SHOP DRAWING REVIEW FORM AND TRANSMITTAL

DATE: **October 15, 2021**

TO: Carl Hendrickson
Project Manager
Veolia Water
825 West Water Street
Taunton, MA 02780

FROM: Michael Andrus, P.E.
Project Manager
BETA Group, Inc.
701 George Washington Hwy
Lincoln, Rhode Island 02865

RE: City of Taunton, MA
WWTF Phase 1 Improvements
Contract S-2021-1

Shop Drawing No. 02610-01 REV 0 – Underground DI Pipe, Fittings, Valves and Accessories

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BETA COMMENTS:

Item	Action Code	Description/Comments
1	**2**	**Underground DI Pipe, Fittings, Valves and Accessories** **1.** All valves shall open when turned left, revise. **2.** Provide AIS certification for Tyler Union related items. **3.** Provide AIS certification for U.S. Pipe Fabrication related items. **4.** Provide AIS certification for Kennedy Valve related items **5.** Provide AIS certification for Uni-Flange related items. **6.** Provide AIS certification for East Jordan Co. related items.

Action Codes
1 - No Exception Taken
2 - Make Corrections Noted
3 - Amend and Resubmit
4 - Rejected, See Remarks
5 - Record File Only

a. Installation shall proceed only when Action Code is '1' or '2'.
b. Submittals action coded '3' shall be resubmitted within time limit set in Contract.
c. Review does not relieve Contractor from responsibility of compliance with the Contract Documents.

Hart Engineering Corporation

SUBMITTAL:
02610-01

PROJECT: 9900. - Veolia/Taunton WWTF Phase 1 Improvements **DATE: 10/12/2021**

SUBMITTAL: 02610-01 - Underground DI Pipe,Fittings, Valves and Accessories
REVISION: 0
STATUS: Eng
SPEC #: 02610

TO:
Michael Andrus
Beta Group Inc.
6 Blackstone Place
Lincoln, RI 02865
MAndrus@BETA-Inc.com

FROM:
Ryan Murphy
Hart Engineering Corporation
800 Scenic View Drive
Cumberland, RI 02864
rmurphy@hartcompanies.com

Item	Revision	Description	Status	Date Sent	Date Returned
02610-01	0	Underground DI Pipe,Fittings,Valves and Accessories	Eng	10/12/2021	
Notes:					

SHOP DRAWING REVIEW

☐ 1 – Approved ☑ 2 – Approved as Noted

☐ 3 – Revise and Resubmit ☐ 4 - Rejected

☐ 5 – Record File Only – No Action Taken

(Above Check Designates Action Code – See Review Comments)

IMPORTANT NOTE FOR CONTRACTOR

Review is only for general compliance with the design concept and information provided in Contract Documents. Corrections and comments made on the Shop Drawings during review do not relieve the Contractor from compliance with the requirements of the plans and specifications. Review and/or approval of a specific item shall not include review or approval of an assembly of which the item is a component. No approval or correction of a Shop Drawing shall be construed as an order for extra work. The Contractor is responsible for: all quantities and dimensions to be confirmed and correlated; information that pertains solely to the fabrication processes or to the means, methods, techniques, sequences and procedures of construction; coordination of the Work with that of all trades and subcontractors; and performing all Work in a safe and satisfactory manner.

BETA GROUP, INC. Checked By: BM

By: Mike Andrus Date: 10/15/2021

Additional Notes:

Status Codes
1-APP – No Exceptions Taken
2-ANR – Make Corrections Noted
3-R&R – Revise and Resubmit
4-REJ – Rejected
5-IPO – For Information Purposes Only
6-NRR – Not Required for Review
ENG – Submitted to Engineer

Sincerely,
Hart Engineering Corporation

DATE: 10/12/2021

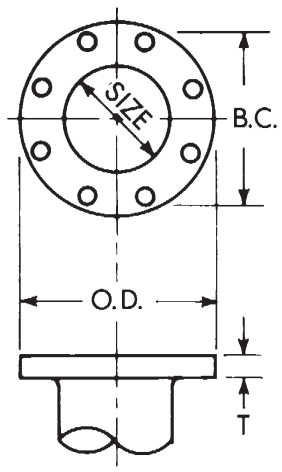
DUCTILE IRON C110 FLANGED FITTINGS

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

TYLER UNION

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

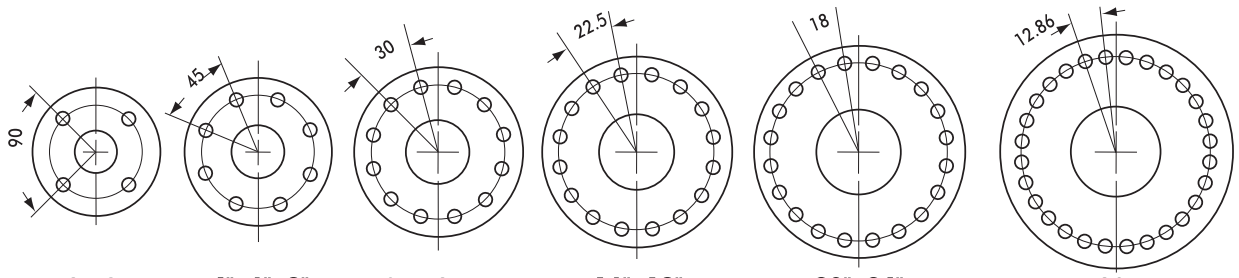
Nominal Pipe Size Inch	Flange O.D.	Dia. of Bolt Circle	Flange Thickness T	Bolt Hole Diameter	Number of Bolts	Bolt Dia. and Lengths
2	6	4.75	.62	.75	4	⅝ x 2¼
3	7.5	6	.75	.75	4	⅝ x 2½
4	9	7.5	.94	.75	8	⅝ x 3
6	11	9.5	1.00	.875	8	¾ x 3½
8	13.5	11.75	1.12	.875	8	¾ x 3½
10	16	14.25	1.19	1.00	12	⅞ x 4
12	19	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	1⅛ x 5
20	27.5	25	1.69	1.25	20	1⅛ x 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	1½ x 7
42	53	49.50	2.62	1.625	36	1½ x 7½
48	59.50	56.00	2.75	1.625	44	1½ x 8

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.

TYLER UNION

DUCTILE IRON C110 FLANGED FITTINGS

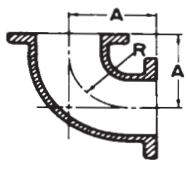
Sizes 3" thru 12" UL Listed for Fire Main Equipment

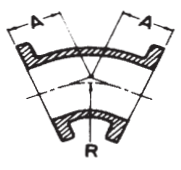


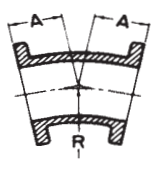
2", 3" | 4", 6", 8" | 10", 12", 14" | 16", 18" | 20", 24" | 30"

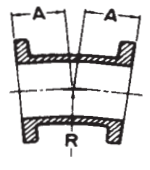
BENDS

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







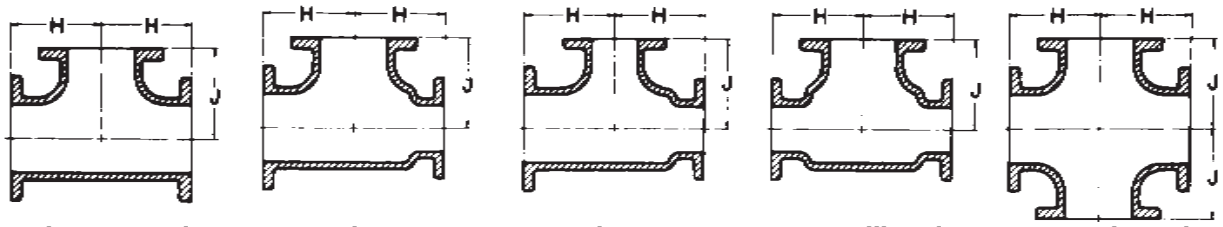


90° Bends (1/4)				45° Bends (1/8)			22½° Bends (1/16)			11¼° Bends (1/32)		
	Dimensions			Dimensions			Dimensions			Dimensions		
Size	R	A	Weight	R	A	Weight	R	A	Weight	R	A	Weight
2	3.0	4.5	14	...	...	...	...	...	...	...	...	...
3	4	5.5	26	3.62	3	20	7.56	3	22	15.25	3	20
4	4.5	6.5	44	4.81	4	36	10.06	4	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

DUCTILE IRON C110 FLANGED FITTINGS

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.

***NOTE: "H" & "J" dimensions are approximate, contact Tyler Union for laying length of a specific fitting**

TYLER UNION

DUCTILE IRON C110 FLANGED FITTINGS

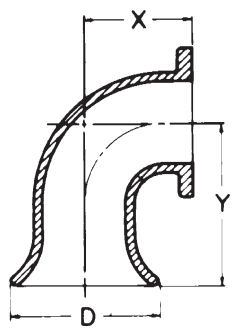
TEES, REDUCING TEES, CROSSES (Con't)

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 C110

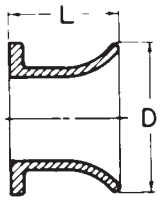
***NOTE:"D", "H", "J", "X", "Y" and "L" dimensions are approximate, contact Tyler Union for diameter or laying length of a specific fitting.**

FLANGE AND FLARE



***Flange and Flare 90° Ell**

Size	Dimensions 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



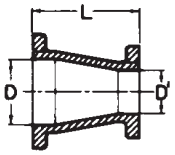
***Flange and Flare Piece**

Size	Dimensions 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

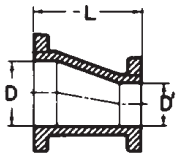
TYLER UNION®

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

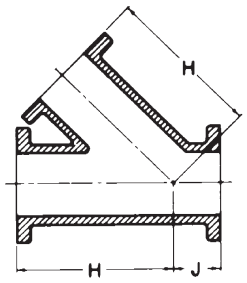
NOTE: Eccentric Reducers Offset
1/2 D minus 1/2 D1 = Offset
Example:
6x3 Ecc.Reducer
3-1½ = 1½" Offset

NOTE: "L" dimensions for C110 Eccentric reducers are approximate, contact Tyler Union for the laying length of a specific fitting

DUCTILE IRON C110 FLANGED FITTINGS

TYLER UNION

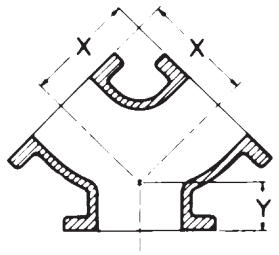
* WYES/LATERALS



*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

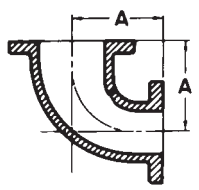


*True Wye

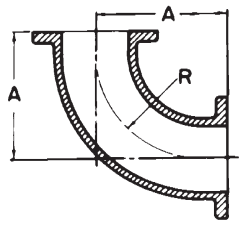
Size Stem	Size Branch	Dimensions X	Y	Weight
4	4	6.5	3.0	49
6	4	8.0	3.5	75
6	6	8.0	3.5	84
8	6	9.0	4.5	134
8	8	9.0	4.5	125
10	6	8.0	5.0	140
10	8	9.0	5.0	155
10	10	11.0	5.0	220
12	8	9.0	5.5	210
12	10	11.0	5.5	240
12	12	12.0	5.5	315
16	16	15.0	6.5	520

* Not included in AWWA C110

*BENDS



*90° Reducing Bend (1/4)

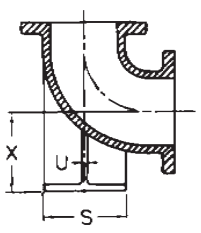


*90° Long Radius Bend (1/4)

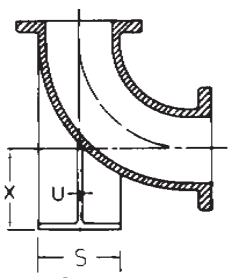
Size	Dimensions A	Weight	Size	Dimensions R	A	Weight
4x3	6.5	35	3	6.25	7.75	32
6x4	8.0	65	4	7	9	46
8x4	9.0	88	6	9.5	11.5	83
8x6	9.0	96	8	14	14	140
10x6	11.0	126	10	16.5	16.5	252
10x8	10.0	151	12	17	19	310
12x6	12.0	172	14	19	21.5	475
12x8	12.0	191	16	21.5	24	630
12x10	12.0	218	18	.....	26.5	840
14x6	14.0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

* Not included in AWWA C110

*BASE BENDS

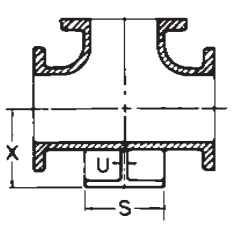


90° Base Bend (1/4)



*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	...

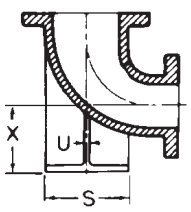
* Not included in AWWA C110

*NOTE: "A", "H", "J", "X", & "Y" dimensions are approximate, contact Tyler Union for laying length or base height of a specific fitting

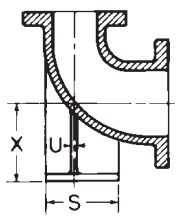
DUCTILE IRON C110 FLANGED FITTINGS

TYLER UNION

* REDUCING BASE BENDS



Base Under Large End

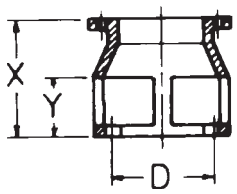


Base Under Small End

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.

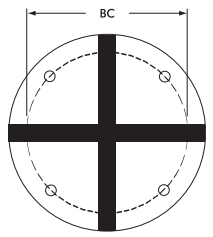
* FLANGE SLUDGE SHOE



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



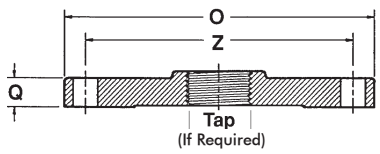
Base Drilling Details

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

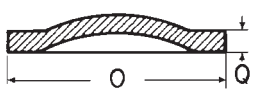
FLANGES (COMPANION FLG)

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

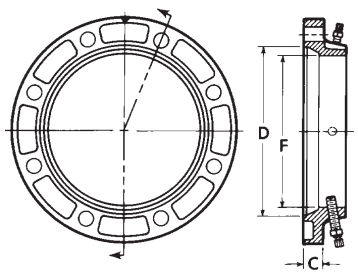
*NOTE: "X" and "Y" dimensions are approximate, contact Tyler Union for these dimensions of a specific fitting

PUTNAM PIPE CORPORATION

DUCTILE IRON C110 FLANGED FITTINGS

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

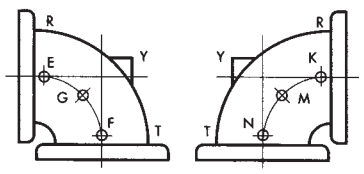
All set screws are 5/8" 80 lb. torque head.

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

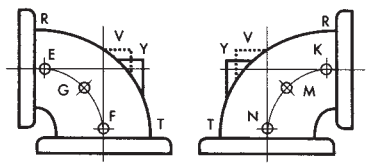
**LOCATION OF TAPPED HOLES FOR DRAINS AWWA C110 Flanged Fittings

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.

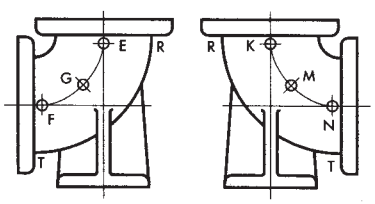
NOTE:
A BOSS IS ALWAYS REQUIRED AT "Y" OR "V" ON STRAIGHT AND REDUCING SIZES OF 90-DEGREE ELBOWS, AND ON TAPERED SIDES OF REDUCERS.



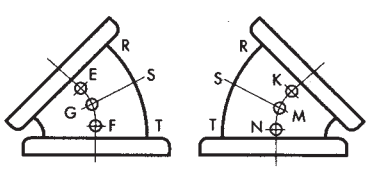
90° Elbow, Straight Size



90° Elbow, Reducing Size

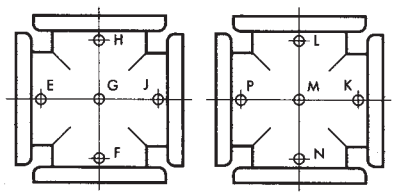


90° Base Elbow

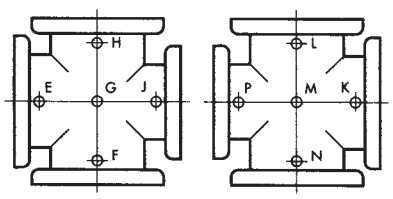


45° Elbow

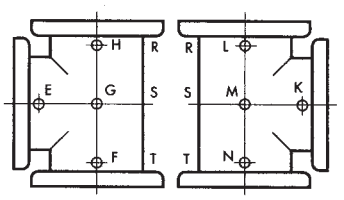
Fitting Size	Maximum Tap Without Boss
3"	1/2"
4" - 6"	3/4"
8"	1-1/4"
10" - 16"	1-1/2"
18" - 36"	2"



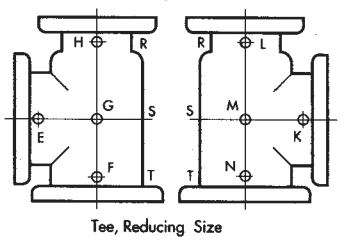
Cross, Straight Size



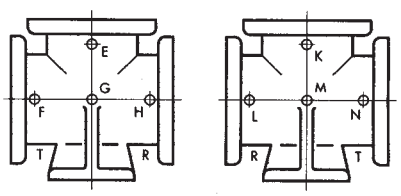
Cross, Reducing Size



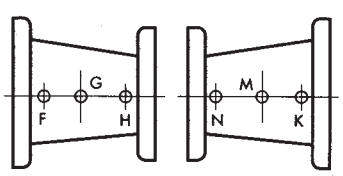
Tee, Straight Size



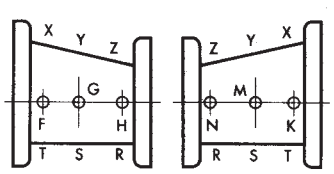
Tee, Reducing Size



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 C-110 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.**

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 10F to 425F 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 applications requiring specific weights or laying lengths of our fittings, contact Tyler Union

TYLER UNION

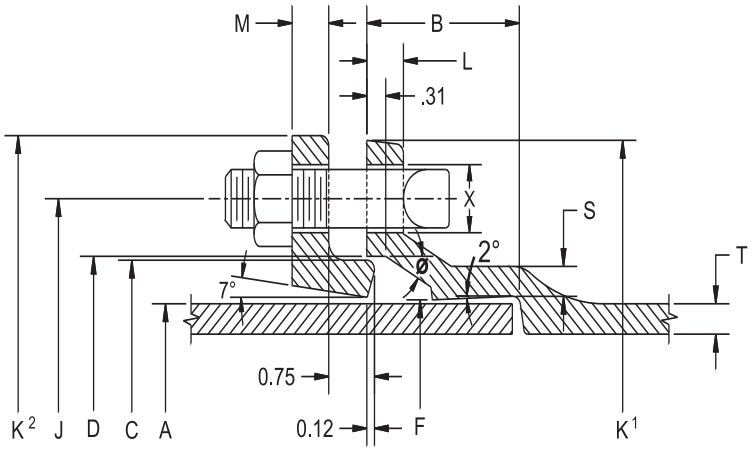
MECHANICAL JOINT C153 DUCTILE IRON COMPACT FITTINGS

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



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 beginning 2012. Call Tyler Union for availability or additional product dimensions.
*NOTE: Contact Tyler Union for 54"-64" product information.
NOTE: The fitting laying lengths provided are approximate, contact Tyler Union Waterworks for the laying length of a specific fitting.

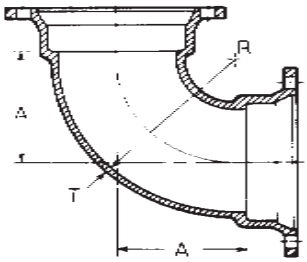
PUTNAM PIPE CORPORATION

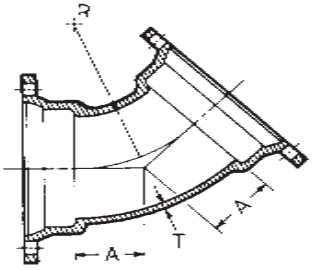
TYLER UNION®

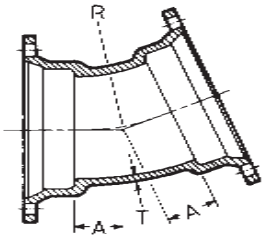
MECHANICAL JOINT C153 DUCTILE IRON COMPACT FITTINGS

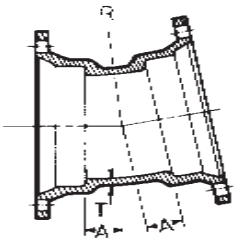
Sizes 3"-12" UL & 3"-10" FM Listed
For Fire Main Equipment

BENDS









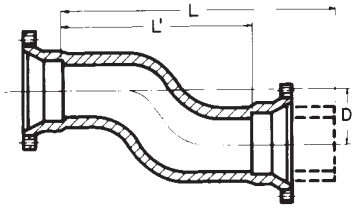
	90° Bends (1/4)				45° Bends (1/8)			22½° Bends (1/16)			11¼° Bends (1/32)		
	Dimensions				Dimensions			Dimensions			Dimensions		
Size	T	*A	R	Weight	*A	R	Weight	*A	R	Weight	*A	R	Weight
3	.34	3.5	2.5	19	2.00	2.41	17	1.50	2.51	15	1.25	2.53	16
4	.35	4.0	3.0	22	2.50	3.56	20	1.75	3.81	18	1.50	5.12	18
6	.37	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: "A" dimensions are approximate, contact Tyler Union for the laying length of a specific fitting**

**Note: 2 Inch Compact ductile iron 22.5, 45, and 90 degeree bends available in 2012. Call Tyler Union for information.

OFFSETS

	MJ x MJ				MJ x PE	
		Dimensions			Weights	
Size	D	L[1]	L		MJxMJ	MJxPE
4	6	10	--		42	--
4	12	18	--		52	--
4	18	22	--		58	--
4	24	28	--		70	--
6	6	12	17.5		50	--
6	12	18	--		65	--
6	18	24	--		82	--
6	24	30	--		91	--
8	6	13	--		79	--
8	12	19	--		96	--
8	18	25	--		116	--
10	12	21	--		136	--
12	6	17	--		137	--



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

PUTNAM PIPE CORPORATION

TYLER UNION®

MECHANICAL JOINT C153 DUCTILE IRON COMPACT FITTINGS

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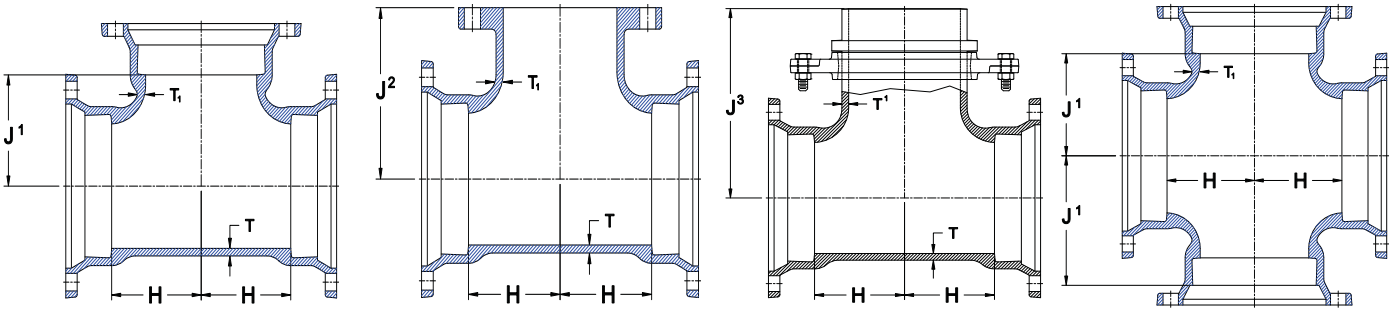
TEES

CROSS



	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 available in 2012. Call Tyler Union for information.

***NOTE: "H" and "J" dimensions are approximates. contact Tyler Union for the laying length of specific fittings**

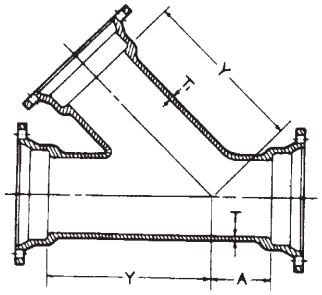
PUTNAM PIPE CORPORATION

TYLER UNION®

MECHANICAL JOINT C153 DUCTILE IRON COMPACT FITTINGS

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

WYES/LATERAL



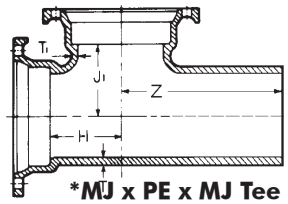
***Wyes**

Size	Dimensions A	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 included in AWWAC153, laying lengths are approx.

† Rated at 250 psi.

MJ x FE Flange Dimensions are on inside front cover.

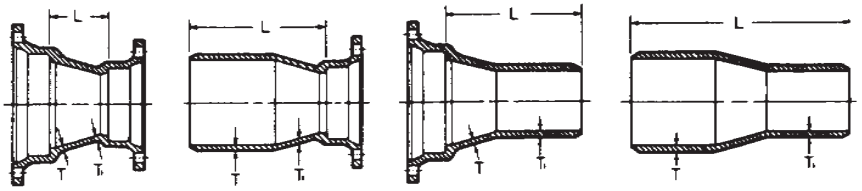


***MJ x PE x MJ Tee**

Size	Dimensions 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

*Note: Laying lengths are approximate, contact Tyler Union for the laying length of a specific fitting

REDUCERS (laying lengths are approximate)



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

Size	Dimensions T	T¹	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	...	...	...

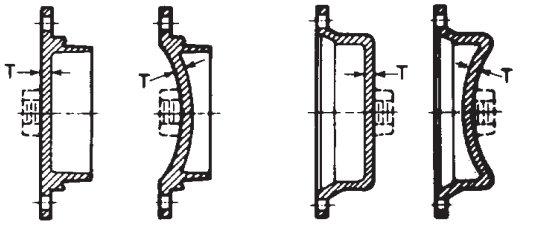
TYLER UNION®

PUTNAM PIPE CORPORATION

MECHANICAL JOINT C153 DUCTILE IRON COMPACT FITTINGS

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

SOLID & TAPPED PLUGS & CAPS



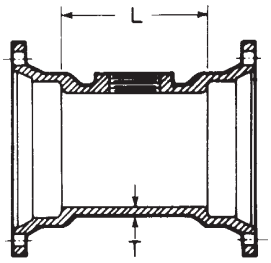
3"-12" 14"-24" 3"-12" 14"-24"

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

MJ x FE Flange Dimensions are on inside front cover.

*TAPPED TEE

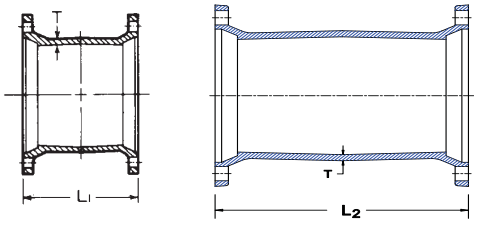


MJ Tapped Tee (2" Tap)

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

Note: "L" dimensions are approximate, contact Tyler Union for laying length of a spcific fitting

SOLID SLEEVES



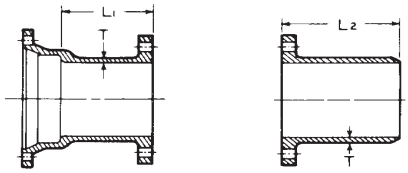
Short **Long**

Size	T	Dimensions L^1	L^2	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

***Note: Verify non-domestic laying lengths with Tyler Union**



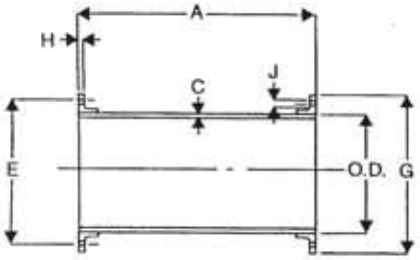
MJ x FE **FE x PE**

Size	T	Dimensions L^1	L^2	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	...

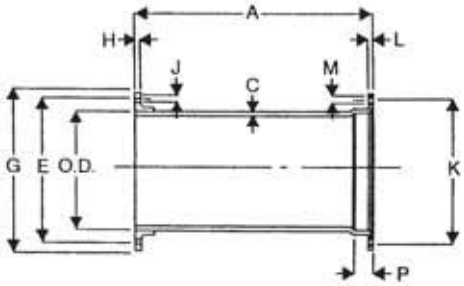
PUTNAM PIPE CORPORATION

FABRICATED FLANGE PIPES

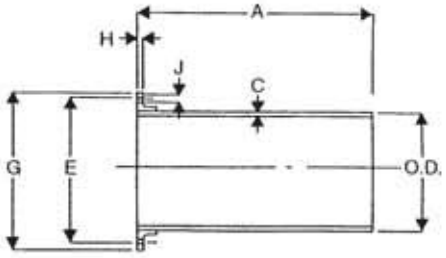
Lengths to be Specified by Contractor



FLG. x FLG.



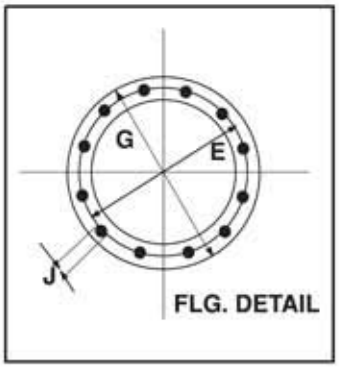
FLG. x M.J.



FLG. xP.E

SIZE	A	B	C	O.D. MIN.	O.D. MAX.	E	G	H MIN.	H MAX.	NO. OF FLG'D BOLT HOLES	J	K MIN.	K MAX.	L MIN.	L MAX.	NO. OF M.J. BOLT HOLES	M MIN.	M MAX.	P
3	•	•	0.31	3.90	4.02	6.00	7.50	0.63	0.87	4	0.75	6.13	6.25	0.88	0.94	4	0.75	0.81	2.50
4	A	A	0.32	4.74	4.86	7.50	9.00	0.82	1.06	8	0.75	7.44	7.56	0.94	1.00	4	0.875	0.935	2.50
6	S	S	0.34	6.84	6.96	9.50	11.00	0.88	1.12	8	0.875	9.44	9.56	1.00	1.06	6	0.875	0.935	2.50
8	•	•	0.36	8.99	9.11	11.75	13.50	1.00	1.24	8	0.875	11.69	11.81	1.04	1.12	6	0.875	0.935	2.50
10	•	•	0.38	11.04	11.16	14.25	16.00	1.07	1.31	12	1.00	13.94	14.06	1.11	1.19	8	0.875	0.935	2.50
12	R	R	0.40	13.14	13.26	17.00	19.00	1.13	1.37	12	1.00	16.19	16.31	1.17	1.25	8	0.875	0.935	2.50
14	E	E	0.42	15.22	15.35	18.75	21.00	1.19	1.57	12	1.125	18.69	18.81	1.19	1.31	10	0.875	0.935	3.50
16	Q	Q	0.43	17.32	17.45	21.25	23.50	1.25	1.63	16	1.125	20.94	21.06	1.26	1.38	12	0.875	0.935	3.50
18	U	U	0.44	19.42	19.55	22.75	25.00	1.37	1.75	16	1.25	23.19	23.31	1.32	1.44	12	0.875	0.935	3.50
20	I	I	0.45	21.52	21.65	25.00	27.50	1.50	1.88	20	1.25	25.44	25.56	1.38	1.50	14	0.875	0.935	3.50
24	R	R	0.47	25.72	25.85	29.50	32.00	1.69	2.07	20	1.375	29.94	30.06	1.50	1.62	16	0.875	0.935	3.50
30	E	E	0.51	31.94	32.08	36.00	38.75	1.87	2.37	28	1.375	36.82	36.94	1.69	1.81	20	1.125	1.185	4.00
36	D	D	0.58	38.24	38.38	42.75	46.00	2.13	2.63	32	1.625	43.69	43.81	1.88	2.00	24	1.125	1.185	4.00
42	•	•	0.65	44.44	44.58	49.50	53.00	2.37	2.87	36	1.625	50.56	50.68	1.88	2.00	28	1.375	1.435	4.00
48	•	•	0.72	50.74	50.88	56.00	59.50	2.50	3.00	44	1.625	57.44	57.56	1.88	2.00	32	1.375	1.435	4.00
54	•	•	0.81	57.40	57.64	62.75	62.75	2.75	3.25	44	1.875	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
60	•	•	0.83	61.51	61.65	69.25	73.00	2.87	3.37	52	2.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
64	•	•	0.87	65.57	65.71	76.00	80.00	3.13	3.63	52	2.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

1. Tolerance on length of FLG. x FLG. and FLG. x M.J. pipe shall be ± 0.125".
2. Tolerance on length of FLG. x P.E. shall be ± 0.25"/
3. Above material shall meet all applicable sections of ANSI A21.10, A21.15, A21.51, B2.1, B16.1/ AWWA, C110, C115, C150, C151, and all revisions thereto.
4. Flanged pipe shall be ductile iron pipe with ductile iron flanges threaded on.
5. Flange pipe is provided with cement lining per AWWA C104/A21.4. If other linings are required, contact your local sales representative.
6. The mechanical joint bell for 30" & 36" sizes of ductile iron pipe have thicknesses different from those shown in ANSI A21.11, which are based on gray iron pipe. These reduced thicknesses provide a lighter-weight bell which is compatible with the wall thickness of ductile iron pipe.
7. Submitted material only. Consult engineer for application.
8. 250 lb. faced and drilled flanges available upon request.



U.S. PIPE FABRICATION, LLC

Dopmestic A.I.S

PUTNAM PIPE CORPORATION

SIGMA™

Quality – Service – Commitment – Delivered.

FLANGE PAK™ Flange Accessories

All Domestic A.I.S.

PRODUCT SPECIFICATIONS

GASKET

- 1/8” thick either Ring or Full Face per ANSI/AWWA C110/A21.10 and ANSI/AWWA C111/A21.11
- Material: Red Synthetic Rubber
- Other material gasket (EPDM, Nitrile, Neoprene & FKM) are available on request

HEX BOLTS & NUTS

- Bolts & Nuts are as per ANSI/AWWA C110/A21.10 and ANSI/AWWA C111/A21.11
- Hex Bolts: Per ASME/ ANSI B18.2.1 Material per ASTM A307 Grade A, Zinc Plated
- Hex Nuts: Per ASME/ ANSI B18.2.2 Material per ASTM A563 Grade A or B, Zinc Plated
- Bolts & Nuts are threaded in accordance with ASME/ANSI B1.1
- Other Material Hex Bolt

US PIPE FABRICATION
A Forterra Company

PUTNAM PIPE CORPORATION

US Pipe Fabrication
Two Chase Corporate Drive
Suite 200
Birmingham, AL 35244
Telephone: 205-263-8540

Glass Lining Submittal
US Pipe Fabrication Vitco®, SG-14®
ASTM B1000-15 Compliant

I. Substrate Materials

Pipe used for glass lining shall be the product of one manufacturer and applied in one of the manufacturer's fabrication facilities.

Glass lining shall meet all requirements of ASTM B1000-15.

Glass linings shall be applied to Class 53 or thicker ductile iron pipe or ductile iron fittings.

Steel pipe minimum wall thickness will vary with diameter and fitting and end configurations (see Table I.) U.S. Pipe Fabrication should be consulted for the proper size.

Pipe and fittings used for glass lining shall be ordered without lining or coatings.

Ductile iron pipe shall be ordered from the foundry as "for glass lining".

Table I. Minimum Wall Thickness for Steel Pipe

Diameter	Minimum Wall
10 inch or smaller	Schedule 40*
12 inch and larger	3/8 inch *
* consult with US Pipe Fabrication for minimum wall thickness	

II. Preparation of Substrate

Pipe or fittings shall be ground to remove casting anomalies which will interfere with the lining quality.

Large defects in fittings may be ground and welded using approved welding procedures.

Minor defects in fittings may be patched using approved materials and procedures.

When applied to steel fabrications, all internal welds must be ground smooth and any voids or slag holes must be ground out, re-welded and ground smooth.

Pipe and/or fittings shall be grit blasted.

III. Lining Material

The glass lining applied to pipe and fittings shall be hard, smooth, continuous vitreous material which is formulated to prevent the adherence of grease in sludge and scum lines, and to resist the adherence of crystalline metal salt deposits (Struvite and Vivionite) to sludge and centrate lines in sewage and wastewater treatment plants.

The glass portion of the lining, the frit(s) used in the formulation, as supplied from the manufacturer, shall have a density of 2.5 to 3.0 grams per cubic centimeter as measured by ASTM D-792.

IV. Lining Process

The slip (mixed slurry) shall be prepared according to documented procedures. Pertinent quality control characteristics including specific gravity (SG) and pick-up shall be recorded.

The slip shall be applied to the freshly blasted substrate within 8 hours of blasting.

The slip shall be applied to a minimum wet film thickness (WFT) to provide the desired dry film thickness (DFT).

The freshly applied slip shall be thoroughly dried prior to the firing process.

The coated product shall be fired according to documented procedures. Times and temperatures should reflect those needed to provide the physical and corrosion results desired. Pertinent quality control characteristics including oven temperature and time at temperature should be recorded.

The fired lining shall be inspected.

V. Lining Characteristics

The lining shall be of a light, bright color to allow visual detection of defects more easily prior to electronic holiday detection testing. Glass linings are not intended to be Holiday free, but to prevent the build-up of grease, scum, and crystalline metal salt deposits.

The entire finished coating shall be a minimum of 10 mils (0.010 inch) as tested with an acceptable Type I or Type II dry film thickness gage as described in ASTM D7091.

The finished lining shall be able to withstand a strain of 0.001 inch/inch of the base metal without visible damage to the glass.

The glass lining shall have a minimum hardness of 5 on the Moh's hardness scale.

The lining shall be capable of withstanding an instantaneous thermal shock from ambient +350^{o}F to ambient without visible crazing, blistering or spalling.

The lining shall be resistant to corrosion by an HCl solution adjusted to a PH of 3 at 125°F and a NaOH solution adjusted to a PH of 10 at 125°F. Demonstration of this shall be by a weight loss of not more than 3 milligrams per square inch when exposed for 30 minutes.

There shall be negligible visible loss of surface gloss to the lining after immersing a cut production sample in an 8% by weight sulfuric acid solution at 148°F for a period of 10 minutes.

VI. Inspection, Testing, and Certification

Qualification Testing

Laboratory Testing Results of representative production samples shall be available for review. These include:

a. Strain testing of the base material to 0.001 inch/inch.

b. Hardness of the lining using the Moh's scratch hardness scale.

c. Thermal shock testing of a 350°F differential from ambient.

d. Weight loss when exposed to a solution of HCl adjusted to PH of 3 at 125°F for 30 minutes.

e. Weight loss when exposed to a solution of NaOH adjusted to PH of 10 at 125°F for 30 minutes.

f. Surface gloss condition when a cut piece is exposed to an 8% by weight solution of H_2SO_4 at 148°F for 10 minutes.

Routine Quality Testing

Each pipe/fitting shall be inspected prior to shipment. Inspection shall include:

a. Lining thickness as tested with a Type I or Type II dry film thickness gage as described in ASTM D7091.
b. Holiday testing shall be performed to a documented procedure. It shall use the low voltage wet sponge testing apparatus as described in ASTM D5162, Test Method A. The testing should insure that for long pipe, testing is performed from both ends of the pipe with the diameter of the dampened sponge exceeding the diameter of the pipe so that the sponge is in full circumferential contact with the lining. Wetting agents should not be used. The sponge should be moved over the surface at a moderate rate approximately 0.3 m/s (1 ft/s) using a two pass (in and out)motion over each area. Care should be exercised near the exposed pipe ends to prevent excess water from tracking and giving a false indication. Limits for holidays are given in Table II included at the end of this document.

c. The finished glass lined pipe straightness shall comply with the following:

Fabricated (Flanged and Grooved Ends)	Bell X Spigot Pipe
3/8 inch in 20 feet	5/8 inch in 20 feet
0.01875 in per foot	0.03125 in per foot

d. Copies of the test results from the Routine Quality Testing shall be available for review.

A document of compliance attesting that the lining meets the requirements of this specification, the internal procedures, and applicable standards of ASTM, ANSI, NACE, SSPC and NAPF shall be available for review and/or accompany each shipment.

A label shall be affixed to the interior of each piece showing the inspector's initials and the Quality Control Sequence Number of the part.

Documentation for each pipe/fitting shall include the identification of each item by customer mark number and description, Quality Control Sequence Number, the date tested, the inspector identity, and the test results.

VII. Miscellaneous

a. The applicator shall have a minimum of five (5) years of successful experience in the application of high temperature glass and porcelain coatings for the wastewater and sewage treatment industry.

b. All glass lining of pipe and fittings shall be from one manufacturer.

c. All handling and/or lifting of glass lined pipe and fittings must be done on the exterior only. Lifting with internal hooks, forks or chains shall not be done at any time.

d. Welding on glass-lined pipe shall not be performed. Wall collars, restrained joint weld ends, etc. shall be welded applied prior to glass lining.

e. Tapping shall also be done prior to glass lining.

f. Glass lined pipe can be successfully cut for field closure pieces using approved procedures from the manufacturer.

g. The standard for quality shall be U.S. Pipe Fabrication VITCO® SG-14®.

Table II. Allowable holiday indications

Fittings	Maximum Number of Holidays	Pipe	Maximum Number of Holidays*
-	-	3 inch diameter up to 10 foot long	6
4 inch through 8 inch diameter	5	4 inch through 8 inch diameter	12
10 inch through 18 inch diameter	8	10 inch through 18 inch diameter	20
20 inch diameter and larger	10	20 inch diameter and larger	28

*NOTE: Except as noted, these are for 20 foot lengths. For shorter lengths the maximum is proportional to the 20 foot length.

Field Fabrication of Glass Lined Pipe

Field cutting and /or fabrication of glass lined pipe is NOT acceptable, except for an occasional closure piece where a final field measurement is necessary. Welding on glass lined pipe is NOT acceptable at any time.

Please refer to the section of our on-line "U.S. Pipe Fabrication-Handling, Cutting and Field Repair Procedures" for proper cutting and field repair procedures for those occasional, necessary instances.

OPEN RIGHT

PUTNAM PIPE CORPORATION

KENNEDY VALVE AWWA C515 Resilient Wedge Gate Valves Meet or Exceed the Requirements of AWWA Standard C515 UL-262/FM-1120/1130 ULC-Underwriters' of Canada

Size Range	Water Working Pressure psi	Seat Test psi	Hydrostatic Shell Test psi
AWWA 2"-12"	250 Water Works	250 & 400	500
ULFM 2 1/2"-12"	200 Fire Protection	250 & 400	500

Available in either non-rising stem or outside screw & yoke.

Available End Connections & Size Range	Figure No.	Figure No. with (STD)	Post Plate
Flg. End (NRS)	2" - 12"	7561SS	7701SS (3" - 12")
M.J.	2" - 12" (except 2 1/2")	7571SS	7071SS (3" - 12")
Flg. & M.J.	3" - 12"	7572SS	7702SS (3" - 12")
Push-on for PVC (SDR)	2" - 8"	7597SS	7597PSS (3" - 8")
Flg. End (OS & Y)	2" - 12"	7068A	N/A
M.J. for Tapping	4" - 12"	7950SS	7950PSS
Push-on for D.I. & C900 PVC	4" - 12"	7901SS	7901PSS
M.J. Cutting-in	4" - 12"	7576SS	(Consult K.V.)
Push-on D.I. X Flg.	4" - 12"	7902SS	7902PSS
Threaded (NRS)	2" - 3"	7057SS	7057PSS (3" only)
Threaded (OS&Y)	2" - 3"	7067	
FLG & GRV OS&Y	2 1/2" - 10"	7092ABF	----------
GRV & GRV OS&Y	2 1/2" - 10"	7093ABF	----------
FLG & GRV NRS	2 1/2" - 10"	7592ABF	7592PABF
GRV & GRV NRS	2 1/2" - 10"	7593ABF	7593PABF

Accessories

Indicator Posts
"T" Handles
Stem Guides
2" Sq. Operating Nuts
Floorstands (non-rising stem
Handwheels
Extension Stems
Floor Boxes
Chain Wheels

NOTE: 2" OS&Y Flanged and Threaded versions are UL Listed

NOTE: All RSGV's 18" and larger will be furnished with either spur gearing (vertical) or or bevel gearing (horizontal)

NOTE: 2" to 3" sizes full wall ductile iron (per AWWA C509 dimensions)

NSF Certified to NSF/ANSI 61-G NSF/ANSI 372

Sizes 2" - 12"

KENNEDY VALVE AWWA Resilient Wedge Gate Valves Meet or Exceed the Requirements of AWWA Standard C515

Size Range	Water Working Pressure psi	Bubble Tight Test psi	Hydrostatic Shell Test psi
AWWA 14"-24"	250	250	500
*UL/FM 14"-16"	200	200	400

* (NRS style only)

Available in either non-rising stem or outside screw & yoke.

Available End Connections & Size Range		**Figure No.**
FLG End (NRS)	14"-24"	7561SS
M.J.	14"-24"	7571SS
FLG & M.J.	14"-24"	7572SS
FLG End (OS&Y)	14"-24"	7566SS
M.J. for Tapping	14"-24"	7950SS
Tyton for D.I. & C900 PVC	16"	7901SS

Note: Gearing is recommended on valves 18" and larger.

Gearing is required on 30" and larger.

Accessories:

Indicator Posts	2" sq. Operating Nuts
Enclosed Gearing (14"-24")	Handwheels
"T" Handles	Extension Stems
Stem Guides	Floor Boxes
Electric Motor Actuators	Chain Wheels

Floorstands (non-rising stem)

MODEL KS-RW/2638 AWWA C515 REDUCED WALL DUCTILE IRON

PUTNAM PIPE CORPORATION

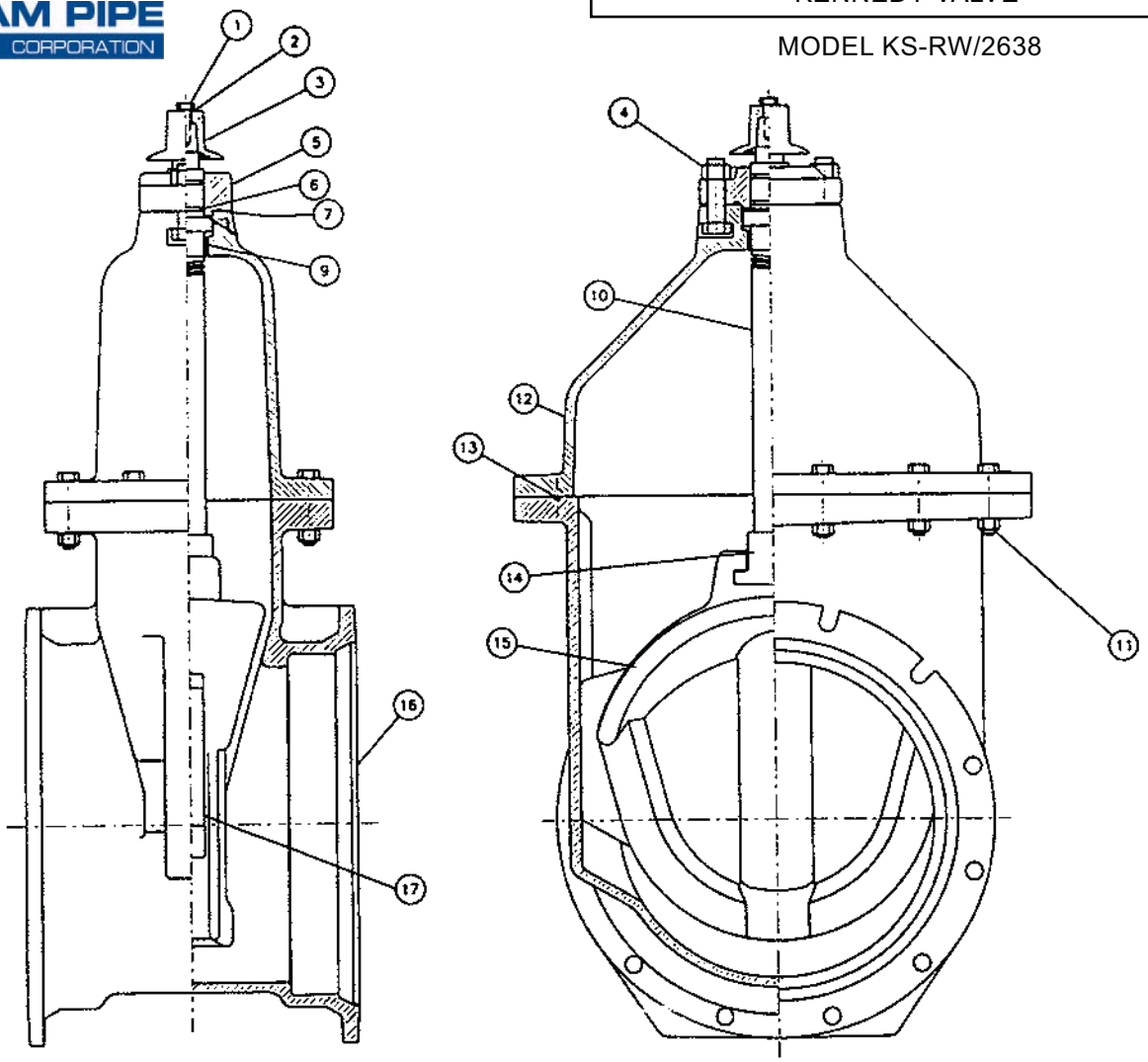
Complies with applicable
requirements of AWWA C515

PUTNAM PIPE CORPORATION

14"-24" R/W VALVE
NRS ASSEMBLY MATERIAL LIST

KENNEDY VALVE

MODEL KS-RW/2638



ITEM	DESCRIPTION	MATERIAL	ASTM SPEC.
1	HEX HEAD BOLTS	STAINLESS STEEL	ASTM F593-304
2	FLAT WASHERS	STAINLESS STEEL	ASTM F593-304
3	OPERATING NUT OR HANDWHEEL	CAST IRON	ASTM A126 CLASS B
4	HEX HEAD BOLTS & NUTS	STAINLESS STEEL	ASTM F593-304
5	FOLLOWER PLATE	DUCTILE IRON	ASTM A536 Grade 65-45-12
6	STEM O-RING	BUNA - N	----------
7	FOLLOWER PLATE O-RING	BUNA - N	----------
9	BONNET BUSHING	BRONZE	ASTM B584 C83600
10	STEM	BRONZE/STAINLESS STEEL	ASTM B584 C86700/A276 304/316
11	HEX HEAD BOLTS & NUTS	STAINLESS STEEL	ASTM F593-304
12	COVER	DUCTILE IRON	ASTM A536 Grade 65-45-12
13	COVER O-RING	BUNA - N	----------
14	STEM NUT	BRONZE	ASTM B584 C83600
15	WEDGE (EPDM Encapsulated)	DUCTILE IRON	ASTM A536 Grade 65-45-12
16	BODY - ALL TYPES	DUCTILE IRON	ASTM A536 Grade 65-45-12
17	WEDGE PROTECTOR CAP-18" THRU 24"	DELRIN	----------

Complies with applicable
requirements of AWWA C515

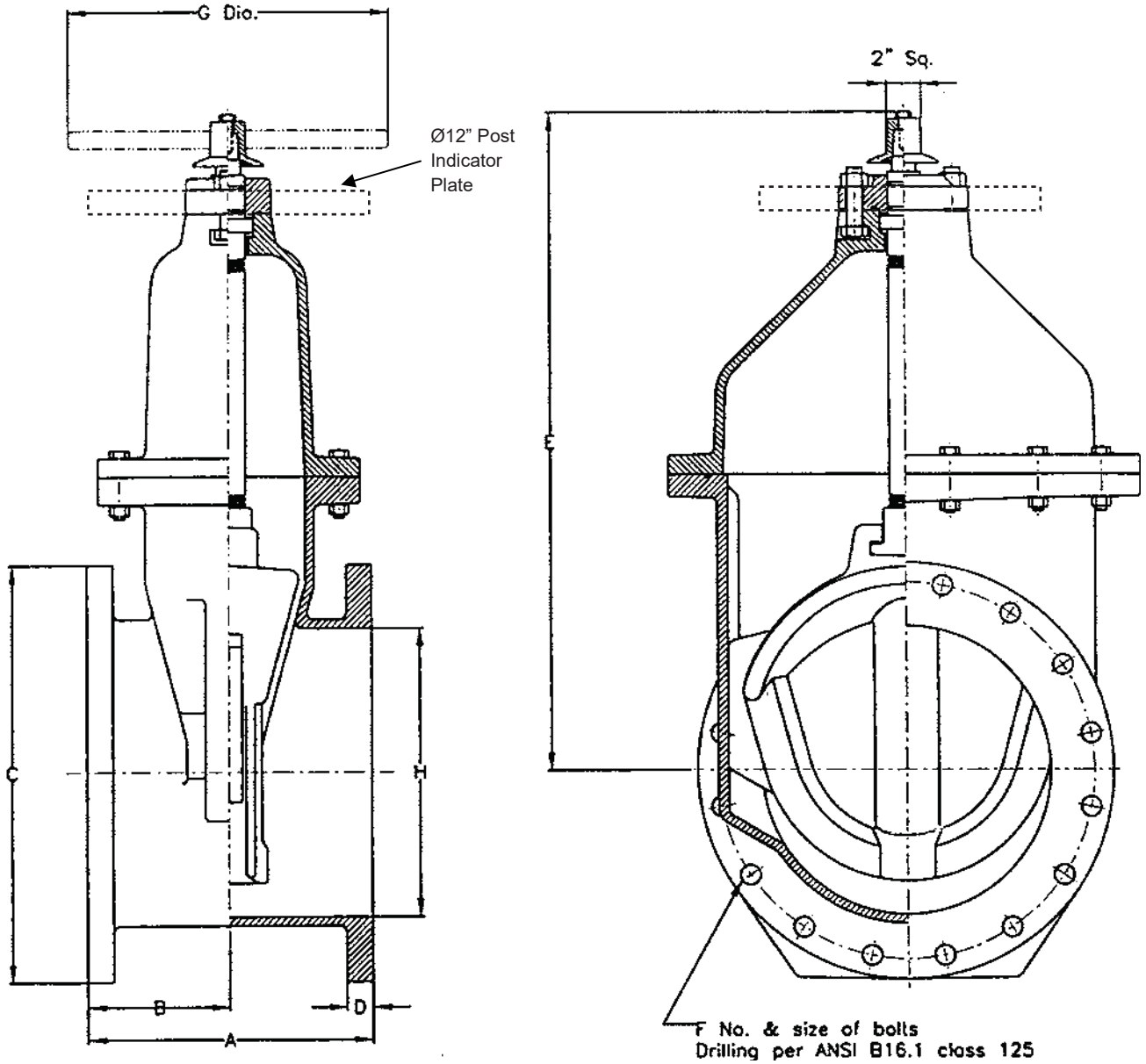
PUTNAM PIPE CORPORATION

14"-16" R/W VALVE FLANGED ENDS GENERAL DIMENSION

KENNEDY VALVE

MODEL KS-RW/2638

7561SS



ALL FLANGE VALVES ARE TAPPED & PLUGGED @ POSITION "A"																		
VALVE SIZE		A		B		C		D		E		F			G		H	
inch	*mm*	inch	*mm*	inch	*mm*	inch	*mm*	inch	*mm*	inch	*mm*	#	inch	*mm*	inch	*mm*	inch	*mm*
14	*360*	15	*381*	7 1/2	*191*	21	*530*	1 3/8	*30*	37 3/4	*959*	12	1	*25.4*	26	*660*	14 1/4	*360*
16	*410*	16	*406*	8	*203*	23.5	*600*	1 7/16	*37*	37 3/4	*959*	16	1	*25.4*	26	*660*	16 1/4	*410*

Complies
AWWA C515

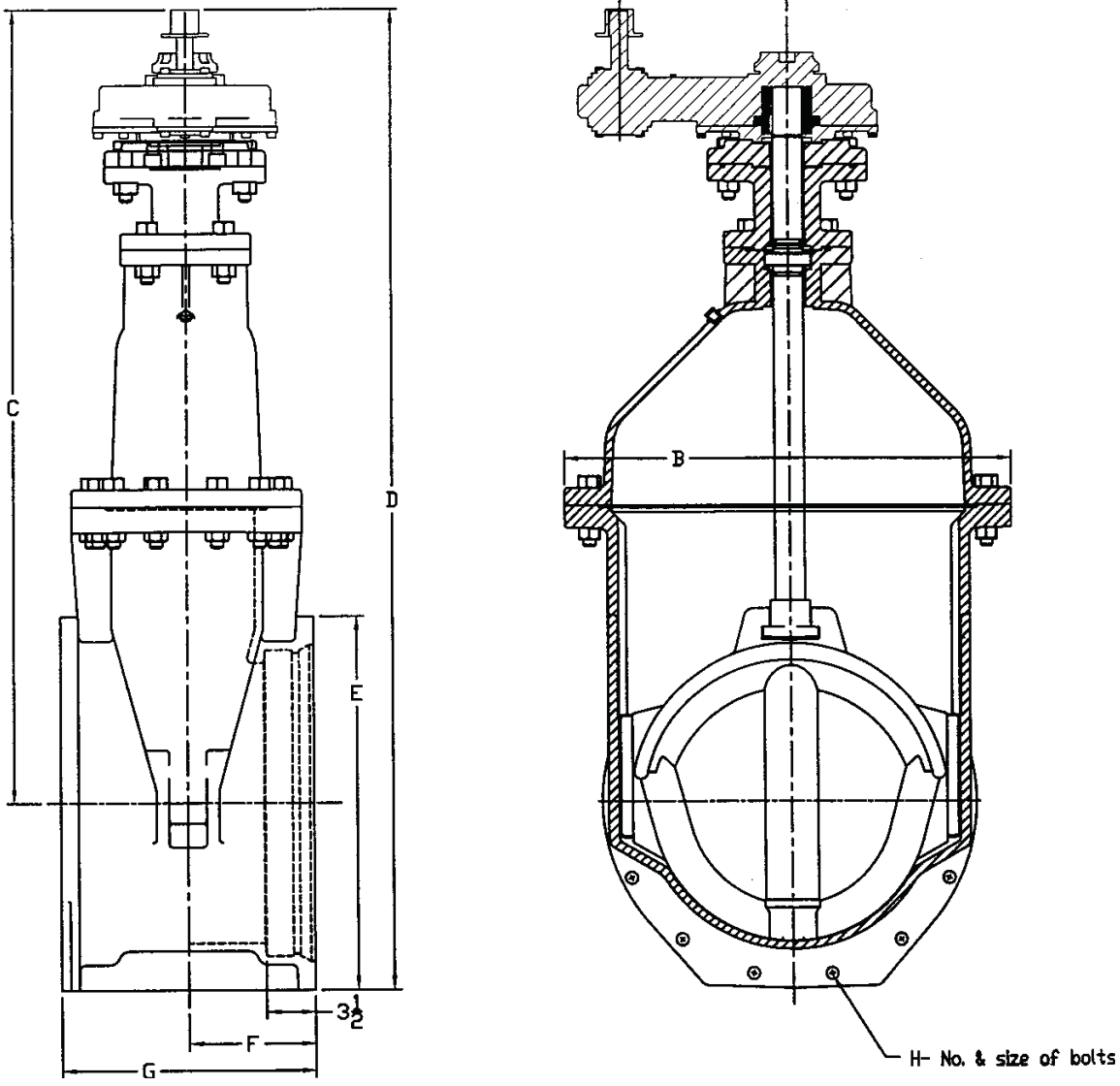
PUTNAM PIPE CORPORATION

14"-24" R/W VALVE MJ END SPUR GEAR GENERAL DIMENSIONS

KENNEDY VALVE

MODEL KS-RW/2638

7571AMSS



VALVE SIZE	A	B	C	D	E	F	G	H
14	8	26 11/16	52 1/8	62 1/2	20 1/4	8 1/2	17	10-3/4
16	8	26 11/16	51 1/8	62 1/2	22 1/2	8 1/2	17	12-3/4
18	12	32 1/4	58	70 1/2	24 3/4	9	18	12-3/4
20	12	32 1/4	57	70 1/2	27	9	18	14-3/4
**24	12	38	62 5/8	77 1/4	31 1/2	10 1/2	21	16-3/4

*30" AND LARGER SIZES REQUIRE GEARING
**24" ARE NOW FURNISHED WITH ROLLERS, TRACKS, AND SCRAPERS.
(see dimensions on page 6-12 for new installation)

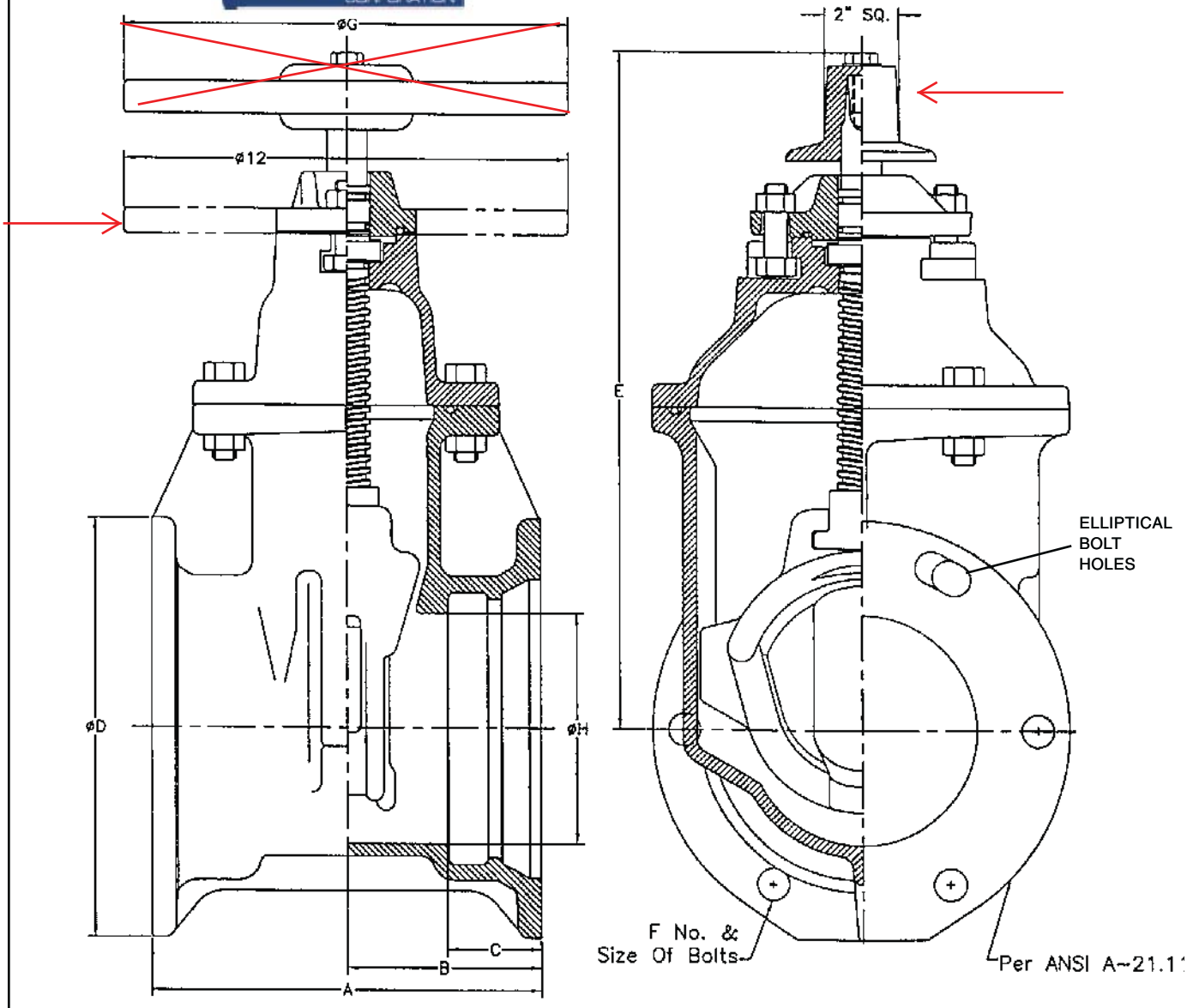
2"-12" R/S VALVE MECHANICAL JOINT ENDS GENERAL DIMENSIONS

KENNEDY VALVE MODEL KS-RW

Complies with applicable requirements of AWWA C515

~~7571SS~~ ~~STANDARD~~
7071SS W/POST PLATE (3-12")

PUTNAM PIPE CORPORATION



ELLIPTICAL BOLT HOLE DESIGN ELIMINATES THE NEED FOR ANTI-ROTATIONAL BOLTS

VALVE SIZE	A	B	C	D	E	F	G	H
2	8 1/4	4 1/8	2 1/2	4 1/2	10 7/8	2 5/8	7 1/4	2
2 1/2	—	—	—	—	—	—	—	—
3	8 1/2	4 1/4	2 1/2	7 3/4	12 3/8	4 5/8	10	3
4	9 1/2	4 3/4	2 1/2	9 1/8	14 3/4	4 3/4	10	4 1/4
6	10 1/2	5 1/4	2 1/2	11 1/8	19	6 3/4	12	6 1/4
8	13 1/8	6 9/16	2 1/2	13 3/4	22 1/2	6 3/4	14	8 1/4
10	15 1/2	7 3/4	2 1/2	15 3/4	26 1/2	8 3/4	18	10 1/4
12	16	8	2 5/8	18	30	8 3/4	18	12 1/4

Uni-Flange® Series 1400

Wedge Action MJ Retainer Gland Joint Restraint for Ductile Iron Pipe

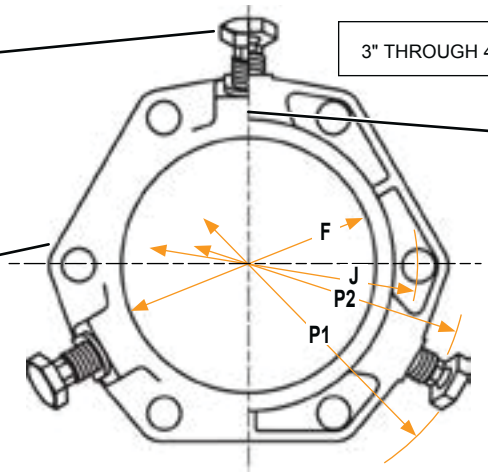
WORKING PRESSURE - 3" THROUGH 16" **350 PSI**
- 18" THROUGH 48" **250 PSI**

Domestic AIS Restraint

Actuating Screw -
Ductile iron wedge actuating screw, with the Auto-Tork break-away head design, ensures proper torque during installation.

Gland -
Gland body is of High Strength Ductile Iron per ASTM A536, Grade 65-45-12. Compatible with all mechanical joints conforming to ANSI / AWWA C111 / A21.11.

Color Code:
All components black epoxy coated applied by the ecoat process.



3" THROUGH 48" SIZES - 100% DUCTILE IRON CONSTRUCTION

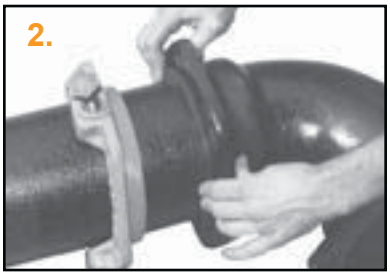
Wedges are ductile iron and heat treated to a hardness of 370 BHN minimum.

The Uni-Flange® Series 1400 offers a minimum 2:1 safety factor at the full rated pressure of the device, in all sizes, when tested in dead-end situations.

Note: UFR1400s are not to be used with plain end fittings.

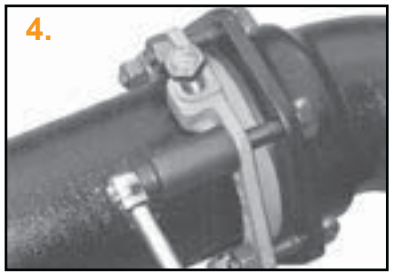
Uni-Flange® Series 1400 Installation Instructions

1. Clean the socket and plain end. Lubricate gasket and plain end with approved pipe lubricant meeting AWWA C111. Place the gland on the plain end with the lip extension toward the plain end, followed by the gasket with the tapered edge of the gasket toward the plain end.

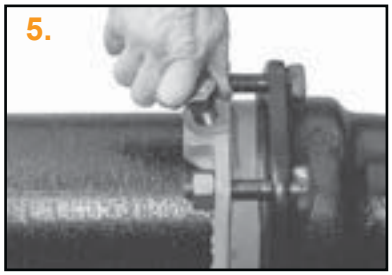


2. Insert the pipe into the socket and press the gasket firmly and evenly into the gasket recess. Keep the joint straight during assembly. (In cold conditions, it is best to warm the gasket to room temperature to improve gasket elasticity.)

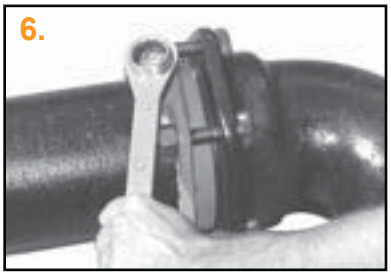
3. Push the gland toward the socket and center it around the pipe with the gland lip against the gasket. Insert T-bolts and hand tighten nuts with the gland centered around the pipe. Set deflection after joint assembly but before tightening bolts (Maximum deflection is 5° on 3" - 12", 3° on 14" - 24", 1° on 30" - 48" sizes.)



4. Tighten the T-bolts to the same torque recommended in AWWA C111 **(45-60 ft-lb on 3", 75-90 ft-lb on 4" - 24" sizes, 100-120 ft-lb on 30" - 48" sizes)**. Tighten in an alternating manner (6 o'clock, 12 o'clock, 3 o'clock, 9 o'clock), maintaining the same gap between the gland and the face of the MJ bell at all points around the MJ socket. Repeat the process until all bolts are within the approximate torque range. Use of a torque wrench is recommended to ensure proper torque.



5. After correct assembly of the mechanical joint, bring all wedges in contact with the pipe surface by turning the Auto-Tork actuating screws in a clockwise direction until contact is made and screw is "hand tight."



6. Tighten each Auto-Tork actuating screw by turning approximately 180 degrees (1/2 turn), alternating among screws until the break away heads twist off.

Note: The Series 1400 can be re-used or re-installed after the Auto-Tork screw heads have been twisted off. In this case, tighten the hex head of the wedge activating screw to 75 - 110 ft-lb.

Consult the Ford Meter Box website for the most currrent installation instructions.

Uni-Flange® Series 1400

Information - Wedge Action MJ Retainer Gland for Ductile Iron Pipe

HISTORY

The Series 1400 was originally designed to provide joint restraint for ductile iron pipelines installed in areas subject to earthquakes. Its unique “controlled expansion and flexibility” feature has allowed it to withstand several major earthquakes; one as large as magnitude 7.7 in 1983 and another of magnitude 7.8 in 1993. Uni-Flange® has licensed this technology and has adapted the design to AWWA standards and dimensions.

HOW IT WORKS

The Series 1400 is a mechanical joint restraining gland, incorporating individually actuated wedges located around the circumference of the pipe. When the specially designed wedge actuating screws are tightened, the teeth on the bottom of each wedge lock onto the pipe surface. Under normal operating conditions, this is all the restraint that is required. If external forces cause the pipe to move, the wedge teeth remain locked on the pipe and the wedge moves against the actuating screw, enclosed in its ductile iron pocket. This feature allows the joint to prevent separation yet remain resilient and flexible after assembly. In high pressure applications, or when surge pressures occur, the 1400 uses the line pressure to increase its restraining grip on the pipe. If the pressure decreases, the wedge returns to its original position and controlled expansion and flexibility are available again.

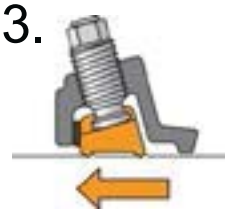
1. 

“Auto-Tork” wedge actuating screw with break-away heads that twist off at the recommended torque.

Wedges are contoured to fit the pipe and are mechanically retained in pockets.

2. 

Wedge is positioned at the front of the pocket during normal operating pressures.

3. 

Pressure surges cause the wedge to move back in its pocket, increasing its grip on the pipe.

ADVANTAGES OF THE SERIES 1400

• **Eliminates** the need of costly and time consuming **concrete thrust blocks.**

• **“Auto-Tork” wedge actuating screws assure proper installation.** Auto-Tork screws are designed with a break away head that twists off at the recommended torque, leaving a hex head in case future maintenance or removal is required. This gives a visual indicator and ensures correct installation every time.

• **Wedges are contoured to fit the pipe.** This provides greater surface area contact, increasing the restraint capability and distributing the restraining force. The Series 1400 can be used on any thickness or class of ductile iron pipe.

• **High Pressure Capabilities.** The Series 1400 is rated at 350 psi in 3" - 16" nominal sizes, 250 psi in 18" - 48". Minimum 2:1 safety factor in all sizes.

• **Proven Technology**. The Series 1400 design has decades of successful field service.

• **The Series 1400 Offers 5° deflection** on sizes 3"-12", **3° deflection** on sizes 14"-24" and **1° deflection** on 30" through 48" sizes. This advantage is provided even after installation and pressurization.

• **No special tools necessary.** Designed for use with standard mechanical joint bells conforming to AWWA C111. The same wrench used to tighten the T-bolt nuts can be used on the wedge actuating screws.

• **Wedges are mechanically retained in pockets.** The Series 1400 wedges cannot fall out! All necessary parts show up at the job site and no parts are lost in the trench if the gland is removed from the pipe for system maintenance or relocation.

• **Used with ordinary ductile iron pipe and mechanical joint sockets.** There is no need to order, pay for, and wait for special factory fabricated parts. Totally field adaptable; no beveling, special segments, or welded rings required.

• **4" - 12" UL listed and FM approved**. Contact factory for details.

LISTED
547U

FM Approved

Uni-Flange® Series 1400

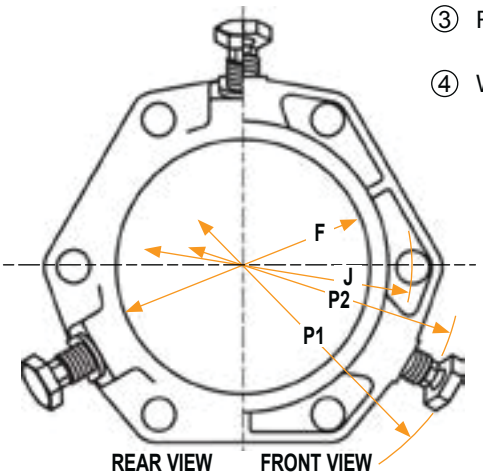
Information - Wedge Action MJ Retainer Gland Joint Restraint for Ductile Iron Pipe

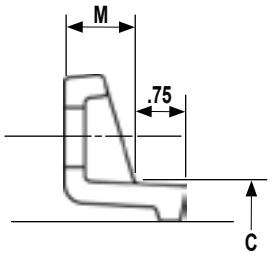
① Auto-Tork break-away head, 1-1/4" across the flat (same as 3/4" heavy hex nut).

② 5/8" hex-head, operating screw.

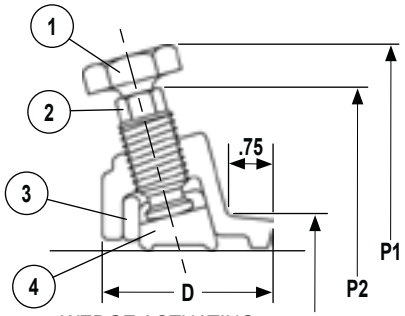
③ Rubber spacer (positions wedge during assembly).

④ Wedge





GLAND BODY DETAIL



WEDGE ACTUATING SCREW DETAIL

Series 1400 MJ Retainer Gland for Ductile Iron Pipe

Nom. Pipe Size	Pipe O.D. (Inches)	Catalog Number	Pressure Rating (psi)	No. of Wedges	Approx. Weight (lbs.)	P1*	P2**	C	D	F	M	J	No. of Bolt Holes
3"	3.96	**UFR1400-D-3-(I or U)**	350	2	6.0	11.04	9.06	4.84	2.65	4.06	0.68	6.19	4
4"	4.80	**UFR1400-D-4-(I or U)**	350	2	7.5	11.9	10.0	5.92	2.65	4.90	0.88	7.50	4
6"	6.90	**UFR1400-D-6-(I or U)**	350	3	11.0	14.0	12.1	8.02	2.65	7.00	0.88	9.50	6
8"	9.05	**UFR1400-D-8-(I or U)**	350	4	14.5	16.2	14.3	10.17	2.65	9.15	1.10	11.75	6
10"	11.10	**UFR1400-D-10-(I or U)**	350	6	22.0	18.2	16.3	12.22	2.75	11.20	1.10	14.00	8
12"	13.20	**UFR1400-D-12-(I or U)**	350	8	28.0	20.3	18.4	14.32	2.75	13.30	1.10	16.25	8
14"	15.30	**UFR1400-D-14-(I or U)**	350	10	42.0	22.9	20.9	16.40	3.00	15.44	1.50	18.75	10
16"	17.40	**UFR1400-D-16-(I or U)**	350	12	50.0	25.0	23.0	18.50	3.00	17.54	1.56	21.00	12
18"	19.50	**UFR1400-D-18-(I or U)**	250	12	67.0	28.1	25.8	20.60	3.05	19.64	1.65	23.25	12
20"	21.60	**UFR1400-D-20-(I or U)**	250	14	75.0	30.2	27.9	22.70	3.10	21.75	1.70	25.50	14
24"	25.80	**UFR1400-D-24-(I or U)**	250	16	85.0	34.4	32.1	26.90	3.20	25.94	1.85	30.00	16
30"	32.00	***UFR1400-D-30-(I or U)**	250	20	221.0	40.6	38.6	33.29	3.55	32.17	2.25	36.88	20
36"	38.30	***UFR1400-D-36-(I or U)**	250	24	256.0	46.9	44.9	39.59	3.76	38.47	2.25	43.75	24
42"	44.50	***UFR1400-D-42-(I or U)**	250	28	475	53.9	53.9	45.79	5.68	44.79	2.56	50.62	28
48"	50.80	***UFR1400-D-48-(I or U)**	250	32	573	60.2	60.2	52.09	5.68	51.09	2.56	57.50	32

~~**I = Import Casting**~~ **U = Domestic Casting**

All dimensions in inches unless otherwise stated.

* Maximum O.D. of gland on pipe before break-away heads have been removed (as received).

** Maximum O.D. of gland on pipe after wedges have been activated and break-away heads have been removed.

*** 30" through 48" sizes include a Uni-Seal gasket.

Note: 4" - 12" oversized 1400 Retainer Glands are available for Class C and D gray cast iron (Color Coded Gray). To order these oversized units, add "-XL" to the end of the catalog number. Example: UFR1400-D-6-XL.

Note: Not to be used on plain end fittings.

Uni-Flange® Series 1400

Wedge Action MJ Retainer Gland Joint Restraint for Ductile Iron Pipe

SERIES 1400 WEDGE ACTION RETAINER GLAND PACKAGED WITH ACCESSORIES

PACKAGE CONTAINS

1 - Series 1400 Wedge Action retainer gland.
1 - Set of high strength, low alloy T-bolts & nuts (AWWA C111).
1 - Mechanical joint gasket (AWWA C111) 3" - 24" sizes, Uni-Seal Gasket 30" - 48" sizes.

3" through 12" sizes are shrink wrapped in a weather resistant carton. 14" through 48" sizes are bulk packaged.

Series 1400-DA Retainer MJ Retainer Gland for Ductile Iron Pipe with Accessories

Nom. Pipe Size	Pipe O.D. (Inches)	Catalog Number	No. of Wedges	Pressure Rating (PSI)	Approx. Weight (lbs.)
3"	3.96	**UFR1400-DA-3-(I or U)**	2	350	8.0
4"	4.80	**UFR1400-DA-4-(I or U)**	2	350	10.5
6"	6.90	**UFR1400-DA-6-(I or U)**	3	350	15.5
8"	9.05	**UFR1400-DA-8-(I or U)**	4	350	19.8
10"	11.10	**UFR1400-DA-10-(I or U)**	6	350	29.5
12"	13.20	**UFR1400-DA-12-(I or U)**	8	350	35.0
14"	15.30	**UFR1400-DA-14-(I or U)**	10	350	52.0
16"	17.40	**UFR1400-DA-16-(I or U)**	12	350	62.0
18"	19.50	**UFR1400-DA-18-(I or U)**	12	250	79.0
20"	21.60	**UFR1400-DA-20-(I or U)**	14	250	88.0
24"	25.80	**UFR1400-DA-24-(I or U)**	16	250	101.0
30"	32.00	**UFR1400-DA-30-(I or U)**	20	250	262.0
36"	38.30	**UFR1400-DA-36-(I or U)**	24	250	306.0
42"	44.50	**UFR1400-DA-42-(I or U)**	28	250	575.0
48"	50.80	**UFR1400-DA-48-(I or U)**	32	250	690.0

30" thru 48" sizes include a Uni-Seal Gasket.

~~**I = Import Casting**~~ **U = Domestic Casting**

Note: Not to be used on plain end fittings.

Sample Specification – Series 1400

Restraint for standardized mechanical joints shall be incorporated in the design of the follower gland and shall impart multiple points of wedge action against the pipe, increasing its resistance as the pressure increases. The assembled joint shall maintain its flexibility after burial and shall maintain its integrity by a controlled and limited expansion of each joint during the wedging action. Restraining glands shall be manufactured of high strength ductile iron conforming to the requirements of ASTM A536. Wedges shall be contoured to properly fit on the pipe and shall be manufactured of ductile iron, heat-treated to a minimum hardness of 370 BHN. Dimensions of the glands shall be such that they can be used with the standardized mechanical joint bell and tee head bolts conforming to the requirements of ANSI/AWWA C111/A21.11 and ANSI/AWWA C153/A21.53 of latest revision. Twist –off heads shall be incorporated in the design of the wedge actuating screws to ensure proper torque. All ductile iron components shall be phosphate washed and coated with an electrostatically applied, heat cured epoxy coating. The restraining device shall have a water working pressure rating of 350 psi in sizes 3" through 16" and 250 psi in sizes 18" and larger with a safety factor of at least 2:1 against separation when tested in a dead-end situation. Restraint device shall be Uni-Flange Series 1400 or approved equal.

2012 EDITION

4"–24"

FIELD LOK 350® Gasket

JOINT RESTRAINT

NSF® Certified to ANSI/NSF 61

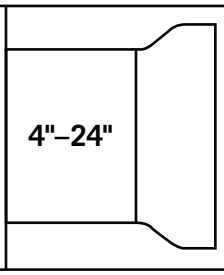
FOR WATER & WASTEWATER, FIRE PROTECTION & INDUSTRIAL APPLICATIONS

MORE THAN JUST PIPE.

U.S. PIPE

PUTNAM PIPE CORPORATION

866.DIP.PIPE



FIELD LOK 350® GASKET

NSF Certified to ANSI/NSF 61

2012 EDITION

P 2

PUTNAM PIPE CORPORATION

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PUTNAM PIPE CORPORATION

FIELD LOK 350® Gasket

Restrained joint pipe and fittings are used in pressurized Ductile Iron pipelines to prevent the joints of the line from separating due to thrust forces. Thrust forces generally occur at changes of direction in the line. Usually, a calculated length of pipeline extending from the location of the thrust force is restrained in the joints so that this force can be transmitted to the soil surrounding the line. The entire pipeline is often restrained for installations in poor soil or for critical lines.

U.S. Pipe's FIELD LOK 350 Gasket has proven to be an extremely successful, trouble-free means of joint restraint for well over one million Ductile Iron pipe and fitting joint assemblies across North America. By simply inserting a FIELD LOK 350 Gasket into the socket of a TYTON JOINT® Pipe, Fitting or Valve, restraint is instantly achieved when the joint is assembled. Stainless steel locking segments vulcanized into the FIELD LOK 350 Gasket grip the pipe to prevent joint separation.

FIELD LOK 350 Gaskets, utilizing patented improvements, are rated by U.S. Pipe for operating pressures up to 350 psi — a rating that now matches that of Pressure Class 350 pipe — giving the engineer and user new flexibility in designing piping systems.

Underwriters Laboratories lists the 4"–24" sizes for 350 psi. Factory Mutual, utilizing a safety factor of 4, approves the 4"–16" sizes for 250 psi and the 18"–24" sizes for 200 psi service.

With the use of the FIELD LOK 350 Gasket, push-on joint Ductile Iron TYTON JOINT Pipe or Fittings can be quickly and securely restrained as the joint is assembled. The restraint provided shall be a boltless, integral restraining system and shall be rated for 350 psi in accordance with the performance requirements of ANSI/AWWA C111/A21.11. Field cut pipe are no longer a problem to restrain. No pipe surface preparation* or grooving is required for field cut pipe other than the cut end needing to be beveled as required for any push-on joint spigot end. With the FIELD LOK 350 Gasket in place, the joints are restrained without thrust blocks, bolts, grooves, rods, clamps or retainer glands, resulting in savings of labor, material and time.

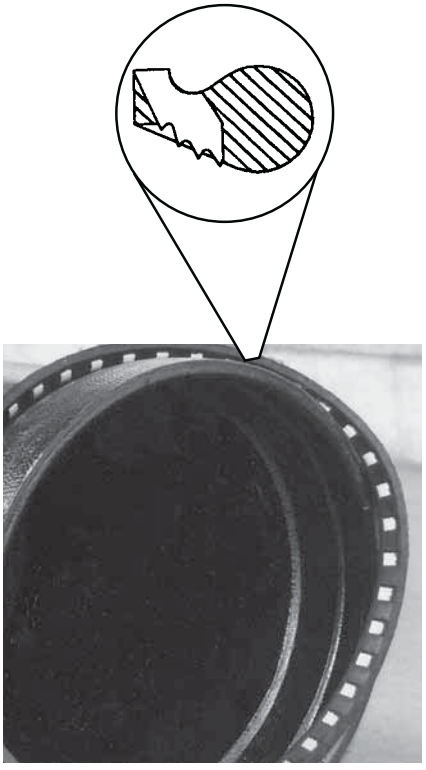
CAUTION: *U.S. Pipe does not recommend FIELD LOK 350 Gaskets for use above ground. The long-term effect of cyclical movements can be gradual joint separation to the point that the seal on the gasket bulb is compromised. Sources of cyclical movements include vibration as may be found on bridge crossings, and thermal expansion and contraction resulting from atmospheric temperature changes. These conditions are not experienced with buried pipe lines.*

*See note on page 5 regarding pipe with thick coatings or tape wrap.

ANSI/AWWA Standards

ANSI/AWWA C111/A21.11 Standard for Rubber-Gasket Joints for Ductile Iron Pressure Pipe and Fittings.

FIELD LOK 350 Gaskets are available in 4"–24" sizes and the pressure rating is based on the performance requirements of ANSI/AWWA C111/A21.11.



NOTE: *If specifiers and users believe that corrosive soils will be encountered where products are to be installed, please refer to ANSI/AWWA C105/A21.5* Polyethylene Encasement for Ductile Iron Pipe Systems *for proper external protection procedures.*

Pressure Rating: The working pressure rating of the FIELD LOK 350 Gasket Restrained Joint System does not exceed that of the working pressure rating of the pipe in which it is installed.

866.DIP.PIPE

4"–24"

FIELD LOK 350® GASKET

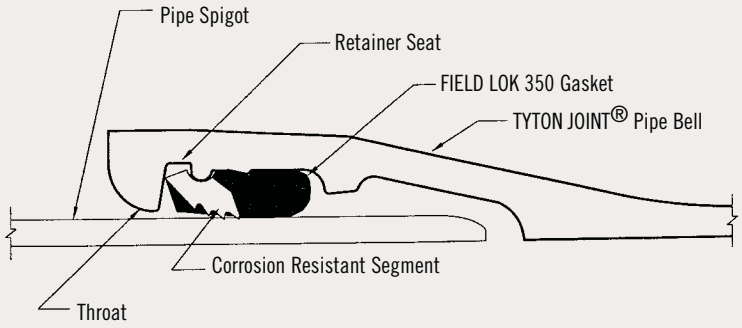
NSF Certified to ANSI/NSF 61

2012 EDITION

P 4

PUTNAM PIPE CORPORATION

Assembly



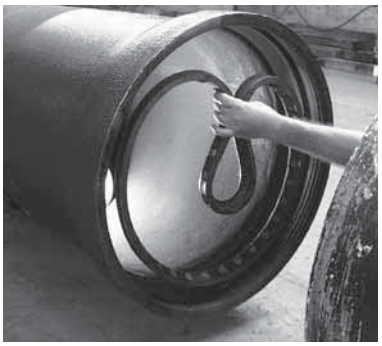
Socket Configuration

NOTE: *Actual socket configuration may vary from illustration.*

Figures 1-4.

All foreign matter in the socket must be removed, i.e., mud, sand, cinders, gravel, pebbles, trash, frozen material, etc. The gasket seat should be thoroughly inspected to be certain it is clean. Foreign matter in the gasket seat may cause a leak. The gasket must be wiped clean with a clean cloth, flexed, and then placed into the socket with the rounded bulb end entering first. Looping the gasket in the initial insertion will facilitate seating the gasket heel evenly around the retainer seat. 4" through 12" sizes require only one loop. For larger sizes, additional loops may be required: 14" through 36", two to three loops; 42" through 54", four to six loops; 60" and 64", six or more loops. Evenly space the loops around the socket with each loop raised 4-5 inches. After loops are established, push each loop down to finish installation of the gasket. When installing TYTON JOINT Pipe in sub-freezing weather, the gaskets, prior to their use, must be kept at a temperature of at least 40°F by suitable means, such as storing in a heated area or keeping them immersed in a tank of warm water. If the gaskets are kept in warm water, they should be dried before placing in the pipe socket.

1.



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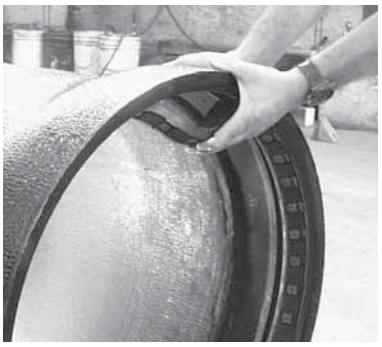

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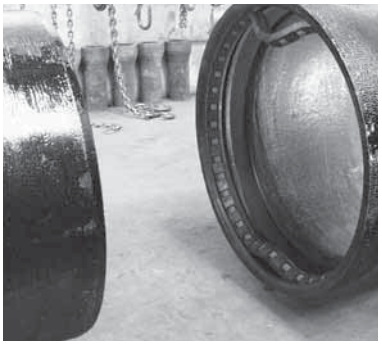

4.

FIELD LOK 350® GASKET

PUTNAM PIPE CORPORATION

Assembly (cont.)

Figure 5.

Apply a thin film of TYTON JOINT® Lubricant to the exposed surface of the gasket that will come into contact with the entering pipe spigot. In warm, dry weather conditions, the lubricant can dry out, especially when applied to warm or hot pipe, it will be necessary to add a small amount of water to hydrate the lubricant. Only TYTON JOINT Lubricant should be used.

CAUTION: *The use of spray-on lubricant is not recommended. Experience has determined that spray-on lubricant may not have sufficient lubricity to allow joint assembly without gasket displacement.*

Figure 6.

When pipe is cut in the field, the cut end may be readily conditioned so that it can be used to make up the next joint. The outside of the cut end (or any pipe without a bevel) should be beveled about 1/4" at an angle of about 30 degrees and the leading edge should be rounded. This can be done quite easily with a portable grinder. The operation removes any sharp, rough edges which otherwise might damage the gasket.

Figure 7.

When cut pipe, which have no assembly stripes, are to be assembled, the spigot insertion depth should be marked on the spigot to ensure that the joint is fully assembled. When deflection is required at the joint, the spigot should not be completely homed. Assembly mark locations by size and deflection information is given in Table 2.

Figure 8.

6 to 7 inches of the spigot should be cleaned and a thin coat of TYTON JOINT® Lubricant applied.

NOTE: *Thick Coatings or Tape Wrap — The FIELD LOK 350 Gasket should not be used on pipe and fittings which have thick coatings or tape wrap on the outer diameter of the pipe. In general, if the peen pattern is not visible on the pipe surface, the asphalt coating may be too thick for proper penetration of the teeth of the FIELD LOK 350 Gasket. The thick coating should be removed from the end of the pipe or fitting before assembly. The coating must be no more than 2 mils thick for asphalt coating and 6 mils nominal thickness for 2 part epoxy coating on the plain end of the pipe.*

When it is known that field cuts will be made, several lengths can be ordered as "gauged full length". U.S. Pipe "gauged full length" pipe are marked with a green stripe on the bell face. The ANSI/AWWA C151/A21.51 standard for Ductile Iron pipe requires factory gauging of the spigot end. Accordingly, pipe selected for field cutting should be measured at the location of the intended cut and must be within the tolerances shown in Table 1.

5.

6.

7.

8.

FIELD LOK 350® GASKET

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Assembly (cont.)

Figure 9.

Insert the end of the pipe into the socket until it contacts the gasket. Keep the pipe in alignment during assembly.

Figure 10.

Assemble the joint until the stripe closest to the plain end has the edge farthest from the plain end, flush with the bell face. It is not homed as deeply as with TYTON® Gaskets. **Carefully reverse the assembly force to ensure that the joint is properly restrained.**

NOTE: *If the pipe is inserted too far into the socket, it will not be possible to fully deflect the joint. See Table 2.*

Figure 11.

A feeler gauge can be inserted into the socket to verify the proper installation of the joint. After assembly, the joint may be deflected up to the number of degrees shown in Table 2.

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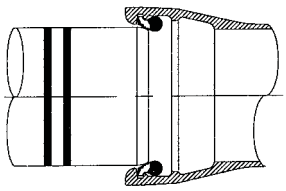

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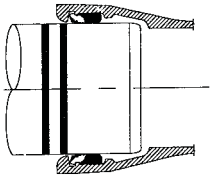

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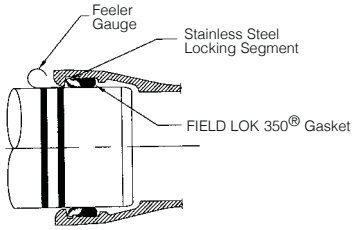

FIELD LOK 350® GASKET

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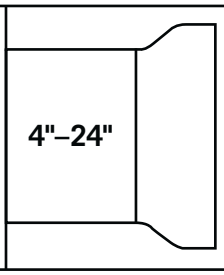
Alternative Assembly Methods

The Backhoe Method of Assembly

A backhoe may be used to assemble pipe of all sizes. The plain end of the pipe should be carefully guided by hand into the bell of the previously assembled pipe. The bucket of the backhoe may then be used to push the pipe until fully seated. Keep pipe in alignment to avoid damage to or dislodging of the gasket. A timber header should be used between the pipe and backhoe bucket to avoid damage to the pipe. Avoid "slamming" the pipe home to prevent damage to the lining material inside the bell at the back of the socket.

The Come-A-Long Method of Assembly

Some installers may prefer to use come-alongs to assemble TYTON JOINT® Pipe with FIELD LOK 350 Gaskets.



FIELD LOK 350® GASKET

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Pipe Diameters

Table 1. Suitable Pipe Diameters for Field Cuts and Restrained Joint Field Fabrication.

NOMINAL PIPE SIZE Inches	PIPE DIAMETER Inches	
	MINIMUM	MAXIMUM
4	4.74	4.86
6	6.84	6.96
8	8.99	9.11
10	11.04	11.16
12	13.14	13.26
14	15.22	15.35
16	17.32	17.45
18	19.42	19.55
20	21.52	21.65
24	25.72	25.85

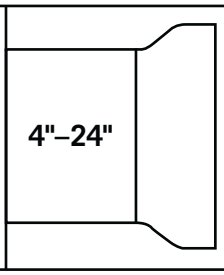
NOTE: *For accuracy, a diameter tape graduated in 100th's must be used.*

Assembly Mark and Deflection

Table 2. Assembly Mark and Deflection.

PIPE SIZE Inches	LOCATION OF ASSEMBLY MARK Inches	MAXIMUM JOINT DEFLECTION Degrees	DEFLECTION OF 18 ft LENGTHS Inches	APPROX. RADIUS OF CURVE PRODUCED BY SUCCESSION OF JOINTS-18 ft LENGTHS Feet
4	2-3/4	5	19	205
6	2-15/16	5	19	205
8	3-1/4	5	19	205
10	3-5/16	5	19	205
12	3-5/16	5	19	205
14	4-9/16	4	15	257
16	4-9/16	4	15	257
18	4-9/16	4	15	257
20	5-1/16	2.5	9.5	412
24	5-1/2	2.5	9.5	412

866.DIP.PIPE



FIELD LOK 350® GASKET

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PUTNAM PIPE CORPORATION

Special Notes Regarding the use of FIELD LOK 350 Gaskets

FIELD LOK 350 Gaskets will have a tag attached to them with gasket assembly instructions and a "CAUTION!" notice.

1. Do not use FIELD LOK 350 Gaskets to provide electrical joint conductivity for thawing purposes. Such use may damage the gaskets.
2. Use FIELD LOK 350 Gaskets only in push-on joints which have the trademark TYTON®, TRIM TYTON® or TYTON JOINT®. Use in unapproved joints may result in joint separation.
3. FIELD LOK 350 Gaskets should not be used in above ground installations.
4. Do not use FIELD LOK 350 Gaskets with corroded pipe.
5. U.S. Pipe has not conducted tests with gray iron or plastic piping products and, therefore, cannot recommend or warrant the use of FIELD LOK 350 Gaskets with gray iron (pipe, fittings or valves) or plastic (pipe or fittings).
6. Always make sure that the gasket is properly placed in the socket with the bulb or thickest portion of the gasket being deepest in the socket.
7. Use in casings: pipelines restrained with FIELD LOK 350 Gaskets may be installed in straight casings by pulling, not pushing, the pipe through the casing. Assembly of the joints must be controlled, such as with come-a-longs or cable hoist, to prevent fully "homing" the spigot to the base of the socket to allow for joint deflection.
8. Do not reuse FIELD LOK 350 Gaskets.
9. Do not use FIELD LOK 350 Gaskets with Tyton Plugs or TR FLEX® Joints since it is not possible to take the joint apart once it is assembled.
10. Although disassembly of joints restrained with FIELD LOK 350 Gaskets is possible, the use of TR FLEX Pipe and Fittings is recommended if disassembly of the joints is planned or anticipated.
11. If the maximum joint deflection is necessary, do not push the pipe to the bottom of the socket.
12. For cold weather assemblies, keep the temperature of the FIELD LOK 350 Gaskets above 40º F.
13. Approximately twice as much assembly force may be required to assemble a FIELD LOK 350 Gasket joint as is required for a conventional TYTON® Gasket push-on joint.
14. Concrete Thrust blocking or other means of thrust restraint is not required to be used with FIELD LOK 350 Gaskets when FIELD LOK 350 Gaskets are used in a designed thrust restraint system. The Thrust Restraint Design for Ductile-Iron Pipe published by the Ductile-Iron Pipe Research Association (DIPRA) is one method used to calculate the required length of restraint at a change in direction. This publication is available through your U.S. Pipe representative or at www.dipra.org

    Pressure Rating: The working pressure rating of the FIELD LOK 350 Gasket Restrained Joint System does not exceed that of the working pressure rating of the pipe in which it is installed.

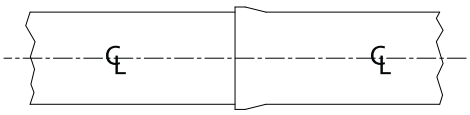
FIELD LOK 350® GASKET

PUTNAM PIPE CORPORATION

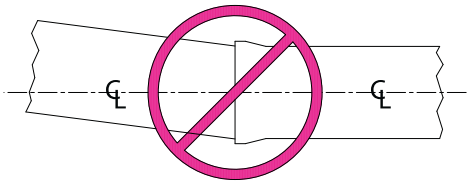
Special Notes Regarding the use of FIELD LOK 350 Gaskets (cont.)

15. If FIELD LOK 350 Gaskets are used in vertical installations, provisions must be made to keep the joint extended and not allow the teeth to become disengaged from the pipe. Failure to keep vertical joints extended can result in joint separation.
16. For cut pipe, select pipe with diameters at the cut location which conform to Table 1.
17. For cut pipe, ensure that a tapered bevel similar to the one furnished with the pipe is ground onto the end of the pipe. (See illustration at right.)
18. Measure the socket depth and make a mark on the pipe spigot that distance from the end of the pipe. This mark will indicate when the joint is fully "home".
19. Keep the joint in straight alignment during assembly, especially when handling fittings. Do not fully "home" the joint if maximum joint deflection is required. Set the joint deflection after the assembly is made.
20. Check for correct positioning of the FIELD LOK 350 Gasket by inserting a feeler gauge in the space between the bell and the pipe OD in several locations around the socket to assure that the gasket is in proper position in the socket.

CAUTION!!
DURING ASSEMBLY



CORRECT



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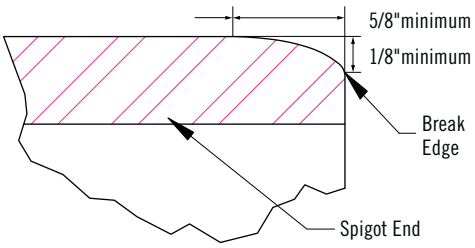

Grind Bevel
(See Note #16)

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4"–24"

FIELD LOK 350® GASKET

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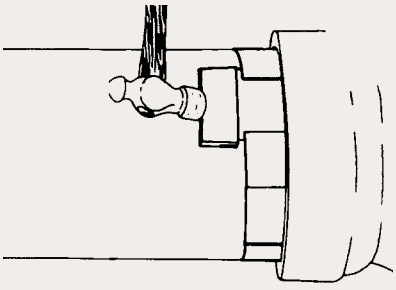
Disassembly for All Sizes

Figure 1.

While wearing gloves to protect hands, insert an extractor shim into the carrying anvil (slotted and curved steel block) and apply lubricant over the leading edge of the shim. Commencing at the bottom of the joint, drive the shim under the gasket by striking the anvil. Pry the anvil off the shim and insert a new shim.

Figure 2.

Continue driving shims under the gasket around the whole circumference of the joint. Keep the gap between the shims to a minimum. Insert the final shim so that it is overlapped by the shims on either side. After all shims have been properly installed, the joint can be separated by pulling, using a cable and a backhoe or other equipment to force joint separation. Reuse of the gasket is not recommended.



For disassembly for sizes 14"–24", follow the same procedure shown in Figures 1 and 2. Use a backhoe to force joint separation. Reuse of the gasket is not recommended.

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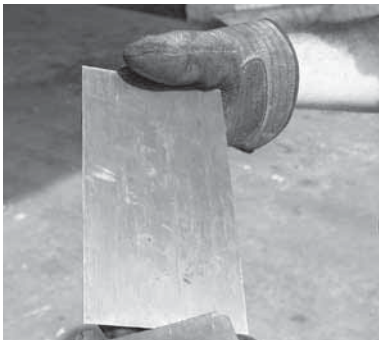

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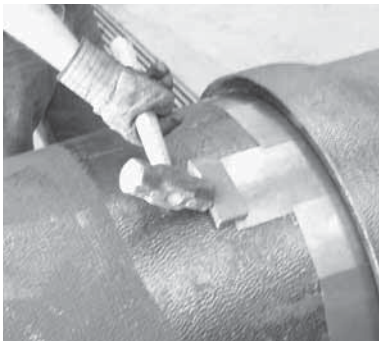

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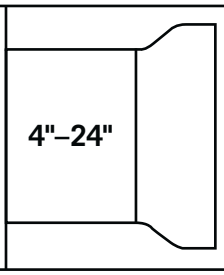

FIELD LOK 350® GASKET

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Products for Water, Wastewater and Fire Protection

Ductile Iron Pipe	SIZE RANGE
TYTON JOINT® Pipe	4"-64" Ductile Iron
Mechanical Joint Pipe	4"-12" Ductile Iron
TR FLEX® Pipe	4"-36" Ductile Iron
HP LOK® Pipe	30"-64" Ductile Iron
Flanged Pipe	3"-64" Ductile Iron
Grooved Pipe	4”-36” Ductile Iron
USIFLEX® Boltless Ball Joint Pipe For Subaqueous Installations	4"-48" Ductile Iron
Restrained Joints	
TR FLEX® Restrained Joint	4"-36" Ductile Iron
HP LOK® Restrained Joint	30"-64" Ductile Iron
MJ FIELD LOK® Gaskets	4"-24"
FIELD LOK 350® Gaskets	4"-24"
FIELD LOK® Gasket	30" & 36"
TR FLEX GRIPPER® Rings	4"-36" Ductile Iron
TR TELE FLEX® Assemblies	4"-24" Ductile Iron
Fittings	
TYTON® Fittings	14"-24" Ductile Iron
TRIM TYTON® Fittings	4”-12” Ductile Iron
TR FLEX® Fittings and TR FLEX® Telescoping Sleeves	4"-36" Ductile Iron
HP LOK® Fittings and HP LOK® Telescoping Sleeves	30”-64” Ductile Iron
Mechanical Joint Fittings	30"-48" Ductile Iron
Flanged Fittings	30"-64" Ductile Iron
XTRA FLEX® Couplings	4"-24" Ductile Iron
Miscellaneous Products	
PROTECTO 401™ Lined Ductile Iron Pipe for Domestic Sewage and Industrial Wastes	4"-64" Ductile Iron
GLASS Lined Ductile Iron Pipe for Wastewater Treatment Plants	4”-30” Ductile Iron
RING FLANGE-TYTE® Gaskets	4"-36"
FULL FACE FLANGE-TYTE® Gaskets	4"-64"
MJ Harness-Lok	4”-48” Ductile Iron
Saddle Outlets	Various Ductile Iron
Welded Outlets	Various Ductile Iron
Polyethylene Encasement	4"-64"

Our products are manufactured in conformance with National Standards so that our customers may be assured of getting the performance and longevity they expect. Use of accessories or other appurtenances that do not comply with recognized standards may jeopardize the performance and longevity of the project.

2013 EDITION

3"-64"

TYTON JOINT® Pipe

DUCTILE IRON

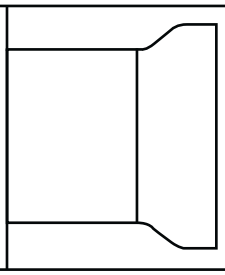
NSF® Certified to ANS/NSF 61

FOR WATER & WASTEWATER, FIRE PROTECTION & INDUSTRIAL APPLICATIONS

PUTNAM PIPE CORPORATION

MORE THAN JUST PIPE.

U.S. PIPE



TYTON JOINT® Pipe

PUTNAM PIPE CORPORATION

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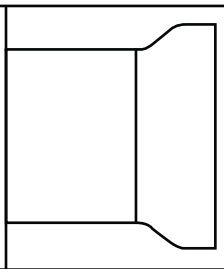

TYTON JOINT® Pipe

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TYTON JOINT Pipe

TYTON JOINT is U.S. Pipe's trademark for pipe with a push-on type connection. Simplicity, sturdiness and water-tightness of the system are built into the system by design. Convincing proof of its worldwide acceptance is shown by the fact that more than 95% of the pipe now sold by U.S. Pipe is TYTON JOINT Pipe.

TYTON JOINT Pipe is available in sizes 3" through 64". Sizes 3" through 42" are available in nominal 18-foot laying lengths. 6" through 24" sizes along with sizes 48" through 64" are available in nominal 20-foot laying lengths.

TYTON JOINT Pipe in sizes 4" through 36" are UL Listed and sizes 4" through 16" are FM Approved.

When TYTON JOINT Pipe are used for bridge crossings or other above-ground installations, each length of pipe must be supported in a manner to restrict both vertical and horizontal movement.

TYTON® Gasket is the only accessory required when installing TYTON JOINT Pipe. It is a circular rubber gasket which has a modified bulb shape in cross section. Gaskets are furnished in accordance with ANSI/AWWA C111/A21.1. Composition and dimensions of the gasket have been carefully engineered to ensure a water-tight and lasting seal. The standard TYTON Gasket is manufactured of SBR - styrene butadiene rubber. Gaskets of special elastomers may be ordered for special applications. The gasket contour and bell socket contour ensure that the gasket will remain seated during proper assembly of the pipe. When joint restraint is required for push-on joint pipe, two options are available from U.S. Pipe. For joint restraint of 4" through 24", FIELD LOK 350® Gaskets may be used and for joint restraint for 30" and 36", FIELD LOK® Gaskets may be used. FIELD LOK 350 Gaskets are rated for 350 psi in sizes 4" through 24". In addition, for 4" through 36" sizes, TR FLEX Pipe and Fittings may be used and for 30" through 64" sizes, HP LOK® Pipe and Fittings may be used. TR FLEX Pipe and Fittings are rated for working pressures for 350 psi in 4" through 24" sizes, 250 psi in sizes 30" through 36" and for HP LOK Pipe and Fittings, the working pressure is 350 psi for 30" through 64". For higher pressure applications contact your U.S. Pipe representative. Complete details on both FIELD LOK 350 Gaskets and TR FLEX Pipe and Fittings can be found on our website, www.uspipe.com.

NOTE: *U.S. Pipe qualifies for Federal Procurement under Public Law No. 94-580, Section 6002, known as the Resource Recovery Act of 1976, since, due to modern technology, recycled iron and steel scrap is used to a large degree in our Ductile Iron Pipe production.*

The plain end of the pipe is furnished beveled or with a quarter ellipse on the edge to allow assembly. More than 40 years of successful experience have proved its sealing capabilities. Hydrostatic tests have shown that the system will withstand pressures far in excess of rated pressures.

ANSI/AWWA Standards

ANSI/AWWA C151/A21.5, Ductile-Iron Pipe, Centrifugally Cast for Water.

Ductile Iron TYTON JOINT Pipe is centrifugally cast in metal molds in accordance with ANSI/AWWA C151/A21.5.

The asphaltic outside coating is in accordance with ANSI/AWWA C151/A21.51.

As specified in ANSI/AWWA C151/A21.51, pipe weights have been calculated using standard barrel weights and weights of bells being produced.

ANSI/AWWA C104/A21.4, Cement-Mortar Lining For Ductile-Iron Pipe and Fittings For Water.

The cement-mortar lining and inside coating are in accordance with ANSI/AWWA C104/ A21.4. Special linings and/or coatings can be furnished for specific conditions.

ANSI/AWWA C111/A21.11, Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.

TYTON® Gaskets are furnished in accordance with ANSI/AWWA C111/A21.11.

ANSI/AWWA C105/A21.5, Polyethylene Encasement for Ductile Iron Pipe Systems.

If specifiers and users believe that corrosive soils will be encountered where our products are to be installed, please refer to ANSI/AWWA C105/A21.5, for proper external protection procedures.

ASTM A746-03 "Standard specification for Ductile Iron Gravity Sewer Pipe."

ASTM A716-08 "Standard Specification for Ductile Iron Culvert Pipe."

ASTM A536 "Standard Specification for Ductile Iron Castings."

TYTON JOINT® Pipe

PUTNAM PIPE CORPORATION

Assembly

Figure 1. Insertion of Gasket

All foreign matter in the socket must be removed, i.e., mud, sand, cinders, gravel, pebbles, trash, frozen material, etc. The gasket seat should be thoroughly inspected to be certain it is clean. Foreign matter in the gasket seat may cause a leak. The gasket must be wiped clean with a clean cloth, flexed, and then placed into the socket with the rounded bulb end entering first. Looping the gasket in the initial insertion will facilitate seating the gasket heel evenly around the retainer seat. 3" through 12" sizes require only one loop. For larger sizes, additional loops may be required: 14" through 36", two to three loops; 42" through 54", four to six loops; 60" and 64", six or more loops. Evenly space the loops around the socket with each loop raised 4-5 inches. After loops are established, push each loop down to finish installation of the gasket. When installing TYTON JOINT Pipe in sub-freezing weather, the gaskets, prior to their use, must be kept at a temperature of at least 40°F by suitable means, such as storing in a heated area or keeping them immersed in a tank of warm water. If the gaskets are kept in warm water, they should be dried before placing in the pipe socket.

Figure 2. Application of Lubricant

A thin film of TYTON JOINT® Lubricant should be applied to the inside surface of the gasket, which will come in contact with the plain end of the pipe. In warm, dry weather conditions, the lubricant can dry out, especially when applied to warm or hot pipe, it will be necessary to add a small amount of water to hydrate the lubricant. Only TYTON JOINT Lubricant should be used. Spray-on lubricants should not be used as it may not provide sufficient lubricity. The plain end of the pipe must be cleaned of all foreign matter on the outside from the end to the stripes. Frozen materials may cling to the pipe in cold weather and must be removed. A thin film of lubricant is applied to the outside of the plain end for about 3" back from the end. Do not allow the plain end to touch the ground or trench side after lubricating since foreign matter may adhere to the plain end and cause a leak.

Figure 3. Initial Entry of Plain End in Socket

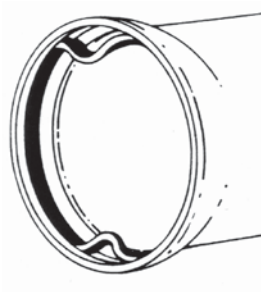
The plain end of the pipe should be aligned and carefully entered into the socket until it just makes contact with the gasket. This is the starting position for the final assembly of the joint. Note the two painted stripes on the plain end.

Figure 4. Completely Assembled Joint

Joint assembly should be completed by forcing the plain end of the entering pipe past the gasket (which is thereby compressed) until the plain end makes contact with the bottom of the socket. Note that the first painted stripe will have disappeared into the socket and the front edge of the second stripe will be approximately flush with the bell face. Joint deflection may be achieved after the pipe is fully inserted. If assembly is not accomplished with the application of reasonable force by the methods indicated, the plain end of the pipe should be removed to check for the proper positioning of the gasket, adequate lubrication, and removal of foreign matter in the joint.

A feeler gage may be inserted between the bell and the plain end of the assembled joint to verify the position of the gasket. When the gage encounters the gasket, increased resistance will be felt. Note the depth of insertion of the gage. Continue probing around the periphery of the joint, noting the depth to resistance each time. If the depth of insertion is uniform, the gasket has remained in place. If, at any point, the depth of insertion increases significantly, this indicates a dislodged gasket. The joint should be disassembled, thoroughly cleaned with water, and examined for any condition that might have caused the gasket to become dislodged before attempting to reassemble the joint.

1.



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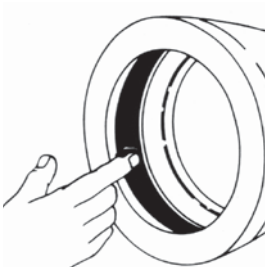

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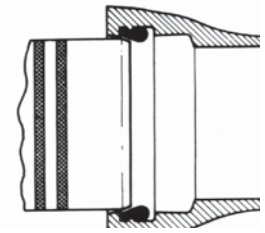

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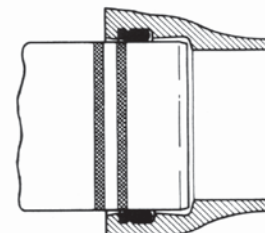


NOTE: *When using FIELD LOK 350® Gaskets or pipe with special linings, assemble the joint until the inside edge of the first painted stripe (or the assembly mark) is flush with the bell face.*

CAUTION: *The inside of the socket, the gasket, and the plain end to be inserted must be kept clean through-out the assembly. Joints are only as water-tight as they are clean. If the joint is somewhat difficult to assemble, inspect for proper gasket positioning, adequate lubrication, and foreign matter in the joint.*

PUTNAM PIPE CORPORATION

Alternate Methods of Assembly

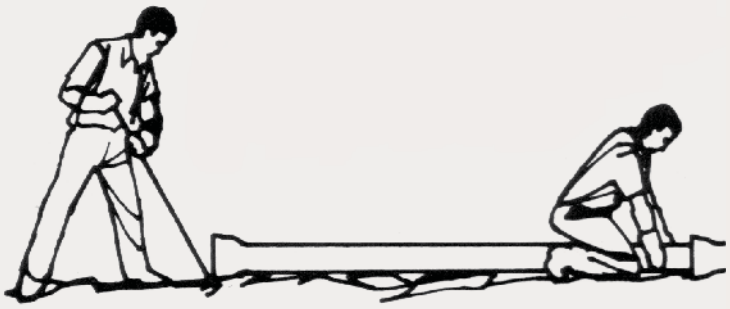
Procedures outlined in figures 1-3 on page 3, showing the assembly of TYTON JOINT Pipe, should be followed before proceeding with the methods shown below.

Backhoe Method of Assembly

A backhoe may be used to assemble pipe of intermediate and larger sizes. The plain end of the pipe should be carefully guided by hand into the bell of the previously assembled pipe. The bucket of the backhoe may then be used to carefully push the pipe until fully seated. A timber header should be used between the pipe and the backhoe bucket to avoid damage to the pipe. Caution: Avoid "slamming" the pipe home to prevent damage to lining material inside the bell at the back of the socket.

Crowbar Method of Assembly

Smaller sizes of pipe may be assembled using a crowbar as a lever and pushing against the face of the bell.



Come-along Method of Assembly

Installers may prefer to use come-alongs to assemble pipe of all sizes. Two (2) 3/4 ton chain hoists, 24 feet of chain and two (2) bell choker slings for 3"-24" sizes or two (2) 1-1/2 ton (minimum) chain hoists for 30"-64" sizes.

TYTON JOINT® Pipe

PUTNAM PIPE CORPORATION

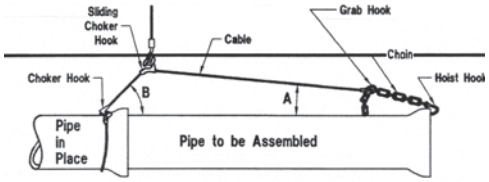
Alternate Methods of Assembly (cont.)

The most common field method of assembling larger diameter TYTON JOINT Pipe is to use a backhoe to push against the face of the bell end of the pipe to be assembled. Occasionally, there are installations where a backhoe cannot be located in line with the pipe and it is, therefore, difficult to develop enough axial force to assemble the pipe. In such cases, it may be possible to use the method described below to assemble the pipe from the side of the trench. With this method, the weight of the pipe is used to provide the axial force required for assembly. In general, a choker chain or cable is hooked around the bell of the previously laid pipe. The spigot end of the pipe to be assembled is first inserted as far as possible into the bell end of the previously laid pipe. The end of the choker is then hooked into the bell end of the pipe to be laid.

One such rigging is made from a long cable with a choker on one end and a chain grab hook on the other end with a sliding choker hook between the two other hooks. A second section of the rigging is a shorter chain with a wide throat hoisting hook on one end. The cable is first "choked" around the bell of the previously laid pipe using the fixed choker hook. The chain is hooked into the bell end of the pipe to be laid. The cable is hooked to the chain with the grab hook. The connected length of the rigging can thus be adjusted with the connection between the cable grab hook and the chain. The pipe assembly is made by lifting up on the sliding choker hook.

A few rules of thumb:

1. Angle 'A' should be no greater than 15 degrees.
2. Angle 'B' should be from 45 to 60 degrees.
3. The sliding choker hook should be located from 2 to 8 feet from the bell of the previously laid pipe.
4. Trial assembly may be made to get a "feel" for the correct amount of slack to be left in the rigging and the proper location of the sliding choker hook.



A few precautions:

1. The smaller the angle (A), the larger will be the assembly force and the tension in the rigging. The assembly force and the tension will generally range from 2 to 10 times the weight of the pipe being assembled. These forces are at a maximum when the assembly is bottomed out and lift is still being applied to the rigging. To minimize the loads on the rigging, it is recommended that the assembly be made slowly and the assembly stopped as soon as the joint is bottomed out.
2. The rigging should be properly designed to accommodate the diameter, length, and weight of the pipe on the job and the loads previously described.

NOTE: *This method should not be employed when installing FIELD LOK 350® Gaskets since alignment of the joint cannot be assured. For the proper installation practice, refer to U.S. Pipe Brochure FIELD LOK 350® Gasket Joint Restraint for 4"-24" Ductile Iron Pipe for Water, Wastewater, Fire Protection and Industrial Applications.*

TYTON JOINT® Pipe

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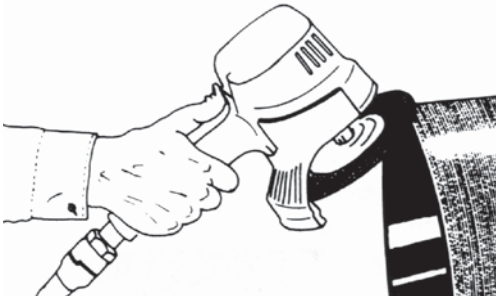
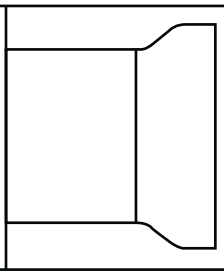
Field Cut Pipe

When pipe are cut in the field, the cut end may be readily conditioned so that it can be used to make up the next joint. The outside of the cut end should be beveled with a portable grinder about 1/4 - inch at an angle of about 30 degrees. This operation removes any sharp, rough edges which otherwise might damage the gasket.

When Ductile Iron pipe 14" and larger is to be cut in the field, the material should be ordered as “GAUGED FULL LENGTH.” A *Full Length Gauged Pipe* is a pipe whose barrel outside diameter is within the spigot diameter dimensional specifications as determined by diameter tape measurements over the pipe’s length to within approximately two feet of the bell chime. Pipe that is “gauged full length" is specially marked to avoid confusion. ANSI/AWWA C151 Standard for Ductile Iron pipe requires factory gauging of the spigot end. Accordingly, pipe selected for field cutting should also be field gauged in the location of the cut and ensured to be within the tolerances shown in the table on page 8. In the field a mechanical joint gland can be used as a gauging device.



NOTE: *When necessary, pipe may be rounded in accordance with U.S. Pipe’s Brochure, Recommended Methods For Rounding The Cut Ends Of Out-Of-Round 14" And Larger Diameter Ductile Iron Pipe.*



TYTON JOINT® Pipe

PUTNAM PIPE CORPORATION

Pipe Diameters

Suitable Pipe Diameters for Field Cuts and Restrained Joint Field Fabrication.

NOMINAL PIPE SIZE Inches	PIPE DIAMETER Inches	
	MINIMUM	MAXIMUM
3	3.90	4.02
4	4.74	4.86
6	6.84	6.96
8	8.99	9.11
10	11.04	11.16
12	13.14	13.26
14	15.22	15.35
16	17.32	17.45
18	19.42	19.55
20	21.52	21.65
24	25.72	25.85
30	31.94	32.08
36	38.24	38.38
42	44.44	44.58
48	50.74	50.88
54	57.46	57.60
60	61.51	61.65
64	65.57	65.71

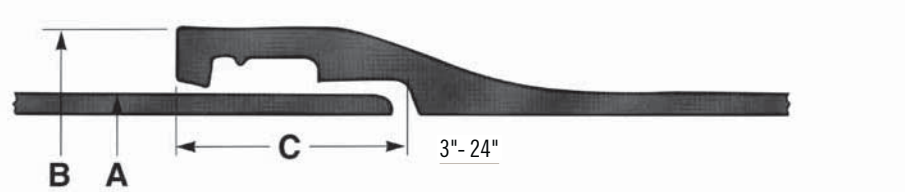
Above table based on ANSI/AWWA C151/A21.51 guidelines for push-on joints.

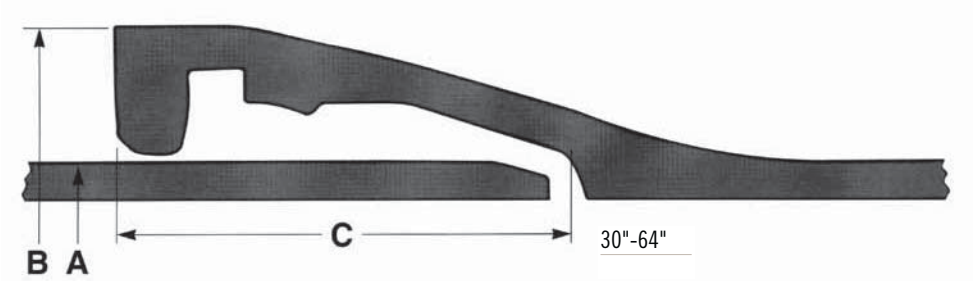
NOTE: *For accuracy, a diameter tape graduated in 100th's must be used.*

TYTON JOINT® Pipe

PUTNAM PIPE CORPORATION

Bell Dimensions

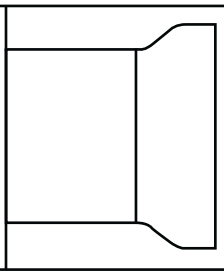




NOTE: *Actual bell configuration may vary from illustration shown.*

SIZE Inches	A PIPE OUTER DIAMETER Inches	B BELL OUTER DIAMETER Inches	C SOCKET DEPTH Inches
3	3.96	5.56	3.00
4	4.80	6.52	3.15
6	6.90	8.66	3.38
8	9.05	10.82	3.69
10	11.10	12.91	3.75
12	13.20	15.05	3.75
14	15.30	17.67	5.00
16	17.40	19.79	5.00
18	19.50	21.91	5.00
20	21.60	24.03	5.50
24	25.80	28.21	5.95
30	32.00	35.40	6.55
36	38.30	41.84	7.00
42	44.50	49.36	7.90
48	50.80	55.94	8.60
54	57.56	63.38	9.40
60	61.61	67.38	10.10
64	65.67	71.56	10.65

**Subject to manufacturing tolerances. Dimensions in inches.*



TYTON JOINT® Pipe

PUTNAM PIPE CORPORATION

Pressure Class

Nominal Thickness for Standard Pressure Classes of Ductile Iron Pipe

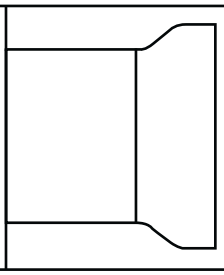
SIZE Inches	OUTSIDE DIAMETER Inches	NOMINAL THICKNESS Inches PRESSURE CLASS*					CASTING TOLERANCES Inches
		150	200	250	300	350	
3	3.96	—	—	—	—	0.25**	0.05
4	4.80	—	—	—	—	0.25**	0.05
6	6.90	—	—	—	—	0.25**	0.05
8	9.05	—	—	—	—	0.25**	0.05
10	11.10	—	—	—	—	0.26	0.06
12	13.20	—	—	—	—	0.28	0.06
14	15.30	—	—	0.28	0.30	0.31	0.07
16	17.40	—	—	0.30	0.32	0.34	0.07
18	19.50	—	—	0.31	0.34	0.36	0.07
20	21.60	—	—	0.33	0.36	0.38	0.07
24	25.80	—	0.33	0.37	0.40	0.43	0.07
30	32.00	0.34	0.38	0.42	0.45	0.49	0.07
36	38.30	0.38	0.42	0.47	0.51	0.56	0.07
42	44.50	0.41	0.47	0.52	0.57	0.63	0.07
48	50.80	0.46	0.52	0.58	0.64	0.70	0.08
54	57.56	0.51	0.58	0.65	0.72	0.79	0.09
60	61.61	0.54	0.61	0.68	0.76	0.83	0.09
64	65.67	0.56	0.64	0.72	0.80	0.87	0.09

NOTE: *Per ANSI/AWWA C150/A21.50 the thicknesses in above table include the 0.08" service allowance and the casting tolerance by size ranges.*

Dimensions and weights of Special Classes (Thickness Classes) are found on pages 13, 14, 15 and 16.

** Pressure Classes are defined as the rated water pressure of the pipe in psi. The thicknesses shown are adequate for the rated water working pressure plus a surge allowance of 100 psi. Calculations are based on a minimum yield strength of 42,000 and a 2.0 safety factor times the sum of the working pressure and 100 psi surge allowance.*

*** Calculated thickness for these sizes and pressure ratings are less than those shown above. Presently these are the lowest nominal thicknesses available in these sizes.*



TYTON JOINT® Pipe

Pressure Class – Thickness, Dimensions and Weig...

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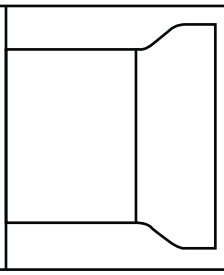
SIZE Inches	PRESSURE CLASS psi	THICKNESS Inches	OUTSIDE DIAMETER* Inches	BARREL WEIGHT PER FOOT Pounds	18-FOOT LAYING LENGTH WEIGHT PER LENGTH† Pounds	20-FOOT LAYING LENGTH WEIGHT PER LENGTH† Pounds
3	350	0.25	3.96	8.9	170	—
4	350	0.25	4.80	10.9	205	—
6	350	0.25	6.90	16.0	305	335
8	350	0.25	9.05	21.1	400	445
10	350	0.26	11.10	27.1	515	570
12	350	0.28	13.20	34.8	660	730
14	250	0.28	15.30	40.4	780	865
14	300	0.30	15.30	43.3	920	1010
14	350	0.31	15.30	44.7	860	945
16	250	0.30	17.40	49.3	950	1050
16	300	0.32	17.40	52.5	1010	1115
16	350	0.34	17.40	55.8	1065	1175
18	250	0.31	19.50	57.2	1095	1210
18	300	0.34	19.50	62.6	1195	1320
18	350	0.36	19.50	66.2	1260	1390
20	250	0.33	21.60	67.5	1285	1420
20	300	0.36	21.60	73.5	1395	1540
20	350	0.38	21.60	77.5	1465	1620
24	200	0.33	25.80	80.8	1550	1710
24	250	0.37	25.80	90.5	1725	1905
24	300	0.40	25.80	97.7	1855	2050
24	350	0.43	25.80	104.9	1985	2195
30	150	0.34	32.00	103.5	2005	—
30	200	0.38	32.00	115.5	2220	—
30	250	0.42	32.00	127.5	2595	—
30	300	0.45	32.00	136.5	2810	—
30	350	0.49	32.00	148.4	2685	—
36	150	0.38	38.30	138.5	2945	—
36	200	0.42	38.30	152.9	2940	—
36	250	0.47	38.30	170.9	3265	—
36	300	0.51	38.30	185.3	3525	—
36	350	0.56	38.30	203.2	3845	—

NOTE: *Thicknesses and dimensions of 3" through 64" Ductile Iron pipe conform to ANSI/AWWA C151/A21.51. Weights may vary from the standard because of differences in bell weights.*

**Tolerance of O.D. of spigot end: 3-12 in., ±0.06 in.; 14-24 in., +0.05 in., -0.08 in.; 30-48 in., +0.08 in., -0.06 in.; 54-64 in., +0.04 in., -0.10 in.*

† Including bell; calculated weight of pipe rounded off to nearest 5 lbs.

Table continued on next page.



TYTON JOINT® Pipe

PUTNAM PIPE CORPORATION

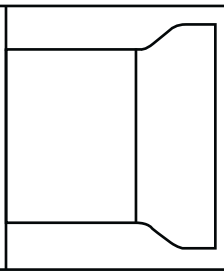
Pressure Class – Thicknesses, Dimensions and Weight (cont.)

SIZE Inches	PRESSURE CLASS psi	THICKNESS Inches	OUTSIDE DIAMETER* Inches	BARREL WEIGHT PER FOOT Pounds	18-FOOT LAYING LENGTH WEIGHT PER LENGTH† Pounds	20-FOOT LAYING LENGTH WEIGHT PER LENGTH† Pounds
42	150	0.41	44.50	173.8	3505	—
42	200	0.47	44.50	198.9	3960	—
42	250	0.52	44.50	219.9	4335	—
42	300	0.57	44.50	240.7	4710	—
42	350	0.63	44.50	265.7	5160	—
48	150	0.46	50.80	—	—	4950
48	200	0.52	50.80	—	—	5525
48	250	0.58	50.80	—	—	6095
48	300	0.64	50.80	—	—	6670
48	350	0.70	50.80	—	—	7240
54	150	0.51	57.56	—	—	6430
54	200	0.58	57.56	—	—	7190
54	250	0.65	57.56	—	—	7945
54	300	0.72	57.56	—	—	8700
54	350	0.79	57.56	—	—	9455
60	150	0.54	61.61	—	—	7305
60	200	0.61	61.61	—	—	8120
60	250	0.68	61.61	—	—	8935
60	300	0.76	61.61	—	—	9860
60	350	0.83	61.61	—	—	10665
64	150	0.56	65.67	—	—	8100
64	200	0.64	65.67	—	—	9090
64	250	0.72	65.67	—	—	10080
64	300	0.80	65.67	—	—	11065
64	350	0.87	65.67	—	—	11925

NOTE: *Thicknesses and dimensions of 3" through 64" Ductile Iron pipe conform to ANSI/AWWA C151/A21.51. Weights may vary from the standard because of differences in bell weights.*

**Tolerance of O.D. of spigot end: 3-12 in., ±0.06 in.; 14-24 in., +0.05 in., -0.08 in.; 30-48 in., +0.08 in., -0.06 in.; 54-64 in., +0.04 in., -0.10 in.*

† Including bell; calculated weight of pipe rounded off to nearest 5 lbs.



TYTON JOINT® Pipe

PUTNAM PIPE CORPORATION

Thickness Class – Thicknesses, Dimensions and Weight

SIZE Inches	THICKNESS CLASS	THICKNESS Inches	OUTSIDE DIAMETER* Inches	BARREL WEIGHT PER FOOT Pounds	18-FOOT LAYING LENGTH WEIGHT PER LENGTH† Pounds	20-FOOT LAYING LENGTH WEIGHT PER LENGTH† Pounds
3	51	0.25	4.02	8.9	170	—
3	52	0.28	4.02	9.9	185	—
3	53	0.31	4.02	10.9	205	—
3	54	0.34	4.02	11.8	220	—
3	55	0.37	4.02	12.8	240	—
3	56	0.40	4.02	13.7	255	—
4	51	0.26	4.80	11.3	215	—
4	52	0.29	4.80	12.6	235	—
4	53	0.32	4.80	13.8	260	—
4	54	0.35	4.80	15.0	280	—
4	55	0.38	4.80	16.1	300	—
4	56	0.41	4.80	17.3	320	—
6	50	0.25	6.90	16.0	305	335
6	51	0.28	6.90	17.8	335	370
6	52	0.31	6.90	19.6	370	410
6	53	0.34	6.90	21.4	400	445
6	54	0.37	6.90	23.2	435	480
6	55	0.40	6.90	25.0	465	515
6	56	0.43	6.90	26.7	495	550
8	50	0.27	9.05	22.8	430	475
8	51	0.30	9.05	25.2	475	525
8	52	0.33	9.05	27.7	520	575
8	53	0.36	9.05	30.1	560	620
8	54	0.39	9.05	32.5	605	670
8	55	0.42	9.05	34.8	650	720
8	56	0.45	9.05	37.2	690	765

NOTE: *Thicknesses and dimensions of 3" through 64" Ductile Iron pipe conform to ANSI/AWWA C151/A21.51. Weights may vary from the standard because of differences in bell weights.*

**Tolerance of O.D. of spigot end: 3-12 in., ±0.06 in.; 14-24 in., +0.05 in., -0.08 in.; 30-48 in., +0.08 in., -0.06 in.; 54-64 in., +0.04 in., -0.10 in.*

† Including bell; calculated weight of pipe rounded off to nearest 5 lbs.

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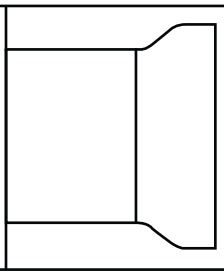

TYTON JOINT® Pipe

PUTNAM PIPE CORPORATION

Thickness Class – Thicknesses, Dimensions and Weight (cont.)

SIZE Inches	THICKNESS CLASS	THICKNESS Inches	OUTSIDE DIAMETER* Inches	BARREL WEIGHT PER FOOT Pounds	18-FOOT LAYING LENGTH WEIGHT PER LENGTH† Pounds	20-FOOT LAYING LENGTH WEIGHT PER LENGTH† Pounds
10	50	0.29	11.10	30.1	570	630
10	51	0.32	11.10	33.2	625	690
10	52	0.35	11.10	36.2	680	750
10	53	0.38	11.10	39.2	730	810
10	54	0.41	11.10	42.1	785	870
10	55	0.44	11.10	45.1	840	930
10	56	0.47	11.10	48.0	890	990
12	50	0.31	13.20	38.4	725	800
12	51	0.34	13.20	42.0	790	875
12	52	0.37	13.20	45.6	855	945
12	53	0.40	13.20	49.2	920	1015
12	54	0.43	13.20	52.8	985	1090
12	55	0.46	13.20	56.3	1045	1160
12	56	0.49	13.20	59.9	1110	1230
14	50	0.33	15.30	47.5	910	1005
14	51	0.36	15.30	51.7	985	1090
14	52	0.39	15.30	55.9	1060	1170
14	53	0.42	15.30	60.1	1135	1255
14	54	0.45	15.30	64.2	1210	1340
14	55	0.48	15.30	68.4	1285	1420
14	56	0.51	15.30	72.5	1360	1505
16	50	0.34	17.40	55.8	1065	1175
16	51	0.37	17.40	60.6	1150	1275
16	52	0.40	17.40	65.4	1240	1370
16	53	0.43	17.40	70.1	1325	1465
16	54	0.46	17.40	74.9	1410	1560
16	55	0.49	17.40	79.7	1495	1655
16	56	0.52	17.40	84.4	1580	1750

NOTE: *Thicknesses and dimensions of 3" through 64" Ductile Iron pipe conform to ANSI/AWWA C151/A21.51. Weights may vary from the standard because of differences in bell weights.*

**Tolerance of O.D. of spigot end: 3-12 in., ±0.06 in.; 14-24 in., +0.05 in., -0.08 in.; 30-48 in., +0.08 in., -0.06 in.; 54-64 in., +0.04 in., -0.10 in.*

† Including bell; calculated weight of pipe rounded off to nearest 5 lbs.

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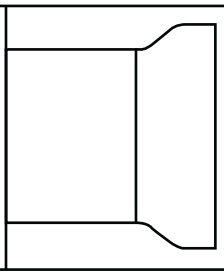


TYTON JOINT® Pipe

PUTNAM PIPE CORPORATION

Thickness Class – Thicknesses, Dimensions and Weight (cont.)

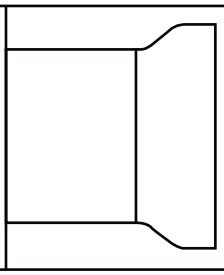
SIZE Inches	THICKNESS CLASS	THICKNESS Inches	OUTSIDE DIAMETER* Inches	BARREL WEIGHT PER FOOT Pounds	18-FOOT LAYING LENGTH WEIGHT PER LENGTH† Pounds	20-FOOT LAYING LENGTH WEIGHT PER LENGTH† Pounds
18	50	0.35	19.50	64.4	1225	1355
18	51	0.38	19.50	69.8	1325	1465
18	52	0.41	19.50	75.2	1420	1570
18	53	0.44	19.50	80.6	1520	1680
18	54	0.47	19.50	86.0	1615	1785
18	55	0.50	19.50	91.3	1710	1895
18	56	0.53	19.50	96.7	1805	2000
20	50	0.36	21.60	73.5	1395	1540
20	51	0.39	21.60	79.5	1505	1660
20	52	0.42	21.60	85.5	1610	1780
20	53	0.45	21.60	91.5	1720	1900
20	54	0.48	21.60	97.5	1825	2020
20	55	0.51	21.60	103.4	1935	2140
20	56	0.54	21.60	109.3	2040	2260
24	50	0.38	25.80	92.9	1765	1955
24	51	0.41	25.80	100.1	1895	2095
24	52	0.44	25.80	107.3	2025	2240
24	53	0.47	25.80	114.4	2155	2385
24	54	0.50	25.80	121.6	2285	2530
24	55	0.53	25.80	128.8	2415	2670
24	56	0.56	25.80	135.9	2540	2815
30	50	0.39	32.00	118.5	2275	—
30	51	0.43	32.00	130.5	2490	—
30	52	0.47	32.00	142.5	2705	—
30	53	0.51	32.00	154.4	2920	—
30	54	0.55	32.00	166.3	3135	—
30	55	0.59	32.00	178.2	3350	—
30	56	0.63	32.00	190.0	3560	—

NOTE: *Thicknesses and dimensions of 3" through 64" Ductile Iron pipe conform to ANSI/AWWA C151/A21.51. Weights may vary from the standard because of differences in bell weights.*

**Tolerance of O.D. of spigot end: 3-12 in., ±0.06 in.; 14-24 in., +0.05 in., -0.08 in.; 30-48 in., +0.08 in., -0.06 in.; 54-64 in., +0.04 in., -0.10 in.*

† Including bell; calculated weight of pipe rounded off to nearest 5 lbs.

Table continued on next page.



TYTON JOINT® Pipe

PUTNAM PIPE CORPORATION

Thickness Class – Thicknesses, Dimensions and Weight (cont.)

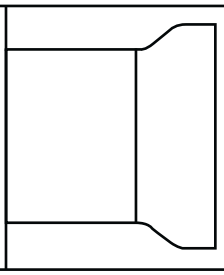
					18-FOOT LAYING LENGTH	20-FOOT LAYING LENGTH
SIZE Inches	**THICKNESS CLASS**	**THICKNESS** Inches	**OUTSIDE DIAMETER*** Inches	**BARREL WEIGHT PER FOOT** Pounds	**WEIGHT PER LENGTH†** Pounds	**WEIGHT PER LENGTH†** Pounds
36	50	0.43	38.30	156.5	3010	—
36	51	0.48	38.30	174.5	3330	—
36	52	0.53	38.30	192.4	3655	—
36	53	0.58	38.30	210.3	3975	—
36	54	0.63	38.30	228.1	4295	—
36	55	0.68	38.30	245.9	4615	—
36	56	0.73	38.30	263.7	4935	—
42	50	0.47	44.50	198.9	3960	—
42	51	0.53	44.50	224.0	4410	—
42	52	0.59	44.50	249.1	4860	—
42	53	0.65	44.50	274.0	5310	—
42	54	0.71	44.50	298.9	5760	—
42	55	0.77	44.50	323.7	6205	—
42	56	0.83	44.50	348.4	6650	—
48	50	0.51	50.80	—	—	5430
48	51	0.58	50.80	—	—	6095
48	52	0.65	50.80	—	—	6765
48	53	0.72	50.80	—	—	7430
48	54	0.79	50.80	—	—	8095
48	55	0.86	50.80	—	—	8755
48	56	0.93	50.80	—	—	9415
54	50	0.57	57.56	—	—	7080
54	51	0.65	57.56	—	—	7945
54	52	0.73	57.56	—	—	8810
54	53	0.81	57.56	—	—	9670
54	54	0.89	57.56	—	—	10530
54	55	0.97	57.56	—	—	11390
54	56	1.05	57.56	—	—	12240

NOTE: *Thicknesses and dimensions of 3" through 64" Ductile Iron pipe conform to ANSI/AWWA C151/A21.51. Weights may vary from the standard because of differences in bell weights.*

60" and 64" classified as pressure class only.

**Tolerance of O.D. of spigot end: 3-12 in., ±0.06 in.; 14-24 in., +0.05 in., -0.08 in.; 30-48 in., +0.08 in., -0.06 in.; 54-64 in., +0.04 in., -0.10 in.*

† Including bell; calculated weight of pipe rounded off to nearest 5 lbs.



TYTON JOINT® Pipe

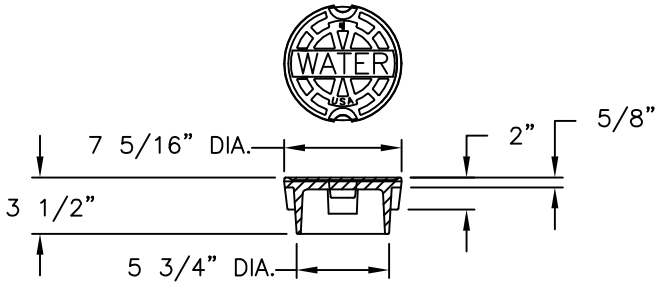
PUTNAM PIPE CORPORATION

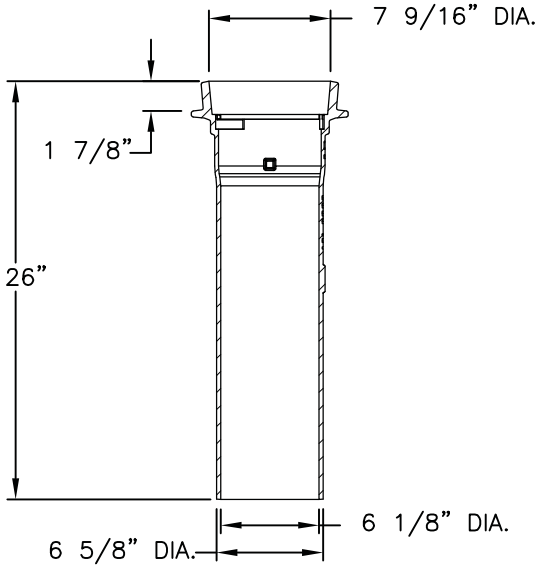
Maximum Deflection – Full Length Pipe

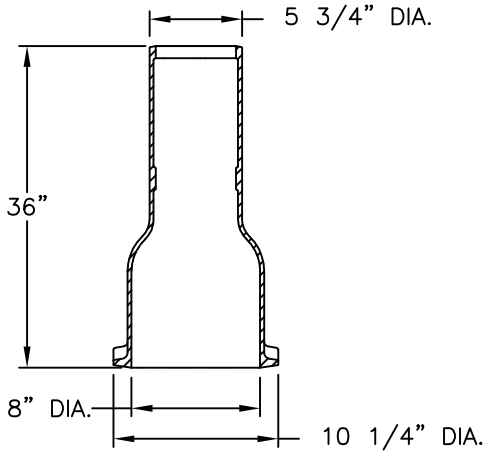
SIZE Inches	MAXIMUM JOINT DEFLECTION Degrees	DEFLECTION Inches		PRODUCED BY SUCCESSION OF JOINTS Feet	
		18 FT. LENGTH	20 FT. LENGTH	18 FT. LENGTH	20 FT. LENGTH
3	5º	19	—	206	—
4	5º	19	—	206	—
6	5º	19	—	206	—
8	5º	19	21	206	229
10	5º	19	—	206	—
12	5º	19	21	206	229
14	5º	19	21	206	229
16	5º	19	21	206	229
18	5º	19	21	206	229
20	5º	19	21	206	229
24	5º	19	21	206	229
30	5º	19	—	206	—
36	5º	19	—	206	—
42	4º	15	—	258	—
48	4º	—	17	—	287
54	4º	—	17	—	287
60	4º	—	17	—	287
64	4º	—	17	—	287

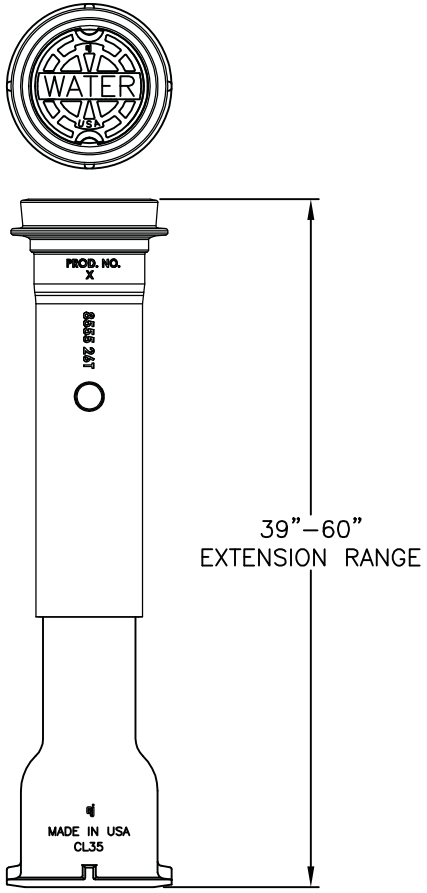
EJ VALVE BOXES ARE OF DOMESTIC MANUFACTURE

8555 36B 26T Set









VIEW OF ASSEMBLED COMPONENTS
TO BE ASSEMBLED ON JOB SITE

Product Number

06800001C01

Design Features

-Materials
Valve Box Cover
Gray Iron (CL35B)

Gray Iron (CL35B)

Gray Iron (CL35B)

-Design Load
Heavy Duty
-Open Area
n/a
-Coating
Dipped
-√Designates Machined Surface

Certification

- ASTM A48
- ASTM A48
-
-Country of Origin:USA

Major Components

06800001
85557228
85556036

Drawing Revision

9/10/2009 Designer: GAD
1/24/2014 Revised By: MAH

Disclaimer

Weights (lbs./kg) dimensions (inches/mm) and drawings provided for your guidance. We reserve the right to modify specifications without prior notice.

Contact

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