12	18	24
60	0.72	3.6	7.2	14	22	29
70	0.84	4.2	8.4	17	25	34
80	0.96	4.8	9.6	19	29	39

#### Thermal Expansion Formula 1

$$\lambda = \alpha \times L \times T$$

$\lambda$  : Thermal Expansion

$\alpha$  : Linear Expansion

coefficient for steel

L : Pipe length

T : Temperature difference

## Riser Design

Risers assembled with Flexible couplings are generally installed in either of two ways. In the most common method, the pipe ends are butted together within the coupling joint. Note that when installing risers, the gasket is first placed onto the lower pipe and rolled back away from the pipe end prior to positioning the upper pipe. Anchoring of the riser may be done prior to pressurization with the pipe ends butted or while pressurized, when, due to pressure thrust, the pipe ends will be fully separated.

An alternative method of riser installation is to place a metal spacer of a predetermined thickness, between the pipe ends when an additional length of pipe is added to the riser stack. The upper pipe length is anchored, the spacer removed and the coupling is then installed. This method creates a predetermined gap at each pipe joint which can be utilized in pipe systems where thermal movement is anticipated and in systems with rigid (threaded, welded, flanged) branch connections where shear forces due to pressure thrust could damage the rigid connections.

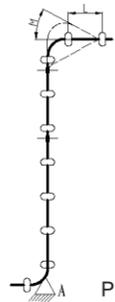
The following examples illustrate methods of installing commonly encountered riser designs.

### • Risers without Branch Connections

Install the riser with the pipe ends butted.

Locate an anchor at the base of the riser (A) to support the total weight of the pipe, couplings and fluid. Provide pipe guides on every other pipe length, as a minimum, to prevent possible deflection of the pipe line at the coupling joints as the riser expands due to pressure thrust or thermal growth. Note that no intermediate anchors are required.

When the system is pressurized the pipe stack will "grow" due to pressure thrust which causes maximum separation of pipe ends within the couplings. The maximum amount of stack growth can be predetermined (see Linear Movement). In this example the pipe length "L" at the top of the riser must be long enough to permit sufficient deflection (see Angular Movement) to accommodate the total movement "M" from both pressure thrust and thermal gradients.

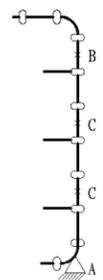


Picture 1

### • Risers with Branch Connections

Install the riser with the predetermined gap method. Anchor the pipe at or near the base with a pressure thrust anchor "A" capable of supporting the full pressure thrust, weight of pipe and the fluid column. Anchor at "B" with an anchor capable of withstanding full pressure thrust at the top of the riser plus weight of pipe column. Place intermediate anchors "C" as shown, between anchors "A" and "B". Also place intermediate clamps at every other pipe length as a minimum.

When this system is pressurized, the pipe movement due to pressure thrust will be strained and there will be no shear forces acting at the branch connections.



Picture 2

### • Misalignment & Deflections

The angular movement capability of the flexible coupling permits the assembly of pipe joints where the piping is not properly aligned. At least two couplings are required to provide for lateral pipe misalignment. Deflection (longitudinal misalignment) may be accommodated within a single coupling as long as the angle of deflection does not exceed the value shown in the coupling performance data for the particular size and coupling type.

A pipe joint that utilizes the angular deflection capability of the coupling will react to pressure and thermal forces dependent upon the manner in which it is restrained. An unrestrained joint will react to these forces by straightening, thus reducing, if not eliminating, the deflection at the joint. If joint deflection has been designed into the pipe layout and must be maintained, then sufficient anchors must be provided to resist the lateral forces and hold the joint in the deflected condition.

The amount of deflection from pipe run centerline can be calculated utilizing the following equations:

$$M = L \sin \theta$$

$$\theta = \sin^{-1} (G \div D)$$

$$M = (G \div D) \times L$$

Where:

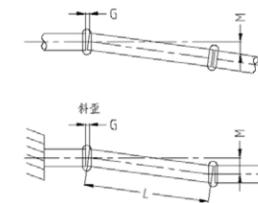
M = Misalignment (inches)

G = Maximum Allowable Pipe End Movement (Inches) as shown under "Performance Data" (Value to be reduced by Design Factor)

$\theta$  = Maximum Deflection (Degrees) from centerline as shown under "Performance Data" (Value to be reduced by Design Factor)

D = Pipe Outside Diameter (Inches)

L = Pipe Length (Inches)



### • Curve Layout

Utilizing the angular deflection at each coupling joint curves may be laid out using straight pipe lengths and Couplings.

This example shows how to calculate the curve radius, required pipe lengths, and number of required couplings.

$$R = L / (2 \times \sin(\theta/2))$$

$$L = 2 \times R \times \sin(\theta/2)$$

$$N = T / \theta$$

WHERE:

N = Number of Couplings

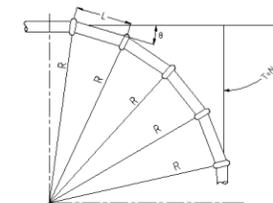
R = Radius of Curve (feet)

L = Pipe Length (feet)

$\theta$  = Deflection from centerline (Degrees) of each Coupling

(See coupling performance data, value to be reduced by Design Factor)

T = Total Angular Deflection of all Couplings.



## Anchoring and Supports

When designing the hangers, supports and anchors for a grooved end pipe system, the piping designer must consider certain unique characteristics of the grooved type coupling in addition to many universal pipe hanger and support design factors. As with any pipe system, the hanger or support system must provide for

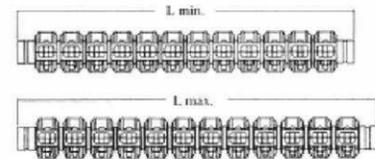
- 1) the weight of the pipe, couplings, fluid and pipe system components;
- 2) reduce stresses at pipe joints; and
- 3) permit required pipe system movement to relieve stress.

The following chart shows the maximum span between pipe hangers, supports and anchors.

### Max. Span between Supports (steel pipe)

Nominal Size (mm)		15	20	25	32	40	50	70	80	100	125	150	200	250	300
Max. Span Between Supports (mm)	Insulating Pipe	2	2.5	2.5	2.5	3	3	4	4	4.5	6	7	7	8	8.5
	Non-insulating Pipe	2.5	3	3.5	4	4.5	5	6	6	6.5	7	8	9.5	11	12

## Movement capability of couplings-expansion and contraction joints



Nominal Size	Pipe O.D. (mm)	Maximum Allowable Movement (mm)	L. min. (mm)	L. max. (mm)	Number of Couplings	Filled With Water Pressure
1	33.7	45	617	662	10	300
1¼	42.4	45	617	662	10	300
1½	48.3	45	617	662	10	300
2	60.3	45	617	662	10	300
2½	73.0	45	617	662	10	300
76.1	76.1	45	617	662	10	300
3	88.9	45	617	662	10	300
4	114.3	47	503	550	7	300
139.7	139.7	47	503	550	7	300
5	141.3	47	503	550	7	300
165.1	165.1	52	503	550	7	300
6	168.3	52	591	643	7	300
8	219.1	52	591	643	7	300
10	273.0	52	591	643	7	300
12	323.9	52	591	643	7	300

## Engineering Test

No.	Item	Standard Requirements
1	Vacuum Test	Grooved couplings, grooved reducing couplings, grooved split flanges, mechanical tees, and plain end couplings shall be able to withstand the effects of vacuum conditions encountered when sprinkler systems are drained. Samples of each nominal size and style of gasketed coupling and fitting shall be subjected to an internal vacuum of 25 in-Hg (85 kPa) for a duration of 5 minutes. Following the vacuum test, the test assembly shall be pneumatically pressurized from zero to 50 psi (345 kPa) while submerged in a water bath. There shall be no leakage or permanent deformation as a result of this test.
2	Hydrostatic Strength Test	All items shall be able to withstand an internal hydrostatic pressure equal to three-five times the rated working pressure without cracking, rupture, or permanent distortion. The test shall be conducted for a duration of 1 minute. (Test Size ≤6" , Five time; 8" -10" , 4time; ≥12" , 3times)
3	Air Leakage Test	The coupling assembly shall be pressurized with air to 3 bar +0.5/-0 bar. The assembly shall be immersed in water to establish that there is no visible leakage
4	Moment Test	The moment resistance shall be demonstrated while the test assembly is internally pressurized to the rated working pressure. Then a force was applied to the test assembly. There shall be no leakage, cracking, or fitting or coupling pull-off as a result of this test.
5	Hot Gasket Test	Standard gaskets shall be assembled to short lengths of pipe, and subjected to 275° F (135° C) for a duration of 45 days. After exposure, the test assembly shall be submerged in a water bath and subjected to an air under water leakage test from zero to 50 psi (0 to 345 kPa) in order to evaluate for leakage. After the air under water testing is completed, the test assembly shall be disassembled and the gasket shall not crack when squeezed together from any two diametrically opposite points, or twisted into a figure-eight shape. The gasket shall then be visually inspected for signs of cracking, tearing, or excessive degradation as a result of this test.
6	Cold Gasket Test	The low temperature exposure shall consist of -40° F (-40° C) air exposure for 4 days. After exposure, the assembly while submerged in -40° F (-40° C) antifreeze, shall be pneumatically pressurized from 0 to 50 psi (0 - 345 kPa). No leakage shall occur. The assembly shall then be allowed to warm to ambient temperature and then be disassembled. The gasket, after removal from the assembly, shall not crack when squeezed together from any two diametrically opposite points, or twisted into a figure eight shape.
7	Flame test	The test shall be conducted in a room free from air draught. The test joint is mounted, U-bent on the test apparatus and filled with water. The angle corresponds to the angle documented as a result of the test. Subsequently the test joint is drained. The fuel pan is placed centrally below the pipe joint. Fuel is filled into the pan and the fuel is ignited. Burning time 5 min for nominal diameters < DN 100; 8 min for nominal diameters ≥ DN 100. For reducer couplings the dimension of the smaller nominal diameter shall apply for the determination of the burning time. The flame shall be extinguished immediately once the burning time has expired (5 min or 8 min) and the test joint shall be cooled down. For cooling the test joint is immediately sprayed with water until steam formation is no longer visible, but at least for 3 min. The test joint is then filled completely with water and exposed to a test pressure which corresponds to the maximum permissible pressure and is checked visibly for leaks. Water may leak in form of drops, however, not in form of flowing water or a water spray. The test joint is then pressure relieved (force and internal pressure).
8	Cycling Pressure Resistance (Water Hammer Test)	Prior to the cycling, assemblies shall be subjected to a hydrostatic strength test to the rated working pressure, 175 psi (1205 kPa) minimum, for a duration of 5 minutes. Without leakage or cracking. Assemblies shall then be subjected to 20,000 cycles from zero pressure to the rated working pressure, 175 psi (1205 kPa) minimum. After cycling, the test assembly shall be tested Hydrostatic Strength and maintain 5minutes without leakage and cracking.

## Engineering Test

No.	Item	Standard Requirements
9	Friction Loss Determination	The construction and installation of the coupling or fitting shall be such that obstruction to the passage of water through the coupling or fitting body is minimal. The loss in pressure through the coupling or fitting shall not exceed 5.0 psi (35 kPa) at a flow producing a velocity of 20 ft/s (6.1 m/s) in Schedule 40 steel pipe of the same nominal diameter as the coupling or fitting.
10	Leakage Test - Assembly without Gasket	Leakage from a gasket-less coupling assembly or fitting shall not exceed that of an operating sprinkler head whose discharge coefficient (K-factor) is 5.3 to 5.8 gal/min(psi) <sup>1/2</sup> [76 - 84 L/min/(bar) <sup>1/2</sup> ]. This test is for nominal pipe sizes normally associated with over-head piping, less than or equal to 12 in. NPS (300 mm).
11	Torsion test	This test relates to pipe joints ≤ DN 40 only. The test joint is filled with water and exposed once to the maximum permissible pressure and is then pressure relieved again. Subsequently the test joint is fixed on one pipe end and an increasing torque is applied to the other pipe end. At the pressure-less test joint the pipe joint shall be able to transmit a torque of up to 80 Nm from one pipe end to the other pipe end without any torsion of the pipe ends against each other.
12	Flexibility Test for Flexible Fittings	With the assembly pressurized to its rated pressure, a bending moment is to be applied to deflect the joint to the maximum angle specified by the manufacturer, while not less than 1 degree for nominal pipe diameters less than 8 inches (203.2 mm) or 0.5 degrees for 8 inches (203.2 mm) and larger. Observations are to be made for leakage or pipe damage.
13	Seismic Evaluation	In order to evaluate the use of grooved couplings in Earthquake zones 50 through 500 years, test assemblies utilizing flexible couplings and short lengths of steel pipe, in the same nominal size, will be subjected to cyclic testing. The test will deflect the assembly to the manufacturer's maximum recommended angle in the forward and reverse direction for a total 15 cycles with the internal pressure equal to the rated working pressure. There shall be no leakage, cracking, or rupture as a result of this test.
14	Lateral Displacement	The coupling shall not leak during any of the tests, within the manufacturer's stated limitations for angular deflection or lateral displacement of associated pipework.
15	Hydrostatic fluctuation pressure test	The coupling assembly shall be pressurized with water to a gauge pressure of 10 bar ± 1 bar for 2min, +30s/-0s to establish a datum. The assembly shall then be drained before being subjected to the greatest vacuum attainable to a maximum of 600mm a/mercury or -0.8bar +0bar/-0.1 bar for 2min +30s/-0s, and allowed to return to atmospheric pressure in not less than 5s. The assembly shall then be pressurized with water to 10 bar ± 1bar for 2 min +30s/-0s. The assembly shall be examined for leakage throughout the test. The relative movement of each pipe shall be recorded at the greatest vacuum and at each pressure. There shall be no leakage.
16	Fire Test	If a gasketed pipe coupling or fitting employs non-ferrous materials for its substantial structural components, or if in the judgment of FM Approvals, the design is otherwise suspect with respect to fire resistance, a fire test shall be conducted. A representative size assembled joint without a gasket shall be exposed to a 1000 ° F (538 ° C) fire environment for 5 minutes. The assembly shall be dry for the duration of this exposure. Immediately after the exposure, a water flow shall be introduced through the joint and sustained until the assembly is cool to the touch. No cracking or distortion of any component of the coupling or fitting shall occur. The coupling or fitting shall then be disassembled and the gasket installed. After reassembly, the joint shall be hydrostatically tested, as described in to the hydrostatic test.