



construction managers

general contractors

design builders

**SUBMITTAL REVIEW**  
**Project # 417 The Residences at Echelon**

**Date:** September 11 2017

**Submittal Number:** 33-1000-02-a  
Sanitary and Water Piping and Accessories

**Sequence Number:** 10

**Subcontractor:** Kat Excavation  
Bart Fisher

**Submit To:** NSPJ Architects  
Tim Hauschild  
Clint Evans

SUBMITTAL FOR APPROVAL	
Job Name/No: 417 The Residences at Echelon	
<input checked="" type="checkbox"/> REVIEWED	<input type="checkbox"/> REVISE & RESUBMIT
<input type="checkbox"/> REVIEWED& NOTED	<input type="checkbox"/> REJECTED
Submittal received for general compliance with the Contract Documents. Contractor's review does not relieve sub/vendor of responsibility for dimension, quantities, accuracy or completion of submittals or from any responsibilities required by terms and conditions of Subcontract/PO with Luke Draily Construction Co., Inc.. Sub/Vendors shall follow all manufacturer installation instructions. Installing contractor shall be responsible to coordinate with trades for hookup, supports, routing, etc.	
By: JDW	Date:

Engineering Solutions	Shop Drawing Review
Project: Echelon	Date: 9/12/17
Submittal #: San 3 H2O	By: MJS
<input checked="" type="checkbox"/> APPROVED	<input type="checkbox"/> REJECTED
<input type="checkbox"/> APPROVED AS NOTED	

# BLUE SPRINGS WINWATER

TM

## Submittal

Customer: Kat Excavating

Job: The Residences at Echelon - LSMO

Location: Lees Summit, MO

Date: 6/13/17

Pipelife: Sdr 26 and C900 DR 18.

Copperhead: Tracer wire.

Plastic Trends: Sdr 26 fittings.

Fernco: Couplings.

Tyler Union: FBE fittings and tuf grips, Flange fittings

AA Thread: poly wrap and poly tape.

Clow Valve: MJ valves, Flange valve, OSY Valve

Sigma: Detectable tape and castings.

Kennedy: Hydrant.

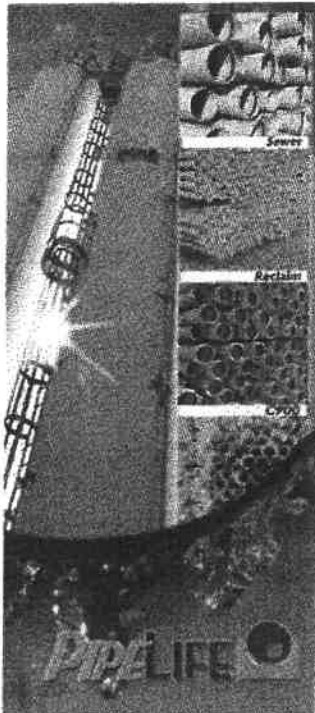
Foundry: Flange pipe.

Cambridge: Copper pipe

AY Mcdonald: Brass fittings



## Sewer



PipeLife Jetstream manufactures sewer pipe from 4" to 18" in both bell end and gasketed products. Our pipes are manufactured under ASTM D-3034 and ASTM D-2729 Standards. PipeLife Jetstream Sewer pipe is available in 14ft and 20ft lengths.

The primary purpose of PipeLife Jetstream IPS is for the conveyance of sewage from the building and for the collection and transmission to treatment source.

PipeLife Jetstream uses compound according to Class 12454-B as prescribed in ASTM-1784. All sewer pipe shall meet the requirements of ASTM D-3034 for sizes 4" - 15" and ASTM F-679 for 18" pipe. Integral gasket joints are manufactured according to ASTM F477 and ASTM D3139. To aid in the installation of PipeLife Jetstream's IPS, each spigot end is beveled and includes a depth mark for insertion guidance.

### SDR 35

Nominal Size	O.D.	I.D.	Wall Thickness	WT. Per FT.
4	4.215	4.095	.120	.986
6	6.275	6.095	.180	2.27
8	8.400	8.16	.240	4.08
10	10.500	10.200	.300	6.35
12	12.500	12.140	.360	9.11
15	15.300	14.863	.437	13.78

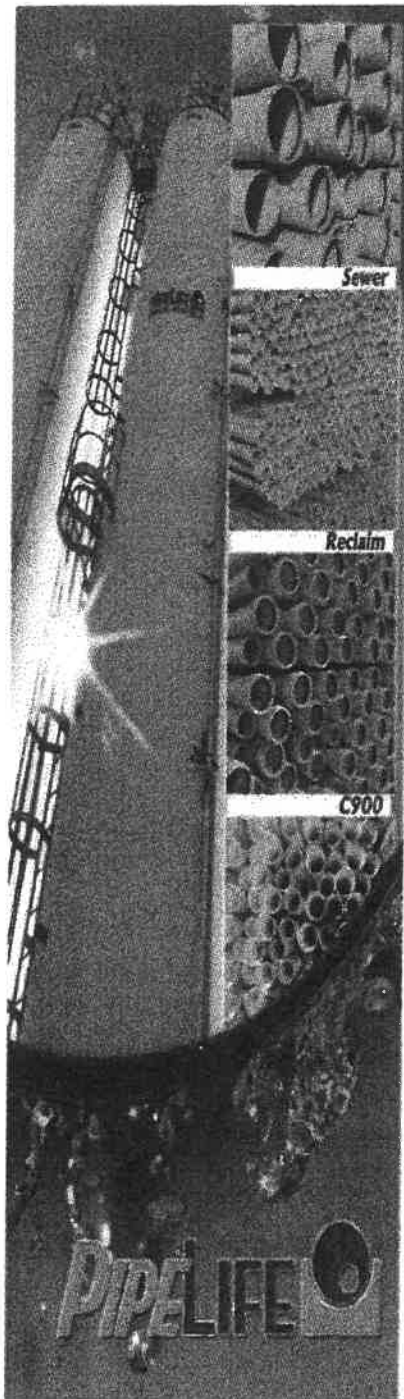
Nominal Size	O.D.	I.D.	Wall Thickness	WT. Per FT.
4	4.215	4.053	.162	1.435
6	6.275	6.034	.241	3.157
8	8.400	8.077	.323	5.664
10	10.500	10.096	.404	8.873
12	12.500	12.019	.481	12.612
15	15.300	14.712	.588	18.962

### F-679

18	18.701	18.165	0.536	20.78
----	--------	--------	-------	-------



## C900



PipeLife Jetstream manufactures AWWA C900 product family which includes 4" to 12" C.I OD pipes. AWWA C900 standards include all specifications relating to the production and testing of C900 pipes. In three pressure ratings of DR25, DR 18 and DR 14.

Our C900 is suitable for the transmission and distribution of water. PipeLife Jetstream carries various certifications from NSF International (NSF), Underwriters Laboratories (UL) and Factory Mutual (FM).

PipeLife Jetstream uses compound according to ASTM D1784—12454 as well as integral gasket joints according to ASTM F477 and ASTM D3139. To aid in the installation of PipeLife Jetstream's C900, each spigot end is beveled and includes a depth mark for insertion guidance.

**DR 14 Pressure Ratings are: UL 305 and FM 200 PSI both at 73.4 degrees**

Size	Outside Diameter	Minimum Wall Thickness	Weight LBS/Foot	Pieces per Pallet	Order Units	*Optional Colors
4	4.80	0.343	3.22	36	2.4	Yes
6	6.90	0.493	6.70	18	3	Yes
8	9.05	0.646	11.55	10	2.4	Yes
10	11.10	0.793	17.46	4	2	Yes
12	13.20	0.943	24.75	4/3	4	Yes

**12454 (Type 1, Grade 1, PVC 1120) Material**

**DR 18 Pressure Ratings are: UL 235 PSI and FM 150 PSI both at 73.4 degrees**

Size	Outside Diameter	Minimum Wall Thickness	Weight LBS/Foot	Pieces per Pallet	Order Units	*Optional Colors
4	4.800	0.267	2.55	36	2.4	Yes
6	6.900	0.383	5.29	18	3	Yes
8	9.050	0.503	9.15	10	2.4	Yes
10	11.100	0.617	13.82	4	2	Yes
12	13.200	0.733	19.56	4/3	4	Yes

**DR 25 Pressure Ratings are: UL 165 PSI**

Size	Outside Diameter	Minimum Wall Thickness	Weight LBS/Foot	Pieces per Pallet	Order Units	*Optional Colors
4	4.800	0.192	1.87	36	2.4	Yes
6	6.900	0.276	3.90	18	3	Yes
8	9.050	0.362	6.69	10	2.4	Yes
10	11.100	0.444	10.16	4	2	Yes
12	13.200	0.528	14.43	4	4	Yes



**Copperhead High Strength Tracer Wire**

**Part# (1230\*-HS-\*\*)**

**\*= Color- ~~B=Blue~~ Green, Y=Yellow, P=Purple, R=Red,**

**B=Black, N=Orange**

**\*\*=Spool Size- 500', 1000', 2500'**

Tracer wire shall be a #12 AWG HS-CCS high-strength copper clad steel conductor (HS-CCS), insulated with a 30 mil, high-density, high molecular weight polyethylene (HDPE) insulation, and rated for direct burial use at 30 volts. HS-CCS conductor must be a 21% conductivity for locating purposes, Break load 380# minimum. HDPE insulation shall be RoHS compliant and utilize virgin grade material. Insulation color shall meet the APWA color code standard for identification of buried utilities. Tracer wire shall be Copperhead™ HS-CCS HDPE 30 mil insulation or pre-approved equal and made in the USA.

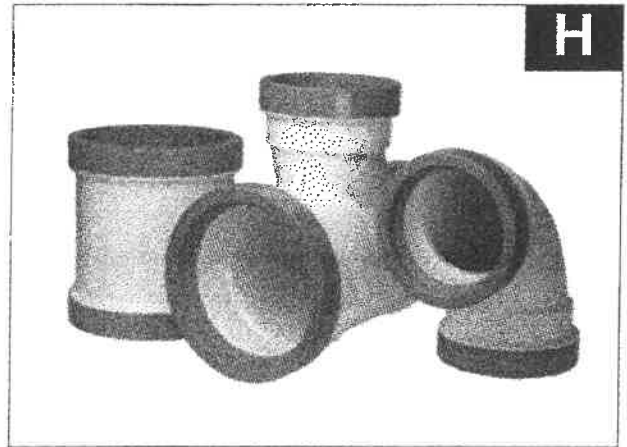
**PO Box 1081 Monticello, MN 55362 Ph 877-726-5644 Fax 763-271-3694**

**[www.copperheadwire.com](http://www.copperheadwire.com)**

## Heavy Wall Gasketed Sewer Fittings

Injection Molded in Sizes 4" - 36"

Fabricated in Sizes 15" - 36"



With a 34.5% thicker wall than SDR 35 and high impact retention ring, Royal Building Product's PVC Heavy Wall Gasketed Sewer fittings are manufactured to last. The distinctive green gasket is also heavy duty and engineered to make assembly fast and easy. Just push the pipe in until it hits the square stop for a solid, positive seal.

SDR 26 Heavy Wall Gasketed Sewer fittings also feature distinctive green high impact gasket retention rings for easy identification in the field. The deep lead into the gasket reduces the possibility of gasket damage or rolling. In addition, the shock absorbing ring inhibits fittings from breaking under impact.

### Applications

Heavy Wall Gasketed Sewer fittings can be used where extra heavy (SDR 26) is specified by your local jurisdiction. SDR 26 fittings are intended for non-pressure drainage of sewage and surface water.

### Certifications

Heavy Wall Gasketed Sewer fittings are third party tested and listed by NSF to meet specifications defined in ASTM D3034 and F1336 and CSA to meet specifications defined in CSA B182.2, where applicable.

### Product Spotlights

#### Vertical Riser Adapter (H984, H986, H988)

This simple solution in conjunction with the unique integral flange, inhibits system failure due to pipe spearing beyond the pipe stop. Refer to page H11 for pricing and available configurations.

Third Party Tested



### Short Specs

Heavy Wall Gasketed Sewer Fittings SDR 26 (4" - 36")

4" through 36" gasketed SDR 26 sewer fittings shall be manufactured in accordance with ASTM D3034 and F1336. Fitting gaskets shall comply with ASTM F477 or ASTM F913. Fitting gaskets shall be locked firmly in position to prevent displacement. 4" through 12" SDR 26 fittings shall have green color coded gasket retaining collars for easy identification. 4" through 8" fittings shall be injection molded from virgin PVC compound having a minimum cell classification of 12454 or 13343 in accordance with, and certified by the National Sanitation Foundation (NSF), to meet ASTM D1784. Gasketed SDR 26 sewer fittings may be injection molded or fabricated from pipe meeting the requirements of ASTM D3034. Gasket joints of all fitting sizes must comply with ASTM D3212 Internal Pressure Test (exfiltration) and Vacuum Test (infiltration) at 5 degrees of gasket joint deflection. Injection Molded Gasketed SDR 26 sewer fittings shall be certified by the National Sanitation Foundation (NSF) to meet ASTM D3034 & ASTM F1336 and certified at 200 psi internal pressure.

Where available, reducing branches on injection molded 8", 10", and 12" tees, wyes, and tee-yses shall be minimum DR18 wall thickness in the reducing branch body and reducing branch hub area below the gasket race.

**ATTENTION:** Royal Building Products fittings are not to be used with compressed air or gases. Royal does not recommend that piping systems that include its products be tested with compressed air or gases.

Royal Building Products  
(formerly Plastic Trends)

56400 Mound Road  
Shelby Twp., MI 48316

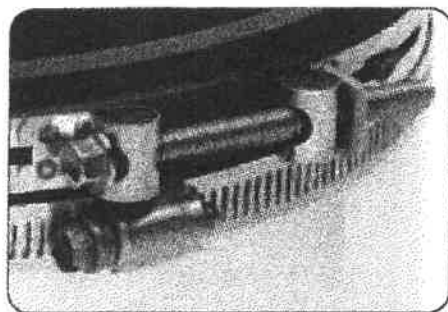
586.781.2700 • 800.232.5690

Fax: 586.781.0888

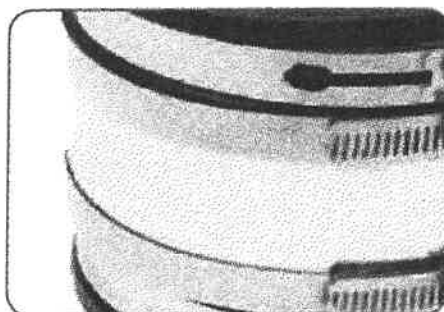
[www.royalbuildingproducts.com](http://www.royalbuildingproducts.com)

# 5000 Series Repair Couplings

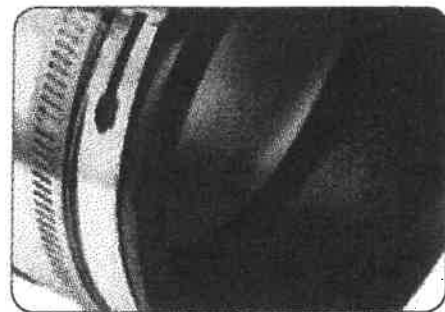
**The Ultimate Nut & Bolt RC - Engineered for resistance to heavy earth loads and shear forces, while providing improved pipe alignment.**



**316 S.S. Nut and Bolt Clamps**



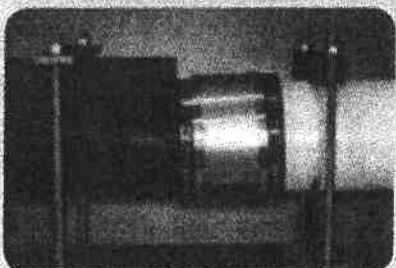
**.012" (12mil) Stainless Steel Shield**



**One Piece Molded-in Bushing Gaskets**



Shear Resistance Test using an unshielded sewer coupling per ASTM C 1173 (applied load 50 pounds per nominal inch of pipe diameter)



Shear Resistance Test using a Fernco 5000 Series Repair Coupling per ASTM C 1173 (applied load 50 pounds per nominal inch of pipe diameter)

## Meets requirements of:

- **ASTM C 1173** - Standard Specification for Flexible Transition Couplings for Underground Piping Systems
- **ASTM D 5926** - Standard Specification for Poly Vinyl Chloride (PVC) Gaskets for Drain, Waste, and Vent (DWV), Sewer, Sanitary, and Storm Plumbing Systems
- **CSA B602** - mechanical couplings for drain, waste, vent pipe and sewer pipe

**Ultimate Shear Resistance** - .012" (12mil) 300 series stainless steel shear ring is the heaviest the industry offers with excellent resistance to corrosion.

**Ultimate Pipe Alignment** - Due to the thickness and strength of the 5000 Series shear ring, you are assured consistent pipe alignment against shear forces from soil compaction, shifting and settling, and improper backfill.

**Ultimate Sealing Clamps** - 316 series stainless steel nut and bolt clamps provide the strongest seal and the greatest corrosion resistance possible.

**Ultimate Sealing Gasket** - Designed for same pipe size and material connections as well as differing pipe size and pipe material connections. The 5000 Series gasket has a smooth inside surface providing greater sealing performance than ribbed surfaces. The smooth internal wall of the gasket makes contact 360° over its entire length. This equates to a larger sealing surface and a higher coefficient of friction, providing maximum sealing capabilities as well as preventing slippage under the weight of shear forces. The gaskets have excellent resistance to sewer gas, common household chemicals found in the sewer system, as well as dry rot, fungus growth, ozone and UV. When properly installed Strong Back RC series gaskets will provide decades of problem free service.

**Ultimate Transition Connections** - For the transition connection of differing pipe sizes or materials, the 5000 Series gasket features a one piece molded-in bushing.

**Ultimate Versatility** - The 5000 Series offers the ability to connect clay, concrete, asbestos cement fibre, ductile iron, cast iron, steel, plastic and copper.



United States  
PH: 810-653-9626  
FX: 810-653-8714

[www.fernco.com](http://www.fernco.com)

Canada  
PH: 519-332-6711  
FX: 519-332-8610 MF0310



### 5001 RC Series - Clay to Clay

Fernco Part No.	Mission Part No.	A		B		C	
		in.	mm	in.	mm	in.	mm
5001-44RC	MR01 44 ARC	5.29	134	5.29	134	4.10	104
5001-44WCRC	MR01 44 ARC	5.51	140	5.51	140	3.97	101
5001-64RC	N/A	7.50	191	5.50	140	6.02	153
5001-66RC	MR01 66 ARC	7.50	191	7.50	191	6.02	153
5001-66WCRC	MR01 66 ARC	8.01	203	8.01	203	6.00	152
5001-88RC	MR01 88 ARC	9.65	245	9.65	245	5.99	152
5001-88WCRC	MR01 88 ARC	10.00	254	10.00	254	6.00	152
5001-1010RC	MR01 1010 ARC	12.40	315	12.40	315	5.90	150
5001-1010WCRC	MR01 1010 ARC	12.40	315	12.40	315	5.90	150
5001-1212RC	MR01 1212 ARC	14.51	369	14.51	369	6.38	162
5001-1515RC	MR01 1515 ARC	18.14	461	18.14	461	9.89	251
5001-1818RC	MR01 1818 ARC	21.90	556	21.90	556	9.63	245

### 5002 RC Series - Clay to Cast Iron or Plastic

Fernco Part No.	Mission Part No.	A		B		C	
		in.	mm	in.	mm	in.	mm
5002-43RC	MR02 43 ARC	5.29	134	3.38	86	4.10	104
5002-44RC	MR02 44 ARC	5.36	136	4.51	115	4.07	103
5002-44WCRC	MR02 44 ARC	5.44	138	4.55	116	3.96	101
5002-46RC	MR02 46 ARC	7.50	191	5.13	130	6.02	153
5002-55RC	MR02 55 ARC	6.60	168	5.50	140	5.74	146
5002-64RC	MR02 64 ARC	7.50	191	4.50	114	6.02	153
5002-64WCRC	MR02 64 ARC	8.02	204	4.57	116	6.00	152
5002-66RC	MR02 66 ARC	7.50	191	6.56	167	5.89	150
5002-66WCRC	MR02 66 ARC	8.04	204	6.38	162	5.91	150
5002-86RC	MR02 86 ARC	9.65	245	6.63	168	6.00	152
5002-88RC	MR02 88 ARC	9.76	248	8.57	218	5.96	151
5002-88WCRC	MR02 88 ARC	10.00	254	8.66	220	6.00	152
5002-1010RC	MR02 1010 ARC	12.40	315	10.75	273	5.90	150
5002-1010WCRC	MR02 1010 ARC	12.40	315	10.75	273	5.90	150
5002-1212RC	MR02 1212 ARC	14.51	369	12.60	320	6.38	162
5002-1515RC	MR02 1515 ARC	18.14	461	15.40	391	9.89	251
5002-1818RC	MR02 1818 ARC	21.90	556	19.00	483	9.63	245

### 5003 RC Series - Clay to Asbestos Cement Fibre or Ductile Iron

Fernco Part No.	Mission Part No.	A		B		C	
		in.	mm	in.	mm	in.	mm
5003-44RC	MR03 44 ARC	5.41	137	4.94	125	4.07	103
5003-66RC	MR03 66 ARC	7.25	184	6.84	174	5.93	151
5003-88RC	MR03 88 ARC	9.75	248	9.06	230	5.94	151
5003-1212RC	MR03 1212 ARC	14.51	369	13.20	335	6.38	162
5003-1516RC	MR03 1516 ARC	18.10	460	18.10	460	9.89	251

### 5004 RC Series - Concrete to Concrete

Fernco Part No.	Mission Part No.	A		B		C	
		in.	mm	in.	mm	in.	mm
5004-44RC	MR04 44 ARC	5.51	140	5.51	140	3.97	101
5004-66RC	MR04 66 ARC	7.58	193	7.58	193	5.94	151
5004-88RC	MR04 88 ARC	10.38	264	10.38	264	5.90	150

5004-1010RC	MR04 1010 ARC	12.40	315	12.40	315	5.90	150
5004-1212RC	MR04 1212 ARC	15.25	387	15.25	387	6.42	163
5004-1212LCRC	MR04 1212 ARC	16.10	409	16.10	409	9.89	251

### 5006 RC Series - Concrete to Cast Iron or Plastic

Fernco Part No.	Mission Part No.	A		B		C	
		in.	mm	in.	mm	in.	mm
5006-44RC	MR06 44 ARC	5.51	140	4.50	114	3.97	101
5006-66RC	MR06 66 ARC	7.58	193	6.63	168	5.94	151
5006-88RC	MR06 88 ARC	10.38	264	8.50	216	5.90	150
5006-1010RC	MR06 1010 ARC	12.40	315	10.75	273	5.90	150
5006-1212RC	MR06 1212 ARC	15.25	387	12.60	320	6.42	163
5006-1212LCRC	MR06 1212 ARC	16.10	409	12.60	320	9.89	251

### 5051 RC Series -

Asbestos Cement Fibre (AC) or Ductile Iron to CI or PL

Fernco Part No.	Mission Part No.	A		B		C	
		in.	mm	in.	mm	in.	mm
5051-44RC	MR51 44 ARC	4.80	122	4.39	112	3.94	100
5051-46RC	N/A	6.60	168	4.75	121	5.74	146
5051-64RC	N/A	6.95	177	4.38	111	5.92	150
5051-66RC	MR51 66 ARC	6.96	177	6.69	170	5.91	150
5051-88RC	MR51 88 ARC	9.25	235	8.51	216	5.97	152
5051-1010RC	MR51 1010 ARC	11.02	280	10.52	267	5.85	148
5051-1212RC	MR51 1212 ARC	13.20	335	12.60	320	5.97	152
5051-1615RC	MR51 1615 ARC	18.14	461	15.40	391	9.89	251

### 5055 RC Series - Asbestos Cement Fibre or Ductile Iron to Asbestos Cement Fibre or Ductile Iron

Fernco Part No.	Mission Part No.	A		B		C	
		in.	mm	in.	mm	in.	mm
5055-44RC	MR55 44 ARC	4.75	121	4.75	121	3.96	101
5055-66RC	MR55 66 ARC	6.65	169	6.65	169	5.92	150
5055-88RC	MR55 88 ARC	9.05	230	9.05	230	5.98	152
5055-1212RC	MR55 1212 ARC	13.20	335	13.20	335	5.98	152

### 5056 RC Series -

CI, PL, Copper, or Steel to CI, PL, Copper, or Steel

Fernco Part No.	Mission Part No.	A		B		C	
		in.	mm	in.	mm	in.	mm
5056-43RC	MR56 43 ARC	4.58	116	3.38	86	4.02	102
5056-44RC	MR56 44 ARC	4.58	116	4.58	116	4.02	102
5056-44XERC	N/A	0	0	0	0	0	0
5056-54RC	MR56 54 ARC	5.52	140	4.38	111	3.97	101
5056-55RC	MR56 55 ARC	5.52	140	5.52	140	3.97	101
5056-64RC	MR56 64 ARC	6.60	168	4.50	114	5.74	146
5056-66RC	MR56 66 ARC	6.60	168	6.60	168	5.74	146
5056-88RC	MR56 88 ARC	8.64	219	8.64	219	6.04	153
5056-1010RC	MR56 1010 ARC	10.63	270	10.63	270	5.89	150
5056-1212RC	MR56 1212 ARC	12.52	318	12.52	318	6.32	161
5056-1515RC	MR56 1515 ARC	15.44	392	15.44	392	9.89	251
5056-1818RC	MR56 1818 ARC	19.00	483	19.00	483	9.89	251
5056-2424RC	N/A	25.10	638	25.10	638	9.89	251

☐ DOMESTIC

☒ NON-DOMESTIC

## SUBMITTAL: PROTECTIVE FUSION BONDED EPOXY

(Current revisions for all noted Standards apply)

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

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

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

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

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

Tyler: 11910 CR 492 • Tyler, TX 75706 • (800) 527-8478  
Anniston: 1501 W 17<sup>th</sup> St. • Anniston, AL 36201 • (800) 226-7601  
New Lenox: 2200 West Haven • New Lenox, IL 60451  
Corona: 1001 El Camino Ave. • Corona, CA 92879 • (866) 527-8471

Dallas: 1201, Avenue 5 • Grand Prairie, TX 75050  
Anniston: 1800 Greenbrier Rd • Anniston, AL 36201 • (800) 226-7601  
Elmer: 701 Kenyon Ave • Elmer, NJ 03318  
Portland: 6204 N. Marine Dr. • Portland, OR 97203

☐ DOMESTIC

☒ NON-DOMESTIC

## SUBMITTAL: PROTECTIVE FUSION BONDED EPOXY

(Current revisions for noted Standards apply)

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

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

**\*NOTE:**

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

**\*\*NOTE:**

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

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



## MECHANICAL JOINT C153 DUCTILE IRON COMPACT FITTINGS

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

### SAMPLE SPECIFICATIONS (Current ANSI/AWWA revisions apply)

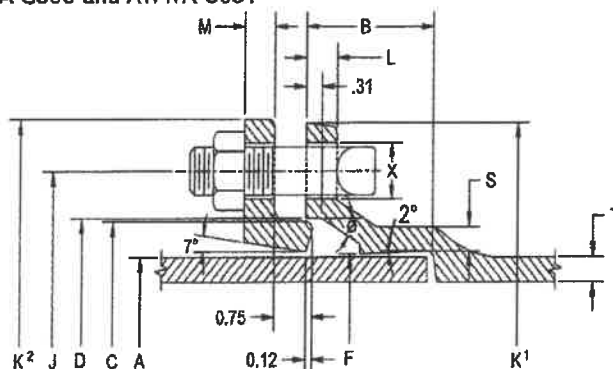
Mechanical joint watermain fittings with accessories, 2" through 64" shall be manufactured from ductile iron in accordance with and meet all applicable terms and provisions of standards ANSI/AWWA C153/A21.53 and ANSI/AWWA C111/A21.11. Ductile iron mechanical joint fittings 2" through 24" shall be rated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

NOTE - EXCEPTIONS: Mechanical joint fittings with flanged branches are rated for water pressure of 250 PSI.

NOTE - Wyes over 12" are not pressure rated. Contact manufacturer for rating in your application.

NOTE - Fittings are cement lined and seal coated in accordance with ANSI/AWWA C104/A21.4. Fittings are available double cement-lined, bare, or epoxy coated upon request. Epoxy coating per ANSI/AWWA C116

NOTE - Installation per AWWA C600 and AWWA C651



NOMINAL JOINT DIMENSIONS IN INCHES

BOLTS

Size	A Dia.	B	C Dia.	D Dia.	E Dia.	F Dia.	G Dia.	H Dia.	I Dia.	J Dia.	K Dia.	L	M	N	O	P	Q	R	S	T	X	Size	No.
2	2.51	2.50	3.50	3.60	2.61	4.75	6.19	6.89	.58	.62	.36	.30	3/4	3/4x3	2								
3	3.96	2.50	4.84	4.94	4.06	6.19	7.62	7.69	.58	.62	.39	.33	3/4	3/4x3	4								
4	4.80	2.50	5.92	6.02	4.90	7.50	9.06	9.12	.60	.75	.39	.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	.63	.88	.43	.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	.66	1.00	.45	.38	7/8	3/4x4	6								
10	11.10	2.50	12.22	12.34	11.20	14.00	15.62	15.62	.70	1.00	.47	.40	7/8	3/4x4	8								
12	13.20	2.50	14.32	14.44	13.30	16.25	17.88	17.88	.73	1.00	.49	.42	7/8	3/4x4	8								
14	15.30	3.50	16.40	16.54	15.44	18.75	20.31	20.25	.79	1.25	.55	.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	.85	1.31	.58	.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	.68	.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	.69	.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	.75	.61	7/8	3/4x5	16								
30	32.00	4.00	33.29	33.46	32.17	36.88	39.12	39.12	1.31	2.00	.82	.66	1 1/8	1x6	20								
36	38.30	4.00	39.59	39.76	38.47	43.75	46.00	46.00	1.45	2.00	1.00	.74	1 1/8	1x6	24								
42	44.50	4.00	45.79	45.96	44.67	50.62	53.12	53.12	1.45	2.00	1.35	.82	1 1/8	1 1/4x6 1/2	28								
48	50.80	4.00	52.09	52.26	50.97	57.50	60.00	60.00	1.45	2.00	1.35	.90	1 1/8	1 1/4x6 1/2	32								

NOTE: 2 Inch MJ ASTM A536 ductile iron Compact fittings (2"-22.5 bend, 2"-45 bend, 2"-90 bend, 2"x12" solid sleeve, 2"x2" tee, 4"x2" tee, and 4"x2" reducer) are available beginning 2012. Call Tyler Union for availability or additional product dimensions.

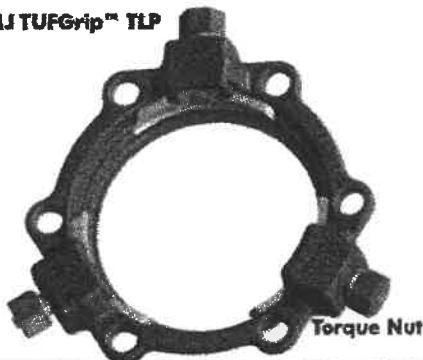
\*NOTE: Contact Tyler Union for 54"-64" product information.

NOTE: The fitting laying lengths provided are approximate, contact Tyler Union Waterworks for the laying length of a specific fitting.

# TUFGRIP™

**Series 2000 for PVC & PVCO Pipe**  
"A Proven Third Generation Mechanical Joint Restraint"

MJ TUF Grip™ TLP



Torque Nut

**TYLER UNION**  
Quality Waterworks Products

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



Designed by Harold Kennedy & Associates, Inc.

**"BETTER BY DESIGN"**

## SPECIFICATIONS:

- Proven to restrain plain end PVC pipe in diameters 3" thru 36" and PVCO pipe in diameters 4" thru 12"
- Restraint design conforms to applicable requirements of ANSI/AWWA C111, ANSI/AWWA C153, and ANSI/AWWA C110
- Restraint engineered for securing plain end pipe to mechanical joint fittings conforming to ANSI/AWWA C110, C111, and C153
- Rated for working water pressure of 385 psi for 3"-12", 235 psi for 14"-24", 150 psi for 30", and 125 psi for 36" (details on page 2)
- Cast of ASTM compliant 65-45-12 ductile iron complete with cast on date code and country of origin for traceability
- Restraint and all components are designed and proven for a 2:1 safety factor based on the PVC and PVCO pipe pressure rating
- Deflection rating when installed on pipe with nominal diameter shall be 3" for 3" thru 12", 2" for 14" thru 16", and 1.5" for 18" thru 36"
- Standard coating for Non-Domestic restraint is 4-6 mil of Alkyd resin baking enamel - \*Note: Epoxy coatings available upon request
- Gripping wedge, wedge collar bolt and twist off torque limiting nut shall be e-coated
- FM approved for 4" thru 12" applications and UL listed and approved for 3" thru 12" applications
- Color coded red for pipe type (C900 PVC/C905 PVC/ \*C909 PVCO/D2241 PVC) - \*Note: Refer to page 2 for C909 pipe applications

## FEATURES & ADVANTAGES:

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

ISO 9001-2008 Registered

Listed with Underwriters Laboratory

Factory Mutual Approved

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

### \*Tyler Union Waterworks Contact Information\*

**Tyler:** 11910 CR 492 • Tyler, Texas 75706 • (800) 527-8478  
**Anniston:** 1501 W 17<sup>th</sup> St • Anniston, AL 36201 • (800) 226-7601  
**Corona:** 1001 El Camino Ave. • Corona, CA 92879 • (866) 527-8471





28U - ANSI/AWWA C110/A21.10  
Class 125 Flange Joint Full Body  
Ductile Iron Fittings  
Revised 6/2016

☐ DOMESTIC

☐ NON-DOMESTIC

## SUBMITTAL: C110 FLANGE JOINT CLASS 125 PRODUCT

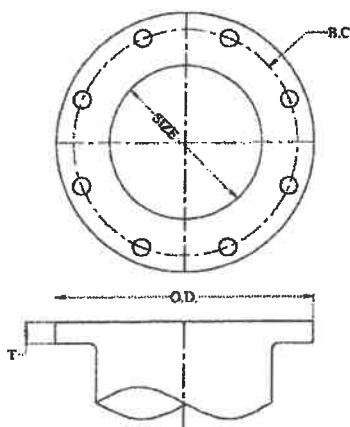
(Current revisions for the noted Standards apply)

- SIZES:** 2" through 64" (Contact Tyler Union for 54" – 64" Flange fitting information)
- STANDARDS:** ANSI/AWWA C110/A21.10, NFPA 13/24, ASME B16.1, 3" - 12" UL listed and FM approved
- MATERIAL:** Cast of ASTM A536 qualified ductile iron. Date code is cast on and required for traceability.
- PRESSURE RATING:** \*Flanged fittings \*2" – 48" rated at 250 psl. 54" – 64" rated at 150psi.  
\*Note: With rubber annular ring flange gasket, 2" – 24" Flanged fittings can be rated at 350 psi.
- DEFLECTION:** Deflection is "not" recommended for flange joint due to the rigidity of the joint.
- NSF-61 & NSF372:** Meets all requirements including Annex G, Tyler Union's Underwriters Laboratory listing MH16439.
- COATING:** Asphaltic or Primer per ANSI/AWWA C104/A21.4, Standard primer is Tnemec Pota Pox 140N-1211. Contact Tyler Union for additional coating options.
- CEMENT LINING:** Per ANSI/AWWA C104/A21.4, with double cement lining.
- EPOXY COATING:** Fusion bonded epoxy per ANSI/AWWA C116/A21.16. Additional coatings available upon request.
- BARE FITTINGS:** Available upon request.
- FLANGES:** ANSI Class 125 per ASME B16.1 and ANSI/AWWA C111/A21.11. Bolt holes shall straddle the center line  
**NOTE: Class 125 ASME B16.1 are not compatible with Class 250 Flanges**  
**NOTE: Class 250 ASME B16.1 fittings are available upon request.**
- FASTENERS:** High strength low alloy weathering steel per ANSI/AWWA C111/A21.11 and ASTM A242
- INSTALLATION:** Install per AWWA C600/C651 using pipe conforming to ANSI/AWWA C151/A21.51.

FLANGE DETAILS IN INCHES

BOLTS

Size Inches	Diameter DI Pipe	Flange O.D.	Bolt Circle Diameter	Flange Thickness "T"	Bolt Hole Diameter	Size	Qty.
2	2.51	6.00	4.75	0.62	0.750	5/8 x 2.25	4
3	3.96	7.50	6.00	0.73	0.750	5/8 x 2.25	4
4	4.80	9.00	7.50	0.94	0.750	5/8 x 3.00	8
6	6.90	11.00	9.50	1.00	0.875	3/4 x 3.50	8
8	9.05	13.50	11.75	1.12	0.875	3/4 x 3.50	8
10	11.10	16.00	14.25	1.19	1.000	7/8 x 4.00	12
12	13.20	19.00	17.00	1.25	1.000	7/8 x 4.00	12
14	15.30	21.00	18.75	1.38	1.125	1 x 4.50	12
16	17.40	23.50	21.25	1.44	1.125	1 x 4.50	16
18	19.50	25.00	22.75	1.56	1.250	1-1/8 x 5.00	16
20	21.60	27.50	25.00	1.69	1.250	1-1/8 x 5.00	20
24	25.80	32.00	29.50	1.88	1.375	1-1/4 x 5.50	20
30	32.00	38.75	36.00	2.12	1.375	1-1/4 x 5.50	28
36	38.30	46.00	42.75	2.38	1.625	1-1/2 x 7.00	32
42	44.50	53.00	49.50	2.62	1.625	1-1/2 x 7.50	36
48	50.80	59.50	56.00	2.75	1.625	1-1/2 x 8.00	44
54	Available on Request						
60	Available on Request						
64	Available on Request						



**Anniston:** 1501 W 17<sup>th</sup> 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. Suite 100 • 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

AA Thread Seal Tape, Inc.  
 1275 KYLE COURT  
 WAUCONDA, IL 60084  
 Tel: (800) 537-7139 • Fax: (847) 526-2209  
 E-Mail: support@aathread.aranya.com  
 Website: aathread.com

## Product Specifications



Model # 76002, Model # 76002 12 MIL Clear Polyethylene Encasements for Ductile Iron Pipe

### SPECIFICATIONS

Item #	76002
Item Name	12 MIL Clear Polywrap
Pipe Diameter	up to 8"
Tube Size	20" x 220'
Width	20
Length	220
Pipe Length	20
Perforations	22
Thickness	12
Country of Origin	USA
Tensile Strength	MD-4594 psi, TD-4410 psi
Elongation	MD-1073%, TD-1126%
Dielectric Strength	1946 V/MIL
Impact Resistance	1189
Propagation Tear Resistance	MD-4462 g/f, TD-5539 g/f
Standard	ANSI/AWWA C105/A21.5
Markings	Pipe Diameter, Corrosion Warning, MIL thickness, Spec, Date of manufacture.
Quantity/Case	1 roll
Lbs./Roll	47
Length<1-1->	21 1/2
Width<1-1->	10
Height	10
Units Per Package	1
Note	This material is clear plastic and has "Waterline" printed on it.

AA Thread Seal Tape, Inc.  
 1275 KYLE COURT  
 WAUCONDA, IL 60084  
 Tel: (800) 537-7139 • Fax: (847) 526-2209  
 E-Mail: support@aathread.aranya.com  
 Website: aathread.com

## Product Specifications



Model # 60211, Model # 60211 Black Pipe Wrapping Tape - Made in Taiwan

## SPECIFICATIONS

Item #	60211
Item Name	10 MIL Black Pipe Wrapping Tape
Size	2" x 100'
Thickness	10
Country of Origin	Taiwan
Width	2
Length	100
Tensile Strength	25 lbs./in. (43.8 N/10mm)
Elongation	200%
Adhesion to Steel	20 oz./in. (2.4 N/10mm)
Adhesion to Backing	20 oz./in. (2.4 N/10mm)
Dielectric Strength	1250 V/Mil
Max. Temperature	176°F (80°C)
Min. Temperature	14°F (-10°C)
Max. Volts	600V
Quantity/Case	36 rolls
Quantity/Sleeve	6 rolls
Weight/Case	39
Length<1-->	13 1/2
Width<1-->	9 1/4
Height	13 1/4
Units Per Package	1
Package Type	Each
Description	10 MIL X 2" X 100' BLK PIPE WRAP TAPE

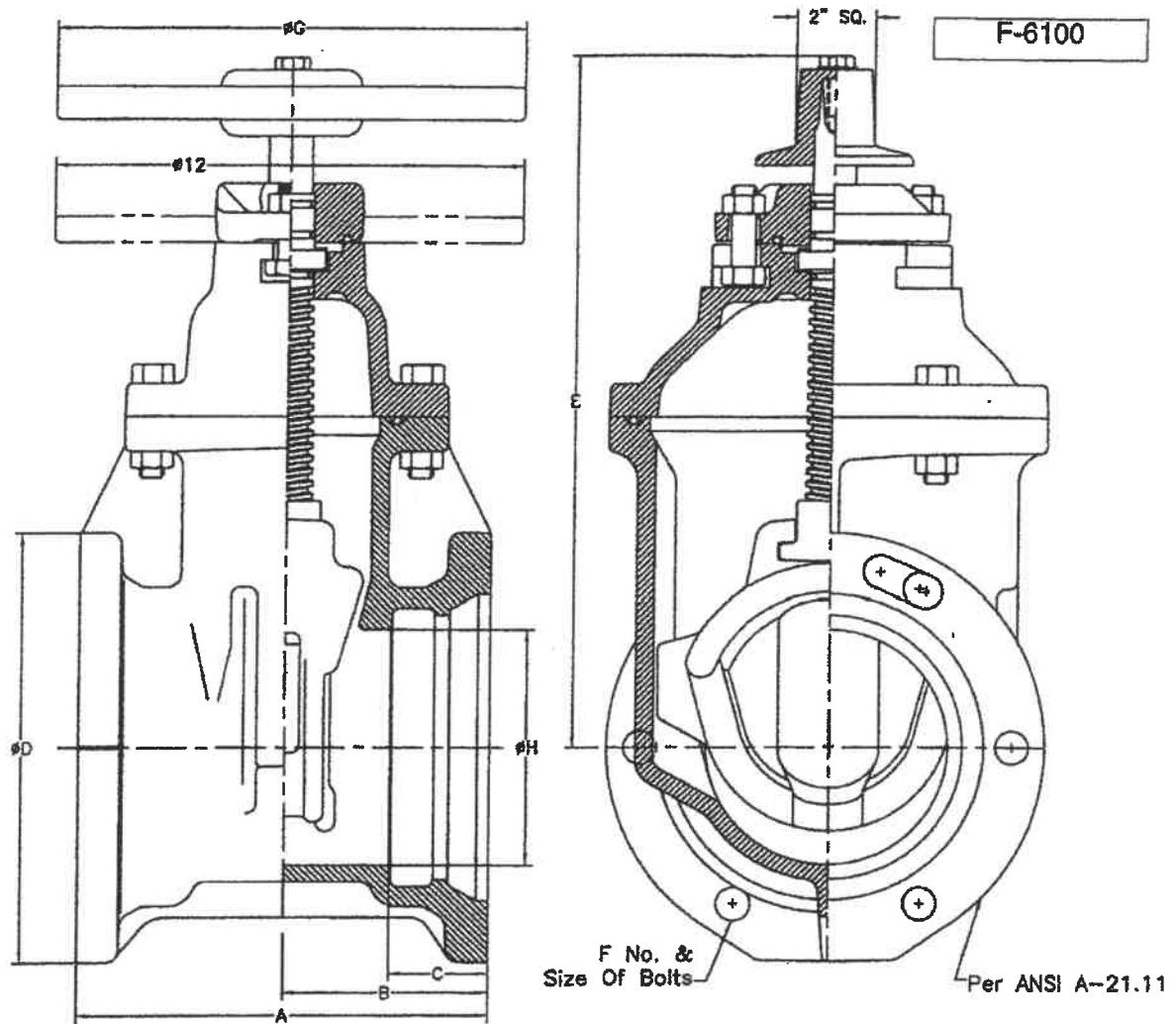


Complies with applicable  
requirements of AWWA C509

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

**CLOW VALVE COMPANY**

MODEL 2639 & 2640



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

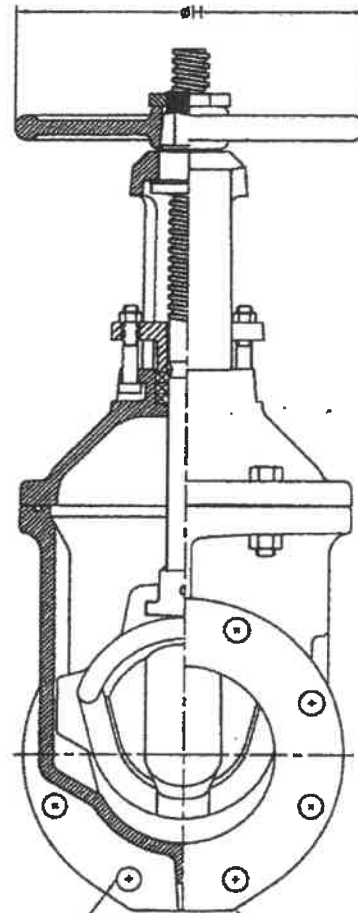
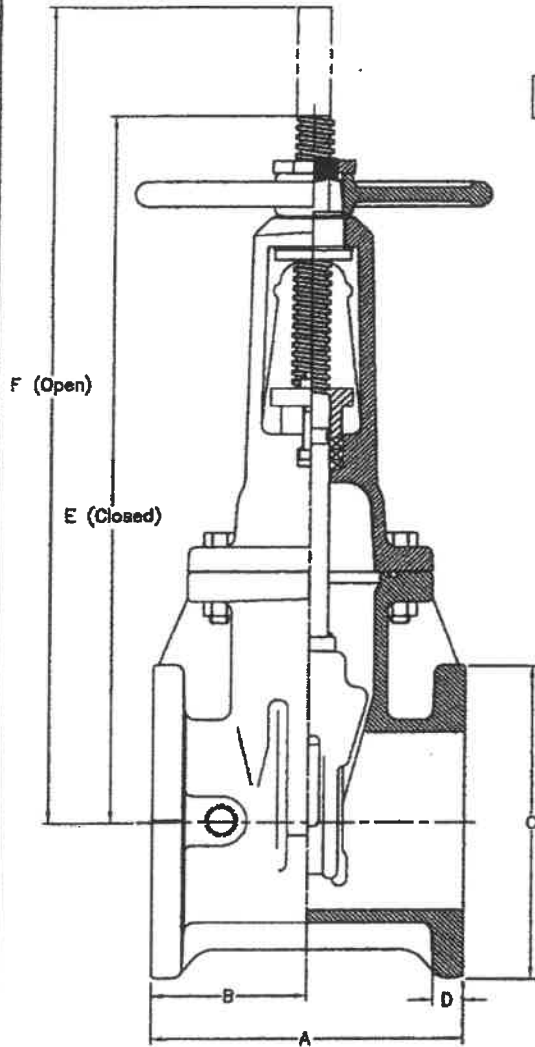
Complies with applicable  
requirements of AWWA C509

2"-12" R/W VALVE FLANGE ENDS  
OS&Y GENERAL DIMENSIONS

**CLOW VALVE COMPANY**

MODEL 2639 & 2640

F-6136



G  
No. & Size Of Bolts

Flanges  
ANSI B16.1-CL 125

VALVE SIZE	A	B	C	D	E	F	G	H
2	7	3 1/2	6	5/8	12	10	4-5/8	7 1/4
2 1/2	7 1/2	3 3/4	7	11/16	13 7/8	16 3/8	4-5/8	7 1/4
3	8	4	7 1/2	3/4	15 5/8	18 7/8	4-5/8	10
4	9	4 1/2	9	15/16	18 1/4	22 3/4	8-5/8	10
6	10 1/2	5 1/4	11	1	23 3/4	30 1/8	8-3/4	12
8	11 1/2	5 3/4	13 1/2	1 1/8	29 1/4	37 3/4	8-3/4	14
10	13	6 1/2	16	1 3/16	35 3/8	45 3/4	12-7/8	18
12	14	7	19	1 1/4	40 5/8	53 1/8	12-7/8	18

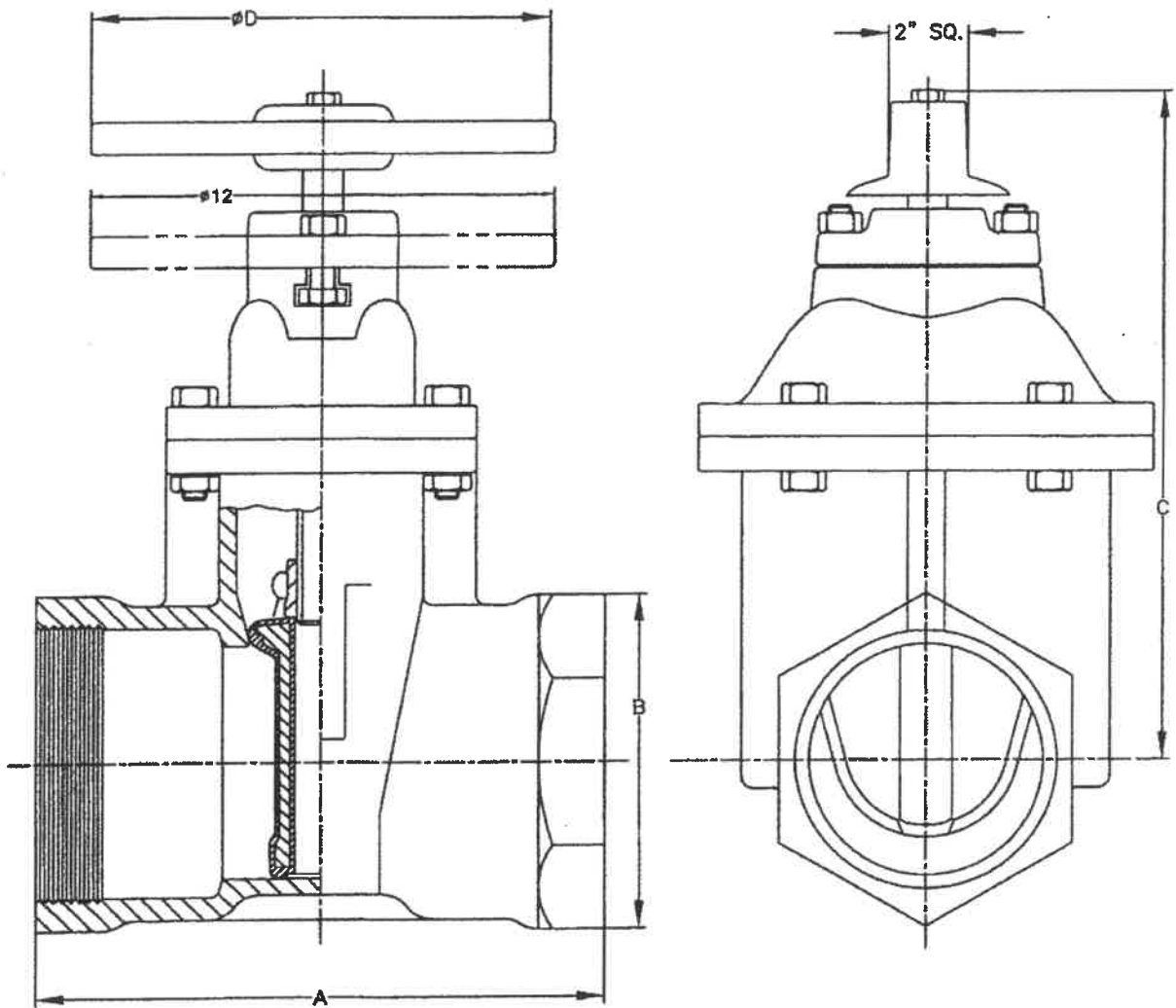
Complies with applicable  
requirements of AWWA C509

2"-3" R/W VALVE THREADED ENDS  
NRS GENERAL DIMENSIONS

**CLOW VALVE COMPANY**

MODEL 2639 & 2640

F-6103



VALVE SIZE	A	B	C	D
2	5 1/4	4 1/8	10 7/8	7 1/4
2 1/2	7	5 3/16	11 3/8	7 1/4
3	7 1/8	5 5/8	12 3/8	10

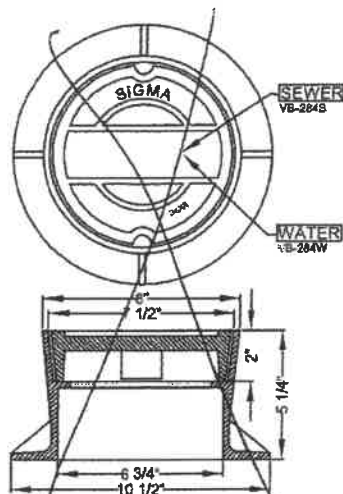


# Valve, Curb, & Service Boxes

**Municipal  
Construction**

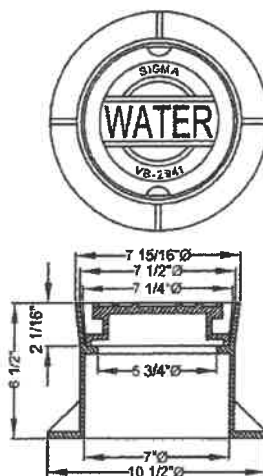
**C  
A  
S  
T  
I  
N  
G  
S**

## VB-284



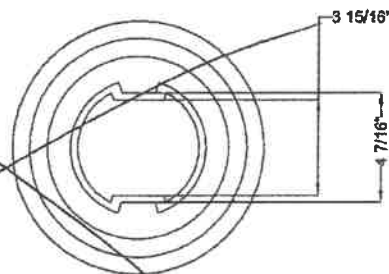
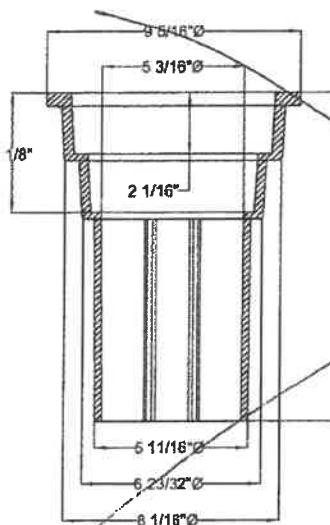
Shipping Weight: 21 lbs.

## VB-294W



Shipping Weight: 25 lbs.

## VB-4688-12/18/24



DRG. NO.	DIMN. "A"	APPROX. WT. (LBS.)
VB-4688-12	12"	20
VB-4688-18	18"	26.5
VB-4688-24	24"	33

# DETECTABLE TAPE (5.0 MIL)

Solid Aluminum Foil Core • Virgin Clear Polypropylene Film Laminated Top Structure  
Virgin Clear Polyethylene Film Laminated Base Structure • Reverse Printed Polypropylene Structure  
Acid, Alkali, Chemical, and Oil Resistant • Direct Burial Rated • Made in the USA

**CAUTION BURIED GAS LINE BELOW**

## Applications and Information

- **Pro-Line's Detectable Marking Tape** is used for detecting, locating, identifying, and protecting buried utility lines for gas, water, sewer, telecommunication, and electrical markets. The width of tape used, is determined by the size of, and depth at which the underground utility line is buried. The depth at which detectable tape is buried, is determined by the width of the tape used.
- **DETECT:** Aluminum core is detected through means of inductive locating.
- **LOCATE:** Line is located and marked after inductive locating is performed.
- **IDENTIFY:** Utility type is identified by both the APWA color-code and utility legend printed on the marking tape.
- **PROTECT:** Detectable tape works 24 hours a day and year round, even if tape is not inductively located during excavation, the tape provides a "stop-sign" effect that is highly visible.

## Standards and References

Pro-Line's Detectable Marking Tape meets or exceeds all applicable ASTM specifications.

- ASTM D2103-08: Standard Specification for Polyethylene Films and Sheeting.
- ASTM D882-09: Standard Test Method for Tensile Properties and Elongation of Thin Plastic Sheeting.
- ASTM D2578-08: Standard Test Method for Wetting Tension of Polyethylene and Polypropylene Films.
- ASTM D792-08: Standard Test Methods for Density of Plastics by Displacement.
- ASTM D671-93: Standard Test Method for Flexural Fatigue of Plastics.

## Construction

Pro-Line's Detectable Marking Tape consists of a minimum 5.0 mil overall thickness. Construction is 0.8 mil clear virgin polypropylene film, reverse printed and laminated to a 0.35 solid aluminum foil core and then laminated to a 3.75 mil clear virgin polyethylene film. Tape is printed with our APWA Color-Coded, patented "Diagonally Striped" design with big, bold, black lettering to identify a specific buried utility line.

## Specifications

### DETECTABLE UNDERGROUND MARKING TAPE

Underground marking tape shall be a (2", 3", 4", 6", or 12" width), detectable marking tape, with a minimum 5.0 mil overall thickness. Tape shall be manufactured using a 0.8 mil clear virgin polypropylene film, reverse printed and laminated to a 0.35 mil solid aluminum foil core, and then laminated to a 3.75 mil clear virgin polyethylene film. Tape shall be printed using a diagonally striped design for maximum visibility, and meet the APWA Color-Code standard for identification of buried utilities. Detectable marking tape shall be **Pro-Line Safety Products** or approved equal and made in the USA.

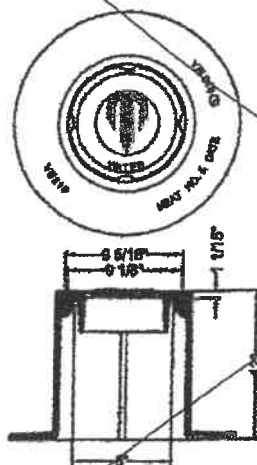


# Valve Boxes

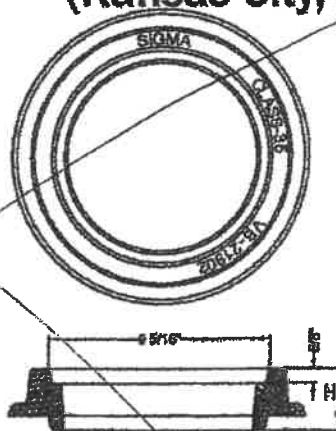
Municipal

# CASTINGS

**VB219**  
(Kansas City, MO)



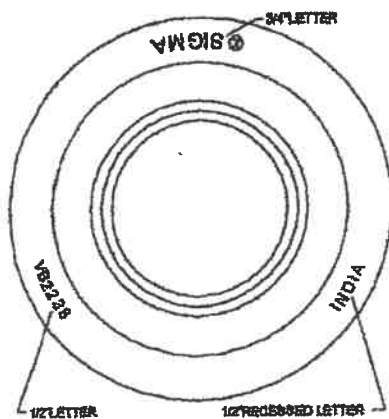
Weight: 95 lbs.



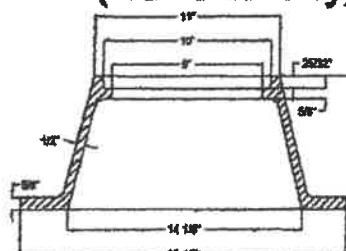
Riser Rings

Item No.	Ext.	H.	Weight
VB21915-35	1-1/2	2-1/8	18
VB21902-35	2	2-5/8	23

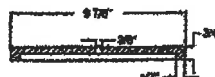
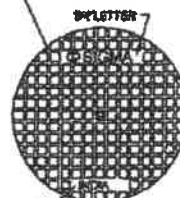
**VB2238**  
(Kansas City, MO)



Weight: 75 lbs.



CHECKER GROOVED  
500\"/>





# The Kennedy Guardian



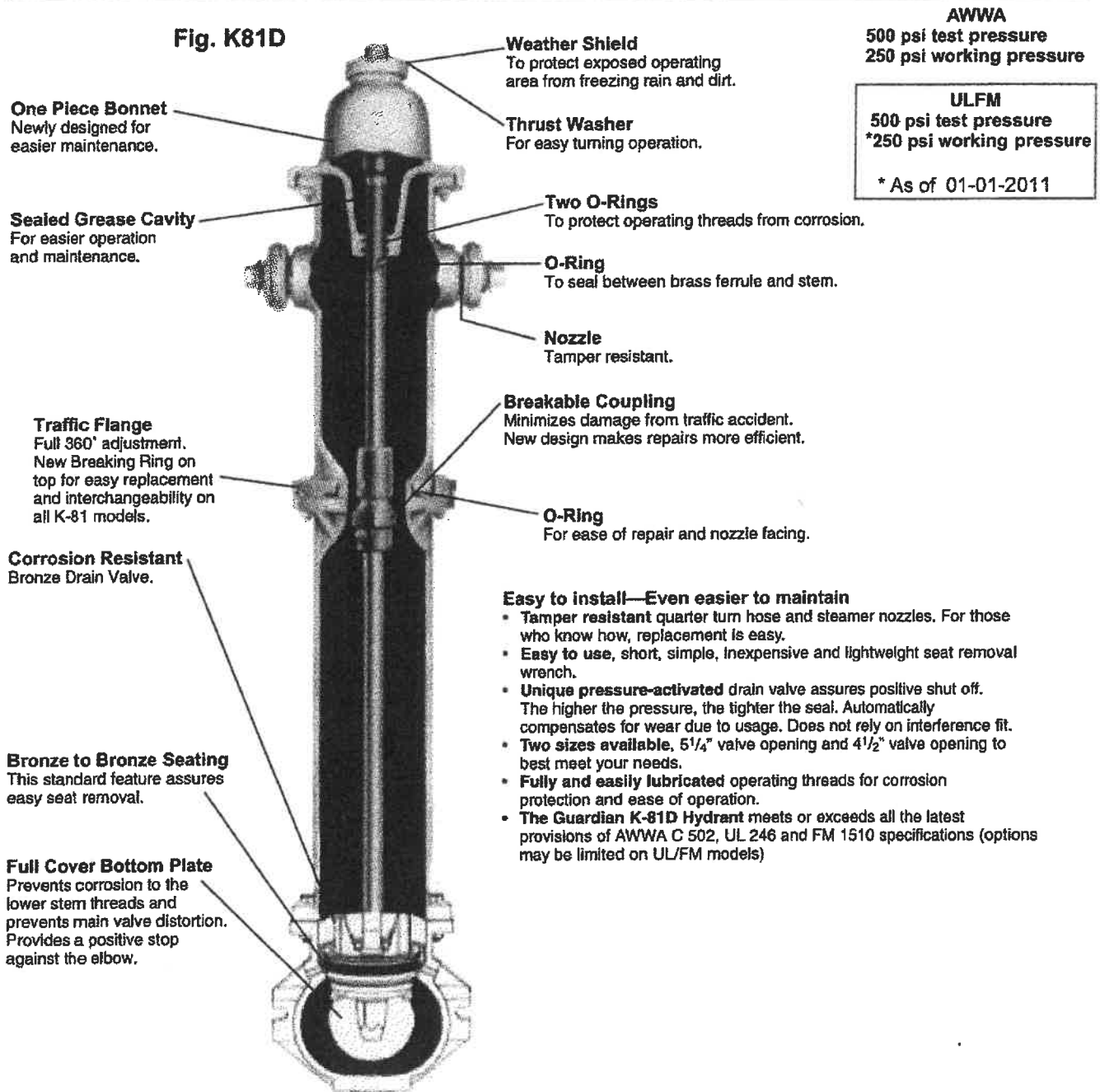
Fire hydrants have been used in fire protection for over 100 years. A.W.W.A. C502 was developed in 1913 as a standard for the manufacture and use of dry barrel hydrants. Kennedy has established itself as a leader in the industry with manufacturing experience dating back to 1905. Many of the early hydrants are in use today.

Kennedy's most recent design is the Guardian. Based on a simple design, it is easy to install, maintain and repair. The Guardian sets a standard for quality in the industry and meets or exceeds all requirements for A.W.W.A. C502 latest revision, and is UL listed and FM approved.

## Guardian Features

Meets or exceeds requirements of A.W.W.A. C-502 and is UL listed and FM approved.

K-81A Meets or exceeds requirements of A.W.W.A. C-502.

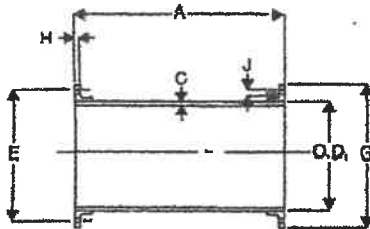




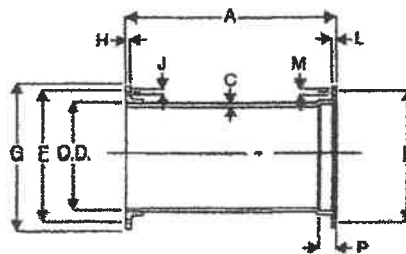
# Foundry Services Co.

Kempf Holdings, LLC

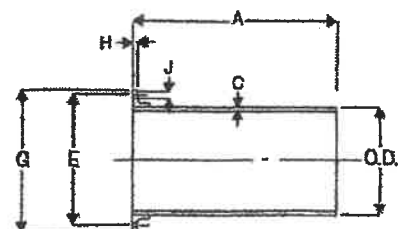
## FABRICATED FLANGE PIPES



FLG



FLG. x M.J.



FLG. x P.E.

SIZE	A	B	C	O.D.		E	G	H		NO. OF FLG. B BOLT HOLES	J	K		L		NO. OF M.J. BOLT HOLES	M		P
				MIN.	MAX.			MIN.	MAX.			MIN.	MAX.	MIN.	MAX.		MIN.	MAX.	
8	•	•	0.31	3.90	4.02	6.00	7.50	0.63	0.87	4	0.75	6.13	6.25	0.88	0.94	4	0.75	0.81	2.50
10	A	A	0.32	4.74	4.86	7.50	9.00	0.82	1.06	4	0.75	7.44	7.56	0.94	1.00	4	0.875	0.935	2.50
12	S	S	0.34	6.84	6.96	9.50	11.00	0.88	1.12	8	0.875	9.44	9.56	1.00	1.06	8	0.875	0.935	2.50
14	•	•	0.36	8.99	9.11	11.75	13.50	1.00	1.24	8	0.875	11.69	11.81	1.04	1.12	8	0.875	0.935	2.50
16	•	•	0.38	11.04	11.16	14.25	16.00	1.07	1.31	12	1.00	13.94	14.06	1.11	1.19	8	0.875	0.935	2.50
18	R	R	0.40	13.14	13.26	17.00	19.00	1.13	1.37	12	1.00	16.19	16.31	1.17	1.25	8	0.875	0.935	2.50
20	E	E	0.42	15.22	15.35	18.75	21.00	1.19	1.57	12	1.125	18.69	18.81	1.19	1.31	10	0.875	0.935	3.50
24	Q	Q	0.43	17.32	17.45	21.25	23.50	1.25	1.63	16	1.125	20.94	21.06	1.26	1.38	12	0.875	0.935	3.50
28	U	U	0.44	19.42	19.55	22.75	25.00	1.37	1.75	16	1.25	23.19	23.31	1.32	1.44	12	0.875	0.935	3.50
30	I	I	0.45	21.52	21.65	25.00	27.50	1.50	1.88	20	1.25	25.44	25.56	1.38	1.50	14	0.875	0.935	3.50
36	R	R	0.47	25.72	25.85	29.50	32.00	1.69	2.07	20	1.375	29.94	30.06	1.50	1.62	16	0.875	0.935	3.50
40	E	E	0.51	31.94	32.08	36.00	38.75	1.87	2.37	28	1.375	36.82	36.94	1.69	1.81	20	1.125	1.185	4.00
48	D	D	0.58	38.24	38.38	42.75	46.00	2.13	2.63	32	1.625	43.69	43.81	1.88	2.00	24	1.125	1.185	4.00
54	•	•	0.65	44.44	44.58	49.50	53.00	2.37	2.87	36	1.625	50.56	50.68	1.88	2.00	28	1.375	1.435	4.00
60	•	•	0.72	50.74	50.88	56.00	59.50	2.50	3.00	44	1.625	57.44	57.56	1.88	2.00	32	1.375	1.435	4.00
66	•	•	0.81	57.40	57.64	62.75	62.75	2.75	3.25	44	1.875	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

1. Tolerance on length of FLG. X FLG. X MJ. Pipe shall be  $\pm 0.125"$ .
2. Tolerance on length of FLG. X P.E. shall be  $\pm 0.25"$ .
3. Above material shall meet all applicable sections of ANSI A21.10, A21.15, A21.51, 82. 1.816.11 AWWA, C110, C115, C150, C151, and all revisions.
4. Flanged pipe shall be ductile iron pipe with ductile iron flanges threaded on.
5. Linings, if required, shall be in accordance with ANSI A21.4.
6. The mechanical joint bell for 30" & 36" sizes of ductile iron pipe have thicknesses different from those shown in ANSI A21.11, which are based on gray iron pipe. These reduced thicknesses provide a lighter-weight bell which is compatible with the wall thickness of ductile iron pipe.
7. Submitted material only. Consult engineer for application.
8. 250 lb. faced and drilled flanges available upon request.





# CAMBRIDGE-LEE INDUSTRIES, LLC.

Reading Tube Division

P.O. Box 14026, Reading, PA 19612 - 4026

Phone 610 - 926 4141 Fax 610 - 926 7317

<b>Distributor:</b>	<b>Customer:</b>
<b>Address:</b>	<b>Address:</b>
<b>Order No.:</b>	<b>P.O. No.:</b>
<b>Product:</b>	

## Standard Tube Certificate of Conformance

Tube Type	Specification No.	Specification Title
Type K, L & M	ASTM B 88	Standard Specification for Seamless Copper Water Tube
	NSF 61	ANSI/NSF Standard 61 Drinking Water System Components Health Effects <sup>1</sup>
Coils and Straight Lengths Marked as ACR	ASTM B 280	Standard Specification for Seamless Copper Tube for Air Conditioning and Refrigeration Field Service
Type DWV Drainage	ASTM B 306	Standard Specification for Copper Drainage Tube (DWV)
Type K & L Straight Lengths Marked as OXY/MED	ASTM B 819	Standard Specification for Seamless Copper Tube for Medical Gas Systems

Cambridge-Lee Industries, LLC, located in Reading, PA, USA, manufactures seamless copper tubing in the United States of America and is fully compliant with the "Buy American" requirements of Public Law 111-5, the American Recovery and Investment Act of 2009.

Cambridge-Lee Industries, LLC, manufactures seamless copper tubing with recycled scrap. Our production meets the LEED, Leadership in Energy and Environmental Design qualifications. The process of scrap recycling entails the purchase of #1 grade scrap and converting it in a finished cast form, which meets specification; alloy C12200, for standard product production. Currently, operations purchases about 65% of #1 scrap. The remaining capacity is cathode copper and run around.

Cambridge-Lee Industries, LLC certifies that the copper tube manufactured is grade UNS C12200 and meets the applicable chemical, mechanical, cleanliness and eddy current testing requirements of the current specification(s) indicated above.

When specified at order placement and for an additional cost, CLI - RTD can supply product mill test reports of the current ASTM standard.

Copper tube manufactured by Cambridge-Lee Industries does not contain mercury or come in contact with mercury, mercury compounds or mercury containing devices at any stage in manufacturing, inspection, packaging or shipping.

All of the specifications require a minimum copper plus silver content of 99.9% and phosphorus content between .015 - .040%. As indicated by the compositional requirements, the copper tube is essentially lead free.

<sup>1</sup> NSF Standard 61 Restriction Statement: "Seamless Copper Tube (Alloy C12200) is certified by NSF to NSF/ANSI Standard 61 for public water supplies meeting, or in process of meeting the U.S. EPA Lead and Copper Rule (56FR 26460, June 7, 1991). Water Supplies with pH less than 6.5 may require corrosion control to limit copper solubility in drinking water." Some water supplies may be corrosive to copper and in these cases water treatment may be necessary.



# Technical Specifications

## No-Lead Brass Fittings & Valves

### GENERAL

All brass valves and fittings for service lines shall be provided under this contract.

### PRODUCT

a. All fittings and valves shall be manufactured in accordance with AWWA Standard C-800, latest revision, and as further specified in these technical specifications.

a.i Exception: Any brass part of the fitting or valve in contact with potable water shall be made of a "No-Lead Brass", defined for this specification as UNS Copper Alloy No. C89520 or C89833 in accordance with the chemical and mechanical requirements of ASTM B584 and AWWA C-800. This "No-Lead Brass" alloy shall not contain more than nine one hundredths of one percent (0.09% or less) total lead content by weight.

a.ii Any Brass part of the fitting or valve not in contact with potable water shall be made of 85-5-5 brass as defined for this specification as UNS Copper Alloy C83600 per ASTM B62, ASTM B584 and AWWA C-800.

b. All brass fittings and valves shall be certified by an ANSI accredited test lab per NSF/ANSI Standard 61, Drinking Water Components – Health Effects, Section 8 or NSF/ANSI Standard 372, Drinking Water System Components – Lead Content. Proof of certification is required.

c. Brass fittings and valves shall comply with the United States Of America Safe Drinking Water Act, and the U.S. Environmental Protection Agency.

d. All brass fittings and valves shall have the manufacturers name or trademark permanently stamped or cast on it. Another marking identifying the "no lead" brass alloy, e.g., 'NL', shall be cast or permanently stamped on the fitting or valve.

### QUALITY CONTROL AND TESTING

If requested, an affidavit certifying compliance with these standards and specifications shall be signed and submitted by the manufacturing firm's Quality Assurance or Engineering Manager.

### MANUFACTURER

The brass fittings and valves shall be produced by a manufacturer in the United States of America or Canada.

# NO-LEAD AHEAD.

## WE'RE READY. >>>>>