Farmington, NM Branch 522
5142 Primavera Drive
Farmington, NM 87401
Ph: (505)327-6674 Fax: (505)327-6927

MAY, 2021

Contractor: NTUA

Job Name: ANETH, UT- NTUA- PRV

To Whom It May Concern:

Attached and listed below are ___ ( ) copies of certifications, data sheets and/or drawings for use as submittal data for the above referenced job. Please have one (1) copy of each marked “APPROVED” and returned to us as soon as possible. Thank you.

Storm:

1. C900 DR18, SDR35 & SDR21 PVC PIPE; NAPCO, JM EAGLE, VINYL TECH, DIAMOND PLASTIC
2. TJ PR350 DI PIPE, SCH40 GALV STL PIPE, STL BOLLARD; MCWANE DUCTILE, US PIPE, 101 PIPE
3. MJ C153 FITTINGS, FLG TEE C110, 564S VLV BOX,MJ BOLT & GSKT KIT; TYLER UNION, STAR PIPE, US PIPE
4. A2361, A2362 GATE VALVE; MUELLER CO
5. 2” MODEL 90-01, 4” MODEL 90-01; CLA-VAL
6. MEGALUG 2000 SERIES, MEGALUG DI SERIES 1104, MEGAFLG 2104; EBBA IRON
7. 421 CPLG, 317 TAP SADDLE; SMITH BLAIR
8. GALV FITTINGS & NIPPLES, 304SS FF RR ACC KIT; ANVIL INTL, BRECCO
9. 5544AB VLV, HOSE BIBB BFP-9; RED WHITE VALVE
10. GALV COMP FLG; MATCO NORCA
11. LS-300-SS; LINKSEAL
12. CL200 PVC FITTING; HARCO
13. CUM375 WTR MARKER, POLY TAPE; CARSONITE, NORTHTOWN
14. 100-200PSI PRESS GAUGE 4.5; BOSHART IND

If you have any questions or concerns, please do not hesitate to contact us.

NAPCO PIPE & FITTINGS

MUNICIPAL
PRODUCT SPECIFICATION

AWWA C900/IB PVC Pressure Pipe | Gasketed Integral Bell

NAPCO's AWWA C900 Gasketed Integral Bell PVC Pipe product line is manufactured to meet the needs of modern municipal water, wastewater, and reclaimed water systems. With top quality raw materials and modern processing technology, our C900 pipe meets all industry standards in addition to our own rigorous quality control requirements.

Our C900 pipe utilizes Rieber style gaskets throughout the entire product offering to create a leak-free joint.

Short Form Specification		
Pipe Standard:	AWWA C900-16	
Diameter Std.:	Cast Iron Outside Diameter (CIOD)	
Nominal Sizes:	4", 6", 8", 10", 12", 14", 16", 18", 20", 24", 30", 36"	
Dimension Ratios & Pressure Ratings"	DR 51 – 80 psi DR 41 – 100 psi DR 32.5 – 125 psi DR 25 – 165 psi DR 21 – 200 psi	DR 18 – 235 psi (185 psi)** DR 14 – 305 psi (250 psi)**
Lay Length:	20' [6.1m]	
Pipe Compound:	ASTM D1784 Cell Class 12454	
Pipe Joint Std.:	ASTM D3139	
Max. Angular Joint Deflection:‡	1°	
Gasket Standard:	ASTM F477, UL 157	
Gasket Material Offerings:	Standard – SBR Optional – NBR or EPDM	
Installation Std.:	AWWA C605	

Applications	Potable Water	Waste-water	Reclaimed Water
Color:	Blue	Green	Purple
Certifications:*	NSF 14, NSF 61 CSA B137.3* UL 1285 FM 1612** BNQ 3624-250 (24in)*, BNQ 3660-950 (24in)	CSA B137.3*	CSA B137.3*

**See Certification Letter for full explanation and list of exceptions.*
***FM 1612 calculates pressure ratings differently than AWWA for 4"-12" only with DR 18 as 185 psi and DR 14 as 250 psi.*
‡See Installation Guide for more information.

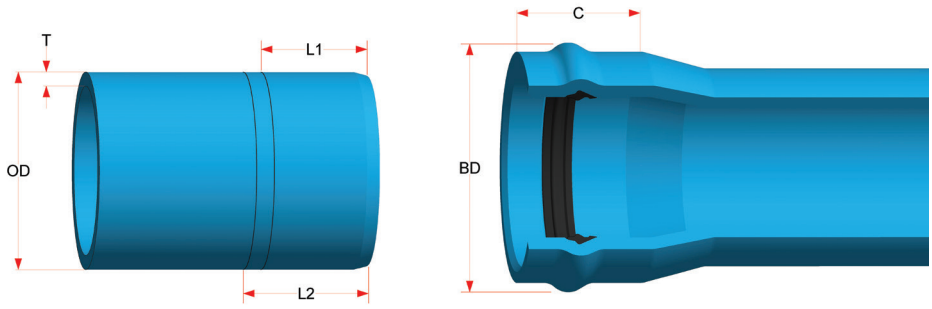
NSF *Only products bearing the NSF Mark are Certified* CSA UL FM APPROVED BNQ

napcopipe.com | 1.855.624.7473

NAPCO PIPE & FITTINGS

MUNICIPAL
PRODUCT SPECIFICATION

AWWA C900/IB PVC Pressure Pipe | Gasketed Integral Bell



C900/IB PIPE DIMENSIONS & PERFORMANCE									
Nom. Size	Outside Diameter (OD)	DR	Pressure Class psi [kPa]	Min. Wall Thickness (T)	Internal Diameter (ID)	Approx. Bell Diameter (BD)	Bell Depth (C)	1st Insertion Mark (L1)	2nd Insertion Mark (L2)
4" [100mm]	4.800 [121.9]	25	165 [1150]	0.192 [4.88]	4.416 [112.1]	6.250 [158.8]	5.000 [127]	3.375 [85.7]	4.375 [111.1]
		18	235 [1620]	0.267 [6.78]	4.266 [108.3]				
		14	305 [2130]	0.343 [8.70]	4.114 [104.5]				
6" [150mm]	6.900 [175.3]	25	165 [1150]	0.276 [7.00]	6.348 [161.3]	8.625 [219.1]	5.750 [146.1]	4.625 [117.5]	5.625 [135.3]
		18	235 [1620]	0.383 [9.72]	6.134 [155.9]				
		14	305 [2130]	0.493 [12.50]	5.914 [150.3]				
8" [200mm]	9.050 [229.9]	25	165 [1150]	0.362 [9.20]	8.326 [211.5]	11.500 [292.1]	7.000 [177.8]	5.625 [135.3]	6.625 [168.3]
		18	235 [1620]	0.503 [12.80]	8.044 [204.3]				
		14	305 [2130]	0.646 [16.40]	7.758 [197.1]				
10" [250mm]	11.100 [281.9]	25	165 [1150]	0.444 [11.30]	10.212 [259.3]	14.000 [355.6]	7.250 [184.2]	6.125 [155.6]	7.125 [181.0]
		18	235 [1620]	0.617 [15.70]	9.866 [250.3]				
		14	305 [2130]	0.793 [20.10]	9.514 [241.7]				
12" [300mm]	13.200 [335.3]	25	165 [1150]	0.528 [13.40]	12.144 [308.5]	16.563 [420.7]	8.000 [203.2]	6.875 [174.6]	7.875 [200]
		18	235 [1620]	0.733 [18.60]	11.734 [298.1]				
		14	305 [2130]	0.943 [23.90]	11.314 [287.5]				
14" [350mm]	15.300 [388.6]	32.5	125 [860]	0.471 [12.0]	14.358 [364.7]	19.063 [484.2]	9.000 [228.6]	7.500 [190.5]	8.500 [215.9]
		25	165 [1150]	0.612 [15.6]	14.076 [357.5]				
		21	200	0.729	13.842				
		18	235 [1620]	0.850 [21.6]	13.600 [345.4]				
		14	305	1.093	13.114				
16" [400mm]	17.400 [442.0]	41	100	0.424	16.552	21.750 [552.5]	10.000 [254.0]	8.500 [215.9]	9.500 [241.3]
		32.5	125 [860]	0.535 [13.6]	16.330 [414.8]				
		25	165 [1150]	0.696 [17.7]	16.008 [406.6]				
		21	200	0.829	15.742				
		18	235 [1620]	0.967 [24.6]	15.466 [392.8]				
		14	305	1.243	14.914				

NAPCO PIPE & FITTINGS

MUNICIPAL
PRODUCT SPECIFICATION

ASTM D2241/IB PVC Pressure Pipe | Gasketed Integral Bell

NAPCO's ASTM D2241 Gasketed Integral Bell PVC Pipe product line is manufactured to meet the needs of water distribution and irrigation systems. With top quality raw materials and modern processing technology, our D2241 pipe meets all industry standards in addition to our own rigorous quality control requirements.

Our D2241 pipe utilizes Rieber style gaskets throughout the entire product offering to create a leak-free joint.

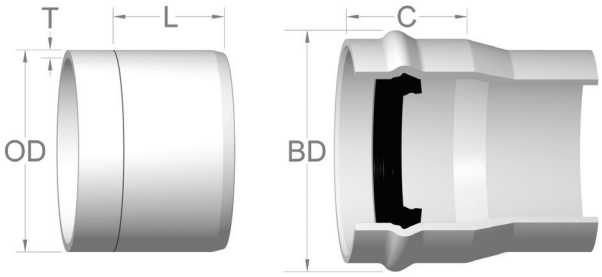
Short Form Specification		
Pipe Standard:	ASTM D2241	
Diameter Std.:	Iron Pipe Size (IPS)	
Nominal Sizes:	1½", 2", 2½", 3", 4", 6", 8", 10", 12"	
Dimension Ratios & Pressure Ratings:	SDR 41 – 100 psi SDR 32.5 – 125 psi SDR 26 – 160 psi	SDR 21 – 200 psi SDR 17 – 250 psi SDR 13.5 – 315 psi
Lay Length:	14' – Made-to-order 20' – All Sizes 40' and 42' – 2" to 6" Sizes	
Pipe Compound:	ASTM D1784 Cell Class 12454	
Pipe Joint Std.:	ASTM D3139	
Max. Angular Joint Deflection:‡	1°	
Gasket Standard:	ASTM F477	
Gasket Material Offerings:	Standard – SBR Optional – NBR or EPDM	
Installation Std.:	ASTM D2774	

Applications	Potable Water	Wastewater	Reclaimed Water
Color:	White	Green	Purple
Certifications:*	NSF 14 NSF 61	None	None

‡See Installation Guide for more information.

NSF *Only products bearing the NSF Mark are Certified*

ASTM D2241/IB PVC Pressure Pipe | Gasketed Integral Bell



D2241/IB PIPE DIMENSIONS & PERFORMANCE								
Nom. Size	Outside Diameter (OD)	SDR	Pressure Rating (psi)	Min. Wall Thickness (T)	Internal Diameter (ID)	Approx. Bell Diameter (BD)	Bell Depth (C)	Insertion Mark (L)
1 1/2"	1.900	21	200	0.090	1.720	2.625	3.250	2.625
		17	250	0.112	1.676			
		13.5	315	0.141	1.618			
2"	2.375	26	160	0.091	2.193	3.250	3.500	2.750
		21	200	0.113	2.149			
		17	250	0.140	2.095			
		13.5	315	0.176	2.023			
2 1/2"	2.875	26	160	0.110	2.655	4.000	4.125	3.125
		21	200	0.137	2.601			
		17	250	0.169	2.537			
		13.5	315	0.213	2.449			
3"	3.500	41	100	0.085	3.330	4.750	4.125	3.625
		32.5	125	0.108	3.284			
		26	160	0.135	3.230			
		21	200	0.167	3.166			
		17	250	0.206	3.088			
		13.5	315	0.259	2.982			
4"	4.500	41	100	0.110	4.280	5.875	4.625	4.000
		32.5	125	0.138	4.224			
		26	160	0.173	4.154			
		21	200	0.214	4.072			
		17	250	0.265	3.970			
		13.5	315	0.333	3.834			

Notes:
1. These dimensions are for estimating purposes only. All dimensions are in inches unless otherwise specified.
2. SDR = Standard Dimension Ratio
3. ASTM Pressure Rating @ 73°F and includes 2:1 safety factor.
4. Internal diameter calculated using nominal outside diameter and minimum wall thickness.
5. Dimension given for Approx. Bell Diameter (BD) is for highest pressure rating.

ASTM D2241/IB PVC Pressure Pipe | Gasketed Integral Bell

D2241/IB PIPE DIMENSIONS & PERFORMANCE								
Nom. Size	Outside Diameter (OD)	SDR	Pressure Rating (psi)	Min. Wall Thickness (T)	Internal Diameter (ID)	Approx. Bell Diameter (BD)	Bell Depth (C)	Insertion Mark (L)
6"	6.625	41	100	0.162	6.301	8.500	6.250	5.375
		32.5	125	0.204	6.217			
		26	160	0.255	6.115			
		21	200	0.316	5.993			
		17	250	0.390	5.845			
		13.5	315	0.491	5.643			
8"	8.625	41	100	0.210	8.205	10.625	7.250	6.375
		32.5	125	0.265	8.095			
		26	160	0.332	7.961			
		21	200	0.410	7.805			
		17	250	0.508	7.609			
10"	10.750	41	100	0.262	10.226	13.125	7.500	6.625
		32.5	125	0.331	10.088			
		26	160	0.413	9.924			
		21	200	0.511	9.728			
		17	250	0.632	9.486			
12"	12.750	41	100	0.311	12.128	15.550	8.250	7.375
		32.5	125	0.392	11.966			
		26	160	0.490	11.770			
		21	200	0.606	11.538			
		17	250	0.750	11.250			

Notes:
1. These dimensions are for estimating purposes only. All dimensions are in inches unless otherwise specified.
2. SDR = Standard Dimension Ratio
3. ASTM Pressure Rating @ 73°F and includes 2:1 safety factor.
4. Internal diameter calculated using nominal outside diameter and minimum wall thickness.
5. Dimension given for Approx. Bell Diameter (BD) is for highest pressure rating.

Blue Brute | C900

PRESSURE-RATED PVC PIPE

JM Eagle™

DELIVERING GOOD WATER TO YOU

AWWA C900-16, CSA B137.3
ASTM D1784 Cell Class 12454
ANSI/NSF 61/14, UL 1285

Gasket: ASTM F477
Joint: ASTM D3139

MARKETS

Potable | Irrigation | Reclaim | Sewer

DESCRIPTION

Available Pipe Sizes (CIOD)

4", 6", 8", 10", 12", 14", 16", 18", 20", 24", 30", 36", 42", 48"

Nominal Laying length = 20 feet *(Laying length tolerances are in accordance with AWWA and CSA standards)*

Color: Blue | Green | Purple | White

AWWA C900-16	
305 psi	(DR 14)
235 psi	(DR 18)
200 psi	(DR 21)
165 psi	(DR 25)
125 psi	(DR 32.5)
100 psi	(DR 41)
80 psi	(DR 51)

Note: FM Approvals Pressure Class 185 psi for DR18 and 250 psi for DR14.

CSA B137.3	
309 psi	(DR 14)
235 psi	(DR 18)
167 psi	(DR 25)

BENEFITS

Field-cut with a power saw or handsaw; bevel without complicated machinery.

Does not need lining, wrapping, coating, or cathodic protection to prevent galvanic corrosion.

Corrosive resistant, safe, long-lasting, and stable solution for a modern infrastructure.

Consistency in carrying capacity (flow coefficient, C=150), for savings in pumping costs, and size of the pipe.

Made in America

JM Eagle 50 YEAR WARRANTY* ON PLASTIC PIPE

*50 year warranty only applicable to C900/Eagle Loc 900, C905, C909, AWWA C901/C906. Check www.jmeagle.com/warranty for full details.

Blue Brute | C900

PRESSURE-RATED PVC PIPE

SUBMITTAL AND DATA SHEET

DELIVERING GOOD WATER TO YOU

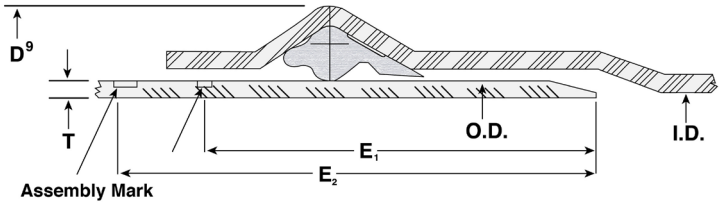
PIPE SIZE (IN)	AVERAGE O.D. (IN)	NOM. I.D. (IN)	MIN. T. (IN)	APPROX. E_1 (IN)	APPROX. E_2 (IN)	APPROX. D^9 (IN)	APPROX. WGT (LBS/FT)
PRESSURE CLASS 305 psi (DR 14)							
PIPE STIFFNESS: 815 psi							
4	4.80	4.07	0.343	4.5	5.5	6.365	3.2
6	6.90	5.86	0.493	5.25	6.25	8.887	6.7
8	9.05	7.68	0.646	6.25	7.25	11.499	11.6
10	11.10	9.42	0.793	7.25	8.25	14.072	17.6
12	13.20	11.20	0.943	8.25	9.25	16.57	25.1
16	17.40	14.85	1.242	7.25	8.75	21.637	43.77
24	25.80	21.89	1.843	9.75	11.25	31.958	98.33
PRESSURE CLASS 235 psi (DR 18)							
PIPE STIFFNESS: 364 psi							
4	4.80	4.23	0.267	4.5	5.5	6.204	2.6
6	6.90	6.09	0.383	5.25	6.25	8.654	5.3
8	9.05	7.98	0.503	6.25	7.25	11.195	9.2
10	11.10	9.79	0.617	7.25	8.25	13.699	13.9
12	13.20	11.65	0.733	8.25	9.25	16.125	19.7
14	15.30	13.50	0.850	6.5	8	18.603	26.75
16	17.40	15.35	0.967	7.25	8.75	21.135	34.86
18	19.50	17.20	1.083	7.75	9.25	23.832	48.95
20	21.60	19.06	1.200	8.75	10.25	26.107	54.22
24	25.80	22.76	1.433	9.75	11.25	31.089	77.97
30	32.00	28.23	1.778	11.5	13.5	38.264	117.82
PRESSURE CLASS 200 psi (DR 21)*							
PIPE STIFFNESS: 224 psi							
14	15.30	13.75	0.729	6.5	8	18.347	23.07
16	17.40	15.64	0.829	7.25	8.75	20.097	30.04
18	19.50	17.53	0.929	7.75	9.25	23.505	37.27
20	21.60	19.42	1.029	8.75	10.25	25.744	46.71
24	25.80	23.19	1.229	9.75	11.25	30.656	67.53
30	32.00	28.77	1.524	11.5	13.5	37.725	103.71
36	38.30	34.43	1.824	13.25	15.25	44.753	152.16
PRESSURE CLASS 165 psi (DR 25)							
PIPE STIFFNESS: 129 psi							
4	4.80	4.39	0.192	4.5	5.5	6.045	1.9
6	6.90	6.31	0.276	5.25	6.25	8.427	3.9
8	9.05	8.28	0.362	6.25	7.25	10.896	6.7
10	11.10	10.16	0.444	7.25	8.25	13.332	10.1
12	13.20	12.08	0.528	8.25	9.25	15.69	14.4
14	15.30	14.00	0.612	6.5	8	18.098	19.48
16	17.40	15.92	0.696	7.25	8.75	20.561	25.38
18	19.50	17.85	0.780	7.75	9.25	23.19	31.99
20	21.60	19.77	0.864	8.75	10.25	25.395	39.46
24	25.80	23.61	1.032	9.75	11.25	30.239	56.98
30	32.00	29.29	1.280	11.5	13.5	37.208	88.49
36	38.30	35.05	1.532	13.25	15.25	44.134	128.41
42	44.50	40.73	1.780	15.5	17.5	51.56	176.02
48*	50.80	46.49	2.032	16.5	18.5	58.393	231.22
PRESSURE CLASS 125 psi (DR 32.5)*							
PIPE STIFFNESS: 57 psi							
14	15.30	14.30	0.471	6.5	8	17.799	15.14
16	17.40	16.27	0.535	7.25	8.75	20.219	19.63
18	19.50	18.23	0.600	7.75	9.25	22.808	24.75
20	21.60	20.19	0.665	8.75	10.25	24.973	30.54
24	25.80	24.12	0.794	9.75	11.25	29.734	44.11
30	32.00	29.91	0.985	11.5	13.5	36.582	68.45
36	38.30	35.80	1.178	13.25	15.25	43.383	99.22
48	50.80	47.49	1.563	16.5	18.5	57.399	178.49

PIPE SIZE (IN)	AVERAGE O.D. (IN)	NOM. I.D. (IN)	MIN. T. (IN)	APPROX. E_1 (IN)	APPROX. E_2 (IN)	APPROX. D^9 (IN)	APPROX. WGT (LBS/FT)
PRESSURE CLASS 100 psi (DR 41)							
PIPE STIFFNESS: 28 psi							
14	15.30	14.52	0.373	6.5	8	17.599	12.01
16	17.40	16.51	0.424	7.25	8.75	19.992	15.63
18	19.50	18.50	0.476	7.75	9.25	22.555	19.72
20	21.60	20.49	0.527	8.75	10.25	24.691	24.31
24	25.80	24.48	0.629	9.75	11.25	29.397	35.10
30	32.00	30.35	0.780	11.5	13.5	36.163	54.65
36	38.30	36.30	0.934	13.25	15.25	42.885	78.97
42	44.50	42.18	1.085	15.5	17.5	50.108	108.19
48	50.80	48.14	1.239	16.5	18.5	56.736	142.10
PRESSURE CLASS 80 psi (DR 51)*							
PIPE STIFFNESS: 14 psi							
30	32.00	30.67	0.627	11.5	13.5	35.836	44.08
36	38.30	36.71	0.751	13.25	15.25	42.478	64.32
42	44.50	42.65	0.872	15.5	17.5	49.652	88.10
48	50.80	49.69	0.996	16.5	18.5	56.217	115.79

Product Standard: ANSI/AWWA C900-16
CSA B137.3* (DR 18, 25, 4"-18"; DR 14, 4"-12")
Pipe Compound: ASTM D1784 Cell Class 12454
Gasket: ASTM F477
Integral Bell Joint: ASTM D3139
Certifications: ANSI/NSF 61, ANSI/NSF 14*
UL 1285 (DR 14, 18, 25, up to 24"), FM 1612* (DR 14 / DR 18; 4-12"), CSA B137.3*
Note: FM Approvals Pressure Class 185 psi for DR 18 and 250 psi for DR 14.
Nominal Laying Length: 20 feet
(Laying length tolerences with AWWA and/or CSA standards)
Installation: JM Eagle™ Blue Brute Installation Guide

Manning Coefficient (n) = 0.009 • Hazen-Williams Coefficient (c) = 150

*Please call regarding availability.



I.D.: Inside Dameter
O.D.: Outside Diameter
T: Wall Thickness
D^9: Bell Outside Diameter

E_1: Distance between 1st Insertion/ Assembly Mark to the end of spigot.

E_2: Distance between 2nd Insertion/ Assembly Mark to the end of spigot.

IPS Pressure | Ring-Tite

PRESSURE-RATED PVC PIPE

JM Eagle™

DELIVERING GOOD WATER TO YOU

ASTM D2241
ASTM D1784 Cell Class 12454
ANSI/NSF 61/14, Uniform Plumbing Code

Gasket: ASTM F477
Joint: ASTM D3139

MARKETS

Irrigation | Reclaim | Sewer | Plumbing

DESCRIPTION

Available Pipe Sizes

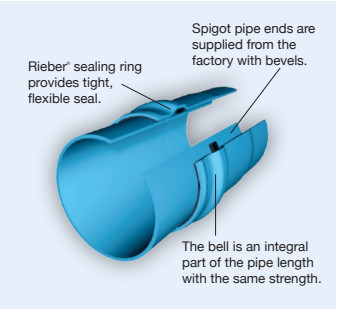
IPS: 1½", **2",** 2½", 3", 4", 5", 6", 8", 10", 12"

Nominal Laying Length: 20/22 feet *(Laying length tolerances are in accordance with ASTM standards)*

Color: Blue | Green | Purple | White

Ring-Tite Joint

- Flexible elastomeric Rieber® locked-in gasket provides a tight seal that protects and compensates for expansion, contraction, vibration or other movements.
- Quick and easy to assemble with a simple push, there's no field mixing or application of cement.
- Meets or exceeds ASTM D3219 for joint tightness, including a 22-inch Hg vacuum and a 25-foot head pressure test.



ASTM D2241	
63 psi	SDR 64
100 psi	SDR 41
125 psi	SDR 32.5
160 psi	SDR 26
200 psi	SDR 21
250 psi	SDR 17

BENEFITS

Lightweight, great for manual installation.

Field-cut with a power saw or handsaw; bevel without complicated machinery.

Does not need lining wrapping, coating, or cathodic protection to prevent galvanic corrosion.

Unaffected by corrosive elements: sewer gas, sulfuric acid, alkaline, or acidic soils.

Consistency in carrying capacity (flow coefficient, C=150), for savings in pumping and material costs.

Made in America

IPS Pressure | Ring-Tite

PRESSURE-RATED PVC PIPE

SUBMITTAL AND DATA SHEET

DELIVERING GOOD WATER TO YOU

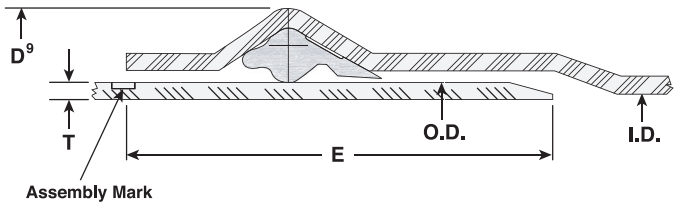
PIPE SIZE (IN)	AVERAGE O.D. (IN)	NOM. I.D. (IN)	MIN. T. (IN)	AVG. E (IN)	APPROX. D^9 (IN)	APPROX. WGT (LBS/FT)
PRESSURE CLASS 250 psi (SDR 17)*						
PIPE STIFFNESS: 437 psi						
1½	1.900	1.641	0.112	3.575	2.39	0.58
2	2.375	2.078	0.140	3.825	2.94	0.66
2½	2.875	2.517	0.169	4.075	3.55	—
3	3.500	3.063	0.206	4.325	4.32	1.42
4	4.500	3.938	0.265	4.625	5.56	2.36
6	6.625	5.803	0.390	5.325	8.19	5.11
8	8.625	7.553	0.508	6.025	10.66	8.69
10	10.750	9.410	0.632	6.825	13.28	13.55
12	12.750	11.160	0.750	8.225	15.75	19.20
PRESSURE CLASS 200 psi (SDR 21)*						
PIPE STIFFNESS: 224 psi						
1½	1.900	1.709	0.090	3.575	2.26	0.44
2	2.375	2.135	0.113	3.825	2.83	0.54
2½	2.875	2.585	0.137	4.075	3.42	0.79
3**	3.500	3.146	0.167	4.325	4.17	1.17
4**	4.500	4.046	0.214	4.625	5.36	1.93
6**	6.625	5.955	0.316	5.325	7.89	4.23
8**	8.625	7.754	0.410	6.025	10.27	7.18
10	10.750	9.667	0.511	6.825	12.79	11.20
12	12.750	11.465	0.606	8.225	15.17	15.82
PRESSURE CLASS 160 psi (SDR 26)*						
PIPE STIFFNESS: 115 psi						
1½	1.900	1.745	0.073	3.575	2.19	0.28
2	2.375	2.182	0.091	3.825	2.74	0.44
2½	2.875	2.642	0.110	4.075	3.32	0.64
3	3.500	3.214	0.135	4.325	4.04	0.95
4	4.500	4.133	0.173	4.625	5.19	1.58
5	5.563	5.109	0.214	4.750	6.42	2.40
6	6.625	6.084	0.255	5.325	7.65	3.44
8	8.625	7.921	0.332	6.025	9.95	5.85
10	10.750	9.874	0.413	6.825	12.40	9.12
12	12.750	11.711	0.490	8.225	14.71	12.89
PRESSURE CLASS 125 psi (SDR 32.5)*						
PIPE STIFFNESS: 57 psi						
1½	1.900	1.773	0.060	3.575	2.14	—
2	2.375	2.220	0.073	3.825	2.67	—
2½	2.875	2.688	0.088	4.075	3.23	—
3	3.500	3.271	0.108	4.325	3.93	0.77
4	4.500	4.207	0.138	4.625	5.05	1.28
5	5.563	5.200	0.171	4.750	6.25	2.00
6	6.625	6.193	0.204	5.325	7.44	2.79
8	8.625	8.063	0.265	6.025	9.69	4.70
10	10.750	10.048	0.331	6.825	12.07	7.35
12	12.750	11.919	0.392	8.225	14.32	10.36

PIPE SIZE (IN)	AVERAGE O.D. (IN)	NOM. I.D. (IN)	MIN. T. (IN)	AVG. E (IN)	APPROX. D^9 (IN)	APPROX. WGT (LBS/FT)
PRESSURE CLASS 100 psi (SDR 41)*						
PIPE STIFFNESS: 28 psi						
3	3.500	3.320	0.085	4.325	3.84	—
4	4.500	4.267	0.110	4.625	4.94	1.03
5	5.563	5.27	0.136	4.750	6.10	1.60
6	6.625	6.282	0.162	5.325	7.27	2.23
8	8.625	8.180	0.210	6.025	9.47	3.75
10	10.750	10.195	0.262	6.825	11.80	5.86
12	12.750	12.091	0.311	8.225	13.99	8.28
PRESSURE CLASS 63 psi (SDR 64)*						
PIPE STIFFNESS: 7 psi						
6	6.625	6.40	0.104	5.325	7.20	1.60
8	8.625	8.33	0.135	6.025	9.30	2.40
10	10.750	10.39	0.168	6.825	11.50	3.80
12	12.750	12.32	0.199	8.225	13.80	5.30

Product Standard: ASTM D2241
Pipe Compound: ASTM D1784 Cell Class 12454
Gasket: ASTM F477
Integral Bell Joint: ASTM D3139
Certifications: ANSI/NSF 61, ANSI/NSF 14*, Uniform Plumbing Code*
Nominal Laying Length: 20/22 feet
(Laying length tolerances are in accordance with ASTM standards)
Installation: JM Eagle™ IPS Pressure Installation Guide

Manning Coefficient (n) = 0.009
Hazen-Williams Coefficient (c) = 150

*Supply may vary based on plant location. Please call regarding availability.
**This item is also available with an Eagle Loc Joint. Please call for more details.



I.D.: Inside Diameter
O.D.: Outside Diameter
T: Wall Thickness
D^9: Bell Outside Diameter
E: Distance between Assembly Mark and the end of the spigot.

This information may have been updated. Please visit www.jmeagle.com for all updated information and warranty details.

CUSTOMER SERVICE:1.800.621.4404

THIS PRODUCT IS MADE IN AMERICA

PRINTED JUNE 2018 REV13

C900
PVC PRESSURE PIPE

4"-12" SPECIFICATION DATA

Diamond (C900) PVC Pipe (4" through 12") is made of 12454 compound per ASTM D1784, in accordance with the dimensional chemical, and physical requirements of AWWA C900.

Diamond (C900) PVC Pipe bears the mark of NSF, International (NSF), the listing of Underwriters Laboratory, Inc. (UL), and (DR14 & DR18) bears the listing of Factory Mutual(FM). Some factory locations produce C900 bearing the mark of the Canadian Standards Association (CSA) and NSF14.

Diamond (C900) PVC Pipe utilizes a gasket, per ASTM F477, to seal the integral bell socket to the spigot of the next joint (which conforms to the requirements of ASTM D3139.) Each male end is beveled to facilitate joint assembly, and the spigot is referenced marked to ensure proper insertion depth. Diamond furnished lubricant is to be used in the joining process. Specialty gaskets may be available upon request.

PHYSICAL PROPERTIES OF PVC 12454:

Property	ASTM Test	Minimum
Specific Gravity	D792	1.40
Tensile Strength, psi	D638	7,000
Tensile Modulus, psi	D638	400,000
IZOD Impact Strength	D256	.65ft., lb./in.

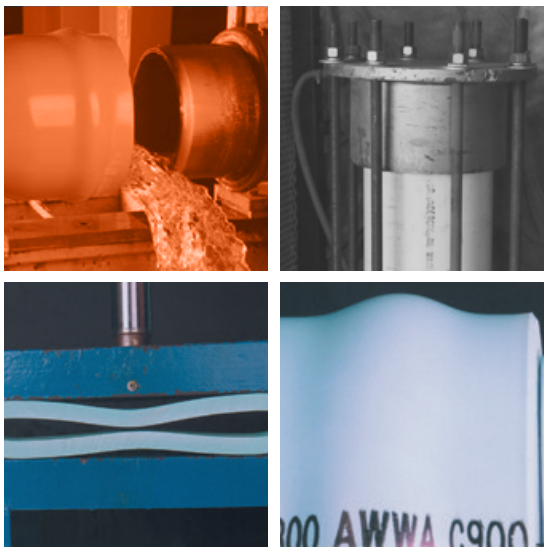
SHORT FORM Specification for Diamond C900 PVC Water Pipe

Diamond C900 PVC Water Pipe shall be made of compounds conforming to ASTM D1784 with a cell classification of 12454. Diamond C900 shall meet all the dimensional, chemical, and physical requirements as outlined in AWWA C900 and will be supplied in 20 and 22 foot laying lengths. Joints shall meet the requirements of ASTM D3139 and shall be formed using Rieber Technology. Gaskets shall meet the requirements of ASTM F477.

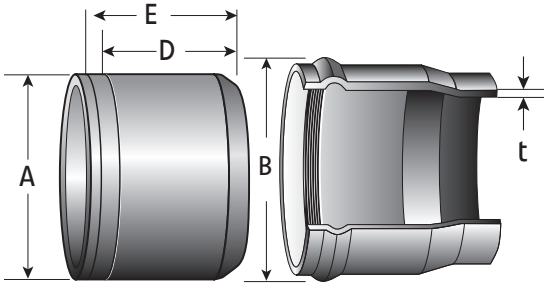
Potable water pipe shall be manufactured from National Sanitation Foundation (NSF) approved compounds.

EXTREME TESTING CONDITIONS

C900 PVC pressure pipe, available in pressure ratings for a wide range of water transfer applications (Available in sizes from 4" through 12")



RIEBER JOINT ILLUSTRATION



C900™

AWWA C900 SPECIFICATION DATA. SUPPLIED IN 20 AND 22 FOOT LAYING LENGTHS.

Nominal Pipe Size in. (mm)	A Outside Dia. Inches	B Bell Dia. Inches	D Assembly Mark 1 Inches *	E Assembly Mark 2 Inches *	t C900 DR-14 305 psi Min Wall Inches	t C900 DR-18 235 psi Min Wall Inches	t C900 DR-25 165 psi Min Wall Inches
4" (100)	4.800	6-1/2"	4-1/4"	5-1/4"	0.343	0.267	0.192
6" (150)	6.900	9-1/4"	4-5/8"	5-5/8"	0.493	0.383	0.276
8" (200)	9.050	11-3/4"	5-1/8"	6-1/8"	0.646	0.503	0.362
10" (250)	11.100	14-1/4"	5-3/4"	6-3/4"	0.793	0.617	0.444
12" (300)	13.200	16-3/4"	6-1/8"	7-1/8"	0.943	0.733	0.528

Prices are subject to a firm policy of "Price in effect at time of shipment on regular purchases"
"Possession of this page does not constitute an offer of sale"
*Tolerance of +/- 1/4" allowed

Underwriters Laboratories Inc.©

FM APPROVED

VINYLTECH AWWA C900 BLUE

TECHNICAL DATA SUBMITTAL (4" – 12")

VINYLTECH VT PVC • PIPE

CONFORMANCE

These specifications designate the requirements for manufacturing and installing Vinyltech AWWA C900 PVC Pressure Pipe for potable water (4"-12").

ANSI/AWWA C900 - Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4" Through 60" (100mm Through 1,500mm)

AWWA C605 - Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for Water

ASTM D1784 - Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds

ASTM D3139 - Standard Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals

ASTM F477 - Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe

NSF/ANSI 61, Annex G - Drinking Water Systems Components-Health Effects

FM 1612 - Approval Standard for Polyvinyl Chloride (PVC) Pipe and Fittings for Underground Fire Protection

UL 1285 - Standard for Pipe and Couplings, Polyvinyl Chloride (PVC), and Oriented Polyvinyl Chloride (PVCO) for Underground Fire Service

PIPE COMPOUND

The pipe shall be extruded from compounds meeting (PVC 1120) the requirements of Cell Classification 12454, as defined in ASTM D1784, Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds. The PVC shall also be listed by the National Sanitation Foundation (NSF) for use in potable water.

PIPE

Vinyltech pipe shall be manufactured in accordance with AWWA C900.

GASKET JOINT

The gasket shall be reinforced with a steel band and meet the requirements of ASTM F477. Vinyltech pipe shall have an integral bell end with a locked-in factory installed gasket and shall meet the joint requirements of ASTM D3139.

MARKING

The pipe shall be marked in accordance with AWWA C900.

QUALITY CONTROL

Each length of the pipe including the bell shall be hydrostatically tested in accordance with AWWA C900. The pipe shall meet all additional test requirements as described in AWWA C900. Our full-time quality assurance staff continually administers a rigid program of tests to maintain the production of the best pipe products available.

INSTALLATION

Recommended installation procedures of Vinyltech Corporation are outlined in AWWA C605, Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for Water. The AWWA Manual M23, PVC Pipe Design and Installation, is also an invaluable resource guide for design and installation.

TAPPING

The consistent success of tapping PVC pressure pipe is contingent upon the use of proper procedures and equipment. Vinyltech recommends strict compliance with the requirements as specified in AWWA C605.

ASSEMBLING THE PIPE

Assembly of Vinyltech PVC water pipe is easily accomplished. A depth of entry mark is on each spigot end to serve as a visual check for rapid, accurate joint inspection. **Do not over insert.**

1) Remove any mud, sand, or other foreign matter from the belled and spigot ends of the pipe. Carefully clean the gasket area.
2) With a clean applicator (a brush or hand) lubricate the entire surface of the pipe from the spigot end to the depth of entry mark and the contact surface of the gasket with **Vinyltech Brand Lubricant**.
3) Brace the bell to avoid disturbing the already installed joints. Align the pipe, insert the spigot into the bell and push.
4) **Do not insert past the entry mark line.**

ASTM INTERNATIONAL · FM APPROVED · NSF · UL Underwriters Laboratories Inc.® LISTED

VINYLTECH • 201 S. 61st Avenue • Phoenix, AZ 85043 • 602 233-0071 • Fax: 602 272-4847 • www.vtpipe.com

VINYLTECH AWWA

C900 BLUE

TECHNICAL DATA SUBMITTAL (4" – 12")

VINYLTECH VT PVC • PIPE

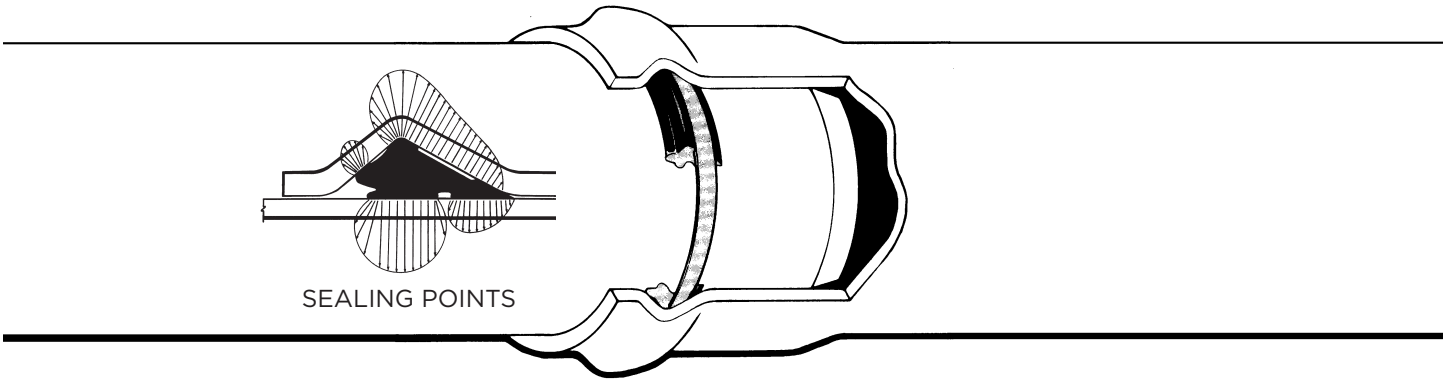
Effective 11/17

C900 DR 18 Pressure Class 235

NOMINAL SIZE		OUTER DIAMETER (IN)	MINIMUM WALL (IN)	FEET PER LIFT	LIFTS PER TRUCK	APPROX WEIGHT (LB/100')
(IN)	(mm)					
4	100	4.800	0.267	1020	16	251.6
6	150	6.900	0.383	440	16	521.2
8	200	9.050	0.503	200	20	903.0
10	250	11.100	0.617	240	12	1364.4
12	300	13.200	0.733	60-80	28	1935.8

C900 DR 14 Pressure Class 305

NOMINAL SIZE		OUTER DIAMETER (IN)	MINIMUM WALL (IN)	FEET PER LIFT	LIFTS PER TRUCK	APPROX WEIGHT (LB/100')
(IN)	(mm)					
4	100	4.800	0.343	1020	16	317.5
6	150	6.900	0.493	440	16	658.7
8	200	9.050	0.646	200	20	1139.7
10	250	11.100	0.793	240	12	1722.3
12	300	13.200	0.943	60-80	28	2445.5



The Rieber Sealing System

The Rieber system provides a proven pipe joint with an excellent track record in the field. It is the fastest growing system in the world because of its many advantages.

- Factory installed, locked-in gasket
- The pipe bell forms over the gasket, making a perfect fit
- Avoids the possibility of installing the wrong gasket
- Reduces installation problems
- The locked-in gasket eliminates gasket roll-out during joining
- The gasket is molded vs. extruded and spliced
- Works equally well under pressure or vacuum
- Three sealing points achieved vs. two
- **LEAK-PROOF JOINTS**
- **"THE WORLDS BEST JOINT"**

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 is U.S. Pipe's trademark for pipe with a push-on type connection. Simplicity, sturdiness and watertightness 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.

Tyton Joint Pipe is available in sizes 3" through 64". Sizes 3" through 42" are available in nominal 18-foot laying lengths. 4" through 30" 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 is 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.

A Tyton Gasket is the only accessory required when installing Tyton Joint Pipe. It is a circular rubber gasket that 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 watertight 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. 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". 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 Field Lok 350 Gaskets, TR Flex Pipe and Fittings, and HP Lok Pipe and Fittings can be found on our website, www.uspipe.com.

Tyton joint pipe is NSF/ANSI 61 Certified for drinking water system components.

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 are 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.

NOTE: Each of the following is a nationally recognized standards organization: American National Standards Institute (ANSI), American Water Works Association (AWWA), American Society for Testing and Materials (ASTM), Underwriters Laboratories (UL), National Fire Protection Association (NFPA), National Sanitation Foundation (NSF), Factory Mutual (FM)

INSERTION OF GASKET *(Figure 1)*

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.

APPLICATION OF LUBRICANT *(Figure 2)*

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 they 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.

INITIAL ENTRY OF PLAIN END IN SOCKET *(Figure 3)*

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.

COMPLETELY ASSEMBLED JOINT *(Figure 4)*

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.

ASSEMBLY GUIDE

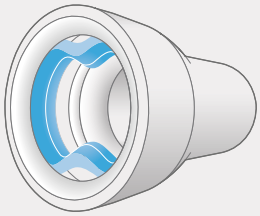


Figure 1

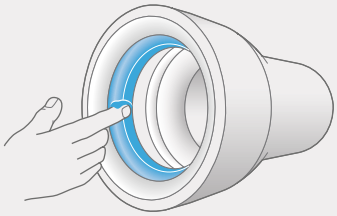


Figure 2

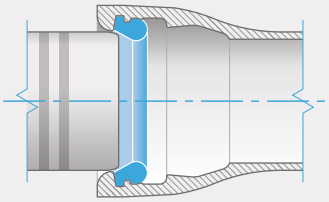


Figure 3

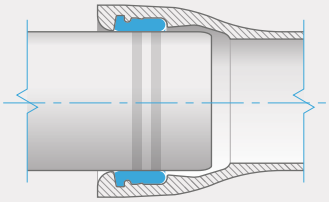


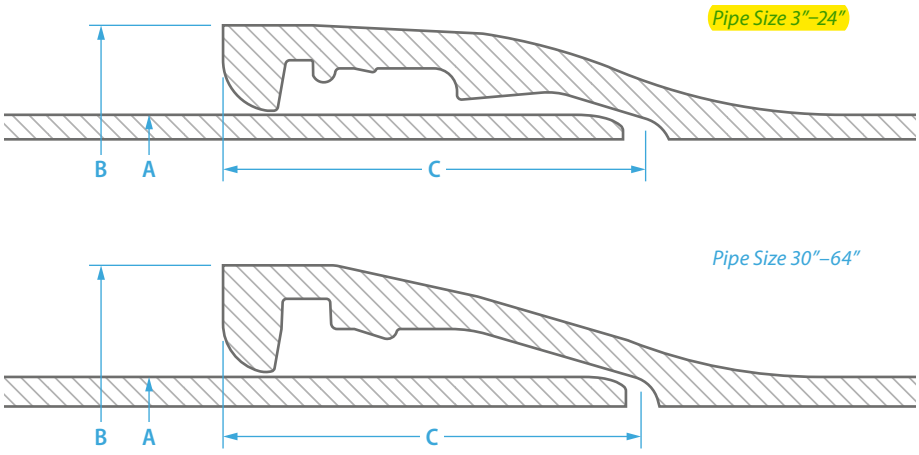
Figure 4

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 and to prevent damaging the cement lining or other special sewer linings.

CAUTION: *The inside of the socket, the gasket, and the plain end to be inserted must be kept clean throughout the assembly. Joints are only as watertight 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.*

INCH		
SIZE	PIPE DIAMETER	
	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

NOTE: For accuracy, a diameter tape graduated in 100th's must be used. Above table based on ANSI/AWWA C151/A21.51 guidelines for push-on joints.



INCHES			
SIZE	PIPE OUTER DIAMETER	BELL OUTER DIAMETER	SOCKET DEPTH
	A	B	C
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

NOTE: Actual bell configuration may vary from illustration shown. Subject to manufacturing tolerances.

INCHES							
SIZE	OUTSIDE DIAMETER	NOMINAL THICKNESS					CASTING TOLERANCES
		Pressure Class[a]					
		150	200	250	300	350	
3	3.96	—	—	—	—	—	[c]
4	4.80	—	—	—	—	0.25[b]	0.05
6	6.90	—	—	—	—	0.25[b]	0.05
8	9.05	—	—	—	—	0.25[b]	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 thickness in the above table includes 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.

[a]Pressure Classes are defined as the rated water pressure of the pipe in psi. The thickness shown is 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.

[b]Presently these are the lowest nominal thickness available in these sizes.

[c]See thickness class for 3".

McWANE DUCTILE | IRON STRONG

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Certification of Compliance

McWane Ductile certifies that all products furnished by McWane Ductile comply with all applicable provisions and latest revisions of the following Standards.

ANSI/AWWA	C150/A21.50	Thickness Design of Ductile Iron Pipe
ANSI/AWWA	C151/A21.51	Manufacture of Ductile Iron Pipe
ANSI/AWWA	C110/A21.10	Fittings - Cast and Ductile Iron
ANSI/AWWA	C153/A21.53	Fittings - Ductile Iron
ANSI/AWWA	C111/A21.11	Rubber Gasket Joints for Ductile Iron Pipe
ANSI/AWWA	C115/A21.15	Ductile Iron Flanged Pipe
ANSI/AWWA	C104/A21.4	Cement - Mortar Linings for Ductile Iron Pipe
ANSI/AWWA	C105/A21.5	Polyethylene Encasement for Ductile Iron Pipe
ASTM	A674	Polyethylene Encasement for Ductile Iron Pipe
ANSI/AWWA	C600	Installation & Testing of Ductile Iron Pipe
ANSI/AWWA	C651	Disinfecting Water Mains
ASTM	A746	Ductile Iron Gravity Sewer Pipe
ASTM	A716	Ductile Iron Culvert Pipe
NSF	NSF/ANSI 61	Drinking Water System Components – Health Effects
NSF	NSF/ANSI 372	Drinking Water System Components – Lead Content
NFPA	Outside Protection 24	Fire Protection Piping

SURE STOP® GASKET FOR TYTON® JOINT

Size In.	Rating psi	Deflection Degrees
3	350	5
4	350	5
6	350	5
8	350	5
10	350	5
12	350	5
14	350	4
16	350	4
18	350	4
20	350	2.5
24	350	2.5

SURE STOP 350® GASKETS are available in sizes 3 in. – 24 in., and with a rating of 350 psi they will meet or exceed the capabilities of ductile iron pipe, valves, and fittings.

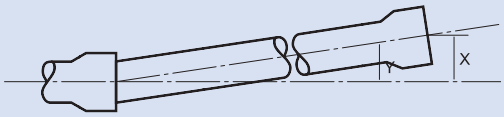
SURE STOP 350® GASKETS are NSF 61 approved, UL listed, and FM approved.

FM Rating: 4 in. – 6 in. = 250 psi
18 in. – 24 in. = 200 psi

APPLICATION NOTES

1. For ductile iron applications utilizing TYTON® pipe, vales, and fittings made to AWWA specifications.
2. In cold weather assembly maintain the temperature of the gasket above 40° F.
3. The socket of the joint should be clean and free of debris or significant corrosion.
4. Gasket should be properly seated in the bell socket.
5. Keep the pipe and joint in alignment during assembly. If installed out of alignment, the gasket can be pushed out of position, creating the potential for leaks or failure.
6. If deflection is wanted in the joint, deflect before fully inserting the joint.
7. Some extension of the joint will occur when pressurized. To avoid this, the joint should be pulled out after assembly to "set" the stainless steel teeth in the inserted pipe.
8. Once assembled, the joint can be disassembled using steel shims.
9. When cut pipe is used, the following steps are required:
   a. Ensure that the spigot end is properly beveled
   b. Mark the joint depth on the spigot so it is clear when the joint is fully inserted.
   c. Ensure that the pipe meets the required dimensional tolerances.
10. Do not reuse SURE STOP 350® GASKETS, as they may have been damaged during any previous installation or during removal.
11. Do not use SURE STOP 350® GASKETS to conduct electricity through the pipe joint, as they could be damaged and fail.
12. Do not use SURE STOP 350® GASKETS in above ground applications.
13. Do not use SURE STOP 350® GASKETS with thick coating on the pipe exterior.
14. If SURE STOP 350® GASKETS are used in straight casings, you must pull the pipe through the casing. Do not push the pipe.

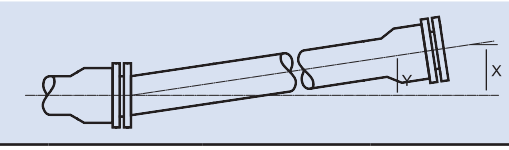
JOINT DEFLECTION CHART



PUSH-ON JOINT PIPE
Maximum Allowable Joint Deflection

Pipe Size In.	Y-Maximum Joint Deflection in Degrees	X Deflection in Inches 18 ft. Length	Approximate Radius in ft. of Curve Produced by Succession of Joints 18 ft. Length
3	5°	19	205
4	5°	19	205
6	5°	19	205
8	5°	19	205
10	5°	19	205
12	5°	19	205
14	5°	19	205
16	5°	19	205
18	5°	19	205
20	5°	19	205
24	5°	19	205
30	5°	19	205
36	4°	15	260

MAXIMUM DEFLECTION FOR FULL LENGTH PIPE



MECHANICAL JOINT PIPE
Maximum Allowable Joint Deflection

Pipe Size In.	Y-Maximum Joint Deflection in Degrees	X Deflection in Inches 18 ft. Length	Approximate Radius in ft. of Curve Produced by Succession of Joints 18 ft. Length
6	7°–7′	27	145
8	5°–21′	20	195
10	5°–21′	20	195
12	5°–21′	20	195
14	3°–35′	13.5	285
16	3°–35′	13.5	285
18	3°–0′	11	340
20	3°–0′	11	340
24	2°–23′	9	450

FIELD CUT PIPE

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 should be beveled about 1/4–inch at an angle of about 30 degrees (Figure 1). This can be quite easily done with a coarse file or a portable grinder. The operation removes any sharp, rough edges which otherwise might damage the gasket.

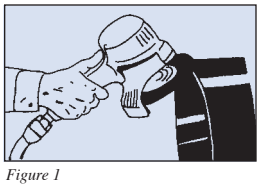


Figure 1

When ductile iron pipe 14 in. and larger is to be cut in the field, the material should be ordered as "GAUGED FULL LENGTH". Pipe that is "gauged full length" is specially marked to avoid confusion. The ANSI/AWWA 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 found to be within the tolerances shown in Table 1. In the field, a mechanical joint gland can be used as a gauging device.

TABLE 1: SUITABLE PIPE DIAMETERS FOR FIELD CUTS AND RESTRAINED JOINT FIELD FABRICATION

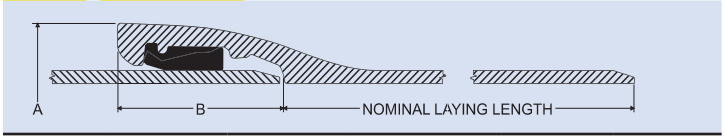
Pipe Size In.	Min. Pipe Diameter In.	Max. Pipe Diameter In.	Min. Pipe Circumference In.	Max. Pipe Circumference In.
3	3.9	4.02	12-1/4	12-5/8
4	4.74	4.86	14-29/32	15-9/32
6	6.84	6.96	21-1/2	21-7/8
8	8.99	9.11	28-1/4	28-5/8
10	11.04	11.16	34-11/16	35-1/16
12	13.14	13.26	41-9/32	41-21/32
14	15.22	15.35	47-13/16	48-7/32
16	17.32	17.45	54-13/32	54-13/16
18	19.42	19.55	61	61-13/32
20	21.52	21.65	67-19/32	68
24	25.72	25.85	80-13/16	81-7/32
30	31.94	32.08	100-11/32	100-25/32
36	38.24	38.38	120-1/8	120-9/16

Above Table Based on ANSI/AWWA C151/A21.51 Guidelines for Push-On Joints.

THE 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 push the pipe until fully seated. A timber header should be used between the pipe and backhoe bucket to avoid damage to the pipe.

TYTON® JOINT PIPE

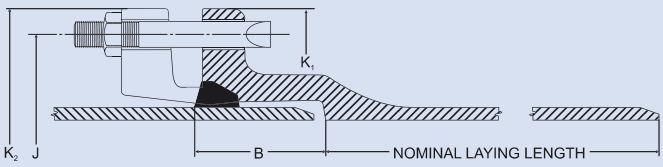


Tyton® Joint

Pipe Size In.	Pipe Thickness In.		Outside Diameter	*Dimensions In.	
	From	To	In.	A	B
3	.25	.40	3.96	5.80	3.00
4	.25	.41	4.80	7.10	3.15
6	.25	.43	6.90	8.63	3.38
8	.25	.45	9.05	10.94	3.69
10	.26	.47	11.10	13.32	3.75
12	.28	.49	13.20	15.06	3.75
14	.28	.51	15.30	17.80	5.00
16	.30	.52	17.40	19.98	5.00
18	.31	.53	19.50	22.00	5.00
20	.33	.54	21.60	24.12	5.25
24	.33	.56	25.80	28.43	5.50
30	.34	.63	32.00	35.40	6.55
36	.38	.73	38.30	41.84	7.00

*Nominal laying length is 18 ft.

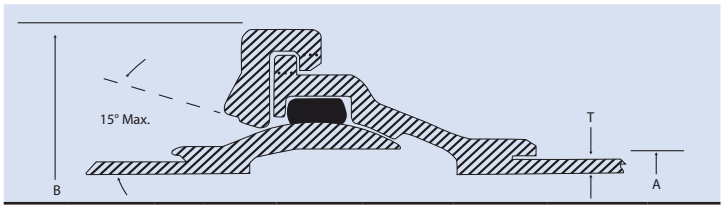
MECHANICAL JOINT PIPE



Pipe Size In.	Pipe Thickness In.		Outside Diameter	*Dimensions In.					Bolts		Bell Weight Lb.	Gland** Bolts Gasket Weight Lb.
	From	To	In.	B	J	K1	K2	No.	Size In.	Length In.		
3	.25	.40	3.96	2.50	6.19	7.62	7.69	4	5/8	3	11	7
4	.26	.41	4.80	2.50	7.50	9.06	9.12	4	3/4	3-1/2	16	10
6	.25	.43	6.90	2.50	9.50	11.06	11.12	6	3/4	3-1/2	18	16
8	.27	.45	9.05	2.50	11.75	13.31	13.37	6	3/4	4	24	25
10	.29	.47	11.10	2.50	14.00	15.62	15.62	8	3/4	4	31	30
12	.31	.49	13.20	2.50	16.25	17.88	17.88	8	3/4	4	37	40
14	.33	.51	15.30	3.50	18.75	20.25	20.25	10	3/4	4-1/2	61	45
16	.34	.52	17.40	3.50	21.00	22.50	22.50	12	3/4	4-1/2	74	55
18	.35	.53	19.50	3.50	23.25	24.75	24.75	12	3/4	4-1/2	85	65
20	.36	.54	21.60	3.50	25.50	27.00	27.00	14	3/4	4-1/2	98	85
24	.38	.56	25.80	3.50	30.00	31.50	31.50	16	3/4	5	123	105

* Nominal laying length is 18 ft.
** Weight shown for regular grey cast iron follower gland, corton bolts and rubber gasket.

BALL AND SOCKET JOINT PIPE



Pipe Size In.	Thickness		A	B	Full Length Weight - Lb.**			Safe End Pull Lb.
	Class (A21.51)	T	Pipe O.D.	Retainer O.D.	As Shipped	Under Water		
						Full of Air	Full of Water	
6	55	.40	6.90	13.88	545	240	465	50,000
8	55	.42	9.05	16.63	770	240	655	70,000
10	55	.44	11.10	19.13	1005	220	860	95,000
12	55	.46	13.20	22.00	1270	155	1080	120,000
14	56	.51	15.30	24.50	1655	160	1410	145,000
16	56	.52	17.40	27.00	1990	45	1685	165,000
18	56	.53	19.50	30.00	2375	-70	2015	195,000
	58*	.59			2560	110	2170	
20	56	.54	21.60	32.75	2810	-200	2375	210,000
	59*	.63			3110	100	2635	
24	56	.56	25.80	38.25	3700	-620	3110	260,000
	62*	.74			4415	95	3715	
30	58	.71	32.00	46.25	5855	-900	4920	335,000
	61*	.83			6435	-180	5360	
36	57	.78	38.30	54.25	8145	-1300	6880	400,000
	59*	.88			8725	-725	7330	

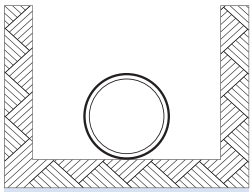
* Thickness required to overcome buoyancy.
** Weights listed are for 18'–0" laying lengths. Nominal full lengths vary by size.
Pipe, Bell, Ball and Retainer are ductile iron.
Dimensions and weights are subject to manufacturing tolerances.
6 in. – 24 in. pressure rating: 350 psi
30 in. – 36 in. pressure rating: 250 psi

STANDARD DIMENSIONS AND WEIGHTS OF 3" THROUGH 36" PUSH-ON JOINT DUCTILE IRON PIPE

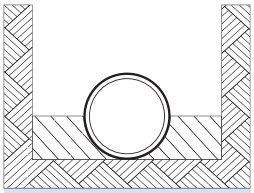
Pipe Size In.	Pressure Class psi	Nominal Thickness In.	OD* In.	Wt. of Barrel Per Ft. † Lb.	Tyton® Joint		
					Wt. of Bell Lb.	Wt. Per Lgth.† Lb.	Avg. Wt. Per Ft.‡ Lb.
3	350	0.25	3.96	8.90	7.00	185	9.20
4	350	0.25	4.80	10.90	9.00	225	11.30
6	350	0.25	6.90	16.00	11.00	300	16.60
8	350	0.25	9.05	21.10	17.00	395	22.00
10	350	0.26	11.10	27.10	24.00	510	28.40
12	350	0.28	13.20	34.80	29.00	655	36.40
14	250	0.28	15.30	40.40	45.00	770	42.90
	300	0.30	15.30	43.30	45.00	825	45.80
	350	0.31	15.30	44.70	45.00	850	47.20
16	250	0.30	17.40	49.30	54.00	940	52.30
	300	0.32	17.40	52.50	54.00	1000	55.50
	350	0.34	17.40	55.80	54.00	1060	58.80
18	250	0.31	19.50	57.20	59.00	1090	60.50
	300	0.34	19.50	62.60	59.00	1185	65.90
	350	0.36	19.50	66.20	59.00	1250	69.50
20	250	0.33	21.60	67.50	74.00	1290	71.60
	300	0.36	21.60	73.50	74.00	1395	77.60
	350	0.38	21.60	77.50	74.00	1470	81.60
24	200	0.33	25.80	80.80	95.00	1550	86.10
	250	0.37	25.80	90.50	95.00	1725	95.80
	300	0.40	25.80	97.70	95.00	1855	103.00
	350	0.43	25.80	104.90	95.00	1985	110.20
30**	150	0.34	32.00	103.50	139.00	2000	111.20
	200	0.38	32.00	115.50	139.00	2220	123.20
	250	0.42	32.00	127.50	139.00	2435	135.20
	300	0.45	32.00	136.50	139.00	2595	144.20
	350	0.49	32.00	148.40	139.00	2810	156.10
36**	150	0.38	38.30	138.50	184.00	2675	148.70
	200	0.42	38.30	152.90	184.00	2935	163.10
	250	0.47	38.30	170.90	184.00	3260	181.10
	300	0.51	38.30	185.30	184.00	3520	195.50
	350	0.56	38.30	203.20	184.00	3840	213.40

† Including bell; calculated weight of pipe rounded off to the nearest 5 lb.
‡ Including bell; average weight per foot, based on calculated weight of pipe before rounding.
* Tolerances of OD of spigot end: 3 – 12 in. = +0.06 in. & -0.06 in. ; 14 – 24 in. = +0.05 in. & -0.08 in. ; 30 – 36 in. = +0.08 in. & -0.06 in.
** Fastite® Joint

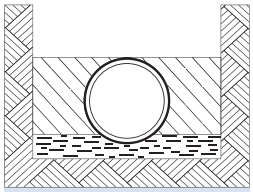
LAYING CONDITIONS



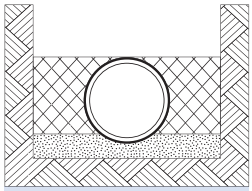
Type 1*
Flat-bottom trench.† Loose backfill.



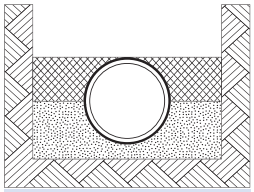
Type 2
Flat-bottom trench.† Backfill lightly consolidated to centerline of pipe.



Type 3
Pipe bedded in 4 in. (100 mm) minimum of loose soil.++ Backfill lightly consolidated to top of pipe.



Type 4
Pipe bedded in sand, gravel, or crushed stone to depth of 1/8 pipe diameter, 4 in. (100 mm) minimum. Backfill compacted to top of pipe. (Approximately 80 percent Standard Proctor, AASHTO T-99.)



Type 5
Pipe bedded in compacted granular material to centerline of pipe. Compacted granular or select material++ to top of pipe. (Approximately 90 percent Standard Proctor, AASHTO T-99.)

* For 14 in. (355-mm) and larger pipe, consideration should be given to the use of laying conditions other than Type 1.

† "Flat-bottom" is defined as undisturbed earth.

++ "Loose soil" or "select material" is defined as native soil excavated from the trench, free of rocks, foreign materials, and frozen earth.

Notes:
Consideration of the pipe-zone embedment conditions included in this figure may be influenced by factors other than pipe strength. For additional information on pipe bedding and backfill, see ANSI/AWWA C600.

American Association of State Highway and Transportation Officials, 444 N. Capitol St. N.W., Suite 225, Washington, DC 20001.

STANDARDS APPLICABLE TO DUCTILE IRON PIPE AND FITTINGS

THICKNESS DESIGN OF DUCTILE IRON PIPE	ANSI/AWWA C150/A21.50
DUCTILE IRON PIPE FOR WATER AND OTHER LIQUIDS	ANSI/AWWA C151/A21.51
	FEDERAL WWP421D, Grade C
DUCTILE IRON PIPE FOR GRAVITY FLOW SERVICE	ANSI/ASTM A746
DUCTILE IRON FITTINGS FOR WATER AND OTHER LIQUIDS	
3 in. through 36 in.	ANSI/AWWA C110/A21.10
DUCTILE IRON COMPACT FITTINGS	
3 in. through 24 in.	ANSI/AWWA C153/A21.53
FLANGED FITTINGS	ANSI/AWWA C110/A21.10
	ANSI B16.1
DUCTILE IRON PIPE WITH THREADED FLANGES	ANSI/AWWA C115/21.15
COATINGS AND LININGS	
Asphaltic	ANSI/AWWA C151/A21.51
	ANSI/AWWA C110/A21.10
	ANSI/AWWA C153/A21.53
Cement Lining	ANSI/AWWA C104/A21.4
Various Epoxy Linings and Coatings	MANUFACTURER'S STANDARD
Exterior Polyethylene Encasement	ANSI/AWWA C105/A21.5
JOINTS – PIPE AND FITTINGS	
Push-On and Mechanical Rubber-Gasket Joints	ANSI/AWWA C111/A21.11
	FEDERAL WWP421D
Flanged	ANSI/AWWA C115/A21.15
	ANSI B16.1
Grooved and Shouldered	ANSI/AWWA C606
PIPE THREADS	ANSI B2.1
INSTALLATION	ANSI/AWWA C600

McWANE DUCTILE | IRON STRONG

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Coshocton, OH 43812
740-622-6651
mcwaneductile.com

UTAH
1401 E 2000 S.
Provo, UT 84603
801-373-6910
mcwaneductile.com

CANADA
1757 Burlington St. E
Hamilton, ON L8N-3R5
905-547-3251
canadapipe.com

DIMENSIONS AND WEIGHTS FOR SPECIAL CLASSES OF PUSH-ON DUCTILE IRON PIPE

Pipe Size In.	Thickness Class	Nominal Thickness In.	OD* In.	Wt. of Barrel Per Ft. † Lb.	Tyton® Joint		
					Wt. of Bell Lb.	Wt. Per Lgth.† Lb.	Avg. Wt. Per Ft.‡ Lb.
3	52	0.28	3.96	9.9	7	185	10.3
3	54	0.34	3.96	11.8	7	220	12.2
3	56	0.40	3.96	13.7	7	255	14.1
4	51	0.26	4.80	11.3	9	210	11.8
4	52	0.29	4.80	12.6	9	235	13.1
4	53	0.32	4.80	13.8	9	255	14.3
4	54	0.35	4.80	15	9	280	15.5
4	56	0.41	4.80	17.3	9	320	17.8
6	50	0.25	6.90	16	11	300	16.6
6	51	0.28	6.90	17.8	11	330	18.4
6	52	0.31	6.90	19.6	11	365	20.2
6	53	0.34	6.90	21.4	11	395	22.0
6	54	0.37	6.90	23.2	11	430	23.8
6	55	0.40	6.90	25	11	460	25.6
6	56	0.43	6.90	26.7	11	490	27.3
8	50	0.27	9.05	22.8	17	425	23.7
8	51	0.30	9.05	25.2	17	470	26.1
8	52	0.33	9.05	27.7	17	515	28.6
8	53	0.36	9.05	30.1	17	560	31.0
8	54	0.39	9.05	32.5	17	600	33.4
8	55	0.42	9.05	34.8	17	645	35.7
8	56	0.45	9.05	37.2	17	685	38.1
10	50	0.29	11.10	30.1	24	565	31.4
10	51	0.32	11.10	33.2	24	620	34.5
10	52	0.35	11.10	36.2	24	675	37.5
10	53	0.38	11.10	39.2	24	730	40.5
10	54	0.41	11.10	42.1	24	780	43.4
10	55	0.44	11.10	45.1	24	835	46.4
10	56	0.47	11.10	48	24	890	49.3
12	50	0.31	13.20	38.4	29	720	40.0
12	51	0.34	13.20	42	29	785	43.6
12	52	0.37	13.20	45.6	29	850	47.2
12	53	0.40	13.20	49.2	29	915	50.8
12	54	0.43	13.20	52.8	29	980	54.4
12	55	0.46	13.20	56.3	29	1040	57.9
12	56	0.49	13.20	59.9	29	1105	61.5
14	50	0.33	15.30	47.5	45	900	50.0
14	51	0.36	15.30	51.7	45	975	54.2
14	52	0.39	15.30	55.9	45	1050	58.4
14	53	0.42	15.30	60.1	45	1125	62.6
14	54	0.45	15.30	64.2	45	1200	66.7
14	55	0.48	15.30	68.4	45	1275	70.9
14	56	0.51	15.30	72.5	45	1350	75.0
16	50	0.34	17.40	55.8	54	1060	58.8
16	51	0.37	17.40	60.6	54	1145	63.6
16	52	0.40	17.40	65.4	54	1230	68.4
16	53	0.43	17.40	70.1	54	1315	73.1
16	54	0.46	17.40	74.9	54	1400	77.9
16	55	0.49	17.40	79.7	54	1490	82.7
16	56	0.52	17.40	84.4	54	1575	87.4
18	50	0.35	19.50	64.4	59	1220	67.7
18	51	0.38	19.50	69.8	59	1315	73.1
18	52	0.41	19.50	75.2	59	1415	78.5
18	53	0.44	19.50	80.6	59	1510	83.9
18	54	0.47	19.50	86	59	1605	89.3
18	55	0.50	19.50	91.3	59	1700	94.6
18	56	0.53	19.50	96.7	59	1800	100.0
20	50	0.36	21.60	73.5	74	1395	77.6
20	51	0.39	21.60	79.5	74	1505	83.6
20	52	0.42	21.60	85.5	74	1615	89.6
20	53	0.45	21.60	91.5	74	1720	95.6
20	54	0.48	21.60	97.5	74	1830	101.6
20	55	0.51	21.60	103.4	74	1935	107.5
20	56	0.54	21.60	109.3	74	2040	113.4
24	50	0.38	25.80	92.9	95	1765	98.2
24	51	0.41	25.80	100.1	95	1895	105.4
24	52	0.44	25.80	107.3	95	2025	112.6
24	53	0.47	25.80	114.4	95	2155	119.7
24	54	0.50	25.80	121.6	95	2385	126.9
24	55	0.53	25.80	128.8	95	2415	134.1
24	56	0.56	25.80	135.9	95	2540	141.2
30	50	0.39	32.00	118.5	139	2270	126.2
30	51	0.43	32.00	130.5	139	2490	138.2
30	52	0.47	32.00	142.5	139	2705	150.2
30	53	0.51	32.00	154.4	139	2920	162.1
30	54	0.55	32.00	166.3	139	3130	174.0
30	55	0.59	32.00	178.2	139	3345	185.9
30	56	0.63	32.00	190.0	139	3560	197.7
36	50	0.43	38.30	156.5	184	3000	166.7
36	51	0.48	38.30	174.5	184	3325	184.7
36	52	0.53	38.30	192.4	184	3645	202.6
36	53	0.58	38.30	210.3	184	3970	220.5
36	54	0.63	38.30	228.1	184	4290	238.3
36	55	0.68	38.30	245.9	184	4610	256.1
36	56	0.73	38.30	263.7	184	4930	273.9

†Including bell; calculated weight of pipe rounded off to the nearest 5 lb.
‡Including bell; average weight per foot, based on calculated weight of pipe before rounding.
*Tolerances of OD of spigot end; 3–12 in. ±0.06 in., 14–24 in. +0.05 in., -0.08 in., 30–36 in. +0.08 in., -0.06 in.

MP-047

SEAH STEEL VINA CORPORATION

NO. 7 STREET 3A BIEN HOA II, INDUSTRIAL ZONE, DONG NAI PROVINCE, VIETNAM

INSPECTION CERTIFICATE

EVER POWER V. 100B
05087SVP

CERTIFICATE NO.:QA100810- 77
DATE: AUG 10TH, 2010

MANUFACTURER/ MILL: SEAH STEEL VINA CORPORATION
NO.7 STREET 3A, BIEN HOA II INDUSTRIAL ZONE, DONG NAI PROVINCE, VIETNAM.

TO: SEAH STEEL AMERICA INC..
9615 S. NORWALK BLVD. SUITE B SANTA FE SPRINGS, CA 90670, USA

- INVOICE NO.: INV2010-167/SEAH — DATE: JUNE 26TH, 2010
- L/C NO.: OIP051210000033 — DATE: 08 - 07 - 2010
- DESCRIPTION OF GOODS:

SEAH STEEL AMERICA INC. PO. No: 102-L188
CUSTOMER'S PO. No: 05087SVP
E.R.W. STEEL PIPE TO ASTM A53-2006, Gr.A
FROM 3" TO 8" ALSO MEET A135 & A795
PIPES ALSO MEET ALL APLICABLE ASTM AND ANSI SPECIFICATION ON THE VICT. GROOVE PIPE CHART

ITEM NO	HEAT(Lot) NO	END TYPE	ORDER SIZE						QUANTITY		
			O.D	x	WALL THICKNESS		x	LENGTHS	PCS(EA)	TOTAL LENGTH (FT)	WEIGHT(MT)
1	504812	BPE	1-1/4"	X	0.109"	(Sch.10)	X	21 FT	42	882.00	0.723
2	1024434	BPE	6"	X	0.134"	(Sch.10)	X	21 FT	133	2,793.00	11.758
3	64820	BTC	4"	X	0.237"	(Sch.40)	X	21 FT	40	840.00	4.116
	011739	BTC	4"	X	0.237"	(Sch.40)	X	21 FT	10	210.00	1.029
4	2Y755	GPE	1-1/4"	X	0.140"	(Sch.40)	X	21 FT	252	5,292.00	5.452
	1023536	GPE	1-1/4"	X	0.140"	(Sch.40)	X	21 FT	84	1,764.00	1.816
	J013002A	GPE	1-1/4"	X	0.140"	(Sch.40)	X	21 FT	126	2,646.00	2.725
	8W3750	GPE	1-1/4"	X	0.140"	(Sch.40)	X	21 FT	42	882.00	0.908
	SP64691	GPE	1-1/4"	X	0.140"	(Sch.40)	X	21 FT	42	882.00	0.908
5	J0103002A	GPE	1-1/4"	X	0.140"	(Sch.40)	X	24 FT	252	6,048.00	6.229
6	J0203210A	GPE	2"	X	0.154"	(Sch.40)	X	21 FT	338	7,098.00	11.783
	J0103149A	GPE	2"	X	0.154"	(Sch.40)	X	21 FT	78	1,638.00	2.719
7	1043742	GPE	4"	X	0.237"	(Sch.40)	X	21 FT	90	1,890.00	9.261
	1083742	GPE	4"	X	0.237"	(Sch.40)	X	21 FT	20	420.00	2.058
	1011739	GPE	4"	X	0.237"	(Sch.40)	X	21 FT	10	210.00	1.029
8	1043742	GPE	4"	X	0.237"	(Sch.40)	X	24 FT	100	2,400.00	11.760
9	24768	GPE	6"	X	0.134"	(Sch.10)	X	24 FT	49	1,176.00	4.952
	4A514	GPE	6"	X	0.134"	(Sch.10)	X	24 FT	21	504.00	2.121
10	J013002A	GTC	1-1/4"	X	0.140"	(Sch.40)	X	21 FT	294	6,174.00	6.361
	2Y755	GTC	1-1/4"	X	0.140"	(Sch.40)	X	21 FT	168	3,528.00	3.633
	8W3750	GTC	1-1/4"	X	0.140"	(Sch.40)	X	21 FT	168	3,528.00	3.633
11	2Y673	GTC	1-1/2"	X	0.145"	(Sch.40)	X	21 FT	144	3,024.00	3.720

ITEM NO.	HEAT(Lot) NO.	HYDROSTATIC TEST		VISUAL TEST	FLATTE -NING TEST	BENDING TEST	CHEMICAL COMPOSITION(%)					MECHANICAL TEST (Gage Length: 50mm)			COATING TEST		
							C	Si	Mn	P	S	TENSILE STRENGTH	YIELD POINT	E.L	WEIGHT OF ZINC COAT	DIP TEST	
		Psi	RESULT				X 100			X1000		N/MM²	N/MM²	[D/D]	G / M²	TIMES	RESULT
1	504812	1200	G	G	G	G	4.0	1.0	23	10	13	320.0	250.0	41			
2	1024434	800	G	G	G	G	5.0	1.0	22	13	10	350.0	271.0	44			
3	64820	1900	G	G	G	G	4.0	1.0	23	11	14	307.0	234.0	39			
	011739	1900	G	G	G	G	4.0	1.0	13	13	11	371.0	291.0	43			
4	2Y755	1200	G	G	G	G	3.0	2.0	38	11	3	308.0	246.0	42	577.0	5	G
	1023536	1200	G	G	G	G	3.0	1.0	21	19	11	338.0	233.0	47	577.0	5	G
	J013002A	1200	G	G	G	G	4.0	1.0	14	12	10	410.0	321.0	39	577.0	5	G
	8W3750	1200	G	G	G	G	4.0	2.0	25	16	13	361.0	240.0	40	577.0	5	G
	SP64691	1200	G	G	G	G	5.0	2.0	19	10	9	401.0	320.0	38	577.0	5	G
5	J0103002A	1200	G	G	G	G	4.0	1.0	14	12	10	410.0	321.0	39	577.0	5	G
6	J0203210A	2300	G	G	G	G	4.0	1.0	13	13	11	371.0	291.0	43	577.0	5	G
	J0103149A	2300	G	G	G	G	4.0	1.0	16	15	9	390.0	281.0	41	577.0	5	G
7	1043742	1900	G	G	G	G	4.0	1.0	24	14	6	315.0	237.0	42	577.0	5	G
	1083742	1900	G	G	G	G	4.0	1.0	16	13	10	360.0	256.0	43	577.0	5	G
	1011739	1900	G	G	G	G	3.0	2.0	16	16	10	412.0	326.0	40	577.0	5	G
8	1043742	1900	G	G	G	G	4.0	2.0	19	14	11	380.0	275.0	37	577.0	5	G
9	24768	800	G	G	G	G	5.0	1.0	25	8	11	320.0	250.0	40	590.0	5	G
	4A514	800	G	G	G	G	5.0	1.0	25	8	11	320.0	250.0	40	590.0	5	G
10	J013002A	1200	G	G	G	G	4.0	1.0	14	12	10	410.0	321.0	39	577.0	5	G

EXLTUBE

1000 BURLINGTON STREET, NORTH KANSAS CITY, MO 64116 1-816-474-5210 TOLL FREE 1-800-892-TUBE

STEEL VENTURES, LLC dba EXLTUBE

Certified Test Report

Customer:	Size:	Customer Order No:	Date:
Kelly Pipe Co., LLC-Non AD 11680 Bloomfield Ave. Santa Fe Springs CA 90670-4608	06.625	10P30007SS	01/29/2019
	Gauge: .280	Delivery No:83304568 Load No:4114228	
	Specification: ASTM A53-12 Gr.B / ASME SA53-15 Gr.B		

Heat No	Yield KSI	Tensile KSI	Elongation % 2 Inch	Hydro Test PSI
77486D	58.0	71.6	33.00	1780

Heat No	C	MN	P	S	SI	CU	NI	CR	MO	V
77486D	0.0800	0.9100	0.0100	0.0080	0.0060	0.0200	0.0100	0.0300	0.0000	0.0000

This material was melted & manufactured in the U.S.A.
Coil Producing Mill: UNITED STATES STEEL, GRANITE CITY, IL

We hereby certify that all test results shown in this report are correct as contained in the records of our company. All testing and manufacturing is in accordance to A.S.T.M. parameters encompassed within the scope of the specifications denoted in the specification and grade tiles above. This product was manufactured in accordance with your purchase order requirements.

This material has not come into direct contact with mercury, any of its compounds, or any mercury bearing devices during our manufacturing process, testing, or inspections.

This material is in compliance with EN 10204 Section 4.1 Inspection Certificate Type 3.1

This material has passed NDE (eddy current, A309) testing. This material has passed flattening tests.

Tensile test completed using test specimen with 3/4" reduced area.

FM APPROVED

c UL us

STEEL VENTURES, LLC dba EXLTUBE

Jonathan Wolfe
Quality Assurance Manager

TYLER UNION®
Quality Waterworks Products

23U - ANSI/AWWA C153/A21.53
Mechanical Joint Compact
Ductile Iron Fittings
Revised 4/2018

☐ **DOMESTIC** ☐ **NON-DOMESTIC**

SUBMITTAL: C153 MECHANICAL JOINT PRODUCT

(Current revisions for the noted Standards apply)

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

STANDARDS: ANSI/AWWA C153/A21.53, NFPA13/24, 3"-16" UL and 3"-10" FM listed & approved (File - Tyler Union)

MATERIAL: Cast of ASTM A536 qualified ductile iron. Date code is cast on and required for traceability.

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

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

NSF-61 & NSF372: Meets all requirements including Annex G, Tyler Union's Underwriters Laboratory listing MH16439.

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

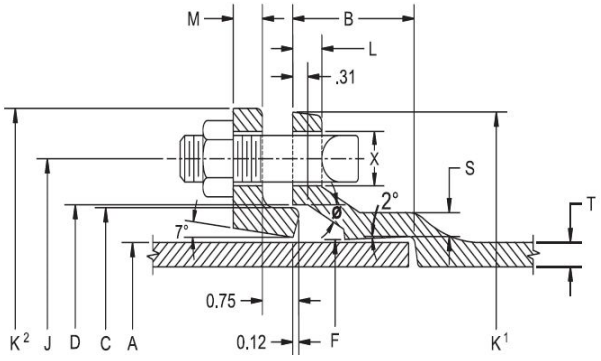
CEMENT LINING: Per ANSI/AWWA C104/A21.4, with double cement lining available upon request.

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

BARE FITTINGS: Available upon request.

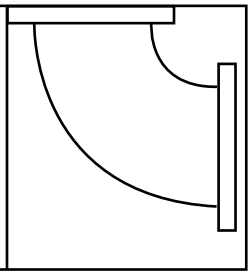
FASTNERS: High strength low alloy weathering steel per ANSI/AWWA C111/A21.11 and ASTM A242

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



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

Anniston: 1501 W 17th St. ● Anniston, AL 36201 ● (800) 226-7601
Corona: 1001 El Camino Ave. ● Corona, CA 92879 ● (866) 527-8471
Tyler: 11910 CR 492 ● Tyler, Texas 75706 ● (800) 527-8478
Dallas: 1201 Ave. S. Suite100 ● Grande Prairie, TX 75050
Elmer: 701 Kenyon Ave.● Elmer, New Jersey 03318
New Lenox: 2200 West Haven● New Lenox, IL 60451
Portland: 15670 N. Lombard St. ● Portland, OR 97203
Oxford: 1800 Greenbrier Dear Road ●Anniston, AL 36207



FLANGED FITTINGS

Flanged Fittings for Water and Other Liquids (cont.)

Accessories

The gaskets and bolts to be used with flanged pipe and fittings should be selected by the purchaser with due consideration for the particular service and installation requirements. Flanged joint accessories (bolts, nuts and gaskets) can be furnished by U.S. Pipe if so specified. U.S. Pipe's FULL FACE FLANGE-TYTE™ Gaskets or RING FLANGE-TYTE™ Gaskets (4" through 64"size) are recommended for all flanged joints.

Flange Compatibility and Pressure Ratings

The flanges of **ANSI/AWWA C110/A21.10** and **C153/A21.53** standards conform to the drilling and facing of ANSI B16.1 Class 125 flanges. This B16.1 Class 125 designation leads some to conclude that these AWWA flanges are only rated at 125 psi service which is not correct. **ANSI/AWWA C110/A21.10** flanged fittings are rated for 350 psi operating pressure for 3" through 12" sizes, 250 psi operating pressure for 14" through 48" sizes and **ANSI/AWWA C153/A21.53** fittings are rated for 150 psi operating pressure for 54" through 64" sizes. These ratings are at ambient temperatures with at least a 2:1 factor of safety. Special gaskets such as U.S. Pipe's FULL FACE FLANGE-TYTE™ Gaskets or RING FLANGE-TYTE™ Gaskets are required for operating pressures greater than 250 psi.

(Flanges of Ductile Iron fittings meeting the requirements of **ANSI/AWWA C110/A21.10** cannot be joined with Class 250 ANSI B16.1 flanges.)

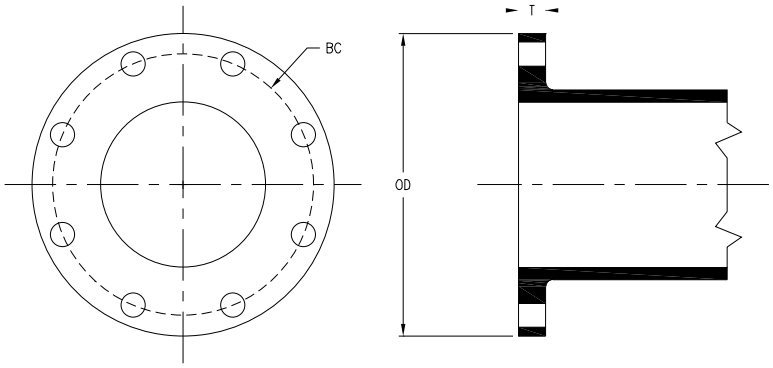
Special Service Requirements

When requesting prices for flanged piping other than water service, please furnish complete information regarding the type of material to be conveyed, composition, concentration, pH, pressure and temperature.

NOTE: *U.S. Pipe recommends the use of* ***FULL FACE FLANGE-TYTE®*** *Gaskets or* ***RING FLANGE-TYTE®*** *Gaskets with Ductile Iron flanged joint products supplied by U.S. Pipe. These gaskets were designed specifically for the unique surface of Ductile Iron. Flat rubber gaskets are NOT considered equal in performance and may not provide the sealing capability the project requires. In addition, their use could result in unintended damage to the flanges and threads of the fabricated pipe by applying excess torque to the bolts/flanges in order to seal the joint.*

FLANGED FITTINGS

Flanged Fittings - Flange Details



SIZE Inches	DIMENSIONS Inches					
	OD	BC	T	BOLT HOLE Diameter	BOLT Diameter & Length	QTY. OF BOLTS
3	7.50	6.00	.75 ± .12	3/4	5/8 x 2-1/2	4
4	9.00	7.50	.94 ± .12	3/4	5/8 x 3	8
6	11.00	9.50	1.00 ± .12	7/8	3/4 x 3-1/2	8
8	13.50	11.75	1.12 ± .12	7/8	3/4 x 3-1/2	8
10	16.00	14.25	1.19 ± .12	1	7/8 x 4	12
12	19.00	17.00	1.25 ± .12	1	7/8 x 4	12
14	21.00	18.75	1.38 ± .19	1-1/8	1 x 4-1/2	12
16	23.50	21.25	1.44 ± .19	1-1/8	1 x 4-1/2	16
18	25.00	22.75	1.56 ± .19	1-1/4	1-1/8 x 5	16
20	27.50	25.00	1.69 ± .19	1-1/4	1-1/8 x 5	20
24	32.00	29.50	1.88 ± .19	1-3/8	1-1/4 x 5-1/2	20
30	38.75	36.00	2.12 ± .25	1-3/8	1-1/4 x 6-1/2	28
36	46.00	42.75	2.38 ±.25	1-5/8	1-1/2 x 7	32
42	53.00	49.50	2.62 ± .25	1-5/8	1-1/2 x 7-1/2	36
48	59.50	56.00	2.75 ± .25	1-5/8	1-1/2 x 8	44
54	66.25	62.75	3.00 ± .25	2	1-3/4 x 8-1/2	44
60	73.00	69.25	3.12 ± .25	2	1-3/4 x 9	52
64	80.00	76.00	3.38 ± .25	2	1-3/4 x 9	52

LAYING LENGTH DIMENSIONS: *Pipe face-to-face dimensions conform to a tolerance of ±.12" for sizes 3"-64"*
Fittings face-to-face dimensions conform to a tolerance of ±.06" for sizes 3"-10" and ±.12" for sizes 12"-64". The largest opening governs the tolerance for all openings. Center-to-face tolerances are one half the face-to-face tolerances.

FLANGES: *The bolt circle and bolt holes of these flanges match those of **ANSI/AWWA C115/A21.15** and Class 125 flanges shown in ANSI B16.1 and can be joined with A21.15 and Class 125 B16.1 flanges. The flanges do not match the Class 250 flanges shown in ANSI B16.1 and cannot be joined with Class 250 B16.1 flanged fittings and valves. For technical information on Class 250 flanges see U.S. Pipe's Class 250 Flanges submittal document at **www.uspipe.com**.*

FACING: *Class 125 flanges are plain faced without projection and are furnished smooth or with shallow serrations.*

CERTIFICATION: *Complies with **ANSI/AWWA C115/A21.15 Flanged Ductile Iron Pipe.***

TYLER UNION®
Quality Waterworks Products

32U – Heavy Duty Valve and Service Boxes and Components
Revised 11/2016

☐ DOMESTIC ☐ NON-DOMESTIC

SUBMITTAL:

(Current revisions for the noted Standards apply)

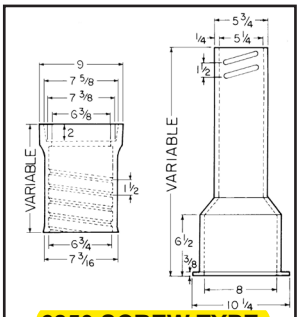
SIZES: Adjustable Slip and Screw type with standard assembly lengths ranging from 19" to 72" (Lengths noted do not include the addition of risers, extensions, and/or bases). See the catalog or List Price guide for accessories, lids, bases, risers, meter covers, etc.

STANDARDS: Produced with Class 35 cast iron in accordance with and meeting all applicable terms and provisions of ASTM A48. All Tyler Union valve boxes when properly installed are suitable for use in conjunction with projects utilizing American Association of State Highway and Transportation Officials (AASHTO) standards and provisions.

INSTALLATION: Per AWWA M44, Manual of Water Supply Practices

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

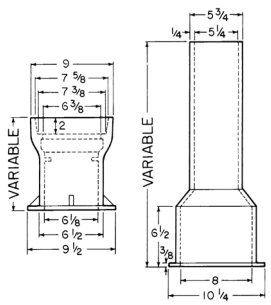
For 4" - 12" Valves
5-1/4" Shaft, Screw Type



6850 SCREW TYPE VALVE BOX
Cast Iron - 2 piece

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

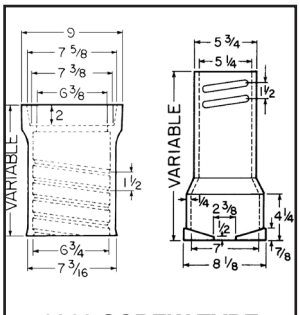
For 4" - 12" Valves
5-1/4" Shaft, Slip Type



6855 SLIP TYPE VALVE BOX
Cast Iron - 2 piece

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

For 3" - 20" Valves
5-1/4" Shaft, Screw Type

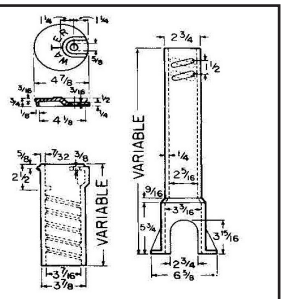


6860 SCREW TYPE VALVE BOX
Cast Iron - 3 piece

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

NOTE: Base Required, Order Separately

For 1/2" to 2"
Curbstops

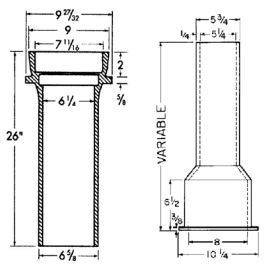


6500 SCREW TYPE CURB/SERVICE BOX

Components	Extension Height
12T + 12B	15-21
12T + 15B	18-24
15T + 15B	21-27
15T + 21B	24-33
15T + 27B	30-39
18T + 27B	30-42
18T + 33B	36-48
24T + 33B	36-54
24T + 39B	45-60
30T + 39B	41-64

NOTE: Enlarged Base Available

T = Top B = Bottom Ext = Extension



For 4" - 12" Valves
5-1/4 Shaft, Slip Type
7126 SLIP TYPE VALVE BOX
Cast Iron - 2 Piece

Components	Extension Height
26T + 30B	36-52
26T + 36B	39-60

Anniston: 1501 W 17th St. ● Anniston, AL 36201 ● (800) 226-7601
Corona: 1001 El Camino Ave. ● Corona, CA 92879 ● (866) 527-8471
Tyler: 11910 CR 492 ● Tyler, Texas 75706 ● (800) 527-8478
Dallas: 1201 Ave. S. Suite100 ● Grande Prairie, TX 75050
Elmer: 701 Kenyon Ave. Elmer, New Jersey 03318
New Lenox: 2200 West Haven● New Lenox, IL 60451
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Oxford: 1800 Greenbrier Dear Road ●Anniston, AL 36207

TYLER UNION®
Quality Waterworks Products

31U – Standard Mechanical & Push-On Joint Gaskets (SBR, NBR, EPDM, Neoprene, FKM)
Revised 10/2016

SUBMITTAL

(Current revisions for the noted Standards apply)

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

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

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

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

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

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

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

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

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

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TYLER UNION®
Quality Waterworks Products

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

Revised 10/2016

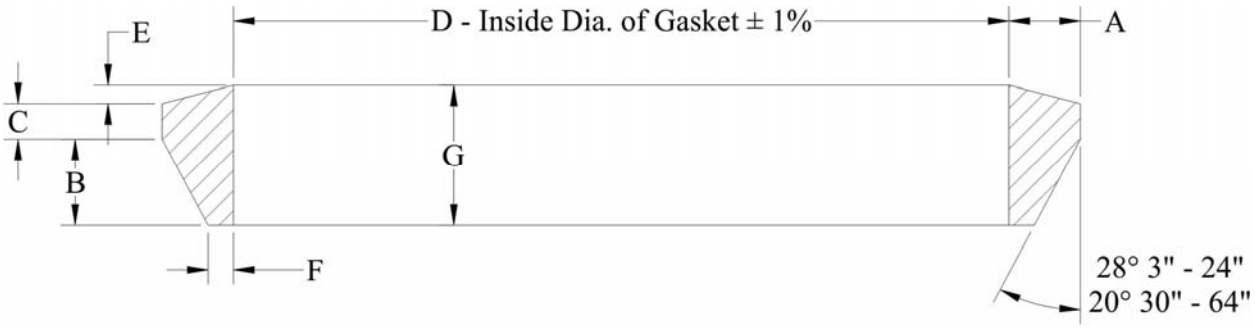
Mechanical Joint Gaskets

ANSI/AWWA C111/A21.11-12

*MJ Tru-Lock Gaskets 30-48 inch

Pipe Size	Pipe OD	A ±0.01''	B	C	D ±1%	E ±0.01%	F ±0.01''	G ±0.02''
**2	2.50	0.48	0.62	0.31	2.48	0.12	0.15	1.05
3	3.96	0.48	0.62	0.31	3.86	0.12	0.15	1.05
4	4.80	0.62	0.75	0.31	4.68	0.16	0.22	1.22
6	6.90	0.62	0.75	0.31	6.73	0.16	0.22	1.22
8	9.05	0.62	0.75	0.31	8.85	0.16	0.22	1.22
10	11.10	0.62	0.75	0.31	10.87	0.16	0.22	1.22
12	13.20	0.62	0.75	0.31	12.95	0.16	0.22	1.22
14	15.30	0.62	0.75	0.31	14.99	0.16	0.22	1.22
16	17.40	0.62	0.75	0.31	17.07	0.16	0.22	1.22
18	19.50	0.62	0.75	0.31	19.13	0.16	0.22	1.22
20	21.60	0.62	0.75	0.31	21.20	0.16	0.22	1.22
24	25.80	0.62	0.75	0.31	25.34	0.16	0.22	1.22
30	32.00	0.73	1.00/*.50	.38/*.50	31.47	0.16	.37/*.55	1.54/*1.16
36	38.30	0.73	1.00/*.50	.38/*.50	37.67	0.16	.37/*.55	1.54/*1.16
42	44.50	0.73	1.00/*.50	.38/*.50	43.78	0.16	.37/*.55	1.54/*1.16
48	50.80	0.73	1.00/*.50	.38/*.50	49.98	0.16	.37/*.55	1.54/*1.16

** Not included in AWWA C111. Manufacture's Standard does not meet AWWA C111



** Mechanical Joint Transition Gasket Dimensions in Inches

Pipe Size	A ± 0.01"	B	C	D ±1%	E	F ± 0.01"	G ± 0.02"
2	0.57	0.62	0.31	2.28	0.16	0.24	1.08
3	0.70	0.62	0.31	3.45	0.16	0.37	1.11
4	0.77	0.75	0.31	4.43	0.16	0.37	1.26
6	0.76	0.75	0.31	6.53	0.16	0.36	1.25
8	0.82	0.75	0.31	8.50	0.16	0.42	1.27
10	0.79	0.75	0.31	10.59	0.16	0.39	1.26
12	0.84	0.75	0.31	12.56	0.16	0.44	1.28

** Not included in AWWA C111. Manufacture's Standard does not meet AWWA C111

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SUBMITTAL: C111 T-BOLTS AND NUTS FOR MECHANICAL JOINT

(Current revisions for all noted Standards apply)

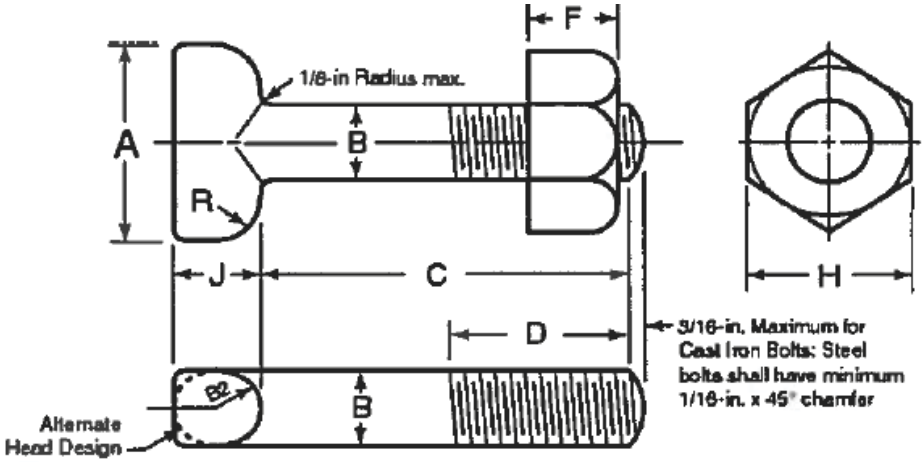
SIZES: 5/8 X 3 through 1-1/4 X 8.5

STANDARDS: ANSI/AWWA C111/A21.11

Material: ASTM A242 High Strength Low Alloy Steel. Also available in ANSI 304 or 316 AISI Stainless Steel.

COATING: Standard bolts and nuts are not coated. Stainless Steel bolt and coated Green or Red. Flouropolymer costing is available on request. Flouropolymer is Flurokote #1 (Blue for Low Alloy Steel).

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



T-HEAD LOW ALLOY WEATHERING AND AISI STAINLESS STEEL FASTENER DIMENSION IN INCHES									
Size Inches	A ± 0.05	B +0.03 / - 0.074	C +0.25 / - 0.06	F	H	J +0.15/0.03	R Max	D*	Threads Per Inch E**
5/8 x 3	1.5	0.625	3.00	0.625	1.062	0.625	0.312	2.00	11
3/4 x 3.5	1.75	0.750	3.50	0.750	1.250	0.750	0.375	2.50	10
3/4 x 4	1.75	0.750	4.00	0.750	1.250	0.750	0.375	3.00	10
3/4 x 4.5	1.75	0.750	4.50	0.750	1.250	0.750	0.375	3.00	10
3/4 x 5	1.75	0.750	5.00	0.750	1.250	0.750	0.375	3.00	10
1 x 6	1.75	1.000	6.00	1.000	1.625	1.000	0.500	3.00	8
1 x 7.5	2.25	1.000	7.50	1.000	1.625	1.000	0.625	4.50	8
1 - 1/4 x 6.5	2.50	1.250	6.50	1.250	2.000	1.250	0.750	3.50	7
1 - 1/4 x 8.5	2.50	1.250	8.50	1.250	2.000	1.250	0.750	4.00	7

NOTES:

1. Dimension B is unthreaded shank.
2. Draft, when required to be 6 degree maximum, may be deducted from bolt head dimensions, and radius (B/2) may be changed to suit draft.
3. Gates, if required, may protrude a maximum of 1/8'' above the top of bolt thread.
4. Chamfer is optional if threads are rolled.
5. If threads are rolled, the body diameter may be reduced to the approximate pitch diameter of the thread.
6. * Tolerance +3/-0 thread.
7. ** Number of threads per inch – course-thread series (ANSI/ASME B1.1), Class 2A, external fit UNC2A and Class 2B, UNC2B (ANSI/ASME B1.2).

Domestic Ductile Iron Flanged Fittings

ANSI/AWWA C110/A21.10

GENERAL SPECIFICATIONS

MATERIAL:	Ductile iron per ASTM A536
PRESSURE:	250 PSI ratiing for 1" - 48" sizes and 150 PSI rating for 54" - 64"
TESTING:	In accordance with ANSI/AWWA C110/A21.10, UL and FM requirements
LAYING LENGTH:	2" - 48" sizes in accordance with ANSI/AWWA C110/A21.10 and ANSI B16.1 and 54" - 64" sizes in accordance with ANSI/AWWA C153/A21.53 (fittings not listed in ANSI/AWWA have dimensions per Star design as noted in the catalog)
WEIGHTS:	Are in pounds, unless noted otherwise and do not include accessories, cement lining and coatings
DRILLING:	In accordance with ANSI/AWWA C110/A21.10, ANSI/AWWA C153/A21.53 and ANSI B16.1 Class 125 Flanges
CEMENT LINING:	In accordance with ANSI/AWWA C104/A21.4 -- sizes 1"- 3" single thickness and sizes 4"- 64" double thickness
COATING:	Asphaltic seal coat inside in accordance with ANSI/AWWA C104/A21.4 and Tnemec Pota Pox 140N-1211 outside
APPROVALS:	2" - 12" Underwriters Laboratories and ULC Listed and Factory Mutual approved for 300 PSI rating. Please consult factory for detail listing and approvals. 2" and greater are UL/NSF-61.
DIMENSIONS:	All dimensions are in inches unless noted otherwise.
INSTALLATION:	Per ANSI/AWWA C110 and C111

AWWA MEMBER

FM APPROVED

ULC

UL

CLASSIFIED UL WATER QUALITY

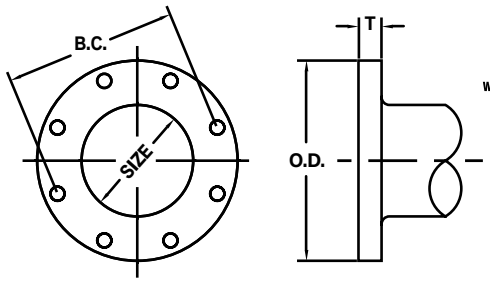
SUBMITTAL INFORMATION

PROJECT NAME:

ENGINEER:

CONTRACTOR:

SPEC. SECTION:



FLANGE DETAILS

NOM. SIZE	O.D.	B.C.	T	BOLT HOLE DIA.	BOLTS	
					SIZE	NO.
1	4.25	3.12	0.44	0.62	½ x 2	4
1 ½	5.00	3.88	0.56	0.62	½ x 2	4
2	6.00	4.75	0.62	0.75	⅝ x 2 ¼	4
2 ½	7.00	5.50	0.69	0.75	⅝ x 2 ½	4
3	7.50	6.00	0.75	0.75	⅝ x 2 ½	4
4	9.00	7.50	0.94	0.75	⅝ x 3	8
5	10.00	8.50	0.94	0.88	¾ x 3	8
6	11.00	9.50	1.00	0.88	¾ x 3 ½	8
8	13.50	11.75	1.12	0.88	¾ x 3 ½	8
10	16.00	14.25	1.19	1.00	⅞ x 4	12
12	19.00	17.00	1.25	1.00	⅞ x 4	12
14	21.00	18.75	1.38	1.13	1 x 4 ½	12
16	23.50	21.25	1.44	1.13	1 x 4 ½	16
18	25.00	22.75	1.56	1.25	1 ⅛ x 5	16
20	27.50	25.00	1.69	1.25	1 ⅛ x 5	20
24	32.00	29.50	1.88	1.38	1 ¼ x 5 ½	20
30	38.75	36.00	2.12	1.38	1 ¼ x 6 ½	28
36	46.00	42.75	2.38	1.63	1 ½ x 7	32
42	53.00	49.50	2.62	1.63	1 ½ x 7 ½	36
48	59.50	56.00	2.75	1.63	1 ½ x 8	44
54	66.25	62.75	3.00	2.00	1 ¾ x 8 ½	44
60	73.00	69.25	3.12	2.00	1 ¾ x 9	52
64	80.00	76.00	3.38	2.00	1 ¾ x 9	52

SIZE RANGE (Please specify):

Size Range _____

LINING OPTIONS (Please check one):

- [x] Standard: Cement-lined and asphalt seal coat per ANSI/AWWA C104/A21.4 and UL/NSF-61
- [ ] Optional: FBE (Fusion Bonded Epoxy) per ANSI/AWWA C116/A21.16 and UL/NSF-61 - ID & OD Only
- [ ] Optional: P401 (Protecto 401) Ceramic Epoxy - sewer applications only. Not NSF-61
- [ ] Optional: Other (specify) _____

COATING OPTIONS (Please check one):

- [x] Standard: Tnemec Pota Pox 140N-1211 (Red)
- [ ] Optional: Asphaltic seal coat per ANSI/AWWA C104/A21.4
- [ ] Optional: FBE (Fusion Bonded Epoxy) per ANSI/AWWA C116/A21.16 and UL/NSF-61 - ID & OD Only
- [ ] Optional: Other (specify) _____

REV2001

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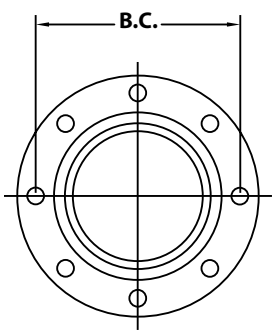
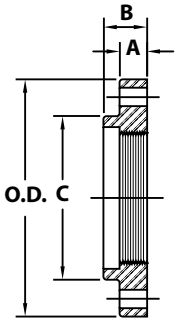
Flanges

ANSI/AWWA C115/A21.15





GENERAL SPECIFICATIONS

MATERIAL: Ductile Iron per ASTM A536

PRESSURE: 250 PSI

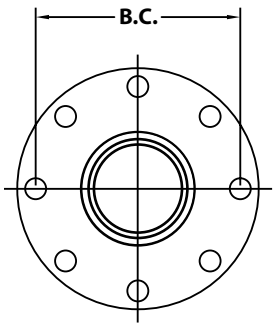
DRILLING: In accordance with ANSI/AWWA C110/21.10, ASME B16.1 Class 125 and ASME B16.42 Class 150

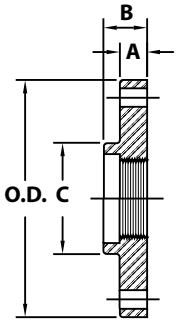
DIMENSIONS: Per ANSI/AWWA C115/A21.15 Flange O.D. & thickness per ANSI/AWWA C110/21.10

FLANGE THREADS: Taper pipe thread per ASME B1.20.1 adapted to ductile iron pipe O.D.

HI HUB THREADED 125 LB. FLANGES FOR DUCTILE PIPE (DUCTILE IRON)

NOM. SIZE	OD PIPE	FLANGE THK. A	FLANGE THK. B	THREAD LENGTH	OD FLANGE O.D.	HUB DIA. C	BOLT CIRCLE B.C.	BOLT HOLE DIA.	BOLT DIA. & LENGTH	NO. OF BOLT HOLES	WT (LBS.)
2	2.50	0.62	1.25	1.00	6.00	3.06	4.75	¾	⅝ x 2 ¼	4	4
3	3.96	0.75	1.69	1.25	7.50	4.45	6.00	¾	⅝ x 2 ½	4	7
4	4.80	0.94	1.81	1.37	9.00	5.32	7.50	¾	⅝ x 3	8	12
6	6.90	1.00	2.00	1.53	11.00	7.56	9.50	⅞	¾ x 3 ½	8	17
8	9.05	1.12	2.25	1.75	13.50	9.69	11.75	⅞	¾ x 3 ½	8	26
10	11.10	1.19	2.44	1.88	16.00	12.00	14.25	1	⅞ x 4	12	37
12	13.20	1.25	2.56	2.12	19.00	14.06	17.00	1	⅞ x 4	12	55
14	15.30	1.38	2.62	2.12	21.00	16.25	18.75	1 ⅛	1 x 4 ½	12	70
16	17.40	1.44	2.75	2.12	23.50	18.44	21.25	1 ⅛	1 x 4 ½	16	80
18	19.50	1.56	3.00	2.25	25.00	20.53	22.75	1 ¼	1 ⅛ x 5	16	85
20	21.60	1.69	3.25	2.44	27.50	22.63	25.00	1 ¼	1 ⅛ x 5	20	106
24	25.80	1.88	3.50	2.75	32.00	26.82	29.50	1 ⅜	1 ¼ x 5 ½	20	147
30	32.00	2.12	3.75	3.37	38.75	32.75	36.00	1 ⅜	1 ¼ x 6 ½	28	224
36	38.30	2.38	5.00	4.00	46.00	39.12	42.75	1 ⅝	1 ½ x 7	32	337
42	44.50	2.62	5.12	4.50	53.00	46.00	49.50	1 ⅝	1 ½ x 7 ½	36	495
48	50.80	2.75	5.50	5.12	59.50	52.25	56.00	1 ⅝	1 ½ x 8	44	622
54	57.56	3.00	6.45	4.75	66.25	58.75	62.75	2	1 ¾ x 8 ½	44	711
60	61.61	3.12	6.75	5.00	73.00	63.00	69.25	2	1 ¾ x 9	52	1084
64	65.67	3.38	7.06	5.25	80.00	67.18	76.00	2	1 ¾ x 9	52	1575





GENERAL SPECIFICATIONS

MATERIAL: Ductile Iron per ASTM A536

PRESSURE: 250 PSI

DRILLING: In accordance with ANSI/AWWA C110/21.10, ASME B16.1 Class 125 and ASME B16.42 Class 150

DIMENSIONS: Per ANSI/AWWA C115/A21.15 Flange O.D. & thickness per ANSI/AWWA C110/21.10

FLANGE THREADS: Taper pipe thread per ASME B1.20.1 adapted to ductile iron pipe O.D.

REDUCING 125 LB. FLANGES FOR DUCTILE PIPE (DUCTILE IRON)

NOM. SIZE	OD PIPE	FLANGE THK. A	FLANGE THK. B	THREAD LENGTH	OD FLANGE O.D.	HUB DIA. C	BOLT CIRCLE B.C.	BOLT HOLE DIA.	BOLT DIA. & LENGTH	NO. OF BOLT HOLES	WT (LBS.)
4 x 3	3.96	0.94	1.37	0.94	9.00	4.45	7.50	¾	⅝ x 3	8	16
6 x 4	4.80	1.00	1.56	1.00	11.00	5.32	9.50	⅞	¾ x 3 ½	8	25
8 x 4	4.80	1.12	1.75	1.00	13.50	5.32	11.75	⅞	¾ x 3 ½	8	40
8 x 6	6.90	1.12	1.75	1.16	13.50	7.56	11.75	⅞	¾ x 3 ½	8	35
10 x 8	9.05	1.19	2.00	1.38	16.00	9.69	14.25	1	⅞ x 4	12	50
12 x 8	9.05	1.25	2.19	1.38	19.00	9.69	17.00	1	⅞ x 4	12	85
12 x 10	11.10	1.25	2.19	1.38	19.00	12.00	17.00	1	⅞ x 4	12	65

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A2361 RESILIENT WEDGE GATE VALVES, 350 PSI

Product Specifications

1. GENERAL CLASSIFICATION

1.1 Mueller Resilient Wedge Gate Valves comply with ANSI/AWWA C515.

1.2 Mueller Resilient Wedge Gate Valves are approved by Factory Mutual Research Corporation (FM).

1.3 Mueller Resilient Wedge Gate Valves are listed by Underwriters Laboratories, Inc. (UL). Valves with actuators are not listed.

1.4 Mueller Resilient Wedge Gate Valves are tested and certified to ANSI/NSF Standard 61 & 372.

1.5 Mueller Resilient Wedge Gate Valves are suitable for potable water applications.

1.6 Mueller Resilient Wedge Gate Valves are iron body, fully encapsulated resilient wedge type.

1.7 Mueller Resilient Wedge Gate Valves are manufactured in the U.S.A. at an ISO9001 Certified factory.

2. SIZE RANGE, WORKING TEMPERATURE & WORKING PRESSURE

2.1 **Sizes:** 3" to 12".

2.2 **Working Temperature:** 33°F minimum to 170°F maximum working temperature.

2.3 **Working Pressure:** 350 psi for AWWA, UL and FM.

3. TYPE OF VALVE

3.1 Resilient Wedge Gate Valves are non-rising stem type.

3.2 NRS Resilient Wedge Gate Valves feature O-ring stem seals.

3.3 Resilient Wedge Gate Valves are available to either open left or open right.

3.4 Resilient Wedge Gate Valves have a 2" square wrench nut complying with AWWA C515. Optional hand wheels are available.

3.5 **Resilient Wedge Gate Valves are offered with the following end connections:**

3.5.1 **Flanged Ends** with flange drilling complying to ASME B16.1 Class 125 (ISO PN10 / PN16 drilling optional). Per ANSI/AWWA C111, working pressure above 250 psi requires the use of a special gasket rated for the higher pressure.

3.5.2 **Mechanical Joint Ends** complying with ANSI/AWWA C111/A21.11.

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3.6 **Resilient Wedge Tapping valves are offered with the following end connections:**

3.6.1 Inlet flange machined specifically for mating with Tapping Sleeves and Crosses. Raised ring on flange face complies with MSS SP-60. Drilling complies with ASME B16.1 Class 125 flange.

3.6.2 Standard Mechanical Joint outlet connection complies with ANSI/AWWA C111/A21.11 and is precision machined for proper alignment of Mueller Drilling Machines.

4. MATERIAL SPECIFICATIONS

4.1 **Cap screw** - Stainless Steel Type 316.

4.2 **Wrench nut** – Ductile Iron, ASTM A-536.

4.3 **Handwheel** – Cast Iron, ASTM A-126, Class B.

4.4 **Stuffing box** – Ductile Iron, ASTM A-536.

4.5 **Stem O-rings** – Nitrile, ASTM D2000.

4.6 **Anti-friction washers** – Acetal.

4.7 **Stem** – Manganese Bronze, CDA Alloy C67600.

4.8 **Bonnet** – Ductile Iron, ASTM A-536.

4.9 **Bonnet seal** – O-ring, Nitrile, ASTM D2000.

4.10 **Stuffing box bolts & nuts** – Stainless Steel Type 316.

4.11 **Bonnet bolts & nuts** – Stainless Steel Type 316.

4.12 **Disc nut** – Bronze, ASTM B-584 Alloy C89833.

4.13 **Guide cap bearings** – Acetal.

4.14 **Disc** – 3" Cast Iron, ASTM A-126, Class B
4" - 12" Ductile Iron, ASTM A-536.

4.15 **Disc encapsulated** – SBR ASTM D2000.

4.16 **Body** – Ductile Iron, ASTM A-536.

4.17 **Coating** – Inside and outside of valve fully coated Mueller PRO-GARD Fusion Bonded Epoxy - coating complies with ANSI/AWWA C550 and valve is certified to ANSI/NSF Standard 61 & 372.

5. DESIGN FEATURES

5.1 **Flow Way** – Fully unobstructed, oversized flow-way. The sealing mechanism is withdrawn from the flow-way in a full open position. No pockets in bottom of flow-way to trap sediment or debris. The flow-way will permit passage of full-sized shell cutters.

5.2 **Bronze Disc Nut** – On all valves.

5.3 **Anti-Friction Washers** on non-rising stem valves – Located above and below the thrust collar portion of the stem to reduce friction and provide more effective conversion of operating torques into seating loads.

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5.4 **Stem** for non-rising stem valves, with O-ring Seals – One O-ring is located below the thrust collar of the stem and two are located above the thrust collar, the upper most serving as a dirt seal. The O-rings and thrust collar are factory lubricated. The two primary O-rings seal the thrust collar area from outside contaminants and water, and retain an ample amount of lubricant on the thrust collar and anti-friction washers to reduce operating torque and wear.

5.5 **Stem** – The threads on the bronze stem are Acme form threads for strength and efficiency. The stem thrust collar is made integral with the stem -- and is formed by a heat upset operation.

5.6 **Upper Stem O-ring Replacement** – The two O-rings above the thrust collar of all Mueller Resilient Wedge Gate Valves can be replaced with the valve in the fully open position, under pressure, with no leakage.

5.7 **Corrosion Resistance** – All inside and outside cast iron surfaces are coated with Mueller PRO-GARD® Epoxy Coating, 10 mils nominal. Mueller PRO-GARD Epoxy Coating is non-toxic and imparts no taste to water. Valves comply with ANSI/AWWA C550 and are certified to ANSI/NSF Standard 61 & 372.

6. OPTIONAL FEATURES

6.1 Mueller A-2361 350 psi Resilient Wedge Gate Valves can be furnished with the following optional designs or features:

6.1.1 **Gearing** – Bevel and Spur gearing available. Bevel geared valves are for horizontal installations; spur geared for vertical. Geared valves provide an additional bearing to support the extreme end of the stem.

6.1.2 **Position Indicator** – Available for NRS valves 3" and larger.

6.1.3 **Stem** – Silicon bronze - ASTM B98 C66100; 304 Stainless Steel or 316 Stainless Steel.

6.1.4 **Disc Encapsulation and O-rings** – EPDM ASTM D2000.

7. TEST PRESSURE

7.1 The pressure test on each Mueller Resilient Wedge Gate Valve meets the requirements of AWWA Standard C515 for Resilient Seated Valves.

7.1.1 Each Mueller Resilient Wedge Gate Valve is subjected to two pressure tests. The seat test is at the working pressure of AWWA valves and 1 ½ times working pressure of UL Listed valves. Shell tests are at two times the working pressure.

7.1.2 Pressure tests at the working pressure shall show NO leakage past the seat from either side of the wedge or at the flange joints. Pressure tests at twice the working pressure shall show NO leakage through the metal or flange joints.

7.1.3 Test pressures are as follows: 525 psi seat test, 700 psi shell test.

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PRODUCT SPECIFICATIONS

A-2362 RESILIENT WEDGE GATE VALVES, 2”-12”

Mueller Co.
Reliable Connections®

1. General Classification

1.1 Mueller® Resilient Wedge Gate Valves comply with ANSI/AWWA C509 where applicable.
1.2 Mueller Resilient Wedge Gate Valves are approved by Factory Mutual Research Corporation (FM).
1.3 Mueller Resilient Wedge Gate Valves are listed by Underwriters Laboratories, Inc. (UL). Valves with actuators are not listed.
1.4 Mueller Resilient Wedge Gate Valves are tested and certified to ANSI/NSF Standard 61 & 372.
1.5 Mueller Resilient Wedge Gate Valves are suitable for potable water applications.
1.6 Mueller Resilient Wedge Gate Valves are iron body, fully encapsulated resilient wedge type.
1.7 Mueller Resilient Wedge Gate Valves are manufactured in the U.S.A. at an ISO9001 Certified factory.

2. Size Range, Working Temperature & Working Pressure

2.1 **Sizes:** 2” thru 12”
2.2 **Working Temperature:** 33° F minimum to 170° F maximum.
2.3 **Working Pressure**
2.3.1 350 psi for AWWA/UL/FM.

3. Type of Valve

3.1 Mueller Resilient Wedge Gate Valves are non-rising stem or post indicator type.
3.2 Mueller NRS Resilient Wedge Gate Valves are offered with O-ring stem seals.
3.3 Mueller Resilient Wedge Gate Valves are offered to open either left or right.
3.4 Mueller Resilient Wedge Gate Valves have a 2" square wrench nut complying with AWWA C509. Optional hand wheels are available.
3.5 Mueller Resilient Wedge Gate Valves of the non-rising stem type and post indicator type are offered with the following end connections:
3.5.1 Flanged Ends (2” thru 12”) with flange drilling complying to ANSI B16.1 Class 125 (ISO PN10/PN16 drilling optional).
3.5.2 Flanged Ends (3” thru 12”) with flange drilling complying to ANSI B16.1 Class 250 (ISO PN25 drilling optional).
3.5.3 Standard Mechanical Joint Ends (2”, 3” thru 12”) for cast iron pipe or ductile iron pipe with end dimensions complying with ANSI/AWWA C111/A21.11.
3.5.4 Slip-On Joint Ends* (4” thru 12”) complete with Mueller Slip-On Gasket, complying with ANSI/AWWA C111/A21.11. Fits plain end of classes 150, 200 and 250 cast iron; ductile iron, and classes 150 and 200 cast iron O.D. PVC**.

*Design and dimensions of the joint are manufactured under license of U.S. Pipe and Foundry Company.
**When using DI O.D. PVC pipe, the gaskets supplied by Mueller Co. must be used with this valve connection.

3.5.5 Radial Compression Joint Ends (2” thru 8”) for I.P. size PVC pipe.
3.6 Mueller Resilient Wedge Tapping valves (2”, 3” thru 12”) have an inlet flange complying with ANSI B16.1 Class 125 and MSS SP-60, and are offered with a Standard Mechanical Joint outlet end with dimensions complying with ANSI/AWWA C111/A2.11.

3.7 Mueller® Resilient Wedge Cut-In valves (4” thru 8”) have D-150 Mechanical Joint Ends with two specially designed gaskets to fit either of two diameters of Cast Iron or Ductile Iron Pipe; duck-tipped rubber gasket for Class 150 pipe, or plain rubber gasket for Class D pit cast pipe.

4. Material Specifications

4.1 **Cap screw –** Stainless Steel, Type 316.
4.2 **Wrench nut** – Ductile, ASTM A-536.
4.3 **Handwheel** – Cast Iron, ASTM A-126, Class B.
4.4 **Stuffing box** – Cast Iron, ASTM A-126, Class B.
4.5 **Stem O-rings** – Nitrile, ASTM D2000.
4.6 **Anti-friction washers** – Acetal Copolymer.
4.7 **Stem –** Manganese Bronze, ASTM B138 Alloy C67600.
4.8 **Bonnet** - Ductile Iron, ASTM A-536.
4.9 **Bonnet seal**
- **4.9.1** 2” thru 3" – Flat gasket, Neoprene, ASTM D-2000.
- **4.9.2** 4” thru 12” – O-ring, Nitrile, ASTM D-2000.

4.10 **Stuffing box bolts & nuts –** Stainless Steel, Type 316.
4.11 **Bonnet bolts & nuts** - Stainless Steel, Type 316.
4.12 **Disc nut** – Bronze, ASTM B-584 Alloy.
4.13 **Guide cap bearings** – Acetal Copolymer.
4.14 **Disc**
- **4.14.1** 2” thru 3” sizes – Cast Iron, ASTM A-126, Class B.
- **4.14.2** 4” thru 12” sizes – Ductile Iron, ASTM A-536.

4.15 **Disc encapsulated** – SBR ASTM D-2000.
4.16 **Body** – Ductile Iron, ASTM A-536.
4.17 **Coating** – Inside and outside of valve fully coated with Mueller PRO-GARD® Fusion Bonded Epoxy. Coating complies with ANSI/AWWA C550 and is certified to ANSI/NSF Standard 61.

5. Design Features

5.1 **Fully unobstructed, oversized flow-way** – the sealing mechanism is withdrawn from the flow-way in a full open position. No pockets in bottom of flow-way to trap sediment or debris. The flow-way will permit passage of full-sized shell cutters.
5.2 **Bronze Disc Nut** - all valves.
5.3 **Anti-Friction Washers on non-rising stem valves** – Located above and below the thrust collar portion of the stem to reduce friction and provide more effective conversion of operating torques into seating loads.
5.4 **Stem for non-rising stem valves, with O-ring Seals** – One O-ring is located below the thrust collar of the stem and two are located above the thrust collar, with the uppermost serving as a dirt seal (4” thru 12”). The O-rings and thrust collar are factory lubricated. The two primary O-rings seal the thrust collar area from outside contaminants and water, and retain an ample amount of lubricant on the thrust collar and anti-friction washers to reduce operating torque and wear.

A-2362 RESILIENT WEDGE GATE VALVES, 2”-12”

5.5 **Stem** – The threads on the bronze stem are Acme form threads for strength and efficiency. The stem thrust collar is made integral with the stem -- and is formed by a heat upset operation.

5.6 **Upper Stem O-ring Replacement** – The two O-rings above the thrust collar of all Mueller® Resilient Wedge Gate Valves can be replaced with the valve in the fully open position, under pressure, with no leakage.

5.7 **Corrosion Resistant** – all inside and outside cast iron surfaces are coated with Mueller PRO-GARD® Fusion Bonded Epoxy Coating, 10 mils nominal. Mueller PRO-GARD® Fusion Bonded Epoxy Coating is non-toxic, imparts no taste to water, and complies with ANSI/AWWA C550. Valves are certified to ANSI/NSF Standard 61.

6. Optional Features

6.1 Mueller 2362 Resilient Wedge Gate Valves can be furnished with the following optional designs or features:

6.1.1 **Gearing** – Bevel and Spur gearing available on 3” thru 12” valves. Bevel-geared valves are for horizontal installations; spur-geared for vertical. Geared valves provide an additional bearing to support the extreme end of the stem.

6.1.2 **Position indicator** – Available for NRS valves 3” and larger.

6.1.3 **Stem** – Silicon bronze - ASTM B98 C66100; 304 Stainless Steel or 316 Stainless Steel.

6.1.4 **Disc encapsulation & O-rings** – EPDM ASTM D2000.

7. Test Pressure

7.1 The pressure test on each Mueller Resilient Wedge Gate Valve meets the requirements of AWWA Standard C509 for Resilient Seated Valves.

7.1.1 Each Mueller Resilient Wedge Gate Valve is subjected to two pressure tests. The seat test is at the working pressure of AWWA valves and 1-1/2 times working pressure of UL Listed valves. Shell tests are at 2 times the working pressure.

7.1.2 Pressure tests at the working pressure shall show NO leakage past the seat from either side of the wedge or at the flange joints. Pressure tests at twice the working pressure shall show NO leakage through the metal or flange joints.

7.1.3 Test pressures are as follows: 525 psi seat test, 700 psi shell test.

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PRODUCT SPECIFICATIONS

A-2362 RESILIENT WEDGE GATE VALVES, 2”-12”

Mueller Co.
Reliable Connections®

1. General Classification

1.1 Mueller® Resilient Wedge Gate Valves comply with ANSI/AWWA C509 where applicable.

1.2 Mueller Resilient Wedge Gate Valves are approved by Factory Mutual Research Corporation (FM).

1.3 Mueller Resilient Wedge Gate Valves are listed by Underwriters Laboratories, Inc. (UL). Valves with actuators are not listed.

1.4 Mueller Resilient Wedge Gate Valves are tested and certified to ANSI/NSF Standard 61 & 372.

1.5 Mueller Resilient Wedge Gate Valves are suitable for potable water applications.

1.6 Mueller Resilient Wedge Gate Valves are iron body, fully encapsulated resilient wedge type.

1.7 Mueller Resilient Wedge Gate Valves are manufactured in the U.S.A. at an ISO9001 Certified factory.

2. Size Range, Working Temperature & Working Pressure

2.1 **Sizes:** 2” thru 12”

2.2 **Working Temperature:** 33° F minimum to 170° F maximum.

2.3 **Working Pressure**

2.3.1 250 psi for AWWA.

2.3.2 250 psi for UL/FM.

3. Type of Valve

3.1 Mueller Resilient Wedge Gate Valves are non-rising stem or post indicator type.

3.2 Mueller NRS Resilient Wedge Gate Valves are offered with O-ring stem seals.

3.3 Mueller Resilient Wedge Gate Valves are offered to open either left or right.

3.4 Mueller Resilient Wedge Gate Valves have a 2" square wrench nut complying with AWWA C509. Optional hand wheels are available.

3.5 Mueller Resilient Wedge Gate Valves of the non-rising stem type and post indicator type are offered with the following end connections:

3.5.1 Flanged Ends (2” thru 12”) with flange drilling complying to ANSI B16.1 Class 125 (ISO PN10/PN16 drilling optional).

3.5.2 Standard Mechanical Joint Ends (2”, 3” thru 12”) for cast iron pipe or ductile iron pipe with end dimensions complying with ANSI/AWWA C111/A21.11.

3.5.3 Slip-On Joint Ends* (4” thru 12”) complete with Mueller Slip-On Gasket, complying with ANSI/AWWA C111/A21.11. Fits plain end of classes 150, 200 and 250 cast iron; ductile iron, and classes 150 and 200 cast iron O.D. PVC**.

**Design and dimensions of the joint are manufactured under license of U.S. Pipe and Foundry Company.*
***When using DI O.D. PVC pipe, the gaskets supplied by Mueller Co. must be used with this valve connection.*

3.5.4 Radial Compression Joint Ends (2” thru 8”) for I.P. size PVC pipe.

3.6 Mueller Resilient Wedge Tapping valves (2”, 3” thru 12”) have an inlet flange complying with ANSI B16.1 Class 125 and MSS SP-60, and are offered with a Standard Mechanical Joint outlet end with dimensions complying with ANSI/AWWA C111/A2.11.

3.7 Mueller® Resilient Wedge Cut-In valves (4” thru 8”) have D-150 Mechanical Joint Ends with two specially designed gaskets to fit either of two diameters of Cast Iron or Ductile Iron Pipe; duck-tipped rubber gasket for Class 150 pipe, or plain rubber gasket for Class D pit cast pipe.

4. MATERIAL SPECIFICATIONS

4.1 **Cap screw –** Stainless Steel, Type 316.
4.2 **Wrench nut** – Ductile, ASTM A-536.
4.3 **Handwheel** – Cast Iron, ASTM A-126, Class B.
4.4 **Stuffing box** – Cast Iron, ASTM A-126, Class B.
4.5 **Stem O-rings** – Nitrile, ASTM D2000.
4.6 **Anti-friction washers** – Acetal Copolymer.
4.7 **Stem –** Manganese Bronze, ASTM B138 Alloy C67600.
4.8 **Bonnet** - Ductile Iron, ASTM A-536.
4.9 **Bonnet seal**
4.9.1 2” thru 3" – Flat gasket, Neoprene, ASTM D-2000.
4.9.2 4” thru 12” - O-ring, Nitrile, ASTM D-2000.
4.10 **Stuffing box bolts & nuts –** Stainless Steel, Type 316.
4.11 **Bonnet bolts & nuts** - Stainless Steel, Type 316.
4.12 **Disc nut** – Bronze, ASTM B-584 Alloy.
4.13 **Guide cap bearings** – Acetal Copolymer.
4.14 **Disc**
4.14.1 2” thru 3” sizes – Cast Iron, ASTM A-126, Class B.
4.14.2 4” thru 12” sizes – Ductile Iron, ASTM A-536.
4.15 **Disc encapsulated** – SBR ASTM D-2000.
4.16 **Body** – Ductile Iron, ASTM A-536.
4.17 **Coating** – Inside and outside of valve fully coated with Mueller PRO-GARD® Fusion Bonded Epoxy. Coating complies with ANSI/AWWA C550 and is certified to ANSI/NSF Standard 61 & 372.

5. DESIGN FEATURES

5.1 **Fully unobstructed, oversized flow-way** – the sealing mechanism is withdrawn from the flow-way in a full open position. No pockets in bottom of flow-way to trap sediment or debris. The flow-way will permit passage of full-sized shell cutters.
5.2 **Bronze Disc Nut** - all valves.
5.3 **Anti-Friction Washers on non-rising stem valves** – Located above and below the thrust collar portion of the stem to reduce friction and provide more effective conversion of operating torques into seating loads.

5.4 **Stem for non-rising stem valves, with O-ring Seals** – One O-ring is located below the thrust collar of the stem and two are located above the thrust collar, with the uppermost serving as a dirt seal (4” thru 12”). The O-rings and thrust collar are factory lubricated. The two primary O-rings seal the thrust collar area from outside contaminants and water, and retain an ample amount of lubricant on the thrust collar and anti-friction washers to reduce operating torque and wear.

5.5 **Stem** – The threads on the bronze stem are Acme form threads for strength and efficiency. The stem thrust collar is made integral with the stem -- and is formed by a heat upset operation.

5.6 **Upper Stem O-ring Replacement** – The two O-rings above the thrust collar of all Mueller® Resilient Wedge Gate Valves can be replaced with the valve in the fully open position, under pressure, with no leakage.

5.7 **Corrosion Resistant** – all inside and outside cast iron surfaces are coated with Mueller PRO-GARD® Fusion Bonded Epoxy Coating, 10 mils nominal. Mueller PRO-GARD® Fusion Bonded Epoxy Coating is non-toxic, imparts no taste to water, and complies with ANSI/AWWA C550. Valves are certified to ANSI/NSF Standard 61 & 372.

6. Optional Features

6.1 Mueller 2362 Resilient Wedge Gate Valves can be furnished with the following optional designs or features:

6.1.1 **Gearing** – Bevel and Spur gearing available on 3” thru 12” valves. Bevel-geared valves are for horizontal installations; spur-geared for vertical. Geared valves provide an additional bearing to support the extreme end of the stem.

6.1.2 **Position indicator** – Available for NRS valves 3” and larger.

6.1.3 **Stem** – Silicon bronze - ASTM B98 C66100; 304 Stainless Steel or 316 Stainless Steel.

6.1.4 **Disc encapsulation & O-rings** – EPDM ASTM D2000.

7. Test Pressure

7.1 The pressure test on each Mueller Resilient Wedge Gate Valve meets the requirements of AWWA Standard C509 for Resilient Seated Valves.

7.1.1 Each Mueller Resilient Wedge Gate Valve is subjected to two pressure tests. The seat test is at the working pressure of AWWA valves and 1-1/2 times working pressure of UL Listed valves. Shell tests are at 2 times the working pressure.

7.1.2 Pressure tests at the working pressure shall show NO leakage past the seat from either side of the wedge or at the flange joints. Pressure tests at twice the working pressure shall show NO leakage through the metal or flange joints.

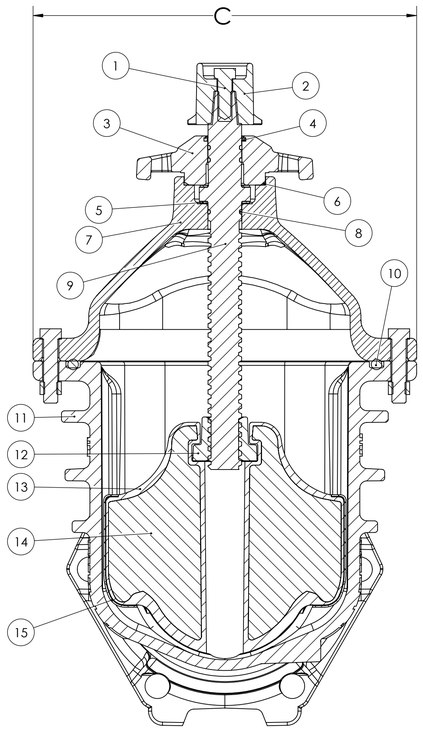
7.1.3 Test pressures are as follows: 300 psi seat test, 500 psi shell test.

Mueller Co. Reliable Connections®

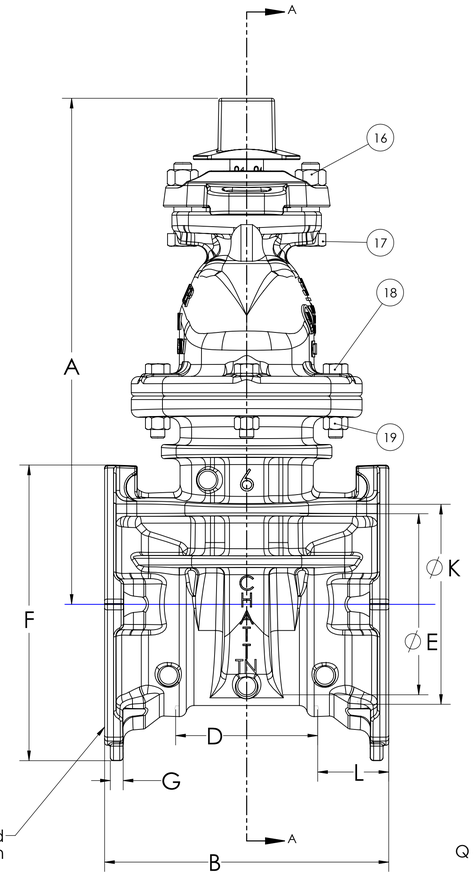
Water (U.S.) 1.800.423.1323
www.muellercompany.com
moreinfo@muellercompany.com

Mueller Canada 1.705.719.9965
www.muellercanada.com
more-info@muellercanada.com

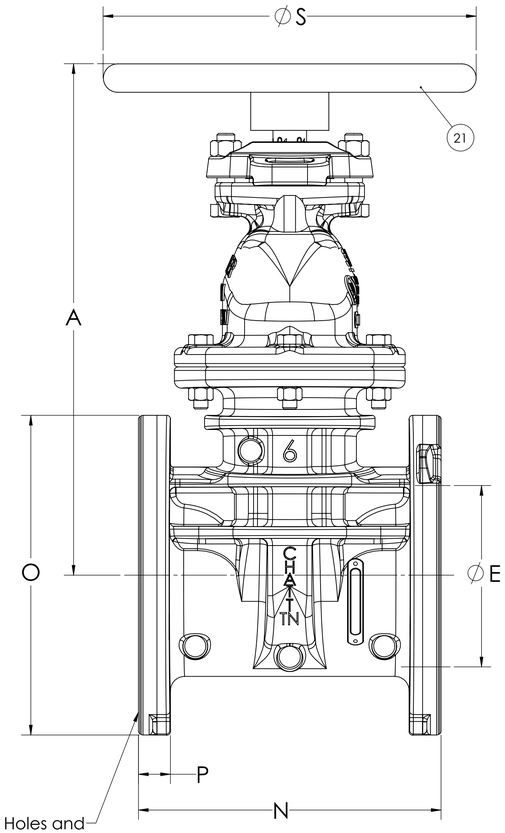
International 1.423.490.9555
www.mueller-international.com
international@muellercompany.com



SECTION A-A - TYPICAL

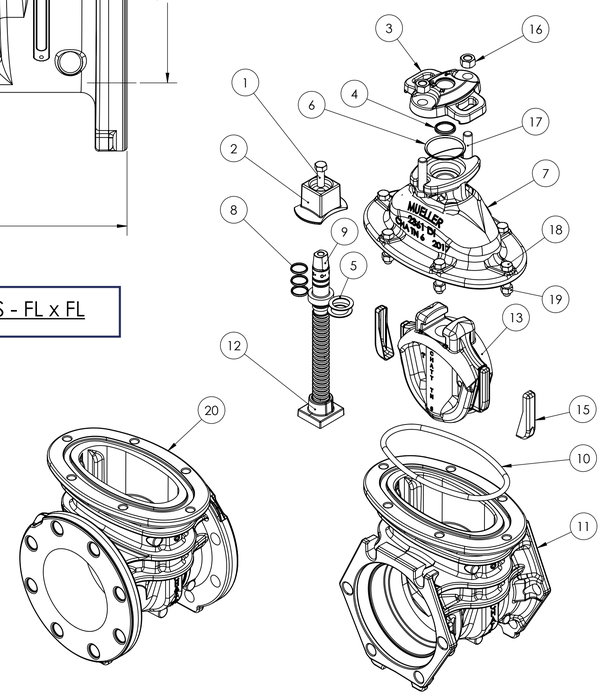


MECH JOINT ENDS - MJ x MJ



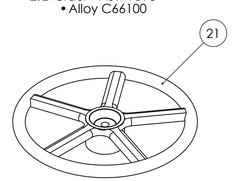
FLANGE ENDS - FL x FL

ITEM NO.	DESCRIPTION	B. QTY.	MATERIAL	ASTM	NOTES
1	Cap Screw	1		F593	Group 2 - CW
2	Wrench Nut	1	Ductile Iron	A536	
3	Stuffing Box	1	Ductile Iron	A536	
4	Wiper Ring (dirt seal)	1	Thermoplastic Polyurethane	D412/ D624 D2240/D792	HY-52D
5	Anti-friction Washer	2	Acetal		
6	Stuffing Box O-Ring	1	Nitrile Rubber		R34
7	Bonnet	1	Ductile Iron	A536	
8	Stem O-ring	3	Nitrile Rubber		R34
9	Stem	1	Bronze	‡	**See Note**
10	Bonnet O-ring	1	Nitrile Rubber		R34
11	Body MJ Ends	1	Ductile Iron	A536	
12	Stem Nut	1	Bronze	B584	C89833 / NSF 372
13	Encapsulated Disc	1	♦	D2000	**See Note**
14	Disc Casting	1	Ductile Iron	A536	
15	Guide Cap	2	Acetal		
18		2	316 Stainless Steel	F594	Group 2 - CW
19	Stuffing Box Bolts	2	316 Stainless Steel	F593	Group 2 - SH
17	Bonnet Bolts	"M"	316 Stainless Steel	F593	Group 2 - SH
16	Bonnet Nuts	"M"	316 Stainless Steel	F594	Group 2 - CW
20	Body FL Ends		Ductile Iron	A536	
21	Handwheel		Ductile Iron	A536	



♦ Rubber Encapsulated Ductile Iron Disc
Ductile Iron - ASTM A536
Rubber Options
1. SBR - ASTM D2000
2. EPDM - ASTM D2000

‡ Bronze Stem Options:
1. Manganese - ASTM B138
   • Alloy C67600
2. Everdur - ASTM B98
   • Alloy C66100



ECO# 2205739

APPROVED
By MATTHEW SLIGER at 10:20 pm, Oct 10, 2018

Valve Size	A	B	C	D	∅E (Thru ∅)	F	G	H	∅J (Bolt Circle ∅)	∅K	L	M	Turns to Open	Weight MJ x MJ	N	O	P	Q	∅R (Bolt Circle ∅)	∅S	Weight FL x FL
4	14.19	9.5	10.79	4.50	4.30	8.40	0.50	4--0.88	7.50	4.90	2.50	4	14	75	9.00	9.00	1.00	8--0.75	7.50	11	85
6	18.00	10	13.5	5.00	6.30	10.41	0.45	6--0.88	9.50	7.00	2.50	6	20.5	124	10.50	11.25	1.13	8--0.88	9.50	13	145
8	21.50	10.5	16.36	5.50	8.30	12.68	0.50	6--0.88	11.75	9.15	2.50	6	26.5	181	11.50	13.50	1.15	8--0.88	11.75	14	208
10	25.50	11.5	20	6.50	10.30	15.24	0.62	8--0.88	14.00	11.20	2.50	8	33	270	13.00	16.00	1.29	12--1.00	14.25	16	310
12	28.62	12	21	7.00	12.30	18.024	0.62	8--0.88	16.25	13.30	2.50	8	38.5	345	14.00	19.00	1.33	12--1.00	17.00	16	420

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES.
ANGULAR: ±
TWO DECIMAL: ±
THREE DECIMAL: ±

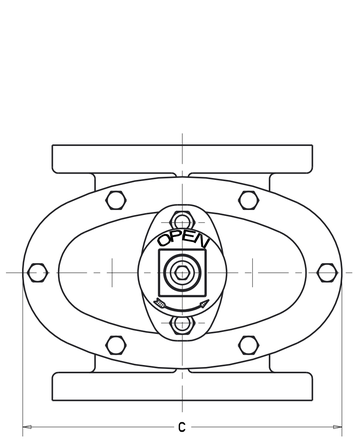
Mueller Co.

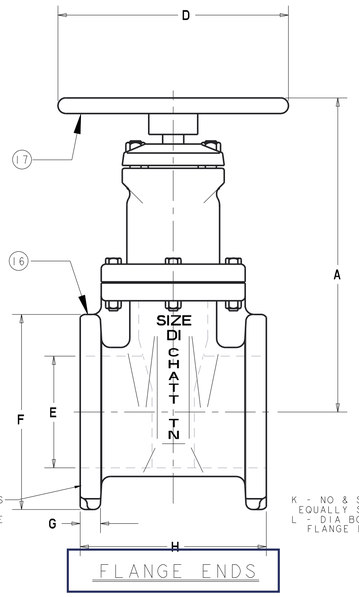
MATERIAL SEE TABLE
FINISH

	NAME	DATE
DRAWN	JMH	9/1/2016
CHECKED	AO	
ENG APPR.	MS	
MFG APPR.		
Q.A.		

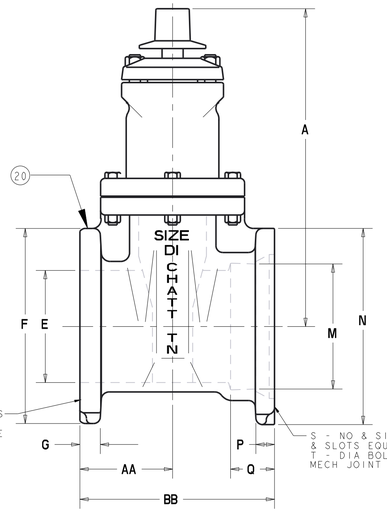
DO NOT SCALE DRAWING

DESCR. 2361 RWGV 350W w/ 316 Fasteners
SIZE D | DWG. NO. 7334 | REV A
SCALE: | WEIGHT (lbs): SEE TABLE | SHEET 1 OF 1

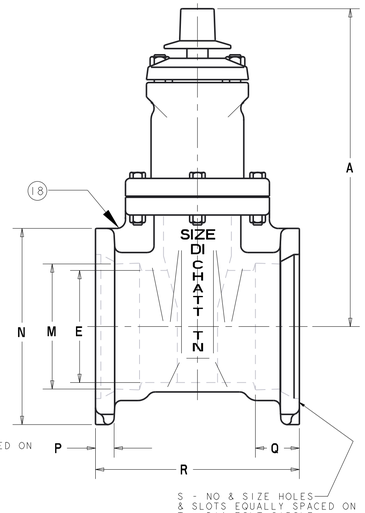




FLANGE ENDS



FLANGE X MECH JOINT ENDS

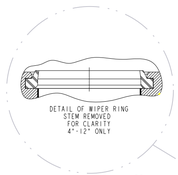


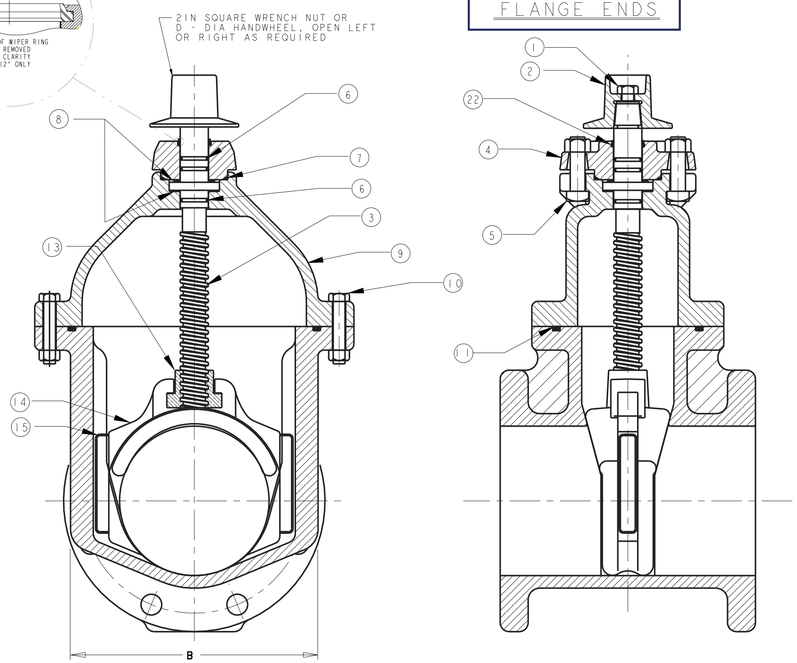
MECHANICAL JOINT ENDS

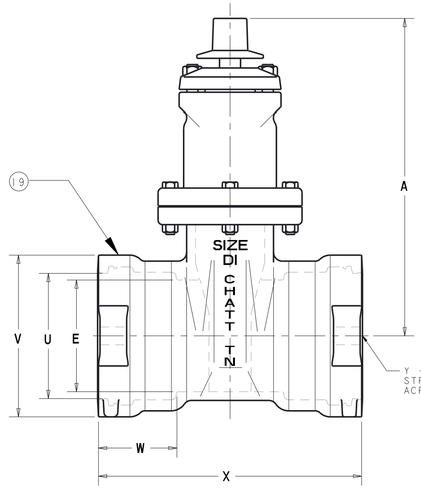
PART LIST					
ITEM	DESCRIPTION	REQ'D	MATERIAL	ASTM	
1	CAP SCREW	1	316 STAINLESS STEEL	F593	GROUP 2-CW
2	WRENCH NUT	1	DUCTILE IRON	A536	
3	STEM	1	MANGANESE BRONZE	B138	
4	STUFFING BOX	1	DUCTILE IRON	A536	
5	STUFFING BOX BOLTS STUFFING BOX NUTS	2	316 STAINLESS STEEL 316 STAINLESS STEEL	F593 F594	GROUP 2-CW GROUP 2-CW
6	O-RING	3	RUBBER	D2000	
7	O-RING	1	RUBBER	D2000	
8	ANTI-FRICTION WASHER	2	ACETAL		
9	BONNET	1	DUCTILE IRON	A536	
10	BONNET BOLTS BONNET NUTS	"Z"	316 STAINLESS STEEL 316 STAINLESS STEEL	F593 F594	GROUP 2-CW GROUP 2-CW
11	BONNET GASKET (O-RING)	1	RUBBER	D2000	
13	DISC NUT	1	BRONZE	B584	
14	DISC	1	SEE NOTE 1 & 2		
15	GUIDE CAP	2	ACETAL		
16	BODY - FLANGE ENDS	1	DUCTILE IRON	A536	
17	HANDWHEEL	1	CAST IRON (SEE NOTE 2)	A126	CLASS B
18	BODY - MJ ENDS	1	DUCTILE IRON	A536	
19	BODY - SLIP-ON ENDS	1	DUCTILE IRON	A536	
20	BODY - FLANGE x MJ END	1	DUCTILE IRON	A536	
21	BODY - FLANGE x SLIP-ON END	1	DUCTILE IRON	A536	
22	WIPER RING	1	RUBBER		

NOTES:
1. RUBBER ENCAPSULATED DUCTILE IRON DISC
   DUCTILE IRON - ASTM A536
   RUBBER - SBR- ASTM D2000

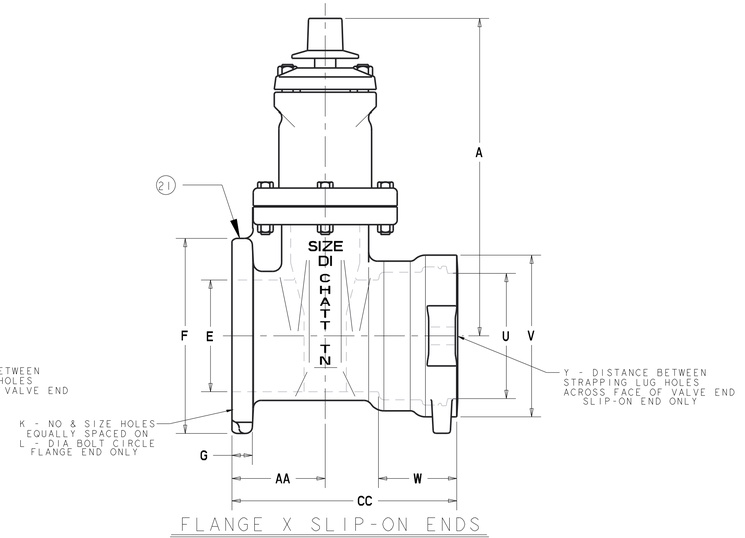
2. MANUFACTURER'S OPTION TO UPGRADE MAT'L TO DI - A536 GR 65-45-12 OR 70-50-05







SLIP-ON ENDS



FLANGE X SLIP-ON ENDS

DIMENSIONS FOR RESILIENT WEDGE VALVE - INCHES (this drawing only)																									
VALVE SIZE	A	B	C	D	E	F	G	H	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	TURN TO OPEN
4	14.19	8.25	10.79	11.00	4.30	9.00	1.00	9.00	8 - 0.75	7.50	4.90	9.12	1.00	2.50	10.00	4 - 0.88	7.50	4.96	6.88	4.12	12.82	8.62	4	4.50	9.50	10.91	14
6	18.00	10.49	13.50	13.00	6.30	11.00	1.06	10.50	8 - 0.88	9.50	7.00	11.12	1.09	2.50	11.62	6 - 0.88	9.50	7.02	9.12	4.38	14.96	10.62	6	5.25	11.06	12.73	20.5
8	21.50	13.21	16.36	14.00	8.30	13.50	1.19	11.50	8 - 0.88	11.75	9.15	13.37	1.18	2.50	12.68	6 - 0.88	11.75	9.30	11.38	5.62	17.94	13.12	6	5.75	12.09	14.72	26.5
10	25.50	16.48	19.99	16.00	10.30	16.00	1.25	13.00	12 - 1.00	14.25	11.20	15.62	1.25	2.50	14.88	8 - 0.88	14.00	11.23	13.50	5.62	18.50	16.38	8	6.50	13.94	15.75	33
12	28.62	16.83	21.00	16.00	12.30	19.00	1.31	14.00	12 - 1.00	17.00	13.30	17.88	1.31	2.50	15.00	8 - 0.88	16.25	13.33	15.75	5.62	18.70	18.12	8	7.00	14.50	16.35	38.5

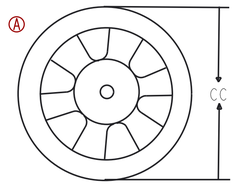
ECO 1838067

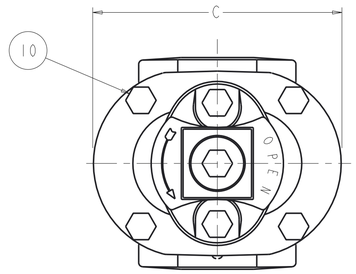
APPROVED
By Matthew Sliger at 11:37 am, Jun 06, 2017

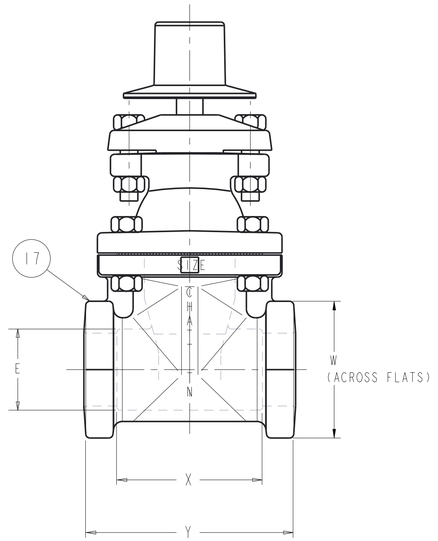
DR BY	AO	06/06/17	UNLESS OTHERWISE NOTED	THIRD ANGLE PROJECTION	C.B. NO.	
CHKR	BB	06/06/17	BREAK CAST CORNER(S)			
ENGR	MS	06/06/17	BREAK MACH CORNER(S)	PURCH. NO	FINISH ASSY	PATT. NO.
MGR			TOLERANCES	REF. NO.	SCALE NONE	
MFG			UNLESS OTHERWISE NOTED			
TOOL			LINEAR ±	ANGULAR ±	STK. NO.	
FDRY						
MAT'L	NOTED					
Mueller Co.			DESCR. 4IN - 12IN RWGV A2362		NUMBER 7420	

4IN - 12IN RWGV A2362

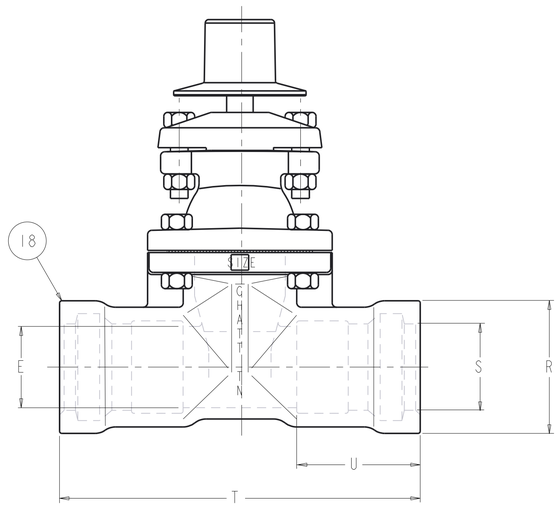
7420







SCREW ENDS

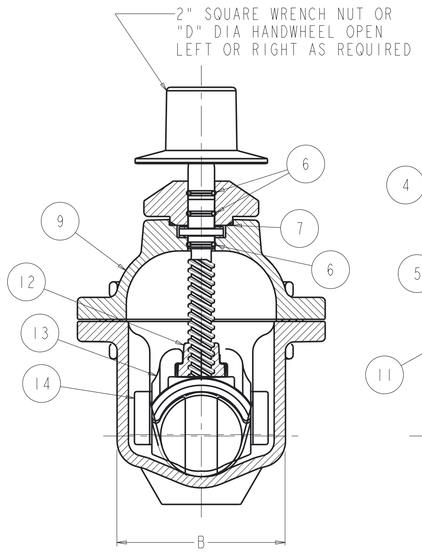


RADIAL ENDS

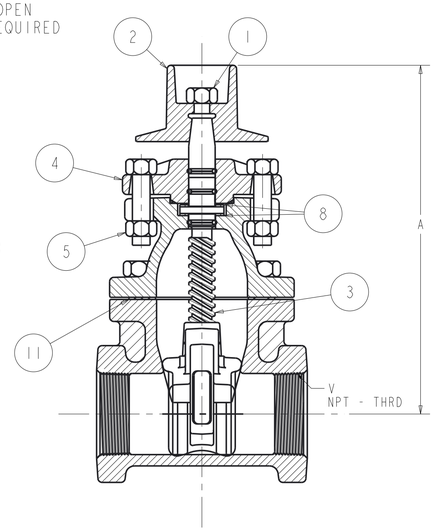
PART LIST					
ITEM	DESCRIPTION	REQ'D	MATEIAL	ASTM	
1	CAP SCREW	1	316 STAINLESS STEEL	F593	GROUP 2-CW
2	WRENCH NUT	1	DUCTILE IRON	A536	
3	STEM	1	BRONZE	B138	ALLOY C67600
4	STUFFING BOX	1	CAST IRON (SEE NOTE 2)	A126	CLASS B
5	STUFFING BOX BOLT STUFFING BOX NUT	2	316 STAINLESS STEEL 316 STAINLESS STEEL	F593 F594	GROUP 2-CW GROUP 2-CW
6	O-RING	3	RUBBER		NITRILE
7	O-RING	1	RUBBER		NITRILE
8	ANTI-FRICTION WASHER	2	ACETAL		
9	BONNET	1	DUCTILE IRON	A536	
10	BONNET BOLT BONNET NUT	"Z"	316 STAINLESS STEEL 316 STAINLESS STEEL	F593 F594	GROUP 2-CW GROUP 2-CW
11	BONNET GASKET	1	RUBBER	D2000	NEOPRENE
12	DISC NUT	1	BRONZE	B62	
13	DISC	1	SEE NOTE 1 & 2		
14	GUIDE CAP	2	ACETAL		
15	BODY - FLANGE ENDS	1	DUCTILE IRON	A536	
16	BODY - M.J. ENDS	1	DUCTILE IRON	A536	
17	BODY - SCREW ENDS	1	DUCTILE IRON	A536	
18	BODY - PVC ENDS	1	DUCTILE IRON	A536	

1. RUBBER ENCAPSULATED CAST IRON DISC
   CAST IRON - ASTM A126 CLASS B
   RUBBER - SBR - ASTM D2000

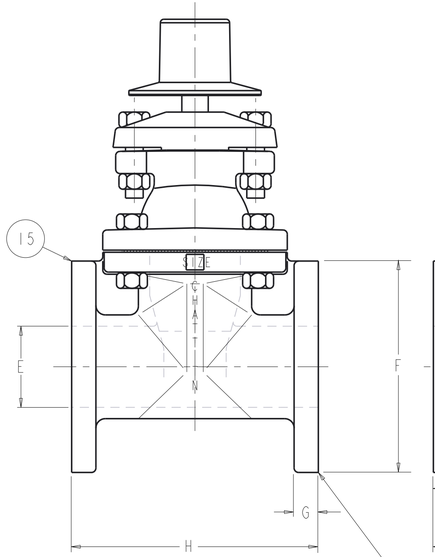
2. MANUFACTURER'S OPTION TO UPGRADE MAT'L
   TO DI - A536 GR 65-45-12 OR 70-50-05



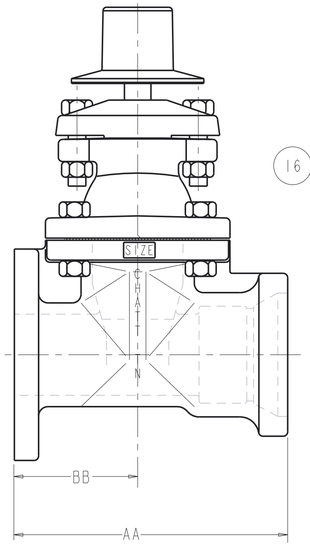
SCREW ENDS



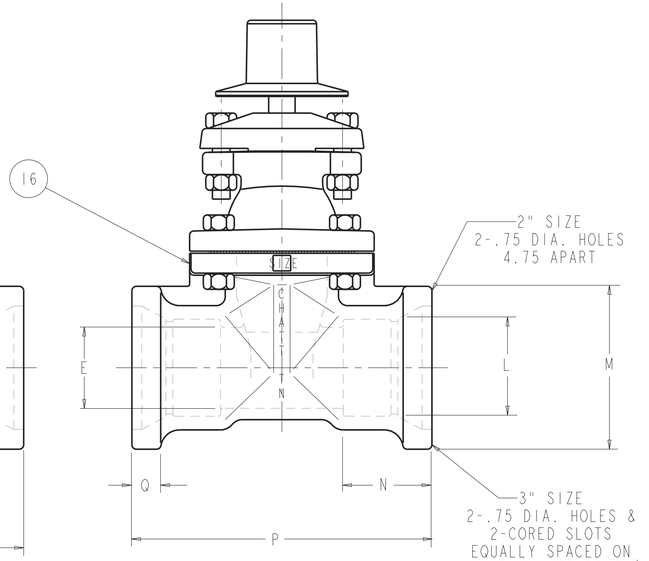
SCREW ENDS



FLANGE ENDS



FLANGE x MECH. JOINT ENDS



MECH. JOINT ENDS

* MUELLER DOES NOT OFFER A 2.5" FL X MJ VALVE

DIMENSIONS - INCHES (ths drawing only)																											
VALVE SIZE	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC Ⓐ	TURN TO OPEN
2	9.88	4.77	7.02	6.00	2.30	6.00	.69	7.00	4 - .75	4.75	2.61	4.62	2.50	8.50	.81	3.75	2.44	10.25	3.50	2 - 11.5	3.88	4.12	5.88	4	8.39	4.36	6.00	8
2.5	12.38	6.01	8.63	6.00	2.80	7.00	.75	7.50	4 - .75	5.50	N/A	N/A	N/A	N/A	N/A	4.44	2.93	12.24	3.69	2.5 - 8	4.38	4.12	6.76	6	N/A *	N/A *	8.00	11
3	12.38	6.01	8.63	6.00	3.30	7.50	.80	8.00	4 - .75	6.00	4.08	7.50	2.50	9.62	.94	5.16	3.56	11.75	4.12	3 - 8	5.12	5.12	6.88	6	8.80	4.55	8.00	11

Ⓐ ECO 1781689
ECO 1803913
ADDED HAND
WHEEL
AO 4/25/17

APPROVED
By Matthew Sliger at 3:35 pm, Apr 25, 2017

DR BY	AO	3/28/17	UNLESS OTHERWISE NOTED BREAK CAST CORNER(S) BREAK MACH CORNER(S)	THIRD ANGLE PROJECTION	C.B. NO.
CHKR	BB	3/28/17			
ENGR	MS	3/28/17		PURCH. NO	FINISH ASSY
MGR			TOLERANCES UNLESS OTHERWISE NOTED LINEAR ± ANGULAR ±	REF. NO.	SCALE NONE
MFG					PATT. NO.
TOOL					
FDRY				STK. NO.	
MAT'L	NOTED				

DESCR. 21N - 31N RWGV
A-2362-6,-8,-23, & -27
NRS - AWWA - 250W - 500 TEST

Mueller Co.

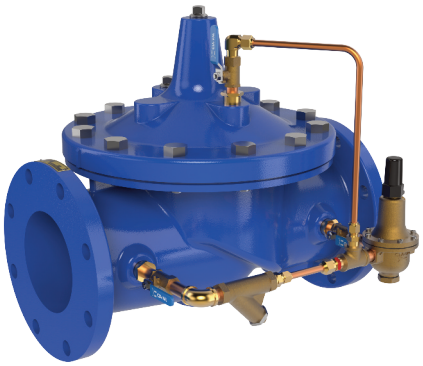
NUMBER 7399

7399

CLA-VAL®

MODEL 90-01

Pressure Reducing Valve



- **Sensitive and Accurate Pressure Control**
- **Easy Adjustment and Maintenance**
- **Optional Check Feature**
- **Fully Supported Frictionless Diaphragm**
- **Meets National Lead Reduction Mandate**

The Cla-Val Model 90-01 Pressure Reducing Valve automatically reduces a higher inlet pressure to a steady lower downstream pressure, regardless of changing flow rate and/or varying inlet pressure. This valve is an accurate, pilot-operated regulator capable of holding downstream pressure to a pre-determined limit. When downstream pressure exceeds the pressure setting of the control pilot, the main valve and pilot valve close drip-tight.

If a check feature is added, and a pressure reversal occurs, the downstream pressure is admitted into the main valve cover chamber, closing the valve to prevent return flow.

For space savings, see Cla-Val Model 90-48 or 90-99 with integral Low Flow Bypass Pressure Regulator.

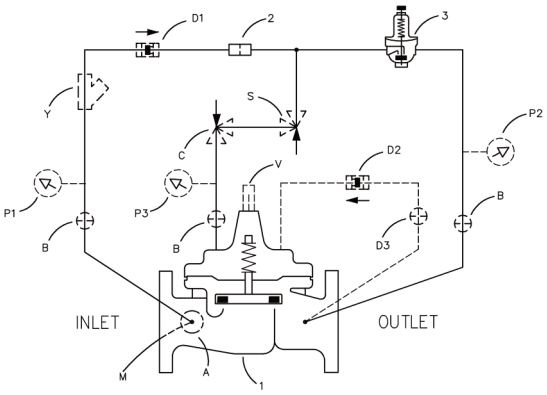
Schematic Diagram

Item	Description
1	100-01 Hytrol Main Valve
2	X58 Restriction Fitting
3	CRD Pressure Reducing Control

Optional Features

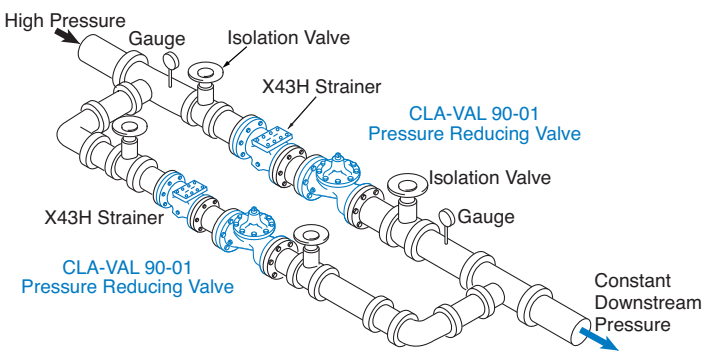
Item	Description
A	X46A Flow Clean Strainer
B	CK2 Isolation Valve
C	CV Flow Control (Closing)*
D	Check Valves with Isolation Valve
M	X144 e-FlowMeter
P	X141 Pressure Gauge
S	CV Flow Control (Opening)
V	X101 Valve Position Indicator
Y	X43 "Y" Strainer

*The closing speed control (optional) on this valve should always be open at least three (3) turns off its seat.

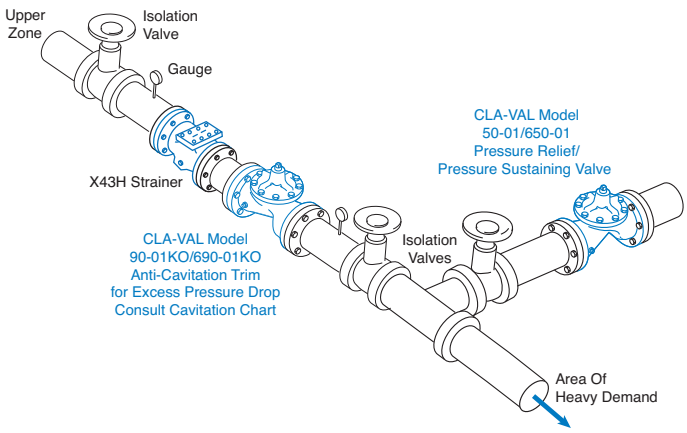


Typical Applications

Typical applications include pressure reducing valve station using Model 90-01 and Model 90-01 in parallel to handle wide range of flow rates. Larger Model 90-01 valve meets requirements of peak loads and smaller Model 90-01 handles low flows. A downstream pressure relief valve is also recommended for this type of application.



Cla-Val Model 90-01KO Pressure Reducing Valve with Anti-Cavitation Trim provides for optimum downstream pressure control while reducing noise and eliminating damage associated with cavitation. See Cavitation Guide to determine if the valve is a candidate for the KO Anti-Cavitation Trim. A downstream pressure relief valve is recommended for this type of application.



Model 90-01 (Uses 100-01 Hytrol Main Valve)

Pressure Ratings (Recommended Maximum Pressure - psi)

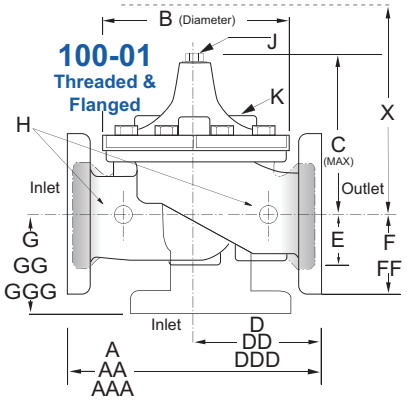
Valve Body & Cover		Pressure Class				
		Flanged			Grooved	Threaded
Grade	Material	ANSI Standards*	150 Class	300 Class	300 Class	End‡ Details
ASTM A536	Ductile Iron	B16.42	250	400	400	400
ASTM A216-WCB	Cast Steel	B16.5	285	400	400	400
UNS 87850	Bronze	B16.24	225	400	400	400

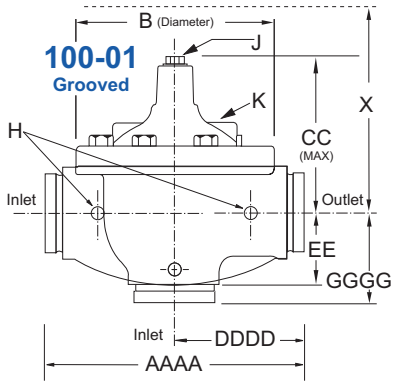
Note: * ANSI standards are for flange dimensions only.
Flanged valves are available faced but not drilled.
‡ End Details machined to ANSI B2.1 specifications.
Valves for higher pressure are available; consult factory for details

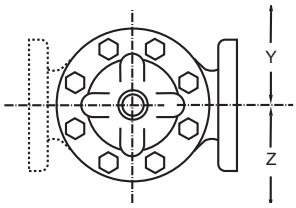
Materials

Component	Standard Material Combinations		
Body & Cover	Ductile Iron	Cast Steel	Bronze
Available Sizes	1" - 36" 25 - 900mm	1" - 16" 25 - 400mm	1" - 16" 25 - 400mm
Disc Retainer & Diaphragm Washer	Cast Iron	Cast Steel	Bronze
Trim: Disc Guide, Seat & Cover Bearing	Bronze is Standard Stainless Steel is Optional		
Disc	Buna-N® Rubber		
Diaphragm	Nylon Reinforced Buna-N® Rubber		
Stem, Nut & Spring	Stainless Steel		

For material options not listed, consult factory.
Cla-Val manufactures valves in more than 50 different alloys.





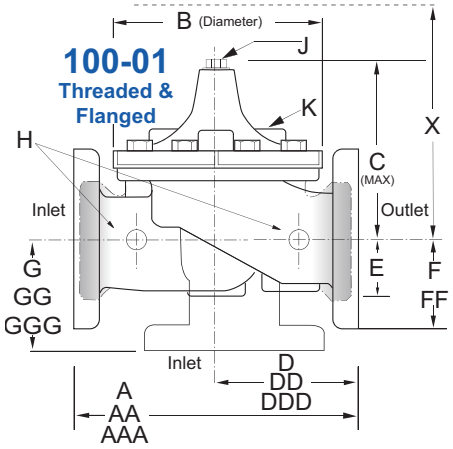


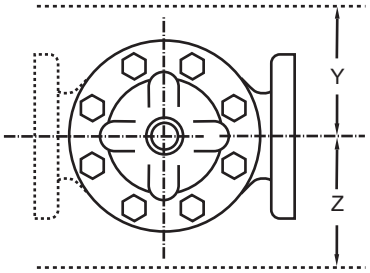
Model 90-01 Dimensions (In Inches)

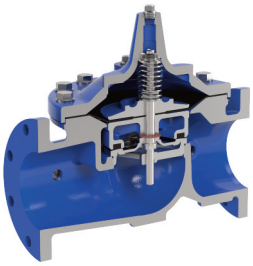
Valve Size (Inches)	1	1 1/4	1 1/2	2	2 1/2	3	4	6	8	10	12	14	16	18	20	24	30	36
A Threaded	7.25	7.25	7.25	9.38	11.00	12.50	—	—	—	—	—	—	—	—	—	—	—	—
AA 150 ANSI	—	—	8.50	9.38	11.00	12.00	15.00	20.00	25.38	29.75	34.00	39.00	41.38	46.00	52.00	61.50	63.00	72.75
AAA 300 ANSI	—	—	9.00	10.00	11.62	13.25	15.62	21.00	26.38	31.12	35.50	40.50	43.50	47.64	53.62	63.24	64.50	74.75
AAAA Grooved End	—	—	8.50	9.00	11.00	12.50	15.00	20.00	25.38	—	—	—	—	—	—	—	—	—
B Diameter	5.62	5.62	5.62	6.62	8.00	9.12	11.50	15.75	20.00	23.62	28.00	32.75	35.50	41.50	45.00	53.16	56.00	66.00
C Maximum	5.50	5.50	5.50	6.50	7.56	8.19	10.62	13.38	16.00	17.12	20.88	24.19	25.00	39.06	41.90	43.93	54.60	59.00
CC Maximum Grooved End	—	—	4.75	5.75	6.88	7.25	9.31	12.12	14.62	—	—	—	—	—	—	—	—	—
D Threaded	3.25	3.25	3.25	4.75	5.50	6.25	—	—	—	—	—	—	—	—	—	—	—	—
DD 150 ANSI	—	—	4.00	4.75	5.50	6.00	7.50	10.00	12.69	14.88	17.00	19.50	20.81	—	—	30.75	—	—
DDD 300 ANSI	—	—	4.25	5.00	5.88	6.38	7.88	10.50	13.25	15.56	17.75	20.25	21.62	—	—	31.62	—	—
DDDD Grooved End	—	—	—	4.75	—	6.00	7.50	—	—	—	—	—	—	—	—	—	—	—
E	1.12	1.12	1.12	1.50	1.69	2.06	3.19	4.31	5.31	9.25	10.75	12.62	15.50	12.95	15.00	17.75	21.31	24.56
EE Grooved End	—	—	2.00	2.50	2.88	3.12	4.25	6.00	7.56	—	—	—	—	—	—	—	—	—
F 150 ANSI	—	—	2.50	3.00	3.50	3.75	4.50	5.50	6.75	8.00	9.50	10.50	11.75	15.00	16.50	19.25	22.50	28.50
FF 300 ANSI	—	—	3.06	3.25	3.75	4.13	5.00	6.25	7.50	8.75	10.25	11.50	12.75	15.00	16.50	19.25	24.00	30.00
G Threaded	1.88	1.88	1.88	3.25	4.00	4.50	—	—	—	—	—	—	—	—	—	—	—	—
GG 150 ANSI	—	—	4.00	3.25	4.00	4.00	5.00	6.00	8.00	8.62	13.75	14.88	15.69	—	—	22.06	—	—
GGG 300 ANSI	—	—	4.25	3.50	4.31	4.38	5.31	6.50	8.50	9.31	14.50	15.62	16.50	—	—	22.90	—	—
GGGG Grooved End	—	—	—	3.25	—	4.25	5.00	—	—	—	—	—	—	—	—	—	—	—
H NPT Body Tapping	0.375	0.375	0.375	0.375	0.50	0.50	0.75	0.75	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00
J NPT Cover Center Plug	0.25	0.25	0.25	0.50	0.50	0.50	0.75	0.75	1.00	1.00	1.25	1.50	2.00	1.00	1.00	1.00	2.00	2.00
K NPT Cover Tapping	0.375	0.375	0.375	0.375	0.50	0.50	0.75	0.75	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00
Stem Travel	0.40	0.40	0.40	0.60	0.70	0.80	1.10	1.70	2.30	2.80	3.40	4.00	4.50	5.10	5.63	6.75	7.50	8.50
Approx. Ship Weight (lbs)	15	15	15	35	50	70	140	285	500	780	1165	1600	2265	2982	3900	6200	7703	11720
Approx. **X** Pilot System	11	11	11	13	14	15	17	29	31	33	36	40	40	43	47	68	79	85
Approx. **Y** Pilot System	9	9	9	9	10	11	12	20	22	24	26	29	30	32	34	39	40	45
Approx. **Z** Pilot System	9	9	9	9	10	11	12	20	22	24	26	29	30	32	34	39	42	47

For sizes 18 through 36-inches, use 90-66 E-Sheet

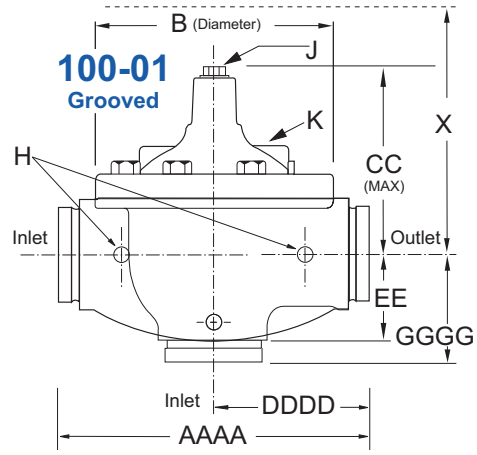
Model 90-01 Metric Dimensions (Uses 100-01 Hytrol Main Valve)







Model 100-01 Full Port Hytrol Main Valve



Other 90 Series Products

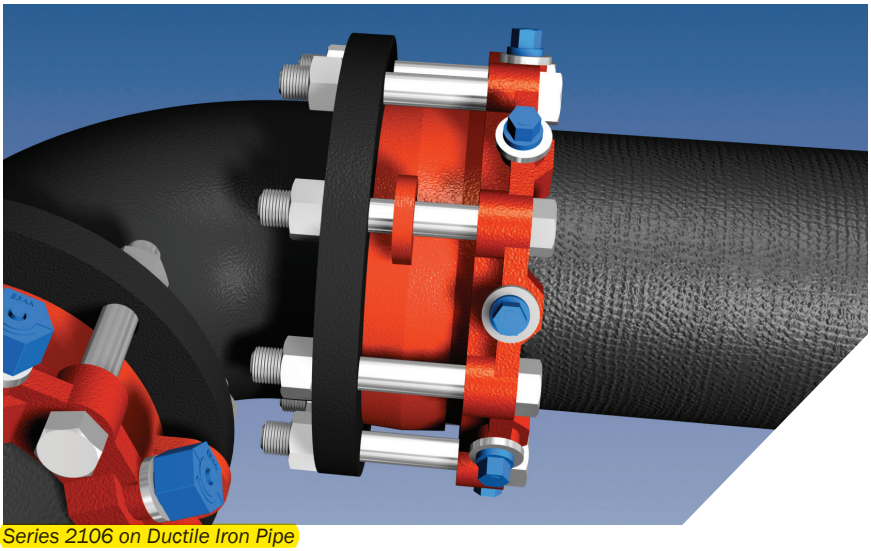
- 90-01KO - Model 90-01 supplied with with KO Anti-Cavitation Trim
- 90-01H - Model 90-01 supplied with X43H Strainer
- 90-01KOH - Model 90-01 supplied with KO Trim & X43H Strainer
- 690-01 - Reduced Port Pressure Reducing Valve
- 690-01KO - Reduced Port Pressure Reducing Valve with KO Trim
- 690-01H - Reduced Port Pressure Reducing Valve with X43H Strainer
- 690-01KOH - Reduced Port Pressure Reducing Valve with KO Trim and X43H Strainer

Model 90-01 Dimensions (In mm)

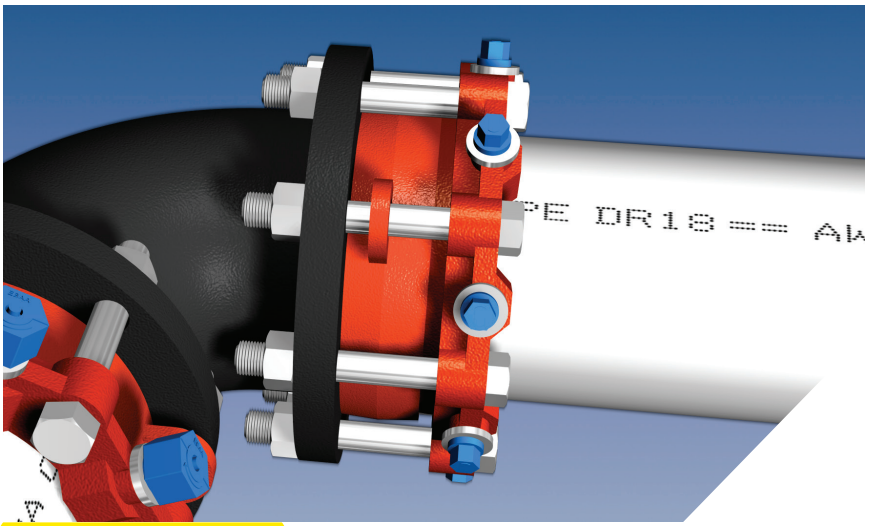
Valve Size (mm)	25	32	40	50	65	80	100	150	200	250	300	350	400	450	500	600	750	900
A Threaded	184	184	184	238	279	318	—	—	—	—	—	—	—	—	—	—	—	—
AA 150 ANSI	—	—	216	238	279	305	381	508	645	756	864	991	1051	1168	1321	1562	1600	1848
AAA 300 ANSI	—	—	229	254	295	337	397	533	670	790	902	1029	1105	1210	1326	1606	1638	1899
AAAA Grooved End	—	—	216	228	279	318	381	508	645	—	—	—	—	—	—	—	—	—
B Diameter	143	143	143	168	203	232	292	400	508	600	711	832	902	1054	1143	1350	1422	1676
C Maximum	140	140	140	165	192	208	270	340	406	435	530	614	635	992	1064	1116	1387	1499
CC Maximum Grooved End	—	—	120	146	175	184	236	308	371	—	—	—	—	—	—	—	—	—
D Threaded	83	83	83	121	140	159	—	—	—	—	—	—	—	—	—	—	—	—
DD 150 ANSI	—	—	102	121	140	152	191	254	322	378	432	495	528	—	—	781	—	—
DDD 300 ANSI	—	—	108	127	149	162	200	267	337	395	451	514	549	—	—	803	—	—
DDDD Grooved End	—	—	—	121	—	152	191	—	—	—	—	—	—	—	—	—	—	—
E	29	29	29	38	43	52	81	110	135	235	273	321	394	329	381	451	541	624
EE Grooved End	—	—	52	64	73	79	108	152	192	—	—	—	—	—	—	—	—	—
F 150 ANSI	—	—	64	76	89	95	114	140	171	203	241	267	298	381	419	489	572	724
FF 300 ANSI	—	—	78	83	95	105	127	159	191	222	260	292	324	381	419	489	610	762
G Threaded	48	48	48	83	102	114	—	—	—	—	—	—	—	—	—	—	—	—
GG 150 ANSI	—	—	102	83	102	102	127	152	203	219	349	378	399	—	—	560	—	—
GGG 300 ANSI	—	—	102	89	110	111	135	165	216	236	368	397	419	—	—	582	—	—
GGGG Grooved End	—	—	—	83	—	108	127	—	—	—	—	—	—	—	—	—	—	—
H NPT Body Tapping	0.375	0.375	0.375	0.375	0.50	0.50	0.75	0.75	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00
J NPT Cover Center Plug	0.25	0.25	0.25	0.50	0.50	0.50	0.75	0.75	1.00	1.00	1.25	1.50	2.00	1.00	1.00	1.00	2.00	2.00
K NPT Cover Tapping	0.375	0.375	0.375	0.375	0.50	0.50	0.75	0.75	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00
Stem Travel	10	10	10	15	18	20	28	43	58	71	86	102	114	130	143	171	190	216
Approx. Ship Weight (kgs)	7	7	7	16	23	32	64	129	227	354	528	726	1027	1353	1769	2812	3494	5316
Approx. **X** Pilot System	280	280	280	331	356	381	432	737	788	839	915	1016	1016	1093	1194	1728	2007	2159
Approx. **Y** Pilot System	229	229	229	229	254	280	305	508	559	610	661	737	762	813	864	991	1016	1143
Approx. **Z** Pilot System	229	229	229	229	254	280	305	508	559	610	661	737	762	813	864	991	1067	1194

Series 2100

MEGAFLANGE®
Restrained Flange Adapter
U.S. Patent Nos. 4627774 and 5071175



Series 2106 on Ductile Iron Pipe



Series 2106 on C900 PVC Pipe

Features and Applications:

- MEGAFLANGE adapts and restrains plain end Ductile Iron, PVC, Carbon Steel and HDPE pipe to flanged pipe or fittings, where the flange conforms to ANSI/AWWA C111/A21.11 with flange surface facing in accordance with ANSI/AWWA C207 of the latest revision.
- Meets ANSI B16.5 Class 150/125 drilling pattern.
- Flange Bolts are zinc coated, fastener class coated bolts or stainless steel bolts are available
- Not for use on plain end fittings
- MEGA-BOND® Restraint Coating System
- For more information regarding MEGA-BOND, refer to our web site @ www.ebaa.com
- Minimum 2 to 1 Safety Factor
- Fully Restrained
- Constructed of ASTM A536 Ductile Iron
- UL listed on sizes 3 inch through 12 inch
- FM approved on sizes 4 inch through 12 inch on C900 Class 150 and Class 200 PVC Pipe
- Pipe can be cut to length in the field
- Joint deflection up to 5°
- Easy dismantling allows fast removal of valves, meters or fittings for replacement or repair

For use on water or wastewater pipelines subject to hydrostatic pressure and tested in accordance with either AWWA C600, C605 or ASTM D2774.

Sample Specification

Restrained flange adapters shall be used in lieu of threaded or welded flanged spool pieces. Flanged adapters shall be made of ductile iron conforming to ASTM A536 and have flange bolt circles that are compatible with ANSI/AWWA C110/A21.10 (125#/Class 150 Bolt Pattern).

Restraint for flange adapter shall consist of a plurality of individual actuated gripping wedges to maximize restraint capability. Torque limiting actuating screws shall be used to insure proper initial set of gripping wedges.

The flange adapters shall be capable of deflection during assembly or permit lengths of pipe to be field cut to allow a minimum 0.6 inch gap between the end of the pipe and the mating flange without affecting the integrity of the seal.

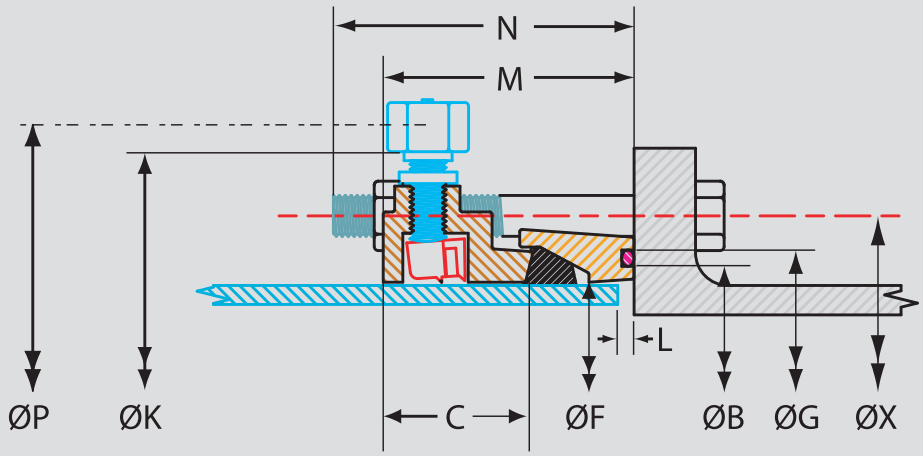
All internal surfaces of the gasket ring (wetted parts) shall be lined with a minimum of 15 mils of fusion bonded epoxy conforming to the applicable requirements of ANSI/AWWA C213. The coating shall meet ANSI/NSF-61. Exterior surfaces of the gasket ring shall be coated with a minimum of 6 mils of fusion bonded epoxy conforming to the applicable requirements of ANSI/AWWA C116/A21.16.

Restraint Ring coated with MEGA-BOND® Restraint Coating System, More information regarding MEGA-BOND can be found at www.ebaa.com.

Pressure ratings shall be a minimum of those shown in the table within current brochure.

The flange adapter shall be the Series 2100 MEGAFLANGE® Restrained Flange Adapter as produced by EBAA Iron, Inc. or approved equal.

Series 2100 Submittal Reference Drawing



Nominal Pipe Size	Series Number	Restraint Ring K	Restraint Ring F	Restraint Ring C	Gasket Ring F	Gasket Ring B	Gasket Ring G	Bolts No.	Bolts Dia.	Bolts Length	Bolts X	L MAX.	Assembly Deflection Degrees	M	P*	Ship Weight (lbs.)
3	2103	7.5	4.1	2.2	4.1	4.3	4.9	4	⅝	5½	6.00	0.7	5.0	4.0	9.2	14
4	2104	9.0	4.9	2.2	4.9	5.4	6.0	8	⅝	5½	7.50	0.6	5.0	4.0	10.0	20
6	2106	11.0	7.0	2.3	7.0	7.5	8.1	8	¾	6	9.50	0.8	5.0	4.3	12.1	32
8	2108	13.5	9.2	2.4	9.2	9.8	10.4	8	¾	6	11.75	0.9	5.0	4.5	14.3	38
10	2110	16.0	11.2	2.5	11.2	11.8	12.4	12	⅞	7½	14.25	1.0	3.0	4.7	16.3	65
12	2112	19.0	13.3	2.5	13.3	13.8	14.4	12	⅞	7½	17.00	1.0	3.0	4.8	18.4	73
14	2114	21.0	15.5	2.5	15.5	16.1	16.9	12	1	8	18.75	1.3	2.0	5.0	20.6	89
16	2116	23.5	17.6	2.5	17.6	18.2	19.0	16	1	8	21.25	1.3	2.0	5.0	22.6	109
18	2118	25.0	19.7	2.6	19.7	20.2	21.0	16	1⅛	8½	22.75	1.3	1.5	5.1	24.7	134
20	2120	27.3	21.8	2.6	21.8	22.4	23.2	20	1⅛	8½	25.00	1.3	1.5	5.1	26.8	157
24	2124	32.0	26.0	2.6	26.0	26.7	27.5	20	1¼	8½	29.50	1.3	1.0	5.1	31.0	192
30	2130	38.5	32.2	3.3	32.2	32.9	34.1	28	1¼	11	36.00	2.0	1.0	6.0	38.8	296
36	2136	45.5	38.5	3.3	38.5	39.2	40.4	32	1½	11**	42.75	2.0	1.0	6.0	44.6	426
42	2142	52.3	44.7	4.1	44.7	45.8	47.0	36	1½	14**	49.50	2.0	1.0	8.0	50.8	642
48	2148	58.8	51.0	4.1	51.0	52.1	53.3	44	1½	14**	56.00	2.0	1.0	8.0	57.1	797

* The "P" dimensions is measured with torque-limiting nuts twisted off.
** Double ended rod in lieu of bolt

Nominal Pipe Size	Minimal Distance Required To Install N
3	4.75
4	4.56
6	5.00
8	4.88
10	6.31
12	6.25
14	6.62
16	6.56
18	6.94
20	6.81
24	6.62
30	8.88
36	8.63
42	11.25
48	11.38

MEGAFLANGE TESTING RESULTS

PVC TESTING

- Quick Burst Test
- DR18 tested to 755 PSI
- DR14 tested to 985 PSI
- Long Term Pressure Test
- On DR18 PVC pipe at 615 PSI for 1000 hours without failure
- Cyclic Pressure Test
- DR18 tested from 94 to 188 PSI for over 1,000,000 cycles

FM APPROVED

DUCTILE IRON AND CARBON STEEL TESTING

- Leakage Test (one minute required)
- Tested to twice rated pressure without leakage
- Hydrostatic Test (one minute required)
- 3 inch though 6 inch sizes tested to 5 times rated pressure
- 8 inch and 10 inch sizes tested to 4 times rated pressure
- 12 inch size tested to 3 times rated pressure
- Flexural Test
- Tested to withstand a bending moment based on requirements of NFPA 12-1991 "Standard for Installation of Sprinkler Systems"

UL®

Note: Dimensions are in inches and are subject to change without notice. All Dimensions are ± 1%.

Pipe Size	Ductile Iron Pipe Pressure (PSI)	Carbon Steel Pipe* Pressure (PSI)	C900 PVC Pipe DR14 Pressure (PSI)	C900 PVC Pipe DR18 Pressure (PSI)	C900 PVC Pipe DR25 Pressure (PSI)	C900 PVC Pipe DR32.5 Pressure (PSI)	IPS PVC Pipe* SDR17 Pressure (PSI)	IPS PVC Pipe* SDR21 Pressure (PSI)	IPS PVC Pipe* SDR26 Pressure (PSI)
3	350	350	-	-	-	-	250	200	160
4	350	350	305	235	165	-	250	200	160
6	350	350	305	235	165	-	250	200	160
8	350	350	305	235	165	-	250	200	160
10	350	350	305	235	165	-	250	200	160
12	350	350	305	235	165	-	250	200	160
14	350	-	-	235	165	125	-	-	-
16	350	-	-	235	165	125	-	-	-
18	300	-	-	235	165	125	-	-	-
20	250	-	-	235	165	125	-	-	-
24	200	-	-	150	165	125	-	-	-
30	150	-	-	-	-	-	-	-	-
36	150	-	-	-	-	-	-	-	-
42	150	-	-	-	-	-	-	-	-
48	150	-	-		-	-	-	-	-

*Transition Gasket Required

NOTE: For Application on HDPE pipe see EBAA's HDPE Restraint Catalog Sheet.

MEGAFLANGE Components

The Series 2100 MEGAFLANGE restrained flange adapter is comprised of two rings. The first is the restraint ring which incorporates wedges around the circumference of the ring to grip the pipe firmly and securely. The wedge style restraint offers enormous pullout strength when compared to set screw restraints. The resiliency of the wedge style restraint allows the MEGAFLANGE to withstand severe moment loads. The restraint ring and it's sub-components are protected from corrosion by the MEGA-BOND® Restraint Coating System. For more information regarding MEGA-BOND see our MEGA-BOND Brochure found at www.ebaa.com.

The second ring is the gasket ring which separates the seals dedicated to each sealing surface. This ring allows pipe to be cut to lengths in the field at a tolerance of 0.6 inch or more. In addition, the gasket ring also enables the joint to deflect during assembly. The gasket ring is coated with a NSF 61 approved Fusion Bonded Epoxy (FBE) so that it may be utilized on potable drinking water systems.

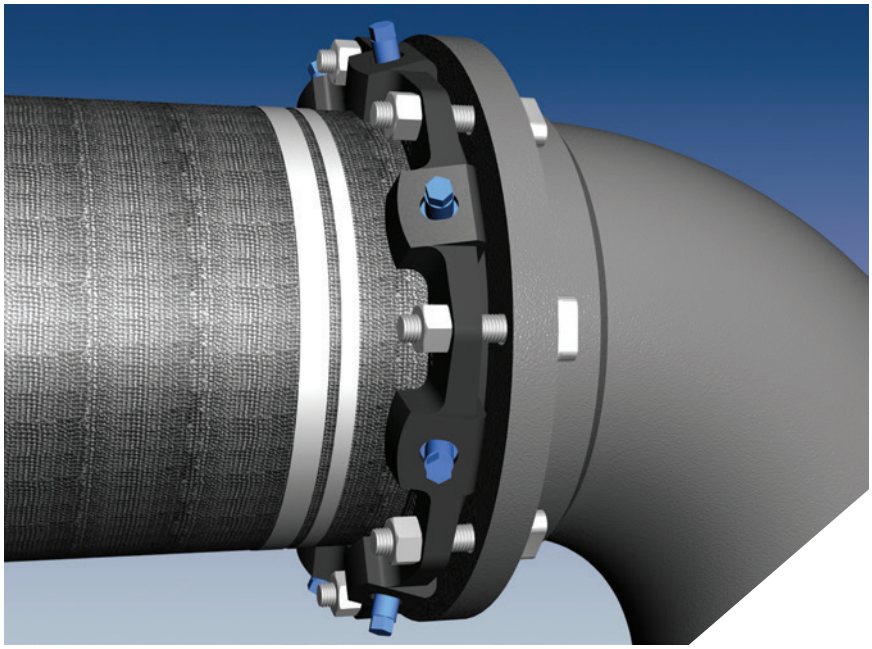
DEFLECTION

Traditional flanged joint connections require a tremendous amount of torque on the bolts to achieve a good seal. The pipe layout must be precisely planned to avoid misalignment errors due to deviations in appurtenances of pipe fabrication.

The Series 2100 MEGAFLANGE is a speedy, on-site fabrication tool which is generous in its deflection limits, from 0.5° to 5° depending on pipe size. The deflection capabilities provided by the gasket ring allow offset of almost nineteen inches of an eighteen foot length of pipe through the eight inch size.

MEGALUG® Series 1100

Mechanical Joint Restraint for Ductile Iron Pipe



Nominal Pipe Size	Series Number	Shipping Weights	Post Assembly Deflection	Pressure Rating (PSI)
3	1103	6.1	3°	350
4	1104	7.7	3°	350
6	1106	11.9	3°	350
8	1108	14.8	3°	350
10	1110	23.9	3°	350
12	1112	31.2	3°	350
14	1114	48.5	2°	350
16	1116	56.4	2°	350
18	1118	63.1	1½°	250
20	1120	72.3	1½°	250
24	1124	133.1	1½°	250
30	1130	194.6	1°	250
36	1136	234.0	1°	250
42	1142	536.0	1°	250
48	1148	653.0	1°	250
54	1154	700.2	0.5°	200

NOTE: For applications or pressures other than those shown please contact EBAA for assistance.

Features and Applications:

- Sizes 3 inch through 54 inch
- Constructed of ASTM A536 Ductile Iron
- Torque Limiting Twist-Off Nuts
- MEGA-BOND® Restraint Coating System
  For more information on MEGA-BOND, refer to www.ebaa.com
- The Mechanical Joint Follower Gland is incorporated into the restraint
- Heavy Duty thick wall design
- Support Products Available:
  Split repair style available 3 inch through 48 inch.
  EBAA Series 1100SD

  Solid restraint harness available for push-on pipe bells.
  EBAA Series 1700

  Split restraint harness available for existing push-on bells.
  EBAA Series 1100HD
- All MEGALUG and related restraint products can be furnished as packaged accessories complete with appropriate restraint, gasket, lubrication, and bolting hardware
- For use on water or wastewater pipelines subject to hydrostatic pressure and tested in accordance with either AWWA C600 or ASTM D2774

Made In The USA

U.S. Patent Nos.
4092036, 4627774, 4779900, 4896903, 5544922

MEGALUG: THE PRODUCT OF PREFERENCE SINCE 1984

Since 1984, engineers and contractors designing and installing water and wastewater pipelines and systems have come to rely on the EBAA Series 1100 MEGALUG Mechanical Joint Restraint as the "Product of Preference" for effectively and economically restraining ductile iron pipe connections above or below ground.

MEGALUG Mechanical Joint Restraints replace external restraints such as cumbersome concrete thrust blocks and corrodible metal tie rods creating a quicker, safer and more economical installation.

Major testing laboratories agree as the 3" through 24" sizes are Underwriters Laboratories (UL) listed, and the 3" through 12" sizes are Factory Mutual (FM) approved.

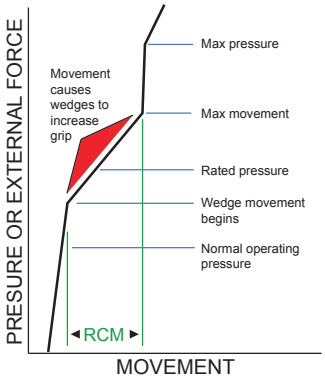
For use on all classes of ductile iron pipe (PC350 through PC150 and CL56 through CL50), for practically any application including valves, hydrants and pipe, the MEGALUG Mechanical Joint Restraint effectively and safely performs without damage to the pipe or cement linings.

THE MEGALUG GRIPPING WEDGE... PERFORMANCE PROVEN

The wedge style MEGALUG design reacts to the amount of force acting on the joint. When each wedge is set, the wedge teeth penetrate the pipe's outer surface, and the wedge does not move on the pipe. There is very little change in this interface until the wedge movement begins inside the pocket of the main casting. Once the wedge starts moving, the formation of the buttress begins.

This "dam" of material (the wedge impression) is cold formed as the wedging action continues. If the force of pressure acting on the joint is released, the wedge moves back to near its original position. This engages the reserve-controlled movement or "RCM". The wedge is then ready for another round.

After the wedge has moved to the back



of the pocket at the maximum pressure or load, the wedge buttress are in shear. The maximum movement is about 0.3 inch through the thirty-six inch size and 0.4 inch for forty-two and forty-eight inch.

The RCM is available even with severe cyclic loads. This has been tested to very high-pressure differentials and the wedge impressions look the same as if a single test had been performed.

Typically, the depth of pipe wall penetration, or wedge impression at around 25,000 pounds of force per wedge (200 PSI on a six inch and 150 PSI on a twelve inch) is 0.03". Finally, at roughly twice that force the penetration is around 0.05" At these high pressures, there is no affect on the design thickness of ductile iron pipe made according to AWWA C150. The lack of damage to the cement lining clearly indicates that the thrust load is primarily longitudinal.

This ability to move in the pocket allows for angular flexibility as well as longitudinal flexibility.

Mechanical Joint Restraint Sample Specifications

(The text of the specifications below can be copied pasted from www.ebaa.com/download/1100Spec.DOC)

Restraint devices for mechanical joint fittings and appurtenances conforming to either ANSI/AWWA C111/A21.11 or ANSI/AWWA C153/A21.53, shall conform to the following:

Design

Restraint devices for nominal pipe sizes 3 inch through 54 inch shall consist of multiple gripping wedges incorporated into a follower gland meeting the applicable requirements of ANSI/AWWA C110/A21.10.

The devices shall have a working pressure rating of 350 psi for 3-16 inch, 250 psi for 18-48 inch and 200 psi for the 54 inch. Ratings are for water pressure and must include a minimum safety factor of 2 to 1 in all sizes.

Material

Gland body, wedges and wedge actuating components shall be cast from grade 65-45-12 ductile iron material in accordance with ASTM A536.

For applications requiring restraint 30 inch and greater, an alternate grade of iron meeting the material requirements of ASTM A536 is acceptable, providing the device meets all end product performance requirements.

Ductile iron gripping wedges shall be heat treated within a range of 370 to 470 BHN.

Three (3) test bars shall be incrementally poured per production shift as per Underwriter's Laboratory (U.L.) Specifications and ASTM A536. Testing for tensile, yield and elongation shall be done in accordance with ASTM E8.

Chemical and nodularity tests shall be performed as recommended by the Ductile Iron Society, on a per ladle basis.

Traceability

An identification number consisting of year, day, plant and shift (YYDDD)(plant designation)(Shift number), shall be cast into each gland body.

All physical and chemical test results shall be recorded such that they can be accessed via the identification number on the casting. These Material Traceability Records (MTR's) are to be made available, in hard copy, to the purchaser that requests such documentation and submits his gland body identification number.

Production pieces that are too small to accommodate individual numbering, such as fasteners and wedges, shall be controlled in segregate inventory until such time as all quality control tests are passed. These component parts may then be released to a general inventory for final assembly and packaging.

All components shall be manufactured and assembled in the United States. The purchaser shall, with reasonable notice, have the right to plant visitation at his/her expense.

Installation

Mechanical joint restraint shall require conventional tools and installation procedures per AWWA C600, while retaining full mechanical joint deflection during assembly as well as allowing joint deflection after assembly.

Proper actuation of the gripping wedges shall be ensured with torque limiting twist off nuts.

Approvals

Restraint devices shall be Listed by Underwriters Laboratories (3" through 24" inch size) and Approved by Factory Mutual (3" through 12" inch size).

Mechanical joint restraint for ductile Iron pipe shall be Megalug Series 1100 produced by EBAA Iron Inc. or approved equal.

MEGA-BOND® Restraint Coating System

All wedge assemblies and related parts shall be processed through a phosphate wash, rinse and drying operation prior to coating application. The coating shall consist of a minimum of two coats of liquid thermoset epoxy coating with heat cure to follow each coat.

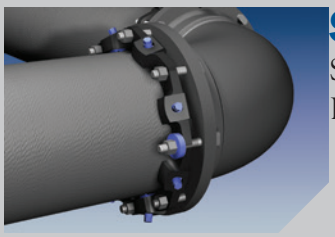
All casting bodies shall be surface pretreated with a phosphate wash, rinse and sealer before drying. The coating shall be electrostatically applied and heat cured. The coating shall be a polyester based powder to provide corrosion, impact and UV resistance.

The coating system shall be MEGA-BOND by EBAA Iron, Inc. or approved equal. Requests for approved equal must submit coating material and process details for review prior to bid.

For more information regarding MEGA-BOND, refer to the MEGA-BOND brochure or visit www.ebaa.com.

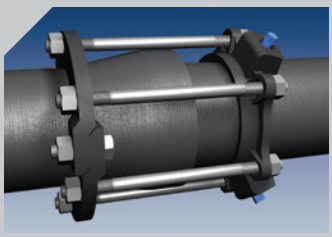
Support Products

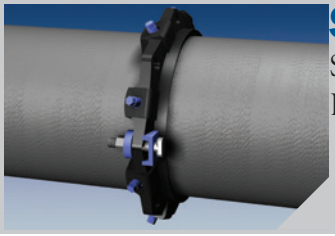
for more information concerning these products please consult the catalog or www.ebaa.com



Series 1100SD
Split MEGALUG Restraint
For Existing Mechanical Joints

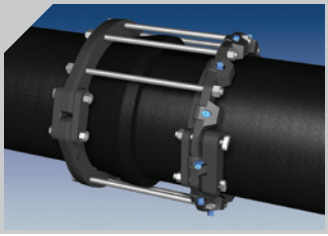
Series 1700
MEGALUG Restraint Harness
For Push-On Bell Joints





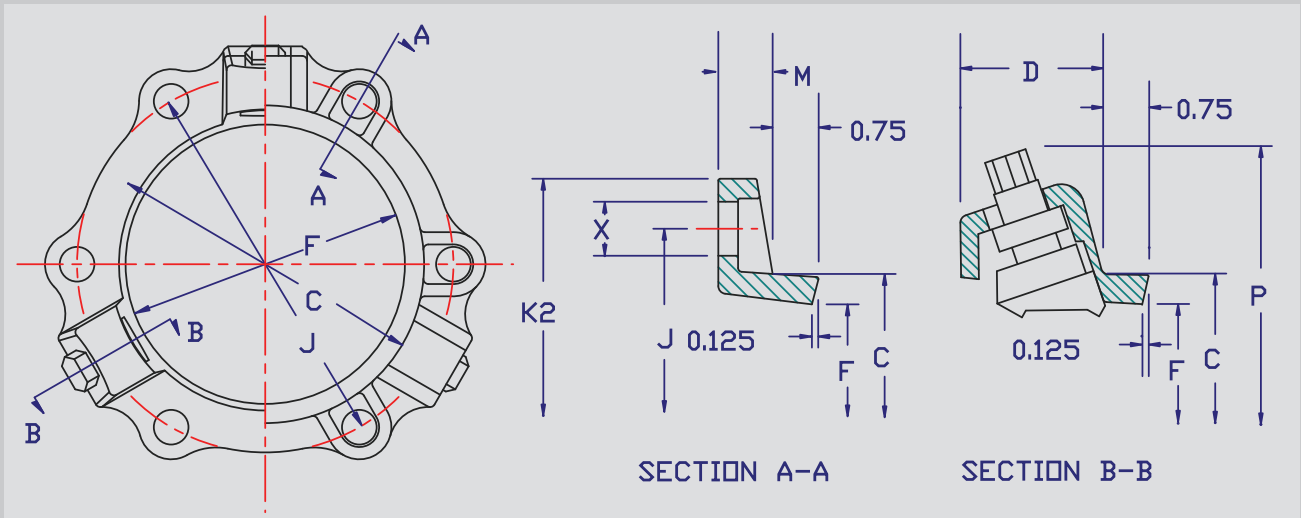
Series 1100SDB
Split MEGALUG Restraint
For Mid-Span Applications

Series 1100HD
Split MEGALUG Restraint
Harness for Existing Push-On Bells



Series 1100 Submittal Reference Drawing

EBAA IRON



MADE IN USA

Nominal Pipe Size	Series Number	C	D	F	M	P*	X	J	K2	Wedge QTY.	Bolt QTY.	Weight (LBS.)	Pressure Rating (PSI)
3	1103	4.48	2.27	4.06	0.62	9.06	0.750	6.19	7.69	2	4	6.1	350
4	1104	5.92	2.27	4.90	0.75	9.90	0.875	7.50	9.12	2	4	7.7	350
6	1106	8.02	2.27	7.00	0.88	12.00	0.875	9.50	11.12	3	6	11.9	350
8	1108	10.17	2.31	9.15	1.00	14.15	0.875	11.75	13.37	4	6	14.8	350
10	1110	12.22	2.37	11.20	1.00	16.20	0.875	14.00	15.62	6	8	23.9	350
12	1112	14.32	2.37	13.30	1.25	18.30	0.875	16.25	17.88	8	8	31.2	350
14	1114	16.40	2.69	15.44	1.50	20.94	0.875	18.75	20.25	10	10	48.5	350
16	1116	18.50	2.69	17.54	1.56	22.90	0.875	21.00	22.50	12	12	56.4	350
18	1118	20.60	2.69	19.64	1.63	25.00	0.875	23.25	24.75	12	12	63.1	250
20	1120	22.70	2.69	21.74	1.69	27.10	0.875	25.50	27.00	14	14	72.3	250
24	1124	26.90	3.20	25.94	1.81	32.64	0.875	30.00	31.50	16	16	133.1	250
30	1130	33.29	3.20	32.17	2.25	38.87	1.125	36.88	39.12	20	20	194.6	250
36	1136	39.59	3.20	38.47	2.25	45.17	1.125	43.75	46.00	24	24	234.0	250
42	1142	45.79	4.56	44.67	3.88	55.57	1.375	50.62	53.48	28	28	536.0	250
48	1148	52.09	4.56	50.97	3.88	61.87	1.375	57.50	60.36	32	32	653.0	250
54	1154	58.82	4.56	57.73	3.88	66.40	1.375	63.20	66.33	36	36	700.3	200

* With Twist-Off Nuts twisted off.

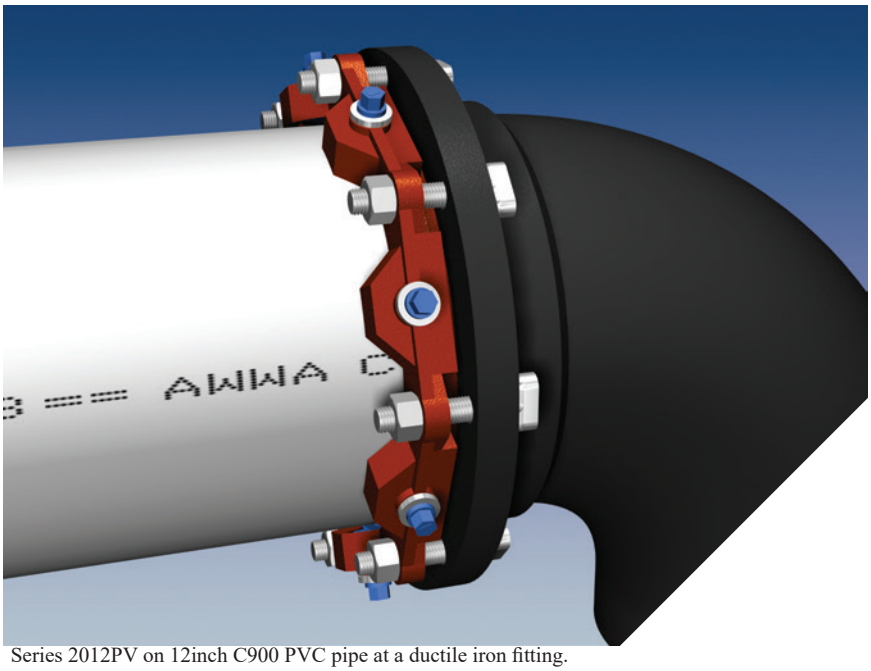
NOTE: Dimensions are in inches (±1%) and are subject to change without notice.

Important Notes

- The Series 1100 MEGALUG should not be used on plain end fittings.
- If encased in concrete, polyethylene wrap must be used to prevent concrete intrusion into the wedge pocket.
- For test pressures above the rated pressures shown, contact EBAA for recommendations, such as tandem restraint for high pressure applications.
- If you experience the need to install the Series 1100 MEGALUG in an unconventional manner please consult our engineering department.
- EBAA-Seal™ Mechanical Joint Gaskets are provided with 30 inch through 54 inch MEGALUG restraints. These are required on the above referenced sizes to accommodate the pressure ratings and safety factors shown.
- Extra length T-bolts are provided with the 42 inch, 48 inch and 54 inch sizes to facilitate easier assembly of the mechanical joint.
- All Series 1100 MEGALUG components are made of ductile iron conforming to ASTM A536. The wedges are heat treated to a hardness range of 370 to 470 BHN.
- LISTINGS AND APPROVALS: Sizes 3 inch through 24 inch are listed by Underwriters Laboratories, Inc. Category HJKF "Fittings, Retainer Type" with a deflection angle of 5 degrees (3 inch through 12 inch) and 2½ degrees (14 inch through 24 inch). The listing file number is EX2836, Sizes 3 inch through 12 inch are Factory Mutual approved.
- The Series 1100 MEGALUG is intended for use on ductile iron pipe. The restraint can be used on grey iron pipe if the pipe is not severely corroded and is in sound condition and has an outside diameter that can be accommodated. For more information on the use of the MEGALUG restraint on grey iron pipe ask for Connections Bulletin DI-1.

Series 2000PV

Mechanical Joint Restraint for PVC Pipe



Series 2012PV on 12inch C900 PVC pipe at a ductile iron fitting.

Nominal Pipe Size	Series Number	Shipping Weight
3	2003PV	7.0
4	2004PV	8.8
6	2006PV	12.1
8	2008PV	16.3
10	2010PV	26.0
12	2012PV	31.4
14	2014PV	47.6
16	2016PV	52.8
18	2018PV	61.8
20	2020PV	70.9
24	2024PV	92.9
30	2030PV	128.5
36	2036PV	161.3
42	2242*	652.0
48	2248*	711.1
54	2254*	1,085.6

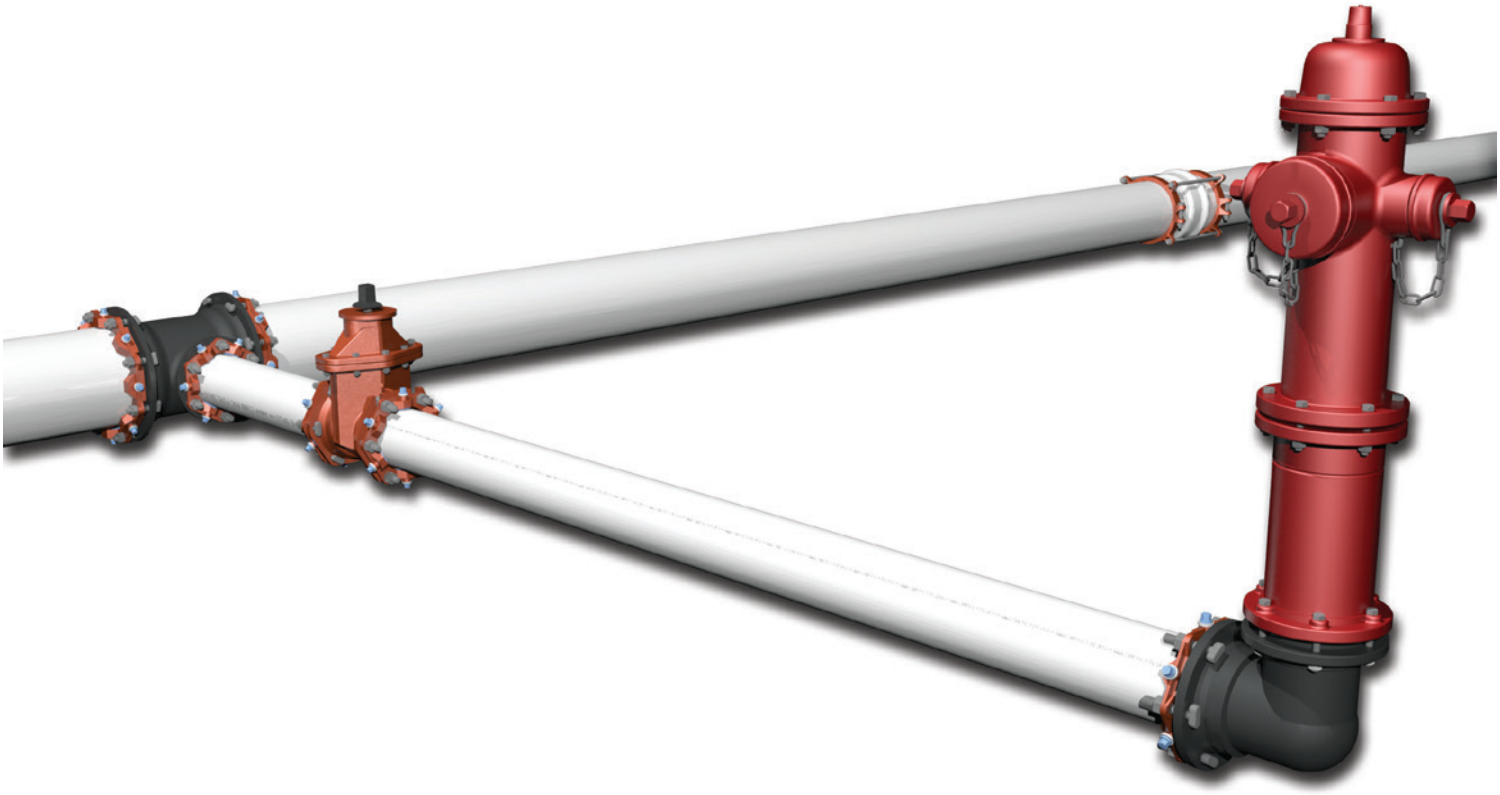
*Restraint for pipe size 42 inch and greater, please refer to Series 2200 Brochure found at www.ebaa.com.

U.S. Patent No.
4627775 4896903 5071175

Features and Applications:

- For restraining plain end PVC pipe at mechanical joint fittings and appurtenances
- Sizes 3 inch through 36 inch
  Sizes 42 inch through 54 inch
  accommodated by Series 2200
- MEGA-BOND® Restraint Coating System
  For more information on MEGA-BOND, refer to www.ebaa.com
- Constructed of ASTM A536 Ductile Iron
- The mechanical joint follower gland is incorporated into the restraint
- Accommodates full deflection of the mechanical joint on which it is used
- Heavy duty thick wall design
- Support Products Available:
  - Split mechanical Joint style available for 3 inch through 12 inch
    EBAA Series 2000SV
  - Solid restraint ring harness available for C900-16 PVC pipe bells
    EBAA Series 2800
  - Split restraint ring harness available for C900-16 PVC pipe bells and PVC fittings
    EBAA Series 1500, 1600 and 2500
- All 2000PV and related restraint products can be furnished as packaged accessories complete with appropriate restraint, gasket, lubrication and bolting hardware

For use on water or wastewater pipelines subject to hydrostatic pressure and tested in accordance with either AWWA C600 or ASTM D2774.



Series 2000PV:
Mechanical Joint Restraint Gland for use With AWWA C900 or IPS Outside Diameter PVC Pipe

The 2000PV MEGALUG Mechanical Joint Restraint is the fastest and most economical method of restraining PVC pipe to mechanical joints. Now the need for costly concrete thrust blocks and corrodible steel tie rods is eliminated. It can be used in straight alignment or at the preset deflection recommended for mechanical joints.

The 2000PV was the first PVC joint restraint to be tested to UNI-B-13, Underwriters Laboratories, and Factory Mutual.

Tested to and meets the requirements of ASTM F 1674-96 'Standard' Test Method for joint restraint products use with PVC pipe through 24 inch size.

UL Listed in the four through twelve inch sizes for joining UL Listed ductile iron fittings to UL Listed, Class 150 PVC pressure pipe. The maximum allowable joint deflection is five degrees.

Factory Mutual approved for use on DR18 PVC pipe in four through twelve inch sizes.

FM APPROVED

UL

ASTM F1674

AWWA MEMBER

Uni-Bell MEMBER

AFS CORPORATE MEMBER

The 2000PV MEGALUG Concept

EBAA Iron started manufacturing joint restraint products for PVC pipe in the early 1980s. The testing of early prototypes of various configurations of restraints on large diameter PVC pipe indicated that a restraint device must be capable of consistently and reliably gripping the pipe. If not, the restraint can slip under pressure, resulting in a sudden impact, and cause the pipe to burst. Armed with this background knowledge and an appreciation for the capabilities of PVC pipe, EBAA purposefully deviated from what many in the industry once considered to be the 'only' way to grip PVC pipe. This led to development of the Series 2000PV MEGALUG Mechanical Joint Restraint for PVC pipe.

The design of the 2000PV incorporates the gripping mechanism into the design of the mechanical joint gland and utilizes a simple two part assembly process. The first step involves assembling the joint the same as any standard mechanical joint. The assembly procedure we recommend is that established in AWWA C600. The second is the actuation of the restraint.

Mechanical Joint Restraint for AWWA PVC Pipe Sample Specification

(The text of the specification below can be downloaded as a Microsoft® Word Doc from our website www.ebaa.com)

Restraint devices for mechanical joint fittings and appurtenances conforming to either ANSI/AWWA C111/A21.11 or ANSI/AWWA C153/A2153, shall conform to the follow:

Design

Restraint devices for nominal pipe sizes 3 inch through 36 inch shall consist of multiple gripping wedges incorporated into a follower gland meeting the applicable requirements of ANSI/AWWA C110/A21.10.

The devices shall have a working pressure rating equal to that found in the most current product brochure. Ratings are for water pressure and must include a minimum safety factor of 2:1 in all sizes.

Material

Gland body, wedges and wedge actuating components shall be cast from grade 65-45-12 ductile iron material in accordance with ASTM A536. Gland body in sizes 30 inch anr larger shall be cast from grade 70-50-05.

Three (3) test bars shall be incrementally poured per production shift as per Underwriter's Laboratory (U.L.) Specifications and ASTM A536. Testing for tensile, yield and elongation shall be done in accordance with ASTM E8. Chemical and nodularity tests shall be performed as recommended by the Ductile Iron Society, on a per ladle basis.

Traceability

An identification number consisting of year, day, plant and shift (YYDDD) (plant designation) (Shift number), shall be cast into each gland body.

All physical and chemical test results shall be recorded such that they can be accessed via the identification number on the casting. These Material Traceability Records (MTR's) are to be made available, in hard copy, to the purchaser that requests such documentation and submits his gland body identification number.

Production pieces that are too small to accommodate individual numbering, such as fasteners and wedges, shall be controlled in segregate inventory until such time as all quality control tests are passed. These component parts may then be released to a general inventory for final assembly and packaging.

All components shall be manufactured and assembled in the United States. The purchaser shall, with reasonable notice, have the right to plant visitation at his/her expense.

Installation

Mechanical joint restraint shall require conventional tools and installation procedures per AWWA C600, while retaining full mechanical joint deflection during assembly.

Proper actuation of the gripping wedges shall be ensured with torque limiting twist off nuts.

Approvals

Mechanical Joint Restraints shall be Listed by Underwriters Laboratories in the 4 inch through 12 inch sizes.

Mechanical Joint Restraints shall be Factory Mutual Approved in the 4 inch through 12 inch sizes.

Mechanical Joint Restraints, 4 inch through 24 inch, shall meet or exceed the requirements of ASTM F1674 of the latest revision.

Mechanical joint restraint shall be Series 2000PV produced by EBAA Iron Inc. or approved equal.

MEGA-BOND® Restraint Coating System

All wedge assemblies and related parts shall be processed through a phosphate wash, rinse and drying operation prior to coating application. The coating shall consist of a minimum of two coats of liquid thermoset epoxy coating with heat cure to follow each coat.

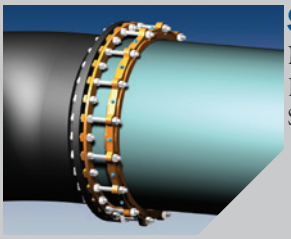
All casting bodies shall be surface pretreated with a phosphate wash, rinse and sealer before drying. The coating shall be electrostatically applied and heat cured. The coating shall be a polyester based powder to provide corrosion, impact and UV resistance.

The coating system shall be MEGA-BOND by EBAA Iron, Inc. or approved equal. Requests for approved equal must submit coating material and process details for review prior to bid.

For more information regarding MEGA-BOND, refer to the MEGA-BOND brochure or visit www.ebaa.com.

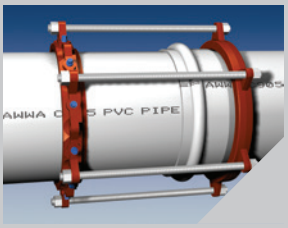
Support Products

for more information concerning these products, please consult the catalog or www.ebaa.com



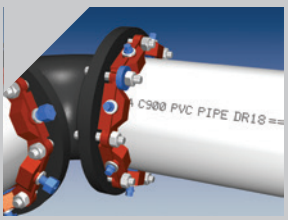
Series 2200
MEGALUG® Restraint for C900-16 PVC Pipe at Mechanical Joint Fittings
Sizes 30 and 48 inch

Series 2500
MEGALUG® Restraint for C900-16 PVC Pipe at PVC Fittings
Sizes 4 inch through 48



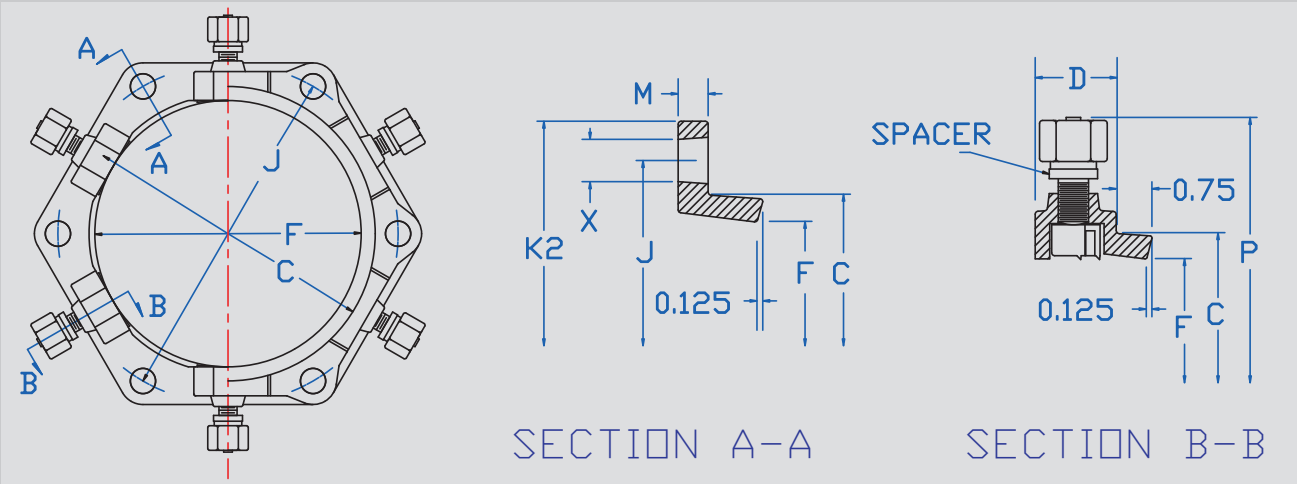
Series 2800
MEGALUG® Restraint Harness for C900-16 PVC Pipe
Sizes 14 inch through 48
Sizes 4 through 12 accommodated by either Series 1500 or 1600

Series 2000SV
Split MEGALUG® Restraint for existing C900 PVC Pipe at Ductile Iron Fittings
Sizes 4 inch through 12



Series 2000PV Submittal Reference Drawing

EBAA IRON



MADE IN USA

Submittal Reference Drawing Dimensions (in.)

Nominal Pipe Size	Series Number	C	D	F	M	P	P†	X	J	K2	Wedge Qty	Bolt Qty	Weight (lbs.)
3	2003PV	4.84	1.55	3.60	0.50	9.8	8.6	¾	6.19	7.69	4	4	7.0
4	2004PV	5.92	1.68	4.90	0.50	10.5	9.5	⅞	7.50	9.13	4	4	8.8
6	2006PV	8.02	1.68	7.00	0.50	13.0	12.1	⅞	9.50	11.13	6	6	12.1
8	2008PV	10.17	1.68	9.15	0.62	14.5	13.6	⅞	11.75	13.38	6	6	16.3
10	2010PV	12.22	2.10	11.20	0.62	17.0	16.0	⅞	14.00	15.63	8	8	26.0
12	2012PV	14.32	2.10	13.30	0.75	19.0	18.1	⅞	16.25	17.88	8	8	31.4
14	2014PV	16.40	2.25	15.49	0.88	21.7	20.9	⅞	18.75	20.38	10	10	47.6
16	2016PV	18.50	2.25	17.58	0.88	23.8	23.0	⅞	21.00	22.63	12	12	52.8
18	2018PV	20.60	2.25	19.68	1.13	25.9	25.1	⅞	23.25	24.88	12	12	61.8
20	2020PV	22.70	2.25	21.79	1.25	28.0	27.2	⅞	25.50	27.13	14	14	70.9
24	2024PV	26.90	2.75	25.99	1.42	32.3	31.5	⅞	30.00	31.63	16	16	92.9
30	2030PV	33.29	2.70	32.22	1.50	38.5	37.7	1⅛	36.88	39.12	20	20	128.5
36	2036PV	39.59	2.70	38.52	1.50	44.8	44.0	1⅛	43.75	46.00	24	24	161.3
42	2242	Submittal information for pipe sizes 42 inch and greater can be found in the Series 2200 Brochure.											
48	2248	Submittal information for pipe sizes 42 inch and greater can be found in the Series 2200 Brochure.											
54	2254	Submittal information for pipe sizes 42 inch and greater can be found in the Series 2200 Brochure.											

Pressure Ratings (PSI)

NOTE: Dimensions are in inches (±1%) and are subject to change without notice.

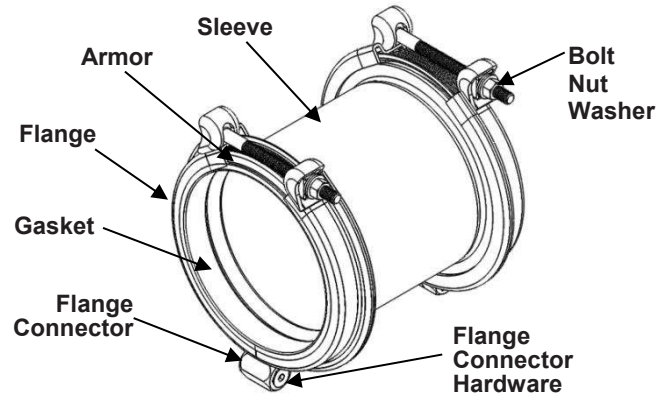
P†: Outside Diameter with "Twist-Off" nuts twisted off.

Nominal Pipe Size	Series Number	Ratings for Ordinary Water Works w/Transient surges only										Ratings for Peak Pressures used in Sewage Force Mains and other installations designed for Cyclic Surges of 1-Mill. Cycles					
		DR14	DR18	DR21	DR25	DR32.5	DR41	DR51	SDR17	SDR21	SDR26	DR14	DR18	DR25	SDR17	SDR21	SDR26
3	2003PV	305	235	-	165	-	-		250	200	160	244	188	132	200	160	120
4	2004PV	305	235	-	165	-	-	-	250	200	160	244	188	132	200	160	120
6	2006PV	305	235	-	165	-	-	-	250	200	160	244	188	132	200	160	120
8	2008PV	305	235	-	165	-	-	-	250	200	160	244	188	132	200	160	120
10	2010PV	305	235	-	165	-	-	-	250	200	160	244	188	132	200	160	120
12	2012PV	305	235	-	165	-	-	-	250	200	160	244	188	132	200	160	120
14	2014PV	305	235	-	165	125	100	-	-	-	-	-	-	-	-	-	-
16	2016PV	235	235	-	165	125	100	-	-	-	-	-	-	-	-	-	-
18	2018PV	-	200	165	165	125	100	-	-	-	-	-	-	-	-	-	-
20	2020PV	-	200	-	165	125	100	-	-	-	-	-	-	-	-	-	-
24	2024PV	-	235	-	165	125	100		-	-	-	-	-	-	-	-	-
30	2030PV	*	200	165	165	125	*	*	-	-	-	-	-	-	-	-	-
36	2036PV	-	-	125	125	125	*	*	-	-	-	-	-	-	-	-	-

* Refer to Series 2200 Product Brochure found either in our Catalog or at www.ebaa.com

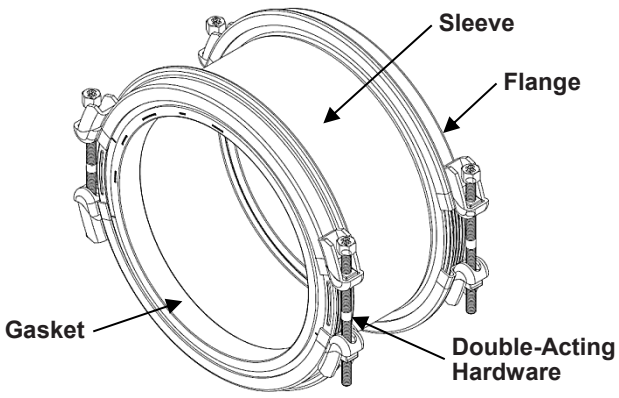
For applications or pressures other than those shown, please contact EBAA for assistance.

SPECIFICATION
TOP BOLT® WIDE RANGE COUPLING
MODEL 421



6" Coupling Shown

2" – 12" Sizes



16", 24" Size

16" Coupling Shown

APPLICATIONS

- **Typical Uses**
  - Joining plain-end pipe of same outside diameters
  - Joining plain-end pipe of different outside diameters within the same nominal pipe size
  - Replace split or excessively damaged pipe
- **Standard Pipe Sizes**
  - 2" to 12" nominal
  - 10" Oversize and 12" Oversize
  - 16", 24" nominal
- **Type of Pipe**
  - Carbon Steel, Stainless Steel, Ductile Iron, Asbestos Cement, PVC, Copper Tube
- **Working Pressure / Test Pressure**
  - 2" – 12" = 260 psi / 390 psi
  - 16", 24" DI Size Pipe = 260 psi / 390 psi
  - 16", 24" IPS Size Pipe = 150 psi / 225 psi

MATERIALS

- **Flange**
  - Carbon Steel per ASTM A283C, A285A or A36
  - Flexi-Coat® fusion bonded epoxy finish
- **Sleeve**
  - Carbon Steel per ASTM A283C, A285A or A36
  - Flexi-Coat fusion bonded epoxy finish
- **Gasket**
  - Nitrile (Buna-N) per ASTM D2000
  - Compounded to resist water, oil, acids, alkalies, most (aliphatic) hydrocarbon fluids, and many other chemicals
  - Temperature range: -20ºF to +180ºF
- **Armor**
  - Type 304 Stainless Steel quarter-hard per ASTM A240

- **Standard Hardware Size(s): 2" – 12"**
  - **Bolt**
    - Type 304 Stainless Steel
    - Epoxy coated
    - 9/16" - 12 UNC, Swivel Head Bolt with Rolled Threads
  - **Flange Connector Hardware**
    - Type 304 Stainless Steel
    - 1/2" – 13 UNC, Countersunk Allen Head
  - **Swivel Washer**
    - Type 304 Stainless Steel
    - 9/16"
  - **Steel Washer**
    - Type 304 Stainless Steel
    - 9/16"
  - **Nylon Washer**
    - Nylon 6/6
    - 9/16"
  - **Nut**
    - Type 304 Stainless Steel or equivalent
    - 9/16" - 12 UNC
    - Fluoropolymer Coated
- **Double-Acting Hardware Size(s): 16", 24"**
  - **Bolt**
    - Type 304 Stainless Steel
    - Anti-Gall Coating
    - 5/8" - 11 UNC Left and Right Hand Threaded Stud with Rolled Threads
    - Standard 5/8" Heavy Hex Cap Nut welded to stud
  - **Tapped Swivel Nuts**
    - Type 304 Stainless Steel or equivalent
    - Fluoropolymer Coated
    - (1) Left Hand tapped and (1) Right Hand Tapped

LISTINGS

- Certified to NSF/ANSI 61 and NSF/ANSI 372
- Meets applicable portions of AWWA C219
- Flexi-Coat Fusion-Bonded Epoxy Coating meets requirements of AWWA C213

OPTIONS

- Anode connector for cathodic protection
- Chloramine resistant EPDM gasket
- Pipe stops

NOTES

- Xylem, Smith-Blair, SB stylized, Top Bolt and Flexi-Coat are registered trademarks of Xylem, Inc., or one of its subsidiaries.
- These product specifications were correct at the time of publication and are subject to change without notice
- See the Smith-Blair website for part numbers and ordering information
- See the Smith-Blair website for warranty information
- See the Smith-Blair website for corrosion notice

THIS PRODUCT DOES NOT RESTRAIN PIPE MOVEMENT. Proper anchoring is required to prevent pipe pullout. Failure to anchor or improper anchoring can result in dangerous pipe content escape, property damage, serious injury, or death. Read the product installation instructions prior to installing this product.

30 Globe Ave, Texarkana, AR 71854
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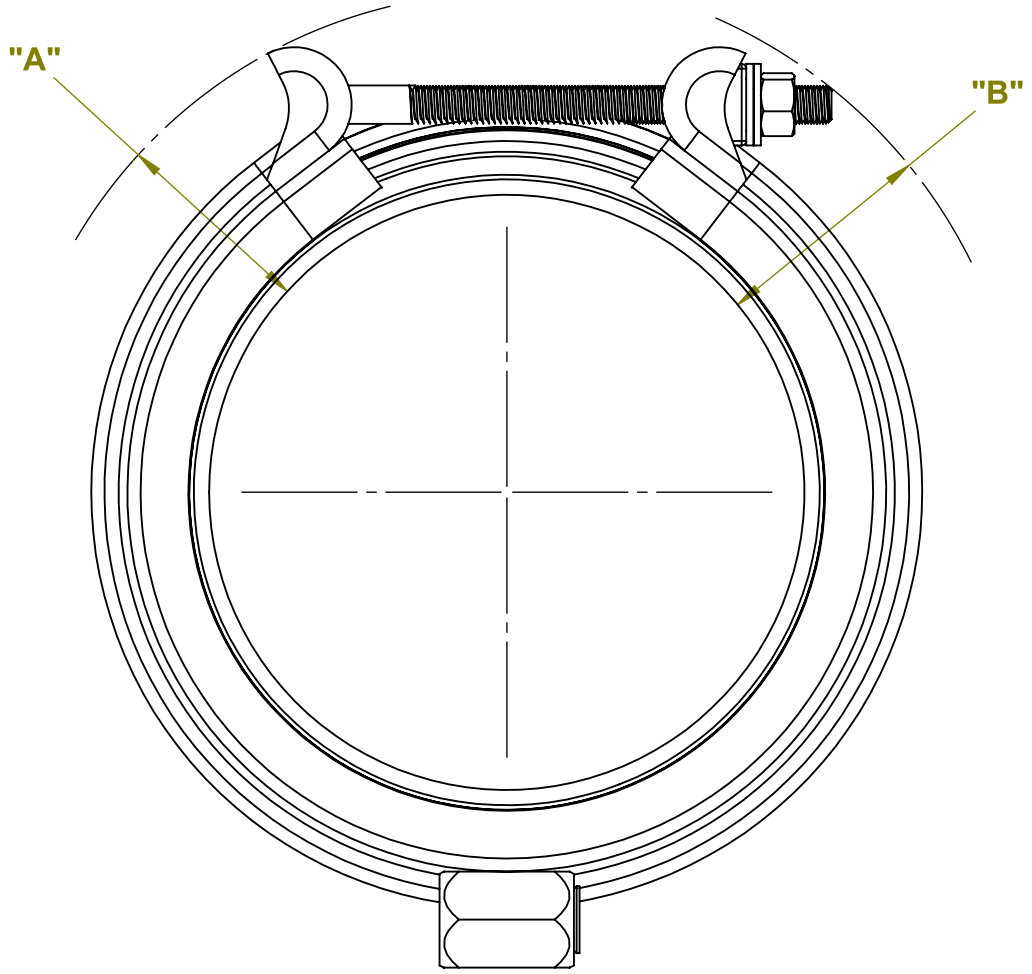
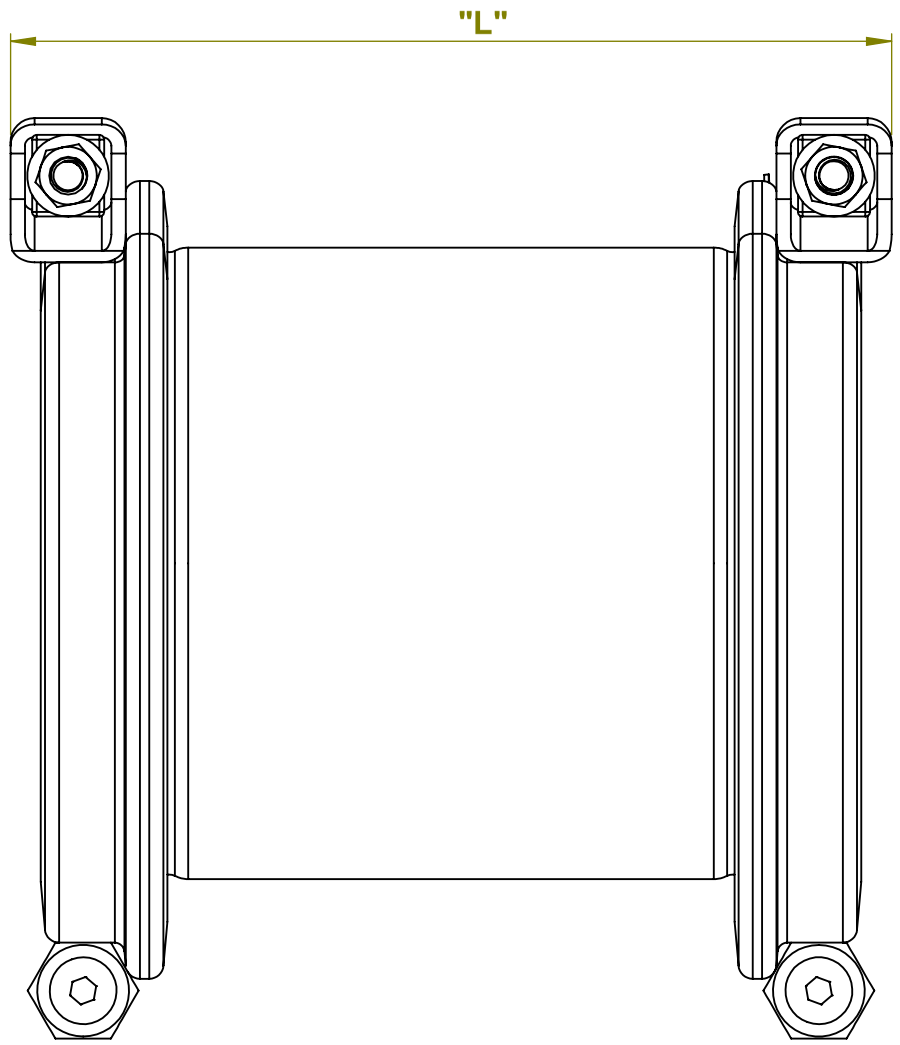




NOTES:
1. SEE CATALOG FOR PART NUMBERS AND RANGES
2. 6" COUPLING SHOWN OTHER SIZES SIMILAR

2"-12" STANDARD COUPLING

NOMINAL SIZE (IN)	A	B		L	BOXED WEIGHT (LBS)
		OPEN	CLOSED		
2	7.25	3.50	5.00 Max	7.5	8
3	8.38	3.50	5.00 Max	9.5	11
4	10.00	3.50	5.00 Max	9.75	19
6	12.13	3.50	5.00 Max	11.75	27
8	14.38	3.00	5.00 Max	11.75	33
10	16.50	3.00	5.00 Max	11.75	38
12	18.75	3.00	5.00 Max	11.75	46

WRENCH SIZE CHART	
NUT/BOLT	SIZE
1/2"-13UNC ALLEN	5/16"
9/16"-12UNC	7/8"

TOLERANCES U.N.O.
.XX= ±.03
.XXX= ±.015
FRACTIONS=
ANGLES=±1°
MACH. FIN=
ALL DIMENSIONS ARE IN INCHES.

NOTES:
REMOVE BURRS AND SHARP EDGES
DO NOT SCALE DWG.

SCALE: N/A

APP'D		DATE	
CK'D		DATE	
DRN	BCM	DATE	6/4/15

TITLE
SPECIFICATION
TOP BOLT® WIDE RANGE COUPLING
MODEL 421

SMITH-BLAIR
TEXARKANA, ARKANSAS

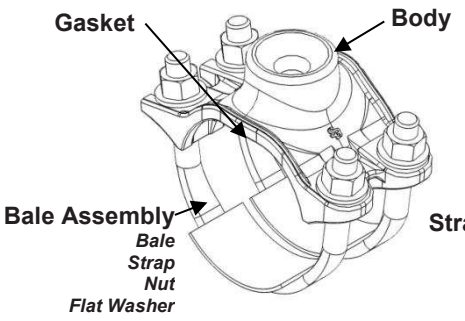
P/N N/A

DWG. NO. SPEC_421.DRW

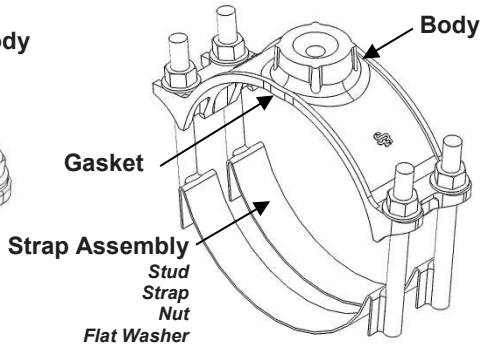
4 OF 6 SHEET

REV. 2-8-19

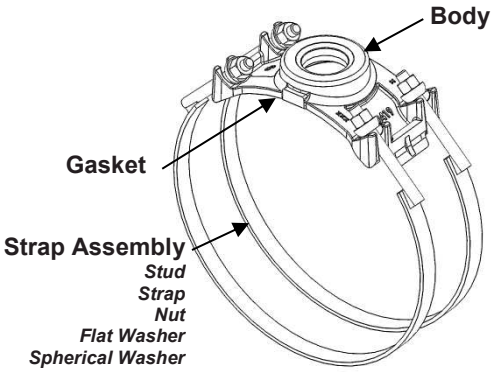
SPECIFICATION
SERVICE SADDLE DOUBLE STRAP
MODEL 317



1.25" – 3" SADDLE ASSEMBLY



4" – 14" SADDLE ASSEMBLY

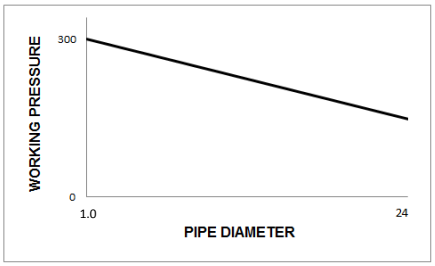


16" – 24" SADDLE ASSEMBLY

APPLICATIONS

- **Typical Uses**
  - Tapping branch connections on new or existing pipe
  - Installing air/vacuum valves, pitot tubes, drain valves, or other miscellaneous service equipment
  - Installing pipe supports, hangers, or sign mounting brackets
- **Standard Pipe Sizes**
  - 1.25" to 24" nominal
- **Standard Taps**
  - NPT: 1/2", 3/4", 1", 1-1/4", 1-1/2", 2", 3" and 4"
  - CC/AWWA: 1/2", 5/8", 3/4", 1", 1-1/4", 1-1/2" and 2"
  - BSP: 1/2", 3/4", 1", 1-1/4", 1-1/2", 2", and 3"

  See Smith-Blair catalog for available pipe diameter and tap size combinations as some combinations are not available
- **Type of Pipe**
  - PVC, Carbon Steel, Stainless Steel, Ductile Iron, HDPE DR17 or thicker (with use of spring washers), Asbestos Cement, Aluminum
- **Working Pressure**
  - Up to 300 psi depending on type of pipe, type of repair, pipe diameter, service conditions, and installation workmanship



SPECIFICATION
SERVICE SADDLE DOUBLE STRAP
MODEL 317

MATERIALS

- **Body** *(used only on 1" - 14" nominal pipe size saddles)*
  - Cast using Ductile Iron 65-45-12 per ASTM A536
  - Flexi-Coat® fusion bonded epoxy finish
  - Closed ears holds nut and bale/strap in place allowing the assembly to hinge for ease of installation around pipe
  - Open ears provide easy slip on installation and removal of nuts are not required preventing lost hardware
  - Canted ears for maximum tangential tightening of bale or strap
  - Wraparound design provides maximum pipe support, reinforcement, and sealing pressure
  - Wide skirt and heavy tapping boss provides excellent stability on the pipe
- **Body** *(used only on 16" - 24" nominal pipe size saddles)*
  - Cast using Ductile Iron 65-45-12 per ASTM A536
  - Flexi-Coat® fusion bonded epoxy finish
  - Open ears provide easy slip on installation and removal of nuts are not required preventing lost hardware
  - Canted ears for maximum tangential tightening of bale or strap
  - Wraparound design provides maximum pipe support, reinforcement, and sealing pressure
  - Wide skirt and heavy tapping boss provides excellent stability on the pipe
- **Bale Assembly** *(used only on 1" - 3" nominal pipe size saddles)*
  - **Bale**
    - Type 304 Stainless Steel per ASTM A276
    - 1/2"-13UNC
    - Pipe contact surface flattened to provide a wider bearing surface against pipe
    - Rolled threads for improved physical characteristics, greater thread accuracy, and smooth surface finish
  - **Strap**
    - Type 304 Stainless Steel per ASTM A240
    - Formed using 14GA x 1.50" strip and welded to Bale
    - Strap distributes load across a larger surface area preventing damage to non-rigid pipe types
    - Relevant product information placed on strap i.e. O.D. range, part number, etc.
  - **Welding**
    - Welds accomplished using qualified welders
    - GMAW weld process utilized
    - Welds passivated to preserve corrosion resistance
  - **Nut**
    - Type 304 Stainless Steel GR. 8 per ASTM A194
    - Fluoropolymer coated to prevent galling
    - 1/2"-13UNC, Heavy Hex Semi-Finished
  - **Flat Washer**
    - Type 304 Stainless Steel per ASTM A240
    - 1/2" Type A Plain
    - Utilized to preserve corrosion resistance of epoxy coated surfaces and increase bearing surface

SPECIFICATION
SERVICE SADDLE DOUBLE STRAP
MODEL 317

- **Strap Assembly** *(used only on 4" – 24" nominal pipe size saddles)*
  - **Strap**
    - Material: 4" – 16" nominal pipe size(s) = Type 304 Stainless Steel per ASTM A240
      18" – 24" nominal pipe size(s) = Type 304 Stainless Steel per ASTM A276
    - Sizes: 4" – 16" nominal pipe size(s) = Formed using 14GA x 1.50" strip
      18" – 24" nominal pipe size(s) = Formed using 0.25" x 1.25" flat bar
    - Strap distributes load across a larger surface area preventing damage to non-rigid pipe types
    - Relevant product information placed on strap i.e. O.D. range, part number, etc.
  - **Stud**
    - Type 304 Stainless Steel per ASTM A276
    - Sizes: 4" – 6" nominal pipe size(s) = 5/8"-11UNC x 6.00" long, Stud welded to Strap
      8" – 14" nominal pipe size(s) = 5/8"-11UNC x 7.00" long, Stud welded to Strap
    - Rolled threads for improved physical characteristics, greater thread accuracy, and smooth surface finish
  - **Welding**
    - Welds accomplished using qualified welders
    - GMAW weld process utilized
    - Welds passivated to preserve corrosion resistance
  - **Nut**
    - Type 304 Stainless Steel GR. 8 per ASTM A194
    - Fluoropolymer coated to prevent galling
    - 5/8"-11UNC, Heavy Hex Semi-Finished
  - **Flat Washer**
    - Type 304 Stainless Steel per ASTM A240
    - 5/8" Type A Plain
    - Utilized to preserve corrosion resistance of epoxy coated surfaces and increase bearing surface
  - **Spherical Washer** *(used only on 16" – 24" nominal pipe size saddles)*
    - Cast using Ductile Iron 65-45-12 per ASTM A536
    - Flexi-Coat® fusion bonded epoxy finish
    - Provide full bearing for the strap nuts and align the straps with the saddle body
    - Distributes load for better performance
- **Gasket**
  - Nitrile (Buna-N) per ASTM D2000
  - Compounded to resist water, oil, natural gas, acids, alkalies, most (aliphatic) hydrocarbon fluids, and many other chemicals
  - Temperature range: -20ºF to +180ºF
  - TaperSeal™ hydro-mechanical lip enables the saddle to hold higher pressures with minimal nut torque
  - Gasket is fully cemented in a cavity to hold it in place

SPECIFICATION
SERVICE SADDLE DOUBLE STRAP
MODEL 317

LISTINGS

- Certified to NSF/ANSI 61 and NSF/ANSI 372
- Meets applicable AWWA C800 standards
- Certain sizes meet Uni-Bell PVC Pipe Associations "Handbook of PVC Pipe" and AWWA M23 Manual "PVC Pipe Design and Installation, when the fitting is ordered with the body properly sized to fit the PVC pipe.
- Fusion-Bonded Epoxy Coating meets requirements of AWWA C213

OPTIONS

- Type 316 Stainless Steel bale assembly with fluoropolymer coated nuts to prevent galling
- Type 316 Stainless Steel strap assembly with fluoropolymer coated nuts to prevent galling *(spherical washers remain D.I)*
- Alternative gasket material (e.g. Viton, EPDM, etc.)
- Anode connector
- Spring washers for use of clamp on HDPE pipe

NOTES

- Spring washers **are required** when this product is used on DR17 or thicker HDPE pipe
- These product specifications were correct at the time of publication and are subject to change without notice
- Flexi-Coat® is a registered trademark of Smith-Blair, Inc.
- Taperseal™ is a trademark of Smith-Blair, Inc.
- See the Smith-Blair web site for part numbers and ordering information
- See the Smith-Blair web site for warranty information
- See the Smith-Blair web site for corrosion notice

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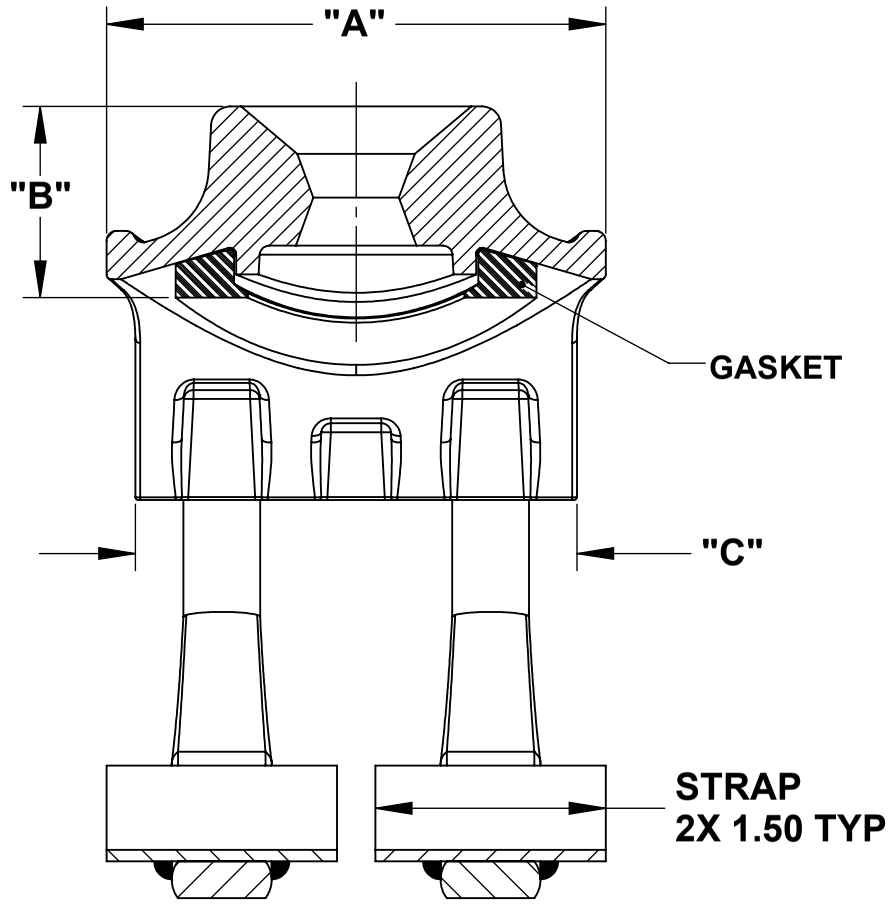
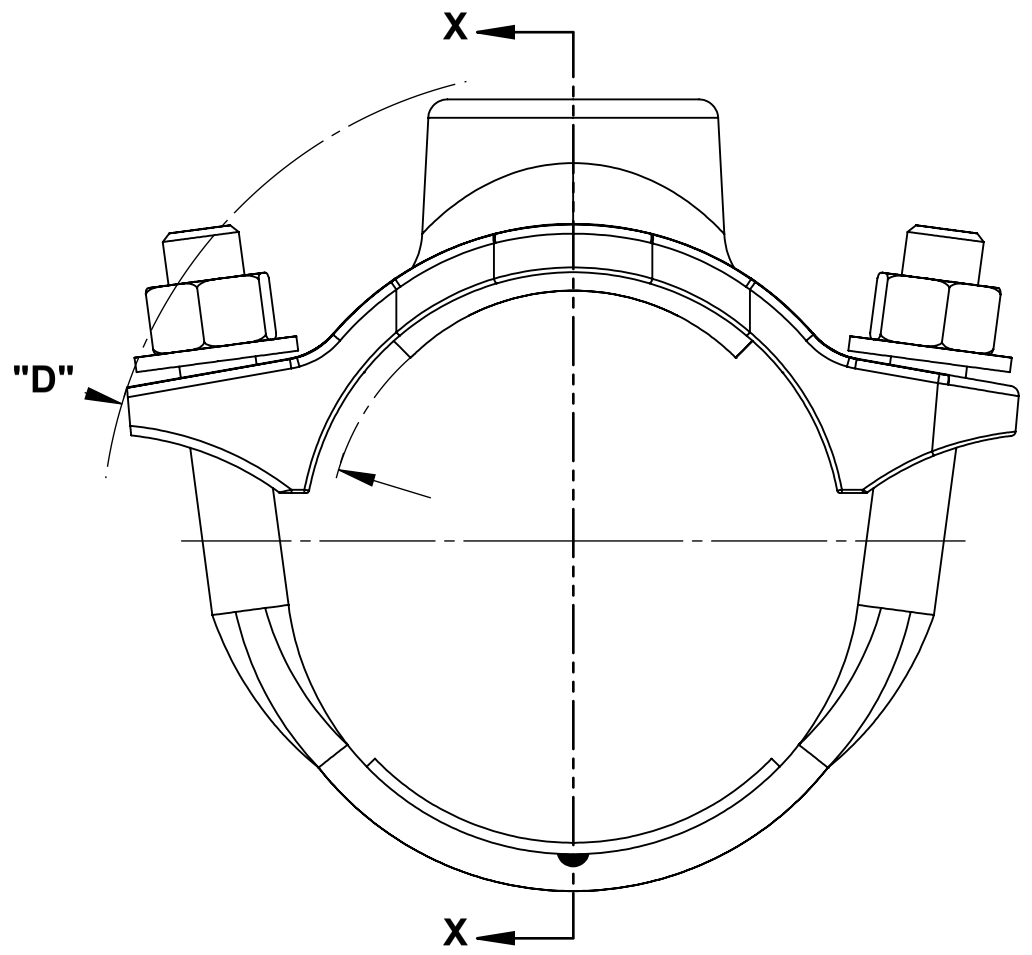


SECTION X-X



NOMINAL SIZE	APPROX. WT. (LB)	TAP CODE	A	B	C	D	SOCKET SIZE
1.25 - 1.50	3	ST	3.40	1.35	2.88	1.53	7/8"
	-	LT	-	-	-	-	
2	3	ST	3.40	1.35	2.88	1.53	
	-	LT	-	-	-	-	
2.25 - 2.50	3	ST	3.40	1.35	2.88	1.53	
	-	LT	-	-	-	-	
3	4	ST	3.40	1.40	3.00	1.70	
	5	LT	4.40	1.40	3.60	1.65	

NOTES:

1. **SEE SMITH-BLAIR CATALOG FOR AVAILABLE PIPE DIAMETER AND TAP SIZE COMBINATIONS AS SOME COMBINATIONS ARE NOT AVAILABLE**
2. **3.54" SADDLE SHOWN OTHER SIZES SIMILAR**
3. **ABREVIATIONS:**
   ST = SMALL TAP SIZES 1/2" THRU 1-1/2"
   LT = LARGE TAP SIZES 1-1/2" THRU 2-1/2"
   XLT = EXTRA-LARGE TAP SIZES 3" AND 4"

TOLERANCES U.N.O.
.XX= ±.03
.XXX= ±.015
FRACTIONS=
ANGLES=±1°
MACH. FIN=
ALL DIMENSIONS ARE IN INCHES.

NOTES:
REMOVE BURRS AND SHARP EDGES
DO NOT SCALE DWG.

SCALE: N/A

APP'D		DATE	
CK'D		DATE	
DRN	CHD	DATE	6/18/15

TITLE

SPECIFICATION
SERVICE SADDLE DOUBLE STRAP
MODEL 317

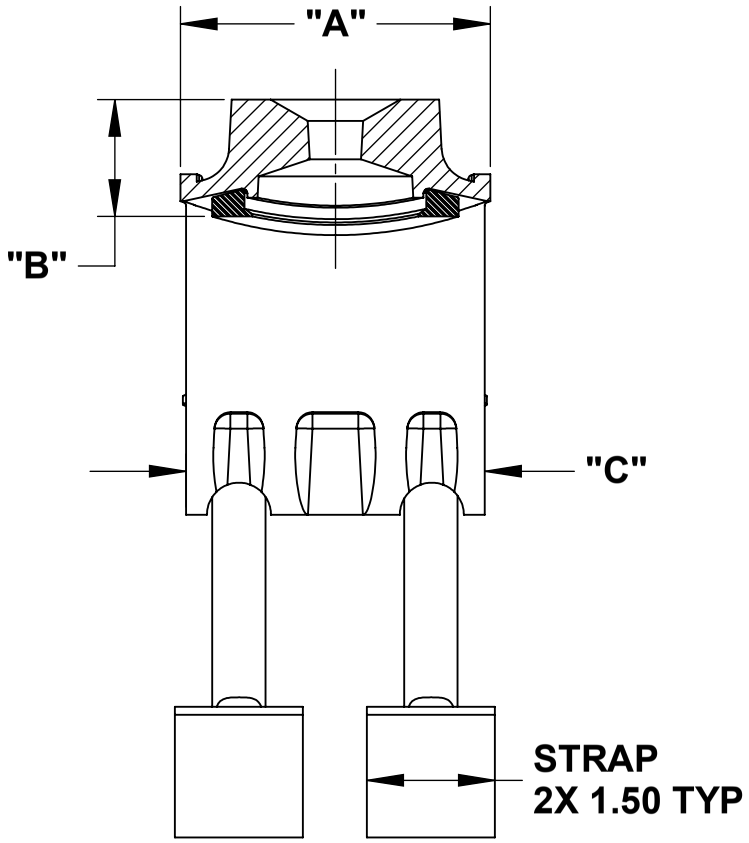
SMITH-BLAIR, Inc.
TEXARKANA, ARKANSAS

P/N N/A

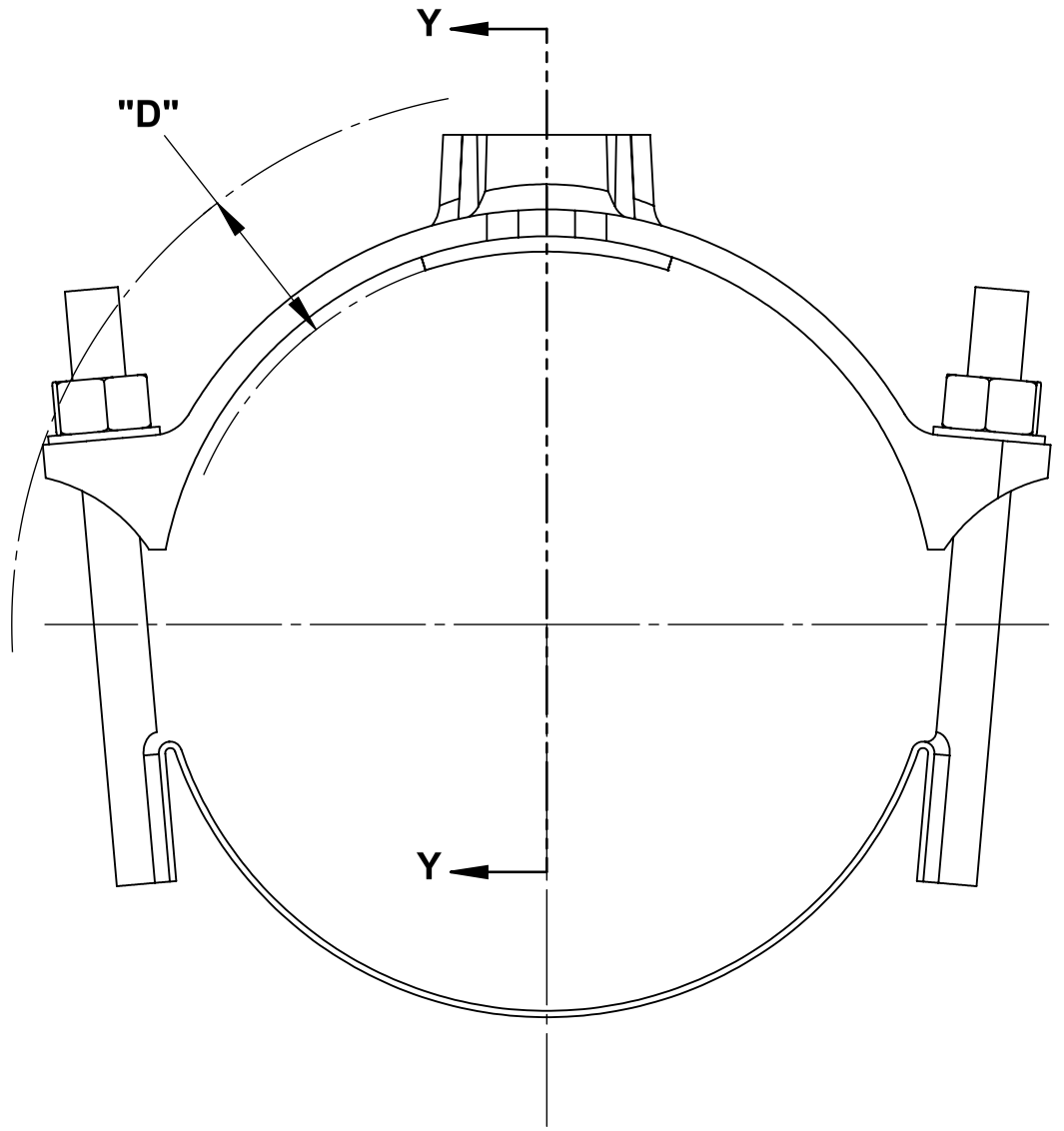
SPEC_317.DRW
DWG. NO.

1 OF 3 SHEET

8/17/16 REV.



SECTION Y-Y



NOMINAL SIZE	APPROX. WT. (LB)	TAP CODE	A	B	C	D	SOCKET SIZE
4	6	ST	3.70	1.40	3.50	1.60	1-1/16"
	6	LT	5.50	1.75	3.65	1.75	
5	6	ST	3.70	1.40	3.60	1.75	
	9	LT	5.50	1.75	3.65	1.70	
6	7	ST	3.75	1.40	3.60	1.75	
	7	LT	5.50	1.75	3.65	1.78	
	13	XLT	6.05	1.93	4.20	1.83	
8	8	ST	3.75	1.40	3.60	1.87	
	11	LT	5.50	1.75	3.65	1.90	
	15	XLT	6.05	1.85	4.10	1.90	
10	10	ST	3.75	1.40	3.60	1.90	
	11	LT	5.50	1.75	3.60	1.90	
	14	XLT	7.20	2.00	4.20	1.85	
12	14	ST	3.75	1.45	3.60	2.00	
	15	LT	5.50	1.75	3.60	1.95	
	18	XLT	7.20	2.00	4.20	1.85	
14	18	ST	4.45	1.40	2.85	1.90	
	18	LT	4.45	1.40	3.60	1.90	
	28	XLT	7.20	2.00	4.20	1.85	
15-16	19	ST	4.45	1.80	5.00	2.15	
	19	LT	4.45	1.80	5.00	2.15	
	29	XLT	6.90	1.95	7.35	2.30	

NOTES:

1. SEE SMITH-BLAIR CATALOG FOR AVAILABLE PIPE DIAMETER AND TAP SIZE COMBINATIONS AS SOME COMBINATIONS ARE NOT AVAILABLE
2. 9.05" SADDLE SHOWN OTHER SIZES SIMILAR
3. ABREVIATIONS:
   ST = SMALL TAP SIZES 1/2" THRU 1-1/2"
   LT = LARGE TAP SIZES 1-1/2" THRU 2-1/2"
   XLT = EXTRA-LARGE TAP SIZES 3" AND 4"

TOLERANCES U.N.O. .XX= ±.03 .XXX= ±.015 FRACTIONS= ANGLES=±1° MACH. FIN= ALL DIMENSIONS ARE IN INCHES.	NOTES: REMOVE BURRS AND SHARP EDGES DO NOT SCALE DWG.	APP'D		DATE	
		CK'D		DATE	
	SCALE: N/A	DRN	CHD	DATE	6/18/15

TITLE

SPECIFICATION
SERVICE SADDLE DOUBLE STRAP
MODEL 317

SMITH-BLAIR, Inc.
TEXARKANA, ARKANSAS

P/N N/A

DWG. NO. SPEC_317.DRW

SHEET 2 OF 3

REV. 8/17/16

MALLEABLE IRON FITTINGS

Malleable Iron Threaded Pipe Unions Pressure - Temperature Ratings

Temperature		Pressure					
		Class 150		Class 250		Class 300	
(°F)	*(°C)*	psi	*bar*	psi	*bar*	psi	*bar*
-20° to 150°	*-28.9° to 65.6°*	300	*20.7*	500	*34.5*	600	*41.4*
200°	*93.3°*	265	*18.3*	455	*31.4*	550	*37.9*
250°	*121.1°*	225	*15.5*	405	*27.9*	505	*34.8*
300°	*148.9°*	185	*12.8*	360	*24.8*	460	*31.7*
350°	*176.7°*	150	*10.3*	315	*21.7*	415	*28.6*
400°	*204.4°*	110	*7.6*	270	*18.6*	370	*25.5*
450°	*232.2°*	75	*5.2*	225	*15.5*	325	*22.4*
500°	*260.0°*	–	–	180	*12.4*	280	*19.3*
550°	*287.8°*	–	–	130	*9.0*	230	*15.9*

Note: Unions with Copper or Copper Alloy seats are not intended for use where temperature exceeds 450°F

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For Listings/Approval Details and Limitations, visit our website at www.anvilintl.com or contact an Anvil Sales Representative.

Malleable Iron Threaded Fittings Pressure - Temperature Ratings

Temperature		Pressure							
		Class 150		Class 300					
				Sizes ¼"–1" *(6–25 mm)*		Sizes 1¼"–2" *(32–51 mm)*		Sizes 2½"–3" *(64–76 mm)*	
(°F)	*(°C)*	psi	*bar*	psi	*bar*	psi	*bar*	psi	*bar*
-20° to 150°	*-28.9° to 65.6°*	300	*20.7*	2,000	*137.9*	1,500	*103.4*	1,000	*68.9*
200°	*93.3*	265	*18.3*	1,785	*123.1*	1,350	*93.1*	910	*62.7*
250°	*121.1*	225	*15.5*	1,575	*108.6*	1,200	*82.7*	825	*56.9*
300°	*148.9*	185	*12.8*	1,360	*93.8*	1,050	*72.4*	735	*50.7*
350°	*176.7*	150	*10.3*	1,150	*79.3*	900	*62.1*	650	*44.8*
400°	*204.4*	–	–	935	*64.5*	750	*51.7*	560	*38.6*
450°	*232.2*	–	–	725	*50.0*	600	*41.4*	475	*32.8*
500°	*260.0*	–	–	510	*35.2*	450	*31.0*	385	*26.5*
550°	*287.8*	–	–	300	*20.7*	300	*20.7*	300	*20.7*

Anvil Class 150/300 Malleable Iron Fittings conform to ASME B16.3 and Unions conform to ASME B16.39.

ALL ELBOWS & TEES ⅜" *(10 DN)* and LARGER ARE 100% GAS TESTED AT A MINIMUM OF 100 PSI. *(6.9 bar)*

Standards and Specifications

	Dimensions	Material	Galvanizing*	Thread	Pressure Rating
MALLEABLE IRON FITTINGS					
Class 150/PN 20	ASME B16.3	ASTM A-197	ASTM A-153	ASME B1 20.1	ASME B16.3
Class 300/PN 50	ASME B16.3	ASTM A-197	ASTM A-153	ASME B1 20.1	ASME B16.3
MALLEABLE IRON UNIONS					
Class 150/PN 20	ASME B16.39	ASTM A-197	ASTM A-153	ASME B1 20.1	ASME B16.39
Class 250	ASME B16.39	ASTM A-197	ASTM A-153	ASME B1 20.1	ASME B16.39
Class 300/PN 50	ASME B16.39	ASTM A-197	ASTM A-153	ASME B1 20.1	ASME B16.39

* ASTM B 633. Type I, SC 4, may be supplied as alternate zinc coating per applicable ASME B16 product standard.

CAST IRON FITTINGS

Anvil standard and extra heavy cast iron threaded fittings are manufactured in accordance with ASME B16.4. Plugs and bushings are manufactured in accordance with ASME B16.14.

NOTE: Figure 367 Concentric Reducers do not meet the overall length requirement of ASME B16.4. All other dimensions are in compliance.

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For Listings/Approval Details and Limitations, visit our website at www.anvilintl.com or contact an Anvil Sales Representative.

Cast Iron Threaded Fittings
Pressure - Temperature Ratings

Temperature		Pressure			
		Class 125		Class 250	
(°F)	*(°C)*	psi	*bar*	psi	*bar*
-20° to 150°	*-28.9 to 65.6*	175	*12.1*	400	*27.6*
200°	*93.3*	165	*11.4*	370	*25.5*
250°	*121.1*	150	*10.3*	340	*23.4*
300°	*148.9*	140	*9.7*	310	*21.4*
350°	*176.7*	125	*8.6*	300	*20.7*
400°	*204.4*	–	–	250	*17.2*

Standards and Specifications

	Dimensions	Material	Galvanizing*	Thread	Pressure Rating
CAST IRON THREADED FITTINGS					
Class 125	ASME B16.4	ASTM A-126 (A)	ASTM A-153	ASME B1.20.1	ASME B16.4
Class 250	ASME B16.4	ASTM A-126 (A)	ASTM A-153	ASME B1.20.1	ASME B16.4
CAST IRON PLUGS AND BUSHINGS					
	ASME B16.14	ASTM A- 126 (A)	ASTM A-153	ASME B1.20.1	ASME B16.14

* ASTM B 633. Type I, SC 4, may be supplied as alternate zinc coating per applicable ASME B16 product standard.

LANSDALE VALVE & MANUFACTURING

www.LansdaleValve.com

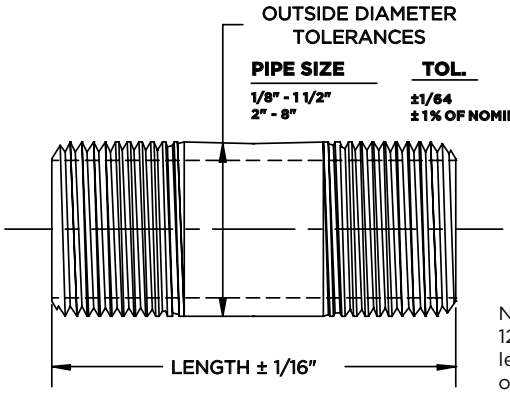
PIPE NIPPLES

MODEL LVWPN

MADE IN THE USA

FEATURES:

- **DIMENSIONS:** ASTM A733 (See table below for standard sizes)
- **THREADS:** NPT per ASME B1.20.1
- **MATERIAL:** ASTM A53, Sch 40 Welded Steel Pipe
- **FINISH:** Black, or Hot Dip Galvanized
- Specials Available upon request - TxG, GxG, GxPE, BxB



Nipples over 12" long have a length tolerance of +/- ⅛".

PIPE SIZE (IN)	PIPE O.D.	LENGTH CLOSE	PIPE LENGTH															
⅛	0.405	¾	1½	2	2½	3	3½	4	4½	5	5½	6	7	8	9	10	11	12
¼	0.540	⅞	1½	2	2½	3	3½	4	4½	5	5½	6	7	8	9	10	11	12
⅜	0.675	1	1½	2	2½	3	3½	4	4½	5	5½	6	7	8	9	10	11	12
½	0.840	1⅛	1½	2	2½	3	3½	4	4½	5	5½	6	7	8	9	10	11	12
¾	1.050	1⅜	1½	2	2½	3	3½	4	4½	5	5½	6	7	8	9	10	11	12
1	1.315	1½		2	2½	3	3½	4	4½	5	5½	6	7	8	9	10	11	12
1¼	1.660	1⅝		2	2½	3	3½	4	4½	5	5½	6	7	8	9	10	11	12
1½	1.900	1¾		2	2½	3	3½	4	4½	5	5½	6	7	8	9	10	11	12
2	2.375	2			2½	3	3½	4	4½	5	5½	6	7	8	9	10	11	12
2½	2.875	2½				3	3½	4	4½	5	5½	6	7	8	9	10	11	12
3	3.500	2⅝				3	3½	4	4½	5	5½	6	7	8	9	10	11	12
3½	4.000	2¾					3½	4	4½	5	5½	6	7	8	9	10	11	12
4	4.500	2⅞						4	4½	5	5½	6	7	8	9	10	11	12
5	5.563	3							4½	5	5½	6	7	8	9	10	11	12
6	6.625	3⅛							4½	5	5½	6	7	8	9	10	11	12

PROJECT	APPROVAL STAMP
PROJECT:	☐ APPROVED
ADDRESS:	☐ APPROVED AS NOTED
ENGINEER:	☐ NOT APPROVED
SUBMITTAL DATA:	REMARKS:
NOTES 1:	
NOTES 2:	

LANSDALE
VALVE & MANUFACTURING
www.LansdaleValve.com

304SS FLANGE PACKS

MODEL LVFP304SS

FEATURES:

Flange Packs include everything needed to make-up a flanged assembly, for class 125/150 flanges. Each kit includes one ⅛" red rubber ring gasket and the correct number of stainless steel type 304, hex head bolts and nuts per flange.

SPECIFICATIONS:

- 1/8" thick Red Rubber Gasket - ASTM D1330, Grade II
- Stainless Steel Hex Cap Screws ANSI B18.2.1 and conform to ASTM F593 Type 304
- Stainless Steel Hex Nuts ANSI B18.2.2 and conform to ASTM F594 Type 304

SIZE	NO. OF BOLTS	BOLT SIZE	CASE QTY
2"	4	⅝" x 2½"	10
2½"	4	⅝"x 3"	10
3"	4	⅝" x 3"	10
4"	8	⅝" x 3"	10
5"	8	¾" x 3½"	6
6"	8	¾" x 3½"	6
8"	8	¾" x 3½"	6
10"	12	⅞" x 4"	5
12"	12	⅞" x 4"	5

PROJECT	APPROVAL STAMP
PROJECT:	☐ APPROVED
ADDRESS:	☐ APPROVED AS NOTED
ENGINEER:	☐ NOT APPROVED
SUBMITTAL DATA:	REMARKS:
NOTES 1:	
NOTES 2:	

5544AB

Lead Free Brass Full Port Ball Valve

Feature

- 150# WSP / 600# WOG
- Lead free brass body
- Full port
- Adjustable packing
- FNPT x FNPT
- Threaded ends (ASME B1.20.1-NPT)
- Blow-out proof stem
- Chrome plated ball
- Virgin PTFE seats
- MSS-SP-110
- 500 psi for UL use (1¼" & 2")
- CSA certified ANSI Z21.15/CSA 9.1 - 1/2 psi (¼" - 3")
- CSA certified CGA CR91.002 - 5G (5 psi) (¼" - 2")
- CSA certified ASME B16.44 - 5G (5 psi) (¼" - 3")
- CSA certified CSA 3.16 -125 psi (¼" - 2")
- UL approved (¼" - 2")
- FM approved (½" - 2")
- AB1953, NSF/ANSI 61 & 372 certified

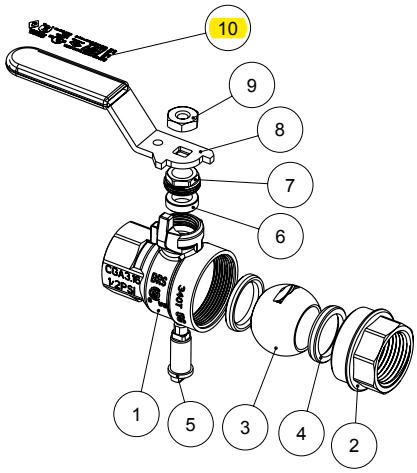
NSF/ANSI 61 & 372

Certified LEAD FREE

- Meet BAA requirement

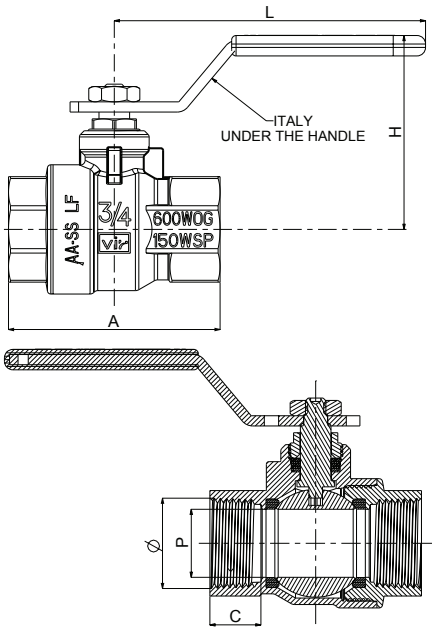
Pressure/ Temperature rating	
600 psi from 15 °F to 160 °F	150 psi max. at 366 °F

Material



	Part	Material	Specification
1	Body	Lead Free Brass	ASTM B927 C28500
2	End piece	Lead Free Brass	ASTM B927 C28500
3	Ball	Lead Free Brass / Cr plated	ASTM B927 C28500
4	Seat	PTFE	PTFE
5	Stem	Lead Free Brass	ASTM B927 C28500
6	Packing	PTFE	PTFE
7	Packing nut	Brass	ASTM B124 C37700
8	Handle	Steel / Geomet® plated	ASTM A36
9	Handle nut	Steel / Zn plated	ASTM A36
10	Valve info	-	-

Dimension, Cv, Weight



Size	Φ	A [in]	C [in]	H [in]	L [in]	P [in]	Cv	Wt. [lb]
¼"	¼ - 18 NPT	1.73	0.45	1.54	3.19	0.39	8	0.30
⅜"	⅜ - 18 NPT	1.73	0.45	1.54	3.19	0.39	8	0.28
½"	½ - 14 NPT	2.13	0.55	2.10	3.60	0.59	15	0.50
¾"	¾ - 14 NPT	2.45	0.59	2.24	3.60	0.79	30	0.72
1"	1 - 11.5 NPT	2.85	0.71	2.57	4.98	0.98	60	1.16
1¼"	1¼ - 11.5 NPT	3.28	0.73	2.78	4.98	1.26	110	1.74
1½"	1½ - 11.5 NPT	3.80	0.77	3.27	5.57	1.57	130	2.64
2"	2 - 11.5 NPT	4.34	0.81	3.56	5.57	1.97	360	3.94
2½"	2½ - 8 NPT	5.91	1.18	4.68	11.07	2.56	450	8.16
3"	3 - 8 NPT	6.82	1.22	5.13	11.07	3.15	620	10.94
4"	4 - 8 NPT	7.56	1.32	5.64	11.07	3.94	1200	16.32

WARNING: This product can expose you to chemicals including lead, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

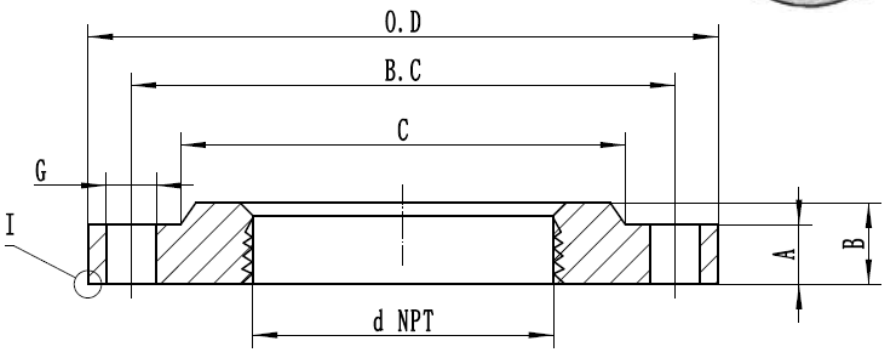
Cast Iron Companion, Reducing & Blind Flanges

Specification Sheet

FEATURES & BENEFITS

- Available in Black and Galvanized
- Cast Iron Conforms to ASTM A126 & ASTM A48
- ANSI Class 125 Flanges
- Meets ASME B16.1 Standard
- Companion Sizes: 1-1/2" - 12"
- Reducing Sizes: 3"x2" - 8"x6"
- Blind Sizes: 2" - 12"

APPLICATIONS: Waterworks, Pump & Well, Plumbing, Irrigation



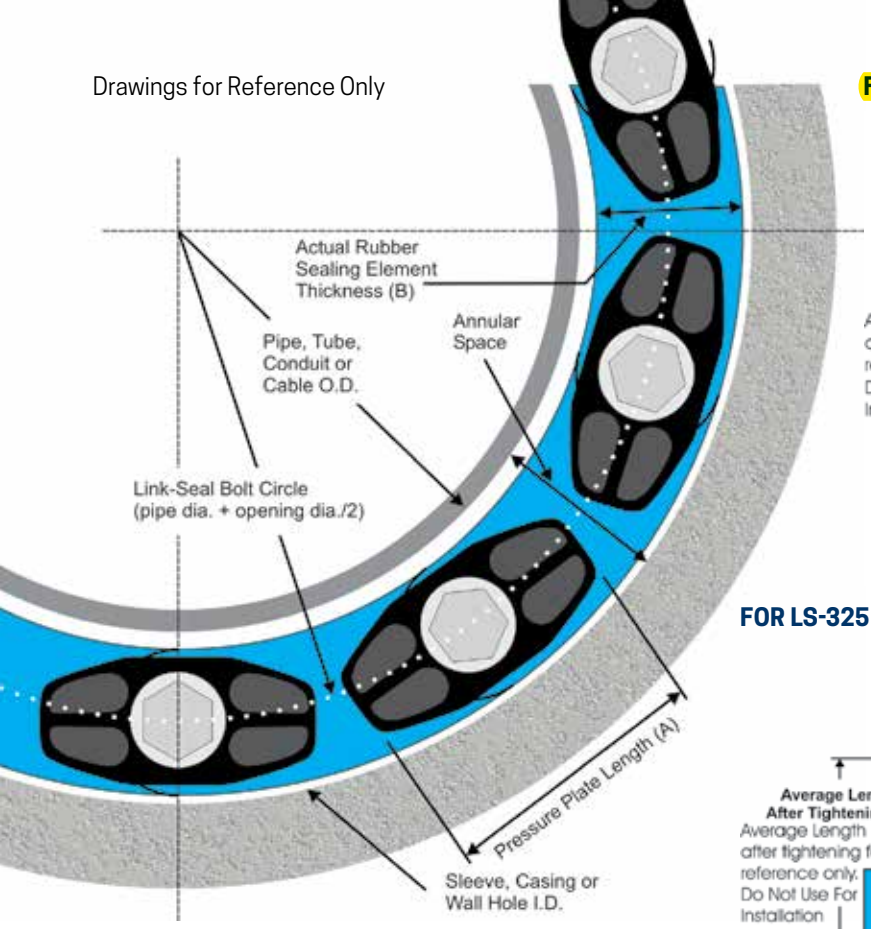
COMPANION FLANGE DIMENSIONS

Size	Size x OD	A min.	B	C	B.C	G	Number of Bolts
1-1/2"	1-1/2"x 5"	0.56	0.9	2.56	3.88	0.62	4
2"	2" x 6"	0.62	1.0	3.06	4.75	0.75	4
2-1/2"	2-1/2" x 7"	0.69	1.1	3.56	5.50	0.75	4
3"	3" x 7-1/2"	0.75	1.2	4.25	6.00	0.75	4
4"	4" x 9"	0.94	1.3	5.31	7.50	0.75	8
5"	5" x 10"	0.94	1.4	6.44	8.50	0.88	8
6"	6" x 11"	1.00	1.6	7.56	9.50	0.88	8
8"	8" x 13-1/2"	1.12	1.8	9.69	11.80	0.88	8
10"	10" x 16"	1.19	1.9	11.90	14.30	1.00	12
12"	12" x 19"	1.25	2.2	14.10	17.00	1.00	12

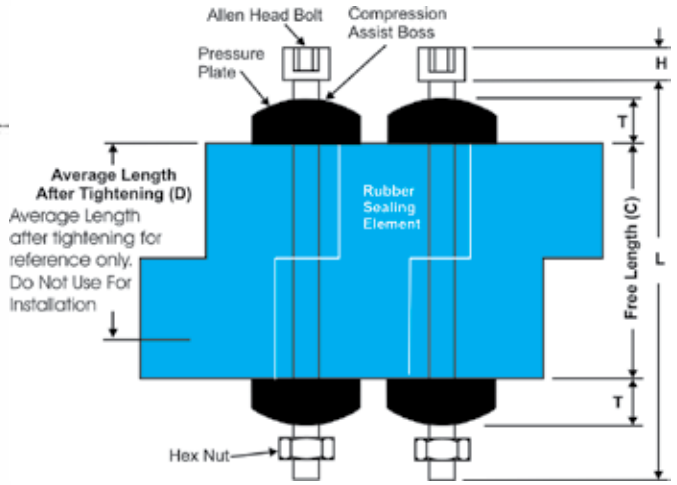
REDUCING FLANGE DIMENSIONS

Size	Size x OD	A min.	B	C	B.C	G	Number of Bolts
3" x 2"	2" x 7-1/2"	0.69	1.00	3.06	6.00	0.75	4
3" x 2-1/2"	2-1/2" x 7-1/2"	0.75	1.10	3.56	6.00	0.75	4
4" x 2"	2" x 9"	0.94	1.10	3.06	7.50	0.75	8
4" x 2-1/2"	2-1/2" x 9"	0.94	1.10	3.56	7.50	0.75	8
4" x 3"	3" x 9"	0.94	1.19	4.25	7.50	0.75	8
5" x 2-1/2"	2-1/2" x 10"	0.94	1.10	3.56	8.50	0.88	8
5" x 4"	4" x 10"	0.94	1.31	5.31	8.50	0.88	8
6" x 2"	2" x 11"	1.00	1.00	3.06	9.50	0.88	8
6" x 2-1/2"	2-1/2" x 11"	1.00	1.10	3.56	9.50	0.88	8
6" x 3"	3" x 11"	1.00	1.19	4.25	9.50	0.88	8
6" x 4"	4" x 11"	1.00	1.31	5.31	9.50	0.88	8
6" x 5"	5" x 11"	1.00	1.44	6.44	9.50	0.88	8
8" x 2"	2" x 13-1/2"	1.12	1.12	3.06	11.75	0.88	8
8" x 2-1/2"	2-1/2" x 13-1/2"	1.12	1.12	3.56	11.75	0.88	8
8" x 3"	3" x 13-1/2"	1.12	1.19	4.25	11.75	0.88	8
8" x 4"	4" x 13-1/2"	1.12	1.31	5.31	11.75	0.88	8
8" x 5"	5" x 13-1/2"	1.12	1.44	6.44	11.75	0.88	8
8" x 6"	6" x 13-1/2"	1.12	1.56	7.56	11.75	0.88	8

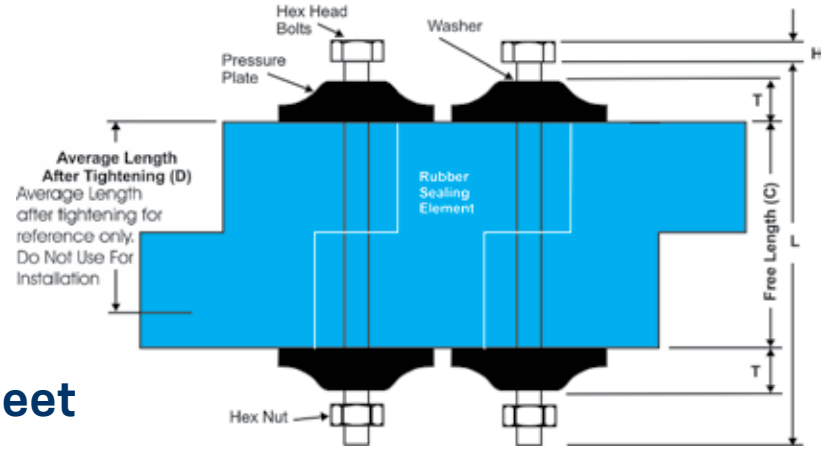
Drawings for Reference Only



FOR LS-200 THROUGH LS-315



FOR LS-325 THROUGH LS-650



Technical Data Submittal Sheet

Supplement 11/06/2018

* DIMENSIONAL DATA FOR MODELS C, L, O, S-316, S61, LS-316 & OS-316

LINK-SEAL® Model No.	Rubber Sealing Elements			Pressure Plates		Bolts				Weight for 10 Link Sections (lbs)	Min. Required Seating Width
	Actual Thinckness (B)	Free Length (C)	Avg. Length After Tighening (D)	(A)	(T)	Allen Head Hex Across Flats	(H)	Thread Size	(L)		
LS-200-*	0.48”	1.75”	1.38”	1.06”	0.31”	4mm Allen (0.157”)	4.95mm (0.195”)	M5-0.8	65mm (2.559”)	0.70	2.25”
LS-275-*	0.61”	1.75”	1.38”	0.97”	0.31”	4mm Allen (0.157”)	4.95mm (0.195”)	M5-0.8	65mm (2.559”)	0.75	2.25”
LS-300-*	0.69”	2.37”	1.87”	1.56”	0.44”	6mm Allen (0.236”)	7.87mm (0.310”)	M8-1.25	90mm (3.543”)	2.15	3.00”
LS-315-*	0.81”	2.37”	1.87”	1.44”	0.44”	6mm Allen (0.236”)	7.87mm (0.310”)	M8-1.25	90mm (3.543”)	2.30	3.00”
LS-325-*	0.88”	2.63”	2.00”	3.13”	1.00”	13mm (0.511”)	5.30mm (0.215”)	M8-1.25	110mm (4.33”)	5.50	4.00”
LS-340-*	1.00”	2.70”	2.25”	1.48”	0.66”	13mm (0.511”)	5.30mm (0.215”)	M8-1.25	110mm (4.33”)	3.30	4.00”
LS-360-*	1.24”	2.70”	2.25”	2.05”	0.77”	13mm (0.511”)	5.30mm (0.215”)	M8-1.25	110mm (4.33”)	5.10	4.00”
LS-400-*	1.38”	3.50”	2.75”	3.50”	1.06”	17mm (0.669”)	6.40mm (0.250”)	M10-1.5	130mm (5.118”)	12.00	5.00”
LS-410-*	1.43”	3.37”	2.87”	2.52”	0.88”	17mm (0.669”)	6.40mm (0.250”)	M10-1.5	130mm (5.118”)	8.20	5.00”
LS-425-*	1.06”	3.00”	2.25”	3.50”	1.19”	17mm (0.669”)	6.40mm (0.250”)	M10-1.5	130mm (5.118”)	10.00	5.00”
LS-475-*	1.56”	3.38”	2.63”	2.63”	0.88”	17mm (0.669”)	6.40mm (0.250”)	M10-1.5	130mm (5.118”)	10.00	5.00”
LS-500-*	2.25”	3.75”	2.75”	3.63”	1.06”	19mm (0.748”)	7.50mm (0.300”)	M12-1.75	140mm (5.511”)	22.50	5.00”
LS-525-*	2.06”	3.75”	2.87”	3.63”	1.06”	19mm (0.748”)	7.50mm (0.300”)	M12-1.75	140mm (5.511”)	21.00	5.00”
LS-575-*	1.81”	3.75”	3.00”	3.00”	1.00”	19mm (0.748”)	7.50mm (0.300”)	M12-1.75	140mm (5.511”)	15.50	5.00”
LS-615-*	3.09”	4.00”	3.00”	6.00”	1.90”	24mm (0.944”)	10.57mm (0.416”)	5/8-11	185mm (7.280”)	60.60	6.00”
LS-650-*	2.71”	3.98”	3.00”	3.96”	1.19”	19mm (0.748”)	7.50mm (0.300”)	M12-1.75	140mm (5.511”)	26.10	6.00”

Visit www.gptindustries.com for literature and installation instructions

GPT™
an EnPro Industries company

LINK-SEAL® Modular Seal Model Properties

WITH EPDM SEAL ELEMENTS
EPDM (Black & Blue)

*Sustained operation near temperature limits may affect life expectancy.

Model "C" LINK-SEAL® Modular Seal
Suitable for direct ground burial, normal atmospheric conditions, and conditions with occasional or periodic water contact. Provides electrical isolation where cathodic protection is required.
Type: Standard
Seal Element: EPDM (Black) or EPDM (Blue)
Pressure Plates: Reinforced Nylon Polymer
Bolts & Nuts: Steel with 2-part Zinc Dichromate & proprietary corrosion inhibiting coating.
Temp. Range: -40˚ to 250˚F (-40˚ to 121˚C)*

Model "S-316" LINK-SEAL® Modular Seal
For chemical processing & waste water treatment. High level of water-resistance, resistant to most inorganic acids and alkalis, and most organic chemicals (acetone, alcohol, ketones).
Type: Stainless
Seal Element: EPDM (Black) or EPDM (Blue)
Pressure Plates: Reinforced Nylon Polymer
Bolts & Nuts: 316 Stainless Steel
Temp. Range: -40˚ to 250˚F (-40˚ to 121˚C)*

WITH NITRILE SEAL ELEMENTS
Nitrile (Green)

*Sustained operation near temperature limits may affect life expectancy.

Model "O" LINK-SEAL® Modular Seal
Nitrile rubber is resistant to oils, fuel and many solvents (gasoline, motor oil, kerosene, methane, jet fuel, hydraulic fluid, water, etc.)
Type: Oil Resistant
Seal Element: Nitrile (Green)
NOTE: Not U.V. Resistant
Pressure Plates: Reinforced Nylon Polymer
Bolts & Nuts: Steel with 2-part Zinc Dichromate & proprietary corrosion inhibiting coating
Temp. Range: -40˚ to 210˚F (-40˚ to 99˚C)*

Model "OS-316" LINK-SEAL® Modular Seal
Combination of oil resistant rubber and stainless steel hardware
Type: Oil Resistant
Seal Element: Nitrile (Green)
NOTE: Not U.V. Resistant
Pressure Plates: Reinforced Nylon Polymer
Bolts & Nuts: 316 Stainless Steel
Temp. Range: -40˚ to 210˚F (-40˚ to 99˚C)*

WITH SILICONE SEAL ELEMENTS
Silicone (Grey)

Sustained operation near temperature limits may affect life expectancy.

Model "T" LINK-SEAL® Modular Seal
Silicone rubber is ideal for temperature extremes. The "T" model is one-hour Factory Mutual approved.
Type: High/Low Temperature
Seal Element: Silicone (Grey)
Pressure Plates: Steel Zinc Dichromate
Bolts: Steel with 2-part Zinc Dichromate & proprietary corrosion inhibiting coating.
Temp. Range: -67˚ to 400˚F (-55˚ to 204˚C)*

Models "FD/FS" LINK-SEAL® Modular Seal
Double seal for added protection
Type: Fire Seals
Seal Element: Silicone (Grey)
Pressure Plates: Steel zinc dichromate
Bolts: Steel with 2-part Zinc Dichromate & proprietary corrosion inhibiting coating.
Temp. Range: -67˚ to 400˚F (-55˚ to 204˚C)*

NOTE: Sustains a constant temp. of 325°F (163°C)

MATERIAL PROPERTIES OF LINK-SEAL® MODULAR SEAL ELEMENTS

Property	ASTM Method	EPDM (EPDM L)	Nitrile	Silicone
Hardness (shore A)	D-2240	50 ±5 (40 ±5)	50 ±5	50 ±5
Tensile	D-412	1450 psi	1300 psi	860 psi
Elongation	D-412	400%	300%	250%
Compression Set	S-395	15% 22 hrs. @ 158° F (70° C)	45% 22 hrs. @ 212° F (100° C)	40% 22 hrs. @ 350° F (177° C)
Specific Gravity	D-297	1.10	1.15	1.40

BOLT & NUT SPECIFICATION

Carbon Steel
Carbon steel, zinc dichromated per ASTM B633, with an additional corrosion inhibiting proprietary organic coating. (passes 1470 hour salt spray test)
Tensile Strength = 60,000 psi, minimum.

Stainless Steel
ANSI Type = 316, Per ASTM F593-95
Tensile Strength = 85,000 psi, average

MATERIAL PROPERTIES OF COMPOSITE PRESSURE PLATES

Property	ASTM Method	Value
Izod Impact - Notched	D-256	1.11 ft-lb/in
Tensile Strength @ Yield	D-638	20,000 psi
Tensile Strength - Break	D-638	20,250 psi
Flexural Strength @ Yield	D-790	30,750 psi
Flexural Modulus	D-790	1,124,000 psi
Elongation, Break	D-638	11.07%
Specific Gravity	D-792	1.38
Moisture Content	--	0.18%

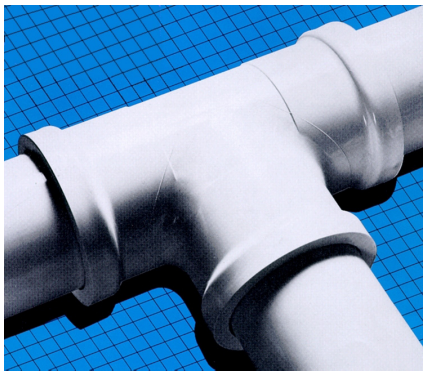
GPT
an EnPro Industries company
www.gptindustries.com

4990 Iris Street
Wheat Ridge, CO 80033
Tel: (303) 988-1242
Fax: (303) 988-1922

6455 Clara Road, Suite 300
Houston, TX 77041
Tel: (713) 747-6948
Fax: (713) 747-6029

HARCO FITTINGS

PRODUCT SHEET



PVC FITTINGS FOR IPS PIPE

IPS PVC PRESSURE

1 1/2" Thru 8" Sizes

Engineered for Durability

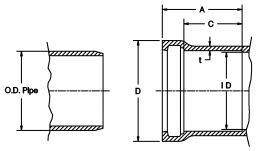
HARCO Class 200 PVC Fittings

HARCO Class 200 Pressure Pipe Fittings will fit all IPS Pipe (Iron Pipe Size). IPS Pipe is available in SDR 21, Class 200; SDR 26, Class 160; Schedule 40 and Schedule 80. HARCO offers a wide selection of sizes 1 1/2" thru 8", and a full complement of reducers, reducing tees, and adapters. HARCO's large inventory assures you of fast and complete orders.

SUGGESTED SPECIFICATION

All fittings for Iron Pipe Size pipe shall be manufactured in one piece of injection molded PVC compound meeting ASTM D1784. Fittings shall be Class 200 and conform to requirements of DR 21. Fittings shall be designed to withstand a minimum of 630 psi quick burst pressure at 73 degrees F., tested in accordance with ASTM D1599. Bell shall be gasketed joint conforming to ASTM D3139 with gaskets conforming to ASTM F477. Push Joint Ductile Iron fittings shall be allowed as alternative when PVC sizes are not available.

STANDARD JOINT DIMENSIONS - IN INCHES



NOMINAL DIAMETER	O. D. PIPE	A	C	D	T	ID
1 1/2	1.900	3.168	2.418	1.938	0.107	1.720
2	2.375	3.273	2.523	2.413	0.133	2.149
2 1/2	2.875	3.383	2.633	2.913	0.158	2.601
3	3.500	3.520	2.770	3.538	0.191	3.166
4	4.500	4.103	2.990	4.558	0.246	4.072
6	6.625	4.571	3.458	6.683	0.358	5.993
8	8.625	5.161	3.898	8.708	9.463	7.805

High Strength

Easy Installation

All PVC System

High Flow Capacity

THE HARRINGTON CORPORATION
P.O. Box 10335 ◆ Lynchburg, VA 24506-0335
Phone: (434) 845-7094 Fax: (434) 845-8562
sales@harcofittings.com
www.harcofittings.com

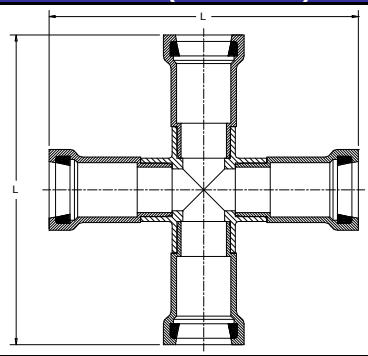
HARCO PVC IPS GASKETED FITTINGS

DESIGN DATA

Applicable Standards:

Materials:	ASTM D-1784, PVC
Joints:	ASTM D-3139, 200 psi
Gaskets:	ASTM F-477, SBR
Wall Thickness:	SDR-21
NSF 14/61 Certification	

CROSS (GxGxGxG)



SIZE	PART #	STYLE	L	WT (approx.)
1½	172-015	Fab	11.6	1.7
2	172-020	Fab	12.1	3.4
2½	172-025	Fab	14.3	4.4
3	172-030	Fab	15.1	5.3
4	172-040	Fab	17.9	9.0

NOTES:

- All lay lengths & weights are approximate and are subject to change without notice
- Fabricated fitting configurations may vary

STYLE LEGEND:

M - One piece molded

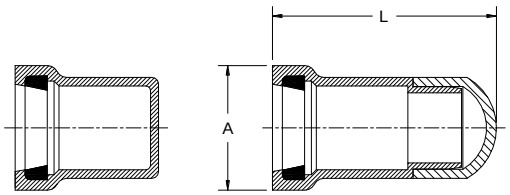
Fab - Fabricated using SCH-40 PVC fittings with Harco Spigot adapters (or pipe) solvent welded together (See pressure rating warning on this page)

Fab Style: These fittings use SCH-40 PVC fittings. SCH-40 PVC fittings do not have a long term pressure rating. See section 6.3.2 of ASTM D2466-97. Use of these fittings in pressure systems is at user's risk.

The use of anything but properly designed and installed thrust blocks will reduce the life of plastic fittings. Thrust blocks must be poured concrete only and sized for the soil conditions. Joint restraint products are available.

WARNING: Cyclical pressure surges (WATER HAMMER) can reduce the life of PVC fittings. Where such conditions may exist, HARCO DEEP BELL DUCTILE IRON FITTINGS for IPS size PVC pipe should be considered. HARCO DEEP BELL DUCTILE IRON FITTINGS are available in sizes 1½" through 12".

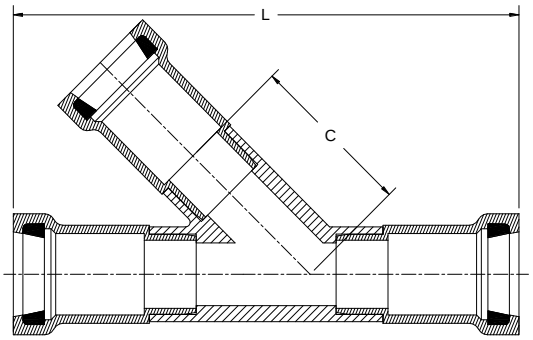
CAP (Gasket)



Poured concrete thrust blocks only.

SIZE	PART #	STYLE	A	L	WT (approx.)
1½	149-015	Fab	2.8	5.3	0.5
2	149-020	M	3.3	3.7	0.5
2½	149-025	Fab	3.8	6.4	1.0
3	149-030	Fab	4.5	6.7	1.4
4	149-040	Fab	5.9	7.6	2.7
5	149-050	Fab	7.0	10.0	4.4
6	149-060	Fab	8.5	9.8	6.9

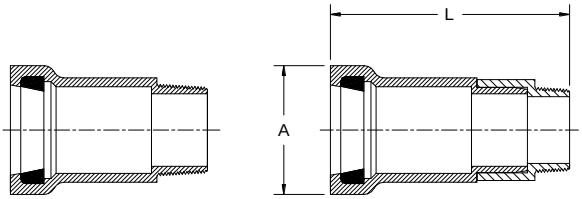
NON-PRESSURE WYE (GxGxG)



SIZE	PART #	STYLE	C	L	WT (appox.)
3 x 3	101-0303	Fab	6.8	10.1	5.0
4 x 4	101-0404	Fab	8.4	12.3	10.0

GASKET x MALE NPT ADAPTER

Do not use joint restraint.



Size on size and reducing sizes of these adapters also available in HARCO Ductile Iron.

SIZE	PART #	STYLE	A	L	WT (approx.)
1½	131-015	M	2.8	4.3	0.5
2	131-020	M	3.3	4.6	0.5
2½	131-025	M	3.8	4.8	1.2
3	131-030	M	4.5	5.0	1.5
4	131-040	Fab	5.9	8.5	2.8
5	131-050	M			3.0
6	131-060	Fab	8.3	10.9	10.3

Call For Other Sizes, Configurations & Gasket Materials

THE HARRINGTON CORPORATION

P.O. BOX 10335 • LYNCHBURG, VIRGINIA 24506 • 3721 COHEN PLACE • LYNCHBURG, VIRGINIA 24501

PHONE: (434) 845-7094 • FAX: (434) 845-8562 • E-MAIL: sales@harcofittings.com • WEB: www.harcofittings.com

20201124

NORTHTOWN

Pipe Protection Products

Product Data Sheet

HYTECH PVC TAPE WRAP

Description

HYTECH PVC tape wrapping is made of a tough, flexible "all weather" polyvinyl film backing over an adhesive layer. The tape is marked with PVC PIPE WRAPPING TAPE, the UPC symbol and the appropriate Mil thickness designation. The PVC tape wrap is moisture resistant, anticorrosive and exhibits outstanding conformability and adhesion to metal and plastic.

HYTECH pipe wrap tape also assists in:

- **Corrosion protection for metal piping systems below and above ground.**
- **Corrosion protection for fittings and joints on pipe.**
- **Resisting corrosive action by soil acids, salt water, salts and alkalies.**
- **Helping prevent dielectric corrosion between buried pipe and soil minerals.**

Technical Data

Properties	10 MIL	20 MIL
Color	Black	Black
Thickness	.010" (0.263 mm)	.020" (0.513 mm)
Elongation	245%	245%
Tensile Strength	30 psi	60 psi
Available Widths	1", 2", 4" and 6"	1", 2", 4" and 6"

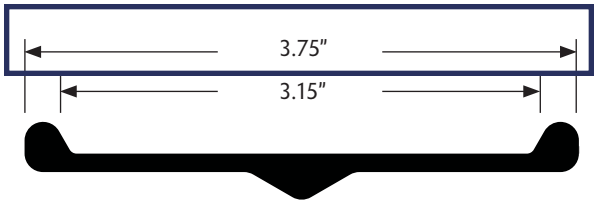
800-WRAP-A-PIPE

P.O. Box 2064 Huntington Beach CA 92647

714-897-0700 FAX 714-897-0606

CRM

High Performance Utility Marker™



Impact resistant, three-rail marker

The Utility Marker, with its three-rail design, was the first fiberglass composite utility marker in the industry and remains the most widely used fiberglass marker on the market. Two ribs on the side protect decals from vehicle impacts while the back rib adds strength for driving into hard soil conditions.

How to Order:

Color (See chart below)

CRM3 – **072** – **01**

Product number

Length (in.) See chart for availability by color.

Other lengths and colors are available. Contact your representative.

Post color	Standard Lengths (in.)
01–White	*60, 62, 66, 72, 84*
02–Yellow	*60, 62, 66, 72*
03–Brown	*72*
04–Orange	*60, 62, 66, 72*
05–Red	*60, 62, 66*
07–Green	*72*
08–Blue	*66*

Material:	Fiberglass Composite, high-performance construction
Options and Accessories:	Reflective sheeting
	Stock or custom decals
	Direct Graphics
	Visibility Enhancer
	Anchor Barb
Installation tools:	Post Driver (PDR, PDRL)
	Post Puller
	Pilot Hole Driver

Carsonite High Performance RoadMarkers are designed to stand up to nature as well as vehicular impacts, controlled ditch burns, and even small arms gunfire.

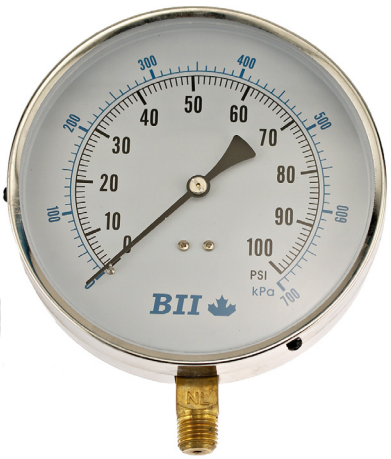
4-1/2" DIAL CONTRACTOR GAUGE LOWER MOUNT

APPLICATION:
General purpose gauge, for potable water pumps & systems, these gauges are suitable for compressors, hydraulic presses, machinery, pneumatic equipment and motors, for most commercial air, water and steam services. To be used with fluid medium which does not clog connection or corrode copper alloy.
Not for use with oxygen, natural gas or propane.

NO LEAD <0.25% Pb by weighted avg.

Third Party Certified to NSF / ANSI 372

CERTIFICATION:
- NSF/ANSI Standard 372 Certified (No Lead Series Only)



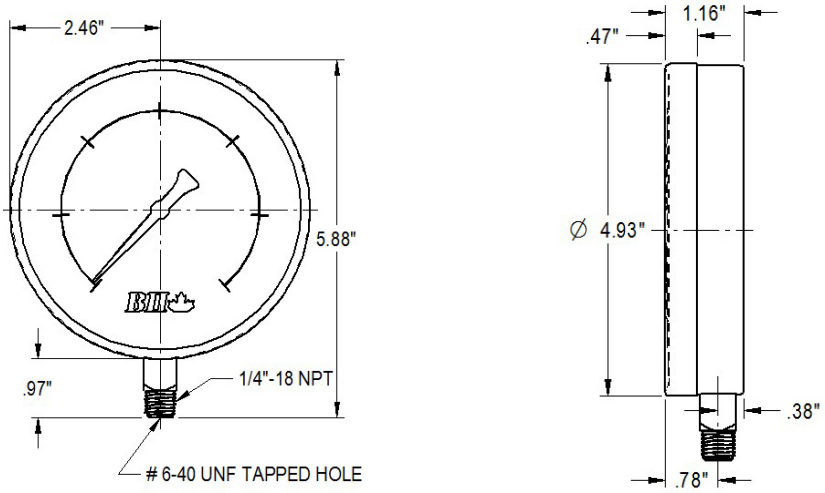
GAUGE SPECIFICATIONS	
Standard	ASME B40.1
Dial	4-1/2" (114mm) white aluminum dial
Case	304 Stainless Steel
Lens	Acrylic
Ring (Bezel)	304 Stainless Steel
Connection	Brass / No Lead Brass
Bourdon Tube	Brass
Fill Liquid	N/A
Movement	Brass / No Lead Brass
Pointer	Aluminum (Anodized Black)
Welding	Tin Solder
Working Pressure	Maximum 75% of Full Scale Value (F.S.V.)
Ambient Op. Temp.	-40°F to 140°F (-40°C to 60°C)
Media Op. Temp.	Max. 140°F (60°C)
Accuracy	+/- 1% Full Scale Value
Enclosure Rating	General Purpose
15 - 600 PSI	Tapped but restrictor screw not included

BOSHART INDUSTRIES

25 Whaley Avenue, PO Box 310, Milverton, ON CANADA N0K 1M0
Tel: 800-561-3164

boshart.com • blog.boshart.com

4-1/2" DIAL CONTRACTOR GAUGE LOWER MOUNT



DIMENSIONS					
Part No.	No Lead Part No.	Connection	Range PSI	Increments	Weight grams
N/A	PG45-15NL	1/4" MPT	0-15	0.2	300
N/A	PG45-30NL	1/4" MPT	0-30	0.5	300
N/A	PG45-60NL	1/4" MPT	0-60	1	300
N/A	PG45-100NL	1/4" MPT	0-100	1	300
N/A	PG45-160NL	1/4" MPT	0-160	2	300
N/A	PG45-200NL	1/4" MPT	0-200	2	300
N/A	PG45-300NL	1/4" MPT	0-300	5	300
N/A	PG45-400NL	1/4" MPT	0-400	5	300
N/A	PG45-600NL	1/4" MPT	0-600	10	300
VACUUM GAUGE					
PGV45-30	N/A	1/4" MPT	30-0Hg	0.5	300
COMBINATION VACUUM / PRESSURE GAUGE					
PGC45-30-30	N/A	1/4" MPT	30Hg-0-30	0.5	300

BOSHART INDUSTRIES

25 Whaley Avenue, PO Box 310, Milverton, ON CANADA N0K 1M0
Tel: 800-561-3164

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