TYLER UNION®

Quality Waterworks Products

Waterworks Catalog

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NOTICE: 1). Weights published in this catalog are approximate and provided for shipping purpose only. Actual weights may vary as products are manufactured in multiple locations. All products meet the applicable ANSI/AWWA specification.
2). Laying length: In accordance with ANSI/AWWA C110/A21.10, ANSI B16.1, ANSI/AWWA C153/A21.53. Fittings not listed in ANSI/AWWA have dimensions as per Tyler Union design. Standard tolerance applies to laying length dimensions.
3). For projects where fitting weights, specifications, or dimensions are critical, advise upon order placement.

TYLER UNION

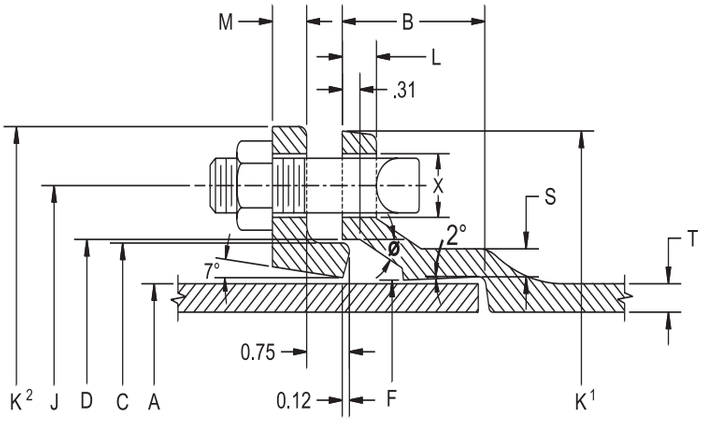
MECHANICAL JOINT C153 DUCTILE IRON COMPACT FITTINGS

Sizes 3"-12" UL & 3"-10" FM Listed
For Fire Main Equipment

SAMPLE SPECIFICATIONS (Current ANSI/AWWA revisions apply)

Mechanical joint watermain fittings with accessories, 2" through *64" shall be manufactured from ductile iron in accordance with and meet all applicable terms and provisions of standards ANSI/AWWA C153/A21.53 and ANSI/AWWA C111/A21.11. Ductile iron mechanical joint fittings 2" through 24" shall be rated for 350 PSI working pressure. Ductile iron 30" through 48" shall be rated for 250 psi working pressure. Flanged ductile iron fittings in 24" (610 mm) and smaller sizes may be rated for 350 psi (2,413 kPa) with the use of special (annular ring or comparable) gaskets. All coated and lined fittings meet requirements of NSF-61, NSF-372, and Annex G.

NOTE - EXCEPTIONS: Mechanical joint fittings with flanged branches are rated for water pressure of 250 PSI.
NOTE - Wyes over 12" are not pressure rated. Contact manufacturer for rating in your application.
NOTE - Fittings are cement lined and seal coated in accordance with ANSI/AWWA C104/A21.4. Fittings are available double cement-lined, bare, or epoxy coated upon request. Epoxy coating per ANSI/AWWA C116
NOTE - Installation per AWWA C600 and AWWA C651, current revision



	NOMINAL JOINT DIMENSIONS IN INCHES												BOLTS	
Size	A Dia.	B	C Dia.	D Dia.	F Dia.	J Dia.	K^1 Dia.	K^2 Dia.	L	M	S	T	X	Size	No.
2	2.51	2.50	3.50	3.60	2.61	4.75	6.19	6.89	.58	.62	.36	.30	¾	⅝x3	2
3	3.96	2.50	4.84	4.94	4.06	6.19	7.62	7.69	.58	.62	.39	.33	¾	⅝x3	4
4	4.80	2.50	5.92	6.02	4.90	7.50	9.06	9.12	.60	.75	.39	.34	⅞	¾x3½	4
6	6.90	2.50	8.02	8.12	7.00	9.50	11.06	11.12	.63	.88	.43	.36	⅞	¾x3½	6
8	9.05	2.50	10.17	10.27	9.15	11.75	13.31	13.37	.66	1.00	.45	.38	⅞	¾x4	6
10	11.10	2.50	12.22	12.34	11.20	14.00	15.62	15.62	.70	1.00	.47	.40	⅞	¾x4	8
12	13.20	2.50	14.32	14.44	13.30	16.25	17.88	17.88	.73	1.00	.49	.42	⅞	¾x4	8
14	15.30	3.50	16.40	16.54	15.44	18.75	20.31	20.25	.79	1.25	.55	.47	⅞	¾x4½	10
16	17.40	3.50	18.50	18.64	17.54	21.00	22.56	22.50	.85	1.31	.58	.50	⅞	¾x4½	12
18	19.50	3.50	20.60	20.74	19.64	23.25	24.83	24.75	1.00	1.38	.68	.54	⅞	¾x4½	12
20	21.60	3.50	22.70	22.84	21.74	25.50	27.08	27.00	1.02	1.44	.69	.57	⅞	¾x4½	14
24	25.80	3.50	26.90	27.04	25.94	30.00	31.58	31.50	1.02	1.56	.75	.61	⅞	¾x5	16
30	32.00	4.00	33.29	33.46	32.17	36.88	39.12	39.12	1.31	2.00	.82	.66	1⅛	1x6	20
36	38.30	4.00	39.59	39.76	38.47	43.75	46.00	46.00	1.45	2.00	1.00	.74	1⅛	1x6	24
42	44.50	4.00	45.79	45.96	44.67	50.62	53.12	53.12	1.45	2.00	1.35	.82	1⅜	1¼x6½	28
48	50.80	4.00	52.09	52.26	50.97	57.50	60.00	60.00	1.45	2.00	1.35	.90	1⅜	1¼x6½	32

NOTE: 2 Inch MJ ASTM A536 ductile iron Compact fittings (2"-22.5 bend, 2"-45 bend, 2"-90 bend, 2"x12" solid sleeve, 2"x2" tee, 4"x2" tee, and 4"x2" reducer) are available. Contact Tyler Union for availability or additional product dimensions.

***NOTE:** Contact Tyler Union for 54"-64" product information.

***NOTE: For projects where product weights, specifications, or dimensions are critical, advise upon order placement.**

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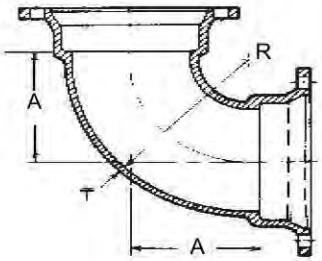
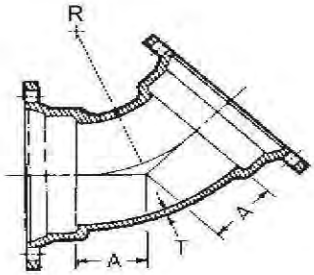
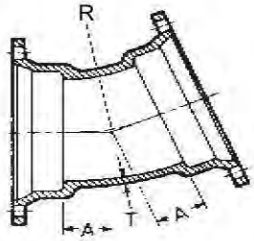
MECHANICAL JOINT C153 DUCTILE IRON COMPACT FITTINGS

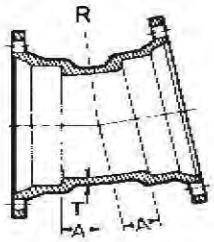
Sizes 3"-12" UL & 3"-10" FM Listed
For Fire Main Equipment

BENDS







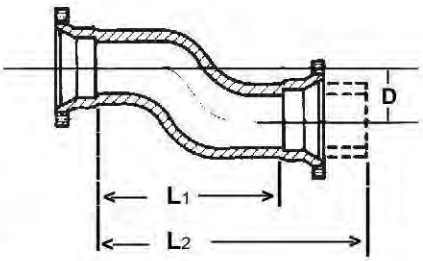


	90° Bends (1/4)				45° Bends (1/8)			22½° Bends (1/16)			11¼° Bends (1/32)		
	Dimensions				Dimensions			Dimensions			Dimensions		
Size	T	A	R	Weight	A	R	Weight	A	R	Weight	A	R	Weight
3	.34	3.5	2.5	19	2.00	2.41	17	1.50	2.51	15	1.25	2.53	16
4	.35	4.0	3.0	22	2.50	3.56	20	1.75	3.81	18	1.50	5.12	18
6	.37	6.5	6.0	49	3.50	7.25	39	2.25	6.35	31	1.50	5.12	29
8	.39	7.5	7.0	64	4.00	8.44	56	2.85	11.80	50	2.06	15.80	45
10	.41	9.5	9.0	102	5.01	10.88	78	3.35	14.35	66	2.32	18.36	59
12	.43	10.5	10.0	129	5.98	13.25	102	3.86	16.90	87	2.56	20.90	82
14	.51	12.0	11.5	214	5.50	12.06	155	3.93	17.25	142	2.59	21.25	136
16	.52	13.0	12.5	273	5.98	13.25	204	3.98	17.50	178	2.62	21.50	157
18	.59	15.5	14.0	411	6.50	12.36	292	7.50	30.19	286	3.00	60.84	283
20	.60	17.0	15.5	519	7.00	13.59	372	8.50	35.19	376	3.50	71.07	374
24	.62	17.0	15.5	721	7.50	14.89	490	9.00	37.69	512	3.50	76.12	487
30	.66	21.50	19.0	930	10.50	9.31	716	6.75	21.36	665	4.75	22.84	600
36	.74	24.50	22.0	1450	11.50	21.73	1110	7.75	26.39	960	5.00	25.38	820
42	.82	29.25	26.7	2205	14.00	27.76	1610	9.00	32.68	1350	6.00	35.54	1180
48	.90	33.25	30.75	2990	15.00	30.17	2090	10.00	27.70	1760	6.50	40.61	1475

**Note: 2 inch compact ductile iron fittings are available, contact Tyler Union for information

*OFFSETS (MJ x MJ) or (MJ x PE)

	Dimensions			Weights	
Size	D	L1	L2	MJxMJ	MJxPE
3	6	9	14.5	23	29
3	12	15	20.5	34	39
3	18	21	26.5	40	48
3	24	27	32.5	47	53
4	6	10	15.5	32	44
4	12	16	21.5	42	54
4	18	22	27.5	56	65
4	24	28	33.5	65	72
6	6	12	17.5	55	54
6	12	18	23.5	72	68
6	18	24	29.5	88	96
6	24	30	35.5	111	117
8	6	13	18.5	79	78
8	12	19	24.5	103	110
8	18	25	30.5	128	124
10	6	15	20.5	112	130
10	12	21	26.5	148	172
10	18	27	32.5	176	189
12	6	17	22.5	157	.....
12	12	23	28.5	174	198
12	18	29	34.5	210	270



	Dimensions			Weight	
Size	D	L1	L2	MJxMJ	MJxPE
12	24	35	40.5	298	334
12	30	41	46.5	283	205

BENDS

5-5/8 Bends (1/64) MJ x MJ

	Dimensions		
Size	*A	R	Weight
3	1.25	5.08	16
4	1.50	7.61	18
6	1.50	10.15	29
8	1.75	12.69	45
10	2.00	15.23	59
12	2.30	17.77	82
14	2.50	20.31	136
16	2.50	20.31	157
18	3.00	25.38	283
20	3.00	25.38	374
24	3.00	25.38	487
30	3.75	32.97	600
36	4.00	34.55	820
42	5.00	42.71	1180
48	5.50	47.35	1475

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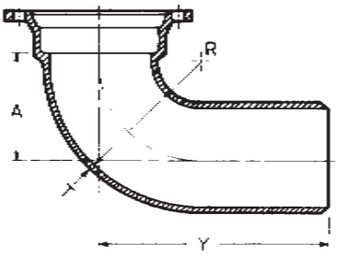
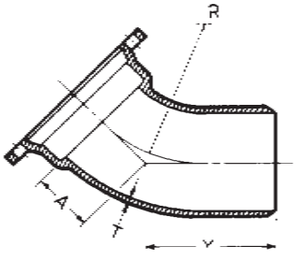


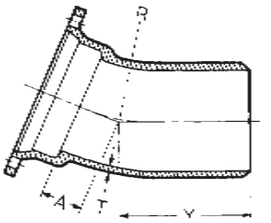
90° Bend MJ x PE (1/4)

Size	T	Dimensions A	Y	R	Weight
3	.34	3.5	9.0	2.5	18
4	.35	4.0	9.5	3.0	26
6	.37	6.0	11.5	5.0	45
8	.39	7.5	13.0	7.0	64
10	.41	9.5	15.0	9.0	108
12	.43	9.0	14.4	6.0	114
14	.51	12.0	20.0	11.5	219
16	.52	13.0	21.0	12.5	254
20	.57	15.0	23.0	13.5	400
24	.62	17.0	25.0	15.5	710
30	.68	21.5	30.5	19.0	865



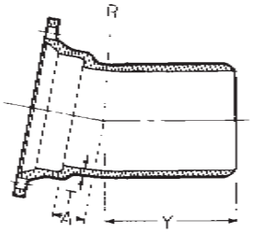
45° Bend MJ x PE (1/8)

Size	A	Dimensions Y	R	Weight
3	2.0	7.5	2.41	17
4	2.5	8.0	3.56	22
6	3.2	8.7	5.49	38
8	4.0	9.5	8.44	55
10	5.0	10.5	10.88	78
12	6.0	11.5	13.25	104
14	5.5	13.4	10.85	165
16	6.0	14.0	13.25	206
20	7.0	15.3	13.97	290
24	7.5	16.6	14.69	460
30	10.5	19.5	19.31	715



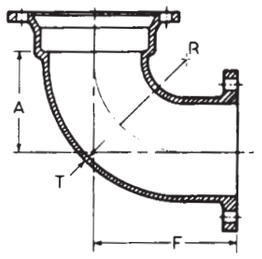
22½° Bend MJ x PE (1/16)

Size	A	Dimensions Y	R	Weight
3	1.50	7.00	2.51	19
4	1.75	7.25	3.81	20
6	2.25	7.75	6.35	33
8	2.84	8.34	11.80	51
10	3.35	8.85	14.35	66
12	3.50	9.00	12.70	89
14	3.93	11.93	17.25	152
16	3.98	11.98	17.50	181
20	7.00	14.00	35.19	290
24	9.00	17.66	37.69	455
30	6.75	15.75	21.36	600



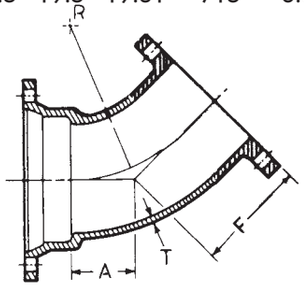
11¼° Bend MJ x PE (1/32)

Size	A	Dimensions Y	R	Weight
3	1.25	6.75	7.62	15
4	1.50	7.00	5.12	20
6	1.50	7.00	5.12	32
8	2.05	7.55	15.80	44
10	2.31	7.81	18.36	60
12	2.56	8.06	20.90	79
14	2.59	10.59	21.25	137
16	2.62	10.62	21.50	161
20	7.00	14.00	21.07	290
24	9.00	26.12	12.00	475
30	4.75	13.75	22.84	535



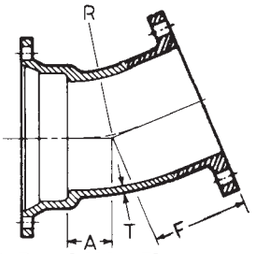
90° Bend MJ x Flange
(1/4)

Size	T	Dimensions A	R	F	Weight
3	.34	3.5	2.5	5.5	21
4	.35	4.0	3.0	6.5	28
6	.37	6.0	5.0	8.0	45
8	.39	7.5	7.0	9.0	73
10	.41	9.5	9.0	11.0	113
12	.43	10.5	10.0	12.0	141
14	.51	12.0	11.5	14.0	217
16	.52	13.0	12.5	15.0	280



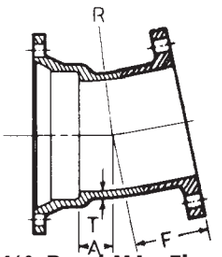
45° Bend MJ x Flange
(1/8)

Size	A	Dimensions R	F	Weight
3	...	...	..	..
4	2.50	3.56	4.0	34
6	3.25	5.49	5.0	57
8	4.25	7.93	5.5	83
10	5.00	9.76	6.5	122
12	6.00	12.19	7.5	159
14	5.50	10.85	8.5	207
16	6.00	12.02	9.5	290



22½° Bend MJ x Flange
(1/16)

Size	A	Dimensions R	F	Weight
3	...	...	..	..
4	1.75	3.81	4.0	34
6	2.25	5.35	5.0	57
8	2.50	7.62	5.5	83
10	3.00	10.16	6.5	122
12	3.50	12.70	7.5	159



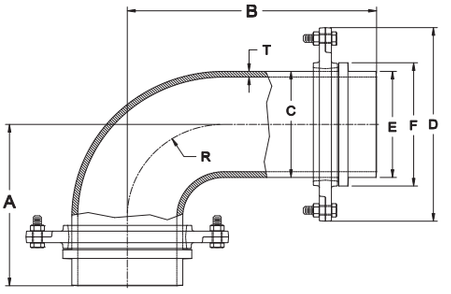
11¼° Bend MJ x Flange
(1/32)

Size	A	Dimensions R	F	Weight
3	...	...	..	..
4	1.50	5.12	4.0	19
6	1.50	5.12	5.0	30
8	1.75	7.70	5.5	50
10	2.00	10.25	6.5	75
12	2.25	12.82	7.5	88

90° Swivel x Swivel Hydrant Ell

Size	T	*A	*B	C	D	E	F	*R	**Weight
					Dimensions				
6	.37	10.5	15.5	6.90	11.2	6.81	7.98	6.0	74

** Weight includes two swivel glands.



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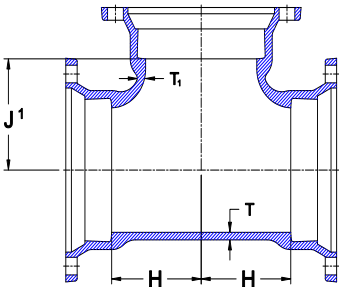
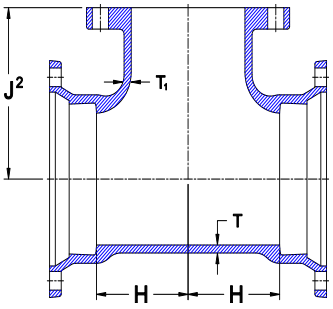
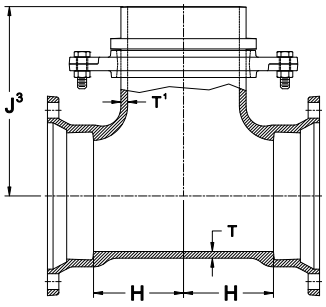
TEES







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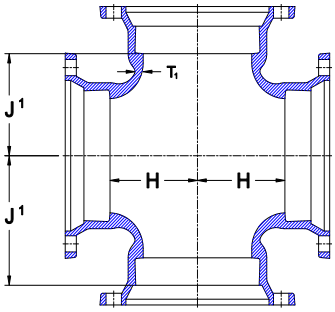
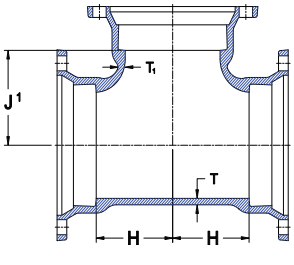


	MJ Tee		MJ x FE Tee			MJ x Swivel Tee				Cross
			Dimensions					Weights		
Size	T	T[1]	*H	*J[1]	*J[2]	*J[3]	MJ	MJxFE	†MJxS	Cross
3	.34	.34	3.5	3.50	5.5	...	26	29	...	31
4x3	.35	.34	3.5	4.00	6.5	...	35	34	...	39
4	.35	.35	4.0	4.00	6.5	...	36	39	...	45
6x3	.37	.34	4.0	4.00	6.5	...	51	54	...	...
6x4	.37	.35	4.0	5.00	8.0	...	52	57	...	62
6	.37	.37	5.0	5.00	8.0	10.50	66	68	77	79
8x3	.39	.34	4.0	6.50	9.0	...	56	...	...	...
8x4	.39	.35	4.5	6.50	9.0	...	72	82	...	84
8x6	.39	.37	5.5	6.50	9.0	11.50	79	81	105	98
8	.39	.39	6.5	6.50	9.0	11.50	90	101	116	112
10x3	.41	.34	4.0	7.50	11.0	...	80	...	...	...
10x4	.41	.35	4.5	7.50	11.0	...	82	92	...	98
10x6	.41	.37	5.5	7.50	11.0	13.00	99	116	114	121
10x8	.41	.39	6.5	7.50	11.0	13.00	116	128	138	135
10	.41	.41	7.5	7.50	11.0	...	132	144	...	156
12x3	.43	.34	4.0	8.75	12.0	...	99	...	...	...
12x4	.43	.35	4.5	8.75	12.0	...	108	118	...	119
12x6	.43	.37	5.5	8.75	12.0	14.25	119	133	132	138
12x8	.43	.39	6.5	8.75	12.0	14.25	126	146	149	149
12x10	.43	.41	7.5	8.75	12.0	...	159	174	...	187
12	.43	.43	8.75	8.75	12.0	...	171	198	...	202
14x6	.51	.44	6.5	10.50	14.0	16.00	183	205	211	210
14x8	.51	.45	7.5	10.50	14.0	...	211	...	...	231
14x10	.51	.46	8.5	10.50	14.0	...	229	244	...	255
14x12	.51	.47	9.5	10.50	14.0	...	245	284	...	269
14	.51	.51	10.5	10.50	14.0	...	281	291	...	299
16x6	.52	.45	6.5	11.50	15.0	17.00	222	230	243	250
16x8	.52	.46	7.5	11.50	15.0	...	245	248	...	264
16x10	.52	.47	8.5	11.50	15.0	...	265	287	...	286
16x12	.52	.48	9.5	11.50	15.0	...	277	312	...	312
16x14	.52	.51	10.5	11.50	15.0	...	317	348	...	...
16	.52	.52	11.5	11.50	15.0	...	337	324	...	451
18x6	.59	.44	6.5	14.50	15.5	18.00	275	261	279	...
18x8	.59	.45	7.5	14.50	14.5	...	280	351	...	...
18x10	.59	.47	8.5	12.50	...	...	286	...	...	...
18x12	.59	.49	9.5	12.50	...	...	372	...	...	...
18x14	.59	.56	10.5	12.50	...	...	415	...	...	...
18x16	.59	.57	11.5	12.50	...	...	445	...	...	...
18x18	.59	.59	13.0	12.50	...	...	490	...	...	...

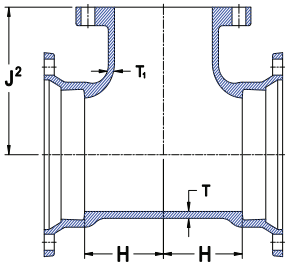
NOTE: Contact TU Inside Sales representative for MJ Crosses larger than 16 inch. †MJxSwl Weights include swivel gland.

**NOTE: 2"x2" and 4"x2" Compact C153 tees area available, contact Tyler Union for information.

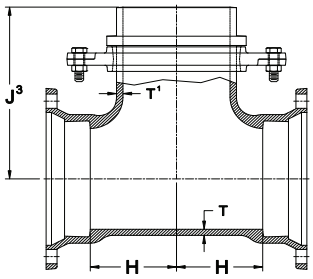
TEES (Continued)



MJ Tee



MJ x FE Tee



MJ x Swivel Tee

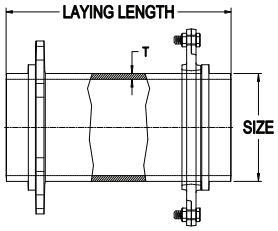
Size	T	T1	Dimensions *H	*J1	*J2	*J3	Weights MJ	MJxFE	†MJxS
20x6	.60	.44	6.50	14.00	17.0	19.5	335	362	358
20x8	.60	.45	8.00	14.00	...	...	390	...	...
20x10	.60	.47	9.00	14.00	...	...	417	...	...
20x12	.60	.49	10.00	14.00	...	...	460	...	...
20x14	.60	.56	11.00	14.00	...	...	475	...	...
20x16	.60	.57	12.00	14.00	...	...	530	...	...
20x18	.60	.59	13.00	14.00	...	...	560	...	...
20x20	.60	.60	14.00	14.00	...	...	605	...	...
24x6	.62	.44	7.00	16.00	19.0	21.5	465	451	457
24x8	.62	.45	8.00	16.00	...	...	475	...	...
24x10	.62	.47	9.00	16.00	...	...	516	...	...
24x12	.62	.49	10.00	16.00	...	...	549	580	...
24x14	.62	.56	11.00	16.00	...	...	585	...	...
24x16	.62	.57	12.00	16.00	...	...	625	744	...
24x18	.62	.59	13.00	16.00	...	...	675	...	...
24x20	.62	.60	14.00	16.00	...	...	740	...	...
24x24	.62	.62	16.00	16.00	...	...	844	...	...
30x6	.66	.36	8.00	20.00	...	...	700	...	...
30x8	.66	.38	8.50	20.00	...	...	739	...	...
30x12	.66	.42	10.00	20.00	...	...	739	...	...
30x16	.66	.50	12.50	20.00	...	...	959	...	...
30x18	.66	.52	13.00	20.00	...	...	975	...	...
30x20	.66	.57	15.00	20.00	...	...	995	...	...
30x24	.66	.61	16.00	20.00	...	...	1160	...	...
30x30	.66	.66	20.00	20.00	...	...	1323	...	...
36x12	.74	.50	10.00	23.50	...	...	1103	...	...
36x16	.74	.50	12.50	23.50	...	...	1350	...	...
36x24	.74	.61	16.00	23.50	...	...	1498	...	...
36x30	.74	.66	20.00	23.50	...	...	1555	...	...
36x36	.74	.74	23.50	23.50	...	...	1910	...	...
42x12	.82	.62	10.00	27.50	...	...	1410	...	...
42x24	.82	.62	20.00	27.50	...	...	2295	...	...
42x30	.82	.66	22.00	29.50	...	...	2337	...	...
42x36	.82	.74	30.00	30.00	...	...	3000	...	...
42x42	.82	.82	30.00	30.00	...	...	3169	...	...
48x12	.90	.62	9.00	32.00	...	...	2500	...	...
48x24	.90	.62	23.00	32.00	...	...	2822	...	...
48x36	.90	.82	33.50	33.25	...	...	3982	...	...
48x42	.90	.82	33.50	33.50	...	...	4100	...	...
48x48	.90	.82	33.50	33.50	...	...	4251	...	...

MJ GLANDS

Glands

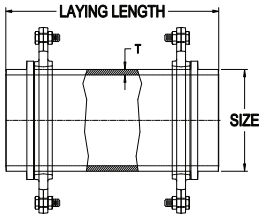
Size	Weight	Size	Weight
3	3	18	22
4	4	20	32
6	5	24	37
8	6	30	85
10	9	36	115
12	10	42	180
14	17	48	275
16	21		

Swivel Glands, page 23
Retainer Glands, page 10



Swivel x Solid Adapter with Swivel Gland

Size by Laying Length	Wall Thickness	Weight
6x13	.37	52
6x18	.37	65
6x24	.37	69
8x12	.39	52



Swivel x Swivel Adapter

Size by Laying Length	Wall Thickness	Weight
6x12	.37	28
6x18	.37	49
6x24	.37	52

†MJxSwivel Tee Weights include swivel gland

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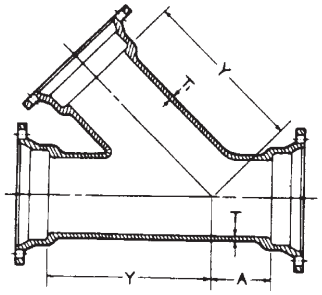
WYES/LATERAL

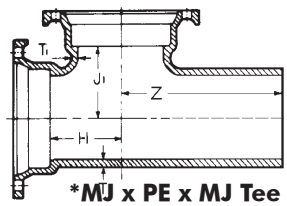


***Wyes**

Size	*A	Dimensions *Y	T	T¹	Weights
3	2.5	7.5	.34	.34	36
4x3	2.0	8.5	.35	.34	39
4	2.5	8.5	.35	.35	45
6x4	1.5	11.0	.37	.35	67
6	3.0	13.0	.37	.37	85
8x4	0.5	13.0	.39	.35	86
8x6	2.0	14.5	.39	.37	109
8	3.5	16.0	.39	.39	117
10x4	0.0	15.0	.41	.35	112
10x6	1.0	16.0	.41	.37	129
10x8	2.5	17.0	.41	.39	162
10	3.5	19.0	.41	.41	199
12x4	0.0	16.5	.43	.35	141
12x6	1.5	18.5	.43	.37	170
12x8	1.5	18.5	.43	.39	177
12x10	3.0	20.0	.43	.41	216
12	4.5	22.5	.43	.43	269
†14	6.0	25.0	.51	.51	476
†16x6	0.0	21.0	.52	.45	300
†16x8	0.5	22.5	.52	.46	349
†16x12	3.5	25.0	.52	.48	471
†16	6.5	28.0	.52	.52	635

*Not in AWWAC153, "A" & "Y" are approximate dim.
† Rated at 250 psi.

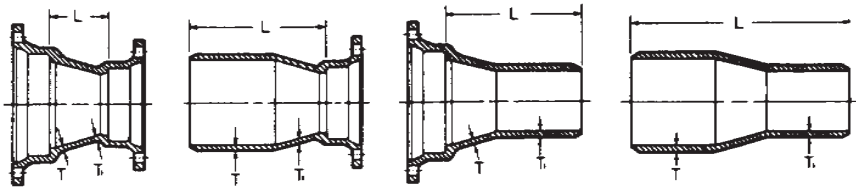
MJ x FE Flange Dimensions are on inside front cover.



***MJ x PE x MJ Tee**

Size	T	T¹	*H	*J¹	*Z	Weights
6	.37	.37	5.0	5.0	11.5	57
8x6	.39	.37	5.5	6.5	11.5	79
8	.39	.39	6.5	6.5	12.5	83
10	.41	.41	7.5	7.5	13.0	133

REDUCERS ("L" dimensions are approximate)



MJ x MJ | **PExMJSEB** | **MJLEBxPE** | **PE x PE**

Size	T	T¹	Dimensions MJ *L	SEB *L	LEB *L	PE *L	Weights MJ	SEB	LEB	PE
4x3	.35	.34	3.0	8.5	8.5	14.0	18	17	17	18
6x3	.37	.34	5.0	10.5	10.5	16.0	28	25	27	20
6x4	.37	.35	4.0	9.5	9.5	15.0	28	26	27	26
8x4	.39	.35	5.0	10.5	10.5	16.0	36	34	36	33
8x6	.39	.37	4.0	9.5	9.5	15.0	39	38	39	30
10x4	.41	.35	7.0	12.5	12.5	18.0	53	46	51	...
10x6	.41	.37	5.0	10.5	10.5	16.0	59	48	52	49
10x8	.41	.39	4.0	9.5	9.5	15.0	54	52	52	47
12x4	.43	.35	9.0	14.5	14.5	20.0	67	61	68	60
12x6	.43	.37	7.0	12.5	12.5	18.0	64	58	66	54
12x8	.43	.39	5.0	10.5	10.5	16.0	57	62	65	60
12x10	.43	.41	4.0	9.5	9.5	15.0	63	61	65	57
14x6	.51	.44	9.0	17.0	14.5	22.5	104	107	112	...
14x8	.51	.45	7.0	15.0	12.5	20.5	104	107	108	...
14x10	.51	.46	5.0	13.0	10.5	18.5	100	102	100	...
14x12	.51	.47	4.0	12.0	9.5	17.5	100	101	100	100
16x6	.52	.45	11.0	19.0	16.5	24.5	132	131	141	128
16x8	.52	.46	9.0	17.0	14.5	22.5	136	128	136	136
16x10	.52	.47	7.0	15.0	12.5	20.5	128	124	128	123
16x12	.52	.48	5.0	13.0	10.5	18.5	120	123	119	113
16x14	.52	.51	4.0	12.0	12.0	20.0	140	139	138	133
18x8	.59	.45	14.0	22.0	19.5	27.5	201	180	195	...
18x10	.59	.47	12.0	20.0	17.5	25.5	196	180	185	...
18x12	.59	.49	10.0	18.0	15.5	23.5	175	170	190	...
18x14	.59	.56	8.0	16.0	16.0	24.0	180	181	200	...
18x16	.59	.57	7.0	15.0	15.0	23.0	194	180	190	...
20x10	.60	.47	14.0	22.0	19.4	27.5	225	210	210	...
20x12	.60	.49	12.0	20.0	17.5	25.5	214	208	210	...
20x14	.60	.56	10.0	18.0	17.8	26.0	208	198	205	...
20x16	.60	.57	8.0	16.0	15.8	24.0	225	215	222	...
20x18	.60	.59	7.0	15.0	15.0	23.0	233	220	...	...
24x12	.62	.49	16.0	24.0	21.4	29.5	320	302	300	...
24x14	.62	.56	14.0	22.0	21.8	30.0	314	325	322	...
24x16	.62	.57	12.0	20.0	19.8	28.0	325	319	340	...
24x18	.62	.59	10.0	18.0	18.0	26.0	325	310	...	...
24x20	.62	.60	8.0	16.0	16.0	24.0	315	305	...	...
30x16	.66	.50	30.0	39.0	...	...	475	565	...	...
30x18	.66	.54	28.0	37.0	...	...	495	590	...	...
30x20	.66	.57	24.0	33.0	...	...	525	560	...	...
30x24	.66	.61	10.0	24.5	...	...	478	495	...	...
36x16	.74	.50	30.0	...	...	...	789	890	...	...
36x20	.74	.57	36.0	45.0	...	...	970	874	...	...
36x24	.74	.61	19.0	33.0	...	...	770	746	...	...
36x30	.74	.66	15.5	24.5	...	...	838	725	...	...
42x30	.82	.74	20.0	...	...	...	1067	...	...	...
42x36	.82	.74	15.5	...	...	...	1116	...	...	...
48x30	.90	.66	40.0	...	...	...	1852	...	...	...
48x36	.90	.74	28.0	...	...	...	1632	...	...	...
48x42	.90	.82	15.5	...	...	...	1486	...	...	...

TYLER UNION®

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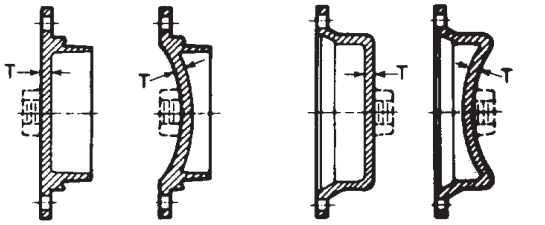
SOLID & TAPPED PLUGS & CAPS



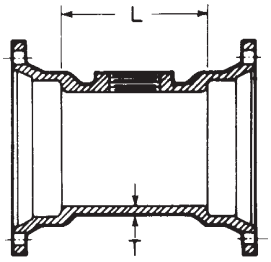
3"-12" 14"-24" 3"-12" 14"-24"

MJ Plug **MJ Cap**

Size	Dimensions T	Max. Tap	Weights Plugs	Caps
3	.46	2	9	8
4	.46	2	9	10
6	.46	2	18	18
8	.46	2	25	26
10	.56	2	36	32
12	.56	2	47	46
14	.62	2	76	85
16	.62	2	98	94
18	.65	2	138	121
20	.66	2	158	149
24	.68	2	223	210
30	.66	2	355	345
36	.74	2	688	626
42	.82	2	1091	723
48	.90	2	1455	974

*TAPPED TEE

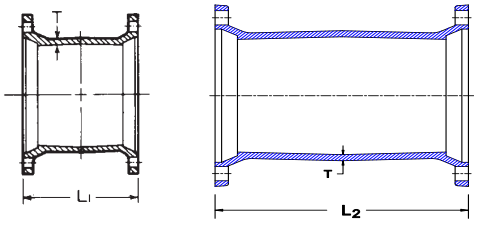
MJ x FE Flange Dimensions are on inside front cover.



MJ Tapped Tee (2" Tap)

Size	Dimensions T	*L	Max. Tap	Weights
3	.34	6	2	19
4	.35	6	2	23
6	.37	6	2	35
8	.39	6	2	54
10	.41	6	2	68
12	.43	6	2	88
16	.52	6	2	164

SOLID SLEEVES

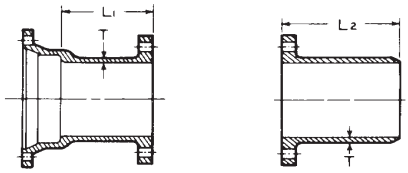


Short **Long**

Size	Dimensions T	L¹	L²	Weights Short	Long
3	.34	7.5	12	13	22
4	.35	7.5	12	19	25
6	.37	7.5	12	28	39
8	.39	7.5	12	38	55
10	.41	7.5	12	48	68
12	.43	7.5	12	62	81
14	.56	9.5	15	116	146
16	.57	9.5	15	138	174
18	.68	9.5	15	160	230
20	.69	9.5	15	212	269
24	.75	9.5	15	272	380
30	.66	15.0	15	500	...
30	.66	...	24	...	640
36	.74	15.0	15	725	662
36	.74	...	24	...	925
42	.82	...	24	...	1146
48	.90	...	24	...	1455

Note: 2"x12" C153 Sleeves available, call for information

ADAPTERS



MJ x FE **FE x PE**

Size	Dimensions T	L¹	L²	Weights MJxFE	FExPE
3	.34	*6	12	18	...
4	.35	*6	12	26	23
6	.37	*6	12	36	35
8	.39	*6	12	50	50
10	.41	*6	12	60	69
12	.43	*6	12	88	88
14	.51	*6	12	127	...
16	.52	*6	12	155	149
18	.56	*6	...	195	...
20	.60	*6	...	275	...
24	.62	*6	...	305	...
30	.66	*7	...	470	...
36	.74	*8	...	750	...

TYLER UNION

MECHANICAL JOINT C153 DUCTILE IRON COMPACT FITTINGS

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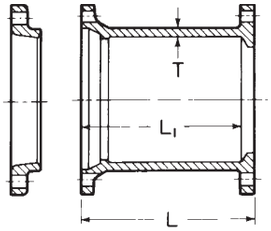
For Fire Main Equipment

DUAL PURPOSE CUTTING-IN SLEEVE



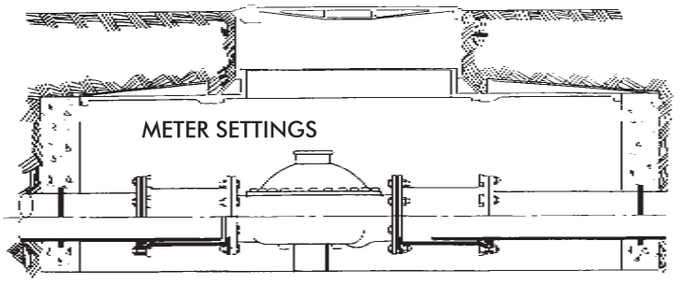
MJ x FE
Cutting-In Sleeve with Dual Purpose Accessories

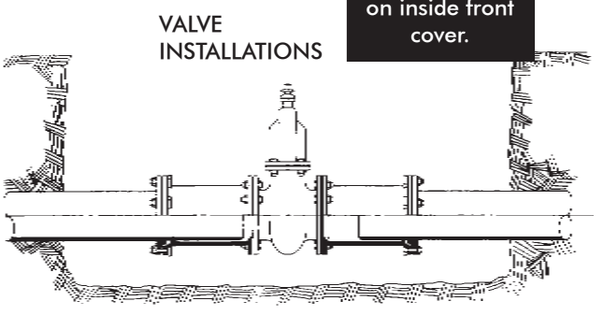
Size	For Pipe Size	Dimensions L	L[1]	T	Shipping Wt. Assembled
4	4.80-5.00 O.D.	10	9.5	.35	33
6	6.90-7.10 O.D.	10	9.5	.37	50
8	9.05-9.30 O.D.	10	9.5	.39	67
10	11.10-11.40 O.D.	10	9.5	.41	122
12	13.20-13.50 O.D.	10	9.5	.43	157

Flanged ends are faced and drilled per ANSI/AWWA C110/A21.10. Mechanical joint ends are designed to receive both standard and oversize gray or ductile iron pipe as shown above.

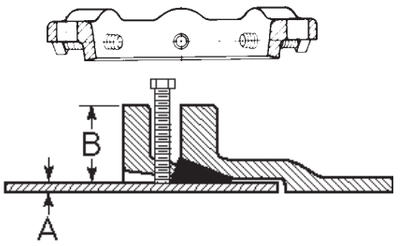
TYPICAL CUTTING-IN SLEEVE INSTALLATIONS

MJ x FE Flange Dimensions are on inside front cover.





*SET-SCREW RETAINER GLAND



See Installations Instructions..... Page 63

Size	Pressure Rating, psi	Gland O.D. B	Pipe O.D. O.D. A	D.I. Pipe Wall Class	No of Set Screws	Size of Set Screws	Gland Weight	Weight w/Acces.
3	350	7.69	3.96	50-56	4	5/8x2	5	7
4	350	9.12	4.80	50-56	4	5/8x2	6	13
6	350	11.12	6.90	50-56	6	5/8x2	11	20
8	250	13.37	9.05	50-56	9	5/8x2	13	25
10	250	15.62	11.10	50-56	12	5/8x2	18	33
12	150	17.88	13.20	50-56	16	5/8x2	23	38
14	250	20.25	15.30	53-56	20	5/8x2 1/2	44	55
16	200	22.50	17.40	53-56	24	5/8x2 1/2	51	64
18	200	24.75	19.50	53-56	24	5/8x2 1/2	62	72
20	200	27.00	21.60	53-56	28	5/8x3	73	91
24	150	31.50	25.80	53-56	32	5/8x3	93	118

* Not included in AWWA C110

Pipe Wall Thickness:
Sizes 3"-12" are recommended for ductile iron pipe class 50 thru 56. Sizes 14" thru 24" are recommended for ductile iron pipe class 53 thru 56.

DUCTILE IRON RETAINER GLANDS

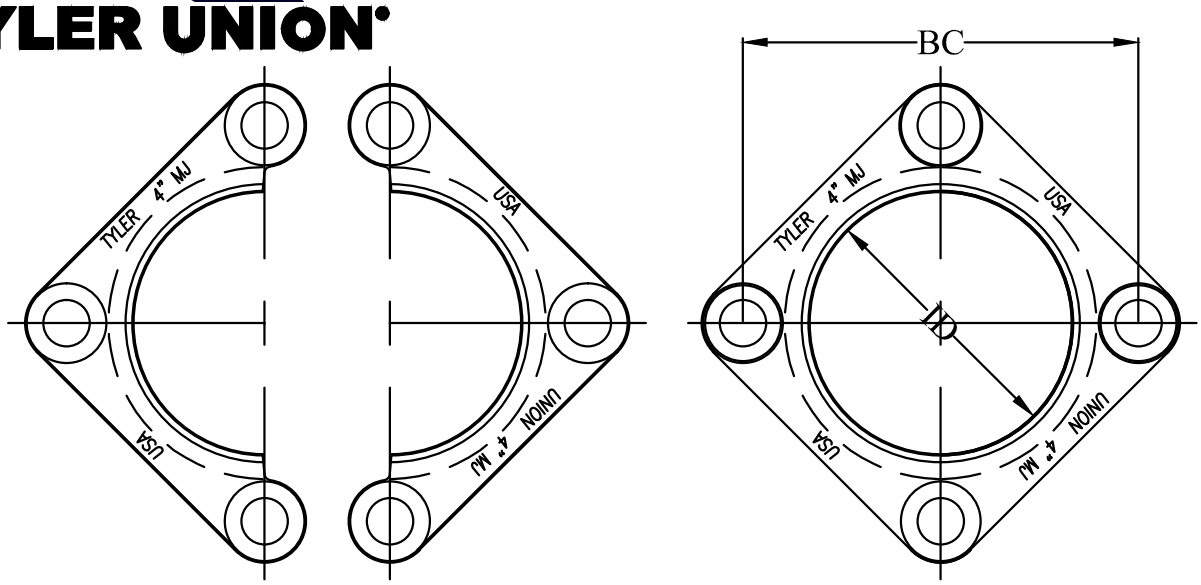
Mechanical Joint Retainer Glands are designed to provide a method for restraining mechanical joint pipe and **fittings and other standardized mechanical joints against possible joint separation, rupture or blow-out caused by internal water pressure.

The set screws are square-headed with Type C knurled cup points, and are shipped already assembled in the Glands. They are manufactured of 4140 grade alloy steel, and are heat treated to a Rockwall "C" 45/53 case hardness. Tee-head bolts and gaskets are not included, but may be ordered separately. Recommended torque for set screws is 75 foot pounds, and set screws on opposite sides of the glands should be tightened alternately.

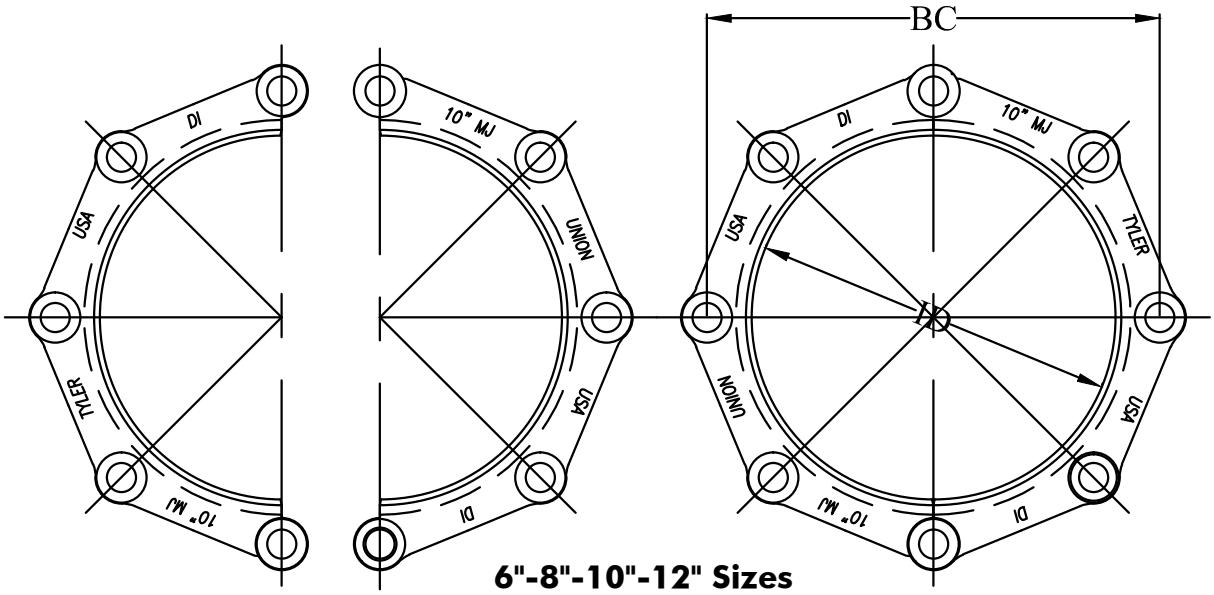
Tee-head bolt hole size and spacing are equal to MJ Glands as shown in AWWA C111. Standard mechanical Joint gaskets as shown in AWWA C111 should be used.

**Note: Not recommended for plain end fittings

TYLER UNION



4" Size



6"-8"-10"-12" Sizes

MJ Compact Split Repair Glands

Size	Inside Diameter (+.07-.03)	Bolt Circle (+-.06)	Weight Lbs.
4	4.90	7.50	4.0
6	7.00	9.50	5.0
8	9.15	11.75	6.0
10	11.20	14.00	7.7
12	12.50	16.25	10.2

Split glands work with standard MJ gaskets and standard T-head bolts. Glands are shipped in halves and do not need separate bolts. T-head bolts alone hold the halves together.

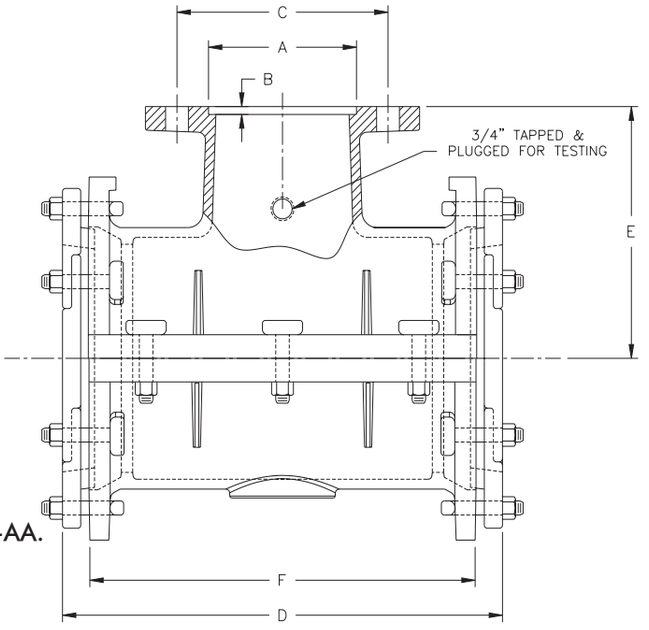
TYLER UNION

COMPACT
DUCTILE IRON MJ TAPPING SLEEVES

SAMPLE SPECIFICATION (Current ANSI/AWWA revisions apply)
Ductile iron mechanical joint tapping sleeves furnished by Tyler Union Waterworks are produced in accordance with manufacturer's standards. Chemical and physical properties of the ductile iron are in accordance with the requirements of ANSI/AWWA C153/A21.53 and ASTM A536. Coatings are NSF-61, NSF-372, Annex G approved and conform with AWWA C104. Flange recess dimensions per MSS SP-60. Tapping sleeve meets requirements of MSS SP-111

General Installation Instructions for Tyler Union Waterworks MJ Tapping Sleeves

1. Clean pipe - insert side gasket into back half of gasket grooves. Make sure ends are flush with or slightly protrude into the end gasket seating area.
2. Bolt sleeve halves together and trim side gaskets as necessary. MAKE SURE SLEEVE WILL ROTATE FREELY ON PIPE.
3. Install end gaskets, locating cut ends 90° from side gasket. If pipe is maximum OD, stretch gasket to make certain cut ends match with no gap in between.
4. Install glands and bolts - rotate sleeve to desired position. Be sure pipe is centered inside the sleeve.
5. Tighten gland bolts alternately, using 80 to 90 foot pounds.
6. After assembly, PRESSURE TEST ALL JOINTS BEFORE TAPPING. If additional tightening is required, release pressure and relax tension on gland bolts before tightening side bolts.



For Cast Iron, Ductile Iron, and PVC C900 Pipe
Mechanical joint tapping sleeves - for 6" through 12" cast iron, ductile iron, or PVC pipe.
Outlet flange per ANSI/AWWA C153/A21.53
Gaskets furnished meet AWWAC111 and ASTM D2000-AA.
Working pressure-250 p.s.i.
Gaskets available in SBR only
Joint deflection is not recommended

Tapping Sleeve for Cast Iron/Ductile Iron

Size	Dimensions A	B	C	D	E	F	O.D. Range DI Min.	O.D. Range DI Max.	Weight DI
6x4	5.016	.250	7.50	15.75	8.00	12.75	6.85	7.15	104
6	7.016	.312	9.50	15.75	8.00	12.75	6.85	7.15	108
8x4	5.016	.250	7.50	16.50	9.00	13.50	9.00	9.35	134
8x6	7.016	.312	9.50	16.50	9.00	13.50	9.00	9.35	140
8	9.016	.312	11.75	16.50	9.00	13.50	9.00	9.35	148
10x4	5.016	.250	7.50	24.00	11.00	20.75	11.04	11.45	236
10x6	7.016	.312	9.50	24.00	11.00	20.75	11.04	11.45	240
10x8	9.016	.312	11.75	24.00	11.00	20.75	11.04	11.45	246
10	11.016	.312	14.25	24.00	11.00	20.75	11.04	11.45	257
12x4	5.016	.250	7.50	26.50	12.00	23.25	13.14	13.56	273
12x6	7.016	.312	9.50	26.50	12.00	23.25	13.14	13.56	286
12x8	9.016	.312	11.75	26.50	12.00	23.25	13.14	13.56	292
12x10	11.016	.312	14.25	26.50	12.00	23.25	13.14	13.56	303
12	13.016	.312	17.00	26.50	12.00	23.25	13.14	13.56	320

TYLER UNION

DUCTILE IRON C110 FULL BODY MECHANICAL JOINT DIMENSIONS

Sizes 3" thru 12" UL Listed for Fire Main Equipment

SAMPLE SPECIFICATION (Current ANSI/AWWA revision apply)

Mechanical joint watermain fittings with accessories, 2" through 48" shall be produced of ductile iron in accordance with and meet all applicable terms and provisions of standards ANSI/AWWA C110/A21.10 and ANSI/AWWA C111/A21.11. Ductile iron mechanical joint fittings 3" through 24" shall be rated for 350 PSI working pressure. All ductile iron mechanical joint fittings 30" through 48" shall be rated for 250 PSI working pressure. Flanged ductile-iron fittings in 24-in. (610mm) and smaller sizes may be rated for 350 psi (2,413 kPa) with the use of special (annular ring or comparable) gaskets.

NOTE - EXCEPTIONS: Mechanical Joint Fittings with flanged branches and 14" and larger caps and plugs are rated for water pressure of 250 PSI.

NOTE - Installation per AWWA C600 and AWWA C651, current revision

NOTE: Fittings are cement lined and seal coated in accordance with ANSI/AWWA C104/A21.4. Fittings are also available double cement lined, bare or epoxy coated. Coated and lined fittings meet requirements of NSF-61, NSF-372, & Annex G..

NOMINAL JOINT DIMENSIONS IN INCHES - MECHANICAL JOINT FITTINGS

DIMENSIONS IN INCHES

Size	A	B	C	D	F	⅓	X	J	K¹	K²	L	M	N	O	P	S
*2	2.50	2.50	3.39	3.50	2.61	28°	¾	4.75	6.25	6.25	.75	.62	1.12	.31	.63	.44
3	3.96	2.50	4.84	4.94	4.06	28°	¾	6.19	7.69	7.69	.94	.62	1.37	.31	.63	.52
4	4.80	2.50	5.92	6.02	4.90	28°	⅞	7.50	9.12	9.12	1.00	.75	1.50	.31	.75	.65
6	6.90	2.50	8.02	8.12	7.00	28°	⅞	9.50	11.12	11.12	1.06	.88	1.63	.31	.75	.70
8	9.05	2.50	10.17	10.27	9.15	28°	⅞	11.75	13.37	13.37	1.12	1.00	1.75	.31	.75	.75
10	11.10	2.50	12.22	12.34	11.20	28°	⅞	14.00	15.69	15.62	1.19	1.00	1.75	.31	.75	.80
12	13.20	2.50	14.32	14.44	13.30	28°	⅞	16.25	17.94	17.88	1.25	1.00	1.75	.31	.75	.85
14	15.30	3.50	16.40	16.54	15.44	28°	⅞	18.75	20.31	20.25	1.31	1.25	2.00	.31	.75	.89
16	17.40	3.50	18.50	18.64	17.54	28°	⅞	21.00	22.56	22.50	1.38	1.31	2.06	.31	.75	.97
18	19.50	3.50	20.60	20.74	19.64	28°	⅞	23.25	24.83	24.75	1.44	1.38	2.13	.31	.75	1.05
20	21.60	3.50	22.70	22.84	21.74	28°	⅞	25.50	27.08	27.00	1.50	1.44	2.19	.31	.75	1.12
24	25.80	3.50	26.90	27.04	25.94	28°	⅞	30.00	31.58	31.50	1.62	1.56	2.31	.31	.75	1.22
30	32.00	4.00	33.29	33.46	32.17	20°	1⅛	36.88	39.12	39.12	1.81	2.00	2.75	.38	1.00	1.50
36	38.30	4.00	39.59	39.76	38.47	20°	1⅛	43.75	46.00	46.00	2.00	2.00	2.75	.38	1.00	1.80
42	44.50	4.00	45.79	45.96	44.67	20°	1⅜	50.62	53.12	53.12	2.00	2.00	2.75	.38	1.00	1.95
48	50.80	4.00	52.09	52.26	50.97	20°	1⅜	57.50	60.00	60.00	2.00	2.00	2.75	.38	1.00	2.20

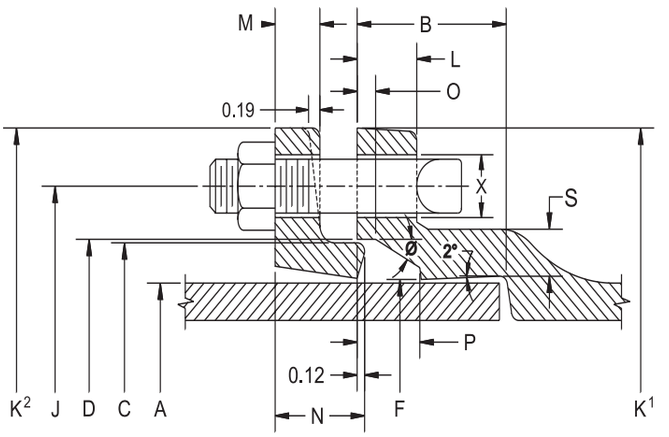
* Not included in AWWA C110.

ACCESSORIES AND WEIGHTS

Size	No.	Bolt Size	Bolt Length	Bolt Torque Ft/Lbs.	Wt. of Gland, Bolts and Gasket, Lbs.	Pipe Barrel O.D.
*2	2	⅝	3	45-60	5	2.50
3	4	⅝	3	45-60	7	3.96
4	4	¾	3½	75-90	10	4.80
6	6	¾	3½	75-90	16	6.90
8	6	¾	4	75-90	25	9.05
10	8	¾	4	75-90	30	11.10
12	8	¾	4	75-90	40	13.20
14	10	¾	4½	75-90	45	15.30
16	12	¾	4½	75-90	55	17.40
18	12	¾	4½	75-90	65	19.50
20	14	¾	4½	75-90	85	21.60
24	16	¾	5	75-90	105	25.80
30	20	1	6	100-120	220	32.00
36	24	1	6	100-120	301	38.30
42	28	1¼	6½	120-150	389	44.50
48	32	1¼	6½	120-150	477	50.80

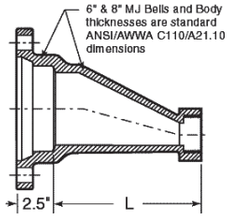
* Not included in AWWA C110.

14" THRU 48" GLANDS MAY BE TAPERED



ANSI/AWWA C110/A21.10, ANSI/AWWA C111/A21.11

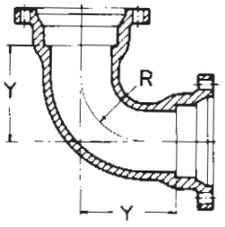
TYLER UNION



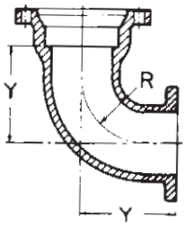
MJ x FIPT ECCENTRIC REDUCER

Size	Dimensions L	Weights
6x2	13	51
8x2	15	71

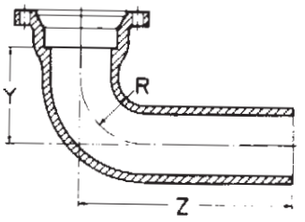
BENDS



90° MJ x MJ (1/4)



90° MJ x FE (1/4)



90° MJ x PE (1/4)

90° Bends (1/4)

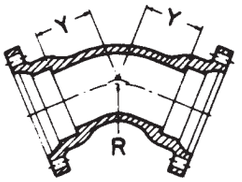
Size	Dimensions R	Y	Z	Weights MJxMJ	MJxPE	MJxFE
*2	2.25	3.25	...	16	...	...
3	4.0	5.5	13.5	26	36	...
4	4.5	6.5	14.5	56	53	51
6	6.0	8.0	16.0	88	80	75
8	7.0	9.0	17.0	123	119	118
10	9.0	11.0	19.0	189	181	168
12	10.0	12.0	20.0	268	252	288
14	11.5	14.0	22.0	380	...	...
16	12.5	15.0	23.0	552	470	465
18	14.0	16.5	24.5	625	600	577
20	15.5	18.0	26.0	862	775	...
24	18.5	22.0	30.0	1423	1301	1150
30	21.5	25.0	33.0	1942	1920	...
36	24.5	28.0	36.0	2629	2310	...
42	27.5	31.0		3410	...	...
48	30.5	34.0		4595	...	...

Mechanical Joint weights do not include Glands, Nuts, Bolts and Gaskets. See Joint Accessories.

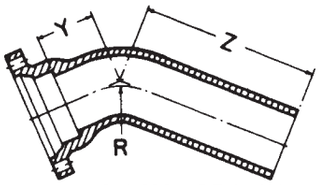
For sizes not found in this section check MJ-SSB DI fittings, pages 3 thru 11.

DUCTILE IRON C110 FULL BODY MECHANICAL JOINT FITTINGS

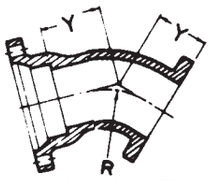
BENDS



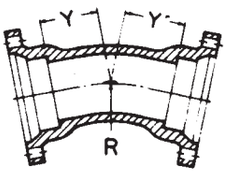
45° MJ (1/8)



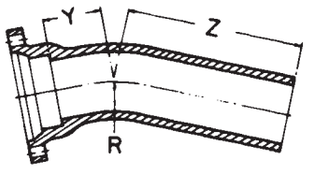
45° MJ x PE (1/8)



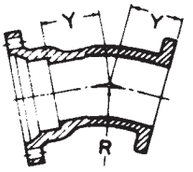
45° MJ x FE (1/8)



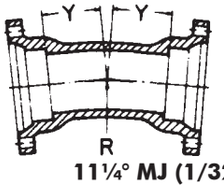
22½° MJ (1/16)



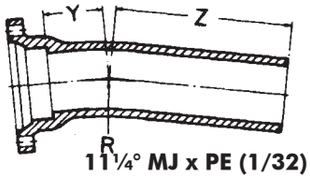
22½° MJ x PE (1/16)



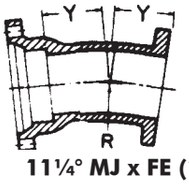
22½° MJ x FE (1/16)



11¼° MJ (1/32)



11¼° MJ x PE (1/32)



11¼° MJ x FE (1/32)

45° Bends (1/8)

Size	Dimensions R	Y	Z	MJ	Weights MJxFE*	MJxPE
*2	1.96	1.8	...	16	...	...
3	3.62	3.0	11.0	30	...	...
4	4.81	4.0	12.0	53	48	45
6	7.25	5.0	13.0	77	60	69
8	8.44	5.5	13.5	110	107	111
10	10.88	6.5	14.5	172	168	167
12	13.25	7.5	15.5	222	215	218
14	12.06	7.5	15.5	311	...	...
16	13.25	8.0	16.0	364	360	360
18	14.50	8.5	16.5	531	430	455
20	16.88	9.5	17.5	655	543	664
24	18.12	11.0	19.0	865	1099	825
30	27.75	15.0	23.0	1447	...	1510
36	35.00	18.0	26.0	2435	...	1930
42	42.25	21.0		2955	...	...
48	49.50	24.0		4080	...	...

* Not included in AWWA C110.

22½° Bends (1/16)

Size	Dimensions R	Y	Z	MJ	Weights MJxFE*	MJxPE
3	7.56	3.0	11.0	30	...	...
4	10.06	4.0	12.0	52	...	...
6	15.06	5.0	13.0	77	71	70
8	17.62	5.5	13.5	110	107	109
10	22.62	6.5	14.5	156	155	163
12	27.62	7.5	15.5	221	215	224
14	25.12	7.5	15.5	300	...	...
16	27.62	8.0	16.0	391	315	365
18	30.19	8.5	16.5	527	422	455
20	35.19	9.5	17.5	611	...	575
24	37.69	11.0	19.0	986	800	930
30	57.81	15.0	23.0	1898	...	1540
36	72.88	18.0	26.0	2372	...	1970
42	88.00	21.0		3020	...	...
48	103.06	24.0		4170	...	...

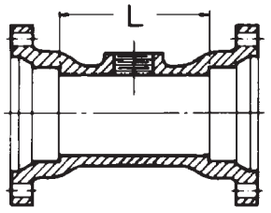
11¼° Bends (1/32)

Size	Dimensions R	Y	Z	MJ	Weights MJxFE*	MJxPE
3	15.25	3.0	11.0	30	...	...
4	20.31	4.0	12.0	52	...	...
6	30.50	5.0	13.0	65	71	...
8	35.50	5.5	13.5	104	105	...
10	45.69	6.5	14.5	171	...	...
12	55.81	7.5	15.5	221	215	...
14	50.75	7.5	15.5	305	...	...
16	55.81	8.0	16.0	391	367	...
18	60.94	8.5	16.5	525	422	...
20	71.06	9.5	17.5	605	...	...
24	76.12	11.0	19.0	996	800	972
30	116.75	15.0	23.0	1410	...	1305
36	147.25	18.0	26.0	2397	...	2185
42	177.69	21.0		3035	...	...
48	208.12	24.0		4190	...	...

ANSI/AWWA C110/A21.10, ANSI/AWWA C111/A21.11

TYLER UNION

MJ TAPPED TEE

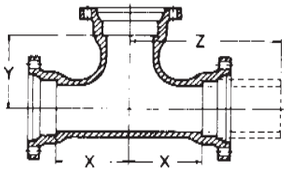


MJ Tapped Tee (2"Tap)

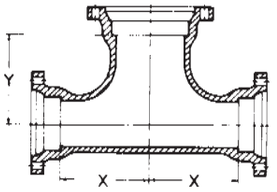
Dimensions			
Size	L	Max. Tap	Weights
3	8	2	40
4	8	2	51
6	8	2	73
8	8	2	104
10	8	2	130
12	8	2	180

For sizes not found in this section check MJ-SSB DI fittings, pages 3 thru 11.

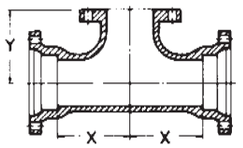
TEES



Straight Tees and Reducing on Branch Tees



Bullhead



MJxMJxFE

	Size		Dimensions			Weights		
Run	Run	Branch	X	Y	Z	MJ	**MJxPExMJ	**MJxMJxFE
*2	2	2	3.25	3.25	...	21	...	...
*3	3	2	3.25	3.25	...	45	...	...
3	3	3	5.5	5.5	13.5	58	...	...
*4	4	2	4.8	4.8	14.5	68	...	49
4	4	3	6.5	6.5	14.5	77	...	...
4	4	4	6.5	6.5	14.5	78	75	76
4	4	6	8.0	8.0	...	112	...	...
*6	6	2	8.0	8.0	...	78	...	...
6	6	3	8.0	8.0	16.0	112	...	...
6	6	4	8.0	8.0	16.0	110	...	109
6	6	6	8.0	8.0	16.0	119	120	141
6	6	8	9.0	9.0	...	158	...	...
8	8	3	9.0	9.0	17.0	155	...	...
8	8	4	9.0	9.0	17.0	157	...	150
8	8	6	9.0	9.0	17.0	175	170	182
8	8	8	9.0	9.0	17.0	199	180	194
10	10	4	11.0	11.0	19.0	...	...	229
10	10	6	11.0	11.0	19.0	258	...	264
10	10	8	11.0	11.0	19.0	268	...	245
10	10	10	11.0	11.0	19.0	300	250	...
12	12	4	12.0	12.0	20.0	318	315	323
12	12	6	12.0	12.0	20.0	325	325	335
12	12	8	12.0	12.0	20.0	335	335	372
12	12	10	12.0	12.0	20.0	392	390	...
12	12	12	12.0	12.0	20.0	396	396	476
14	14	12	14.0	14.0	22.0	540	560	...
14	14	14	14.0	14.0	22.0	585	570	...
*16	16	4	15.0	15.0	23.0	600	580	575
16	16	6	15.0	15.0	23.0	615	590	605
16	16	8	15.0	15.0	23.0	625	605	615
16	16	10	15.0	15.0	23.0	645	620	...
16	16	12	15.0	15.0	23.0	660	640	651
16	16	16	15.0	15.0	23.0	740	720	730

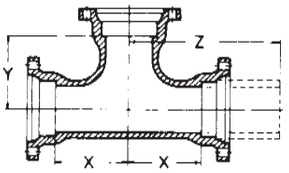
NOTICE: Weights published in this catalog are for shipping purposes only. Actual weights may vary because some fittings are produced in multiple foundries. All fittings meet the AWWA standards to which they are designed.
For weights of specific fittings, please contact Tyler Union Waterworks Company.

*Not included in AWWA C110

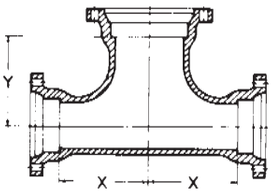
**Made to order only. Not Returnable

ANSI/AWWA C110/A21.10, ANSI/AWWA C111/A21.11

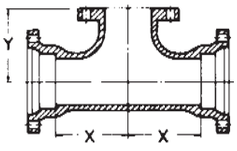
TEES (Con't)



Straight Tees and Reducing on Branch Tees



Bullhead



MJxMJxFE

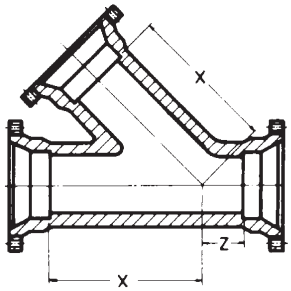
Size			Dimensions			Weights		
Run	Run	Branch	X	Y	Z	MJ	**MJxPExMJ	**MJxMJxFE
18	18	6	13.0	15.5	...	710	...	707
18	18	8	13.0	15.5	...	674	...	675
18	18	12	13.0	15.5	...	749	...	733
18	18	18	16.5	16.5	...	945	...	953
20	20	6	14.0	17.0	...	849	...	...
20	20	8	14.0	17.0	...	892	...	859
20	20	12	14.0	17.0	...	896	...	...
20	20	16	18.0	18.0	...	1095	...	...
20	20	20	18.0	18.0	...	1258	...	1168
24	24	6	15.0	19.0	...	1233	...	1228
24	24	8	15.0	19.0	...	1234	...	1242
24	24	12	15.0	19.0	...	1256	...	1165
24	24	14	15.0	19.0	...	1220	...	...
24	24	16	15.0	19.0	...	1245	...	...
24	24	18	22.0	22.0	...	1735	...	...
24	24	20	22.0	22.0	...	1720	...	...
24	24	24	22.0	22.0	...	1947	...	1795
30	30	6	18.0	23.0	...	2050	...	...
30	30	8	18.0	23.0	...	2060	...	...
30	30	10	18.0	23.0	...	2075	...	...
30	30	12	18.0	23.0	...	2090	....	...
30	30	16	18.0	23.0	...	2145	...	...
30	30	18	18.0	23.0	...	2170	...	...
30	30	20	18.0	23.0	...	2205	...	...
30	30	24	25.0	25.0	...	2880	...	...
30	30	30	25.0	25.0	...	2275	...	3080
36	36	6	20.0	26.0	...	2439	...	2430
36	36	8	20.0	26.0	...	2444	...	...
36	36	10	20.0	26.0	...	2535	...	...
36	36	12	20.0	26.0	...	2541	...	2550
36	36	14	20.0	26.0	...	2570	...	...
36	36	16	20.0	26.0	...	2585	...	2450
36	36	18	20.0	26.0	...	2610	...	...
36	36	20	20.0	26.0	...	2635	...	...
36	36	24	20.0	26.0	...	2792	...	2660
36	36	30	28.0	28.0	...	3545	...	...
36	36	36	28.0	28.0	...	3450	...	...
42	42	24	23.0	30.0	...	3690	...	...
42	42	30	31.0	31.0	...	4650	...	...
42	42	36	31.0	31.0	...	4880	...	...
42	42	42	31.0	31.0	...	6320	...	...
48	48	24	26.0	34.0	...	4995	...	...
48	48	30	26.0	34.0	...	5140	...	...
48	48	36	34.0	34.0	...	6280	...	...
48	48	42	34.0	34.0	...	8130	...	...
48	48	48	34.0	34.0	...	8420	...	...

* Not included in AWWA C110

** Made to order only. Not Returnable

WYES/LATERAL

(Not included in AWWA C110.)

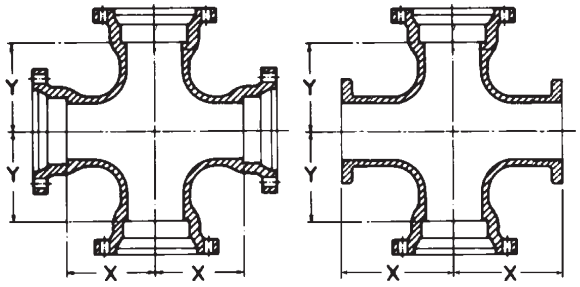


Size		Dimensions		
Run	Branch	X	Z	Weights
3	3	10.0	3.0	60
4	4	12.0	3.0	90
6	4	14.5	3.5	130
6	6	14.5	3.5	145
8	4	17.5	4.5	190
8	6	17.5	4.5	205
8	8	17.5	4.5	230
10	6	20.5	5.0	330
10	8	20.5	5.0	310
10	10	20.5	5.5	435
12	8	24.5	5.5	505
12	12	24.5	5.5	490
14	6	27.0	6.0	626
16	16	30.0	6.5	1079
18	8	32.0	7.0	1073
18	10	32.0	7.0	975
18	12	32.0	7.0	1015
18	16	32.0	7.0	1135
18	18	32.0	7.0	1130
20	10	35.0	8.0	1220
20	12	35.0	8.0	1260
20	16	35.0	8.0	1375
20	20	35.0	8.0	1525
24	24	40.5	9.0	2372
30	30	49.0	10.0	3670
36	24	54.0	15.0	5390
36	36	60.0	19.5	6335
42	24	60.0	12.0	6810
42	30	63.0	12.0	7210

For sizes not found in this section check MJ-C153 sec.

42	36	66.0	12.0	8355
42	42	71.0	15.0	9900
48	48	77.0	16.0	13150

CROSSES

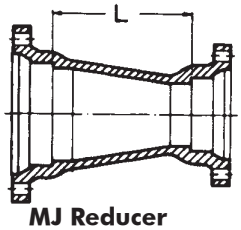


ALL MJ ***MJ x MJ x FE x FE**

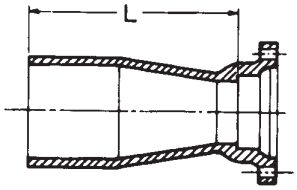
Size		Dimensions			Weights
Run	Branch	X	Y	MJ	*MJxFE
6	6	8.0	8.0	160	141
8	4	9.0	9.0	185	....
8	6	9.0	9.0	205	182
8	8	9.0	9.0	255	245
10	6	11.0	11.0	285	....
10	8	11.0	11.0	310	....
10	10	11.0	11.0	380	360
12	6	12.0	12.0	361	367
12	8	12.0	12.0	371	373
12	12	12.0	12.0	486	487
14	8	14.0	14.0	550	....
14	14	14.0	14.0	779	....
16	6	15.0	15.0	650	....
16	8	15.0	15.0	675	655
16	16	15.0	15.0	895	875
18	8	13.0	15.5	775	....
18	10	13.0	15.5	760	....
18	12	13.0	15.5	860	....
18	18	16.5	16.5	1140	....
20	8	14.0	17.0	951	....
20	12	14.0	17.0	977	....
20	16	18.0	18.0	1245	....
20	20	18.0	18.0	1440	....
24	8	15.0	19.0	1244	....
24	12	15.0	19.0	1326	....
24	16	15.0	19.0	1479	....
24	20	22.0	22.0	1965	....
24	24	22.0	22.0	2192	....
30	6	18.0	23.0	2085	....
30	12	18.0	23.0	2165	....
30	24	25.0	25.0	3180	....
30	30	25.0	25.0	3640	....
36	24	20.0	26.0	2910	....
36	36	28.0	28.0	4370	....
42	42	31.0	31.0	7145	....
48	24	26.0	34.0	5210	....
48	36	34.0	34.0	6790	....
48	48	34.0	34.0	9380	....

*Not included in AWWAC110.

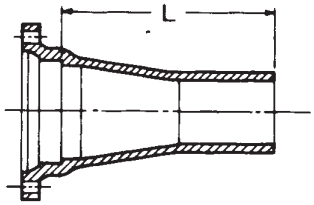
REDUCERS



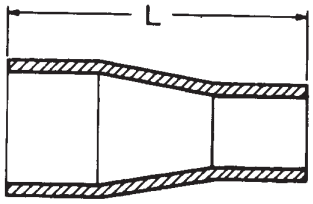
MJ Reducer



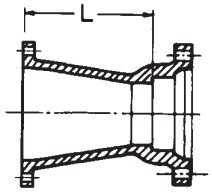
MJ Small End Bell Reducer



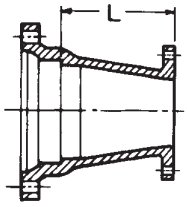
MJ Large End Bell Reducer



Plain End-Plain End Reducer



FExMJ Reducer



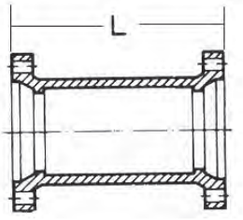
MJxFE Reducer

	Laying Lengths (L)						Weights					
Size	MJ	MJ-SEB	MJ-LEB	PExPE	FExMJ	MJxFE	MJ	MJ-SEB	MJ-LEB	PExPE	FExMJ	MJxFE
* 3x2	6	14	14	...	...	...	24	24	24	...	...	...
* 4x2	7	15	15	...	...	...	31	30	31	...	...	...
4x3	7	15	15	23	7	7	37	38	37	34	34	35
* 6x2	9	17	17	...	...	...	46	43	47	...	...	...
6x3	9	17	17	25	...	9	55	50	55	...	...	50
6x4	9	17	17	25	9	9	56	60	59	57	53	62
8x3	11	19	19	27	...	...	84	77	70	...	...	...
8x4	11	19	19	27	11	11	84	82	84	...	73	75
8x6	11	19	19	27	11	11	94	90	93	96	84	80
10x6	12	20	20	28	12	12	115	116	117	...	100	105
10x8	12	20	20	28	12	12	142	135	130	135	130	130
12x4	14	22	22	30	...	...	139	131	...	...	...	...
12x6	14	22	22	30	14	12	148	150	153	...	145	130
12x8	14	22	22	30	14	12	173	168	165	168	170	175
12x10	14	22	22	30	14	12	194	190	178	185	188	190
14x6	16	24	24	32	...	16	...	...	...	...	...	195
14x8	16	24	24	32	...	16	...	...	...	...	...	215
14x12	16	24	24	32	...	16	...	...	...	...	...	270
16x6	18	26	26	34	...	...	250	...	...	...	...	...
16x8	18	26	26	34	...	...	288	248	...	...	...	...
16x10	18	26	26	34	...	...	300	...	...	...	...	...
16x12	18	26	26	34	18	18	330	304	325	...	305	325
16x14	18	26	26	34	...	...	370	...	...	...	...	...
18x8	19	27	27	35	...	19	320	...	...	...	...	300
18x10	19	27	27	35	...	...	388	...	...	...	...	...
18x12	19	27	27	35	...	19	380	355	...	...	...	405
18x14	19	27	27	35	...	...	450	...	...	...	...	...
18x16	19	27	27	35	...	19	476	...	...	...	...	445
20x10	20	28	28	36	...	...	410	...	...	...	...	...
20x12	20	28	28	36	...	...	515	420	...	...	...	...
20x16	20	28	28	36	...	20	578	525	510	...	...	510
20x18	20	28	28	36	...	...	575	...	...	...	...	...
24x12	24	32	32	40	...	24	610	570	...	...	...	455
24x16	24	32	32	40	...	...	705	665	753	...	...	...
24x18	24	32	32	40	...	...	789	720	...	...	...	...
24x20	24	32	32	40	...	...	815	775	804	...	...	...
*30x16	30	38	38	46	...	...	1150	1040	...	1015	...	...
30x18	30	38	38	46	...	...	1160	1050	...	1025	...	...
30x20	30	38	38	46	...	...	1225	1120	...	1090	...	...
30x24	30	38	38	46	...	...	1360	1255	1320	1215	...	...
36x20	36	44	44	52	...	...	1495	...	1466	...	...	...
36x24	36	44	44	52	...	...	1580	...	1535	1389	...	...
36x30	36	44	44	52	...	...	1919	1721	...	1585	...	...
42x24	42	50	50	58	...	...	2060	...	...	...	...	...
42x30	42	50	50	58	...	...	2370	...	...	...	...	...
42x36	42	50	50	58	...	...	2695	...	...	...	...	...
48x30	48	56	56	64	...	...	3005	...	...	...	...	...
48x36	48	56	56	64	...	...	3370	...	...	...	...	...
48x42	48	56	56	64	...	...	3750	...	...	...	...	...

* Not included in AWWA C110

TYLER UNION

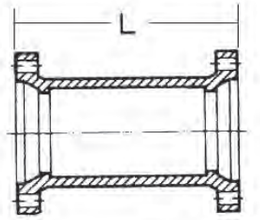
SOLID SLEEVES



Standard

Size	Pipe O.D.	Short L	Short Weight	Long L	Long Weight
*2	2.50	8.0	13	12	18
3	3.96	7.5	25	12	36
4	4.80	7.5	35	12	47
6	6.90	7.5	45	12	65
8	9.05	7.5	65	12	90
10	11.10	7.5	85	12	115
12	13.20	7.5	120	12	136
16	17.40	9.5	206	15	281
18	19.50	9.5	246	15	362
20	21.60	9.5	275	15	404
24	25.80	9.5	360	15	540
30	32.00	15.0	745	24	1085
36	38.30	15.0	1047	24	1502
42	44.50	15.0	1312	24	1550
48	50.80	15.0	1585	24	1940

* Not included in AWWA C110



*** Dual Purpose †**

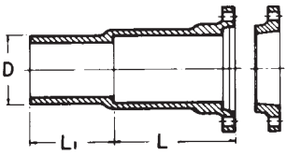
Size	Pipe O.D.	Short L	Short Weight	Long L	Long Weight
4	4.80/5.00	7.5	33	12	44
6	6.90/7.10	7.5	46	12	63
8	9.05/9.30	7.5	65	12	88
10	11.10/11.40	...	...	12	111
†12	13.20/13.50	...	...	12	221
†16	17.40/17.80	...	...	15	385

All Sizes Use MJ Dual Purpose Gland
* Not included in AWWA C110
† 12" & 16" are sold assembled
NOTE: Sizes 4-10" use standard MJ Gaskets;
12" and 16" require special duo gaskets.

* MJ x PE DUAL-PURPOSE CUTTING-IN SLEEVE

With Dual-Purpose Accessories
(NOTES: Gland with cup-joint set screws available at extra cost when specified. NOT FOR RESTRAINT.)
Currently, Tyler and Union Dual Purpose Glands are NOT interchangeable.

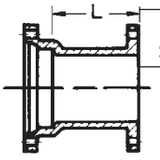
Cutting-In
Sleeve & Gland



Size	For Use On Pipe O.D.	L	L^1	D	Weight Gland Only	Weight Gland & Sleeve
4	4.80 - 5.00	12	8	4.80	6.0	72
6	6.90 - 7.10	12	8	6.90	10.0	94
8	9.05 - 9.30	12	8	9.05	16.0	122
10	11.10 - 11.40	12	8	11.10	25.0	175
12	13.20 - 13.50	12	8	13.20	30.0	235

* Not included in AWWA C110.

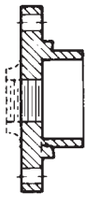
ADAPTERS



MJ x FE

Size	Dimensions L	Weights
3	8	30
4	8	42
6	8	62
8	8	88
10	8	120
12	8	150
16	8	257
18	8	324
20	8	365
24	8	528
30	10	760
36	10	1070

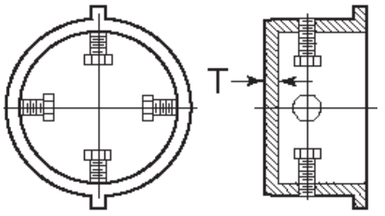
PLUGS



Solid or Tapped

Size	Tap	Weight Solid	Weight Tapped
*2	2	5	5
3	2	9	9
4	2	13	14
6	2	15	15
8	2	45	45
10	2	66	66
12	2	79	79
14	2	120	120
16	2	147	147
†18	2	192	190
†20	2	220	219
†24	2	338	338
†30	2	660	660
†36	2	838	838
†42	...	1180	...
†48	...	1455	...

† Dished – Not flat as shown.
* Not included in AWWA C110.

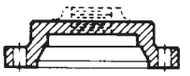


TYTON® Plug**
Solid or Tapped

Size	Tap	T	Weight*
4	2	.60	18
6	2	.65	25
8	2	.70	46
10	2	.75	70
12	2	.75	95

* Weights do not include accessories
** Not included in AWWA C110.
TYTON® is a registered trademark of U.S. Pipe and Foundry Company.

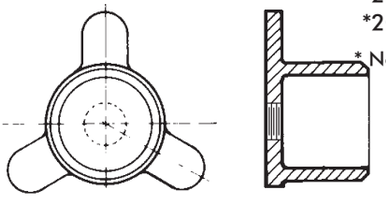
CAPS



Solid or Tapped

Size	Tap	Weight Solid	Weight Tapped
*2	2	6	...
3	2	10	10
4	2	18	13
6	2	34	30
8	2	46	45
10	2	58	54
12	2	86	80
16	2	178	175
†18	2	215	215
†20	2	250	249
†24	2	370	370
†30	2	680	680
†36	2	850	850
42	..	1180	...
48	..	1595	...

†Dished – Not flat as shown.
* Not included in AWWA C110.



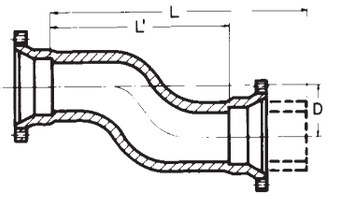
Solid **Tapped**

Push-In Plug with Ears
(To be used with all push-in pipe and fittings)

Size	Tap	Weight
14	2.0	101
16	2.0	137
18	2.0	177
†20	2.0	239
†24	2.0	311

† Dished - Not flat as shown
NOTE: Blocking still required–ears for assembly only.

OFFSETS



MJ x MJ **MJ x PE**

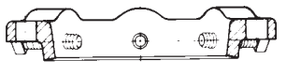
Size	D	Dimensions L'	Dimensions L	Weights MJxMJ	Weights MJxPE
4	6	19	27	...	82
4	12	22	30	85	80
4	18	30	38	105	...
* 4	24	26	34	126	125
6	6	20	28	114	105
6	12	26	34	148	143
6	18	33	41	188	176
* 6	24	24	32	182	160
8	6	21	29	177	155
8	12	28	36	231	195
8	18	35	43	287	282
* 8	24	36	44	280	285
10	12	30	38	347	280
10	18	38	46	340	340
10	24	38	46	420	...
12	12	37	45	420	420
12	18	48	56	520	520
*12	24	48	56	649	630
16	12	40	48	715	...
16	18	50	58	850	830
*20	12	40	48	1025	...
*20	18	48	60	1362	...

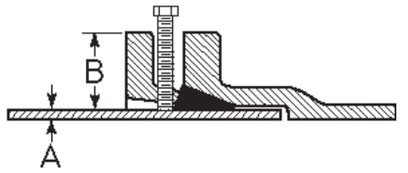
* Not included in AWWA C110.

ANSI/AWWA C110/A21.10, ANSI/AWWA C111/A21.11

TYLER UNION

*SET-SCREW RETAINER GLAND





See Installations Instructions..... Page 63

Size	Pressure Rating, psi	Gland O.D. B	Pipe O.D. O.D. A	D.I. Pipe Wall Class	No of Set Screws	Size of Set Screws	Gland Weight	Weight w/Acces.
3	350	7.69	3.96	50-56	4	⅝x2	4	8
4	350	9.12	4.80	50-56	4	⅝x2	5	11
6	350	11.12	6.90	50-56	6	⅝x2	9	16
8	250	13.37	9.05	50-56	9	⅝x2	13	21
10	250	15.62	11.10	50-56	12	⅝x2	17	26
12	150	17.88	13.20	50-56	16	⅝x2	20	28
14	250	20.25	15.30	53-56	20	⅝x2½	44	55
16	200	22.50	17.40	53-56	24	⅝x2½	54	64
18	200	24.75	19.50	53-56	24	⅝x2½	62	72
20	200	27.00	21.60	53-56	28	⅝x3	76	91
24	150	31.50	25.80	53-56	32	⅝x3	103	118

* Not included in AWWA C110

Pipe Wall Thickness:
Sizes 3"-12" are recommended for ductile iron pipe class 50 thru 56. Sizes 14" thru 24" are recommended for ductile iron pipe class 53 thru 56.

DUCTILE IRON RETAINER GLANDS

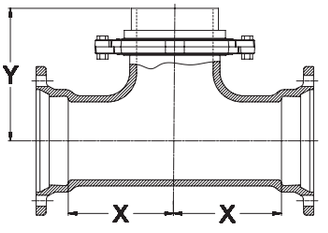
Mechanical Joint Retainer Glands are designed to provide a method for restraining mechanical joint pipe and **fittings and other standardized mechanical joints against possible joint separation, rupture or blow-out caused by internal water pressure.

The set screws are square-headed with Type C knurled cup points, and are shipped already assembled in the Glands. They are manufactured of 4140 grade alloy steel, and are heat treated to a Rockwall "C" 45/53 case hardness. Tee-head bolts and gaskets are not included, but may be ordered separately. Recommended torque for set screws is 75 foot pounds, and set screws on opposite sides of the glands should be tightened alternately.

Tee-head bolt hole size and spacing are equal to MJ Glands as shown in AWWA C111. Standard mechanical Joint gaskets as shown in AWWA C111 should be used.

****Note: Not recommended for use on plain end fittings**

TEES



MJ x MJ x Swivel

Size	Dimensions X	Y	Weight
6	8.0	10.5	150
8x6	9.0	11.5	199
8	9.0	11.5	210
10x6	11.0	13.5	267
12x6	12.0	14.5	346
16x6	15.0	17.5	619
16x8	15.0	17.5	649
30x6	18.0	24.5	2070

All weights shown include the Swivel Gland

MJ GLAND

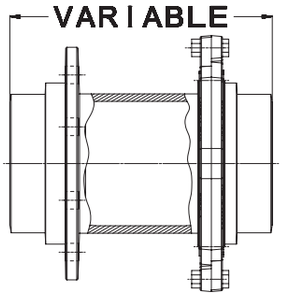
Size	Gland Wt. Pack	Weight Gland Only
2	5	3
3	7	4
4	10	6
6	16	10
8	25	16
10	30	19
12	40	26
14	45	34
16	55	54
18	65	52
20	85	73
24	105	91
30	220	90
36	301	127
42	Call	279
48	Call	341

ANSI/AWWA C110/A21.10, ANSI/AWWA C111/A21.11

TYLER UNION

DUCTILE IRON C110 FULL BODY MECHANICAL JOINT ELLS, ADAPTERS AND GLANDS
For Valve and Hydrant Connections

ADAPTERS



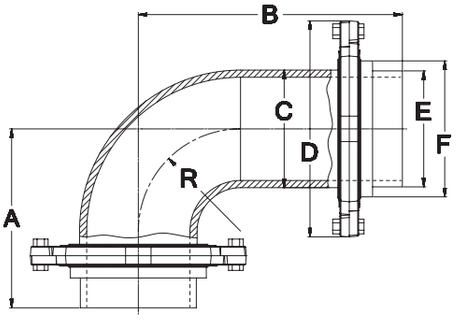
Swivel x Solid Adapter

Size by Laying Length	Wall Thickness	Weight*
4x13	.52	52
6x12	.55	84
6x18	.55	91
6x24	.55	105
6x36	.55	156
8x13	.60	126
12x13	.75	186

*Weights with Gland.

Other Swivel Hydrant Fittings, Pages 5, 6 and 7.

ELLS



***90° Swivel x Swivel Ell (Not Included In AWWA C110)**

Size	Wall Thickness	Dimensions A	B	C	D	E	F	R	*Weight
6	.55	10.5	15.5	7.10	11.12	6.90	8.02	6.0	106
8	.60	11.5	16.5	9.20	13.37	9.05	10.17	7.0	156

* With 2 Swivel Glands

SWIVEL GLAND ASSEMBLY

Used with swivel fittings, the TYLER UNION Swivel gland, with its rotating feature, permits the installer to meet any grade requirements regardless of bolt-hole alignment. In addition, the system permits stiff connections without braces, blocking or strapping.

Swivel Glands** Size	Weight
12	30

** Not included in AWWA C110.

NOTE: When ordering glands separately,
(1) Specify TYLER UNION UPCode Number,
(2) Description, and
(3) Size of fitting to be joined.

ANSI/AWWA C110/A21.10, ANSI/AWWA C111/A21.11

SAMPLE SPECIFICATIONS (Current ANSI/AWWA revisions apply)

4" through 24" Push-On joint ductile iron fittings shall be produced in accordance with all applicable terms and provisions of ANSI/AWWA C153/A21.53. Fittings are cement-lined and seal-coated in accordance with ANSI/AWWA C104/A21.4. Joints shall be in accordance with manufacturer's design with bell sockets designed to receive pressure pipe O.D.'s as specified in ANSI/AWWA C151/A21.51 and AWWA C900 TABLE 2. The working pressure rating shall be 350 PSI, except for wyes and flanged-branch fittings. NOTE: Fittings are cement lined and seal coated in accordance with ANSI/AWWA C104/A21.4, also available bare or epoxy coated. Double cement lined available. Coated and/or lined fittings meet NSF-61, NSF-372 and Annex G.

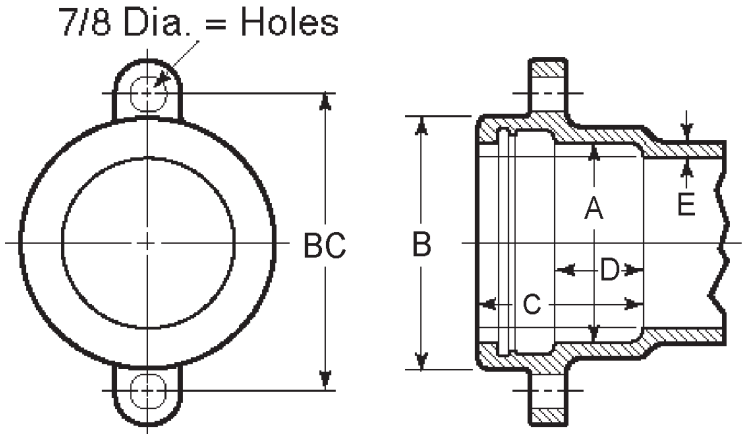
Thicknesses and dimensions of bell sockets and gaskets shall be in accordance with the manufacturer's design. Gaskets shall be furnished by the manufacturer. Working pressures apply to fittings only and do not apply to restraining lugs or external restraining devices. Installation of fittings shall be per AWWA C600 and AWWA C651, current revision.

NOTE: Standard restraining lugs are provided on sizes 4" through 16" ONLY. Restraining lugs are available on 18"-24" fittings provided sufficient time is available to make tooling adaptations.

EXCEPTIONS: Union-Tite fittings with flanged branches are rated for water pressure of 250 PSI but can be rated for 350 PSI with the use of an annular ring or comparable gasket. Wye fittings over 12" are not pressure rated, call Tyler Union for information.

ADVANTAGES AND FEATURES

- Push-on gasket joint uses TYTON® or McWane 350 Sure Stop® gaskets
- For use with Ductile iron pipe, C-900/905 PVC pipe, and 4"-12" pressure rated IPS diameter PVC pipe (with transition gasket)
- Deep stab joint design accommodates common spigot end taper on plastic pipes
- Slip joint installation eliminates T-bolts and nuts (MJ glands not needed)



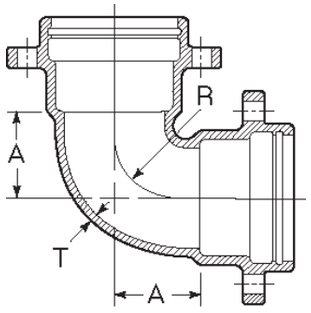
BELL DIMENSIONS IN INCHES FOR UNION-TITE FITTINGS

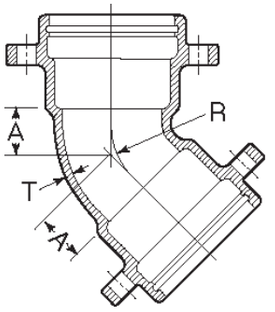
Pipe Size	A	B	B.C.	C	D	E
4	5.04	6.38	7.88	4.16	2.25	.35
6	7.14	8.52	10.50	4.29	2.25	.37
8	9.32	10.90	12.88	4.78	2.25	.39
10	11.37	12.91	14.69	4.98	2.25	.41
12	13.47	15.12	17.19	4.98	2.25	.43
14	15.64	18.12	19.00	5.40	2.25	.51
16	17.74	20.32	21.40	5.40	2.25	.52
18	19.83	22.52	...	5.40	2.25	.59
20	21.94	24.29	...	5.40	2.25	.60
24	26.14	29.14	...	5.65	2.50	.62

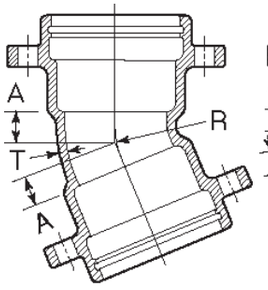
TYTON® is a registered trademark of U.S. Pipe and Foundry Company.

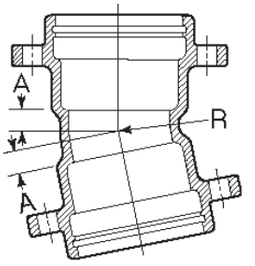
For Joint deflection, refer to Tyler Union product submittal 26U located on page 65 of this catalog.

BENDS









90° (1/4) UT Bends

Size	Dimensions T	*A	*R	Weight
4	.35	4.00	3.87	24
6	.37	5.00	5.37	51
8	.39	6.50	6.37	80
10	.41	7.50	8.36	121
12	.43	9.00	9.36	151
14	.51	11.50	10.98	254
16	.52	12.50	12.00	328
18	.59	14.00	14.00	482
20	.60	15.00	15.50	340
24	.62	16.75	15.59	674

45° (1/8) UT Bends

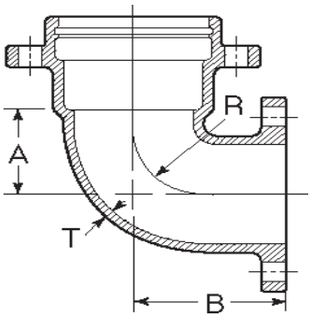
Dimensions *A	*R	Weight
2.00	3.31	26
3.00	5.72	42
3.50	6.93	66
4.50	9.34	101
5.50	11.75	128
5.00	10.85	143
5.50	12.02	225
6.00	12.36	209
7.00	13.59	397
7.50	14.69	492

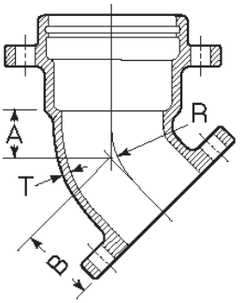
22½° (1/16) UT Bends

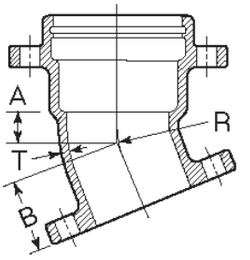
Dimensions *A	*R	Weight
1.50	4.38	18
2.00	8.16	39
2.50	9.40	64
3.00	13.17	67
3.50	14.42	111
3.75	13.82	162
3.75	14.97	195
4.50	30.19	209
4.50	35.19	414
4.50	37.69	596

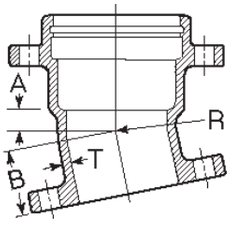
11¼° (1/32) UT Bends

Dimensions *A	*R	Weight
1.25	6.77	18
1.50	9.38	40
1.75	11.48	60
2.00	13.95	77
2.25	16.50	94
2.50	14.26	113
2.50	15.23	172
3.00	60.94	209
3.00	71.07	265
...	...	...









90° (1/4) UT x Flange Bends

Size	Dimensions T	*A	*B	*R	Weight
4	.35	4.5	6.5	3.87	31
6	.37	6.0	7.0	5.37	49
8	.39	7.0	9.0	6.37	74
10	.41	9.0	10.0	8.36	130
12	.43	10.0	12.0	9.36	158
14	.51	12.0	15.5	10.98	231
16	.52	13.0	16.5	12.00	233

45° (1/8) UT x Flange Bends

Dimensions *A	*B	*R	Weight
2.0	4.0	3.31	21
3.0	5.0	5.72	42
3.5	5.5	6.93	60
4.5	6.5	9.34	93
5.5	7.5	11.75	122
5.5	8.5	10.85	162
6.0	9.5	12.02	275

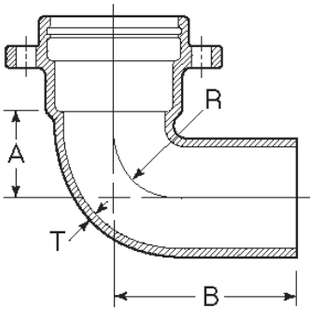
22½° (1/16) UT x Flange Bends

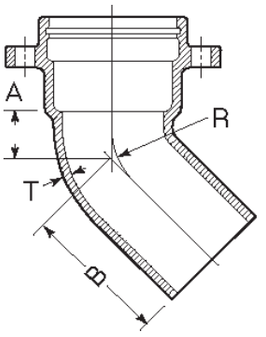
Dimensions *A	*B	*R	Weight
1.50	3.5	4.38	25
2.25	4.3	8.16	44
2.50	4.5	9.40	64
3.00	5.3	13.17	90
3.50	5.5	14.42	112
3.75	6.8	13.82	174
4.00	7.5	14.97	228

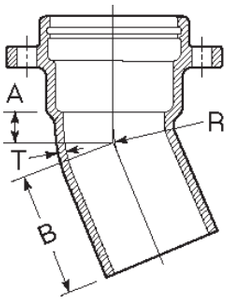
11¼° (1/32) UT x Flange Bends

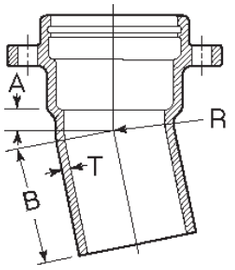
Dimensions *A	*B	*R	Weight
1.25	3.30	6.77	24
1.50	3.50	9.38	30
1.75	3.75	11.48	61
2.00	4.00	13.95	80
2.25	4.30	16.50	94
2.60	5.75	14.26	170
2.60	6.10	15.23	228

BENDS



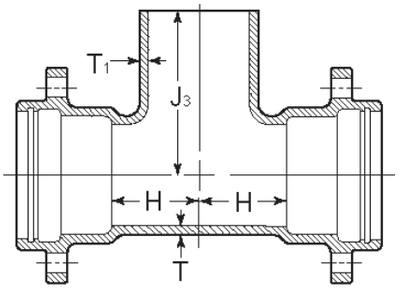






	90° (1/4) UT x PE Bends					45° (1/8) UT x PE Bends				22½° (1/16) UT x PE Bends				11¼° (1/32) UT x PE Bends			
		Dimensions				Dimensions				Dimensions				Dimensions			
Size	T	A	B	R	Weight	A	B	R	Weight	A	B	R	Weight	A	B	R	
Weight																	
4	.35	4.5	10.5	3.87	35	2.0	8.0	3.31	21	...	...	...	..	...	...	...	..
6	.37	6.0	12.0	5.37	70	3.0	9.0	5.72	38	2.25	8.08	8.16	35	1.50	7.30	9.38	36
8	.39	...	...	...	..	3.5	9.5	6.93	60	2.50	8.34	9.40	57	1.75	7.55	11.48	55

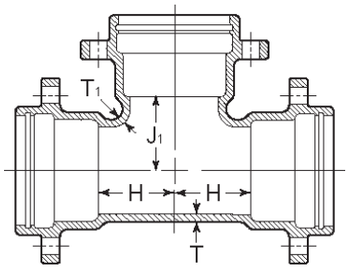
TEES



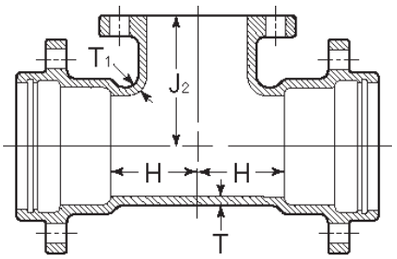
UT x UT x PE Tees

Size		Dimensions				
Run	Branch	T	T1	H	J3	Weight
6	6	.37	.37	6.0	11.5	60
8	6	.39	.37	6.0	12.5	80
12	6	.43	.37	7.0	15.5	140

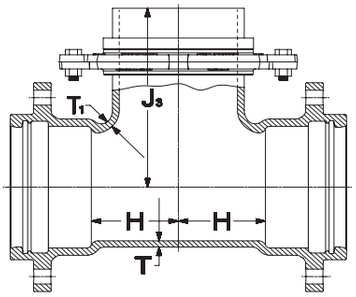
TEES



UT x UT Tees



UT x Flange Tees



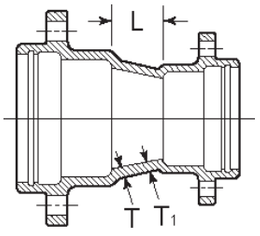
UT x Swivel Tees

			Dimensions				Weights		
Size	T	T1	*H	*J1	*J2	*J3	UT x UT	UT xFlange	UT x Swivel
4	.35	.35	4.5	4.5	6.5	...	44	45	...
6x4	.37	.35	5.0	6.0	8.0	...	68	56	...
6	.37	.37	6.0	6.0	8.0	9.5	69	71	65
8x4	.39	.35	5.0	7.0	9.0	...	73	89	...
8x6	.39	.37	6.0	7.0	9.0	10.5	96	101	100
8	.39	.39	7.0	7.0	9.0	10.5	116	117	110
10x4	.41	.35	6.0	9.0	11.0	...	102	115	...
10x6	.41	.37	7.0	9.0	11.0	12.5	113	128	130
10x8	.41	.39	8.0	9.0	11.0	12.5	145	145	156
10	.41	.41	9.0	9.0	11.0	...	155	158	...
12x4	.43	.35	6.0	10.0	12.0	...	119	138	...
12x6	.43	.37	7.0	10.0	12.0	13.5	141	148	162
12x8	.43	.39	8.0	10.0	12.0	13.5	177	170	158
12x10	.43	.41	9.0	10.0	12.0	...	160	162	...
12	.43	.43	10.0	10.0	12.0	...	217	183	...
14x6	.51	.44	6.5	10.5	12.5	14.0	176	212	202
14x10	.51	.46	8.5	10.5	12.5	...	195	246	...
14x12	.51	.47	9.5	10.5	12.5	...	196	296	...
14	.51	.51	10.5	10.5	14.0	...	209	321	...
16x6	.52	.45	6.5	11.5	13.5	15.0	266	160	229
16x8	.52	.46	7.5	11.5	13.5	15.0	292	270	292
16x10	.52	.47	8.5	11.5	13.5	...	232	330	...
16x12	.52	.48	9.5	11.5	13.5	...	239	321	...
16x14	.52	.51	10.5	11.5	15.0	...	349	342	...
16	.52	.52	11.5	11.5	15.0	...	261	355	...
18x6	.59	.44	6.5	12.5	14.5	16.13	348	301	348
18x8	.59	.45	7.5	12.5	14.5	16.13	325	319	324
18x10	.59	.47	8.5	12.5	14.5	...	344	337	...
18x14	.59	.56	10.5	12.5	16.0	...	342	393	...
18x16	.59	.57	11.5	12.5	16.0	...	362	420	...
20x6	.60	.44	7.0	14.0	16.0	17.5	355	341	400
20x10	.60	.47	9.0	14.0	16.0	...	369	420	...
20x14	.60	.56	11.0	14.0	17.5	...	484	474	...
20x16	.60	.57	12.0	14.0	17.5	...	610	498	...
20x18	.60	.59	13.0	14.0	17.5	...	539	...	...
24x6	.62	.44	7.0	16.0	18.0	19.5	385	512	525
24x10	.62	.47	9.0	16.0	18.0	...	478	468	...
24x12	.62	.49	10.0	16.0	18.0	...	663	503	...
24x14	.62	.56	11.0	16.0	19.5	...	542	531	...
24x16	.62	.57	12.0	16.0	19.5	...	566	555	...
24x18	.62	.59	13.0	16.0	...	...	593	...	
24x20	.62	.60	15.0	17.0	...	...	628	...	...
24	.62	.62	17.0	17.0	...	...	884	...	...

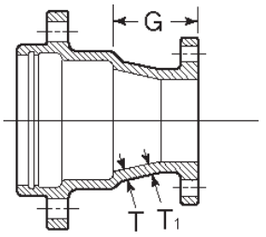
TYLER UNION

UNION-TITE DUCTILE IRON C153 COMPACT FITTINGS

REDUCERS

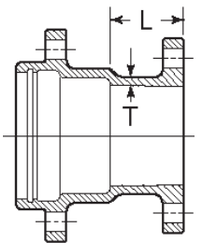


UT x UT Reducers



UT x Flange Reducers

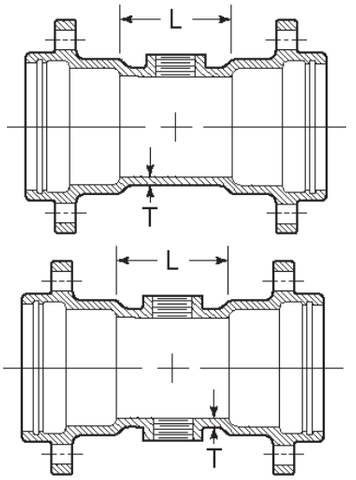
Size	Dimensions T	T1	*L	*G	Weights UT x UT	UT xFlange
6x4	.37	.35	4.0	6.0	32	32
8x4	.39	.35	5.0	7.0	46	46
8x6	.39	.37	4.0	6.0	49	47
10x4	.41	.35	7.0	9.0	47	55
10x6	.41	.37	5.0	7.0	47	59
10x8	.41	.39	4.0	6.0	53	61
12x4	.43	.35	9.0	11.0	74	78
12x6	.43	.37	7.0	9.0	58	75
12x8	.43	.39	5.0	7.0	74	74
12x10	.43	.41	4.0	6.0	82	95
14x6	.51	.44	9.0	11.0	84	121
14x8	.51	.45	7.0	9.0	85	128
14x10	.51	.46	5.0	7.0	87	127
14x12	.51	.47	4.0	6.0	104	144
16x6	.52	.45	11.0	13.0	94	133
16x8	.52	.46	9.0	11.0	104	141
16x10	.52	.47	7.0	9.0	130	158
16x12	.52	.48	5.0	7.0	152	172
16x14	.52	.51	4.0	6.0	139	196
18x8	.59	.45	14.0	16.0	142	157
18x10	.59	.47	12.0	14.0	151	175
18x12	.59	.49	10.0	12.0	167	215
18x14	.59	.56	8.0	11.5	217	234
18x16	.59	.57	7.0	10.5	202	246
20x10	.60	.47	14.0	16.0	180	234
20x12	.60	.49	12.0	...	205	...
20x14	.60	.56	10.0	13.5	233	249
20x16	.60	.57	8.0	11.5	250	272
20x18	.60	.59	7.0	...	248	...
24x12	.62	.49	16.0	18.0	246	262
24x14	.62	.56	14.0	17.5	281	315
24x16	.62	.57	12.0	15.5	380	328
24x18	.62	.59	10.0	...	390	...
24x20	.62	.60	8.0	...	421	...



UT x Flange Adaptor

Size	Dimensions T	*L	Weight
4	.35	6.0	28
6	.37	6.0	36
8	.39	6.0	54
10	.41	6.0	71
12	.43	6.0	102
14	.51	7.0	113
16	.52	7.0	115
20	.60	6.0	295

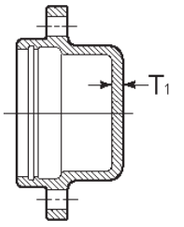
TAPPED TEE/CROSS



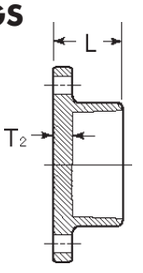
UT x Tapped Tee/Crosses

Size	Dimensions T	Max Tap	*L	Weight
4	.35	3.0	6.0	27
6	.37	3.5	6.0	38
8	.39	3.5	6.0	59
10	.41	3.5	6.0	72
12	.43	3.5	6.0	92

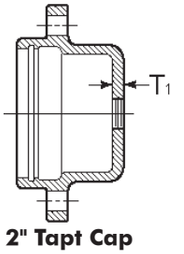
CAPS AND PLUGS



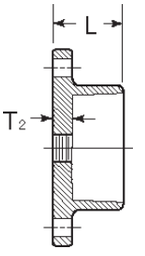
Solid Cap



Solid Plug



2" Tapt Cap



2" Tapt Plug

UT Caps and Plugs*

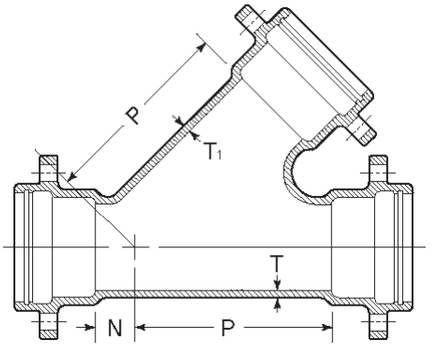
Size	T1	Dimensions T2	*L	Weights Cap	Plug
4	.48	.50	5.25	15	8
6	.48	.50	5.25	20	23
8	.51	.53	5.25	35	32
10	.53	.56	5.25	50	38
12	.55	.62	5.25	75	49

*Restraining lugs (ears) available.

TYLER UNION

UNION-TITE DUCTILE IRON C153 COMPACT FITTINGS

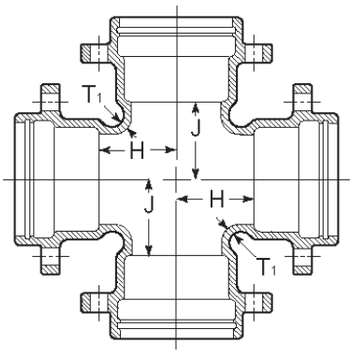
WYES



UT Wyes

Size	Dimensions T	T1	P	N	Weights
8x4	.39	.35	13.5	0.0	89
10x4	.41	.35	15.0	0.0	141
10x6	.41	.37	16.0	1.0	151
10x8	.41	.39	17.0	2.5	175
10	.41	.41	18.0	4.0	200
12x4	.43	.35	16.5	0.0	178
12x6	.43	.37	18.5	1.5	201
12x8	.43	.39	18.5	1.5	224
12x10	.43	.41	20.0	3.0	240
12	.43	.43	20.0	5.0	289
14x6	.51	.44	19.5	0.0	236
14x8	.51	.45	21.0	1.5	255
14x10	.51	.46	22.5	3.0	325
14	.51	.51	25.0	6.0	475
16x6	.52	.45	21.0	0.0	281
16x8	.52	.46	22.5	0.5	304
16x12	.52	.48	25.0	3.5	346
16	.52	.52	28.0	6.5	380

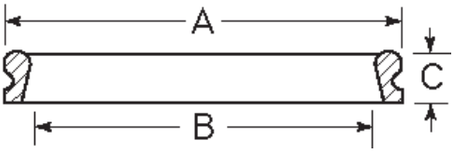
CROSSES



UT Crosses

Size	Dimensions T1	H	J	Weights
6	.37	6.0	6.0	88
8x6	.37	6.0	7.0	117
8	.39	7.0	7.0	156
10x4	.35	6.0	9.0	116
12x8	.39	8.0	10.0	240
12	.43	10.0	10.0	241
14x6	.44	6.5	10.5	189
14x8	.45	7.5	10.5	204
14x10	.46	8.5	10.5	222
14x12	.47	9.5	10.5	239
14	.51	10.5	10.5	270
16x6	.45	6.5	11.5	234
16x8	.46	7.5	11.5	323
16x10	.47	8.5	11.5	268
16x12	.48	9.5	11.5	274
16x14	.51	10.5	11.5	322
16	.52	11.5	11.5	317

TYTON® GASKETS



TYTON® JOINT IPS Transition and Regular Gasket

Size	Dimensions A	Transition (IPS) B(±1%)	Regular (Ductile) B*	C
4	5.74	4.18	4.68	1.00
6	7.86	6.31	6.73	1.10
8	10.15	8.32	8.85	1.29
10	12.10	10.30	10.87	1.36
12	14.31	12.70	12.95	1.45

NOTICE: Weights published in this catalog are for shipping purposes only. Actual weights may vary because some fittings are produced in both foundries. All fittings are made in the USA and meet the AWWA standards to which they are designed.

For weights of specific fittings, please contact your Tyler Union Waterworks representative.

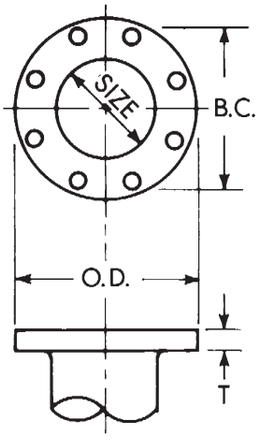
TYLER UNION

DUCTILE IRON C110 FLANGED FITTINGS

Sizes 3" thru 12" UL Listed for Fire Main Equipment

SAMPLE SPECIFICATION (Current ANSI/AWWA revisions apply)

Flanged fittings, 2" through 48" shall be manufactured of ductile Iron in accordance with all applicable terms and provisions of standards ANSI/AWWA C110/A21.10. Flange surfaces shall be faced and drilled in accordance with ANSI Class 125, B16.1. All ductile iron flanged fittings shall be rated for water pressure of 250 PSI. Flanged ductile-iron fittings in 24-in. (610 mm) and smaller sizes may be rated for 350 psi (2,413 kPa) with the use of special gaskets. NOTE: Fittings are cement lined and seal coated in accordance with ANSI/AWWA C104/A21.4. Fittings are also available prime coated, bare or epoxy coated. All coated fittings meet requirements of NSF-61, NSF-372, and Annex G. Interiors of fittings shall be lined and seal coated in accordance with ANSI/AWWA C104/A21.4. Cement mortor lining for ductile iron pipe and fittings for potable water unless otherwise specified. Installation of fittings shall be per AWWA C110.

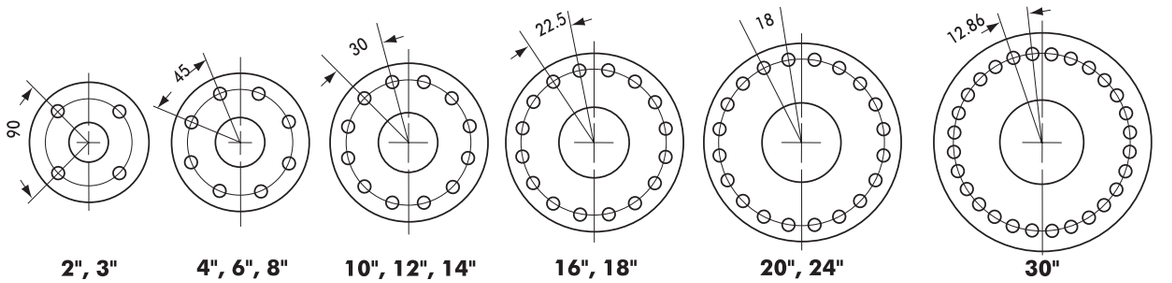


NOTE: No flange joint material furnished.

FLANGE DETAILS

Nominal Pipe Size Inch	Flange O.D.	Dia. of Bolt Circle	Flange Thickness T	Bolt Hole Diameter	Number of Bolts	Bolt Dia. and Lengths
2	6	4.75	.62	.75	4	⅝ x 2¼
3	7.5	6	.75	.75	4	⅝ x 2½
4	9	7.5	.94	.75	8	⅝ x 3
6	11	9.5	1.00	.875	8	¾ x 3½
8	13.5	11.75	1.12	.875	8	¾ x 3½
10	16	14.25	1.19	1.00	12	⅞ x 4
12	19	17	1.25	1.00	12	⅞ x 4
14	21	18.75	1.38	1.125	12	1 x 4½
16	23.5	21.25	1.44	1.125	16	1 x 4½
18	25	22.75	1.56	1.25	16	1⅛x 5
20	27.5	25	1.69	1.25	20	1⅛x 5
24	32	29.5	1.88	1.375	20	1¼ x 5½
30	38.75	36	2.12	1.375	28	1¼ x 6½
36	46	42.75	2.38	1.675	32	1½x7
42	53	49.50	2.62	1.625	36	1½x7½
48	59.50	56.00	2.75	1.625	44	1½x8

NOTE: Drilling templates are in multiples of four, so that fittings may be made to face in any quarter. Bolt holes shall straddle the center line.



2", 3" **4", 6", 8"** **10", 12", 14"** **16", 18"** **20", 24"** **30"**

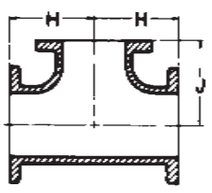
BENDS

Note: Base Bends are on page 33 and 34, reducing and long radius 90° bends are on page 33.

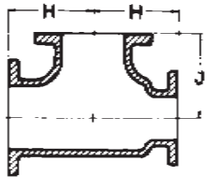
	90° Bends (1/4)			45° Bends (1/8)			22$^{1}/_{2}$° Bends (1/16)			11$^{1}/_{4}$° Bends (1/32)		
	Dimensions			Dimensions			Dimensions			Dimensions		
Size	R	A	Weight	R	A	Weight	R	A	Weight	R	A	Weight
2	3.0	4.5	14	...	...	...	...	...	...	...	...	...
3	4	5.5	26	3.62	3	20	7.56	3	22	15.25	3	20
4	4.5	6.5	44	4.81	4	36	10.06	4	35	20.31	4	40
6	6	8	67	7.25	5	57	15.06	5	64	30.5	5	56
8	7	9	115	8.44	5.5	105	17.62	5.5	90	35.5	5.5	90
10	9	11	164	10.88	6.5	131	22.62	6.5	130	45.69	6.5	130
12	10	12	236	13.25	7.5	196	27.67	7.5	194	55.81	7.5	193
14	11.5	14	330	12.06	7.5	245	25.12	7.5	250	50.75	7.5	245
16	12.5	15	478	13.25	8	315	27.62	8	315	55.81	8	315
18	14	16.5	527	14.5	8.5	422	30.19	8.5	402	60.94	8.5	385
20	15.5	18	878	16.88	9.5	485	35.19	9.5	505	71.06	9.5	505
24	18.5	22	1085	18.12	11	730	37.69	11	528	76.12	11	760
30	21.5	25	1755	27.75	15	1355	57.81	15	1385	116.75	15	1395
36	24.5	28	2135	35.00	18	1755	72.88	18	1790	147.25	18	1805
42	27.5	31	3055	42.25	21	2600	88.00	21	2665	177.69	21	2680
48	30.5	34	4095	49.50	24	3580	103.06	24	3665	208.12	24	3695

TYLER UNION

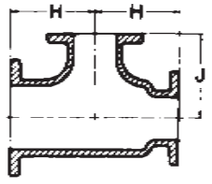
TEES, REDUCING TEES, CROSSES



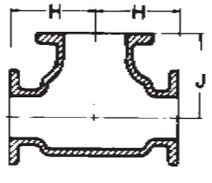
Straight Tees, Reducing on Branch Tees



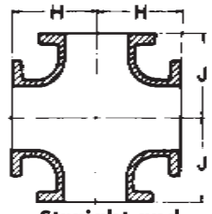
***Reducing on Run**



***Reducing on Run and Branch**



***Bullhead Tees**



Straight and Reducing Crosses

Size			Dimensions		Weights	
Run	Run	Branch	H	J	Tee	Cross
2	2	2	4.5	4.5	20	
3	3	2	5.5	5.5	35	...
3	3	3	5.5	5.5	42	51
4	3	3	6.5	5.5	53	...
*4	4	2	6.5	6.5	55	...
4	4	3	6.5	6.5	54	76
4	4	4	6.5	6.5	60	87
*4	4	6	8.0	8.0	88	...
*6	4	4	8.0	8.0	96	...
*6	4	6	8.0	8.0	100	...
*6	6	2	8.0	8.0	85	...
6	6	3	8.0	8.0	85	96
6	6	4	8.0	8.0	90	112
6	6	6	8.0	8.0	98	141
6	6	8	9.0	9.0	138	...
*8	6	4	9.0	9.0	130	...
*8	6	6	9.0	9.0	148	...
*8	6	8	9.0	9.0	154	...
8	8	3	9.0	9.0	128	140
8	8	4	9.0	9.0	155	155
8	8	6	9.0	9.0	148	172
8	8	8	9.0	9.0	179	195
*8	8	10	11.0	11.0	225	...
*8	8	12	12.0	12.0	277	...
*†10	6	6	13.0	13.0	278	...
*†10	6	10	13.0	13.0	308	...
*†10	8	6	13.0	13.0	298	...
*†10	8	8	13.0	13.0	278	...
*†10	8	10	13.0	13.0	325	...
10	10	4	11.0	11.0	239	220
10	10	6	11.0	11.0	215	242
10	10	8	11.0	11.0	254	294
10	10	10	11.0	11.0	265	330
10	10	12	12.0	12.0	337	...
*†12	6	6	14.0	14.0	346	...
*†12	6	8	14.0	14.0	362	...
*†12	8	6	14.0	14.0	355	...

Size			Dimensions		Weights	
Run	Run	Branch	H	J	Tee	Cross
*12	8	8	12.0	12.0	375	...
*12	8	12	12.0	12.0	420	...
*†12	10	6	14.0	14.0	390	...
12	10	8	12.0	12.0	400	...
12	10	10	12.0	12.0	420	...
12	10	12	12.0	12.0	440	...
12	12	4	12.0	12.0	322	310
12	12	6	12.0	12.0	297	326
12	12	8	12.0	12.0	346	351
12	12	10	12.0	12.0	394	415
12	12	12	12.0	12.0	369	438
*14	14	4	14.0	14.0	410	...
14	14	6	14.0	14.0	420	450
14	14	8	14.0	14.0	435	475
14	14	10	14.0	14.0	450	...
14	14	12	14.0	14.0	470	555
14	14	14	14.0	14.0	500	595
*16	16	4	15.0	15.0	525	...
16	16	6	15.0	15.0	573	565
16	16	8	15.0	15.0	555	590
16	16	10	15.0	15.0	565	620
16	16	12	15.0	15.0	590	665
16	16	14	15.0	15.0	610	...
16	16	16	15.0	15.0	635	755
18	18	6	13.0	15.5	780	...
18	18	8	13.0	15.5	609	...
18	18	10	13.0	15.5	585	...
18	18	12	13.0	15.5	638	706
18	18	14	16.5	16.5	808	...
18	18	16	16.5	16.5	760	...
18	18	18	16.5	16.5	865	915

* Not included in AWWA C110
† H and J dimensions are two-inches longer than straight tees.

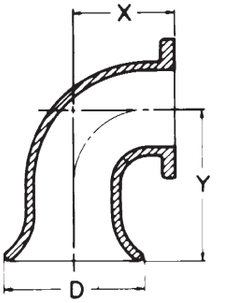
TYLER UNION

TEES, REDUCING TEES, CROSSES (Con't)

Size			Dimensions			Weights
Run	Run	Branch	H	J	Tee	Cross
20	20	6	14.0	17.0	773	...
20	20	8	14.0	17.0	720	...
20	20	10	14.0	17.0	735	...
20	20	12	14.0	17.0	816	820
20	20	14	14.0	17.0	770	...
20	20	16	18.0	18.0	950	1065
20	20	18	18.0	18.0	965	...
20	20	20	18.0	18.0	1005	1175
24	24	6	15.0	19.0	1089	...
24	24	8	15.0	19.0	1060	...
24	24	10	15.0	19.0	1020	...
24	24	12	15.0	19.0	1125	1100
24	24	14	15.0	19.0	1050	1125
24	24	16	15.0	19.0	1070	1160
24	24	18	22.0	22.0	1534	...
24	24	20	22.0	22.0	1510	1695
24	24	24	22.0	22.0	1685	1850
*30	30	6	18.0	23.0	1725	...
30	30	12	18.0	23.0	1801	...
30	30	18	18.0	23.0	1852	...
30	30	24	25.0	25.0	2475	2695
30	30	30	25.0	25.0	2615	2985
36	36	24	20.0	26.0	2255	...
36	36	30	28.0	28.0	3000	...
36	36	36	28.0	28.0	3160	6740
42	42	24	23.0	30.0	3245	...
42	42	30	31.0	31.0	4125	...
42	42	36	31.0	31.0	5360	...
42	42	42	31.0	31.0	5580	...
48	48	24	26.0	34.0	4385	...
48	48	30	26.0	34.0	4455	...
48	48	36	34.0	34.0	5555	...
48	48	42	34.0	34.0	7195	...
48	48	48	34.0	34.0	7385	...

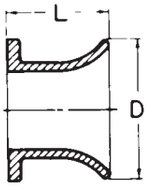
* Not included in AWWA

FLANGE AND FLARE



***Flange and Flare 90° Ell**

	Dimensions			
Size	D	X	Y	Weight
3	7.5	5.5	8.5	26
4	9.0	6.5	9.5	39
6	11.0	8.0	12.0	73
8	13.5	9.0	13.0	110
10	16.0	11.0	15.0	171
12	19.0	12.0	16.0	253
14	21.0	14.0	22.0	450
16	23.5	15.0	23.0	545
18	25.0	16.5	24.5	675
20	27.5	18.0	26.0	860
24	32.0	22.0	30.0	1195
30	38.8	25.0	38.0	2070
36	48.0	28.0	38.0	2900

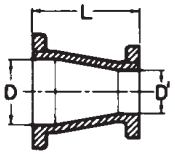


***Flange and Flare Piece**

	Dimensions		
Size	D	L	Weight
3	7.25	8	21
4	9.00	8	30
6	11.00	8	44
8	13.50	10	75
10	16.00	10	113
12	19.00	12	155
14	21.00	16	225
16	23.50	16	330
18	25.00	16	355
20	27.50	18	465
24	32.00	18	598
30	38.75	24	900
36	46.00	24	1200

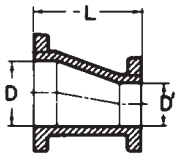
*Flange by Flare not included in AWWA C110

REDUCERS



Concentric Reducer

Size D	Size D1	Dimensions L	Wts
3	2	6	17
4	2	7	23
4	3	7	29
6	2	9	30
6	3	9	44
6	4	9	46
6	5	9	56
8	3	11	61
8	4	11	63
8	5	11	70
8	6	11	75
10	4	12	98
10	6	12	107
10	8	12	116
12	4	14	119
12	6	14	130
12	8	14	152
12	10	14	178
14	6	16	165
14	8	16	185
14	10	16	205
14	12	16	235
16	6	18	210
16	8	18	230
16	10	18	255
16	12	18	285
16	14	18	315
18	8	19	265
18	10	19	290
18	12	19	320
18	14	19	350
18	16	19	405
20	10	20	418
20	12	20	465
20	14	20	430
20	16	20	445
20	18	20	470
24	12	24	608
24	14	24	565
24	16	24	610
24	18	24	645
24	20	24	695
30	16	30	945
30	18	30	970
30	20	30	1144
30	24	30	1155
42	24	42	1810
42	30	42	2060
42	36	42	2345
48	30	48	2615
48	36	48	2940
48	42	48	3320



***Eccentric Reducer**

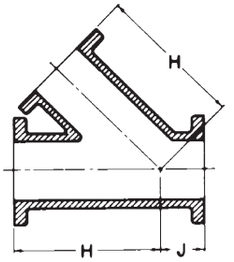
Size D	Size D1	Dimensions L	Wts
4	3	7	30
6	3	9	45
6	4	9	52
8	4	11	70
8	6	11	80
10	4	12	95
10	6	12	98
10	8	12	123
12	4	14	120
12	6	14	135
12	8	14	149
12	10	14	177
14	6	16	165
14	8	16	185
14	10	16	205
14	12	16	294
16	6	18	210
16	8	18	230
16	10	18	255
16	12	18	285
16	14	18	315
18	8	19	265
18	10	19	290
18	12	19	306
18	14	19	350
18	16	19	385
20	10	20	350
20	12	20	370
20	14	20	402
20	16	20	449
20	18	20	455
24	12	24	535
24	14	24	570
24	16	24	614
24	18	24	645
24	20	24	695
30	16	30	778
30	18	30	810
30	20	30	870
30	24	30	970
36	24	36	1425
36	30	36	2120
42	24	42	2340
42	30	42	2060
42	36	42	2345
48	30	48	2625
48	36	48	2950
48	42	48	3320

NOTE: Eccentric Reducers not included in AWWA C110

NOTE: Eccentric Reducers Offset
1/2 D minus 1/2 D1 = Offset
Example:
6x3 Ecc.Reducer
3-1½ = 1½" Offset

TYLER UNION

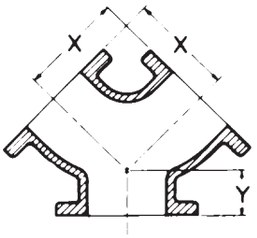
* WYES/LATERALS



*45° Wye

Size Run	Size Branch	Dimensions H	J	Weight
3	3	10	3	49
4	3	12	3	68
4	4	12	3	76
6	4	14.5	3.5	106
6	6	14.5	3.5	131
8	4	17.5	4.5	153
8	6	17.5	4.5	188
8	8	17.5	4.5	201
10	4	20.5	5	232
10	6	20.5	5	288
10	8	20.5	5	333
10	10	20.5	5	300
12	4	24.5	5.5	355
12	6	24.5	5.5	370
12	8	24.5	5.5	395
12	10	24.5	5.5	420
12	12	24.5	5.5	460
14	6	27	6	500
14	8	27	6	525
14	10	27	6	555
14	12	27	6	600
14	14	27	6	640
16	6	30	6.5	655
16	8	30	6.5	680
16	10	30	6.5	715
16	12	30	6.5	755
16	14	30	6.5	800
16	16	30	6.5	850
18	8	32	7	820
18	10	32	7	855
18	12	32	7	1003
18	14	32	7	940
18	16	32	7	990
18	18	32	7	1035
20	10	35	8	1095
20	12	35	8	1130
20	14	35	8	1170
20	16	35	8	1220
20	20	35	8	1345
24	24	40.5	9	2020
36	36	60	19.5	5740

* Not included in AWWA C110

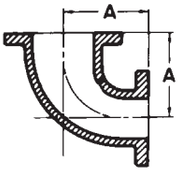


*True Wye

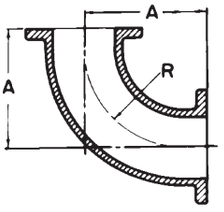
Size Stem	Size Branch	Dimensions X	Y	Weight
4	4	6.5	3.0	49
6	4	8.0	3.5	75
6	6	8.0	3.5	84
8	6	9.0	4.5	134
8	8	9.0	4.5	125
10	6	8.0	5.0	140
10	8	9.0	5.0	155
10	10	11.0	5.0	220
12	8	9.0	5.5	210
12	10	11.0	5.5	240
12	12	12.0	5.5	315
16	16	15.0	6.5	520

* Not included in AWWA C110

*BENDS



*90° Reducing Bend (1/4)

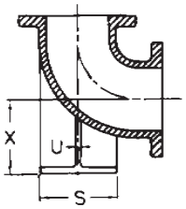


*90° Long Radius Bend (1/4)

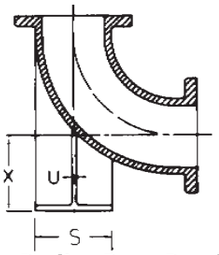
Dimensions Size	A	Weight	Size	Dimensions R	A	Weight
4x3	6.5	35	3	6.25	7.75	32
6x4	8.0	65	4	7	9	46
8x4	9.0	88	6	9.5	11.5	83
8x6	9.0	96	8	14	14	140
10x6	11.0	126	10	16.5	16.5	252
10x8	10.0	151	12	17	19	310
12x6	12.0	172	14	19	21.5	475
12x8	12.0	191	16	21.5	24	630
12x10	12.0	218	18	.....	26.5	840
14x6	14.0	230	20	.....	29	1080
14x8	14.0	240	24	.....	34	1640

* Not included in AWWA C110

*BASE BENDS

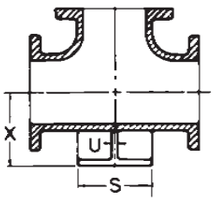


90° Base Bend (1/4)



*90° Long Radius Base Bend (1/4)

BASE TEES



Base Tees

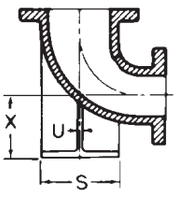
Base Bends are made to order only, not returnable. Bases are furnished faced and drilled.

Size	Dimensions X	S	U	Support Pipe Size	Weight 90°	90°LR	Tee
3	4.88	5	.50	1.5	38	41	47
4	5.50	6	.50	2.0	50	60	76
6	7.00	7	.62	2.5	83	100	115
8	8.38	9	.88	4.0	142	180	195
10	9.75	9	.88	4.0	210	315	315
12	11.25	11	1.00	6.0	300	427	450
14	12.50	11	1.00	6.0	400	580	570
16	13.75	11	1.00	6.0	505	740	710
18	15.00	13.5	1.12	8.0	645	...	900
20	16.00	13.5	1.12	8.0	805	...	1125
24	18.50	13.5	1.12	8.0	1215	...	1927
30	23.00	16	1.15	10.0	1945	...	...
36	26.00	19	1.15	10.0	2395	2895	...

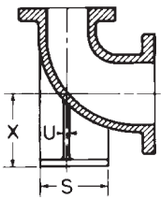
* Not included in AWWA C110

TYLER UNION

* REDUCING BASE BENDS



Base Under Large End

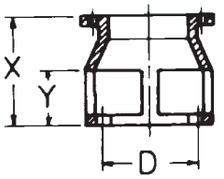


Base Under Small End

Size	Dimensions X	S	U	Weight
4x3	5.5	6	.50	45
6x4	7	7	.62	75
8x4	8.38	9	.88	118
8x6	8.38	9	.88	135
10x6	9.75	9	.88	175
10x8	9.75	9	.88	184
12x6	11.25	11	1.00	230
12x8	11.25	11	1.00	255
12x10	11.25	11	1.00	285

* Not included in AWWA C110
NOTE: "X" dimensions are identical on Base-under-large-end and Base-under-small-end. "S" dimensions are determined by the largest fitting opening.

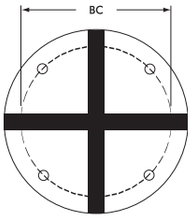
* FLANGE SLUDGE SHOE



Flange Sludge Shoe

Size	Dimensions D	X	Y	Weight
3	5.75	12	6	28
4	7.00	12	6	35
6	7.87	12	6	45
8	10.12	12	6	69
10	12.25	12	6	88
12	15.25	12	6	120

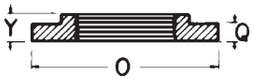
* Not included in AWWA C110



Base Drilling Details

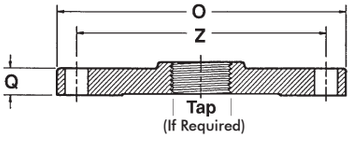
Nom. Diameter Inches	Dimensions - Inches BC	Bolt Hole Diameter	Number of Bolts
3	3.88	5/8	4
4	4.75	3/4	4
6	5.50	3/4	4
8	7.50	3/4	4
10	7.50	3/4	4
12	9.50	7/8	4
14	9.50	7/8	4
16	9.50	7/8	4
18	11.75	7/8	4
20	11.75	7/8	4
24	11.75	7/8	4
30	14.25	1	4
36	17.00	1	4
42	21.25	1-1/8	4
48	22.75	1-1/4	4

FLANGES (COMPANION FLG)

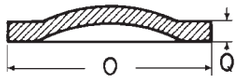


Flange for Steel Pipe
Reducing Flange for Steel Pipe

Flange for DI Pipe
Reducing Flange for DI Pipe



Under 12" Blind Flange
With Optional 2" Taps



12" and Larger Blind Flange
With Optional 2" Taps

Size	Dimensions O	Q	Y	Z	Weight Steel	DI	Blind	Blind Tap
2	6	.62	1	4.75	4	...	...	...
2½	7	.69	1.13	5.50	8	...	...	...
3	7.5	.75	1.19	6.00	7	6	8	8
4	9	.94	1.31	7.50	12	11	15	15
6	11	1.00	1.56	9.50	21	14	28	28
8	13.5	1.12	1.75	11.75	28	34	45	45
10	16	1.19	1.94	14.25	49	33	62	62
12	19	1.25	2.19	...	61	52	72	87
14	21	1.38	2.25	...	...	72	110	110
16	23.5	1.44	2.50	...	...	90	165	165
18	25	1.56	2.69	...	...	105	192	190
20	27.5	1.69	2.88	...	...	115	249	250
24	32	1.88	3.25	...	...	160	375	370
30	38.75	2.12	...	...	...	255	580	580
36	46.00	2.38	...	...	...	...	790	...
42	53.00	2.62	...	...	...	...	1175	...
48	59.50	2.75	...	...	...	...	1585	...

NOTE: All flanges conform to ANSI/AWWA C110/A21.10 Standards.

DI Reducing Flange Threaded For Steel Pipe

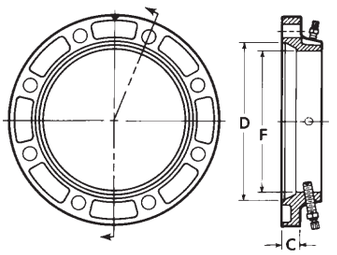
Size	Tap x O.D.	Weight
4x3	3x9	16
6x4	4x11	25
8x4	4x13½	44
8x6	6x13½	31
10x6	6x16	50
12x6	6x19	60
10x8	8x16	55
12x10	10x19	72

DI Reducing Flange Threaded For Cast Iron Pipe

Size	Tap x O.D.	Weight
4x3	3x9	16
6x4	4x11	25
8x4	4x13½	40
8x6	6x13½	35
10x8	8x16	50
12x8	8x19	85

TYLER UNION

ADAPTER FLANGES (EZ OR UNI)



See Index for Installation Instructions

Size	Rated Working Pressure	No. of Set Screws	Bolt Circle	No. of Bolt & Nuts	Size of Bolt	Bolt Hole Dia.
3	250	4	6.00	4	5/8x2 1/2	3/4
4	250	4	7.50	8	5/8x3	3/4
6	250	8	9.50	8	3/4x3 1/2	7/8
8	250	8	11.75	8	3/4x3 1/2	7/8
10	250	12	14.25	12	7/8x4	1
12	150	12	17.00	12	7/8x4	1

DUCTILE IRON ADAPTER FLANGE

Size	Ductile Iron Pipe OD +.06 or -.06	D +.06 -.04	F +.07 -.03	C	Weight
3	3.96	4.94	4.06	.94	7
4	4.80	6.02	4.90	1.00	10
6	6.90	8.12	7.00	1.06	14
8	9.05	10.27	9.15	1.12	22
10	11.10	12.34	11.20	1.19	30
12	13.20	14.44	13.30	1.25	40

All set screws are 5/8" 80 lb. torque head.

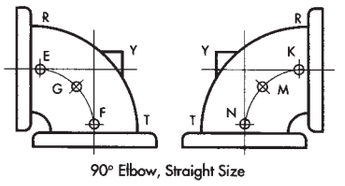
Wall Thickness Note: Recommended for Ductile Iron Pipe Class 53 thru Class 56.

**LOCATION OF TAPPED HOLES FOR DRAINS AWWA C110 Flanged Fittings

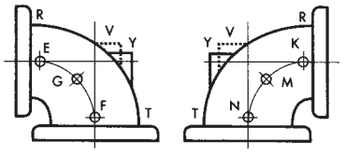
Fittings can be supplied with taps sized and located to ANSI B16.1 and MSS-SP-45. Specify fitting size, tap location by letter (refer to drawings) and tap size by NPT dimension, on order.

NOTE:
A BOSS IS ALWAYS REQUIRED AT "Y" OR "V" ON STRAIGHT AND REDUCING SIZES OF 90-DEGREE ELBOWS, AND ON TAPERED SIDES OF REDUCERS.

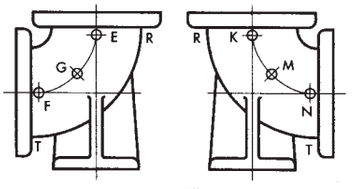
Fitting Size	Maximum Tap Without Boss
3"	1/2"
4" - 6"	3/4"
8"	1-1/4"
10" - 16"	1-1/2"
18" - 36"	2"



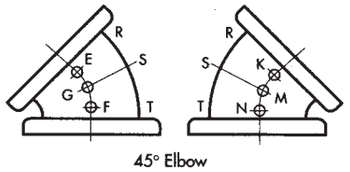
90° Elbow, Straight Size



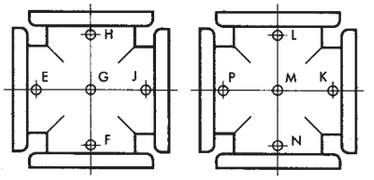
90° Elbow, Reducing Size



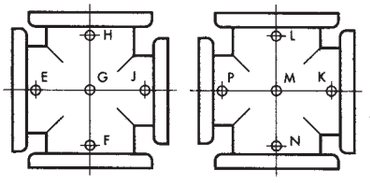
90° Base Elbow



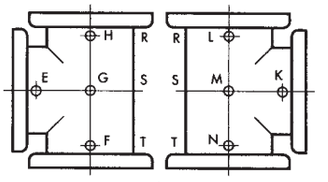
45° Elbow



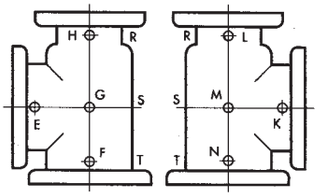
Cross, Straight Size



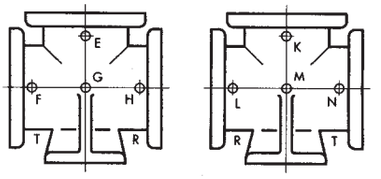
Cross, Reducing Size



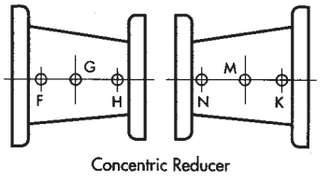
Tee, Straight Size



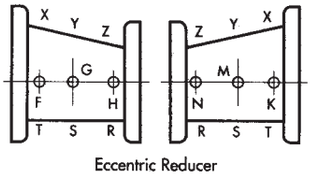
Tee, Reducing Size



Base Tee



Concentric Reducer



Eccentric Reducer

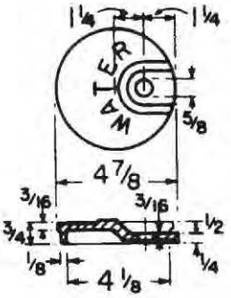
ADDER for Tapping & Extra Heavy 250 Class Flange Policy:
For pricing of tapped outlets, tapped for studs, and extra heavy 250 Class C110 flanged fittings; refer to List Price Guide or consult your Tyler Union Inside Sales Representative for current pricing and more details.

****NOTE:** For additional tapping options contact the Tyler Union Waterworks Inside Sales Representative for your State.**

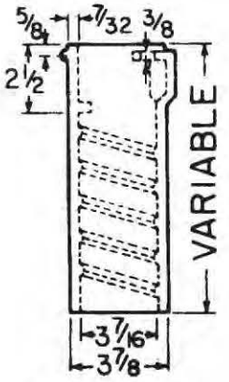
TYLER UNION

CAST IRON SERVICE BOXES, ADJUSTABLE

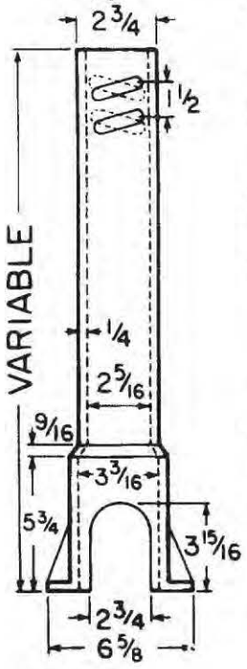
Accommodates 2" through 1¼" curbstops; enlarged base
Accommodates 2" curbstops; 2½" shaft - screw type



Lid



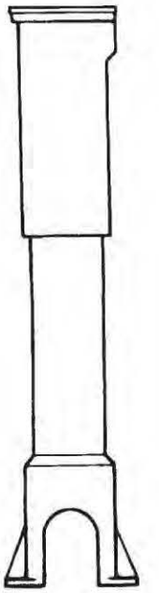
Top



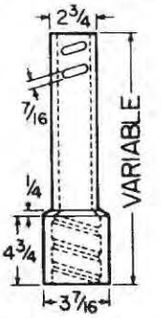
Bottom

6500 SERIES, SCREW TYPE WITH WATER LID

Box (Compoents)	UPCode 67610	Ship Code	Extension In Inches	Weight
89-A (12T & 12B)	146681	S	15-21	20
90-B (12T & 15B)	146742	S	18-24	21
90-C (15T & 15B)	146803	S	21-27	22
91-C (15T & 21B)	146865	S	24-33	24
92-C (15T & 27B)	146926	S	30-39	26
92-D (18T & 27B)	146988	S	30-42	28
93-D (18T & 33B)	147046	S	36-48	32
93-E (24T & 33B)	147114	S	36-54	37
94-E (24T & 39B)	147183	S	42-60	41
95-E (30T & 39B)	147251	S	41-64	44
100-E (24T & 21B & #154 Ext)	147312	S	54-72	50
100-F (30T & 21B & #154 Ext)	147381	S	54-78	53
101-F (30T & 27B & #154 Ext)	147459	S	60-84	55



Box Assembled

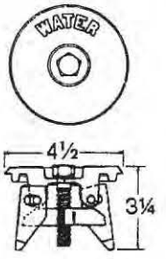


TOP SECTION WITH WATER LID

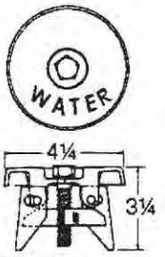
Item	UPCode 67610	Ship Code	Weight
12T	147510	S	11
15T	147589	S	12
18T	147640	S	14
24T	147701	S	19
30T	147763	S	22

BOTTOM ONLY

Item	UPCode 67610	Ship Code	Weight
12B	144670	S	9
15B	144687	S	10
21B	144694	S	12
27B	144700	S	14
33B	144717	S	18
39B	144724	S	22



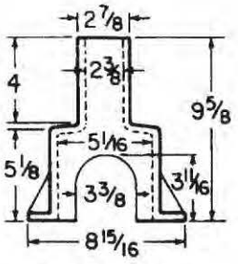
(Old Style) Repair Lid



(Outside Cover) Repair Lid

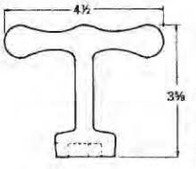
EXTENSION

Item	Height Increase
151	9
152	16
153	28
154	30

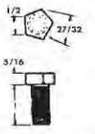


ENLARGED BASE
For 2" Curbstop

Item	Height Increase
6500	6"



Wrench



Brass Screw
Std. WW Pentagon

6500 SERIES PARTS

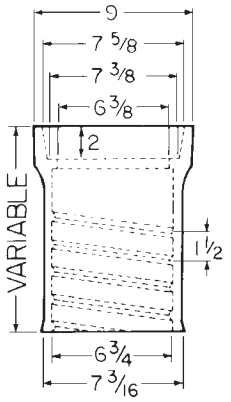
Item	UPCode 67610	Ship Code	Wt.
151 Ext	144762	S	7.0
152 Ext	144779	5	12.0
153 Ext	144786	S	17.0
154 Ext	144793	S	19.0
Enlarged Base	144809	S	8.0
2½" "Water Lid"	144830	S	1.0
Brass Screw (Std. WW Pentagon)	144816	S	...
Wrench (Std. WW Pentagon)	144908	S	0.5
2½" "Repair Lid Old"	144915	S	4.5
2½" "Repair Lid Outside Cover"	381518	S	4.5

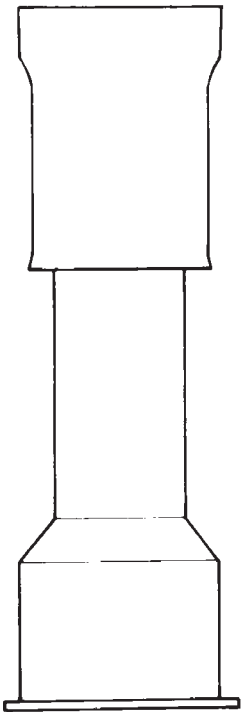
TYLER UNION®

**6850 SERIES
CAST IRON TWO-PIECE VALVE BOXES
for 4" through 12" valves, 5 1/4" shaft, screw-type

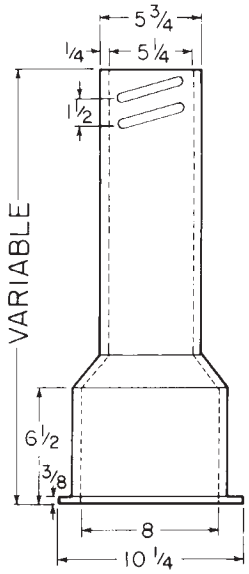
TYLER UNION valve boxes are available either pre-assembled or as individual tops and bottoms. For assembled boxes, The UPC codes shown represent a combination of one top and one bottom in the sizes shown. For unassembled boxes, the UPC code represents only a top or a bottom, not a complete box. Therefore, unassembled boxes require ordering tops and bottoms separately.

****NOTE: Domestic Valve Boxes available in Heavy Duty Only**
Non-Domestic available in Standard or Heavy Duty





Box Assembled
(Less Lid)



Box (Components)	Extension Height	*(D-HD)UPCode 670610	*(ND-HD)UPCode 670610	Wt	*(ND-Std.)UPCode 670610	Wt
461-S (10T + 15B)	19-22	145776	502098	50	112280	35
462-S (10T + 24B)	27-32	145783	502104	58	112297	43
562-S (16T + 24B)	27-37	145790	502111	71	112303	50
563-S (16T + 30B)	33-43	145752	-----	78	112310	60
564-S (16T + 36B)	39-50	145806	502128	85	112327	66
662-S (26T + 30B)	36-52	145769	----	93	112341	76
664-S (26T + 36B)	39-60	145813	----	100	112358	82
665-S (26T + 24B)	39-63	375296	----	87	---	---
666-S (26T+24B+60 Ext)	53-71	145820	502135	128	112365	95
668-S (26T+36B+60 Ext)	64-82	145837	----	136	112372	111

NOTE: D=Domestic ND=Non-Domestic HD=Heavy Duty Weight Std.=Standard Weight

Lids marked "WATER" will ship unless otherwise specified:
Also available 5¼" Drop Lids"
1)WATER OMA 2)SEWER 3)MWW
4)PLAIN 5)GAS 6)REUSE
Note: Special Lettering Available
Contact Tyler Union for
Setup Charge

TYLER UNION®

6850 SERIES
CAST IRON TWO-PIECE VALVE BOXES
for 4" through 12" valves, 5 1/4" shaft, screw-type

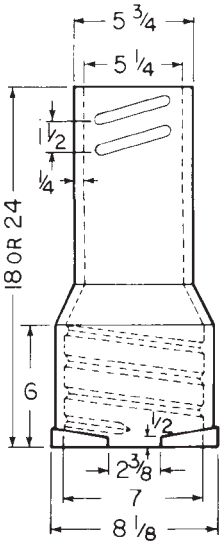
SEPARATE UPCODES for VALVE BOX TOPS ONLY (Less Lids)

Box	TOP Length	**(D-HD) UPCode 670610	Wt	**(ND-HD) UPCode 670610	Wt	**(ND-Std.) UPCode 670610	Wt
461-S	(10T)	144939	22	502142	22	112402	15
462-S	(10T)	144939	22	502142	22	112402	15
562-S	(16T)	144946	36	502159	36	112419	22
563-S	(16T)	144946	36	502159	36	112419	22
564-S	(16T)	144946	36	502159	36	112419	22
662-S	(26T)	144953	51	502166	51	112426	38
664-S	(26T)	144953	51	502166	51	112426	38
666-S	(26T)	144953	51	502166	51	112426	38
668-S	(26T)	144953	51	502166	51	112426	38

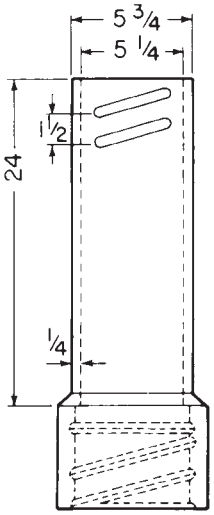
**NOTE: D=Domestic ND=Non-Domestic HD=Heavy Duty Weight Std.=Standard Weight

EXTENSIONS

Item/Description	Height Increase	**(D-HD) UPCode 670610	Wt	**(ND-Std.) UPCode 670610	Wt
#58 Screw-Type	14	145141	29	---	---
#59 Screw-Type	18	145158	30	---	---
#60 Screw-Type	24	145059	37	112389	29



58 and 59 Extension



60 Extension

SEPARATE UPCODES for VALVE BOX BOTTOMS ONLY

Box	Bottom Length	**(D-HD)UPCode 670610	Wt	**(ND-HD)UPCode 670610	Wt	**(ND-Std.)UPCode 670610	Wt
461-S	(15B)	145004	27	502173	27	112242	20
462-S	(24B)	145011	35	502180	35	112259	28
562-S	(24B)	145011	35	502180	35	112259	28
563-S	(30B)	144991	42	502197	42	112266	38
564-S	(36B)	145028	49	502203	49	112273	44
662-S	(30B)	144991	42	502197	42	112266	38
664-S	(36B)	145028	49	502203	49	112273	44
666-S	(24B)	145011	35	502180	35	112259	28
668-S	(36B)	145028	49	502203	49	112273	44
	(48B)	---	---	---	---	452737	62
	(60B)	---	---	---	---	452744	85

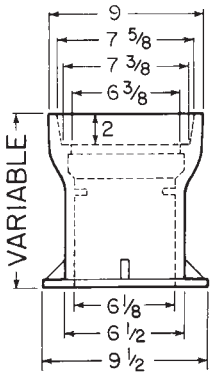
**Note: D=Domestic ND=Non-Domestic HD=Heavy Duty Weight Std.=Standard Weight

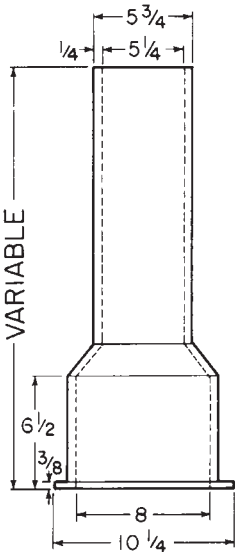
TYLER UNION®

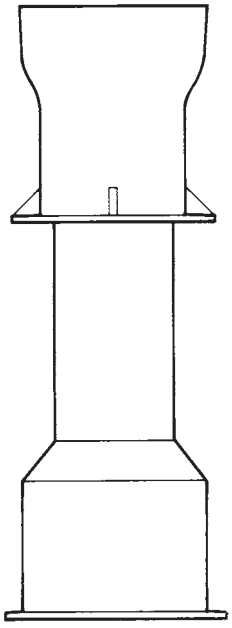
6855 SERIES
CAST IRON TWO-PIECE VALVE BOXES
for 4" through 12" valves, 5 1/4" shaft, slip-type

TYLER UNION valve boxes are available either pre-assembled or as individual tops and bottoms. For assembled boxes, The UPC codes shown represent a combination of one top and one bottom in the sizes shown. For unassembled boxes, the UPC code represents only a top or a bottom, not a complete box. Therefore, unassembled boxes require ordering tops and bottoms separately.

****NOTE: Domestic Valve Boxes available in Heavy Duty Only**
Non-Domestic available in Standard or Heavy Duty







Box Assembled
(Less Lid)

Box (Components)	Extension Height	*(D-HD)UPCode 670610	*(ND-HD)UPCode 670610	Wt	*(ND-Std.)UPCode 670610	Wt
461-A (10T + 15B)	19-22	145844	502234	55	112099	34
462-A (10T + 24B)	27-32	145831	----	65	112105	46
562-A (16T + 24B)	27-37	145868	502241	72	112112	55
563-A (16T + 30B)	33-43	145714	----	81	112129	67
564-A (16T + 36B)	39-50	145875	502258	83	112136	72
662-A (26T + 30B)	36-52	145721	----	97	112143	83
664-A (26T + 36B)	39-60	145882	502265	99	112150	88
666-A (26T+24B+60 Ext)	53-71	145899	----	124	112167	108
668-A (26T+36B+60 Ext)	64-82	145905	----	135	112181	125

NOTE: D=Domestic ND=Non-Domestic HD=Heavy Duty Weight Std=Standard Weight

Lids marked "WATER" will ship unless otherwise specified:
Also available 5¼" Drop Lids"
1)WATER OMA 2)SEWER 3)MWW
4)PLAIN 5)GAS 6)REUSE
Note: Special Lettering Available
Contact Tyler Union for Setup Charge

TYLER UNION®

6855 SERIES
CAST IRON TWO-PIECE VALVE BOXES
for 4" through 12" valves, 5 1/4" shaft, slip-type

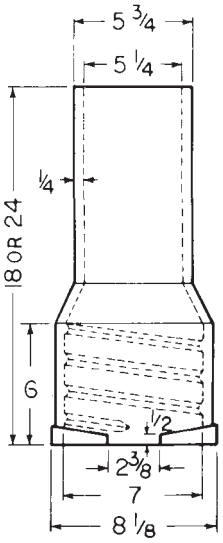
SEPARATE UPCODES for VALVE BOX TOPS ONLY (Less Lids)

Box	TOP Length	**(D-HD) UPCode 670610	Wt	**(ND-HD) UPCode 670610	Wt	**(ND-Std.) UPCode 670610	Wt
461-A	(10T)	144960	29	502272	29	112211	15
462-A	(10T)	144960	29	502272	29	112211	15
562-A	(16T)	144977	36	502289	36	112228	25
563-A	(16T)	144977	36	502289	36	112228	25
564-A	(16T)	144977	36	502289	36	112228	25
662-A	(26T)	144984	52	502296	52	112235	38
664-A	(26T)	144984	52	502296	52	112235	38
666-A	(26T)	144984	52	502296	52	112235	38
668-A	(26T)	144984	52	502296	52	112235	38

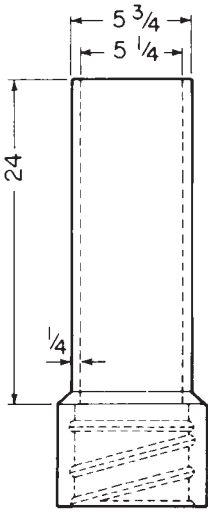
**NOTE: D=Domestic ND=Non-Domestic HD=Heavy Duty Weight Std=Standard Weight

EXTENSIONS

Item/Description	Height Increase	**(D-HD) UPCode 670610	Wt	**(ND-Std.) UPCode 670610	Wt
#58-A Slip-Type	6 to 14	145233	29	136637	26
#59-A Slip-Type	6 to 18	145240	30	136644	28
#60-A Slip-Type	6 to 24	145066	36	112198	37



58-A and 59-A Extension



60-A Extension

SEPARATE UPCODES for VALVE BOX BOTTOMS ONLY

Box	Bottom Length	**(D-HD) UPCode 670610	Wt	**(ND-HD) UPCode 670610	Wt	**(ND-Std.) UPCode 670610	Wt
461-A	(15B)	145073	26	502302	26	112051	20
462-A	(24B)	145080	36	502319	36	112068	30
562-A	(24B)	145080	36	502319	36	112068	30
563-A	(30B)	145127	45	502333	45	112075	39
564-A	(36B)	145097	47	502340	47	112082	43
662-A	(30B)	145127	45	502333	45	112075	39
664-A	(36B)	145097	47	502340	47	112082	43
666-A	(24B)	*145080	36	*502319	36	*112068	30
668-A	(36B)	*145097	47	*502240	47	*112082	43
	(60B)	---	---	---	---	458302	75

**NOTE: D=Domestic ND=Non-Domestic HD=Heavy Duty Weight Std=Standard Weight

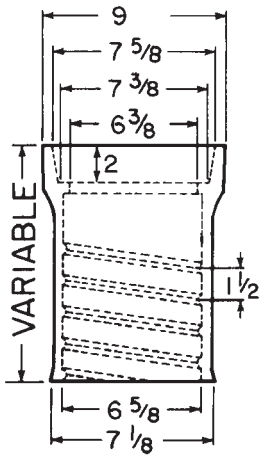
***NOTE: Whe installing thes extensions a 6850 screw type bottom is required**

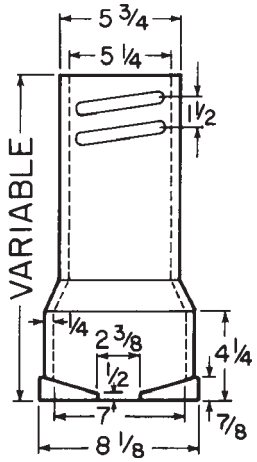
TYLER UNION®

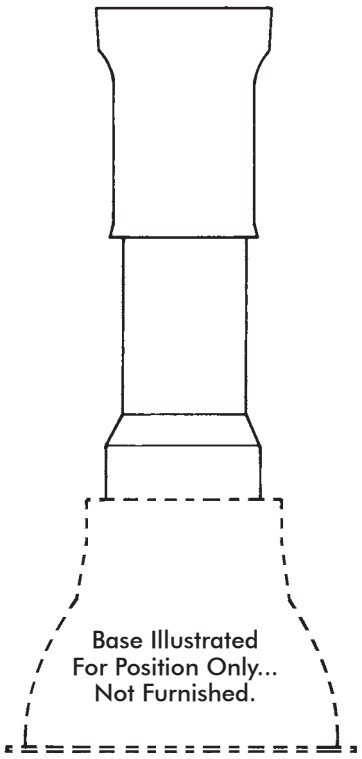
6860 SERIES
CAST IRON THREE-PIECE VALVE BOXES
for 3" through 20" valves, 5 1/4" shaft, screw-type
*****(Base required, order separately)**

TYLER UNION valve boxes are available either pre-assembled or as individual tops and bottoms. For assembled boxes, The UPC codes shown represent a combination of one top and one bottom in the sizes shown. For unassembled boxes, the UPC code represents only a top or a bottom, not a complete box. Therefore, unassembled boxes require ordering tops and bottoms separately.

****NOTE: Domestic Valve Boxes available in Heavy Duty Only**
Non-Domestic available in Standard or Heavy Duty







Box Assembled
(Less Lid)

Box (Components)	Extension Height	*(D-HD)UPCode 670610	*(ND-HD)UPCode 670610	Wt	*(ND-Std.)UPCode 670610	Wt
AA (10T + 12B)	27-37	145912	----	42	136668	29
A (16T + 18B)	33-42	145929	----	65	136651	38
B (16T + 24B)	39-49	145936	----	69	136675	51
C (16T + 30B)	45-54	145943	----	73	136682	55
CC (16T + 36B)	51-60	145950	----	75	136699	59
D (26T + 30B)	45-66	145967	502357	88	136811	71
DD (26T + 36B)	51-72	145974	502364	90	136828	75
E (16T+24B+60 Ext)	63-72	145981	----	105	136835	80
F (26T+24B+60 Ext)	63-84	145998	----	120	136842	96
G (26T+36B+60 Ext)	74-94	146001	502371	126	136859	104

Lids marked "WATER" will ship unless otherwise specified:
Also available 5¼" Drop Lids"
1)WATER OMA 2)SEWER 3)MWW
4)PLAIN 5)GAS 6)REUSE
Note: Special Lettering Available
Contact Tyler Union for
Setup Charge

*NOTE: D=Domestic ND=Non-Domestic HD=Heavy Duty Weight Std=Standard Weight
***NOTE: Base Selection Guide (#4 Base for 6" valves or less) (#6 Base for 12" valves or less) (#160 Base for 24" valves or less)

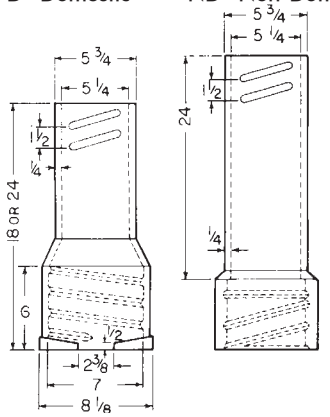
TYLER UNION®

6860 SERIES
CAST IRON THREE-PIECE VALVE BOXES
for 3" through 20" valves, 5 1/4" shaft, screw-type
(Base required, order separately)

SEPARATE UPCODES for VALVE BOX TOPS ONLY (Less Lids)

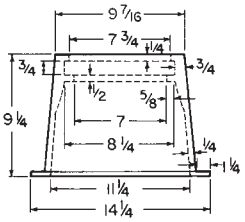
Box	TOP Length	**(D-HD) UPCode 670610	Wt	**(ND-HD) UPCode 670610	Wt	**(ND-Std.) UPCode 670610	Wt
AA	(10T)	144939	23	502142	23	112402	15
A	(10T)	144939	23	502142	23	112402	15
B	(16T)	144946	36	502159	36	112419	22
C	(16T)	144946	36	502159	36	112419	22
CC	(16T)	144946	36	502159	36	112419	22
D	(26T)	144953	51	502166	52	112426	38
DD	(26T)	144953	51	502166	52	112426	38
E	(16T)	144946	36	502159	36	112419	22
F	(26T)	144953	51	502166	52	112426	38
G	(26T)	144953	51	502166	52	112426	38

**NOTE: D=Domestic ND=Non-Domestic HD=Heavy Duty Weight Std.=Standard Weight

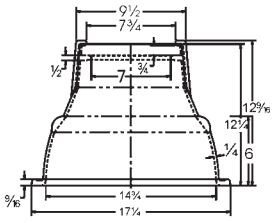


58 and 59 Extension

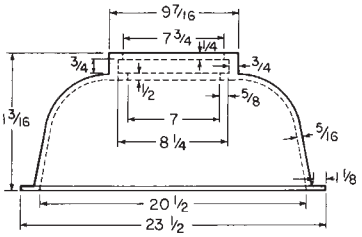
60 Extension



#4 Base



#6 Base (Standard)



#160 Base

EXTENSIONS

Item/Description	UPCode 670610	Height Increase	Wt
#58 Screw-Type	145141	14	29
#59 Screw-Type	145158	18	30
#60 Screw-Type	145059	24	37
#60 Screw-Type	*112389	24	29
#60 Screw-Type	* Call	24	36

*Non-Domestic

BASES

Item/Description	*(D-HD)UPCode 670610	*(ND)UPCode 670610	Wt	*(ND-Std)UPCode 670610	Wt
#4, 11¼" Wide	145653	----	34	381532	22
#6, 14¾" Wide	145660	----	45	381525	36
#160, 20½" Wide	145684	----	68	256861	55

*D=Domestic ND=Non-Domestic HD=Heavy Duty Weight Std.=Standard Weight

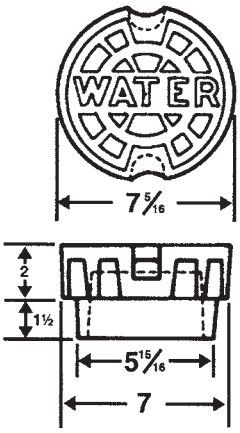
SEPARATE UPCODES for VALVE BOX BOTTOMS ONLY

Box	Bottom Length	**(D-HD) UPCode 670610	Wt	**(ND-HD) UPCode 670610	Wt	**(ND-Std.) UPCode 670610	Wt
AA	(12B)	145134	19	---	---	250524	14
A	(18B)	145141	29	505594	29	250517	25
B	(24B)	145158	33	502388	33	136958	29
C	(30B)	145165	37	502395	37	136613	33
CC	(36B)	145172	39	502401	39	136620	35
D	(30B)	145165	37	502395	37	136613	33
DD	(36B)	145172	39	502401	39	136620	35
E	(24B)	145158	33	502388	33	136958	29
F	(24B)	145158	33	502388	33	136958	29
G	(36B)	145172	39	502401	39	136620	35
	(48B)	---	---	---	---	452713	65
	(60B)	---	---	---	---	452720	91

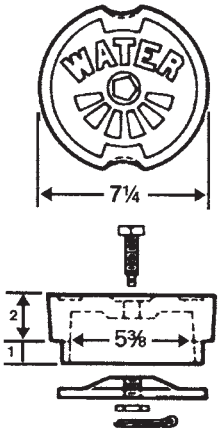
**NOTE: D=Domestic ND=Non-Domestic HD=Heavy Duty Weight Std=Standard Weight

TYLER UNION®

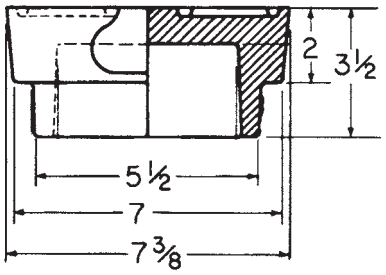
CAST IRON - STANDARD, SPECIAL DROP, AND LOCK LIDS



Drop Lid



Lock Lid



5¼" MWW DROP LID

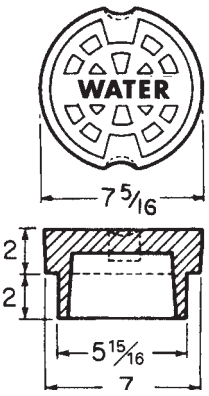
*(D-HD)UPCode 670610	*(ND-HD)UPCode 670610	Wt.
145370	136880	12

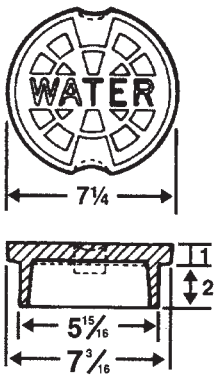
*D=Domestic ND=Non-Domestic
HD=Heavy Duty Weight

RECLAIMED WATER LID

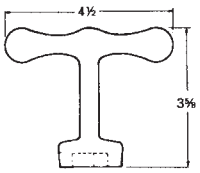
*(D-HD)UPCode 670610
458892

NOTE: Square Valve Box Tops for this Lid will be available in 2012. Call Tyler Union for information.
*D=Domestic HD=Heavy Duty Weight





1 1/8" Lid



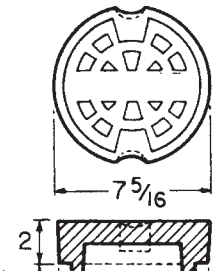
WRENCH
Fits Standard Waterworks Pentagon Head 27/32" Brass Screws

UPCode 670610	Ship Code	Description	Wt
144908	S	Wrench	0.5

5¼" OMA DROP LID**

*(D-HD)UPCode 670610	*(ND-HD)UPCode 670610	Special Markings	Wt.
145301	136927	**WATER OMA	12

*D=Domestic ND=Non-Domestic HD=Heavy Duty wt.
**OMA marking is inside lid.



LIDS (WATER)

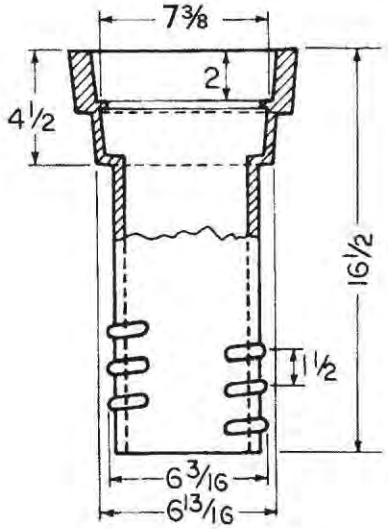
Item/Description	*(D-HDUP)Code 670610	Wt	*(ND-Std)UPCode 670610	Wt	*(ND-HD)UPCode 670610	Wt
5¼ Drop Lid	145325	12	136910	9	---	---
5¼ Lock Lid	145462	11	136866	11	---	---
1⅛ Lid**	145509	11	112532	9	---	---

(Use with 1⅛" Riser Only)
*NOTE: D=Domestic ND=Non-Domestic HD=Heavy Duty Weight Std=Standard Weight

5¼" DROP LID W/SPECIAL MARKINGS**

*(D-HD)UPCode 670610	Wt.	*(ND-Std)UPCode 670610	Wt.	Special Mark
145332	12	136873	9	GAS
145349	12	136903	9	SEWER
145356	12	136897	9	PLAIN
458975	12	---	---	REUSE

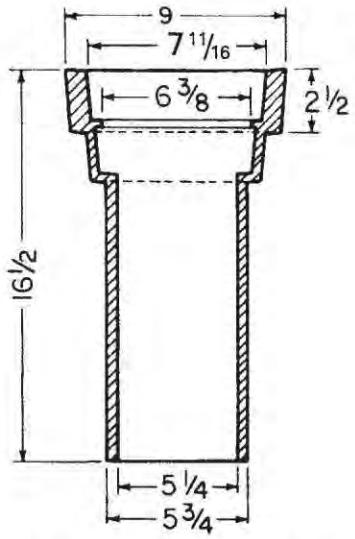
****Lids marked with "WATER" will be shipped unless otherwise specified.**



#69 SCREW TYPE ADJUSTABLE RISER FOR 6850/60 SERIES (Uses Standard Drop Lid)

*(D-HD)UPCode 670610	*(ND-HD)UPCode 670610	Height Increase	Weight
148197	112396	2½" - 9"	29

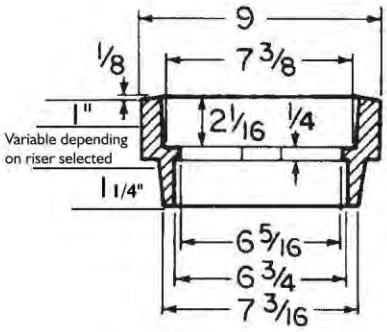
*D=Domestic ND=Non-Domestic HD=Heavy Duty



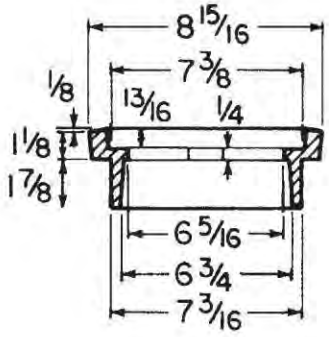
#69-A SLIP TYPE ADJUSTABLE RISER FOR 6855 SERIES (Uses Standard Drop Lid)

*(D-HD)UPCode 670610	*(ND-HD)UPCode 670610	Height Increase	Wt
148241	112204	2½" - 12"	29

*D=Domestic ND=Non-Domestic HD=Heavy Duty



5¼" Paving Riser (Uses Standard 5¼" Drop Lid)



5¼" x 1⅛" Riser (*Requires 1⅛" Riser Lid)

IRON RISERS

Item/Description	*(D)UPCode 670610	*(ND)UPCode 670610	Height Increase	Wt
5¼ x 1 Slip-In	533641	.....	1"	8.3
5¼ x 1⅛ Slip-In	145554	112549	1⅛"	8.0
5¼ x 1 1/2 Slip-In	533672	.....	1 1/2"	11.0
5¼ x 2 Slip-In	533689	.....	2"	13.5
5¼ x 2¼ Slip-In	145547	112556	2¼"	14.0
5¼ x 3 Slip-In	533696	.....	3"	20.5
5¼ x 4 Slip-In	533702	.....	4"	28.5

Specialty Iron Valve Box Tops - Call for Submittal / Product Drawing

*D-UPCode	Description	Weight
376774	7126-26T Slip Type Special with Top Flange See 29U Submittal for dimensions Lid Type: Uses Standard 5-1/4" Drop	49

**ND-UPCode	Description	Weight
502883	910-18T Slip Type Special with Top Flange Body: 7.0" Inside Diameter 7.5" Outside Diameter Top Flange: 12" Outside Diameter Flange 3/8" Thick	37
457305	Complete with HD Lid	56

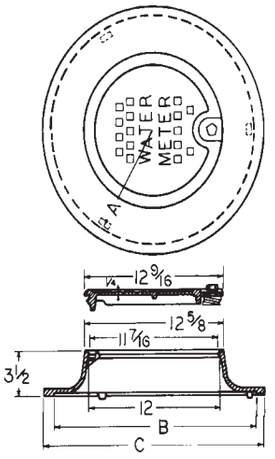
**ND-UPCode	Description	Weight
502890	940-18T Slip Type Special with Bottom Flange Body: 6.125" Inside Diameter 6.50" Outside Diameter Bottom Flange: 9.25" Outside Diameter Flange 7/16" Thick	35
457299	Complete with HD Lid	45

Note: *D = Domestic **ND = Non-Domestic

TYLER UNION

6150 & 6150TR METER COVERS, CAST IRON

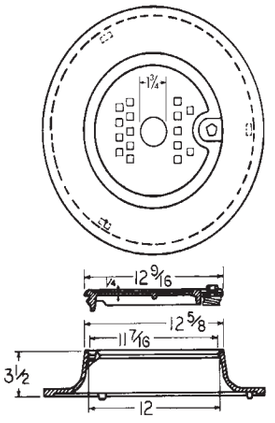
Description	A	B	C
18-in. 6150 Series	8¾	18	20
20-in. 6150	9¾	20	22



6150 Meter Box Cover

UPCode 670610	Ship Code	Description	Weight
148449	S	6150-18 Ring & Lid B/L*	39
148456	S	6150-18 Ring & Lid B/S*	39
148647	S	6150-18 Ring Only	27
148494	S	6150-18/20 Lid With Lock B/L*	13
148593	S	6150-L-18/20 Lid Less Lock	14
148500	S	6150-18/20 Lid With Lock B/S*	13
148463	S	6150-20 Ring & Lid B/L*	41
148470	S	6150-20 Ring & Lid B/S*	41
148630	S	6150-R-20 Ring Only	29

*B/L = Large Head Bolts (1-1/32"); *B/S = Small Head Bolts (27/32" Standard)
NOTE: The B/L & B/S pentagon head screws use the same worm or locking gear.

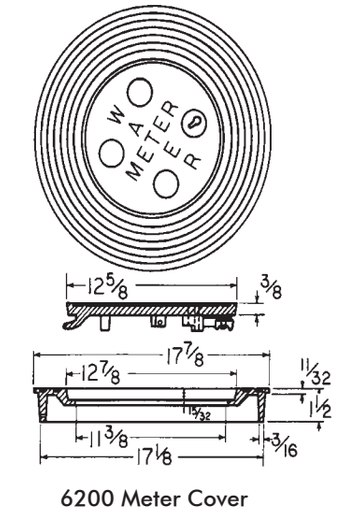


6150TR Meter Cover

6150TR (TOUCH-READER) METER COVERS CAST IRON

UPCode 670610	Ship Code	Description	Weight
148531	S	6150-18 TR Ring & Lid B/L"	39
148524	S	6150-18 TR Ring & Lid B/S*	39
148579	S	6150-18/20 TR Lid With Lock B/L*	13
148562	S	6150-18/20 TR Lid With Lock B/S*	13
148586	S	6150-18/20 TR Lid Less Lock	12
148555	S	6150-20 TR Ring & Lid B/L*	41
148548	S	6150-20 TR Ring & Lid B/S*	41

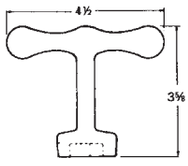
*B/L = Large Head Bolts (1-1/32"); B/S = Small Head Bolts (27/32")
NOTE: 6150TR - Same dimensions as 6150, plus a 1-27/32" access hole in lid.
NOTE: The B/L & B/S pentagon head screws use the same worm or locking gear.



6200 Meter Cover

6200 METER COVER, CAST IRON

UPCode 670610	Ship Code	Description	Weight
148708	S	6200 Ring & Lid Less Lock	28
148760	S	6200-R Ring Only	18
148739	S	6200-L Lid Less Lock	13
148722	S	6200-L Lid With Lock	11



WRENCH
Fits Standard Waterworks Small Pentagon Head 27/32" Brass Screws

UPCode 670610	Ship Code	Description	Weight
144908	S	Wrench	0.5

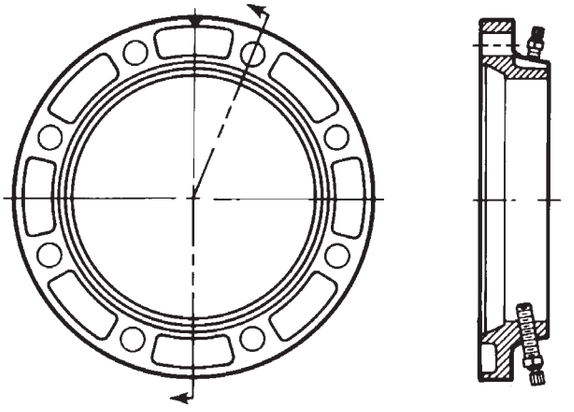
TYLER UNION

ADAPTER FLANGE

UL LISTED

FM APPROVED

Wall Thickness Note: Recommended for ductile iron pipe Class 53 thru Class 56.



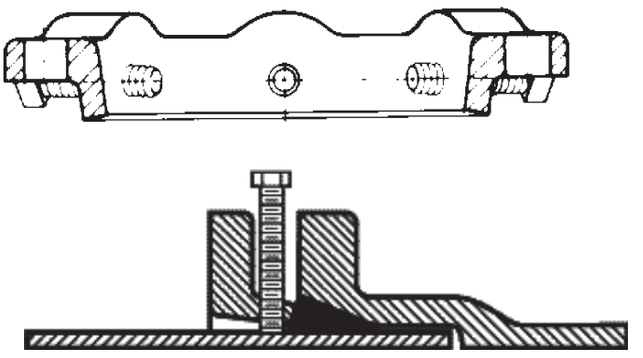
1. Place adapter flange and MJ gasket over the plain end of the pipe with the small side of the MJ gasket facing the flange side of the adapter flange.
2. Place the pipe end against flange to be joined and slip the MJ gasket into position against the flange. Make sure the gasket is evenly seated against the flange.
3. Slide adapter flange into position against the small (tapered) side of the MJ gasket and align the bolt holes. Insert the bolts and finger tighten the nuts to maintain position and alignment.
4. Snug up all nuts evenly. Alternating @ 180°, tighten the nuts to a torque of: 3" - 60 foot pounds; 4" thru 12" - 90 foot pounds.
5. Snug up all set screws evenly around the pipe. Tighten the Torque Head Set Screws evenly, alternating at 180 degrees.

NOTE: THE TORQUE HEAD TOP WILL BREAK OFF AT THE RECOMMENDED SETTING OF 80-90 FT. LBS.
MAXIMUM DEFLECTION OF JOINT (2°)

*SET-SCREW RETAINER GLAND

UL LISTED

Pipe Wall Thickness: Sizes 3"-12" are recommended for ductile iron pipe class 50 thru 56. Sizes 14" thru 24" are recommended for ductile iron pipe class 53 thru 56.



1. Wash bell and plain end with soapy water, then slip gland and gasket over plain end with the small side of the gasket and ring side of the gland facing the bell.
2. Slip plain end into bell. Brush soapy water on gasket. This lubricates the gasket and allows it to slip easily into place. Push gasket into bell making sure it is evenly in the bell gasket landing.
3. Slide the gland into position against the back of the gasket. Align bolt holes, insert T-bolts and tighten nuts to finger tight.
4. Snug up all T-bolt nuts evenly. Alternating at 180°, tighten the T-bolt nuts to a torque of:

   3" - 60 foot pounds 4" thru 24" - 90 foot pounds.
5. Snug up all set screws evenly. Using a torque wrench, tighten the set screws alternating at 180° to the recommended torque value of 75 foot pounds. If required double check set screws immediately.

   Maximum recommended deflection of joints:

   3" thru 12"-2°; 14" thru 30" - 1°

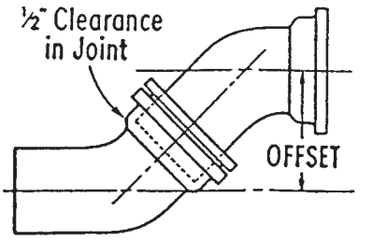
***Note: Not recommended for use on plain end fittings**

TYLER UNION

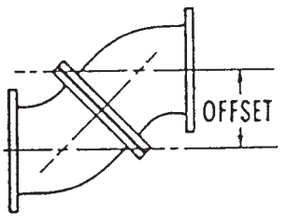
Using Two Bends—Offset in Inches

Nominal Diameter Inches	C153 -A21.53 Mechanical Joint 90°	45°	22½°	11¼°
3	14.00	6.36	3.06	1.46
4	15.00	7.07	3.31	1.58
6	18.00	8.48	3.89	1.68
8	20.00	9.19	4.09	1.77
10	24.00	10.61	4.48	1.88
12	26.00	12.02	4.87	1.97
14	31.50	13.08	5.88	2.47
16	33.50	13.79	5.92	2.48
18	38.00	14.14	8.92	2.54
24	41.50	16.40	9.76	4.97
30	N/A	N/A	N/A	N/A

Nominal Diameter Inches	C110 -A21.10 Mechanical Joint 90°	45°	22½°	11¼°
3	19.60	10.25	5.56	2.63
4	21.50	11.69	6.31	3.02
6	24.50	13.06	7.08	3.41
8	26.60	13.76	7.50	3.61
10	30.50	15.19	8.25	4.00
12	32.50	16.62	9.00	4.39
14	36.50	16.62	8.99	4.39
16	38.50	17.32	9.38	4.58
18	41.50	18.03	9.76	4.78
20	44.50	19.45	10.52	5.17
24	52.50	21.57	11.67	5.75
30	58.50	27.23	14.73	7.32



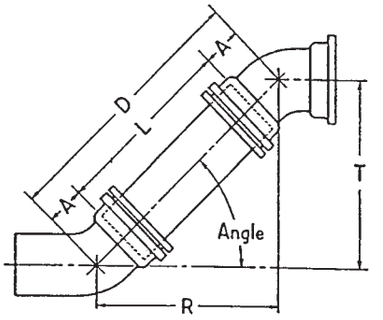
Mechanical Joint



Flanged Joint*

No allowance is made in offset figures for gasket thickness.

DETERMINING LENGTH OF PIPE IN OFFSETS



Mechanical Joint

Angle	D Equals	R Equals	L† Equals
45°	T x 1.414	T x 1.000	D-2A
22½°	T x 2.613	T x 2.414	D-2A
11¼°	T x 5.126	T x 5.027	D-2A

†Cut the Pipe somewhat shorter to allow for clearance in the joints.

Nominal Diameter Inches	C110 -A21.10 Standard Flange 90°	45°	22½°	11¼°	Long Radius 90°
3	11.00	4.24	2.30	1.17	15.50
4	13.00	5.66	3.06	1.56	18.00
6	16.00	7.07	3.83	1.95	23.00
8	18.00	7.78	4.21	2.15	28.00
10	22.00	9.19	4.98	2.54	33.00
12	24.00	10.61	5.74	2.93	38.00
14	28.00	10.61	6.74	2.93	43.00
16	30.00	11.31	6.12	3.12	48.00
18	33.00	12.02	6.51	3.32	53.00
20	36.00	13.44	7.27	3.71	58.00
24	44.00	15.56	8.42	4.29	68.00
30	50.00	21.22	11.48	5.85	N/A

Example:
A 14-inch Mechanical Joint line is to be offset 12 feet on an angle of 45-degrees using two C110 full-body Mechanical Joint bends. What is the laying length (L) of pipe required to make the connection between the two bends?

Solution:
D = 12'0" x 1.414 =16.968'
R = 12' x 1.000 = 12.000'
A = 7.5" or .625'
L = 16.968' - 1.250 = 15.718' or approximately 15' 8⅝.

PIPE O.D.'S AND FLANGE DATA

Because many items listed are not made by Tyler Union, we cannot be certain that all data is current or accurate. Please check with the product manufacturer for their most recent information.

PIPE O.D. CHART

	GRAY/DI IRON			CAST IRON/DWV			ASBESTOS - CEMENT			PVC	PVC	PVC	STEEL	
	CLASSES		O.D.	SV	NH	XH	CLASS	MACHINED	ROUGH	C-900	C-905	STEEL O.D	TYPE	O.D.
	PIT	SPUN						END O.D.	BARREL O.D.	DI O.D.	DI O.D.	SCH. PIPE		
									MIN. - MAX.		DR 41	40, 80, 120		
											32.5	C 905 IPS		
PIPE											25.18	DIA. 14 - 24		
SIZE														
1-1/2"					1.90±.06							1.90	STD.	1.90
2"			2.50	2.30±.09	2.35±.09	2.38				2.50		2.38	STD.	2.38
2-1/2"												2.88	STD.	2.88
	A		3.80	3.30±.09	3.35±.09	3.50	100	3.74	4.00			3.50	STD.	3.50
3"	B,C,D	50-350	3.96				150	3.84	4.10					
							200	3.84	4.29					
	A	50-350	4.80	4.30±.09	4.38+.09	4.50	100	4.64	4.79-5.14	4.80		4.50	O.D.	4.00
4"	B,C,D		5.00		-.05		150	4.81	4.97-5.27				STD.	4.50
							200	4.81	5.22-5.57					
5"				5.30±.09	5.30+.09	5.50						5.56	STD.	5.56
					-.05									
	A	50-350	6.90	6.30±.09	6.30+.09	6.50	100	6.91	7.05-7.40	6.90		6.63	O.D.	6.00
6"	B,C,D		7.10		-.05		150	6.91	7.07-7.37				STD.	6.63
	E,F		7.22				200	6.91	7.26-7.56					
	A,B	50-300	9.05	8.38±.13	8.38+.13	8.62	100	9.11	9.22-9.57	9.05		8.63	O.D.	8.00
8"	C,D	350	9.30		-.09		150	9.11	9.27-9.57				STD.	8.63
	E,F		9.42				200	9.11	9.39-9.74					
	A,B	50-200	11.10	10.50±.13	10.56±.09	10.75	100	11.24	11.42-11.77	11.10		10.75.	O.D.	10.00
10"	C,D	250-350	11.40				150	11.66	11.82-12.12				STD.	10.75
	E,F		11.60				200	11.66	11.77-12.12					
	A,B	50-200	13.20	12.50±19	12.50±.09	12.75	100	13.44	13.69-14.04	13.20		12.75	O.D.	12.00
12"	C,D	250-350	13.50				150	13.92	14.08-14.38				STD.	12.75
	E,F		13.76				200	13.92	14.03-14.38					
	A,B	50-100	15.30				100	15.07	15.40-15.80		15.30		O.D.	14.00
14"	C,D	150-300	15.65				150	16.22	16.38-16.73					
	E,F		16.98				200	16.22	16.48-16.88					
15"				15.88±.19	15.83±.09	15.88								
	A,B	50-100	17.40				100	17.14	17.54-17.94		17.40		O.D.	16.00
16"	C,D	150-300	17.80				150	18.46	18.62-18.97					
	E,F		18.16				200	18.46	18.79-19.19					
18"	A,B	50-100	19.50				100	19.90	20.44		19.50		STD.	18.00
	C,D	150-250	19.92				150	20.94	21.20					
20"	A,B	50-100	21.60				100	22.12	22.50		21.60		STD.	20.00
	C,D	50-250	22.06				150	23.28	23.54					
24"	A,B	50-100	25.80				100	26.48	27.17		25.80		STD.	24.00
	C,D	150-250	26.32				150	27.96	28.22					

125 LB. Flanges And Bolts

Size	Diam of Flange	Bolt Circle	Number of Bolts	Diam Of Bolts	Length Of Bolts
2	6	4¾	4	⅝	2
2½	7	5½	4	⅝	2¼
3	7½	6	4	⅝	2½
3½	8½	7	8	⅝	2½
4	9	7½	8	⅝	2¾
5	10	8½	8	¾	3
6	11	9½	8	¾	3
8	13½	11¾	8	¾	3¼
10	16	14¼	12	⅞	3½
12	19	17	12	⅞	3¾
14	21	18¾	12	1	4¼
16	23½	21¼	16	1	4¼
18	25	22¾	16	1⅛	4¾
20	27½	25	20	1⅛	5
24	32	29½	20	1¼	5½

250 L.B. Flanges And Bolts

Pipe Sizes	Diam of Flanges	Diam of Wt Circle	Number of Bolts	Diam of Bolts	Length of Bolts
2	6½	5	8	⅝	2½
2½	7½	5⅞	8	¾	3
3	8¼	6⅝	8	¾	3¼
3½	9	7¼	8	¾	3¼
4	10	7⅞	8	¾	3½
5	11	9¼	8	¾	3¾
6	12½	10⅝	12	¾	3¾
8	15	13	12	⅞	4¼
10	17½	15¼	16	1	5
12	20½	17¾	16	1⅛	5½
14	23	20¼	20	1⅛	5¾
16	25½	22½	20	1¼	6
18	28	24¾	24	1¼	6¼
20	30½	27	24	1¼	6¾
24	36	32	24	1½	7½

TYLER UNION

Question: From what compound is the standard MJ gasket made of and what is the highest water temperature it will withstand? Are the TYTON® Push-on gaskets made from the same compound?

Answer: The standard MJ and Push-on gasket is made of vulcanized styrene butadiene rubber (SBR) in accordance with ANSI/AWWA C111/A21.11. The recommended temperature range for SBR gaskets is from 20°F to 180°F. SBR gaskets are suitable for water and wastewater, most moderate chemicals, wet or dry organic acids, alcohols, ketones, *chloramines, and aldehydes.
SBR GASKETS ARE NOT RECOMMENDED FOR HYDROCARBON SERVICE
*Note: Rated for Chloramine concentrations of less than 5 parts per million.
NOTE: Review the 31U Submittal on pages 71 and 72 of this catalog for additional gasket information

Question: Does Tyler Union Waterworks offer any other gaskets that will withstand temperatures greater than180°F or for special service applications?

Answer: Yes! Tyler Union offers four other special services gaskets for MJ connections only. Identification, temperature range and applications are listed below:

EPDM (Ethylene Propylene) - Minus 10°F to 250°F Ideal for water and wastewater, ozone and strong oxidizing chemicals. May be used on steam within given temperature range and on hot air without hydrocarbons. NOT RECOMMENDED FOR HYDROCARBON SERVICE.

NEOPRENE (CR) - Minus 10°F to 200°F Recommended for moderate chemicals and acids, oil fats, many solvents and air with hydrocarbons. Will not support combustion.

Nitrile (NBR) (Buna - N) (Hycar) - Minus 40°F to 250°F Ideally suited for gasoline, petroleum products, hydrocarbons, water and mineral and vegetable oils.

FKM (Fluoroelastomer) Minus 10°F to 425°F Ideal for hydrocarbons, acids, vegetable oils, and petrolium

Question: According to AWWA, how much torque should be applied to Mechanical Joint T-bolts?

Answer: The recommended torque ranges, as stated in ANSI/AWWA C600 are:

Joint Size		Range of Torque	
in.	(mm)	ft/lb	N/m
3	(76)	45-60	(61-81)
4-24	(102-610)	75-90	(102-122)
30-36	(762-914)	100-120	(136-163)
42-48	(1067-1219)	120-150	(163-203)

Question: What type of Mechanical Joint T-bolt does Tyler Union Waterworks furnish?

Answer: Tyler Union supplies High-strength, Low-Alloy Steel T-bolts, in compliance with ANSI/AWWA C111/A21.11. Contents of standard MJ Accessory packs comply with ANSI/AWWA C111/A21.11. Anti-Rotation T-bolts, Blue Fluoropolymer coated T-bolts and Stainless Steel (AISI 316 and AISI 304) T-bolts are also available for special applications on request.

For projects where fitting weights, specifications, or dimensions are critical, advise upon order placement

TYLER UNION

Question: What material are the Standard T-bolts, Anti-Rotation and Fluorokote #1 T-bolts made of?

Answer: The Standard T-bolts and Anti-Rotation T-bolts and Nuts are manufactured from ASTM A242 Corrosion Resistent, High-Strength, Low-Alloy Weathering Steel in accordance with ANSI/AWWA C111 (Current Revision). Blue Fluorokote #1, T-bolts and Nuts are manufactured from the same high quality material as the standard T-bolts/Nuts but come with a blue fluoropolymer resin that is baked on and was developed for use in highly corrosive soil conditions. Fluorokote #1 blue low alloy T-bolts and Nuts plus Fluorokote #1 Green SS304 and Red SS316 comply with ANSI/AWWA C111/A21.11 (Current Revision).

Question: How is the torque range for flanged fittings and gaskets determined?

Answer: The required torque for flanged fittings and gaskets is not addressed in the ANSI/AWWA C600 Standard. Generally, this torque range is determined by the flange gasket manufacturer due to the various types of gaskets, bolt patterns and fitting flange diameters available.

Question: What purpose does the cement mortar lining serve?

Answer: Cement mortar lining serves to prevent tuberculation thus maintaining flow characteristics.

Question: What function does the seal coating of fittings serve?

Answer: The seal coating applied to a freshly applied cement lining provides for a controlled curing by providing a barrier that allows for a controlled loss of moisture from the cement resulting in a mortar lining with improved strength. Tyler Union applies a seal coat that is NSF-61, NSF-732 and Annex G approved for use in potable water systems and it will cover the entire fitting unless specified otherwise during order placement. The exterior is coated for aesthetics and to aid in retarding corrosion prior to installation.

Question: Are the fittings furnished by Tyler Union Waterworks UL/FM approved?

Answer: Tyler Union ductile iron ANSI/AWWA C110/A21.10 MJ and Flange Watermain fittings 3"-12" are UL listed for Fire Main Equipment and ANSI/AWWA C153/A21.53 MJ, Flange, and Union-Tite fittings for 3"-12" are UL and 3"-10" FM listed for Fire Main Equipment. (UL Listing #EX2111)(Union-Tite 4" to 12")

Question: Does Tyler Union Waterworks offer fittings with any coatings other than an asphaltic seal coat?

Answer: Yes. For Flanged Full Body (C110) and Compact (C153) fittings, Tyler Union offers an exterior prime coat of Tnemec N140-1211 Pota-Pox Plus that is NSF-61 approved for potable water systems and is accompanied by a cement mortar/seal coated lining. Tyler Union also offers double cement lining upon request. Bare castings are available upon request. Additionally, Tyler Union offers a full line of Protective Fusion Bonded Epoxy (FBE) coated and lined fittings for drinking water service applications. Other specialty coatings and linings may be available upon request; contact your Tyler Union Inside Sales representative for more information. Tyler Union's FBE fittings are red oxide in color plus the coating and lining are supplied standard with 6 to 8 mil average thickness. Our FBE meets the requirements of ANSI/AWWA C116/A21.16. For additional FBE information, see the 20U submittal on pages 56 and 57.

Question: Does Tyler Union Waterworks offer fitting interior coatings for wastewater or sewer systems?

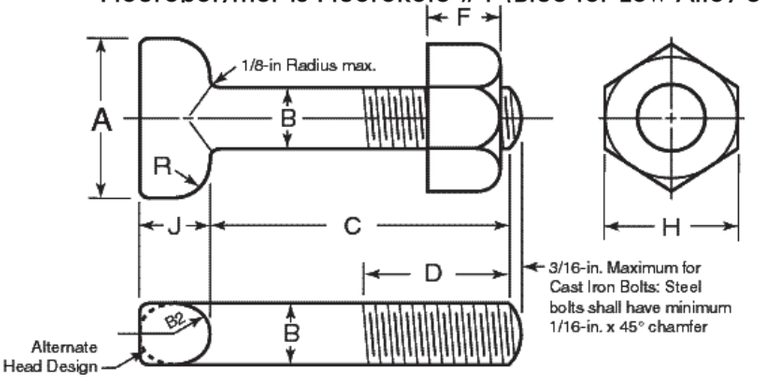
Answer: Yes, under some conditions. Contact your Tyler Union representative for information.

For fitting applications requiring specific weights or dimensions fittings, contact Tyler Union Waterworks

27U-BOLTS AND NUTS FOR MECHANICAL JOINTS

*Bolts and Nuts meet ANSI/AWWA C111/A21.11
*ASTM A242 High Strength Low Alloy Steel (Coated or Uncoated)
*ANSI 304 or 316 AISI Stainless Steel (Coated Green or Red)
*Flouropolymer is Fluorokote #1 (Blue for Low Alloy Steel)

NOTES:
1. Dimension "B" is unthreaded shank.
2. Draft, when required to be 6 degree maximum, may be deducted from bolt head dimensions, and radius (B/2) may be changed to suit draft.
3. Gates, if required, may protrude a maximum of 1/8 inch above the top of the bolt head.
4. Chamfer is optional if threads are rolled.

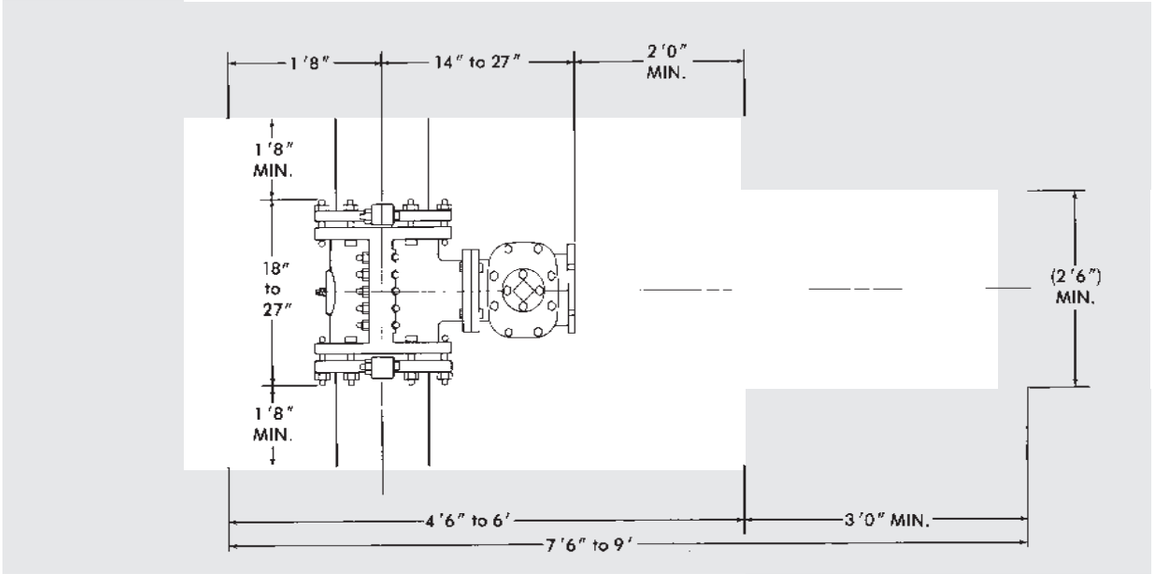


T-Head Low Alloy Weathering and AISI Stainless Steel Fasteners
Dimensions in Inches

Size Inches	A ± 0.05	B +0.030 -0.074	C +0.25 -0.06	D†	Threads per Inch E ††	F	H	J +0.15 -0.03	R Max.
⅝ x 3	1.50	0.625	3.0	2.00	11	0.625 +or -.04	1.062-.04	0.625	0.312
¾ x 3.5	1.75	0.750	3.5	2.50	10	0.750 +or -.06	1.250 -.06	0.750	0.375
¾ x 4	1.75	0.750	4.0	3.00	10	0.750 +or -.06	1.250 -.06	0.750	0.375
¾ x 4.5	1.75	0.750	4.5	3.00	10	0.750 +or -.06	1.250 -.06	0.750	0.375
¾ x 5	1.75	0.750	5.0	3.00	10	0.750 +or -.06	1.250 -.06	0.750	0.375
1 x 6	1.75	1.000	6.0	3.00	8	1.000 +or -.08	1.625 -.08	1.000	0.500
1 x 7.5	2.25	1.000	7.5	4.50	8	1.000 +or -.08	1.625 -.08	1.000	0.625
1-1/4 x 6.5	2.50	1.250	6.5	3.50	7	1.250 +or -.08	2.000 -.08	1.250	0.750
1-1/4 x 8.5	2.50	1.250	8.5	4.00	7	1.250 +or -.08	2.000 -.08	1.250	0.750

The tolerance for cast iron bolts is +or-0.03". If threads are rolled, the body diameter may be reduced to the approximate pitch diameter of the thread.

† Tolerance: +3, - 0 threads †† Number of threads per inch - course-thread series (ANSI/ASME B1.1), Class 2A, course-threads series (ANSI.ASME B1.1), Class 2A, external fit UNC2A and Class 2B, UNC2B (ANSI/ASME B1.2



Excavation dimensions - MJ 4" through 12" Tapping Sleeves for Ductile Pipe

SUBMITTAL: PROTECTIVE FUSION BONDED EPOXY (FBE)

(Current revisions for all noted Standards apply)

Tyler Union Waterworks standard applied coating thickness for protective fusion bonded epoxy (FBE) is 6 to 8 mil and our FBE is NSF61, NSF-372 and Annex G approved. Tyler Union Waterworks FBE water works fittings are coated internally and externally in accordance with the applicable requirements of ANSI/AWWA C116/A21.16. Section 4.3.2 of the ANSI/AWWA C116 standard provides that FBE mil thickness in the joint area shall not have a coating of less than 4 mil. Additionally, the standard advises it may be necessary to establish a limit for the maximum applied thickness in the joint areas.

Tyler Union Waterworks upon request at time of order placement, can provide FBE fittings with increased mil thickness. However, FBE thickness greater than 6 to 8 mil may interfere with the pipe to fitting fit and inhibit the sealing for a leakproof joint. For these reasons, Tyler Union Waterworks does not provide warranty for FBE lined and coated fittings with greater than 8 mil thickness in the joint area.

Tyler Union Waterworks FBE is tested and approved per Underwriters Laboratories UL262. Testing of FBE involves immersing coated parts in four aqueous solutions at 158°F and evaluate for blistering during 90 day continuous exposure period. The solutions are distilled water, 2% sodium chloride in distilled water, distilled water with a pH adjusted to 4.0 using potassium hydrogen phthalate, and distilled water with pH adjusted to 10.0 using sodium carbonate. Tyler Union Waterworks FBE is also tested for blister resistance when immersed in acid, alkali, alcohol, and hydrocarbons at room temperature over 90 days. Additional test data and recommended exposures for Tyler Union Waterworks FBE is as provided in Tables 1 thru 3.

The ANSI/AWWA C116/A21.16 standard describes the use of protective fusion bonded epoxy coatings as being utilized for the interior and exterior surfaces of ductile or gray iron fittings supplied for “water systems”. Section 1.1 of the standard specifically provides that the standard does not cover instances where coatings are agreed upon by purchaser and manufacturer for sewer or other special applications. Though not always recommended for use in **Sewer systems; FBE coated and lined fittings may be used in sewer applications conveying materials conforming to the properties as provided in Tables 2 and 3 on page 2.

TABLE #1

TEST	METHOD	CONDITIONS	RESULT
Abrasion Resistance	ASTM D4060	CS-17 wheels, 1000 cycles, 1 kg load	32 mg loss
Adhesion	ASTM D3359 - Method A	X-cut and tape	5A
Adhesion	ASTM D3359 - Method B	Crosshatch and tape	5B
Gloss, 60°	ASTM D523	N/A	70-85
Humidity Resistance	ASTM D2247	1000 hours at 100°F	No blisters or rusting
Impact	ASTM D2794	N/A	Pass 40 inch-lbs. direct
Pencil hardness	ASTM D3363	N/A	Pass 4H
Salt Spray	ASTM B117	1000 hours	No blisters or face rust, no scoreline creepage
Water Resistance	AWWA C550	90 days immersion at 70°C	Pass
Weather Resistance	ASTM G154	UVA-340, cycle 4 hrs UV at 60°C, 4 hrs condensation at 50°C	Chalks after 200 hours exposure

SUBMITTAL: PROTECTIVE FUSION BONDED EPOXY (FBE)

(Current revisions for noted Standards apply)

TABLE #2	
Immersion Environments with the following chemicals (ambient temperature)	
Aliphatic Hydrocarbons	Fresh water
Calcium Chloride (10% solution)	Fuel Oil
Calcium Hydroxide (10% solution)	Hexane
Calcium Sulfate (saturated solution)	Kerosine
Calcium Carbonate (saturated solution)	Motor oil
Distilled water	Magnesium Sulfate (saturated solution)
Gasoline (unleaded)	Potassium Acetate (saturated solution)
Diesel Fuel	Soap solutions
Sodium Chloride (5% solution)	Sodium Nitrate (10% solution)
Sodium Hydroxide (5% solution)	Trisodium Phosphate (5% solution)

TABLE #3	
Splash and Spillage Environments against the following chemicals	
Aromatic Hydrocarbons	Butanol
Ethanol	Hydrochloric Acid (5% solution)
Isopropyl Alcohol	Methanol
Sulfuric Acid (5% solution)	Toluene
Xylene	

*NOTE:

Due to the prescribed application methods of protective fusion bonded epoxy and the combination of varying fitting diameters, recesses, raised lettering, tapping bosses, and numerous radiused surfaces; the applied thickness of the FBE coating or lining may vary 1 to 2 mils over the coated surfaces of a fitting.

**NOTE:

Final determination of the suitability of this product for your application shall be determined by the end user .

Additional types of epoxy coatings are available upon request at time of order placement. Please contact a Tyler Union Waterworks Customer Service representative to discuss the additional coating and lining options that are available.

SUBMITTAL: CEMENT-MORTAR and ASPHALTIC MATERIAL

(Current revisions for the noted Standards apply)

Tyler Union Waterworks Type I-II cement lining and asphaltic coating and lining provided with our ANSI/AWWA C104 cement-mortar lined ductile iron fittings are NSF-61, NSF-372 and Annex G approved. Tyler Union Waterworks lined and/or coated 2 inch through 64 inch fittings are provided in accordance with and meet all the applicable terms and requirements of ANSI/AWWA C104/A21.4, ANSI/AWWA C110/A21.10, ANSI/AWWA C111/A21.11, ANSI/AWWA C153/A21.53, ANSI/AWWA C151/A21.51, and ASTM C150.

The standard specified thicknesses for cement and asphaltic linings for ductile iron fittings 2 inch through 64 inch are as provided. Unless specified otherwise upon order placement, all cement lined **fittings provided by Tyler Union Waterworks will be provided with an asphaltic lining and coating and the minimum thickness cement lining as provided for by ANSI/AWWA C104.

Fitting Sizes	Minimum AWWA Cement Lining Thickness	*Double Cement Lining Thickness	Minimum Asphaltic Thickness	Typical Tyler Union Asphaltic Thickness
2 in. to 12 in. or 76 to 305 mm	1/16" or 1.6 mm	1/8" or 3.2 mm	1 mil	2 – 4 mil
14 in. to 24 in. or 356 to 610 mm	3/32" or 2.4 mm	3/16" or 4.8 mm	1 mil	2 – 4 mil
30 in. to 64 in. or 762 to 1600 mm	1/8" or 3.2 mm	1/4" or 6.4 mm	1 mil	2 – 4 mil
*NOTE: You must specify double cement lining upon order placement				
**NOTE: Mechanical Joint Solid Sleeves, Caps, and Plugs are provided with asphaltic coating only per AWWA C110/C153 Section 4.4.3				

The asphaltic coating and lining utilized on the "inside" of pipe and fittings is to aide in the proper curing of the cement mortar lining as described in the ANSI/AWWA C104 standard, Section 4.10. The Asphaltic coating and lining utilized on the "outside" of pipe and fittings is for cosmetic purposes and intended to provide some level of corrosion protection prior to being installed

The purpose of the cement lining on the "inside" of ductile iron water works fitting is to reduce the degree of tuberculation (buildup) or corrosion on the fitting wall. Tuberculation or corrosion of the fitting wall is minimized in soft or acid water as the cement lining creates a high pH at the fitting wall. Beginning in 1995, the asphaltic lining for the inside of fittings is no longer required by the AWWA but is recommended in instances where the pH of the water is less than 6.0 or greater than 10.0.

Additional Applications and Ratings for Cement-Mortar and Asphaltic Materials:	
Cement without asphaltic coating: Service to *212°F max.	Cement with asphaltic coating: Service to 150°F max.
Asphalt Only: Air Service to 150°F max.	Cement w/o asphalt: Sea water, non-septic gravity sewer, reclaim water
*NOTE: For systems designed to convey materials above 150°F, contact Tyler Union for adjusted pressure rating of the fittings	

ANSI/AWWA C104/A21.4 - Approved Field Repair Method for Cement-Mortar Lined Fittings:
1. Remove the damaged portion or area of the lining down to the metal surface, making sure any remaining lining edges are undercut slightly or perpendicular to the fitting wall.
2. Clean the surface of loose debris and any tuberculation or corrosion where the lining was removed.
3. Prepare a stiff mortar from a mixture of sand, cement, and water making sure the mix contains no less than one part cement to two parts sand by volume.
4. Thoroughly wet the cut out area and the adjoining lining.
5. Apply mortar mix and trowel smooth with the adjoining lining
6. After any surface water has evaporated, but while the patch is still moist, cure the lining as provided.
7. The repaired cement lining can be kept moist by seal (asphaltic) coating or with the use of **wetted burlap bags placed over the entire waterway opening of the fitting or access point. Once the mortar is applied to the fitting apply the seal coat by spraying or brushing on the seal coat within 5 to 15 minutes after any surface water has evaporated.
**Note: 1) In instances where seal coat is not used, cure cement as provided for 24 hours after application. 2) In cold weather the patched area should be protected from freezing. 3) If seal coat paint is used during field repair, allow a cure time of 48 hours after the seal coat is Applied before placing fitting back in service.
Tyler Union Waterworks - Approved Field Repair for Asphaltic Coating of Interior and Exterior Fitting Surfaces:
1. Paint repair to the fitting body or mechanical joint includes use of a hand steel bristle brush to remove loose corrosion. Wipe area free of dust or debris with a cloth suitable for the task and recoat exterior areas of the fitting with the paint provided as needed using a standard paint brush sized for the task.
2. Recoating of the cement lining is achieved by wiping the lining with a cloth to remove any loose paint or debris and then apply paint using a standard size paint brush suitable for the task applying paint to affected areas as needed.

Note: Pressure washing of cement linings is not recommended. However, if required contact your Tyler Union representative for instructions before proceeding. Failure to follow these instructions or provide suitable supporting documentation will void the warranty on our lining.

DOMESTIC PRODUCT SUBMITTAL

Current Revisions Apply for all Listed Standards

SIZES:..... 2" through 48"

STANDARDS:..... ANSI/AWWA C110/A21.10, NFPA 13/24, 3" - 12" UL listed and approved (File - Tyler Union)
Cast of ASTM A536 qualified ductile iron. Date code is cast on and required for traceability.

PRESSURE RATING:... *Flanged fittings rated at 250 psi. Mechanical joints 2" – 24" rated at 350 psi and 30" – 48" at 250 psi.
*Note: With the use of rubber annular ring flange gasket, 2" – 24" fittings can be rated at 350 psi.

DEFLECTION:..... Max joint deflection 2"– 12", 5° and 14"– 48", 3°. Reduces by 50% at nominal pipe & fitting diameters

NSF-61 & NSF-372:..... Meets all requirements including Annex G, Tyler Union's Underwriters Laboratory listing MH16439.

ASPHALTIC COATING: Per ANSI/AWWA C104/A21.4 and ANSI/AWWA C110/A21.10.

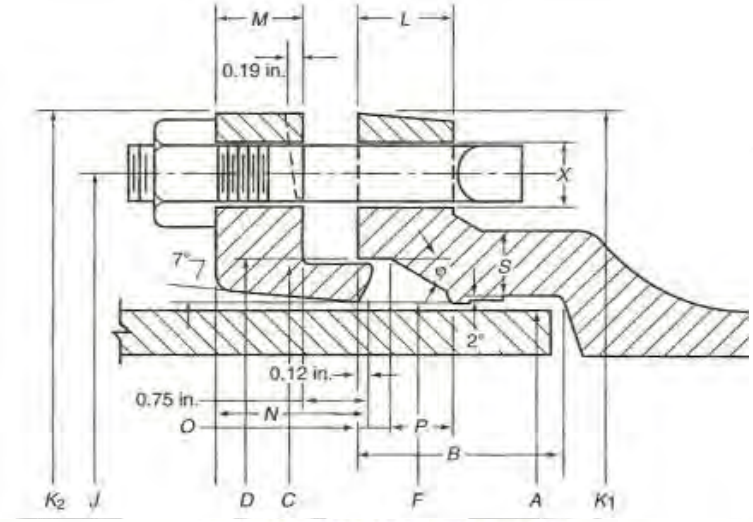
CEMENT LINING:..... Per ANSI/AWWA C104/A21.4, with double cement lining available upon request.

EPOXY COATING:..... Fusion bonded epoxy per ANSI/AWWA C116/A21.16. Additional coatings available upon request.

BARE FITTINGS:..... Available upon request.

FASTENERS:..... High strength low alloy weathering steel per ANSI/AWWA C111/A21.11 and ASTM A242

INSTALLATION:..... Install per AWWA C600/C651 using pipe conforming to ANSI/AWWA C151/A21.51 or AWWA C900/905.



NOMINAL JOINT DIMENSIONS IN INCHES

Size Inches	A Dia. DI Pipe	B Hub Depth	C Dia. GLAND	D Dia.	F Dia.	Ø	X	J Dia. GLAND	K¹ Dia.	K² Dia. GLAND	L	M GLAND	N GLAND	O	P	S	Qty. BOLTS
2	2.51	2.50	3.39	3.50	2.61	28°	3/4	4.75	6.25	6.25	0.73	0.62	1.12	0.31	0.63	0.44	2
3	3.96	2.50	4.84	4.94	4.06	28°	3/4	6.19	7.62	7.69	0.94	0.62	1.37	0.31	0.63	0.52	4
4	4.80	2.50	5.92	6.02	4.90	28°	7/8	7.50	9.06	9.12	1.00	0.75	1.50	0.31	0.75	0.65	4
6	6.90	2.50	8.02	8.12	7.00	28°	7/8	9.50	11.06	11.12	1.06	0.88	1.63	0.31	0.75	0.70	6
8	9.05	2.50	10.17	10.27	9.15	28°	7/8	11.75	13.37	13.37	1.12	1.00	1.75	0.31	0.75	0.75	6
10	11.10	2.50	12.22	12.34	11.20	28°	7/8	14.00	15.69	15.62	1.19	1.00	1.75	0.31	0.75	0.80	8
12	13.20	2.50	14.32	14.44	13.30	28°	7/8	16.25	17.94	17.88	1.25	1.00	1.75	0.31	0.75	0.85	8
14	15.30	3.50	16.40	16.54	15.44	28°	7/8	18.75	20.31	20.25	1.31	1.25	2.00	0.31	0.75	0.89	10
16	17.40	3.50	18.50	18.64	17.54	28°	7/8	21.00	22.56	22.50	1.38	1.31	2.06	0.31	0.75	0.97	12
18	19.50	3.50	20.60	20.74	19.64	28°	7/8	23.25	24.83	24.75	1.44	1.38	2.13	0.31	0.75	1.05	12
20	21.60	3.50	22.70	22.84	21.74	28°	7/8	25.50	27.08	27.00	1.56	1.44	2.19	0.31	0.75	1.12	14
24	25.80	3.50	26.90	27.04	25.94	28°	7/8	30.00	31.58	31.50	2.00	1.56	2.31	0.31	0.75	1.22	16
30	32.00	4.00	33.29	33.46	32.17	20°	1-1/8	36.88	39.12	39.12	2.00	2.00	2.75	0.38	1.00	1.50	20
36	38.30	4.00	39.59	39.76	38.47	20°	1-1/8	43.75	46.00	46.80	2.00	2.00	2.75	0.38	1.00	1.80	24
42	44.50	4.00	45.79	45.96	44.67	20°	1-3/8	50.62	53.12	53.12	2.00	2.00	2.75	0.38	1.00	1.95	28
48	50.80	4.00	52.09	52.26	50.97	20°	1-3/8	57.50	60.00	60.00	2.00	2.00	2.75	0.38	1.00	2.20	32

Tyler Union Waterworks – Call Center Contact Information
Tyler: 11910 CR 492 ● Tyler, Texas 75706 ● (800) 527-8478
Anniston: 1501 W 17th St. ● Anniston, AL 36201 ● (800) 226-7601
Corona: 1001 El Camino Ave. ● Corona, CA 92879 ● (866) 527-8471

NON-DOMESTIC PRODUCT SUBMITTAL

Current Revisions Apply for all Listed Standards

SIZES:..... 2" through 48"

STANDARDS:..... ANSI/AWWA C110/A21.10, NFPA 13/24, 3" - 12" UL listed and approved (File - Tyler Union)
Cast of ASTM A536 qualified ductile iron. Date code is cast on and required for traceability.

PRESSURE RATING:... *Flanged fittings rated at 250 psi. Mechanical joints 2" – 24" rated at 350 psi and 30" – 48" at 250 psi.
*Note: With the use of rubber annular ring flange gasket, 2" – 24" fittings can be rated at 350 psi.

DEFLECTION:..... Max joint deflection 2"– 12", 5° and 14"– 48", 3°. Reduces by 50% at nominal pipe & fitting diameters

NSF-61 & NSF-372:..... Meets all requirements including Annex G, Tyler Union's Underwriters Laboratory listing MH16439.

ASPHALTIC COATING: Per ANSI/AWWA C104/A21.4 and ANSI/AWWA C110/A21.10.

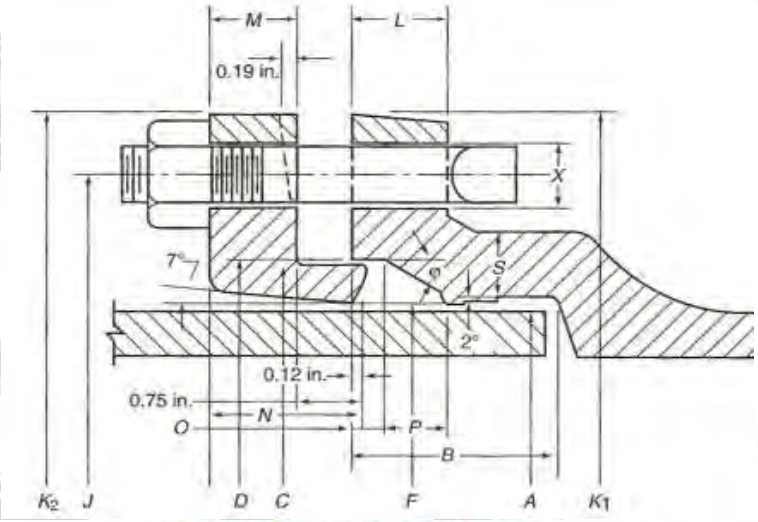
CEMENT LINING:..... Per ANSI/AWWA C104/A21.4, with double cement lining available upon request.

EPOXY COATING:..... Fusion bonded epoxy per ANSI/AWWA C116/A21.16. Additional coatings available upon request.

BARE FITTINGS:..... Available upon request.

FASTENERS:..... High strength low alloy weathering steel per ANSI/AWWA C111/A21.11 and ASTM A242

INSTALLATION:..... Install per AWWA C600/C651 using pipe conforming to ANSI/AWWA C151/A21.51 or AWWA C900/905.



NOMINAL JOINT DIMENSIONS IN INCHES

Size Inches	A Dia. DI Pipe	B Hub Depth	C Dia. GLAND	D Dia.	F Dia.	Ø	X	J Dia. GLAND	K¹ Dia.	K² Dia. GLAND	L	M GLAND	N GLAND	O	P	S	Qty. BOLTS
2	2.51	2.50	3.39	3.50	2.61	28°	3/4	4.75	6.25	6.25	0.73	0.62	1.12	0.31	0.63	0.44	2
3	3.96	2.50	4.84	4.94	4.06	28°	3/4	6.19	7.62	7.69	0.94	0.62	1.37	0.31	0.63	0.52	4
4	4.80	2.50	5.92	6.02	4.90	28°	7/8	7.50	9.06	9.12	1.00	0.75	1.50	0.31	0.75	0.65	4
6	6.90	2.50	8.02	8.12	7.00	28°	7/8	9.50	11.06	11.12	1.06	0.88	1.63	0.31	0.75	0.70	6
8	9.05	2.50	10.17	10.27	9.15	28°	7/8	11.75	13.37	13.37	1.12	1.00	1.75	0.31	0.75	0.75	6
10	11.10	2.50	12.22	12.34	11.20	28°	7/8	14.00	15.69	15.62	1.19	1.00	1.75	0.31	0.75	0.80	8
12	13.20	2.50	14.32	14.44	13.30	28°	7/8	16.25	17.94	17.88	1.25	1.00	1.75	0.31	0.75	0.85	8
14	15.30	3.50	16.40	16.54	15.44	28°	7/8	18.75	20.31	20.25	1.31	1.25	2.00	0.31	0.75	0.89	10
16	17.40	3.50	18.50	18.64	17.54	28°	7/8	21.00	22.56	22.50	1.38	1.31	2.06	0.31	0.75	0.97	12
18	19.50	3.50	20.60	20.74	19.64	28°	7/8	23.25	24.83	24.75	1.44	1.38	2.13	0.31	0.75	1.05	12
20	21.60	3.50	22.70	22.84	21.74	28°	7/8	25.50	27.08	27.00	1.56	1.44	2.19	0.31	0.75	1.12	14
24	25.80	3.50	26.90	27.04	25.94	28°	7/8	30.00	31.58	31.50	2.00	1.56	2.31	0.31	0.75	1.22	16
30	32.00	4.00	33.29	33.46	32.17	20°	1-1/8	36.88	39.12	39.12	2.00	2.00	2.75	0.38	1.00	1.50	20
36	38.30	4.00	39.59	39.76	38.47	20°	1-1/8	43.75	46.00	46.80	2.00	2.00	2.75	0.38	1.00	1.80	24
42	44.50	4.00	45.79	45.96	44.67	20°	1-3/8	50.62	53.12	53.12	2.00	2.00	2.75	0.38	1.00	1.95	28
48	50.80	4.00	52.09	52.26	50.97	20°	1-3/8	57.50	60.00	60.00	2.00	2.00	2.75	0.38	1.00	2.20	32

Tyler Union Waterworks – Call Center Contact Information
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Corona: 1001 El Camino Ave. ● Corona, CA 92879 ● (866) 527-8471

DOMESTIC PRODUCT SUBMITTAL

Current Revisions Apply for all Listed Standards

SIZES:..... 2" through *64" (2" not included in ANSI/AWWA C153)(*Contact Tyler Union for 54"-64" information)

STANDARDS:..... ANSI/AWWA C153/A21.53, NFPA 13/24, 3"-12" UL and 3-10"FM listed & approved (File - Tyler Union) Cast of ASTM A536 qualified ductile iron. Date code is cast on and required for traceability.

PRESSURE RATING:... *Flanged fittings rated at 250 psi. Mechanical joints 2" – 24" rated at 350 psi and 30" – 48" at 250 psi. *Note: With the use of rubber annular ring flange gasket, 2" – 24" fittings can be rated at 350 psi. Note: Wyes over 12" are not pressure rated. Contact Tyler Union for rating in your application.

DEFLECTION:..... Max joint deflection 2"– 12", 5° and 14"– 48", 3°. Reduces by 50% at nominal pipe & fitting diameters

NSF-61 & NSF-372:..... Meets all requirements including Annex G, Tyler Union's Underwriters Laboratory listing MH16439.

ASPHALTIC COATING: Per ANSI/AWWA C104/A21.4 and ANSI/AWWA C153/A21.53.

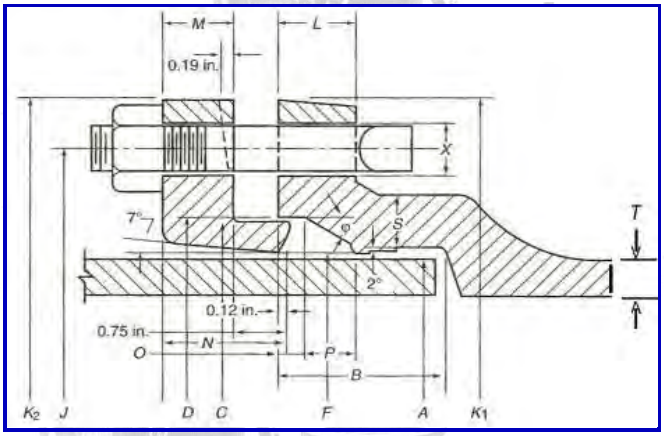
CEMENT LINING:..... Per ANSI/AWWA C104/A21.4, with double cement lining available upon request.

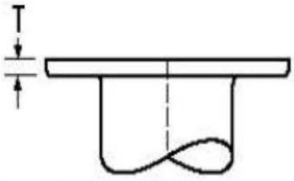
EPOXY COATING:..... Fusion bonded epoxy per ANSI/AWWA C116/A21.16. Additional coatings available upon request.

BARE:..... Available upon request

FASTENERS:..... Per ANSI/AWWA C111/A21.11 and/or ASTM A242 high strength low alloy weathering steel

INSTALLATION:..... Per AWWA C600 and C651 using pipe conforming to ANSI/AWWA C151/A21.51 or AWWA C900/905.





ANSI/AWWA C153/A21.53 – Compact Flange
Nominal Thickness Dimensions in Inches (T = +/- .060")

Size	T	Size	T	Size	T
3	.60	10	.75	18	.93
4	.63	12	.81	20	.96
6	.63	14	.87	24	1.00
8	.70	16	.90	36	1.10

MECHANICAL JOINT - NOMINAL JOINT DIMENSIONS IN INCHES — **BOLTS**

Size Inches	A Dia. DI Pipe	B Hub Depth	C Dia. GLAND	D Dia.	F Dia.	J Dia. GLAND	K^1 Dia.	K^2 Dia. GLAND	L	M GLAND	S	T	X	Size	Qty.
2	2.51	2.50	3.50	3.60	2.61	4.75	6.19	6.89	0.58	0.62	0.36	0.30	3/4	5/8x3.0	2
3	3.96	2.50	4.84	4.94	4.06	6.19	7.62	7.69	0.58	0.62	0.39	0.33	3/4	5/8x3.0	4
4	4.80	2.50	5.92	6.02	4.90	7.50	9.06	9.12	0.60	0.75	0.39	0.34	7/8	3/4x3.5	4
6	6.90	2.50	8.02	8.12	7.00	9.50	11.06	11.12	0.63	0.88	0.43	0.36	7/8	3/4x3.5	6
8	9.05	2.50	10.17	10.27	9.15	11.75	13.31	13.37	0.66	1.00	0.45	0.38	7/8	3/4x4.0	6
10	11.10	2.50	12.22	12.34	11.20	14.00	15.62	15.62	0.70	1.00	0.47	0.40	7/8	3/4x4.0	8
12	13.20	2.50	14.32	14.44	13.30	16.25	17.88	17.88	0.73	1.00	0.49	0.42	7/8	3/4x4.0	8
14	15.30	3.50	16.40	16.54	15.44	18.75	20.31	20.25	0.79	1.25	0.55	0.47	7/8	3/4x4.5	10
16	17.40	3.50	18.50	18.64	17.54	21.00	22.56	22.50	0.85	1.31	0.58	0.50	7/8	3/4x4.5	12
18	19.50	3.50	20.60	20.74	19.64	23.25	24.83	24.75	1.00	1.38	0.68	0.54	7/8	3/4x4.5	12
20	21.60	3.50	22.70	22.84	21.74	25.50	27.08	27.00	1.02	1.44	0.69	0.57	7/8	3/4x4.5	14
24	25.80	3.50	26.90	27.04	25.94	30.00	31.58	31.50	1.02	1.56	0.75	0.61	7/8	3/4x5.0	16
30	32.00	4.50	33.29	33.46	32.17	36.88	39.12	39.12	1.31	2.00	0.82	0.66	1-1/8	1x6.0	20
36	38.30	4.50	39.59	39.76	38.47	43.75	46.00	46.00	1.45	2.00	1.00	0.74	1-1/8	1x6.0	24
42	44.50	4.50	45.79	45.96	44.67	50.62	53.12	53.12	1.45	2.00	1.25	0.82	1-3/8	1-1/4x6.5	28
48	50.80	4.50	52.09	52.26	50.97	57.50	60.00	60.00	1.45	2.00	1.35	0.90	1-3/8	1-1/4x6.5	32

Tyler Union Waterworks Contact Information
Tyler: 11910 CR 492 ● Tyler, Texas 75706 ● (800) 527-8478
Anniston: 1501 W 17th St. ● Anniston, AL 36201 ● (800) 226-7601
Corona: 1001 El Camino Ave. ● Corona, CA 92879 ● (866) 527-8471

TYLER UNION®
Quality Waterworks Products
www.tylerunion.com

23U - Mechanical Joint
ANSI/AWWA C153/A21.53
Compact Ductile Iron Fittings

Revised 4/2013

NON-DOMESTIC PRODUCT SUBMITTAL

Current Revisions Apply for all Listed Standards

SIZES:..... 2" through 64" (2" not included in ANSI/AWWA C153 standard)

STANDARDS:..... ANSI/AWWA C153/A21.53, NFPA 13/24, 3"-12" UL and 3"-10"FM listed & approved (File - Tyler Union)
Cast of ASTM A536 qualified ductile iron. Date code is cast on and required for traceability.

PRESSURE RATING:... *Flanged fittings rated at 250 psi. Mechanical joints 2" – 24" rated at 350 psi and 30" – 48" at 250 psi.
*Note: With the use of rubber annular ring flange gasket, 2" – 24" fittings can be rated at 350 psi.
Note: Wyes over 12" are not pressure rated. Contact Tyler Union for rating in your application.

DEFLECTION:..... Max joint deflection 2"– 12", 5° and 14"– 48", 3°. Reduces by 50% at nominal pipe & fitting diameters

NSF-61 & NSF-372:..... Meets all requirements including Annex G, Tyler Union's Underwriters Laboratory listing MH16439.

ASPHALTIC COATING: Per ANSI/AWWA C104/A21.4 and ANSI/AWWA C153/A21.53.

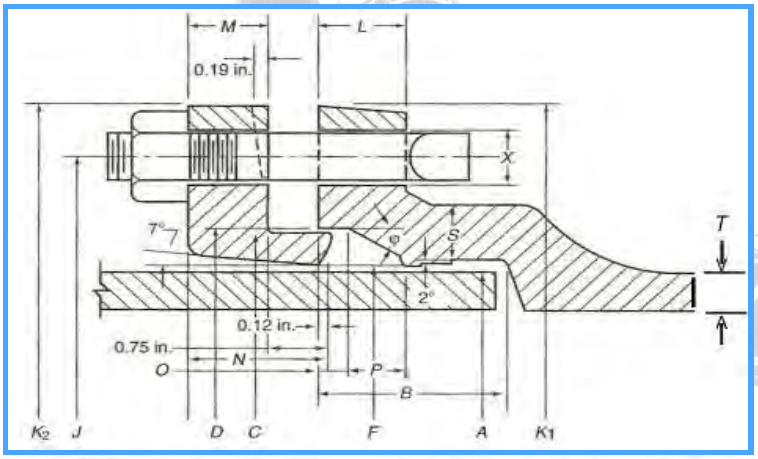
CEMENT LINING:..... Per ANSI/AWWA C104/A21.4, with double cement lining available upon request.

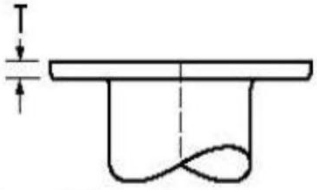
EPOXY COATING:..... Fusion bonded epoxy per ANSI/AWWA C116/A21.16. Additional coatings available upon request.

BARE:..... Available upon request.

FASTENERS:..... Per ANSI/AWWA C111/A21.11 and/or ASTM A242 high strength low alloy weathering steel

INSTALLATION:..... Per AWWA C600 and C651 using pipe conforming to ANSI/AWWA C151/A21.51 or AWWA C900/905.





ANSI/AWWA C153/A21.53 – Compact Flange
Nominal Thickness Dimensions in Inches (T = +/- .060")

Size	T	Size	T	Size	T
3	.60	10	.75	18	.93
4	.63	12	.81	20	.96
6	.63	14	.87	24	1.00
8	.70	16	.90	36	1.10

TYLER UNION — MECHANICAL JOINT - NOMINAL JOINT DIMENSIONS IN INCHES — BOLTS

Size Inches	A Dia. DI Pipe	B HUB Depth	C Dia. GLAND	D Dia.	F Dia.	J Dia. GLAND	K¹ Dia.	K² Dia. GLAND	L	M GLAND	S	T	X	Size	Qty.
2	2.51	2.50	3.50	3.60	2.61	4.75	6.19	6.89	0.58	0.62	0.36	0.30	3/4	5/8x3.0	2
3	3.96	2.50	4.84	4.94	4.06	6.19	7.62	7.69	0.58	0.62	0.39	0.33	3/4	5/8x3.0	4
4	4.80	2.50	5.92	6.02	4.90	7.50	9.06	9.12	0.60	0.75	0.39	0.34	7/8	3/4x3.5	4
6	6.90	2.50	8.02	8.12	7.00	9.50	11.06	11.12	0.63	0.88	0.43	0.36	7/8	3/4x3.5	6
8	9.05	2.50	10.17	10.27	9.15	11.75	13.31	13.37	0.66	1.00	0.45	0.38	7/8	3/4x4.0	6
10	11.10	2.50	12.22	12.34	11.20	14.00	15.62	15.62	0.70	1.00	0.47	0.40	7/8	3/4x4.0	8
12	13.20	2.50	14.32	14.44	13.30	16.25	17.88	17.88	0.73	1.00	0.49	0.42	7/8	3/4x4.0	8
14	15.30	3.50	16.40	16.54	15.44	18.75	20.31	20.25	0.79	1.25	0.55	0.47	7/8	3/4x4.5	10
16	17.40	3.50	18.50	18.64	17.54	21.00	22.56	22.50	0.85	1.31	0.58	0.50	7/8	3/4x4.5	12
18	19.50	3.50	20.60	20.74	19.64	23.25	24.83	24.75	1.00	1.38	0.68	0.54	7/8	3/4x4.5	12
20	21.60	3.50	22.70	22.84	21.74	25.50	27.08	27.00	1.02	1.44	0.69	0.57	7/8	3/4x4.5	14
24	25.80	3.50	26.90	27.04	25.94	30.00	31.58	31.50	1.02	1.56	0.75	0.61	7/8	3/4x5.0	16
30	32.00	4.50	33.29	33.46	32.17	36.88	39.12	39.12	1.31	2.00	0.82	0.66	1-1/8	1x6.0	20
36	38.30	4.50	39.59	39.76	38.47	43.75	46.00	46.00	1.45	2.00	1.00	0.74	1-1/8	1x6.0	24
42	44.50	4.50	45.79	45.96	44.67	50.62	53.12	53.12	1.45	2.00	1.25	0.82	1-3/8	1-1/4x6.5	28
48	50.80	4.50	52.09	52.26	50.97	57.50	60.00	60.00	1.45	2.00	1.35	0.90	1-3/8	1-1/4x6.5	32

Tyler Union Waterworks Contact Information
Tyler: 11910 CR 492 ● Tyler, Texas 75706 ● (800) 527-8478
Anniston: 1501 W 17th St. ● Anniston, AL 36201 ● (800) 226-7601
Corona: 1001 El Camino Ave. ● Corona, CA 92879 ● (866) 527-8471

TYLER UNION®
Quality Waterworks Products

24U-*Mechanical Joint Retainer Gland Series 100

Revised 4/2013

SUBMITTAL

(Current revisions for all Standards apply)

SIZES: ..... Series 100 for 3" through 24"

STANDARDS: ..... Per ANSI/AWWA C110, C111, and C153; cast with ASTM A536 Ductile Iron.
Sizes 3"-12" are recommended for Class 50 through Class 56 ductile pipe
Sizes 14"-24" are recommended for Class 53 through Class 56 ductile pipe

DEFLECTION: ..... Maximum recommended deflection of joints is 2° for 3" through 12" and 1° for 14" through 24"

BOLTS: ..... ANSI/AWWA C111/A21.11, for assembly use AWWA C153 length standard T-bolts. The set screws are square headed with Type C knurled cup points, 4140 grade alloy steel that is heat treated to a Rockwell "C" 45/53 case hardness and are shipped assembled in the gland

PRESSURE RATING: ..... Refer to chart provided below

NSF-61 & NSF-372: ..... Meets all requirements including Annex G, UL Registered

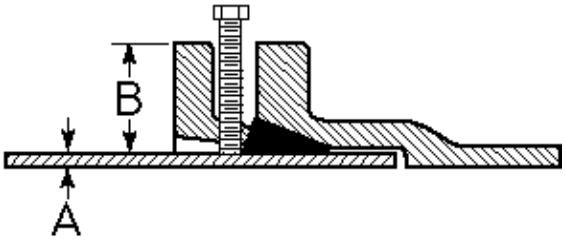
COATING: ..... ANSI/AWWA C104/A21.4 (asphaltic paint that is NSF-61, NSF-372 & Annex G approved)

INSTALLATION: ..... Per Tyler Union instructions below. **Note: Not for use on Plain end fittings**

T-BOLTS (to secure gland to "hub")
4" to 24" Retainer gland T-bolts torque to 60 ft lbs

SET SCREWS (to secure gland to "pipe")
Set screw recommended torque value is 75 ft lbs

1. Wash bell and plain end with soapy water, then slip gland and gasket over plain end with the small side of the gasket and ring side of of the gland facing the bell.
2. Slip plain end into bell. Brush soapy water on gasket. This lubricates the gasket and allows it to slip easily into place. Push gasket into bell making sure it is evenly in the bell gasket landing.
3. Slide the gland into position against the back of the gasket. Align bolt holes, insert T-bolts and tighten nuts to finger tight.
4. Snug up all T-bolt nuts evenly. Alternating at 180°, tighten the T-bolt nuts to a torque of: 3" - 60 foot pounds
   4" thru 24" - 90 foot pounds.
5. Snug up all set screws evenly. Using a torque wrench, tighten the set screws alternating at 180° to the recommended torque value of 75 foot pounds. If required double check set screws immediately.



Size	Pressure Rating, psi	Gland O.D. B	Pipe O.D. O.D. A	D.I. Pipe Wall Class	No of Set Screws	Size of Set Screws	Gland Wt	Wt w/ Acces.
3	350	7.69	3.96	50-56	4	⅝x2	4	8
4	350	9.12	4.80	50-56	4	⅝x2	5	11
6	350	11.12	6.90	50-56	6	⅝x2	9	16
8	250	13.37	9.05	50-56	9	⅝x2	13	21
10	250	15.62	11.10	50-56	12	⅝x2	17	26
12	150	17.88	13.20	50-56	16	⅝x2	20	28
14	250	20.25	15.30	53-56	20	⅝x2½	44	55
16	200	22.50	17.40	53-56	24	⅝x2½	54	64
18	200	24.75	19.50	53-56	24	⅝x2½	62	72
20	200	27.00	21.60	53-56	28	⅝x3	76	91
24	150	31.50	25.80	53-56	32	⅝x3	103	118

* Not included in AWWA C110 or AWWA C153

TYLER UNION®
Quality Waterworks Products

25U-Compact Mechanical Joint Tapping Sleeve for

Ductile Iron, Cast Iron, & C900 PVC Pipe
Revised 7/2013

SUBMITTAL

(Current revisions for all Standards apply)

SIZES: ..... For 6"-12" PVC/ductile pipe per ANSI/AWWA C900 or C151 & Cast iron pipe O.D. as provided. Comes with 4"-12" side flanged outlet & ¾" tap at branch.

STANDARDS: ..... Mechanical and *Flanged joints comply with applicable requirements of ANSI/AWWA C153 and ASME/ANSI B16.1. Cast with tested and traceable ASTM A536 ductile iron. Ductile iron Mechanical Joint Tapping Sleeves are produced in accordance with Tyler Union manufacturer's standard. are Dimension and specification ranges are per the standards as provided.
Note: Recess dimensions are per Manufacturer's Standardization Society standard practice SP-60. Meets requirements of MSS SP-111

PRESSURE RATING:. 6"- 12" Assemblies rated @ 250 PSI.

GASKETS: ..... SBR Mechanical Joint and Split gaskets are per ASTM D2000 - AA and ANSI/AWWA C111/21.11, armor tipped with coiled brass wire spring.

NSF-61& NSF-372:. Meets all requirements including Annex G

ASPHALTIC COATING:..... ANSI/AWWA C104/A21.4

CEMENT LINING: .... Tapping Sleeves are unlined to ensure they fit over the pipe being tapped.

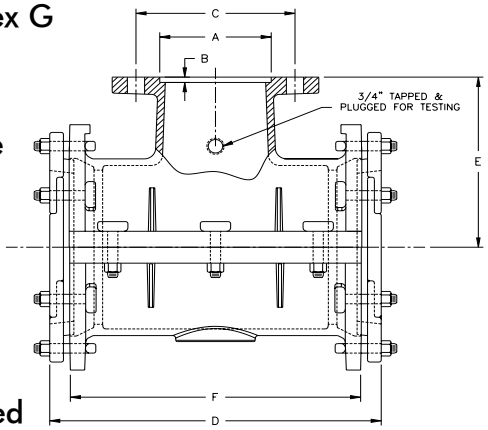
FLANGE:..... ASME/ANSI B16.1, Class 125

FLANGE THICKNESS: ANSI/AWWA C153 and ASME B16.1

BOLTS: ..... ANSI/AWWA C111/A21.11

DEFLECTION:..... Deflection is not recommended

INSTALLATION:..... Per Tyler Union instructions as provided



1. Clean pipe, insert side gasket into back half of gasket grooves. Make sure ends are flush with or slightly protrude into the end gasket seating area.
2. Bolt sleeve halves together and trim side gaskets as necessary. MAKE SURE SLEEVE WILL ROTATE FREELY ON PIPE.
3. Install end gaskets, locating cut ends 90° from side gasket If pipe is maximum OD, stretch gasket to make certain cut ends match with no gap in between.
4. Install glands and bolts-rotate sleeve to desired position. Be sure pipe is centered inside the sleeve.
5. Tighten gland bolts alternately, using 80 to 90 foot pounds.
6. After assembly, PRESSURE TEST ALL JOINTS BEFORE TAPPING. If additional tightening is required, release pressure and relax tension on gland bolts before tightening side bolts.

Size	Dimensions A	B	C	D	E	F	Pipe O.D. Range Min.	Max.	DI
6x4	5.016	.250	7.50	15.75	8.00	12.75	6.85	7.15	104
6	7.016	.312	9.50	15.75	8.00	12.75	6.85	7.15	108
8x4	5.016	.250	7.50	16.50	9.00	13.375	9.00	9.35	134
8x6	7.016	.312	9.50	16.50	9.00	13.375	9.00	9.35	140
8	9.016	.312	11.75	16.50	9.00	13.375	9.00	9.35	148
10x4	5.016	.250	7.50	24.00	11.00	20.75	11.04	11.45	236
10x6	7.016	.312	9.50	24.00	11.00	20.75	11.04	11.45	240
10x8	9.016	.312	11.75	24.00	11.00	20.75	11.04	11.45	246
10	11.016	.312	14.25	24.00	11.00	20.75	11.04	11.45	257
12x4	5.016	.250	7.50	26.50	12.00	23.25	13.14	13.56	273
12x6	7.016	.312	9.50	26.50	12.00	23.25	13.14	13.56	286
12x8	9.016	.312	11.75	26.50	12.00	23.25	13.14	13.56	292
12x10	11.016	.312	14.25	26.50	12.00	23.25	13.14	13.56	303
12	13.016	.312	17.00	26.50	12.00	23.25	13.14	13.56	320

TYLER UNION®
Quality Waterworks Products
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26U - Push On Tyton Joint Union-Tite Ductile Iron Compact Fittings

Revised 4/2013

DOMESTIC PRODUCT SUBMITTAL

Current Revisions Apply for all Listed Standards

SIZES:..... 4" through 24"

STANDARDS:..... ANSI/AWWA C153/A21.53, NFPA 13/24, 4" - 12" UL listed and approved (File - Tyler Union)
Cast of ASTM A536 qualified ductile iron. Date code is cast on and required for traceability.

PRESSURE RATING:... *Flanged fittings rated at 250 psi. Push on joints 4" – 24" rated at 350 psi.
*Note: With the use of rubber annular ring flange gasket, 4" – 24" fittings can be rated at 350 psi.
Note: Wyes over 12" are not pressure rated. Contact Tyler Union for rating in your application.

DEFLECTION:..... Max joint deflection 4"– 12", 5° and 14"– 24", 3°. Reduces by 50% at nominal pipe & fitting diameters

NSF-61 & NSF-372:..... Meets all requirements including Annex G, Tyler Union's Underwriters Laboratory listing MH16439.

ASPHALTIC COATING: Per ANSI/AWWA C104/A21.4 and ANSI/AWWA C153/A21.53.

CEMENT LINING:..... Per ANSI/AWWA C104/A21.4, with double cement lining available upon request.

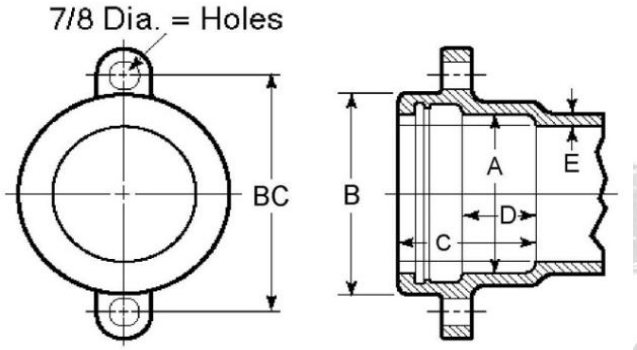
EPOXY COATING:..... Fusion bonded epoxy per ANSI/AWWA C116/A21.16. Additional coatings available upon request.

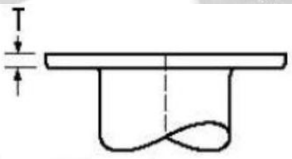
BARE:..... Available upon request.

FASTENERS:..... Per ANSI/AWWA C111/A21.11 and/or ASTM A242 high strength low alloy weathering steel

RESTRAINING LUGS:.. *Lugs provided on 16" and smaller fittings. Lug pattern accommodates most gripper type restraints.
*Note: With sufficient lead time to adapt tooling, restraining lugs are available on 18'-24" fittings.

INSTALLATION:..... Per AWWA C600 and C651 using pipe conforming to ANSI/AWWA C151/A21.51 or AWWA C900/905. Designed for use with TYTON® and McWane Sure Stop® gaskets. Contact Tyler Union regarding the installation or use of other gasket types and/or gasket manufacturers.





ANSI/AWWA C153/A21.53 – Compact Flange
Nominal Thickness Dimensions in Inches (T = +/- .060")

Size	T	Size	T	Size	T
3	.60	10	.75	18	.93
4	.63	12	.81	20	.96
6	.63	14	.87	24	1.00
8	.70	16	.90	36	1.10

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NOMINAL JOINT DIMENSIONS IN INCHES

Size Inches	Pipe Diameter	A Dia.	B Dia.	B.C. Dia.	C Dim.	D Dim.	E Dim.	Bolt Dia.
4	4.80	5.04	6.38	7.88	4.16	2.25	0.35	7/8
6	6.90	7.14	8.52	10.50	4.29	2.25	0.37	7/8
8	9.05	9.32	10.90	12.88	4.78	2.25	0.39	7/8
10	11.10	11.37	12.91	14.69	4.98	2.25	0.41	7/8
12	13.20	13.47	15.12	17.19	4.98	2.25	0.43	7/8
14	15.30	15.64	18.12	19.00	5.40	2.25	0.51	7/8
16	17.40	17.74	20.32	21.40	5.40	2.25	0.52	7/8
18	19.50	19.83	22.52	....	5.40	2.25	0.59	7/8
20	21.60	21.94	24.29	....	5.40	2.25	0.60	7/8
24	25.80	26.14	29.14	....	5.65	2.50	0.62	7/8

Tyler Union Waterworks Contact Information
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26U - Push On Tyton Joint Union-Tite Ductile Iron Compact Fittings

Revised 4/2013

NON-DOMESTIC PRODUCT SUBMITTAL

Current Revisions Apply for all Listed Standards

SIZES:..... 4" through 24"

STANDARDS:..... ANSI/AWWA C153/A21.53, NFPA 13/24, 4" - 12" UL listed and approved (File - Tyler Union)
Cast of ASTM A536 qualified ductile iron. Date code is cast on and required for traceability.

PRESSURE RATING:... *Flanged fittings rated at 250 psi. Push on joints 4" – 24" rated at 350 psi.
*Note: With the use of rubber annular ring flange gasket, 4" – 24" fittings can be rated at 350 psi.
Note: Wyes over 12" are not pressure rated. Contact Tyler Union for rating in your application.

DEFLECTION:..... Max joint deflection 4"– 12", 5° and 14"– 24", 3°. Reduces by 50% at nominal pipe & fitting diameters

NSF-61 & NSF-372:..... Meets all requirements including Annex G, Tyler Union's Underwriters Laboratory listing MH16439.

ASPHALTIC COATING: Per ANSI/AWWA C104/A21.4 and ANSI/AWWA C153/A21.53.

CEMENT LINING:..... Per ANSI/AWWA C104/A21.4, with double cement lining available upon request.

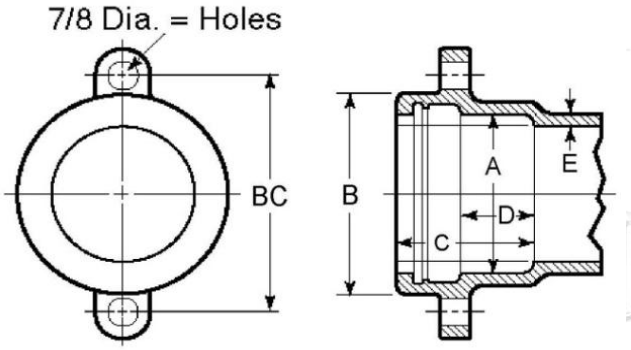
EPOXY COATING:..... Fusion bonded epoxy per ANSI/AWWA C116/A21.16. Additional coatings available upon request.

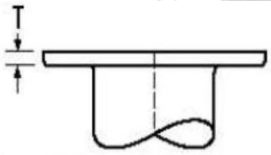
BARE:..... Available upon request.

FASTENERS:..... Per ANSI/AWWA C111/A21.11 and/or ASTM A242 high strength low alloy weathering steel

RESTRAINING LUGS:.. *Lugs provided on 16" and smaller fittings. Lug pattern accommodates most gripper type restraints.
*Note: With sufficient lead time to adapt tooling, restraining lugs are available on 18'-24" fittings.

INSTALLATION:..... Per AWWA C600 and C651 using pipe conforming to ANSI/AWWA C151/A21.51 or AWWA C900/905. Designed for use with TYTON® and McWane Sure Stop® gaskets. Contact Tyler Union regarding the installation or use of other gasket types and/or gasket manufacturers.





ANSI/AWWA C153/A21.53 – Compact Flange
Nominal Thickness Dimensions in Inches (T = +/- .060")

Size	T	Size	T	Size	T
3	.60	10	.75	18	.93
4	.63	12	.81	20	.96
6	.63	14	.87	24	1.00
8	.70	16	.90	36	1.10

TYLER UNION

NOMINAL JOINT DIMENSIONS IN INCHES

Size Inches	Pipe Diameter	A Dia.	B Dia.	B.C. Dia.	C Dim.	D Dim.	E Dim.	Bolt Dia.
4	4.80	5.04	6.38	7.88	4.16	2.25	0.35	7/8
6	6.90	7.14	8.52	10.50	4.29	2.25	0.37	7/8
8	9.05	9.32	10.90	12.88	4.78	2.25	0.39	7/8
10	11.10	11.37	12.91	14.69	4.98	2.25	0.41	7/8
12	13.20	13.47	15.12	17.19	4.98	2.25	0.43	7/8
14	15.30	15.64	18.12	19.00	5.40	2.25	0.51	7/8
16	17.40	17.74	20.32	21.40	5.40	2.25	0.52	7/8
18	19.50	19.83	22.52	....	5.40	2.25	0.59	7/8
20	21.60	21.94	24.29	....	5.40	2.25	0.60	7/8
24	25.80	26.14	29.14	....	5.65	2.50	0.62	7/8

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Quality Waterworks Products
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28U - Flange Joint
ANSI/AWWA C110/A21.10
Full Body Ductile Iron Fittings
Revised 4/2013

DOMESTIC PRODUCT SUBMITTAL

Current Revisions Apply for all Listed Standards

SIZES:..... 2" through *64" (*Contact Tyler Union for 54"-64" Flange fitting information)

STANDARDS:..... ANSI/AWWA C110/A21.10, NFPA 13/24, 3" - 12" UL listed and approved (File - Tyler Union)
Cast of ASTM A536 qualified ductile iron. Date code is cast on and required for traceability

PRESSURE RATING:... *2" through 48" flanged fittings rated at 250 psi.
*Note: With the use of rubber annular ring flange gasket, 2" – 24" fittings can be rated at 350 psi

DEFLECTION:..... Deflection is "not" recommended for flange joint fittings due to the rigidity of the joint upon completion of installation.

NSF-61 & NSF-372:..... Meets all requirements including Annex G, Tyler Union's Underwriters Laboratory listing MH16439

COATING: ..... Asphaltic or Primer per ANSI/AWWA C104/A21.4, Standard primer is Tnemec Pota Pox 140N-1211
Contact Tyler Union for additional coating options

CEMENT LINING:..... Per ANSI/AWWA C104/A21.4, with double cement lining available upon request.

EPOXY COATING:..... Fusion bonded epoxy per ANSI/AWWA C116/A21.16. Additional coatings available upon request.

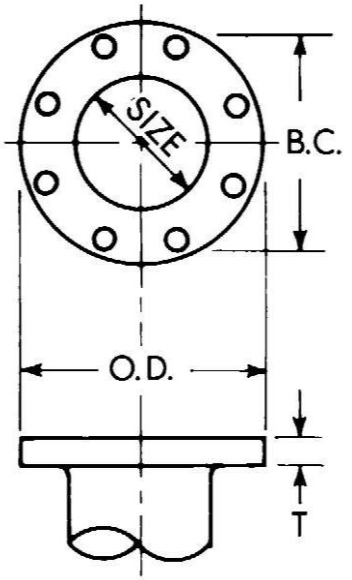
BARE:..... Available upon request

FLANGES:..... ANSI Class 125 per ASME B16.1 and ANSI/AWWA C111/A21.11
Note: *ANSI Class 250 ASME B16.1 flanged fittings available upon request
Note: *Due to larger bolt sizing and bolt circle, Class 250 flanges are "not" compatible with Class 125 flanged fittings. AWWA C110 and AWWA C115 Class 125 flanges are compatible.

FLANGE THICKNESS:. ANSI/AWWA C115/A21.15 standard class 125 template for drilling bolt holes
Note: Drilling templates are in multiples of 4, so that fittings may be made face to in any quarter.
Bolt holes shall straddle the center line.

FASTENERS:..... Per ANSI/AWWA C111/A21.11 and/or ASTM A242 high strength low alloy weathering steel

INSTALLATION:..... Per AWWA C600 and C651 using pipe conforming to ANSI/AWWA C151/A21.51



TYLER UNION

FLANGE DETAILS IN INCHES						BOLTS	
Size Inches	Diameter DI Pipe	Flange O.D.	Bolt Circle Diameter	Flange Thickness "T"	Bolt Hole Diameter	Size	Qty.
2	2.51	6.00	4.75	0.62	0.750	5/8 x 2.25	4
3	3.96	7.50	6.00	0.75	0.750	5/8 x 2.25	4
4	4.80	9.00	7.50	0.94	0.750	5/8 x 3.00	8
6	6.90	11.00	9.50	1.00	0.875	3/4 x 3.50	8
8	9.05	13.50	11.75	1.12	0.875	3/4 x 3.50	8
10	11.10	16.00	14.25	1.19	1.000	7/8 x 4.00	12
12	13.20	19.00	17.00	1.25	1.000	7/8 x 4.00	12
14	15.30	21.00	18.75	1.38	1.125	1 x 4.50	12
16	17.40	23.50	21.25	1.44	1.125	1 x 4.50	16
18	19.50	25.00	22.75	1.56	1.250	1-1/8 x 5.00	16
20	21.60	27.50	25.00	1.69	1.250	1-1/8 x 5.00	20
24	25.80	32.00	29.50	1.88	1.375	1-1/4 x 5.50	20
30	32.00	38.75	36.00	2.12	1.375	1-1/4 x 5.50	28
36	38.30	46.00	42.75	2.38	1.625	1-1/2 x 7.00	32
42	44.50	53.00	49.50	2.62	1.625	1-1/2 x 7.50	36
48	50.80	59.50	56.00	2.75	1.625	1-1/2 x 8.00	44

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Tyler: 11910 CR 492 ● Tyler, Texas 75706 ● (800) 527-8478
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Corona: 1001 El Camino Ave. ● Corona, CA 92879 ● (866) 527-8471

TYLER UNION®
Quality Waterworks Products
www.tylerunion.com

28U - Flange Joint
ANSI/AWWA C110/A21.10
Full Body Ductile Iron Fittings

Revised 4/2013

NON-DOMESTIC PRODUCT SUBMITTAL

Current Revisions Apply for all Listed Standards

SIZES:..... 2" through *64" (*Contact Tyler Union for 54"-64" Flange fitting information)

STANDARDS:..... ANSI/AWWA C110/A21.10, NFPA 13/24, 3" - 12" UL listed and approved (File - Tyler Union)
Cast of ASTM A536 qualified ductile iron. Date code is cast on and required for traceability

PRESSURE RATING:... *2" through 48" flanged fittings rated at 250 psi.
*Note: With the use of rubber annular ring flange gasket, 2" – 24" fittings can be rated at 350 psi

DEFLECTION:..... Deflection is "not" recommended for flange joint fittings due to the rigidity of the joint upon completion of installation.

NSF-61 & NSF-372:..... Meets all requirements including Annex G, Tyler Union's Underwriters Laboratory listing MH16439

COATING: ..... Asphaltic or Primer per ANSI/AWWA C104/A21.4, Standard primer is Tnemec Pota Pox 140N-1211
Contact Tyler Union for additional coating options

CEMENT LINING:..... Per ANSI/AWWA C104/A21.4, with double cement lining available upon request.

EPOXY COATING:..... Fusion bonded epoxy per ANSI/AWWA C116/A21.16. Additional coatings available upon request.

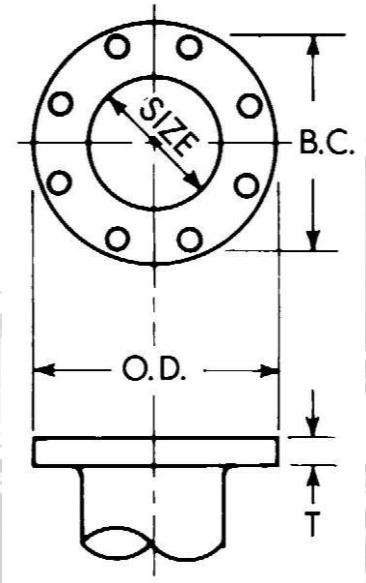
BARE:..... Available upon request

FLANGES:..... ANSI Class 125 per ASME B16.1 and ANSI/AWWA C111/A21.11
Note: *ANSI Class 250 ASME B16.1 flanged fittings available upon request
Note: *Due to larger bolt sizing and bolt circle, Class 250 flanges are "not" compatible with Class 125 flanged fittings. AWWA C110 and AWWA C115 Class 125 flanges are compatible.

FLANGE THICKNESS:. ANSI/AWWA C115/A21.15 standard class 125 template for drilling bolt holes
Note: Drilling templates are in multiples of 4, so that fittings may be made face to in any quarter.
Bolt holes shall straddle the center line.

FASTENERS:..... Per ANSI/AWWA C111/A21.11 and/or ASTM A242 high strength low alloy weathering steel

INSTALLATION:..... Per AWWA C600 and C651 using pipe conforming to ANSI/AWWA C151/A21.51



TYLER UNION

FLANGE DETAILS IN INCHES						BOLTS	
Size Inches	Diameter DI Pipe	Flange O.D.	Bolt Circle Diameter	Flange Thickness "T"	Bolt Hole Diameter	Size	Qty.
2	2.51	6.00	4.75	0.62	0.750	5/8 x 2.25	4
3	3.96	7.50	6.00	0.75	0.750	5/8 x 2.25	4
4	4.80	9.00	7.50	0.94	0.750	5/8 x 3.00	8
6	6.90	11.00	9.50	1.00	0.875	3/4 x 3.50	8
8	9.05	13.50	11.75	1.12	0.875	3/4 x 3.50	8
10	11.10	16.00	14.25	1.19	1.000	7/8 x 4.00	12
12	13.20	19.00	17.00	1.25	1.000	7/8 x 4.00	12
14	15.30	21.00	18.75	1.38	1.125	1 x 4.50	12
16	17.40	23.50	21.25	1.44	1.125	1 x 4.50	16
18	19.50	25.00	22.75	1.56	1.250	1-1/8 x 5.00	16
20	21.60	27.50	25.00	1.69	1.250	1-1/8 x 5.00	20
24	25.80	32.00	29.50	1.88	1.375	1-1/4 x 5.50	20
30	32.00	38.75	36.00	2.12	1.375	1-1/4 x 5.50	28
36	38.30	46.00	42.75	2.38	1.625	1-1/2 x 7.00	32
42	44.50	53.00	49.50	2.62	1.625	1-1/2 x 7.50	36
48	50.80	59.50	56.00	2.75	1.625	1-1/2 x 8.00	44

Tyler Union Waterworks Contact Information
Tyler: 11910 CR 492 ● Tyler, Texas 75706 ● (800) 527-8478
Anniston: 1501 W 17th St. ● Anniston, AL 36201 ● (800) 226-7601
Corona: 1001 El Camino Ave. ● Corona, CA 92879 ● (866) 527-8471

TYLER UNION®
Quality Waterworks Products

29U-Domestic Heavy Duty Cast Iron Curb, Service, & Valve Boxes + Components

Revised 04/2013

SUBMITTAL

(Current Revisions for All Standards Apply)

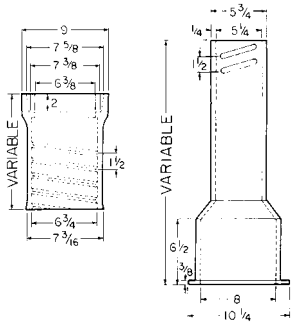
SIZES: ..... Adjustable Slip and Screw type with standard assembled lengths ranging from 19" to 72" (Lengths noted do not include the addition of risers, extensions, and/or bases). See the Catalog or List Price guide for access., lids, rings, bases, risers, meter covers, etc.

STANDARDS: ..... Produced with Class 35 cast iron in accordance with and meeting all applicable terms and provisions of ASTM A-48. All Tyler Union valve boxes when properly installed are suitable for use in conjunction with projects utilizing American Association of State Highway and Transportation Officials (AASHTO) standards and provisions.

INSTALLATION: ..... Per AWWA M44, Manual of Water Supply Practices

COATING: ..... The asphaltic bituminous coating is applied to a minimum thickness of 1.5 mil and the coating once dry is neither brittle when exposed to cold or sticky when exposed to the sun.

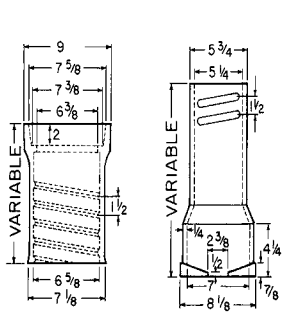
For 4" to 12" Valves
5¼" Shaft, Screw Type



6850 SCREW TYPE VALVE BOX
Cast Iron - 2 piece

Components	Extension Height
10T + 15B	19-22
10T + 24B	27-32
16T + 24B	27-37
16T + 30B	33-43
16T + 36B	39-50
26T + 30B	36-52
26T + 36B	39-60
26T + 24B + #60 Ext	53-71
26T + 36B + #60 Ext	64-82

For 3" to 20" Valves
5¼" Shaft, Screw Type

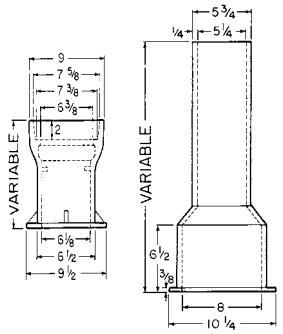


6860 SCREW TYPE VALVE BOX
Cast Iron - 3 piece

Components)	Extension Height
10T + 12B	27-37
10T + 18B	33-42
16T + 24B	39-49
16T + 30B	45-54
16T + 36B	51-60
26T + 30B	45-66
26T + 36B	51-72

NOTE: Base Required, Order Separately

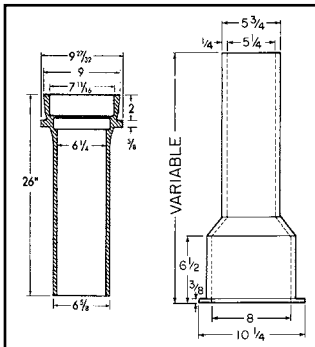
For 4" to 12" Valves
5¼" Shaft, Slip Type



6855 SLIP TYPE VALVE BOX
Cast Iron - 2 piece

Components	Extension Height
10T + 15B	19-22
10T + 24B	27-32
16T + 24B	27-37
16T + 30B	33-43
16T + 36B	39-50
26T + 30B	36-52
26T + 36B	39-60
26T + 24B + #60 Ext	53-71
26T + 36B + #60 Ext	64-82

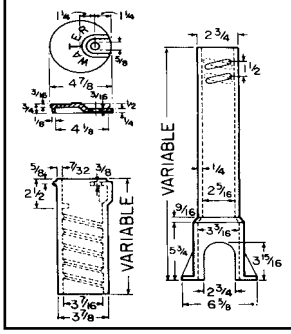
For 4" to 12" Valves
5¼" Shaft, Slip Type



7126 SLIP TYPE VALVE BOX

Components	Extension Height
26T + 24B	28-48
26T + 30B	34-54
26T + 36B	40-60
26T + 24B + #60 Ext	52-72
26T + 36B + #60 Ext	60-80

NOTE: Use the 6855 Bottoms with these Tops



For ½" to 2" Curbstops

6500 SCREW TYPE CURB / SERVICE BOX

Componets	Extension In Inches
18T & 27B	30-42
18T & 33B	36-48
24T & 33B	36-54
24T & 39B	42-60
30T & 39B	41-64

*Enlarged Base Available

T = Top
B = Bottom
EXT = Extension

Tyler: 11910 CR 492-Tyler,TX 75706-(800) 527-8478 **Anniston:** 1501 W. 17th Street-Anniston, AL 36201-(800) 226-7601
Corona: 1001 El Camino Ave.-Corona, CA 92879-(866) 527-8471 **Portland:** 6204 N. Marine Dr.-Portland, OR 97203-(866) 527-8471
www.tylerunion.com

TYLER UNION®
Quality Waterworks Products

30U-Non-Domestic *Standard & Heavy Duty Valve & Service Boxes + Components

Revised 04/2013

SUBMITTAL

(Current revisions for all Standards apply)

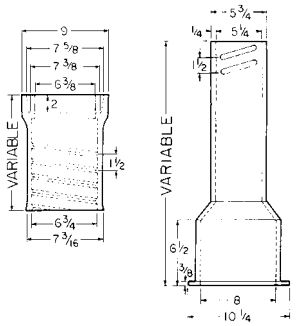
SIZES: .....Adjustable Slip and Screw type with standard assembled lengths ranging from 15" to 72" (Lengths do not include risers, bases, and/or extensions). See the Catalog or List Price guide for acc., lids, rings, bases, risers, meter covers, etc.

STANDARDS: .....Produced with cast iron in accordance with and meeting all applicable terms and provisions of ASTM A-48. All Tyler Union valve boxes when properly installed are suitable for use in conjunction with projects utilizing American Association of State and Highway Transportation Officials (AASHTO) standards.

INSTALLATION: .....Per AWWA M44, Manual of Water Supply Practices

COATING:.....The asphaltic bituminous coating is applied to a minimum thickness of 1.5 mil and the coating once dry is neither brittle when cold or sticky when eposed to the sun.

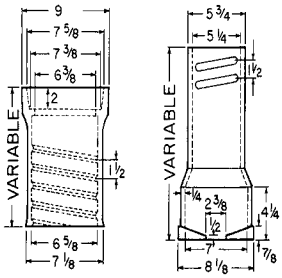
For 4" to 12" Valves
5¼" Shaft, Screw Type



6850 SCREW TYPE VALVE BOX
Cast Iron - 2 piece

Components	Extension Height
10T + 15B	19-22
10T + 24B	27-32
16T + 24B	27-37
16T + 30B	33-43
16T + 36B	39-50
26T + 30B	36-52
26T + 36B	39-60
26T + 24B + #60 Ext	53-71
26T + 36B + #60 Ext	64-82

For 3" to 20" Valves
5¼" Shaft, Screw Type

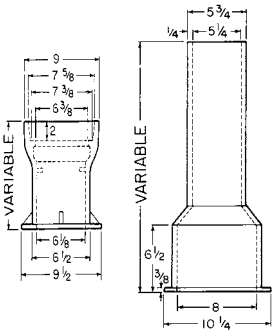


6860 SCREW TYPE VALVE BOX
Cast Iron - 3 piece

Components)	Extension Height
10T + 12B	27-37
10T + 18B	33-42
16T + 24B	39-49
16T + 30B	45-54
16T + 36B	51-60
26T + 30B	45-66
26T + 36B	51-72
16T + 24B + #60 Ext	63-72
26T + 24B + #60 Ext	63-84
26T + 36B + #60 Ext	74-94

NOTE: Base Required, Order Separately

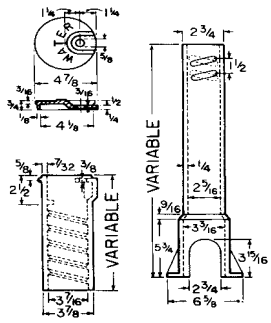
For 4" to 12" Valves
5¼" Shaft, Slip Type



6855 SLIP TYPE VALVE BOX
Cast Iron - 2 piece

Components	Extension Height
10T + 15B	19-22
10T + 24B	27-32
16T + 24B	27-37
16T + 30B	33-43
16T + 36B	39-50
26T + 30B	36-52
26T + 36B	39-60
26T + 24B + #60 Ext	53-71
26T + 36B + #60 Ext	64-82

For ½" to 2"
Curbstops



6500 SCREW TYPE CURB / SERVICE BOX

Componets	Extension In Inches
12T + 12B	15-21
12T + 15B	18-24
15T + 15B	21-27
15T + 21B	24-33
15T + 27B	30-39
18T + 27B	30-42
18T + 33B	36-48
24T + 33B	36-54
24T + 39B	42-60
30T + 39B	41-64

NOTE: Enlarged Base Available

T = Top B = Bottom EXT = Extension

*Note:Wall thickness of Standard weight boxes is 3/16" and the inside diameter is 1/8" greater than the dimensions provided

TYLER UNION®
Quality Waterworks Products

31U-Standard Mechanical & Push-On Joint Gaskets
(SBR, NBR, EPDM, Neoprene, FKM)

SUBMITTAL
(Current revisions for all Standards apply)

Tyler Union Waterworks provides that our *Mechanical and Push-On joint gaskets and dimensions conform to the specifications in ANSI/AWWA C111/A21.11 (current revision). Markings include size, mold number, gasket manufacturer's mark, country where molded, and product identification letters. No markings are placed on sealing surfaces per the AWWA C111 standard.

*Note: Push-On and Mechanical Joint transition gasket design standards and markings are not addressed by ANSI/AWWA C111/A21.11 (current revision). Transition gaskets provided by Tyler Union follow the material testing standards and specifications established for ANSI/AWWA C111/A21.11 gaskets.

Gasket material is vulcanized styrene butadiene rubber (SBR). Purchaser may request special application elastomers (EPDM, Nitrile, Neoprene & FKM) which will be identified on all documentation and corresponding gaskets. Gaskets are free of foreign materials, porous areas, or other defects that make them unfit for the intended use.

Tyler Union gaskets are manufactured under quality control standards and procedures that are maintained by the gasket supplier. Appropriate documentation is maintained by the manufacturer and available for review upon request. Properties and test methods for SBR, EPDM, Nitrile, Neoprene and FKM gaskets are as provided.

Property	ASTM Test Method	Required Value
Hardness, Shore “A”	D2240-86	75 (+-5)
Minimum Tensile	D412-87	1500 psi (10MPa)
Minimum Elongation	D412-87	150 %
Minimum Aging	D572-88	60 %
Maximum Compression Set	D395-89, Method B	20 %
Resistance to surface Ozone cracking	D1149-86	No cracking

Tyler Union's approved suppliers maintain a quality assurance program that is reviewed and updated on an ongoing basis to ensure product quality. Tyler Union's gasket suppliers submit gaskets for testing and provide materials for testing to Underwriters Laboratories, Inc. Tyler Union's gasket providers are recognized under the component program (UL 194/ UL 157) of Underwriters Laboratories, Inc.. Tyler Union UL approved gaskets meet NSF-61, NSF-372 and Annex G.

Tyler Union provides that our Mechanical and Push-On joint gaskets for potable or wastewater projects will perform as designed when selected per the chart provided and installed per AWWA C600-10.

SBR (Styrene Butadiene rubber)(Buna-S) Not Recommended for Hydrocarbon Service	20°F to180°F	Suitable for Water, Wastewater, most moderate chemicals, wet or dry organic acids, alcohols, ketones, and aldehydes
EPDM (Ethylene Propylene) Not Recommended for Hydrocarbon Service	-10°F to 250°F	Ideal for water, wastewater, ozone, & strong oxidizing chemicals May be used on steam and air within its temperature range
CR (Neoprene)	-10°F to 200°F	Recommended for moderate chemicals and acids, oil fats, greases, many solvents and air with hydrocarbons. Will not support combustion
NBR (Nytril)(Buna-N)(Hycar)	-40°F to 250°F	Ideally suited for gasoline, petrolium products, hydrocarbons, water, mineral and vegetable oils
*FKM(Fluoroelastomer) *Check with Customer Service for availability	10°F to 425°F	Ideally suited for hydrocarbons, acids, vegetable oils & petrolium
Gasket Types Offered:		(1)Mechanical Joint std.(2) Push-On Joint std.(3)Mechanical Joint DUO (4)Mechanical & Push-on Joint Transition(5)Push-on Restraining (6)Mechanical Joint Armor Tip Conductivity(7)Compact tapping Sleeve

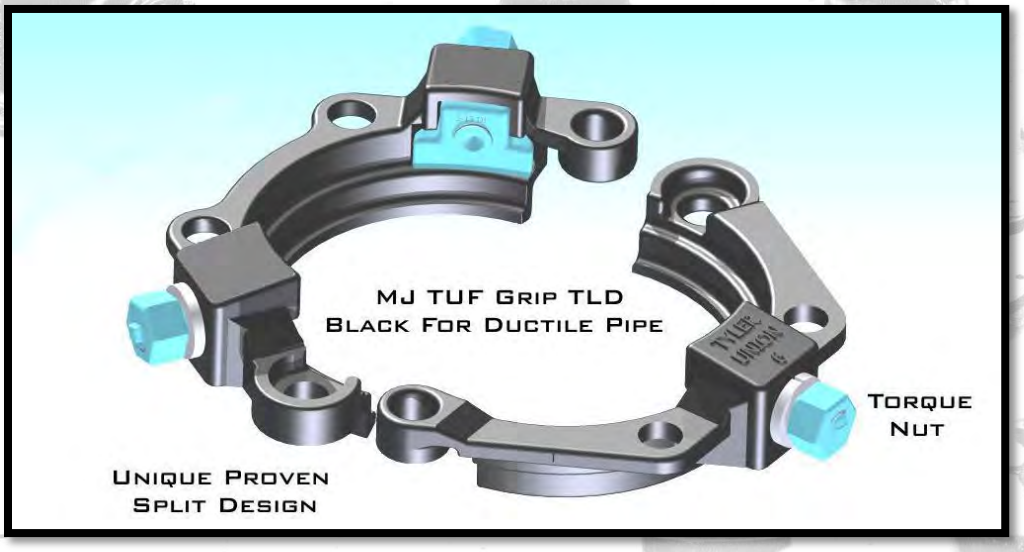
Unless other wise requested by the purchaser upon order placement, all gaskets provided will be of our standard SBR material.

TYLER UNION®
Quality Waterworks Products
www.tylerunion.com

TUFGRIP™

SERIES 1000S – MJ TLD SPLIT FOR DUCTILE PIPE

"A Proven Third Generation Mechanical Joint Restraint"



"BETTER BY DESIGN"

SPECIFICATIONS:

- Designed and proven to restrain plain end ductile iron pipe conforming to ANSI/AWWA C151/A21.51 in diameters 4" thru 12"
- Restraint design conforms with applicable requirements of ANSI/AWWA C111, ANSI/AWWA C153, and ANSI/AWWA C110
- Restraint engineered for securing plain end pipe to mechanical joint fittings conforming to ANSI/AWWA C110, C111, and C153
- Rated restraint rated for working water pressure of 350 psi for 4" thru 12" restraints
- Cast of ASTM A536 compliant 65-45-12 ductile iron complete with a cast on date code and country of origin for traceability
- Restraints and all components are designed and proven for a 2:1 safety factor based on the pipe pressure rating
- Deflection rating when installed on AWWA C151 pipe with nominal diameter shall be 3° for 4" thru 12" restraints
- Standard coating for Non-Domestic restraint is 4-6 mil of *Alkyd resin baking enamel -***Note: Epoxy coatings available upon request**
- Gripping wedges are heat treated to a mininum 420 Brinell Hardness
- Gripping wedge, wedge collar bolt, and twist off torque limiting nut shall be e-coated
- Not recommended for use on plain end fittings
- Color coded black for pipe type(ductile pipe/*cast iron pipe) - ***Note: Refer to page 2 for cast iron pipe application**

FEATURES & ADVANTAGES:

- Torque limiting nut on gripping wedge assembly twists off within a designed torque range eliminating the need for specialized tools
- Gripping wedge assembly pivots providing stronger engagement of pipe wall at lower torque requirement (45-60 ft.-lbs.)
- Proven restraint technology utilizing fewer gripping wedges in frequently applied diameters, reducing trench time and project cost
- Restraint's heavy duty construction and design eliminates the need for costly thrust blocks and tie rods
- Suitable for Potable and Wastewater applications

ISO 9001-2008 Registered

Product Source/Type	Name of Project	Name of Contractor	Project Engineer	Spec. Section and/or Project No.

Tyler Union Waterworks Contact Information
Tyler: 11910 CR 492 ● Tyler, Texas 75706 ● (800) 527-8478
Anniston: 1501 W 17th St. ● Anniston, AL 36201 ● (800) 226-7601
Corona: 1001 El Camino Ave. ● Corona, CA 92879 ● (866) 527-8471

TYLER UNION®
Quality Waterworks Products
www.tylerunion.com

DOMESTIC PRODUCT SUBMITTAL

TUFGRIP™

Series 1000 - For Ductile Iron Pipe

"A Proven Third Generation Mechanical Joint Restraint"

TYLER UNION®
Quality Waterworks Products

Tyler Union's TUF Grip restraints represent the culmination of 20 years of engineering and testing. As a 3rd generation restraint, TUF Grip is the best available technology in the Waterworks market for use in restraining Ductile Iron Pipe.

HK&A Designed by Harold Kennedy & Associates, Inc.

"BETTER BY DESIGN"

SPECIFICATIONS:

- Designed and proven to restrain plain end ductile iron pipe conforming to ANSI/AWWA C151/A21.51 in diameters 3" thru 48"
- Proven for use on heavy wall **Schedule 40 or greater steel pipe in sizes 3"- 12" and on all sizes 3" to 16" when pipe O.D. and wall thickness conforms to C151 **Note: IPS diameter steel pipe requires the use of an MJ Transition gasket
- Restraint design conforms with applicable requirements of ANSI/AWWA C111, ANSI/AWWA C153, and ANSI/AWWA C110
- Restraint engineered for securing plain end pipe to mechanical joint fittings conforming to ANSI/AWWA C110, C111, and C153
- Restraints rated for working water pressure of 350 psi and transitory surges of 100psi for 3" thru 16" and 250 psi for 18" thru 48"
- Cast of ASTM A536 compliant 65-45-12 ductile iron complete with a cast on date code and country of origin for traceability
- Restraints and all components are designed and proven for a 2:1 safety factor based on the pipe pressure rating
- Restraint deflection rating when installed on nominal diameter pipe is 3"- 3", 4"-12" - 5°, 14"-16" - 2°, and 18"-48" - 1.5°
- Standard coating for Domestic restraint is 4-6 mil of TUF-Bond™ **(thermoset polyester for impact, corrosion and UV protection)**
- Gripping wedges are heat treated to a mininum 420 Brinell Hardness
- Gripping wedge, wedge collar bolt, and twist off torque limiting nut shall be e-coated
- FM approved for 4" thru 12" applications and UL listed and approved for 3" thru 24" applications
- Not recommended for use on plain end fittings
- Color coded black for pipe type(ductile/*cast iron/**steel) - ***Note: Refer to page 2 for cast iron and page 3 for steel pipe applications**

FEATURES & ADVANTAGES:

- Torque limiting nut on gripping wedge assembly twists off within a designed torque range eliminating the need for specialized tools
- Gripping wedge assembly pivots providing stronger engagement of pipe wall at lower torque requirement (45-60 ft.-lbs.)
- Proven restraint technology utilizing fewer gripping wedges in frequently applied diameters, reducing trench time and project cost
- Restraint's heavy duty construction and design eliminates the need for costly thrust blocks and tie rods
- Suitable for Potable and Wastewater applications

ISO 9001-2008 Registered	Listed with Underwriters Laboratory	Factory Mutual Approved

Product Source/Type	Name of Project	Name of Contractor	Project Engineer	Spec. Section and/or Project No.

Tyler Union Waterworks Contact Information
Tyler: 11910 CR 492 ● Tyler, Texas 75706 ● (800) 527-8478
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TYLER UNION®
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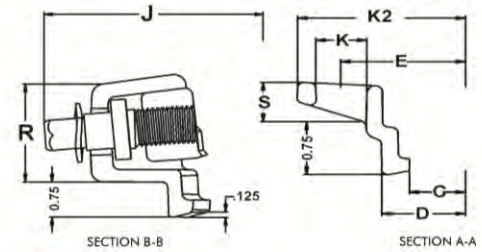
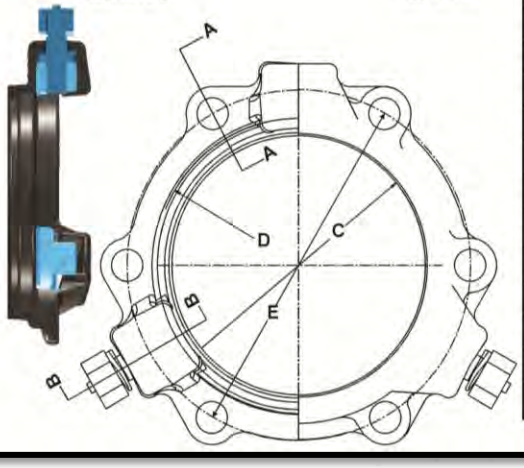
TUFGRIP™

"Better By Design"

Series 1000-Ductile Pipe Restraint





TUFGrip™ MJ Restraint Dimensions

Size (inches)	C	D	E	K2	J	K	R	S
3	4.08	4.88	6.19	7.67	9.82	3/4	2.20	0.86
4	4.93	5.92	7.50	8.98	10.67	7/8	2.20	0.73
6	7.03	8.02	9.50	10.98	12.77	7/8	2.24	0.82
8	9.18	10.17	11.75	13.23	14.92	7/8	2.28	0.82
10	11.23	12.22	14.00	15.70	16.97	7/8	2.37	0.93
12	13.33	14.32	16.25	17.95	19.07	7/8	2.40	0.93
14	15.44	16.40	18.75	20.43	21.18	7/8	2.57	0.91
16	17.54	18.50	21.00	22.88	23.28	7/8	2.57	1.05
18	19.64	20.60	23.25	25.43	25.38	7/8	2.57	1.05
20	21.74	22.70	25.50	27.50	27.48	7/8	2.66	1.15
24	25.94	26.90	30.00	32.00	31.68	7/8	2.72	1.35
30	32.18	33.30	36.88	39.42	39.78	1-1/8	3.86	1.53
36	38.48	39.60	43.75	46.29	46.08	1-1/8	3.86	1.53
42	44.68	45.80	50.62	53.62	53.08	1-3/8	4.56	2.05
48	50.98	52.10	57.50	60.50	59.28	1-3/8	4.56	2.05

SERIES 1000 TLD-DUCTILE TUFGrip™ - APPLICATION CHART

Size (Inches)	Part No. - Gland Only Domestic / Non-Domestic	Wedge Qty.	T-Head Bolt Qty.	Bolt Size	Gland Weight(lbs.)	Weight (w/Acc.)	Pressure Rating	Pipe O.D.
3	CALL / 113805	2	4	⅝" x 3"	6.5	10.5	350	3.96
4	515944 / 113812	2	4	¾" x 3.5"	7.1	11.8	350	4.80
6	515968 / 113829	3	6	¾" x 4"	11.2	18.8	350	6.90
8	515975 / 113836	3	6	¾" x 4"	13.1	20.3	350	9.05
10	515982 / 113843	6	8	¾" x 4"	26.0	32.5	350	11.10
12	515999 / 113850	8	8	¾" x 4"	31.5	40.4	350	13.20
14	516231 / 113867	10	10	¾" x 4.5"	43.3	53.6	350	15.30
16	516255 / 113874	12	12	¾" x 4.5"	54.1	66.3	350	17.40
18	516279 / 113898	12	12	¾" x 4.5"	59.8	72.2	250	19.50
20	516293 / 113904	14	14	¾" x 4.5"	69.8	83.8	250	21.60
24	516316 / 113911	16	16	¾" x 5"	90.4	106.9	250	25.80
30	CALL / 461289	20	20	1" x 7.5"	248	290	250	32.00
36	CALL / 461333	24	24	1" x 7.5"	277	327	250	38.30
42	CALL / 461319	28	28	1-1/4" x 8.5"	448	512	250	44.50
48	CALL / 461326	32	32	1-1/4" x 8.5"	519	597	250	50.80

ISO 9001-2008 Registered | **Listed with Underwriters Laboratory** | **Factory Mutual Approved**

STOP-LOOK :

- Extra length T-Head bolts are provided with 30 thru 48 inch restraints to facilitate mechanical joint assembly
- For UL/FM Approvals, 3-12 inch were tested at 5°of deflection and 14-24 inch were tested at 3° of deflection; all test were to 700 psi
- The Series 1000 TUF Grip is specified for use on ductile iron pipe but can be used on some sizes of cast grey iron or pit cast pipe if the pipe is not severely corroded, is in sound condition, and has an outside diameter compatible with the as provided dimensions
- TUF Grip 30 to 48 inch provided with TRU-Lock™ mechanical joint gasket to ensure pressure ratings and safety factors are met
- Installation and hydrostatic testing shall be in accordance with AWWA C600 and AWWA C651

Tyler Union Waterworks Contact Information

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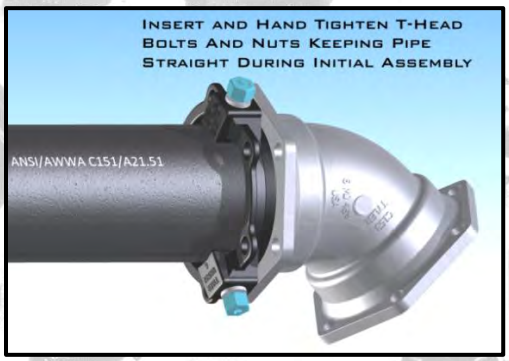
DOMESTIC - TLD TUFGrip™

Assembly Steps – Series 1000 – For Ductile Iron Pipe

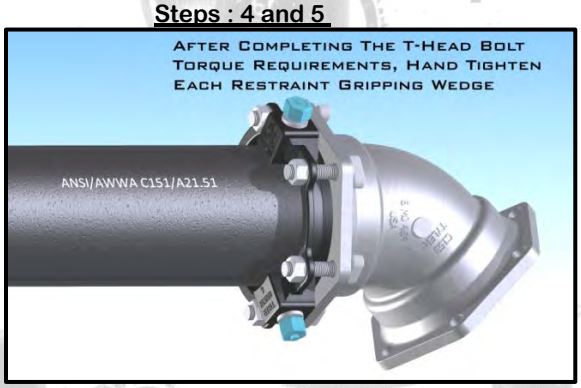
Steps : 1 and 2

Step : 3

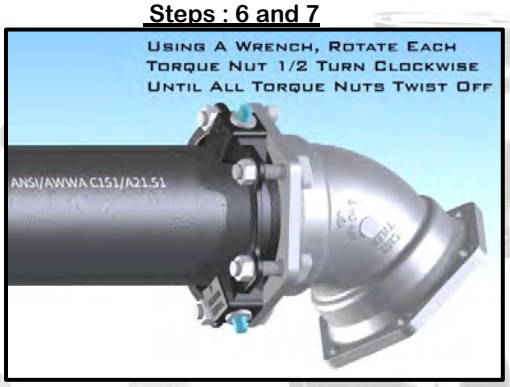


1. Insure the beveled pipe end to be joined and mechanical joint socket are clean and free of debris. Slide the BLACK TUF Grip onto the pipe to be restrained. The TUF Grip compression lip extension must be toward the beveled end of the pipe to be restrained.
2. Evenly lubricate the beveled pipe end, pipe wall exterior, and inside surface of the MJ gasket with a lubricant that meets the requirements of AWWA C111. Now place the **MJ gasket over the plain beveled end of the pipe with the narrow edge of the tapered gasket toward the beveled end of the pipe to be restrained. **NOTE : For Steel pipe with IPS diameter in sizes 3”-12”, use of a MJ Transition gasket is required.
3. Fully insert the pipe end into the MJ socket pipe landing. Keeping the pipe straight, slide/push the MJ gasket firmly and evenly into the socket recess. Joint must be kept straight during assembly.

Steps : 4 and 5



Steps : 6 and 7



4. Push the TUF Grip compression lip extension evenly against the thick side of the gasket and insert T-Head bolts with the T-Head against the back side of the MJ fitting bolt flange. Use only T-Head bolts and nuts that meet AWWA C111 requirements. Evenly hand-tighten the nuts on the T-Head bolts making sure the gland is centered around the pipe and within the MJ socket. If joint deflection is needed, only deflect the pipe in the joint after hand tightening of all nuts is completed. *Joint deflection is 3° max for 3”, 5° max for 4”-12”, 2° max for 14”-16”, and 1.5° max for 18”-48”.

   *NOTE : Maximum deflection values provided apply with nominal pipe, fitting, and restraint diameters.
5. Using a wrench, tighten the nuts on the T-Head bolts a few turns at a time in an alternating or star pattern maintaining equal spacing or distance between the TUF Grip bolt flange and face of the MJ socket bolt flange as the MJ gasket is compressed. The T-Head bolt and nut torque requirement is 3”- 45-60 ft.-lbs., 4”- 24”-75-90 ft.-lbs., 30”- 36”- 100-120 ft.-lbs., and 42”- 48”- 120-150 ft.-lbs.. **DO NOT OVER-TORQUE!**
6. Hand-tighten the torque limiting nut attached to each TUF Grip wedge assembly in a clockwise direction with an alternating or star pattern until all gripping wedges are in contact with the pipe wall. Rotational direction of torque limiting nut is indicated by recessed arrow on the face of the nut. With a wrench (box, socket, or pneumatic), continue to tighten each torque nut ½ turn in an alternating or star pattern around the restraint until all torque limiting nuts twist off. **NEVER** turn a torque limiting nut more than ½ turn without turning the remaining torque nuts an equal amount!
7. When all torque limiting nuts twist off, the assembly of the mechanical joint is complete.

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NON-DOMESTIC PRODUCT SUBMITTAL

TUFGRIP™

Series 1000 - For Ductile Iron Pipe

"A Proven Third Generation Mechanical Joint Restraint"

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Quality Waterworks Products

Tyler Union's TUF Grip restraints represent the culmination of 20 years of engineering and testing. As a 3rd generation restraint, TUF Grip is the best available technology in the Waterworks market for use in restraining Ductile Iron Pipe.

HK&A Designed by Harold Kennedy & Associates, Inc.

"BETTER BY DESIGN"

SPECIFICATIONS:

- Designed and proven to restrain plain end ductile iron pipe conforming to ANSI/AWWA C151/A21.51 in diameters 3" thru 48"
- Proven for use on heavy wall **Schedule 40 or greater steel pipe in sizes 3"- 12" and on all sizes 3" to 16" when pipe O.D. and wall thickness conforms to C151 **Note: IPS diameter steel pipe requires the use of an MJ Transition gasket
- Restraint design conforms with applicable requirements of ANSI/AWWA C111, ANSI/AWWA C153, and ANSI/AWWA C110
- Restraint engineered for securing plain end pipe to mechanical joint fittings conforming to ANSI/AWWA C110, C111, and C153
- Restraints rated for working water pressure of 350 psi and transitory surges of 100psi for 3" thru 16" and 250 psi for 18" thru 48"
- Cast of ASTM A536 compliant 65-45-12 ductile iron complete with a cast on date code and country of origin for traceability
- Restraints and all components are designed and proven for a 2:1 safety factor based on the pipe pressure rating
- Restraint deflection rating when installed on nominal diameter pipe is 3"- 3", 4"-12" - 5°, 14"-16" - 2°, and 18"-48" - 1.5°
- Standard coating for Non-Domestic restraint is 4-6 mil of *Alkyd resin baking enamel
- Gripping wedges are heat treated to a mininum 420 Brinell Hardness
- Gripping wedge, wedge collar bolt, and twist off torque limiting nut shall be e-coated
- FM approved for 4" thru 12" applications and UL listed and approved for 3" thru 24" applications
- Not recommended for use on plain end fittings
- Color coded black for pipe type(ductile/*cast iron/**steel) - ***Note: Refer to page 2 for cast iron and page 3 for steel pipe applications**

FEATURES & ADVANTAGES:

- Torque limiting nut on gripping wedge assembly twists off within a designed torque range eliminating the need for specialized tools
- Gripping wedge assembly pivots providing stronger engagement of pipe wall at lower torque requirement (45-60 ft.-lbs.)
- Proven restraint technology utilizing fewer gripping wedges in frequently applied diameters, reducing trench time and project cost
- Restraint's heavy duty construction and design eliminates the need for costly thrust blocks and tie rods
- Suitable for Potable and Wastewater applications

ISO 9001-2008 Registered	Listed with Underwriters Laboratory	Factory Mutual Approved

Product Source/Type	Name of Project	Name of Contractor	Project Engineer	Spec. Section and/or Project No.

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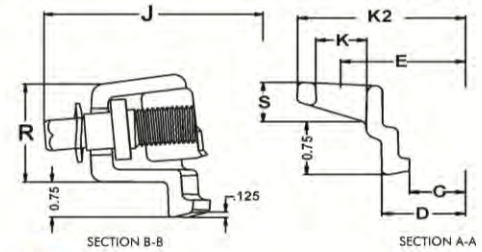
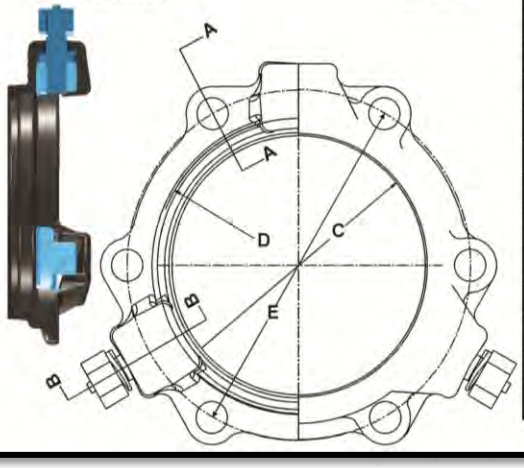
TUFGRIP™

"Better By Design"

Series 1000-Ductile Pipe Restraint





TUFGrip™ MJ Restraint Dimensions

Size (inches)	C	D	E	K2	J	K	R	S
3	4.08	4.88	6.19	7.67	9.82	3/4	2.20	0.86
4	4.93	5.92	7.50	8.98	10.67	7/8	2.20	0.73
6	7.03	8.02	9.50	10.98	12.77	7/8	2.24	0.82
8	9.18	10.17	11.75	13.23	14.92	7/8	2.28	0.82
10	11.23	12.22	14.00	15.70	16.97	7/8	2.37	0.93
12	13.33	14.32	16.25	17.95	19.07	7/8	2.40	0.93
14	15.44	16.40	18.75	20.43	21.18	7/8	2.57	0.91
16	17.54	18.50	21.00	22.88	23.28	7/8	2.57	1.05
18	19.64	20.60	23.25	25.43	25.38	7/8	2.57	1.05
20	21.74	22.70	25.50	27.50	27.48	7/8	2.66	1.15
24	25.94	26.90	30.00	32.00	31.68	7/8	2.72	1.35
30	32.18	33.30	36.88	39.42	39.78	1-1/8	3.86	1.53
36	38.48	39.60	43.75	46.29	46.08	1-1/8	3.86	1.53
42	44.68	45.80	50.62	53.62	53.08	1-3/8	4.56	2.05
48	50.98	52.10	57.50	60.50	59.28	1-3/8	4.56	2.05

SERIES 1000 TLD-DUCTILE TUFGrip™ - APPLICATION CHART

Size (Inches)	Part No. - Gland Only Domestic / Non-Domestic	Wedge Qty.	T-Head Bolt Qty.	Bolt Size	Gland Weight(lbs.)	Weight (w/Acc.)	Pressure Rating	Pipe O.D.
3	CALL / 113805	2	4	⅝" x 3"	6.5	10.5	350	3.96
4	515944 / 113812	2	4	¾" x 3.5"	7.1	11.8	350	4.80
6	515968 / 113829	3	6	¾" x 4"	11.2	18.8	350	6.90
8	515975 / 113836	3	6	¾" x 4"	13.1	20.3	350	9.05
10	515982 / 113843	6	8	¾" x 4"	26.0	32.5	350	11.10
12	515999 / 113850	8	8	¾" x 4"	31.5	40.4	350	13.20
14	516231 / 113867	10	10	¾" x 4.5"	43.3	53.6	350	15.30
16	516255 / 113874	12	12	¾" x 4.5"	54.1	66.3	350	17.40
18	516279 / 113898	12	12	¾" x 4.5"	59.8	72.2	250	19.50
20	516293 / 113904	14	14	¾" x 4.5"	69.8	83.8	250	21.60
24	516316 / 113911	16	16	¾" x 5"	90.4	106.9	250	25.80
30	CALL / 461289	20	20	1" x 7.5"	248	290	250	32.00
36	CALL / 461333	24	24	1" x 7.5"	277	327	250	38.30
42	CALL / 461319	28	28	1-1/4" x 8.5"	448	512	250	44.50
48	CALL / 461326	32	32	1-1/4" x 8.5"	519	597	250	50.80

ISO 9001-2008 Registered | **Listed with Underwriters Laboratory** | **Factory Mutual Approved**

STOP-LOOK :

- Extra length T-Head bolts are provided with 30 thru 48 inch restraints to facilitate mechanical joint assembly
- For UL/FM Approvals, 3-12 inch were tested at 5°of deflection and 14-24 inch were tested at 3° of deflection; all test were to 700 psi
- The Series 1000 TUF Grip is specified for use on ductile iron pipe but can be used on some sizes of cast grey iron or pit cast pipe if the pipe is not severely corroded, is in sound condition, and has an outside diameter compatible with the as provided dimensions
- TUF Grip 30 to 48 inch provided with TRU-Lock™ mechanical joint gasket to ensure pressure ratings and safety factors are met
- Installation and hydrostatic testing shall be in accordance with AWWA C600 and AWWA C651

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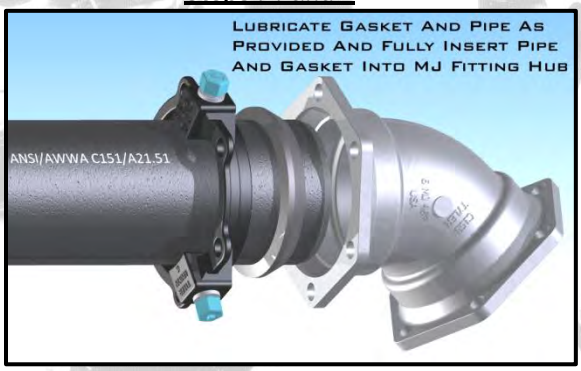
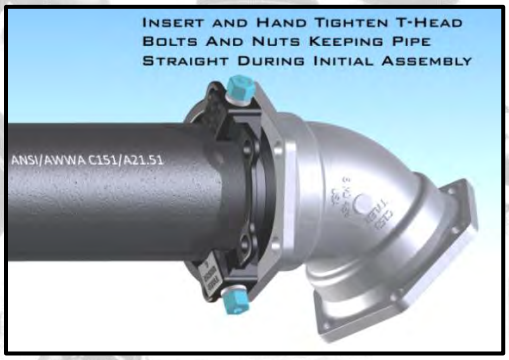
NON-DOMESTIC - TLD TUFGrip™

Assembly Steps – Series 1000 – For Ductile Iron Pipe

Steps : 1 and 2

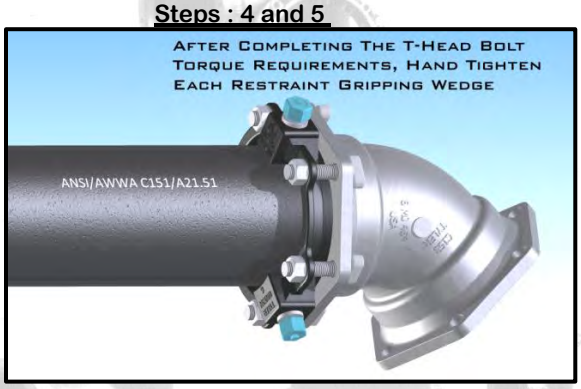


Step : 3

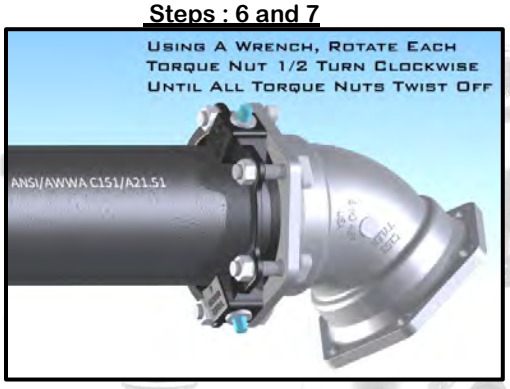


1. Insure the beveled pipe end to be joined and mechanical joint socket are clean and free of debris. Slide the BLACK TUF Grip onto the pipe to be restrained. The TUF Grip compression lip extension must be toward the beveled end of the pipe to be restrained.
2. Evenly lubricate the beveled pipe end, pipe wall exterior, and inside surface of the MJ gasket with a lubricant that meets the requirements of AWWA C111. Now place the **MJ gasket over the plain beveled end of the pipe with the narrow edge of the tapered gasket toward the beveled end of the pipe to be restrained. **NOTE : For Steel pipe with IPS diameter in sizes 3”-12”, use of a MJ Transition gasket is required.
3. Fully insert the pipe end into the MJ socket pipe landing. Keeping the pipe straight, slide/push the MJ gasket firmly and evenly into the socket recess. Joint must be kept straight during assembly.

Steps : 4 and 5



Steps : 6 and 7



4. Push the TUF Grip compression lip extension evenly against the thick side of the gasket and insert T-Head bolts with the T-Head against the back side of the MJ fitting bolt flange. Use only T-Head bolts and nuts that meet AWWA C111 requirements. Evenly hand-tighten the nuts on the T-Head bolts making sure the gland is centered around the pipe and within the MJ socket. If joint deflection is needed, only deflect the pipe in the joint after hand tightening of all nuts is completed. *Joint deflection is 3° max for 3”, 5° max for 4”-12”, 2° max for 14”-16”, and 1.5° max for 18”-48”.
   *NOTE : Maximum deflection values provided apply with nominal pipe, fitting, and restraint diameters.
5. Using a wrench, tighten the nuts on the T-Head bolts a few turns at a time in an alternating or star pattern maintaining equal spacing or distance between the TUF Grip bolt flange and face of the MJ socket bolt flange as the MJ gasket is compressed. The T-Head bolt and nut torque requirement is 3”- 45-60 ft.-lbs., 4”- 24”-75-90 ft.-lbs., 30”- 36”- 100-120 ft.-lbs., and 42”- 48”- 120-150 ft.-lbs.. DO NOT OVER-TORQUE!
6. Hand-tighten the torque limiting nut attached to each TUF Grip wedge assembly in a clockwise direction with an alternating or star pattern until all gripping wedges are in contact with the pipe wall. Rotational direction of torque limiting nut is indicated by recessed arrow on the face of the nut. With a wrench (box, socket, or pneumatic), continue to tighten each torque nut ½ turn in an alternating or star pattern around the restraint until all torque limiting nuts twist off. NEVER turn a torque limiting nut more than ½ turn without turning the remaining torque nuts an equal amount!
7. When all torque limiting nuts twist off, the assembly of the mechanical joint is complete.

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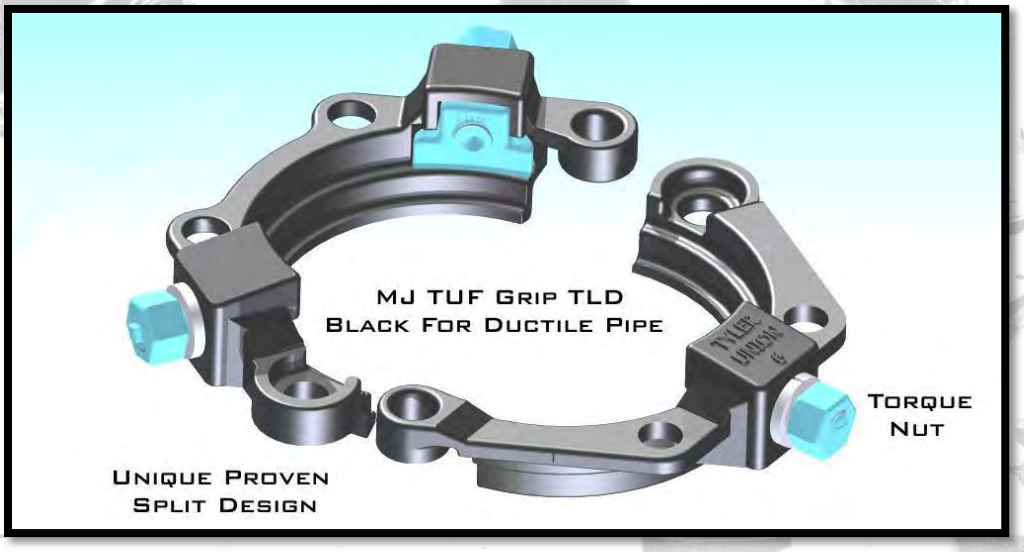
TUFGRIP™

SERIES 1000S – MJ TLD SPLIT FOR DUCTILE PIPE

"A Proven Third Generation Mechanical Joint Restraint"



"BETTER BY DESIGN"

SPECIFICATIONS:

- Designed and proven to restrain plain end ductile iron pipe conforming to ANSI/AWWA C151/A21.51 in diameters 4" thru 12"
- Restraint design conforms with applicable requirements of ANSI/AWWA C111, ANSI/AWWA C153, and ANSI/AWWA C110
- Restraint engineered for securing plain end pipe to mechanical joint fittings conforming to ANSI/AWWA C110, C111, and C153
- Rated restraint rated for working water pressure of 350 psi for 4" thru 12" restraints
- Cast of ASTM A536 compliant 65-45-12 ductile iron complete with a cast on date code and country of origin for traceability
- Restraints and all components are designed and proven for a 2:1 safety factor based on the pipe pressure rating
- Deflection rating when installed on AWWA C151 pipe with nominal diameter shall be 3° for 4" thru 12" restraints
- Standard coating for Non-Domestic restraint is 4-6 mil of *Alkyd resin baking enamel -***Note: Epoxy coati**
- Gripping wedges are heat treated to a mininum 420 Brinell Hardness
- Gripping wedge, wedge collar bolt, and twist off torque limiting nut shall be e-coated
- Not recommended for use on plain end fittings
- Color coded black for pipe type(ductile pipe/*cast iron pipe) - ***Note: Refer to page 2 for cast iron pipe application**

FEATURES & ADVANTAGES:

- Torque limiting nut on gripping wedge assembly twists off within a designed torque range eliminating the need for specialized tools
- Gripping wedge assembly pivots providing stronger engagement of pipe wall at lower torque requirement (45-60 ft.-lbs.)
- Proven restraint technology utilizing fewer gripping wedges in frequently applied diameters, reducing trench time and project cost
- Restraint's heavy duty construction and design eliminates the need for costly thrust blocks and tie rods
- Suitable for Potable and Wastewater applications

ISO 9001-2008 Registered

Product Source/Type	Name of Project	Name of Contractor	Project Engineer	Spec. Section and/or Project No.

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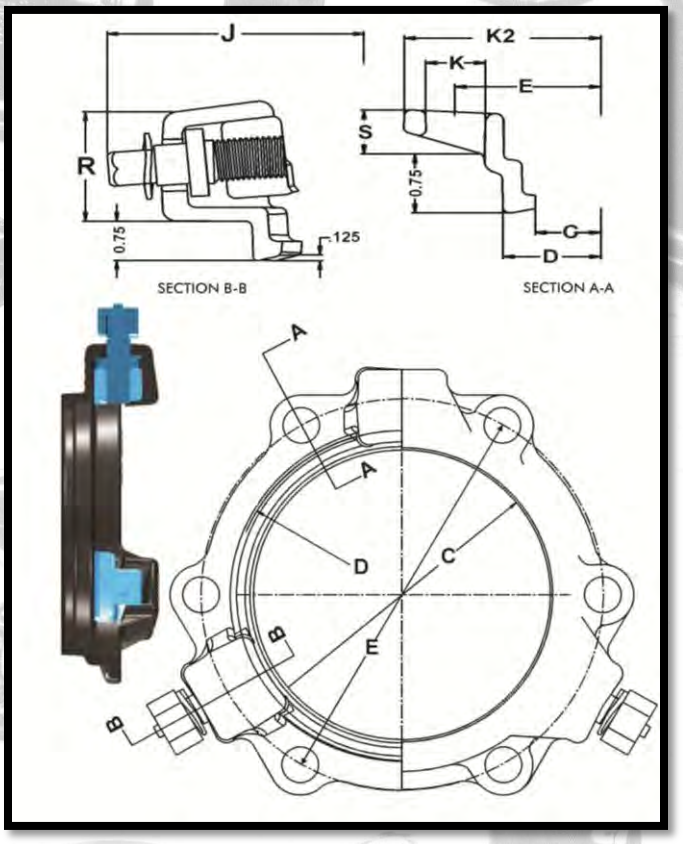
TUFGRIP™

SERIES 1000S – MJ TLD SPLIT FOR DUCTILE PIPE



Size (inches)	C	D	E	K2	J	K	R	S
4	4.93	5.92	7.50	8.98	10.67	7/8	2.20	0.73
6	7.03	8.02	9.50	10.98	12.77	7/8	2.24	0.82
8	9.18	10.17	11.75	13.23	14.92	7/8	2.28	0.82
10	11.23	12.22	14.00	15.70	16.97	7/8	2.37	0.93
12	13.33	14.32	16.25	17.95	19.07	7/8	2.40	0.93

SERIES 1000 TLD-DUCTILE MJ TUFGrip™ - APPLICATION CHART

Size (Inches)	Part # Gland+Accessories Domestic / Non-Domestic	Wedge Qty.	T-Head Bolt Qty.	Bolt Size	Gland Weight(lbs.)	Weight (w/Acc.)	Pressure Rating	Pipe O.D.
4	N/A / 495918	2	4	¾" x 3.5"	7.1	11.8	350	4.80
6	N/A / 495925	3	6	¾" x 4"	11.2	18.8	350	6.90
8	N/A / 495932	3	6	¾" x 4"	13.1	20.3	350	9.05
10	N/A / 495949	6	8	¾" x 4"	26.0	32.5	350	11.10
12	N/A / 495956	8	8	¾" x 4"	31.5	40.4	350	13.20

ISO 9001-2008 Registered

STOP-LOOK :
- The Series 1000S TUF Grip is specified for use on ductile iron pipe but can be used on some sizes of cast grey iron or pit cast pipe as provided (pipe not severely corroded, in sound condition, and with an outside diameter compatible with restraint "C" dimension)
- Installation and hydrostatic testing shall be in accordance with AWWA C600 and AWWA C651

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TUFGRIP™

Assembly Steps – Series 1000S TLD Split – For Ductile Iron Pipe

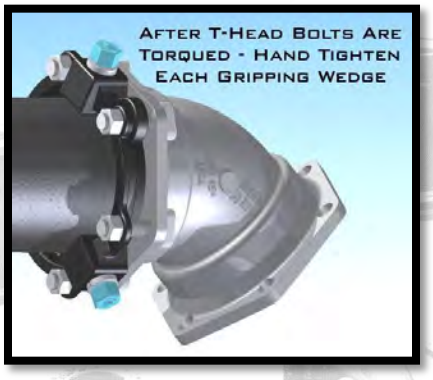
Steps: 1 and 2

Step: 3 and 4

1. Insure the beveled pipe end to be joined and mechanical joint socket are clean and free of debris.
2. Lubricate the pipe end and exterior plus the inside surface of gasket with joint lubricant that meets the requirements of AWWA C111. Now place the MJ gasket over the plain beveled end of the pipe with the narrow edge of the tapered gasket toward the beveled end of the pipe to be restrained.
3. Fully insert the pipe end into the MJ socket pipe landing. Keeping the pipe straight, slide/push the gasket firmly and evenly into the MJ socket recess.
4. Place the two halves of the black TUF Grip around the pipe with the compression lip extension toward the MJ socket. Join the two restraint halves together with two T-Head bolts. Use only T-Head bolts, gaskets, and nuts that meet AWWA C111 requirements.

Step: 5

Steps: 6 and 7



Steps: 8 and 9

5. With the two T-Head bolts inserted through the restraint, push the TUF Grip lip extension evenly against the thick side of the MJ gasket. With the TUF Grip restraint against the gasket, the remaining T-Head bolts are inserted with the T-Head against the back of the MJ fitting bolt flange. Install two additional T-Head bolts with nuts and hand tighten to secure the restraint to the fitting.
6. With the restraint secured to the fitting, remove the original assembly T-Head bolts and reinsert with the T-Head against the back of the MJ fitting bolt flange. Making sure the TUF Grip is centered around the pipe's wall, hand tighten all remaining T-Head bolts and nuts. If joint deflection is needed, only deflect the pipe in the joint after hand tightening of all nuts is completed. Maximum joint deflection is 3° when pipe and fitting dimensions are nominal.
7. Using a wrench, tighten the nuts on the T-Head bolts a few turns at a time in an alternating or star pattern. Maintain equal spacing between the TUF Grip bolt flange and the bolt flange of the MJ socket as the gasket is compressed. The T-Head bolt and nut torque requirement is 75-90 ft.-lbs. for 4" thru 12" restraints. **DO NOT OVER-TORQUE!**
8. Hand-tighten the torque limiting nut attached to the TUF Grip wedge assemblies in a clockwise direction with an alternating or star pattern until all gripping wedges are in contact with the pipe wall. Rotational direction of torque limiting nut is indicated by recessed arrow on the face of the nut. With a wrench, continue to tighten each torque nut ½ turn in an alternating or star pattern until all torque limiting nuts twist off. NEVER turn a torque limiting nut more than ½ turn without turning the remaining torque nuts an equal amount!
9. When all torque limiting nuts twist off, the assembly of the mechanical joint restraint is complete.

Tyler Union Waterworks Contact Information
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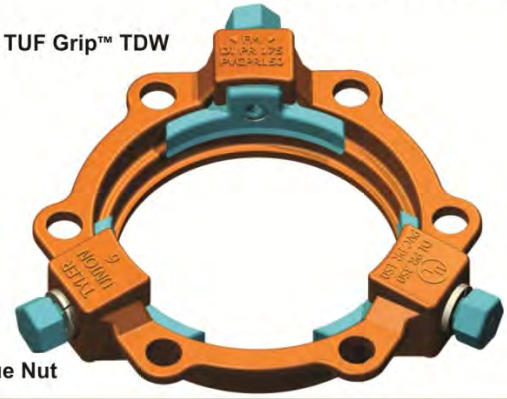
PATENT PENDING

Series 1500 DUAL WEDGE® - For PVC, Ductile, and HDPE Pipe
" A Proven Third Generation Mechanical Joint Restraint"

MJ TUF Grip™ TDW



Torque Nut

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Tyler Union's TUF Grip restraint represents the culmination of 20 years of engineering and testing. As a 3rd generation restraint, TUF Grip is the best available technology in the Waterworks market for use in restraining PVC, Ductile, and HDPE Pipe.

"BETTER BY DESIGN"

SPECIFICATIONS:

- Proven to restrain plain end PVC, Ductile iron, and HDPE pipe in diameters 4" thru 24". **Note: IPS diameter pipe requires the use of an MJ Transition gasket
- Restraint design conforms with applicable requirements of ANSI/AWWA C111, ANSI/AWWA C153, and ANSI/AWWA C110
- Restraint engineered for securing plain end pipe to mechanical joint fittings conforming to ANSI/AWWA C110, C111, and C153
- Cast of ASTM A536 compliant 65-45-12 ductile iron complete with a cast on date code and country of origin for traceability
- Restraints and all components are designed and proven for a 2:1 safety factor based on the pipe pressure rating
- Restraint deflection rating when installed on nominal diameter pipe is 4"-12" - 3°, 14"-16" - 2°, and 18"-24" - 1.5°
- Standard coating for Domestic restraint is 4-6 mil of TUF-Bond™ **(thermoset polyester for impact, corrosion and UV protection)**
- Gripping wedges are heat treated to a mininum 420 Brinell Hardness
- Gripping wedge, wedge collar bolt, and twist off torque limiting nut shall be e-coated
- FM approved for 4" thru 12" applications and UL listed and approved for 4" thru 24" applications
- Not recommended for use on plain end fittings
- Color coded orange for use on multiple classes of pipe and to distunguish from traditional restraints.

FEATURES & ADVANTAGES:

- Torque limiting nut on gripping wedge assembly twists off within a designed torque range eliminating the need for specialized tools
- Gripping wedge assembly pivots providing stronger engagement of pipe wall at lower torque requirement (45-60 ft.-lbs.)
- Proven restraint technology utilizing fewer gripping wedges in frequently applied diameters, reducing trench time and project cost
- Restraint's heavy duty construction and design eliminates the need for costly thrust blocks and tie rods
- Approved for use on multiple classes of pipe – **Pressure ratings and associated pipe classes provided on page 2 and 3**
- Suitable for Potable and Wastewater applications
- Controlled wedge contour to accommodate contact circumfrence when assembled on different types of pipe.

ISO 9001-2008 Registered	Listed with Underwriters Laboratory	Factory Mutual Approved

Product Source/Type	Name of Project	Name of Contractor	Project Engineer	Spec. Section and/or Project No.

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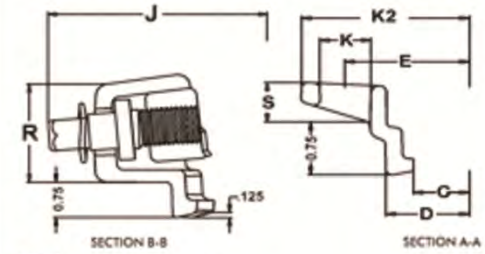

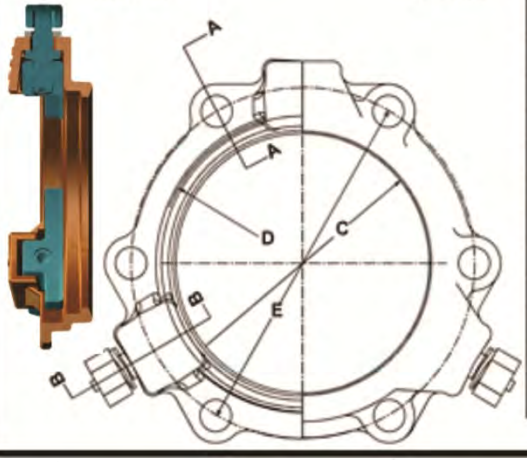

TUFGrip™ MJ Restraint Dimensions

Size (inches)	C	D	E	K2	J	K	R	S
3	4.08	4.88	6.19	7.67	9.82	3/4	2.20	0.86
4	4.93	5.92	7.50	8.98	10.67	7/8	2.20	0.73
6	7.03	8.02	9.50	10.98	12.77	7/8	2.24	0.82
8	9.18	10.17	11.75	13.23	14.92	7/8	2.28	0.82
10	11.23	12.22	14.00	15.70	16.97	7/8	2.37	0.93
12	13.33	14.32	16.25	17.95	19.07	7/8	2.40	0.93
14	15.44	16.40	18.75	20.43	21.18	7/8	2.57	0.91
16	17.54	18.50	21.00	22.88	23.28	7/8	2.57	1.05
18	19.64	20.60	23.25	25.43	25.38	7/8	2.57	1.05
20	21.74	22.70	25.50	27.50	27.48	7/8	2.66	1.15
24	25.94	26.90	30.00	32.00	31.68	7/8	2.72	1.35
30	32.18	33.30	36.88	39.42	39.78	1-1/8	3.86	1.53
36	38.48	39.60	43.75	46.29	46.08	1-1/8	3.86	1.53
42	44.68	45.80	50.62	53.62	53.08	1-3/8	4.56	2.05
48	50.98	52.10	57.50	60.50	59.28	1-3/8	4.56	2.05

SERIES 1500 TDW - TUFGrip™ - APPLICATION CHART | Pressure Rating |

Size (Inches)	Part No. - Gland Only Domestic / Non-Domestic	Wedge Qty.	T-Head Bolt Qty.	Bolt Size	Gland weight(lbs.)	Weight (w/Acc.)	DI Pipe	C-900 C-905	Pipe O.D.
4	603000 / 602000	2	4	¾" x 3.5"	7.1	11.8	350	*305/DR14	4.80
6	603005 / 602005	3	6	¾" x 4"	11.2	18.8	350	*305/DR14	6.90
8	603015 / 602010	3	6	¾" x 4"	13.1	20.3	350	*305/DR14	9.05
10	603020 / 602015	6	8	¾" x 4"	26.0	32.5	350	*305/DR14	11.10
12	603025 / 602020	8	8	¾" x 4"	31.5	40.4	350	*305/DR14	13.20
14	603030 / 602025	10	10	¾" x 4.5"	43.3	53.6	350	*235/DR18	15.30
16	603035 / 602030	12	12	¾" x 4.5"	54.1	66.3	350	*235/DR18	17.40
18	603040 / 602035	12	12	¾" x 4.5"	59.8	72.2	250	*235/DR25	19.50
20	603045 / 602040	14	14	¾" x 4.5"	69.8	83.8	250	*235/DR25	21.60
24	603050 / 602045	16	16	¾" x 5"	90.4	106.9	250	*235/DR25	25.80

***Nore: The pressure ratings are rated working water pressure for the restraint. See page 3 for additional ratings.**

ISO 9001-2008 Registered	Listed with Underwriters Laboratory	Factory Mutual Approved

STOP-LOOK :

- For Approvals, 3-12 inch were tested at 3°of deflection, 14-16 inch were tested at 2° of deflection, and 18-24 inch were tested at 1.5° of deflection; 4-16 inch test were to 700 psi and 18-24 tests were to 500 psi.
- The Series 1500 TUF Grip is specified for use on PVC, Ductile, and HDPE Pipe but can be used on some sizes of cast grey iron or pit cast pipe if the pipe is not severely corroded, is in sound condition, and has an outside diameter compatible with the as provided dimensions.
- Installation and hydrostatic testing shall be in accordance with AWWA C600 and AWWA C651.

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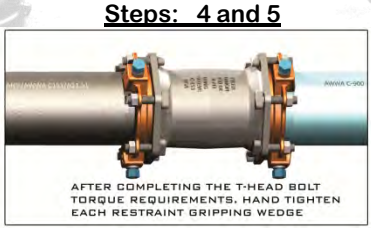
TUFGRIP™ DUAL WEDGE®
PATENT PENDING

**SERIES 1500 TDW-TUF GRIP™ RESTRAINT RATINGS																
SIZE (Inches)	Ductile Pipe	AWWA C900			AWWA C905			AWWA C909	ASTM D2241			HDPE* AWWA C906				
	C151/A21.51	DR14	DR18	DR25	DR18	DR25	DR32.5		SDR17	SDR21	SDR26	DR7.3	DR9	DR11	DR13.5	DR17
4	350	305	235	165	-	-	-	235/150*	250	200	160	254	200	160	128	100
6	350	305	235	165	-	-	-	235/150*	250	200	160	254	200	160	128	100
8	350	305	235	165	-	-	-	235/150*	250	200	160	254	200	160	128	100
10	350	305	235	165	-	-	-	235/150*	250	200	160	254	200	160	128	100
12	350	305	235	165	-	-	-	235/150*	250	200	160	254	200	160	128	100
14	350	-	-	-	235	165	125	-	-	-	-	254	200	160	128	100
16	350	-	-	-	235	165	125	-	-	-	-	254	200	160	128	100
18	250	-	-	-	200	165	125	-	-	-	-	-	-	-	-	-
20	250	-	-	-	200	165	125	-	-	-	-	-	-	-	-	-
24	250	-	-	-	165	165	125	-	-	-	-	-	-	-	-	-
**Note: Pressure Ratings for Ordinary Water Works Restraint Application with Transitory Surges Only																
**Note: AWWA C909 PVCO Restraint Pressure Rating is per the Pressure Rating Listed on the Pipe																
*Note: HDPE application require a separate stiffener ring, 4-16 for DI OD Pipe & 4-12 for IPS OD Pipe																

Steps: 1 and 2

Step: 3

Steps: 4 and 5



Steps: 6 and 7

1. Insure the beveled pipe end to be joined and mechanical joint socket are clean and free of debris. Slide the Orange TUF Grip onto the beveled end of the pipe to be restrained. The TUF Grip compression lip extension must be toward the beveled end of the pipe being restrained.
2. Evenly lubricate the beveled pipe end, exterior pipe wall, and inside surface of the gasket with a lubricant that meets the requirements of AWWA C111. Now place the **MJ gasket over the plain beveled end of the pipe with the narrow edge of the tapered gasket toward the pipe end. **NOTE: Use MJ transition gasket with IPS diameter pipe.
3. Fully insert the beveled pipe end into the MJ socket pipe landing. Keeping the pipe straight in the MJ socket, slide/push the MJ gasket firmly and evenly into the MJ socket recess. Joint must be kept straight during assembly.
4. Push the TUF Grip compression lip extension evenly against the thick side of the MJ gasket and insert all T-Head bolts with nuts. Use only T-Head bolts and nuts that meet AWWA C111 requirements. With the TUF Grip restraint lip extension against the MJ gasket, evenly hand-tighten the nuts on the T--Head bolts making sure the restraint body is centered on the pipe and within in the MJ socket. If joint deflection is needed, deflect the pipe only after hand tightening of all nuts is completed. Joint deflection is 3° max for 4”-12”, 2° max for 14”-16”, 1.5° max for 18”-24”.
   NOTE: Maximum deflection values provided apply with nominal pipe, fitting, and restraint diameters.
5. Using a wrench, tighten the T-Head bolts and nuts a few turns at a time in an alternating or star pattern. Maintain equal spacing or distance between the TUF Grip bolt flange and the MJ socket bolt flange as the MJ gasket is compressed. Repeat the process in an alternating pattern for all T-Head bolts and nuts. The T-Head bolt and nut torque requirement for restraints is 4”- 24”-75-90 ft.-lbs.
   NOTE: The C909 PVCO T-Head bolt and nut torque is 55-65 ft.-lbs. for 4”-8” and 65-75 ft.-lbs. for 10”-12”restraints.
   DO NOT OVER-TORQUE T-HEAD BOLTS and NUTS WHEN ASSEMBLING PVC and PVCO PIPE!
6. **Hand-tighten the torque limiting nuts attached to the TUF Grip wedge assemblies in a clockwise direction with an alternating or star pattern until all gripping wedges are in contact with the pipe wall. Rotational direction of torque nut is indicated by recessed arrow on the face of the nut. With a wrench (box, socket, or pneumatic), continue to tighten each torque nut ½ turn in an alternating or star pattern around the restraint until all torque limiting nuts twist off. NEVER turn a torque limiting nut more than ½ turn without turning the remaining torque nuts an equal amount!
   **NOTE: For IPS and PVCO applications, ensure step 5 is completed before engaging wedges. Failure to comply will result in excessive pipe wall deflection and torque nuts will not twist off as designed.
7. When all torque limiting nuts twist off, the mechanical joint and restraint assembly are complete.

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PATENT PENDING

Series 1500 DUAL WEDGE® - For PVC, Ductile, and HDPE Pipe
" A Proven Third Generation Mechanical Joint Restraint"

MJ TUF Grip™ TDW

Torque Nut

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Tyler Union's TUF Grip restraint represents the culmination of 20 years of engineering and testing. As a 3rd generation restraint, TUF Grip is the best available technology in the Waterworks market for use in restraining PVC, Ductile, and HDPE Pipe.

"BETTER BY DESIGN"

SPECIFICATIONS:

- Proven to restrain plain end PVC, Ductile iron, and HDPE pipe in diameters 4" thru 24". **Note: IPS diameter pipe requires the use of an MJ Transition gasket
- Restraint design conforms with applicable requirements of ANSI/AWWA C111, ANSI/AWWA C153, and ANSI/AWWA C110
- Restraint engineered for securing plain end pipe to mechanical joint fittings conforming to ANSI/AWWA C110, C111, and C153
- Cast of ASTM A536 compliant 65-45-12 ductile iron complete with a cast on date code and country of origin for traceability
- Restraints and all components are designed and proven for a 2:1 safety factor based on the pipe pressure rating
- Restraint deflection rating when installed on nominal diameter pipe is 4"-12" - 3°, 14"-16" - 2°, and 18"-24" - 1.5°
- Standard coating for Non-Domestic restraint is 4-6 mil of enamel paint
- Gripping wedges are heat treated to a mininum 420 Brinell Hardness
- Gripping wedge, wedge collar bolt, and twist off torque limiting nut shall be e-coated
- FM approved for 4" thru 12" applications and UL listed and approved for 4" thru 24" applications
- Not recommended for use on plain end fittings
- Color coded orange for use on multiple classes of pipe and to distunguish from traditional restraints.

FEATURES & ADVANTAGES:

- Torque limiting nut on gripping wedge assembly twists off within a designed torque range eliminating the need for specialized tools
- Gripping wedge assembly pivots providing stronger engagement of pipe wall at lower torque requirement (45-60 ft.-lbs.)
- Proven restraint technology utilizing fewer gripping wedges in frequently applied diameters, reducing trench time and project cost
- Restraint's heavy duty construction and design eliminates the need for costly thrust blocks and tie rods
- Approved for use on multiple classes of pipe – **Pressure ratings and associated pipe classes provided on page 2 and 3**
- Suitable for Potable and Wastewater applications
- Controlled wedge contour to accommodate contact circumfrence when assembled on different types of pipe.

ISO 9001-2008 Registered	Listed with Underwriters Laboratory	Factory Mutual Approved

Product Source/Type	Name of Project	Name of Contractor	Project Engineer	Spec. Section and/or Project No.

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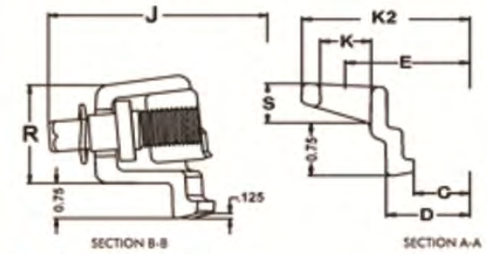

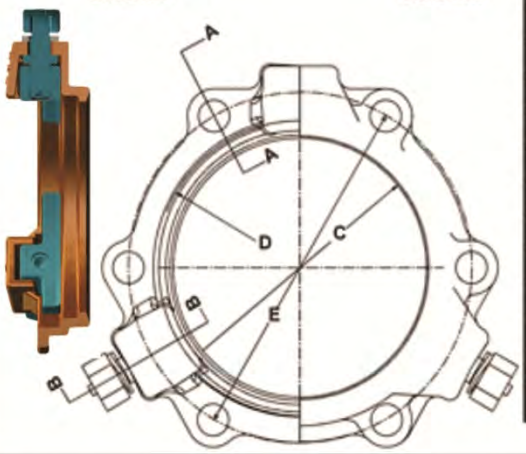

TUFGrip™ MJ Restraint Dimensions

Size (inches)	C	D	E	K2	J	K	R	S
3	4.08	4.88	6.19	7.67	9.82	3/4	2.20	0.86
4	4.93	5.92	7.50	8.98	10.67	7/8	2.20	0.73
6	7.03	8.02	9.50	10.98	12.77	7/8	2.24	0.82
8	9.18	10.17	11.75	13.23	14.92	7/8	2.28	0.82
10	11.23	12.22	14.00	15.70	16.97	7/8	2.37	0.93
12	13.33	14.32	16.25	17.95	19.07	7/8	2.40	0.93
14	15.44	16.40	18.75	20.43	21.18	7/8	2.57	0.91
16	17.54	18.50	21.00	22.88	23.28	7/8	2.57	1.05
18	19.64	20.60	23.25	25.43	25.38	7/8	2.57	1.05
20	21.74	22.70	25.50	27.50	27.48	7/8	2.66	1.15
24	25.94	26.90	30.00	32.00	31.68	7/8	2.72	1.35
30	32.18	33.30	36.88	39.42	39.78	1-1/8	3.86	1.53
36	38.48	39.60	43.75	46.29	46.08	1-1/8	3.86	1.53
42	44.68	45.80	50.62	53.62	53.08	1-3/8	4.56	2.05
48	50.98	52.10	57.50	60.50	59.28	1-3/8	4.56	2.05

SERIES 1500 TDW - TUFGrip™ - APPLICATION CHART | Pressure Rating |

Size (Inches)	Part No. - Gland Only Domestic / Non-Domestic	Wedge Qty.	T-Head Bolt Qty.	Bolt Size	Gland weight(lbs.)	Weight (w/Acc.)	DI Pipe	C-900 C-905	Pipe O.D.
4	603000 / 602000	2	4	¾" x 3.5"	7.1	11.8	350	*305/DR14	4.80
6	603005 / 602005	3	6	¾" x 4"	11.2	18.8	350	*305/DR14	6.90
8	603015 / 602010	3	6	¾" x 4"	13.1	20.3	350	*305/DR14	9.05
10	603020 / 602015	6	8	¾" x 4"	26.0	32.5	350	*305/DR14	11.10
12	603025 / 602020	8	8	¾" x 4"	31.5	40.4	350	*305/DR14	13.20
14	603030 / 602025	10	10	¾" x 4.5"	43.3	53.6	350	*235/DR18	15.30
16	603035 / 602030	12	12	¾" x 4.5"	54.1	66.3	350	*235/DR18	17.40
18	603040 / 602035	12	12	¾" x 4.5"	59.8	72.2	250	*235/DR25	19.50
20	603045 / 602040	14	14	¾" x 4.5"	69.8	83.8	250	*235/DR25	21.60
24	603050 / 602045	16	16	¾" x 5"	90.4	106.9	250	*235/DR25	25.80

***Nore: The pressure ratings are rated working water pressure for the restraint. See page 3 for additional ratings.**

ISO 9001-2008 Registered	Listed with Underwriters Laboratory	Factory Mutual Approved

STOP-LOOK :

- For Approvals, 3-12 inch were tested at 3°of deflection, 14-16 inch were tested at 2° of deflection, and 18-24 inch were tested at 1.5° of deflection; 4-16 inch test were to 700 psi and 18-24 tests were to 500 psi.
- The Series 1500 TUF Grip is specified for use on PVC, Ductile, and HDPE Pipe but can be used on some sizes of cast grey iron or pit cast pipe if the pipe is not severely corroded, is in sound condition, and has an outside diameter compatible with the as provided dimensions.
- Installation and hydrostatic testing shall be in accordance with AWWA C600 and AWWA C651.

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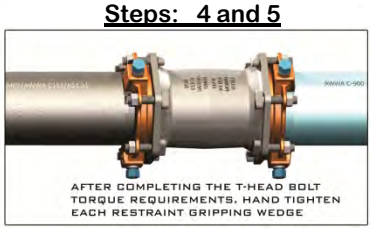
TUFGRIP™ DUAL WEDGE®
PATENT PENDING

**SERIES 1500 TDW-TUF GRIP™ RESTRAINT RATINGS																
SIZE (Inches)	Ductile Pipe	AWWA C900			AWWA C905			AWWA C909	ASTM D2241			HDPE* AWWA C906				
	C151/A21.51	DR14	DR18	DR25	DR18	DR25	DR32.5		SDR17	SDR21	SDR26	DR7.3	DR9	DR11	DR13.5	DR17
4	350	305	235	165	-	-	-	235/150*	250	200	160	254	200	160	128	100
6	350	305	235	165	-	-	-	235/150*	250	200	160	254	200	160	128	100
8	350	305	235	165	-	-	-	235/150*	250	200	160	254	200	160	128	100
10	350	305	235	165	-	-	-	235/150*	250	200	160	254	200	160	128	100
12	350	305	235	165	-	-	-	235/150*	250	200	160	254	200	160	128	100
14	350	-	-	-	235	165	125	-	-	-	-	254	200	160	128	100
16	350	-	-	-	235	165	125	-	-	-	-	254	200	160	128	100
18	250	-	-	-	200	165	125	-	-	-	-	-	-	-	-	-
20	250	-	-	-	200	165	125	-	-	-	-	-	-	-	-	-
24	250	-	-	-	165	165	125	-	-	-	-	-	-	-	-	-
**Note: Pressure Ratings for Ordinary Water Works Restraint Application with Transitory Surges Only																
**Note: AWWA C909 PVCO Restraint Pressure Rating is per the Pressure Rating Listed on the Pipe																
*Note: HDPE application require a separate stiffener ring. 4-16 for DI OD Pipe & 4-12 for IPS OD Pipe																

Steps: 1 and 2

Step: 3

Steps: 4 and 5



Steps: 6 and 7

1. Insure the beveled pipe end to be joined and mechanical joint socket are clean and free of debris. Slide the Orange TUF Grip onto the beveled end of the pipe to be restrained. The TUF Grip compression lip extension must be toward the beveled end of the pipe being restrained.
2. Evenly lubricate the beveled pipe end, exterior pipe wall, and inside surface of the gasket with a lubricant that meets the requirements of AWWA C111. Now place the **MJ gasket over the plain beveled end of the pipe with the narrow edge of the tapered gasket toward the pipe end. **NOTE: Use MJ transition gasket with IPS diameter pipe.
3. Fully insert the beveled pipe end into the MJ socket pipe landing. Keeping the pipe straight in the MJ socket, slide/push the MJ gasket firmly and evenly into the MJ socket recess. Joint must be kept straight during assembly.
4. Push the TUF Grip compression lip extension evenly against the thick side of the MJ gasket and insert all T-Head bolts with nuts. Use only T-Head bolts and nuts that meet AWWA C111 requirements. With the TUF Grip restraint lip extension against the MJ gasket, evenly hand-tighten the nuts on the T--Head bolts making sure the restraint body is centered on the pipe and within in the MJ socket. If joint deflection is needed, deflect the pipe only after hand tightening of all nuts is completed. Joint deflection is 3° max for 4”-12”, 2° max for 14”-16”, 1.5° max for 18”-24”.
   NOTE: Maximum deflection values provided apply with nominal pipe, fitting, and restraint diameters.
5. Using a wrench, tighten the T-Head bolts and nuts a few turns at a time in an alternating or star pattern. Maintain equal spacing or distance between the TUF Grip bolt flange and the MJ socket bolt flange as the MJ gasket is compressed. Repeat the process in an alternating pattern for all T-Head bolts and nuts. The T-Head bolt and nut torque requirement for restraints is 4”- 24”-75-90 ft.-lbs.
   NOTE: The C909 PVCO T-Head bolt and nut torque is 55-65 ft.-lbs. for 4”-8” and 65-75 ft.-lbs. for 10”-12”restraints.
   DO NOT OVER-TORQUE T-HEAD BOLTS and NUTS WHEN ASSEMBLING PVC and PVCO PIPE!
6. **Hand-tighten the torque limiting nuts attached to the TUF Grip wedge assemblies in a clockwise direction with an alternating or star pattern until all gripping wedges are in contact with the pipe wall. Rotational direction of torque nut is indicated by recessed arrow on the face of the nut. With a wrench (box, socket, or pneumatic), continue to tighten each torque nut ½ turn in an alternating or star pattern around the restraint until all torque limiting nuts twist off. NEVER turn a torque limiting nut more than ½ turn without turning the remaining torque nuts an equal amount!
   **NOTE: For IPS and PVCO applications, ensure step 5 is completed before engaging wedges. Failure to comply will result in excessive pipe wall deflection and torque nuts will not twist off as designed.
7. When all torque limiting nuts twist off, the mechanical joint and restraint assembly are complete.

Tyler Union Waterworks Contact Information
Tyler: 11910 CR 492 ● Tyler, Texas 75706 ● (800) 527-8478
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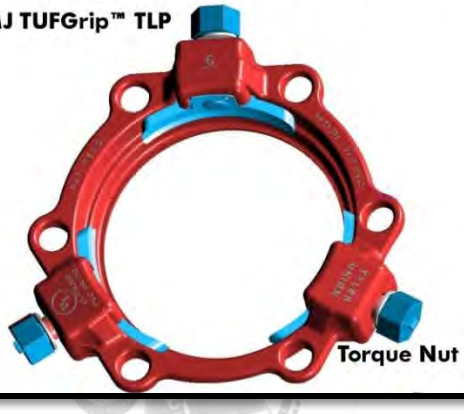
TUFGRIP™

Series 2000 for PVC & PVCO Pipe

"A Proven Third Generation Mechanical Joint Restraint"

MJ TUFGrip™ TLP



TYLER UNION®
Quality Waterworks Products

Tyler Union's TUF Grip restraints represent the culmination of 20 years of engineering and testing. As a 3rd generation restraint, TUF Grip is the best available technology in the Waterworks market for use in restraining PVC pipe.

HK&A Designed by Harold Kennedy & Associates, Inc.

"BETTER BY DESIGN"

SPECIFICATIONS:

- Proven to restrain plain end PVC pipe in diameters 3" thru 36" and PVCO pipe in diameters 4" thru 12"
- Restraint design conforms to applicable requirements of ANSI/AWWA C111, ANSI/AWWA C153, and ANSI/AWWA C110
- Restraint engineered for securing plain end pipe to mechanical joint fittings conforming to ANSI/AWWA C110, C111, and C153
- Rated for working water pressure of 305 psi for 3"-12", 235 psi for 14"-24", 150 psi for 30", and 125 psi for 36" **(details on page 2)**
- Cast of ASTM compliant 65-45-12 ductile iron complete with cast on date code and country of origin for traceability
- Restraint and all components are designed and proven for a 2:1 safety factor based on the PVC and PVCO pipe pressure rating
- Deflection rating when installed on pipe with nominal diameter shall be 3° for 3" thru 12", 2° for 14" thru 16", and 1.5° for 18" thru 36"
- Standard coating for Domestic restraint is 4-6 mil of TUF-Bond™ **(thermoset polyester for impact, corrosion, and UV protection)**
- Gripping wedge, wedge collar bolt and twist off torque limiting nut shall be e-coated
- FM approved for 4" thru 12" applications and UL listed and approved for 3" thru 12" applications
- Color coded red for pipe type (C900 PVC/C905 PVC/ *C909 PVCO/D2241 PVC) - ***Note: Refer to page 2 for C909 pipe applications**

FEATURES & ADVANTAGES:

- Torque limiting nut on gripping wedge assembly twists off within a designed torque range eliminating the need for specialized tools
- Gripping wedge assembly pivots providing stronger engagement of pipe wall at lower torque requirement (45-60 ft.-lbs.)
- Proven restraint technology utilizing fewer gripping wedges in frequently applied diameters, reducing trench time and project cost
- There is no washer or spacer to remove when installing restraints on 3" to 12" ASTM D2241 PVC pipe with IPS outside diameter
- Restraint's heavy duty construction and design eliminates the need for costly thrust blocks and tie rods
- Suitable for Potable and Wastewater applications
- Approved for use on multiple classes of pipe - **Additional pressure ratings and associated pipe classes provided on pages 2 and 3**

ISO 9001-2008 Registered	Listed with Underwriters Laboratory	Factory Mutual Approved

Product Source/Type	Name of Project	Name of Contractor	Project Engineer	Spec. Section and/or Project No.

Tyler Union Waterworks Contact Information

Tyler: 11910 CR 492 ● Tyler, Texas 75706 ● (800) 527-8478
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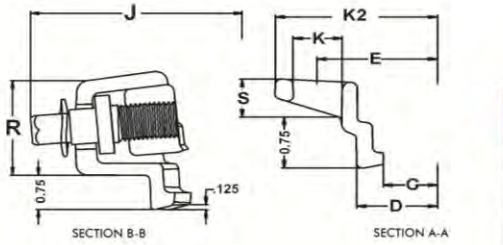
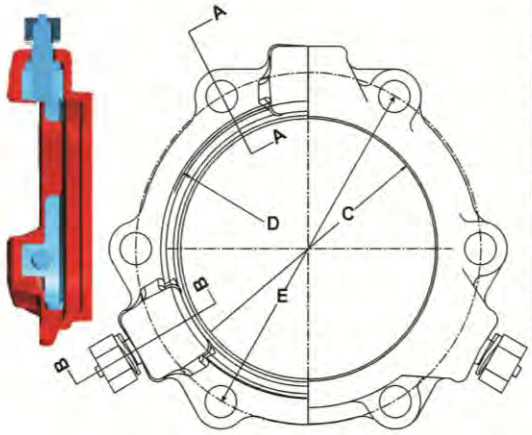
TUFGRIP™

"Better By Design"





TUFGrip™ MJ Restraint Dimensions

Size (inches)	C	D	E	K2	J	K	R	S
3	4.08	4.88	6.19	7.67	9.82	3/4	2.20	0.86
4	4.93	5.92	7.50	8.98	10.67	7/8	2.20	0.73
6	7.03	8.02	9.50	10.98	12.77	7/8	2.24	0.82
8	9.18	10.17	11.75	13.23	14.92	7/8	2.28	0.82
10	11.23	12.22	14.00	15.70	16.97	7/8	2.37	0.93
12	13.33	14.32	16.25	17.95	19.07	7/8	2.40	0.93
14	15.44	16.40	18.75	20.43	21.18	7/8	2.57	0.91
16	17.54	18.50	21.00	22.88	23.28	7/8	2.57	1.05
18	19.64	20.60	23.25	25.43	25.38	7/8	2.57	1.05
20	21.74	22.70	25.50	27.50	27.48	7/8	2.66	1.15
24	25.94	26.90	30.00	32.00	31.68	7/8	2.72	1.35
30	32.18	33.30	36.88	39.42	39.78	1-1/8	3.86	1.53
36	38.48	39.60	43.75	46.29	46.08	1-1/8	3.86	1.53

SERIES 2000 TLP-PVC TUFGrip™ - APPLICATION CHART

Size (Inches)	Part No. - Gland Only Domestic / Non-Domestic	Wedge Qty.	T-Head Bolt Qty.	Bolt Size	Gland Weight(lbs.)	Weight (w/Acc.)	*Pressure Rating	Pipe O.D. (Inches)
3	CALL / 113928	2	4	⅝" x 3"	7.0	11.0	*305 / DR14	3.50
4	516002 / 113935	2	4	¾" x 3.5"	8.3	12.2	*305 / DR14	4.50-4.80
6	516019 / 113942	3	6	¾" x 4"	12.4	18.3	*305 / DR14	6.63-6.90
8	516026 / 113959	3	6	¾" x 4"	14.9	20.8	*305 / DR14	8.63-9.12
10	516033 / 113973	6	8	¾" x 4"	25.7	33.4	*305 / DR14	10.75-11.10
12	516040 / 113980	8	8	¾" x 4"	34.1	42.0	*305 / DR14	12.75-13.20
14	516248 / 113997	10	10	¾" x 4.5"	45.1	55.4	*235 / DR18	15.30
16	516262 / 114000	12	12	¾" x 4.5"	56.2	68.4	*235 / DR18	17.40
18	516286 / 114017	12	12	¾" x 4.5"	62.4	74.8	*235 / DR25	19.50
20	516309 / 114024	14	14	¾" x 4.5"	72.9	86.9	*235 / DR25	21.60
24	516323 / 114031	16	16	¾" x 5"	93.2	109.8	*235 / DR25	25.80
30	CALL / 461302	20	20	1" x 7.5"	251	293	*150 / DR25	32.00
36	CALL / 461357	24	24	1" x 7.5"	281	331	*125 / DR25	38.30

***Note: The pressure ratings are rated working water pressures for the restraint. See page 3 for additional ratings.**

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STOP-LOOK :

- Extra length T-Head bolts are provided with 30"- 36" restraints to facilitate mechanical joint assembly per AWWA C600.
- For UL/FM Approvals, 3"- 12" were tested to 755 psi, 14"-16" were tested to 755 psi and 18"- 24" inch were tested to 535 psi.
- TUF Grip 30-36 inch provided with TRU-Lock™ mechanical joint gasket to ensure pressure rating & safety factors are met.
- Mechanical joint T-head bolt torques for C909 applications are as provided; *55-65 ft.-lbs for 4" to 8" and *65 to 75 ft.-lbs. for 10" to 12" assembly. You must specifiy restraints are for C909 PVCO pipe upon order placement. Call for availability.
- Installation and hydrostatic testing shall be in accordance with AWWA C600 and AWWA C651.
- TUF Grip 4" to 24" restraints shall meet the requirementsof ASTM F1674, current revision.

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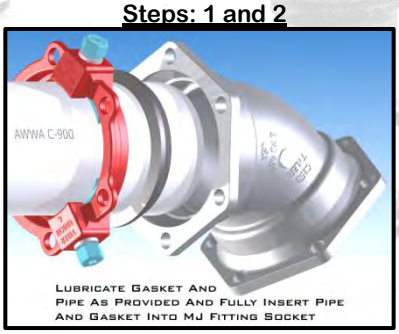
TUFGRIP™

**ADDITIONAL SERIES 2000 TLP-TUF GRIP™ RESTRAINT RATINGS									
	AWWA C900			AWWA C905			ASTM D2241		
SIZE (Inches)	DR14	DR18	DR25	DR18	DR25	DR32.5	SDR17	SDR21	SDR26
3	-	-	-	-	-	-	250	200	160
4	305	235	165	-	-	-	250	200	160
6	305	235	165	-	-	-	250	200	160
8	305	235	165	-	-	-	250	200	160
10	305	235	165	-	-	-	250	200	160
12	305	235	165	-	-	-	250	200	
14	-	-	-	235	165	125	-	-	-
16	-	-	-	235	165	125	-	-	-
18	-	-	-	200	165	-	-	-	-
20	-	-	-	200	165	-	-	-	-
24	-	-	-	165	165	125	-	-	-
30	-	-	-	-	165	125	-	-	-
36	-	-	-	-	125	125	-	-	-
**Note: Pressure Ratings for Ordinary Water Works Restraint Application with Transitory Surges Only									
**Note: AWWA C909 PVCO Restraint Pressure Rating is per the Pressure Rating Listed on the Pipe									

Assembly steps for (3"-12" ASTM D2241 IPS PVC), (4"-12" AWWA C909 PVCO), and (4"-36" AWWAC900/C905 PVC)

Steps: 1 and 2



Step: 3

Steps: 4 and 5

Steps: 6 and 7

1. Insure the beveled pipe end to be joined and mechanical joint socket are clean and free of debris. Slide the RED TUF Grip onto the beveled end of the pipe to be restrained. The TUF Grip compression lip extension must be toward the beveled end of the pipe being restrained.
2. Evenly lubricate the beveled pipe end, exterior pipe wall, and inside surface of the gasket with a lubricant that meets the requirements of AWWA C111. Now place the **MJ gasket over the plain beveled end of the pipe with the narrow edge of the tapered gasket toward the pipe end. **NOTE: Use MJ transition gasket with IPS diameter pipe.
3. Fully insert the beveled pipe end into the MJ socket pipe landing. Keeping the pipe straight in the MJ socket, slide/push the MJ gasket firmly and evenly into the MJ socket recess. Joint must be kept straight during assembly.
4. Push the TUF Grip compression lip extension evenly against the thick side of the MJ gasket and insert all T-Head bolts with nuts. Use only T-Head bolts and nuts that meet AWWA C111 requirements. With the TUF Grip restraint lip extension against the MJ gasket, evenly hand-tighten the nuts on the T--Head bolts making sure the restraint body is centered on the pipe and within in the MJ socket. If joint deflection is needed, deflect the pipe only after hand tightening of all nuts is completed. Joint deflection is 3° max for 3", 5° max for 4"-12", 2° max for 14"-16", 1.5° max for 18"-36". NOTE: Maximum deflection values provided apply with nominal pipe, fitting, and restraint diameters.
5. Using a wrench, tighten the T-Head bolts and nuts a few turns at a time in an alternating or star pattern. Maintain equal spacing or distance between the TUF Grip bolt flange and the MJ socket bolt flange as the MJ gasket is compressed. Repeat the process in an alternating pattern for all T-Head bolts and nuts. The T-Head bolt and nut torque requirement for restraints is 3"- 45-60 ft.-lbs., 4"- 24"-75-90 ft.-lbs., and 30"- 36"- 100-120 ft.-lbs.
   NOTE: The C909 PVCO T-Head bolt and nut torque is 55-65 ft.-lbs. for 4"-8" and 65-75 ft.-lbs. for 10"-12"restraints.
   DO NOT OVER-TORQUE T-HEAD BOLTS and NUTS WHEN ASSEMBLING PVC and PVCO PIPE!
6. **Hand-tighten the torque limiting nuts attached to the TUF Grip wedge assemblies in a clockwise direction with an alternating or star pattern until all gripping wedges are in contact with the pipe wall. Rotational direction of torque nut is indicated by recessed arrow on the face of the nut. With a wrench (box, socket, or pneumatic), continue to tighten each torque nut ½ turn in an alternating or star pattern around the restraint until all torque limiting nuts twist off. NEVER turn a torque limiting nut more than ½ turn without turning the remaining torque nuts an equal amount! **NOTE: For IPS and PVCO applications, ensure step 5 is completed before engaging wedges. Failure to comply will result in excessive pipe wall deflection and torque nuts will not twist off as designed.
7. When all torque limiting nuts twist off, the mechanical joint and restraint assembly are complete.

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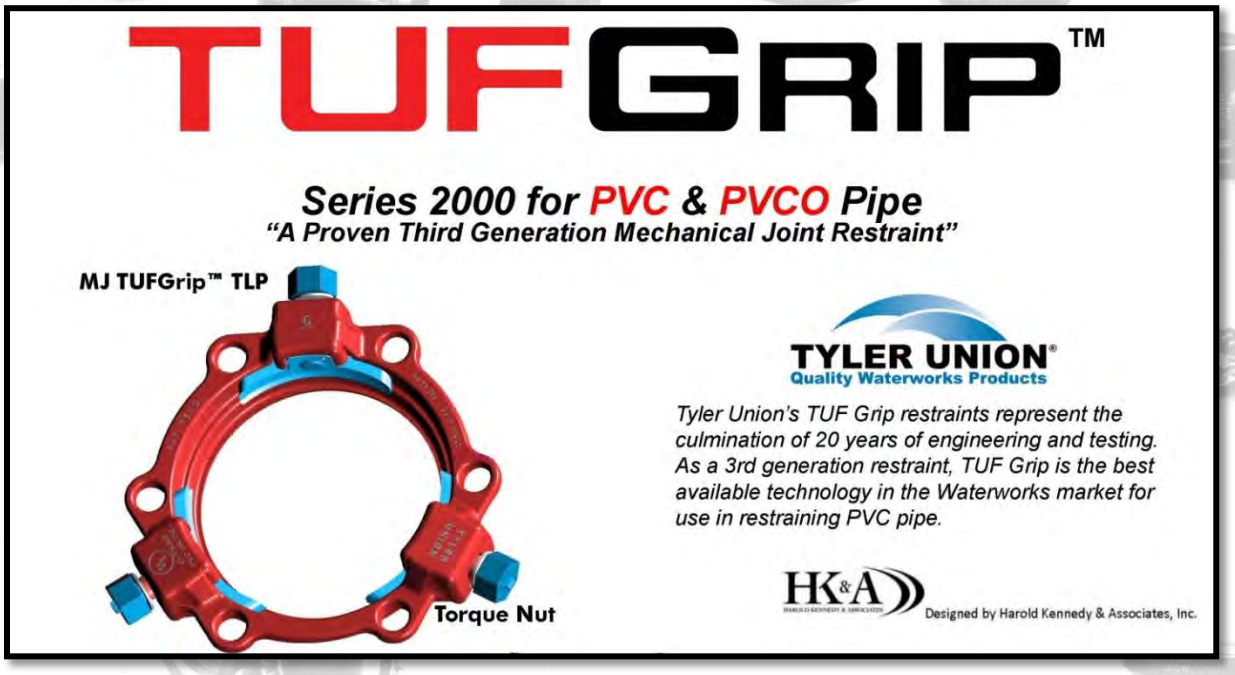

"BETTER BY DESIGN"

SPECIFICATIONS:

- Proven to restrain plain end PVC pipe in diameters 3" thru 36" and PVCO pipe in diameters 4" thru 12"
- Restraint design conforms to applicable requirements of ANSI/AWWA C111, ANSI/AWWA C153, and ANSI/AWWA C110
- Restraint engineered for securing plain end pipe to mechanical joint fittings conforming to ANSI/AWWA C110, C111, and C153
- Rated for working water pressure of 305 psi for 3"-12", 235 psi for 14"-24", 150 psi for 30", and 125 psi for 36" **(details on page 2)**
- Cast of ASTM compliant 65-45-12 ductile iron complete with cast on date code and country of origin for traceability
- Restraint and all components are designed and proven for a 2:1 safety factor based on the PVC and PVCO pipe pressure rating
- Deflection rating when installed on pipe with nominal diameter shall be 3° for 3" thru 12", 2° for 14" thru 16", and 1.5° for 18" thru 36"
- Standard coating for Non-Domestic restraint is 4-6 mil of *Alkyd resin baking enamel
- Gripping wedge, wedge collar bolt and twist off torque limiting nut shall be e-coated
- FM approved for 4" thru 12" applications and UL listed and approved for 3" thru 12" applications
- Color coded red for pipe type (C900 PVC/C905 PVC/ *C909 PVCO/D2241 PVC) - ***Note: Refer to page 2 for C909 pipe applications**

FEATURES & ADVANTAGES:

- Torque limiting nut on gripping wedge assembly twists off within a designed torque range eliminating the need for specialized tools
- Gripping wedge assembly pivots providing stronger engagement of pipe wall at lower torque requirement (45-60 ft.-lbs.)
- Proven restraint technology utilizing fewer gripping wedges in frequently applied diameters, reducing trench time and project cost
- There is no washer or spacer to remove when installing restraints on 3" to 12" ASTM D2241 PVC pipe with IPS outside diameter
- Restraint's heavy duty construction and design eliminates the need for costly thrust blocks and tie rods
- Suitable for Potable and Wastewater applications
- Approved for use on multiple classes of pipe - **Additional pressure ratings and associated pipe classes provided on pages 2 and 3**

ISO 9001-2008 Registered	Listed with Underwriters Laboratory	Factory Mutual Approved

Product Source/Type	Name of Project	Name of Contractor	Project Engineer	Spec. Section and/or Project No.

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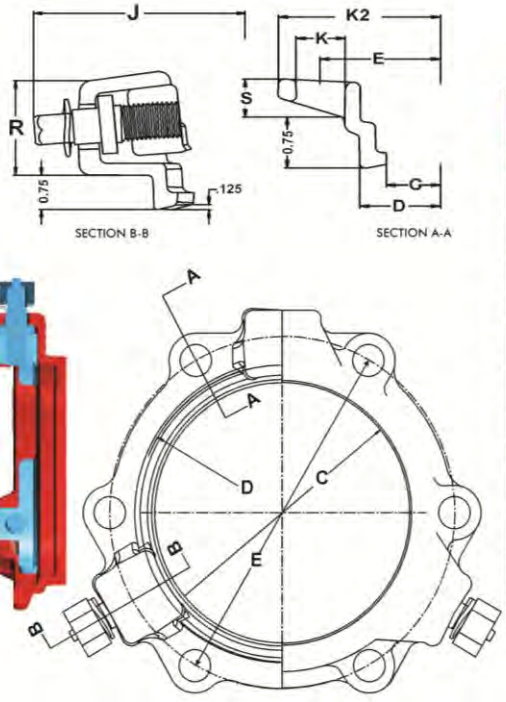

TUFGrip™ MJ Restraint Dimensions

Size (inches)	C	D	E	K2	J	K	R	S
3	4.08	4.88	6.19	7.67	9.82	3/4	2.20	0.86
4	4.93	5.92	7.50	8.98	10.67	7/8	2.20	0.73
6	7.03	8.02	9.50	10.98	12.77	7/8	2.24	0.82
8	9.18	10.17	11.75	13.23	14.92	7/8	2.28	0.82
10	11.23	12.22	14.00	15.70	16.97	7/8	2.37	0.93
12	13.33	14.32	16.25	17.95	19.07	7/8	2.40	0.93
14	15.44	16.40	18.75	20.43	21.18	7/8	2.57	0.91
16	17.54	18.50	21.00	22.88	23.28	7/8	2.57	1.05
18	19.64	20.60	23.25	25.43	25.38	7/8	2.57	1.05
20	21.74	22.70	25.50	27.50	27.48	7/8	2.66	1.15
24	25.94	26.90	30.00	32.00	31.68	7/8	2.72	1.35
30	32.18	33.30	36.88	39.42	39.78	1-1/8	3.86	1.53
36	38.48	39.60	43.75	46.29	46.08	1-1/8	3.86	1.53

SERIES 2000 TLP-PVC TUFGrip™ - APPLICATION CHART

Size (Inches)	Part No. - Gland Only Domestic / Non-Domestic	Wedge Qty.	T-Head Bolt Qty.	Bolt Size	Gland Weight(lbs.)	Weight (w/Acc.)	*Pressure Rating	Pipe O.D. (Inches)
3	CALL / 113928	2	4	⅝" x 3"	7.0	11.0	*305 / DR14	3.50
4	516002 / 113935	2	4	¾" x 3.5"	8.3	12.2	*305 / DR14	4.50-4.80
6	516019 / 113942	3	6	¾" x 4"	12.4	18.3	*305 / DR14	6.63-6.90
8	516026 / 113959	3	6	¾" x 4"	14.9	20.8	*305 / DR14	8.63-9.12
10	516033 / 113973	6	8	¾" x 4"	25.7	33.4	*305 / DR14	10.75-11.10
12	516040 / 113980	8	8	¾" x 4"	34.1	42.0	*305 / DR14	12.75-13.20
14	516248 / 113997	10	10	¾" x 4.5"	45.1	55.4	*235 / DR18	15.30
16	516262 / 114000	12	12	¾" x 4.5"	56.2	68.4	*235 / DR18	17.40
18	516286 / 114017	12	12	¾" x 4.5"	62.4	74.8	*235 / DR25	19.50
20	516309 / 114024	14	14	¾" x 4.5"	72.9	86.9	*235 / DR25	21.60
24	516323 / 114031	16	16	¾" x 5"	93.2	109.8	*235 / DR25	25.80
30	CALL / 461302	20	20	1" x 7.5"	251	293	*150 / DR25	32.00
36	CALL / 461357	24	24	1" x 7.5"	281	331	*125 / DR25	38.30

***Note: The pressure ratings are rated working water pressures for the restraint. See page 3 for additional ratings.**

ISO 9001-2008 Registered | **Listed with Underwriters Laboratory** | **Factory Mutual Approved**

STOP-LOOK :

- Extra length T-Head bolts are provided with 30"- 36" restraints to facilitate mechanical joint assembly per AWWA C600.
- For UL/FM Approvals, 3"- 12" were tested to 755 psi, 14"-16" were tested to 755 psi and 18"- 24" inch were tested to 535 psi.
- TUF Grip 30-36 inch provided with TRU-Lock™ mechanical joint gasket to ensure pressure rating & safety factors are met.
- Mechanical joint T-head bolt torques for C909 applications are as provided; *55-65 ft.-lbs for 4" to 8" and *65 to 75 ft.-lbs. for 10" to 12" assembly. You must specifiy restraints are for C909 PVCO pipe upon order placement. Call for availability.
- Installation and hydrostatic testing shall be in accordance with AWWA C600 and AWWA C651.
- TUF Grip 4" to 24" restraints shall meet the requirementsof ASTM F1674, current revision.

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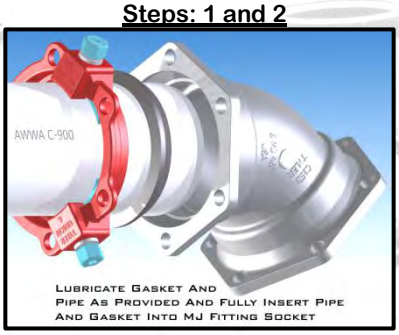
NON-DOMESTIC PRODUCT SUBMITTAL

TUFGRIP™

**ADDITIONAL SERIES 2000 TLP-TUF GRIP™ RESTRAINT RATINGS									
	AWWA C900			AWWA C905			ASTM D2241		
SIZE (Inches)	DR14	DR18	DR25	DR18	DR25	DR32.5	SDR17	SDR21	SDR26
3	-	-	-	-	-	-	250	200	160
4	305	235	165	-	-	-	250	200	160
6	305	235	165	-	-	-	250	200	160
8	305	235	165	-	-	-	250	200	160
10	305	235	165	-	-	-	250	200	160
12	305	235	165	-	-	-	250	200	
14	-	-	-	235	165	125	-	-	-
16	-	-	-	235	165	125	-	-	-
18	-	-	-	200	165	-	-	-	-
20	-	-	-	200	165	-	-	-	-
24	-	-	-	165	165	125	-	-	-
30	-	-	-	-	165	125	-	-	-
36	-	-	-	-	125	125	-	-	-
**Note: Pressure Ratings for Ordinary Water Works Restraint Application with Transitory Surges Only									
**Note: AWWA C909 PVCO Restraint Pressure Rating is per the Pressure Rating Listed on the Pipe									

Assembly steps for (3"-12" ASTM D2241 IPS PVC), (4"-12" AWWA C909 PVCO), and (4"-36" AWWAC900/C905 PVC)

Steps: 1 and 2



Step: 3

Steps: 4 and 5

Steps: 6 and 7

1. Insure the beveled pipe end to be joined and mechanical joint socket are clean and free of debris. Slide the RED TUF Grip onto the beveled end of the pipe to be restrained. The TUF Grip compression lip extension must be toward the beveled end of the pipe being restrained.
2. Evenly lubricate the beveled pipe end, exterior pipe wall, and inside surface of the gasket with a lubricant that meets the requirements of AWWA C111. Now place the **MJ gasket over the plain beveled end of the pipe with the narrow edge of the tapered gasket toward the pipe end. **NOTE: Use MJ transition gasket with IPS diameter pipe.
3. Fully insert the beveled pipe end into the MJ socket pipe landing. Keeping the pipe straight in the MJ socket, slide/push the MJ gasket firmly and evenly into the MJ socket recess. Joint must be kept straight during assembly.
4. Push the TUF Grip compression lip extension evenly against the thick side of the MJ gasket and insert all T-Head bolts with nuts. Use only T-Head bolts and nuts that meet AWWA C111 requirements. With the TUF Grip restraint lip extension against the MJ gasket, evenly hand-tighten the nuts on the T--Head bolts making sure the restraint body is centered on the pipe and within in the MJ socket. If joint deflection is needed, deflect the pipe only after hand tightening of all nuts is completed. Joint deflection is 3° max for 3", 5° max for 4"-12", 2° max for 14"-16", 1.5° max for 18"-36". NOTE: Maximum deflection values provided apply with nominal pipe, fitting, and restraint diameters.
5. Using a wrench, tighten the T-Head bolts and nuts a few turns at a time in an alternating or star pattern. Maintain equal spacing or distance between the TUF Grip bolt flange and the MJ socket bolt flange as the MJ gasket is compressed. Repeat the process in an alternating pattern for all T-Head bolts and nuts. The T-Head bolt and nut torque requirement for restraints is 3"- 45-60 ft.-lbs., 4"- 24"-75-90 ft.-lbs., and 30"- 36"- 100-120 ft.-lbs.
   NOTE: The C909 PVCO T-Head bolt and nut torque is 55-65 ft.-lbs. for 4"-8" and 65-75 ft.-lbs. for 10"-12"restraints.
   DO NOT OVER-TORQUE T-HEAD BOLTS and NUTS WHEN ASSEMBLING PVC and PVCO PIPE!
6. **Hand-tighten the torque limiting nuts attached to the TUF Grip wedge assemblies in a clockwise direction with an alternating or star pattern until all gripping wedges are in contact with the pipe wall. Rotational direction of torque nut is indicated by recessed arrow on the face of the nut. With a wrench (box, socket, or pneumatic), continue to tighten each torque nut ½ turn in an alternating or star pattern around the restraint until all torque limiting nuts twist off. NEVER turn a torque limiting nut more than ½ turn without turning the remaining torque nuts an equal amount! **NOTE: For IPS and PVCO applications, ensure step 5 is completed before engaging wedges. Failure to comply will result in excessive pipe wall deflection and torque nuts will not twist off as designed.
7. When all torque limiting nuts twist off, the mechanical joint and restraint assembly are complete.

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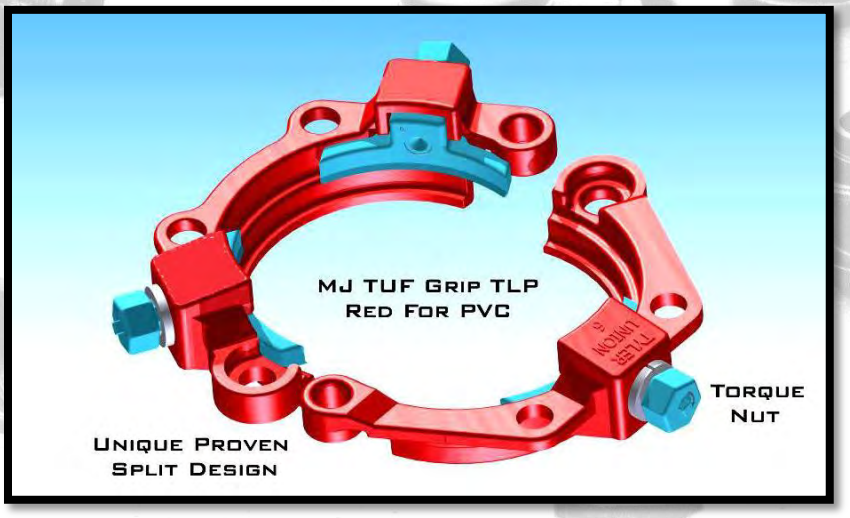
SERIES 2000S – MJ TLP SPLIT FOR PVC PIPE

"A Proven Third Generation Mechanical Joint Restraint"



"BETTER BY DESIGN"

SPECIFICATIONS:

- Proven to restrain plain end PVC pipe in diameters 4" thru 12"
- Restraint design conforms to applicable requirements of ANSI/AWWA C111, ANSI/AWWA C153, and ANSI/AWWA C110
- Restraint engineered for securing plain end pipe to mechanical joint fittings conforming to ANSI/AWWA C110, C111, and C153
- Restraint rated for working water pressure of 305 psi for 4 thru 12 inch restraints **(details on page 2)**
- Cast of ASTM A536 compliant 65-45-12 ductile iron complete with cast on date code and country of origin for traceability
- Restraints and all components are designed and proven for a 2:1 safety factor based on the PVC pipe pressure rating
- Deflection rating when installed on AWWA C900 pipe with nominal diameter shall be 3° for 4" thru 12" restraints
- Standard coating for Non-Domestic restraint is 4-6 mil of *Alkyd resin baking enamel - ***Note: Epoxy coatings available upon request**
- Gripping wedge, wedge collar bolt and twist off torque limiting nut shall be e-coated
- Restraint body color coded red for pipe type (AWWA C900 PVC and ASTM D2241)

FEATURES & ADVANTAGES:

- Unique Split design assembles using standard T-bolts and without additional accessories in sizes 6" thru 12"
- Torque limiting nut on gripping wedge assembly twists off within a designed torque range eliminating the need for specialized tools
- Gripping wedge assembly pivots providing stronger engagement of pipe wall at lower torque requirement (45-60 ft.-lbs.)
- Proven restraint technology utilizing fewer gripping wedges in frequently applied diameters, reducing trench time and project cost
- There is no washer or spacer to remove when installing restraints on 4" to 12" ASTM D2241 PVC pipe with IPS outside diameter
- Restraint's heavy duty construction and design eliminates the need for costly thrust blocks and tie rods
- Suitable for Potable and Wastewater applications
- Approved for use on multiple classes of pipe - **Additional pressure ratings and associated pipe classes provided on page 2**

ISO 9001-2008 Registered

Product Source/Type	Name of Project	Name of Contractor	Project Engineer	Spec. Section and/or Project No.

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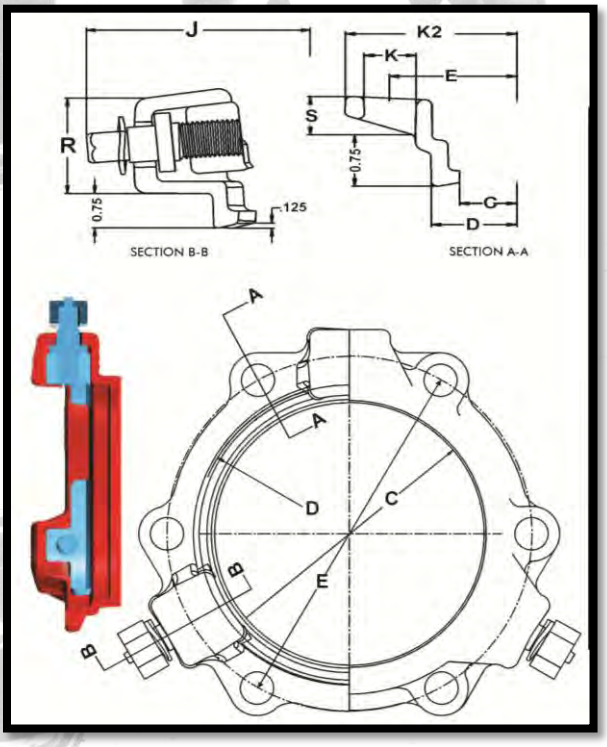
SERIES 2000S – MJ TLP SPLIT FOR PVC PIPE



Size (inches)	C	D	E	K2	J	K	R	S
4	4.93	5.92	7.50	8.98	10.67	7/8	2.20	0.73
6	7.03	8.02	9.50	10.98	12.77	7/8	2.24	0.82
8	9.18	10.17	11.75	13.23	14.92	7/8	2.28	0.82
10	11.23	12.22	14.00	15.70	16.97	7/8	2.37	0.93
12	13.33	14.32	16.25	17.95	19.07	7/8	2.40	0.93

SERIES 2000S TLP-PVC MJ TUFGrip™ - APPLICATION CHART

Size (Inches)	Part # Gland+Accessories Domestic / Non-Domestic	Wedge Qty.	T-Head Bolt Qty.	Bolt Size	Gland Weight(lbs.)	Weight (w/Acc.)	*Pressure Rating	Pipe O.D. (Inches)
4	N/A / 537052	2	4	¾" x 3.5"	8.3	12.2	*305 / DR14	4.50-4.80
6	N/A / 537069	3	6	¾" x 4"	12.4	18.3	*305 / DR14	6.63-6.90
8	N/A / 537076	3	6	¾" x 4"	14.9	20.8	*305 / DR14	8.63-9.12
10	N/A / 537083	6	8	¾" x 4"	25.7	33.4	*305 / DR14	10.75-11.10
12	N/A / 537090	8	8	¾" x 4"	34.1	42.0	*305 / DR14	12.75-13.20

***Note: The Pressure Ratings are Rated Working Water Pressures for the Restraint.**

****ADDITIONAL SERIES 2000S SPLIT TLP-PVC MJ TUFGrip™ RESTRAINT RATINGS**

PIPE TYPE ►	AWWA C900			ASTM D2241		
SIZE (Inches)	DR14	DR18	DR25	SDR17	SDR21	SDR26
4	305	235	150	250	200	160
6	305	235	150	250	200	160
8	305	235	150	250	200	160
10	305	235	150	250	200	160
12	305	235	150	250	200	-

****Note: Ratings for Ordinary Water Works Restraint Applications with Transitory Surges Only**

STOP-LOOK :
- **Piping system Installation and hydrostatic testing shall be in accordance with AWWA C600 and AWWA C651.**
- **TUF Grip 4" to 12" restraints shall meet the requirements of ASTM F1674, current revision.**

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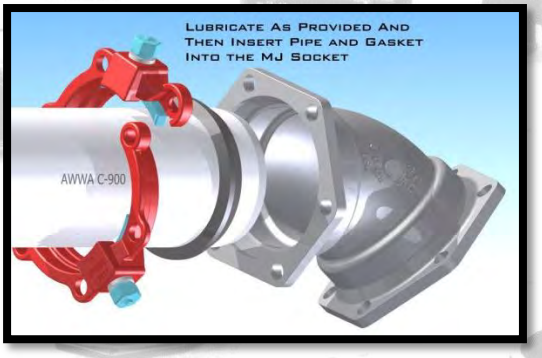
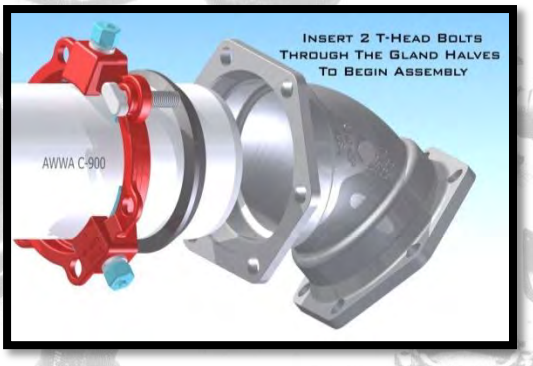
Assembly Steps – Series 2000S TLP Split – For PVC Pipe

Steps:1and 2

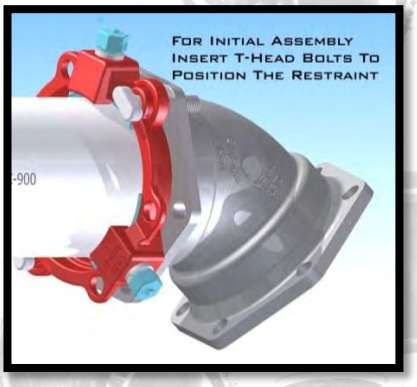


Step:3 and 4

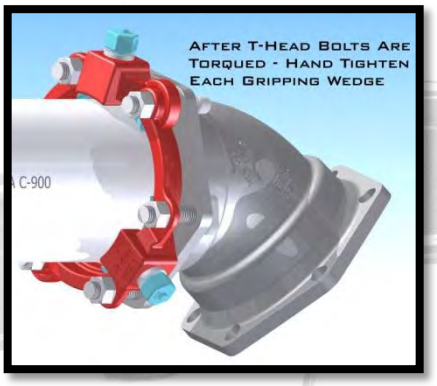


1. Insure the beveled pipe end to be joined and mechanical joint socket are clean and free of debris.
2. Lubricate the pipe end and exterior plus the inside surface of gasket with joint lubricant that meets the requirements of AWWA C111. Now place the MJ gasket over the plain beveled end of the pipe with the narrow edge of the tapered gasket toward the beveled end of the pipe to be restrained.
3. Fully insert the pipe end into the MJ socket pipe landing. Keeping the pipe straight, slide/push the gasket firmly and evenly into the MJ socket recess. **NOTE: For IPS diameter pipe use of an MJ transition gasket is required.
4. Place the two halves of the red TUF Grip around the pipe with the compression lip extension toward the MJ socket. Join the two restraint halves together with two T-Head bolts. Use only T-Head bolts, nuts, and gasket that meet AWWA C111 requirements.

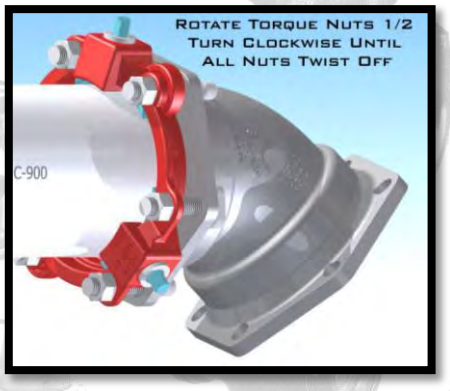
Steps:5



Steps:6 and 7



Steps:8 and 9



5. With the two T-Head bolts inserted through the restraint, push the TUF Grip lip extension evenly against the thick side of the MJ gasket. With the TUF grip restraint against the gasket, the remaining T-Head bolts are inserted with the T-Head against the back of the MJ fitting bolt flange. Install two additional T-Head bolts with nuts and hand tighten to secure the restraint to the fitting.
6. With the restraint secured to the fitting, remove the original assembly T-Head bolts and reinsert with the T-Head against the back of the MJ fitting bolt flange. Making sure the TUF Grip is centered around the pipe's wall, hand tighten all the remaining T-Head bolts and nuts. If joint deflection is needed, only deflect the pipe in joint after hand tightening of all nuts is completed. Maximum joint deflection is 3° when pipe and fitting dimensions are nominal.
7. Using a wrench, tighten the nuts on the T-Head bolts a few turns at a time in an alternating or star pattern. Maintain equal spacing between the TUF Grip bolt flange and the bolt flange of the MJ socket as the gasket is compressed. The T-Head bolt and nut torque requirement is 75-90 ft.-lbs. for 4"-12" restraints. **DO NOT OVER-TORQUE!**
8. Hand-tighten the torque limiting nut attached to the TUF Grip wedge assemblies in a clockwise direction with an alternating or star pattern until all gripping wedges are in contact with the pipe wall. Rotational direction of torque nut is indicated by a recessed arrow on the face of the nut. With a wrench, continue to tighten each torque nut ½ turn in an alternating or star pattern until all torque limiting nuts twist off. NEVER tighten a torque limiting nut more than ½ turn without turning the remaining torque nuts an equal amount! **NOTE: For IPS applications, ensure step 7 is complete before engaging the wedges. Failure to comply will result in excessive pipe wall deflection and torque nuts will not twist off as designed.
9. When all torque limiting nuts twist off, the mechanical joint and restraint assembly are complete.

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32U - PVC Pipe to Pipe Bell to Spigot Restraints
Series 3000PP for 4" to 36" Applications
Sizes 4" to 36" for DIOD & 4" to 12" for IPS

Revised 10/2013

FOR: Restraint of 4” to 36” DIOD AWWAC900/905 PVC Pipe to Pipe Bell to Spigot Applications (Black Clamps)
Restraint of 4” to 12” IPS PVC Pipe to Pipe Bell to Spigot Applications (Grey Clamps)

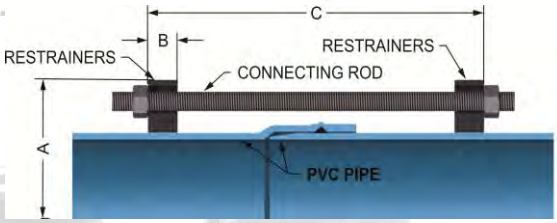
FEATURES and ADVANTAGES:

- Available in sizes 4” through 36” (IPS PVC pipe restraints available in 4” – 12” only)
- Restraints rated at the listed pressure on the PVC pipe with a 2:1 safety factor
- Full 360° contact, no pipe distortion or point loading
- To ease installation, restraints and pipe can be assembled outside the trench
- Connecting rods, hex nuts, T-head bolts consist of low alloy high strength steel and comply with applicable requirements of ANSI/AWWA C111/A21.11
- Clamping bolts are SAE Grade 5 and comply to applicable requirements of ANSI/AWWA C111/A21.11
- For easy identification, *IPS* pipe diameter clamps are GREY and *DI* pipe diameter clamps are BLACK

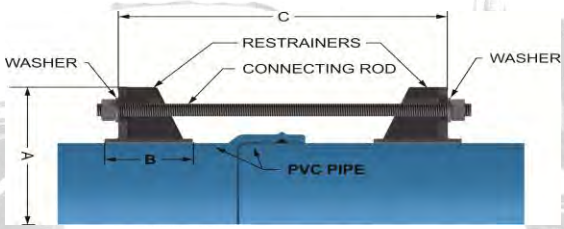
SAMPLE SPECIFICATIONS:

For use on water or wastewater piping systems subject to hydrostatic pressure and tested in accordance with ASTM D2774 or AWWA C600. All sizes of clamps are made of high strength grade 65-45-12 ductile iron in accordance with the requirements and specifications of ASTM A536. Restraint clamps internal serrations are machined to exact tolerances. Restrainers approved per applicable requirements of ASTM F1674, current revisions apply. Standard restraint is provided with an alkyd resin baking enamel coating. The 3000PP kit includes, 1) 2 each 3000C restrainers, 2) hex head bolts and hex nuts for restrainer assembly, and 3) threaded restrainer connecting rods with hex nuts and flat washers where applicable.

4” to 12” Assembly



14” to 36” Assembly



Nom Size	Series 3000PP For PVC Pipe With Ductile Pipe O.D.		Series 3000PP For PVC Pipe With IPS Pipe O.D.		*A	*B	*C Max.	Restraint Rods Connecting		Quantity, Sizing and Torque For Clamp Assembly Bolts (Torque in Foot Pounds)			WT
	Pipe Dia.	Part#	Pipe Dia.	Part#			Qty	Qty	Size	Qty	Size	Torque	lbs.
4	4.80	462422	4.50	462477	9.12	1.12	12.0	2	3/4 X 17	4	5/8 X 3.5	100	15
6	6.90	462439	6.63	462484	11.12	1.12	13.0	2	3/4 X 17	4	5/8 X 3.5	100	19
8	9.05	462446	8.63	462491	14.74	1.25	15.0	2	3/4 X 17	4	3/4 X 5	150	31
10	11.10	462453	10.75	462507	16.81	1.38	16.0	4	3/4 X 24	4	7/8 X 5	150	51
12	13.20	462460	12.75	462514	19.45	1.38	18.0	4	3/4 X 24	4	7/8 X 5	150	55
14	15.30	488033	N/A	N/A	22.54	4.00	24.0	6	3/4 X 30	8	7/8 X 6.5	150	138
16	17.40	488040	N/A	N/A	24.66	4.00	28.0	6	3/4 X 30	8	7/8 X 6.5	150	148
18	19.50	488057	N/A	N/A	26.64	5.06	28.0	8	3/4 X 30	8	1 X 8	175	207
20	21.60	488064	N/A	N/A	28.76	5.06	34.0	8	3/4 X 36	8	1-1/8 X 8.5	200	265
24	25.80	488071	N/A	N/A	33.98	5.20	34.0	12	3/4 X 36	8	1-1/8 X 8.5	225	407
30	32.00	498599	N/A	N/A	40.90	10.0	34.0	12	1 X 40	16	1-1/8 X 8.5	250	605
36	38.30	498605	N/A	N/A	48.00	10.0	34.0	12	1 X 40	16	1-1/8 X 8.5	250	670

Note: Approximate dimensions and weights

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Installation Instructions for Sizes 4" – 36" Series 3000PP:

Figure 1

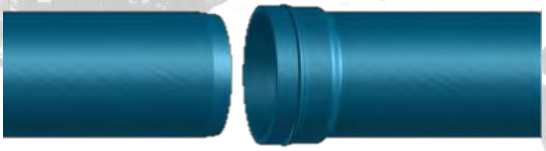

Figure 2

Figure 3

Figure 4

Step (1): Assemble pipe per Figure 1 making sure the spigot end of the pipe is fully seated in the bell end of the pipe.

Step (2): Assemble first restrainer on the bell end of the pipe joint and using one of the connecting rods (included) as a guide, mark the location for the spigot restrainer per Figure 2.

Step (3): Assemble the spigot restrainer leaving sufficient threads on each end of the connecting rod to fully install washer (where provided) and fully engage nut per Figure 3. Tighten the restrainer clamp assembly bolts on each side evenly to the recommended torque maintaining even gaps between the clamp pads.

Step (4): Connect both restrainers per Figure 4 utilizing the threaded restrainer connecting rods provided. Place a flat washer (where provided) over onto connecting rods and against the restrainer ear. Install hex nuts on the connecting rods and hand tighten all hex nuts to hand tight plus 1/2 turn. Do not over tighten connecting rod retaining hex nuts thus forcing the spigot further into the joint.

Suggested hex head bolt and nut *torque recommendations for assembly of the 3000C restrainers is as provided

NOTE: For best results use the lower end of the recommended torque range for DR 41 and DR 51 PVC pipe

***4" – 6" – 100 ft. lbs. / 8" – 12" – 150 ft. lbs. / 14" – 16" – 150 – 200 ft. lbs.**

18" 175 – 225 – ft. lbs. / 20" – 200 – 250 ft. lbs. / 24" – 225 – 275 ft. lbs. / 30" – 36" - 250 – 300 ft. lbs.

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33U - PVC/*PVCO Pipe to Pipe Bell to Spigot Stop
Series 3000PS Kits for 4" to 16" Applications
*4" to 16" for DIOD Diameter PVC/PVCO
*4" to 12" for IPS Diameter PVC/PVCO
Revised 10/2013

FOR: Use as a PVC pipe stop for pipe to pipe bell to spigot joints on (4" – 16") DIOD AWWA C900/C905/C909 pipe
*Use as a PVC pipe stop for pipe to pipe bell to spigot joints on (4" – 12") IPS D2241 pipe
*Use as a PVCO pipe stop for pipe to pipe bell to spigot joints on (4" – 12") IPS AWWA C909 pipe
*NOTE: Requires MJ transition bell stop ring

USE:

Improper installation such as over-insertion of a PVC/PVCO pipe to pipe bell to spigot joint can cause damage to pipe bells, reduction in joint deflection, and joint leaks. The 3000PS properly installed will allow the joint to assemble as designed

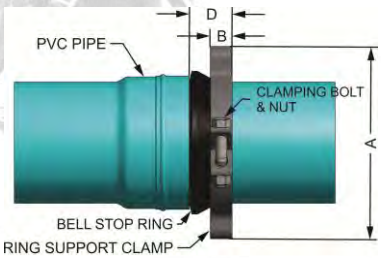
FEATURES and ADVANTAGES:

- Available in sizes 4" through 16" (Ring support clamps for IPS PVC/PVCO pipe available in 4" – 12" only)
- Full 360° contact, no pipe distortion or point loading
- To ease installation, ring support clamp can be assembled on the piping outside the trench
- Clamping bolts comply with applicable ANSI/AWWA C111/A21.11 requirements
- For easy identification, *IPS* pipe diameter clamps are GREY and *DI* pipe diameter clamps are BLACK

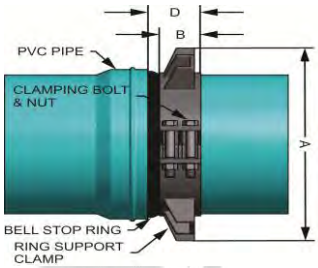
SAMPLE SPECIFICATIONS:

Ring support clamps are made of high strength grade 65-45-12 ductile iron in accordance with the requirements and specifications of ASTM A536 and the standard coating is an alkyd resin baking enamel. Restraint internal serrations are machined to exact tolerances. Serrated restraint clamps shall be used to grip the pipe spigot and be capable of being installed bi-directional. Rubber bell stop ring is NSF 61 approved.

4" to 12" Assembly



14" to 16" Assembly



Nominal Size	Series 3000PS for PVC/PVCO Pipe With Ductile Pipe O.D.		Series 3000PS For PVC/PVCO Pipe With IPS Pipe O.D.		*A	*B	**D	Quantity, Sizing and Torque For Clamp Assembly Bolts			Clamp Weight	Kit Weight
	Pipe O.D.	Part Number	Pipe O.D.	Part Number			DIOD/IPS	Qty	Size	Bolt Torque		
4	4.80	538981	4.50	CALL	9.12	1.12	2.34 /2.38	2	5/8 X 3.5	100 ft. lbs.	4.5 lbs.	6 lbs.
6	6.90	538998	6.63	CALL	11.12	1.12	2.34 /2.37	2	5/8 X 3.5	100 ft. lbs.	6.5 lbs.	7.9 lbs.
8	9.05	539001	8.63	CALL	14.74	1.25	2.47 /2.52	2	3/4 X 5	150 ft. lbs.	10.0 lbs.	13.0 lbs.
10	11.10	538967	10.75	CALL	16.81	1.38	2.60 /2.64	2	7/8 X 5	150 ft. lbs.	18.0 lbs.	20.3 lbs.
12	13.20	538974	12.75	CALL	19.45	1.38	2.60 /2.66	2	7/8 X 5	150 ft. lbs.	21.0 lbs.	22.9 lbs.
14	15.30	539018	N/A	N/A	22.54	4.00	5.22 /N/A	4	7/8 X 6.5	150 ft. lbs.	43.5 lbs.	45.0 lbs.
16	17.40	539025	N/A	N/A	24.66	4.00	5.22 /N/A	4	7/8 X 6.5	150 ft. lbs.	46.0 lbs.	48.0 lbs.
*Note: Approximate dimension							**Note: IPS dimensions for pipe bell stop rings are in red					

Figure 1

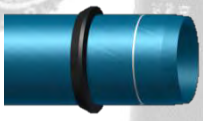


Figure 2

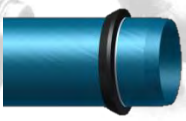


Figure 3

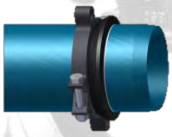


Figure 4

Step (1): Lube the inside diameter of the bell stop ring and slide the ring onto the plain end of the PVC pipe. The angled side of the gasket must face away from the end of the pipe to be assembled per Figure 1.

Step (2): Align the bell stop ring with the pipe manufacturer's reference line per Figure 2. If the pipe has been cut or the line is not visible, mark a line at the pipe manufacturers recommended distance.

Step (3): Assemble the 3000C ring support clamp at the end of the bell stop ring per Figure 3. Tighten the ring support clamping bolts on each side evenly, maintaining equal spacing between the clamp ring support pads on both sides. (Torque 4" – 6" clamp assembly bolts at 100 ft. lbs. and 8" – 12" clamp assembly bots to 150 ft. lbs.)

Step (4): Complete PVC pipe joint assembly per manufacturer's assembly instructions.

Tyler Union Waterworks Contact Information

Tyler: 11910 CR 492 ● Tyler, Texas 75706 ● (800) 527-8478 Anniston: 1501 W 17th St. ● Anniston, AL 36201 ● (800) 226-7601
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TYLER UNION®
Quality Waterworks Products

34U - PVC Pipe to Mechanical Joint Fitting Restraints
Series 3000MJ Kits for 4" to 36" Applications
Sizes 4" to 36" for DIOD and 4" to 12" for IPS Pipe

Revised 10/2013

FOR: Restraint of AWWA C900/905 PVC pipe in sizes 4" – 36" to Mechanical joint AWWAC153/C110 ductile iron fittings
Restraint of *IPS diameter ASTM D2241 PVC pipe in sizes 4" – 12" to Mechanical joint AWWAC153/C110 ductile iron fittings
*NOTE: Transition gasket required for IPS diameter ASTM D2241 PVC pipe
NOTE: 4" – 16" restraints and accessories provided in boxed kits. Sizes larger than 16" will be provided with accessories kitted separate from the restraint and gland.

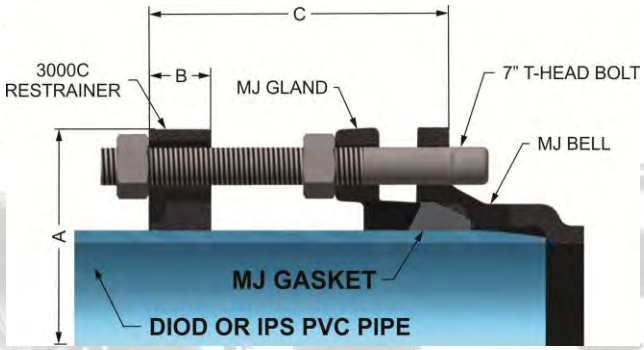
FEATURES and ADVANTAGES:

- Available for PVC sizes 4" through 36" for both ductile iron outside diameter (DIOD) pipe or iron pipe size (IPS) outside diameter pipe
- Restraints and fasteners rated at the listed pressure on the PVC pipe and restraint shall have a 2:1 safety factor
- Full 360° contact, no pipe distortion or point loading
- Connecting T-head bolts or threaded rods, clamp assembly bolts, and hex nuts consist of low alloy high strength steel and comply with applicable requirements of ANSI/AWWA C111/A21.11.
- System pressure rating *DR14 -305psi, *DR18 – 235psi, *DR25 – 165psi.
- For easy identification, *IPS* pipe diameter clamps are GREY and *DI* pipe diameter clamps are BLACK

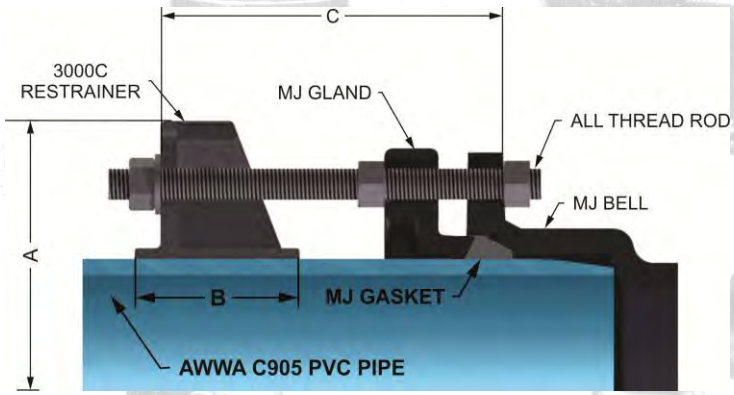
SAMPLE SPECIFICATIONS:

All clamps are made of high strength grade 65-45-12 ductile iron in accordance with the requirements and specifications of ASTM A536. Clamps coated with alkyd resin based baking enamel. Clamps provide 360 degree contact with the PVC pipe and internal serrations are machined to exact tolerances. Restrainers approved per applicable requirements of ASTM F1674, current revisions apply. Kits include, 1 each 3000C restrainer, hex head clamping bolts and nuts for restrainer assembly, NSF approved MJ or transition gasket, mechanical joint gland and restraint to fitting T-head bolts or connecting threaded rods with hex nuts. For use on water or wastewater pipelines subject to hydrostatic pressure and tested in accordance with ASTM D2774 or AWWA C600 as applicable.

4" to 12" Assembly



14" to 36" Assembly



Nominal Size	Series 3000MJ For PVC Pipe With Ductile Pipe O.D.		Series 3000MJ For PVC Pipe With IPS Pipe O.D.		*A	*B	*C Max.	Restraint Rods Connecting		Quantity, Sizing and Torque For Clamp Assembly Bolts			*Kit (lbs.)
	Pipe O.D.	DIOD Part No.	Pipe O.D.	IPS Part No.			Qty.	Qty.	Size	Qty	Size	Torque	
4	4.80	462576	4.50	512899	9.12	1.12	6.00	2	3/4 X 7	2	5/8 X 3.5	100 ft.lbs.	14.4
6	6.90	462583	6.63	512905	11.12	1.12	6.00	2	3/4 X 7	2	5/8 X 3.5	100 ft.lbs.	19.2
8	9.05	462590	8.63	512912	14.74	1.25	6.00	2	3/4 X 7	2	3/4 X 5	150 ft.lbs.	25.7
10	11.10	462606	10.75	512875	16.81	1.38	6.00	4	3/4 X 7	2	7/8 X 5	150 ft.lbs.	39.3
12	13.20	462613	12.75	512882	19.45	1.38	6.00	4	3/4 X 7	2	7/8 X 5	150 ft.lbs.	41.8
14	15.30	CALL	N/A	N/A	22.54	4.00	15.00	6	3/4 X 17	4	7/8 X 6.5	150 ft.lbs.	91.8
16	17.40	CALL	N/A	N/A	24.66	4.00	15.00	6	3/4 X 17	4	7/8 X 6.5	150 ft.lbs.	96.9
18	19.50	CALL	N/A	N/A	26.64	5.06	15.00	8	3/4 X 17	4	1 X 8	175 ft.lbs.	143.3
20	21.60	CALL	N/A	N/A	28.76	5.06	22.00	8	3/4 X 24	4	1-1/8 X 8.5	200 ft.lbs.	169.1
24	25.80	CALL	N/A	N/A	33.98	5.20	22.00	12	3/4 X 24	4	1-1/8 X 8.5	225 ft.lbs.	224.1
30	32.00	CALL	N/A	N/A	40.90	10.00	22.00	12	1 X 24	8	1-1/8 X 8.5	250 ft.lbs.	408.4
36	38.30	CALL	N/A	N/A	48.00	10.00	22.00	12	1 X 24	8	1-1/8 X 8.5	250 ft.lbs.	500

*Note: Approximate dimensions and weights

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Corona: 1001 El Camino Ave. ● Corona, CA 92879 ● (866) 527-8471
Elmira: 1021 East Water ● Elmira, NY 14902
New Lenox: 2200 West Haven● New Lenox, IL 60451
Portland: 6204 N. Marine Dr. ● Portland, OR 97203

www.tylerunion.com

Installation Instructions for Sizes 4" – 12" Series 3000MJ:

Figure 1 Figure 2 Figure 3 Figure 4 Figure 5

Step (1): Assemble the mechanical joint, installing gasket, gland, and T-head bolts per AWWA C600 standard, leave out the T-head bolt corresponding to the restrainer ears per Figure 1.

Step (2): Per Figure 2, use a 7" T-head bolt (included) as a guide and mark the location on the pipe where the restrainer will be assembled.

Step (3): Assemble restrainer per Figure 3, leaving sufficient threads on the end of the T-head bolt to fully engage nut.

Step (4): Tighten the restrainer clamp assembly bolts on each side evenly to the recommended torque maintaining even gaps between the clamp pads. (4" - 6" – 100 ft lbs., 8" – 12" 150 ft. lbs.)

Step (5): Connect restrainer to fitting per Figure 5. Insert the 7" T-head bolt (bolt and 2 hex nuts provided) through the bolt flange installing a hex nut between the gland and restrainer. Tighten the hex nut up to gland per AWWA C600 standard. Tighten the second hex nut up to the restrainer as show in Figure 5. Use additional hex nuts (not included) on the inside of the restrainer ear if joint is expected to contract.

Installation Instructions for Sizes 14" – 36" Series 3000MJ:

Figure 1 Figure 2 Figure 3 Figure 4

Step (1): Assemble the mechanical joint, installing gasket, gland, and T-head bolts per AWWA C600 standard, leave out the T-head bolt corresponding to the restrainer ears per Figure 1.

Step (2): Per Figure 2, use a connecting rod (included) as a guide and mark the location on the pipe where the restrainer will be assembled.

Step (3): Assemble restrainer per Figure 3, leaving sufficient threads on the end of the connecting rod to fully install washer and fully engage hex nut. Tighten the restrainer clamp assembly bolts on each side evenly to the recommended torque maintaining even gaps between the clamp pads. (14" – 16" 150 – 200 ft lbs., 18" - 175 - 225 ft. lbs., 20" - 200 - 250 ft. lbs., 24" - 225 - 275 ft. lbs., 30" – 250 - 300 ft. lbs., and 36" - 250 - 300 ft. lbs.)

Step (4): Connect restrainer to fitting per Figure 4. Inserting the rods through the restrainer ears(rod and 3 hex nuts provided for each ear), gland, and fitting bolt hole. Install one hex nut behind fitting bell, one hex nut against the gland and one hex nut behind the restrainer ear against the washer. Tighten hex nut up to gland per AWWA C600 standard. Use additional hex nuts (not included) on the inside of the restrainer ear if joint is expected to contract.

FOR: Restrains AWWA C900 PVC pipe in sizes 4" – 12" to Push-on AWWAC153 ductile iron fittings
Restrains *IPS diameter PVC pipe in sizes 4" – 12" to Push-on AWWAC153 ductile iron fittings. ***Transition gasket required**

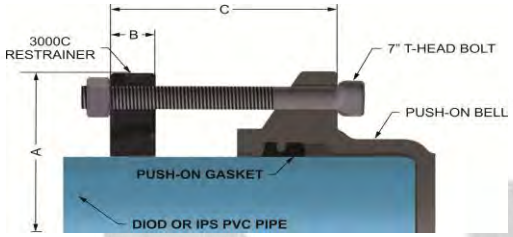
FEATURES and ADVANTAGES:

- Available for PVC sizes 4" through 12" for both ductile iron outside diameter (DIOD) pipe or iron pipe size (IPS) outside diameter pipe
- Restraints and fasteners rated at the listed pressure on the PVC pipe and restraint shall have a 2:1 safety factor
- Full 360° contact, no pipe distortion or point loading
- Connecting T-head bolts, clamp assembly bolts, and hex nuts consist of low alloy high strength steel and comply with applicable requirements of ANSI/AWWA C111/A21.11.
- System pressure rating *DR14 -305psi, *DR18 – 235psi, *DR25 – 165psi. *Derate pressures if not all connecting bolts are installed
- For easy identification, *IPS* pipe diameter clamps are GREY and *DI* pipe diameter clamps are BLACK

SAMPLE SPECIFICATIONS:

All clamps are made of high strength grade 65-45-12 ductile iron in accordance with the requirements and specifications of ASTM A536. Clamps coated with alkyd resin based baking enamel. Clamps provide 360 degree contact with the PVC pipe and internal serrations are machined to exact tolerances. Restrainers approved per applicable requirements of ASTM F1674, current revisions apply. Kits include, 1 each 3000C restrainer, 2 each hex head clamping bolts and nuts for restrainer assembly, and restraint to fitting connecting T-head bolts and hex nuts. For use on water or wastewater pipelines subject to hydrostatic pressure and tested in accordance with ASTM D2774 or AWWA C600.

4" to 12" Assembly



Nominal Pipe Size	Series 3000PO For PVC Pipe With Ductile Pipe O.D.		Series 3000PO For PVC Pipe With IPS Pipe O.D.		*A	*B	C Max.	T-head Connecting Bolt		Quantity, Sizing and Torque For Clamp Assembly Bolts			Kit lbs.
	Nom. Pipe O.D.	DIOD Part#	Nom. Pipe O.D.	IPS Part#	Dim.	Dim.	Dim.	Qty.	Size	Qty	Size	Torque	~Wt
4"	4.80"	462521	4.50"	CALL	9.12"	1.12"	6.00"	2	3/4" X 7"	2	5/8" X 3.5"	100 ft.-lbs.	7.9
6"	6.90"	462538	6.63"	CALL	11.12"	1.12"	6.00"	2	3/4" X 7"	2	5/8" X 3.5"	100 ft.-lbs.	9.7
8"	9.05"	462545	8.63"	CALL	14.74"	1.25"	6.00"	2	3/4" X 7"	2	3/4" X 5"	150 ft.-lbs.	14.8
10"	11.10"	462552	10.75"	CALL	16.81"	1.38"	6.00"	4	3/4" X 7"	2	7/8" X 5"	150 ft.-lbs.	23.8
12"	13.20"	462569	12.75"	CALL	19.45"	1.38"	6.00"	4	3/4" X 7"	2	7/8" X 5"	150 ft.-lbs.	26.3

*Note: Approximate dimension

Installation Instructions for Sizes 4" – 12" Series 3000PO:

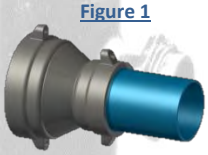
Figure 1 

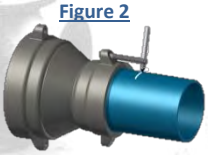
Figure 2 

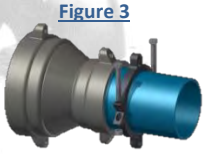
Figure 3 

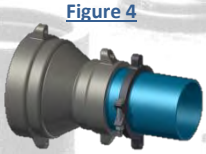
Figure 4 

Figure 5 

Step (1): Figure 1, Push-On joint assembly per AWWA C600 - make sure the pipe spigot is beveled, ensure the fitting gasket seat is clean and dry prior to joint assembly. Insert the gasket into the fitting gasket seat and evenly lubricate the inside surface of the gasket only. Confirm the exterior pipe wall of the spigot end of the pipe is clean and free from raised or rough areas. Keeping the pipe straight with the fitting socket, insert the spigot end of the pipe fully against the pipe stop inside the fitting socket.

Step (2): Per Figure 2, use a 7" T-head bolt (included) as a guide and mark the location on the pipe where the restrainer will be assembled.

Step (3): Assemble restrainer per Figure 3, leaving sufficient threads on the end of the T-head bolt to fully engage nut.

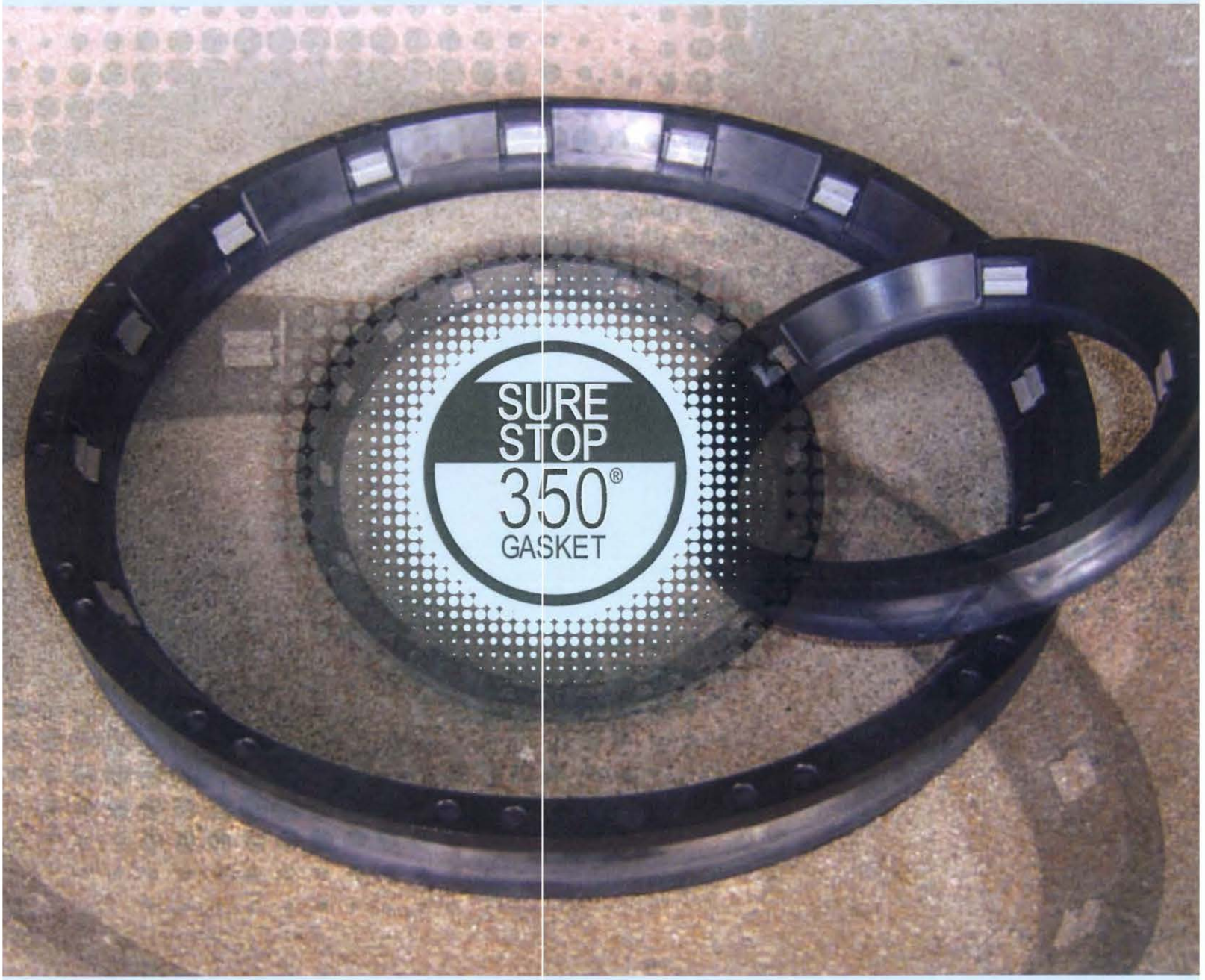
Step (4): Tighten the restrainer clamp assembly bolts on each side evenly to the recommended torque maintaining even gaps between the clamp pads. (4" - 6" – 100 ft lbs., 8" – 12" 150 ft. lbs.)

Step (5): Connect restrainer to fitting per Figure 5. Insert the 7" T-head bolt (bolts and hex nuts provided) through the fitting ear and tighten the hex nut up to the restrainer hand tight plus a half turn. Do not over tighten T-head bolts thus forcing the spigot further into the joint.

INSTANT JOINT RESTRAINT WITH McWANE'S NEW SURE STOP 350® GASKET

Listed at 350 PSI • NSF 61 Approved
3"- 24" Listed and Approved

FM APPROVED



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Phillipsburg, NJ 08865
(908) 454-1161

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1757 Burlington Street East
Hamilton, ON L8H 3L5
(905) 547-3251

Clow Water Systems
2266 South 6th Street
Coshocton, OH 43812
(740) 622-6651

McWane Pipe
1201 Vanderbilt Road
Birmingham, AL 35234
(205) 322-3521

Pacific States
1401 East 2000 South
Provo, UT 84606
(801) 373-6910

SURE STOP 350® GASKETS

McWane's SURE STOP 350® GASKETS are a fast and easy way of restraining TYTON®, TRIM TYTON®, or TYTON JOINT® pipe, valves and fittings. The gaskets are suitable for water, wastewater, fire protection and other related applications. Simply install the gasket in a TYTON JOINT® pipe, valve or fitting socket, assemble the joint in accordance with proper procedures, and the joint is restrained for working pressures up to 350 psi. **The gaskets are available in sizes 3" - 24", and with a rating of 350 psi they will meet or exceed the capabilities of ductile iron pipe, valves and fittings. SURE STOP 350® GASKETS are NSF 61 approved, UL listed and approved by FM Approvals.** There is no need to use bolts, clamps, rods, thrust blocks or other restraining devices when you can use an easy push on restraining SURE STOP 350® GASKET. SURE STOP 350® GASKETS are produced and tested in accordance with ANSI/AWWA C111/A21.11, and have a 350 psi pressure rating. The gaskets have been successfully tested at a minimum of 700 psi to nationally recognized listing agency requirements, as witnessed by independent testing agencies (certificates available upon request).

Application Notes

1. For ductile iron applications utilizing TYTON® pipe, valves, and fittings made to AWWA specifications.
2. In cold weather assembly maintain the temperature of the gasket above 40° F.
3. The socket of the joint should be clean and free of debris or significant corrosion.
4. Gasket should be properly seated in the bell socket.
5. Keep the pipe and joint in alignment during assembly. If installed out of alignment, the gasket can be pushed out of position, creating the potential for leaks or failure.
6. If deflection is wanted in the joint, deflect before fully inserting the joint.
7. Some extension of the joint will occur when pressurized. To avoid this, the joint should be pulled out after assembly to "set" the stainless steel teeth in the inserted pipe.
8. Once assembled, the joint can be disassembled using steel shims.
9. When cut pipe are used, the following steps are required:
   a. Ensure that the spigot end is properly beveled.
   b. Mark the joint depth on the spigot so it is clear when the joint is fully inserted.
   c. Ensure that the pipe meets the required dimensional tolerances, as follows:

Pipe Size	Circumference		Diameter	
(Nominal)	(Maximum)	Minimum	(Maximum)	Minimum
3"	12-5/8"	12-1/4"	4.02"	3.90"
4"	15-9/32"	14-29/32"	4.86"	4.74"
6"	21-7/8"	21-1/2"	6.96"	6.84"
8"	28-5/8"	28-1/4"	9.11"	8.99"
10"	35-1/16"	34-11/16"	11.16"	11.04"

Pipe Size	Circumference		Diameter	
(Nominal)	(Maximum)	Minimum	(Maximum)	Minimum
12"	41-21/32"	41-9/32"	13.26"	13.14"
14"	48-7/32"	47-13/16"	15.35"	15.22"
16"	54-13/16"	54-13/32"	17.45"	17.32"
18"	61-13/32"	61"	19.55"	19.42"
20"	68"	67-19/32"	21.65"	21.52"
24"	81-7/32"	80-13/16"	25.85"	25.72"

10. Do not reuse SURE STOP 350® GASKETS, as they may have been damaged during any previous installation or during removal.
11. Do not use SURE STOP 350® GASKETS to conduct electricity through the pipe joint, as they could be damaged and fail.
12. Do not use SURE STOP 350® GASKETS in above ground applications.
13. Do not use SURE STOP 350® GASKETS with thick coatings on the pipe exterior.

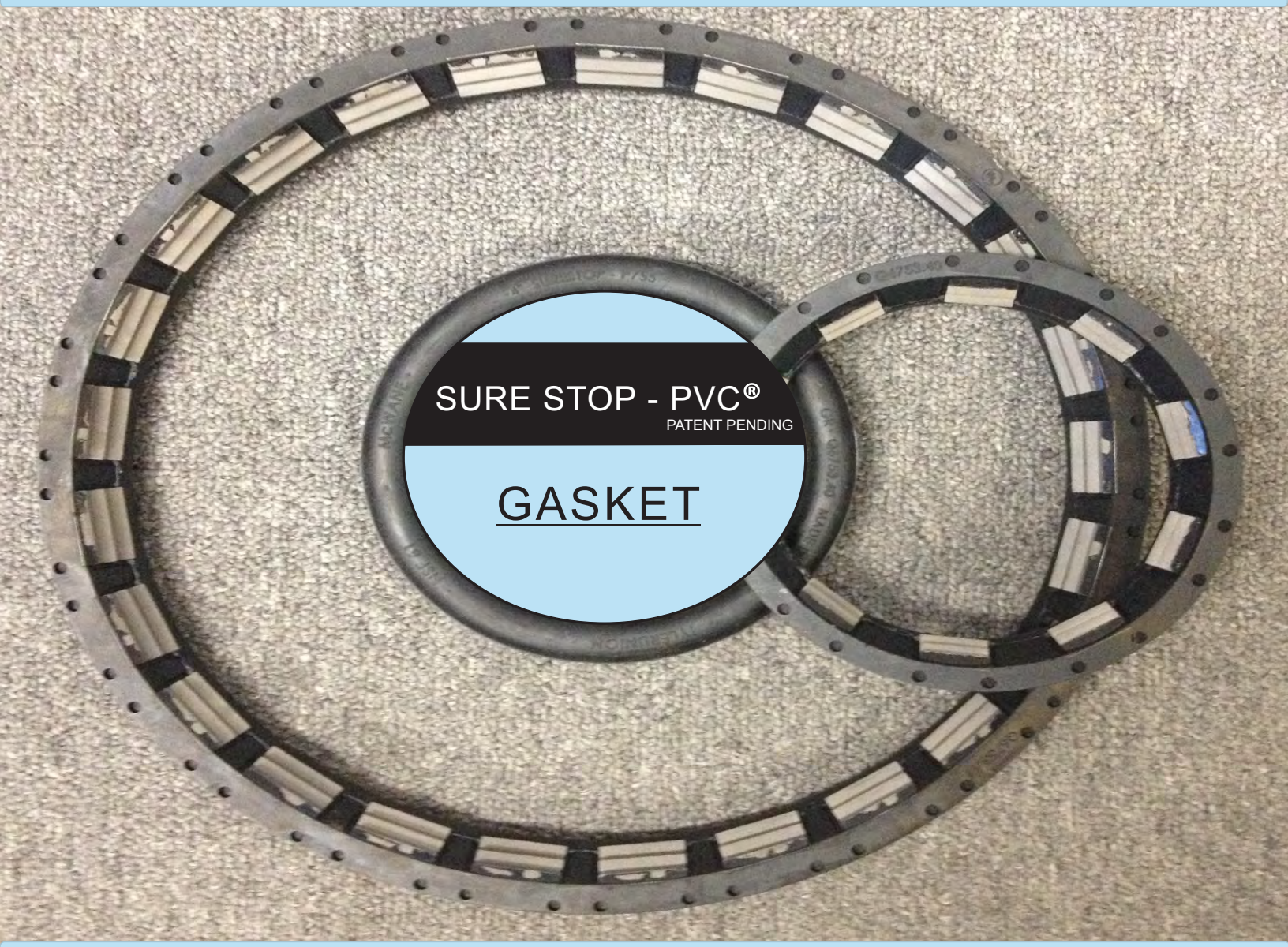
INSTANT JOINT RESTRIANT WITH McWANE'S NEW SURE STOP - PVC® GASKET 4” - 12”

PATENT PENDING

NSF – 61 APPROVED

FM APPROVED

TYLER UNION®
Quality Waterworks Products



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Elmira:
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Elmira, NY 14902

New Lenox:
2200 West Haven
New Lenox, IL 60451

Portland:
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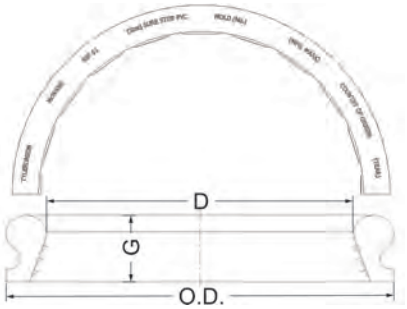
Portland, OR 97203

Tyler:
11910 CR 492
Tyler, Texas 75706
(800) 527-8478

SURE STOP - PVC® GASKETS

McWane's SURE STOP - PVC® Gaskets are a fast and easy way of restraining UNION TITE, TYTON®, TRIM TYTON®, OR TYTON JOINT® fittings and valves. The gaskets are suitable for water, wastewater, fire protection and other related applications. Simply install the gasket in a UNION TITE fitting or valve socket, assemble the joint in accordance with proper procedure, and the joint is restrained for working pressure up to 305 psi. **The gaskets are available in sizes 3" - 12", refer to table below for pressure rating. Gaskets will meet or exceed the capabilities of AWWA PVC pipe, valves, and fittings. SURE STOP - PVC® GASKETS are NSF 61 approved and listed by Factory Mutual.** There is no need to use bolts, clamps, rods, thrust blocks, or other restraining devices when you can use an easy push on restraining SURE STOP - PVC® GASKET. SURE STOP - PVC® GASKET are produced and tested in accordance with ANSI/AWWA C111/A21.11 / ASTM F-1674.

PRESSURE RATING			
	AWWA C-900		
SIZE (Inches)	DR14	DR18	DR25
3	305	235	165
4	305	235	165
6	305	235	165
8	305	235	165
10	305	235	165
12	305	235	165



Pipe Size	Pipe O.D.	D	G	O.D.
4"	4.80"	4.68"	1.00"	5.74"
6"	6.90"	6.73"	1.00"	7.86"
8"	9.05"	8.85"	1.29	10.12"
10"	11.10"	10.87"	1.29"	12.23"
12"	13.20"	12.95"	1.29"	14.34"

Installation Notes

1. For PVC applications utilizing UNION TITE, TYTON®, TRIM TYTON®, or TYTON JOINT® fittings and valves made to AWWA specifications.
2. In cold weather assembly maintain the temperature of the gasket above 40° F.
3. The socket of the joint should be clean and free of debris.
4. Gasket should be properly seated in the bell socket.
5. Keep the pipe and joint in alignment during assembly. If installed out of alignment, the gasket can be pushed out of position, creating the potential for leaks and failures.
6. If deflection is wanted in the joint, deflect before fully inserting the joint.
7. Some extension of the joint will occur when pressurized. To avoid this, the joint should be pulled out after assembly to "set" the steel teeth in the inserted pipe.
8. When cut pipe is used, the following steps are required:
   a. Ensure that the spigot end is properly beveled.
   b. Mark the joint depth on the spigot so it is clear when the joint is fully inserted.
   c. Ensure that the pipe meets the required dimensional tolerances, in the table below:
9. Do not reuse SURE STOP - PVC® GASKETS, as they may have been damaged during any previous installation or during removal.
10. Do not use SURE STOP - PVC® GASKETS in above ground applications.

Pipe Size	Circumference		Diameter	
(Nominal)	(Maximum)	Minimum	(Maximum)	Minimum
3"	12-5/8"	12-1/4"	4.02"	3.90"
4"	15-9/32"	14-29/32"	4.86"	4.74"
6"	21-7/8"	21-1/2"	6.96"	6.84"
8"	28-5/8"	28-1/4"	9.11"	8.99"
10"	35-1/16"	34-11/16"	11.16"	11.04"
12"	41-21/32"	41-9/32"	13.26"	13.14"


Step 1


Step 2


Step 3


Step 4

TYLER UNION®
Quality Waterworks Products

2013/2014 - Certificate of Compliance • Waterworks Division

Tyler Union Waterworks manufactures and distributes ductile iron water main fittings with accessories. Tyler Union 2 inch through *64 inch fittings are cast with tested and traceable ASTM A536 compliant ductile iron that is designed for use with and conforms to the applicable terms and requirements (including markings) of ANSI/AWWA C153/A21.53, ANSI/AWWA C151/A21.51, ANSI/AWWA C115/A21.15, ANSI/AWWA C111/A21.11, ANSI/AWWA C116/A21.16, ANSI/AWWA C110/A21.10, and ANSI/AWWA C104/A21.4, Tyler Union Waterworks mechanical and push on joint fittings are compatible with PVC pipe conforming to AWWA C900-C905. Current revisions apply for each noted standard. Tyler Union offers a full line of ANSI/AWWA Imported products as well as a full line of Domestic products made in the U.S.A. If you have a product preference, you must specify upon order placement. *Note: For certification of 54" to 64" fittings, contact your Tyler Union Waterworks representative.

****Tyler Union Waterworks ANSI/AWWA C153/A21.53 ductile iron Mechanical and Push-On joint fittings "2 inch through 24 inch" shall be rated for 350 PSI working pressure and a surge allowance of 100 PSI. Mechanical and Push-On joint fittings "30 inch through 48 inch" shall be rated for 250 PSI working pressure and a surge allowance of 100 PSI.**

****Tyler Union Waterworks ANSI/AWWA C110/A21.10 ductile iron Mechanical joint fittings in "2 inch through 24 inch" shall be rated for 350 PSI working pressure and a surge allowance of 100 PSI. Mechanical joint fittings "30 inch through 48 inch" shall be rated for 250 PSI working pressure and a surge allowance of 100 PSI.**

****Tyler Union Waterworks ANSI/AWWA C110/A21.10 and ANSI/AWWA C153/A21.53 ductile iron Flanged joint fittings in 2 inch through 48 inch shall be rated for 250 PSI working pressure and a surge allowance of 100 PSI. Flange fittings 24 inches (610 millimeters) and smaller may be rated for 350 PSI (2,413 kPa) working pressure with the use of special gaskets. Per Section A.3 of ANSI/AWWA C110/A21.10 ductile iron Flange joint fittings are not recommended for underground installation due to the rigid design of the fitting flange and joint.**

****Note – Exceptions:** **Mechanical and Push-On joint fittings with flanged branches are rated for working pressure of 250 PSI. [1]Flange fittings 24 inches and smaller may be rated for 350 PSI working pressure with the use of special flange gaskets. [2]For 350 PSI flange joint applications we recommend the use of annular ring type gasket or comparable. [3]AWWA C153 MJ and Push on joint wyes larger than 12" are not pressure; contact Tyler Union for the allowable pressure ratings for 14" and larger wyes.**

Tyler Union Waterworks ANSI/AWWA C110/A21.10 and ANSI/AWWA C153/A21.53 ductile iron Mechanical joint fittings and ANSI/AWWA C153/A21.53-06 (manufacturer's standards) Push-On joint fittings when installed per AWWA C600/651 are rated for a *maximum 5 degrees of deflection for "3 inch through 12 inch" fittings and a *maximum 3 degrees of deflection for "14 inch through 48 inch" fittings.

***Note : The total joint deflection is determined by the O.D. of the pipe and the I.D. of the fitting. When both the pipe and the fitting are at nominal; the joint deflection will be approximately 50% of the maximum listed.**

Tyler Union Waterworks coated and/or cement lined Potable water ductile iron fittings meet all the applicable terms and requirements of ANSI/AWWA C116/A21.16, ANSI/AWWA C104/A21.4, and AWWA C550. Potable water products manufactured and distributed by Tyler Union Waterworks are National Sanitation Foundation NSF 61, NSF-372, and Annex G compliant. Current revisions apply for each noted standard.

Tyler Union Waterworks Valve and Service boxes are produced in accordance with and meet all applicable terms and provisions of ASTM-A48. Cast iron Service and Valve box products when properly selected and installed per the guidelines provided by AWWA M44 (Manual of Water Supply Practices) will provide accessibility for testing and maintenance of a water supply system and will meet the Wheel load designation as provided by the American Association of State Highway Transportation Officials (AASHTO).

Tyler Union Waterworks Mechanical joint fittings, Glands, T-Head bolts, and Nuts are produced in accordance with and meet all applicable terms and provisions of ANSI/AWWA C111/A21.11. Tyler Union Mechanical and Push-On joint gaskets are produced in accordance with and meet all applicable terms and provisions of ANSI/AWWA C111/A21.11. Tyler Union manufacturer's standard design Mechanical and Push-On joint Transition gaskets are produced in accordance with and will meet all applicable terms and provisions of ANSI/AWWA C111/A21.11.

All applicable tests have been performed and results maintained with all materials supplied being of the same quality, manufacture, and make as those tested.

Sincerely,

Ajay Roy

Ajay Roy
Engineering and Quality Manager
Tyler Union Waterworks
Email: ajay.roy@tylerunion.com
Tel.: (800) 226-7601

Project Name: _____

Project Material: _____
Product Supplier: _____
Contractor: _____

File: **COC TU Products**

Tyler Union Waterworks Contact Information

Tyler: 11910 CR 492 ● Tyler, Texas 75706 ● (800) 527-8478
Elmira: 1021 East Water ● Elmira, NY 14902
Anniston: 1501 W 17th St. ● Anniston, AL 36201 ● (800) 226-7601
New Lenox: 2200 West Haven● New Lenox, IL 60451
Corona: 1001 El Camino Ave. ● Corona, CA 92879 ● (866) 527-8471
Portland: 6204 N. Marine Dr. ● Portland, OR 97203
www.tylerunion.com

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Ductile Iron Compact Flanged Fittings

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