Submittal Transmittal

Project: Pike Addition Lift Station near Maple & 151st St.

City of Wichita Project Number: 468-2019-005340

Contractor Project Number: 20059

Submittal Number: 1-04

Subcontractor/Supplier: Winwater

Description: Lift Station Module

Date Submitted: May 26, 2020

Stamp Area

315 ELLIS | WICHITA, KS 67211
[P] 316-262-7271
[BaughmanCo.com]

BAUGHMAN

☒ REVIEWED ONLY BY: TPV
☐ REVIEWED AS NOTED
☐ REJECTED DATE: 5-26-20

3612 S. WEST STREET
WICHITA, KS 67217
P: (316) 522-8900
F: (316) 522-1472

DATE: 5/26/20

ATTENTION: Ryan McCullough / McCullough Excavation

FROM: Dane Fugleberg / Wichita Winwater

NOTES:

Submittal information for Lift Station Module - Pike Addition.

PRODUCT DATA SHEET

HI-BUILD EPOXOLINE® SERIES 66

Tnemec Series 66 coating will be on all Flanged Fittings and Flanged Fabricated DI Piping. - All Tnemec 66 will be red

PRODUCT PROFILE

GENERIC DESCRIPTION Polyamide Epoxy

COMMON USAGE Industry standard for epoxy coatings for over 30 years. Known for its forgiving application characteristics in adverse and varied conditions, and for benchmark performance.

COLORS Refer to Tnemec Color Guide. **Note:** Epoxies chalk with extended exposure to sunlight and may yellow on aging. Lack of ventilation, incomplete mixing, miscatalyzation or the use of heaters that emit carbon dioxide and carbon monoxide during application and initial stages of curing may accelerate any potential yellowing.

FINISH Satin

SPECIAL QUALIFICATIONS Meets the performance requirements of **AWWA C 210** (not for potable water contact). Contact your Tnemec representative for system recommendations.

PERFORMANCE CRITERIA Extensive test data available. Contact your Tnemec representative for specific test results.

COATING SYSTEM

PRIMERS **Steel:** Self-priming or Series 1, 20, FC20, 37H, N69, 90, 91-H_2O, 94-H_2O, 161, 394, 530
Galvanized Steel and Non-Ferrous Metal: Self-priming
Concrete: Self-priming, 54-660, 201, 216, 218
CMU: 54-562, 54-660, 130, 216, 218
Drywall: 51-792 for dry interior environments
Note: A maximum recoat time may apply depending on the topcoat specified. Refer to the applicable topcoat product sheet for information on product specific maximum recoat times.

TOPCOATS 46H-413, 66, N69, 73, 84, 104, 113, 114, 161, 262, 265, 290, 291, 1070, 1071, 1072, 1074, 1074U, 1075, 1075U, 1077, 1078. Refer to COLORS on applicable topcoat data sheets for additional information. **Note:** A maximum recoat time may apply depending on the topcoat specified. Refer to the applicable topcoat product sheet for information on product specific maximum recoat times.

SURFACE PREPARATION

PRIMED STEEL **Immersion Service:** Scarify the Series 66 prime coat surface by abrasive-blasting with a fine abrasive before topcoating if: (a) the 66 prime coat has been in exterior exposure for 60 days or longer and 66, 46H-413, N69 or 161 is the specified topcoat; (b) the 66 prime coat has been in exterior exposure for 14 days or longer and Series 104 is the specified topcoat; (c) the 66 prime coat has been in exterior exposure for 7 days or longer and Series 262 or 265 is the specified topcoat.

STEEL **Immersion Service:** SSPC-SP10/NACE 2 Near-White Blast Cleaning
Non-Immersion Service: SSPC-SP6/NACE 3 Commercial Blast Cleaning

GALVANIZED STEEL & NON-FERROUS METAL Surface preparation recommendations will vary depending on the substrate and exposure conditions. Contact your Tnemec representative or Tnemec Technical Services.

CAST/DUCTILE IRON Contact your Tnemec representative or Tnemec Technical Services.

CONCRETE Allow new concrete to cure 28 days. For optimum results and/or immersion service, abrasive blast referencing SSPC-SP13/NACE 6 Surface Preparation of Concrete and Tnemec's Surface Preparation and Application Guide.

CMU Allow mortar to cure for 28 days. Prepare in accordance with SSPC-SP13/NACE 6 to level protrusions and mortar spatter, and remove other contaminants.

PAINTED SURFACES **Non-Immersion Service:** Ask your Tnemec representative for specific recommendations.

ALL SURFACES Must be clean, dry and free of oil, grease and other contaminants.

TECHNICAL DATA

VOLUME SOLIDS 56.0 ± 2.0% (mixed) †

RECOMMENDED DFT 2.0 to 6.0 mils (50 to 150 microns) per coat.
Note: Number of coats and thickness requirements will vary with substrate, application method and exposure. Contact your Tnemec representative.

CURING TIME

Temperature	To Touch	To Handle	To Recoat	Immersion
75°F (24°C)	2 hours	10 hours	12 hours	7 days

Curing time varies with surface temperature, air movement, humidity and film thickness.
Ventilation: When used as a tank lining or in enclosed areas, provide adequate ventilation during application and cure. Reference guidelines contained in the latest edition of AWWA D 102.

VOLATILE ORGANIC COMPOUNDS **Unthinned:** 3.02 lbs/gallon (362 grams/litre)
Thinned 5%: 3.20 lbs/gallon (384 grams/litre)
Thinned 10%: 3.37 lbs/gallon (404 grams/litre) †

THEORETICAL COVERAGE 898 mil sq ft/gal (22.0 m²/L at 25 microns). See APPLICATION for coverage rates. †

NUMBER OF COMPONENTS Two: Part A and Part B

PACKAGING 5 gallon (18.9L) pails and 1 gallon (3.79L) cans — Order in multiples of 2.

NET WEIGHT PER GALLON 12.50 ± 0.25 lbs (5.67 ± .11 kg) (mixed) †

STORAGE TEMPERATURE Minimum 20°F (-7°C) Maximum 110°F (43°C)

TEMPERATURE RESISTANCE (Dry) Continuous 250°F (121°C) Intermittent 275°F (135°C)

SHELF LIFE Part A: 24 months; Part B: 12 months at recommended storage temperature.

FLASH POINT - SETA Part A: 82°F (28°C) Part B: 64°F (18°C)

HI-BUILD EPOXOLINE® | SERIES 66

HEALTH & SAFETY

Paint products contain chemical ingredients which are considered hazardous. Read container label warning and Material Safety Data Sheet for important health and safety information prior to the use of this product.
Keep out of the reach of children.

APPLICATION

COVERAGE RATES

	Dry Mils (Microns)	Wet Mils (Microns)	Sq Ft/Gal (m²/Gal)
Suggested	4.0 (100)	7.0 (180)	225 (20.9)
Minimum	2.0 (50)	3.5 (90)	450 (41.8)
Maximum	6.0 (150)	10.5 (265)	150 (13.9)

Note: The above reflects the total range to which Series 66 can be applied for specific applications. To insure the proper thickness and number of coats is specified for certain substrates and exposures, consult the Tnemec Guide Specifications and/or contact your Tnemec representative. **Note:** Roller or brush application may require two or more coats to obtain recommended film thickness. Allow for overspray and surface irregularities. Wet film thickness is rounded to the nearest 0.5 mil or 5 microns. Application of coating below minimum or above maximum recommended dry film thicknesses may adversely affect coating performance. †

MIXING

Power mix contents of each container, making sure no pigment remains on the bottom. Pour a measured amount of Part B into a clean container large enough to hold both components. Add an equal volume of Part A to Part B while under agitation. Continue agitation until the two components are thoroughly mixed. Do not use mixed material beyond pot life limits. **Note:** Both components should be above 50°F (10°C) prior to mixing. For application to surfaces between 50°F to 60°F (10°C to 16°C), allow mixed material to stand thirty (30) minutes and restir before using. For optimum application properties, blended components should be above 60°F (16°C). Mixing ratio is one to one by volume.

THINNING

Use No. 4 Thinner. For air spray, thin up to 10% or 3/4 pint (380 mL) per gallon. For airless spray, roller or brush, thin up to 5% or 1/4 pint (190 mL) per gallon.

POT LIFE

20 hours at 50°F (10°C) 10 hours at 77°F (25°C) 4 hours at 100°F (38°C)

APPLICATION EQUIPMENT

Air Spray

Gun	Fluid Tip	Air Cap	Air Hose ID	Mat'l Hose ID	Atomizing Pressure	Pot Pressure
DeVilbiss JGA	E	765 or 704	5/16" or 3/8" (7.9 or 9.5 mm)	3/8" or 1/2" (9.5 or 12.7 mm)	75-100 psi (5.2-6.9 bar)	10-20 psi (0.7-1.4 bar)

Low temperatures or longer hoses require higher pot pressure.

Airless Spray

Tip Orifice	Atomizing Pressure	Mat'l Hose ID	Manifold Filter
0.015"-0.019" (380-485 microns)	3000-4000 psi (207-276 bar)	1/4" or 3/8" (6.4 or 9.5 mm)	60 mesh (250 microns)

Use appropriate tip/atomizing pressure for equipment, applicator technique and weather conditions.
Note: Application over inorganic zinc-rich primers: Apply a wet mist coat and allow tiny bubbles to form. When bubbles disappear in 1 to 2 minutes, apply a full wet coat at specified mil thickness.
Roller: Roller application optional when environmental restrictions do not allow spraying. Use 3/8" or 1/2" (9.5 mm to 12.7 mm) synthetic woven nap covers.
Brush: Recommended for small areas only. Use high quality natural or synthetic bristle brushes.

SURFACE TEMPERATURE

Minimum 50°F (10°C) Maximum 135°F (57°C)
The surface should be dry and at least 5°F (3°C) above the dew point. Coating will not cure below minimum surface temperature.

CLEANUP

Flush and clean all equipment immediately after use with the recommended thinner or MEK.

† Values may vary with color.

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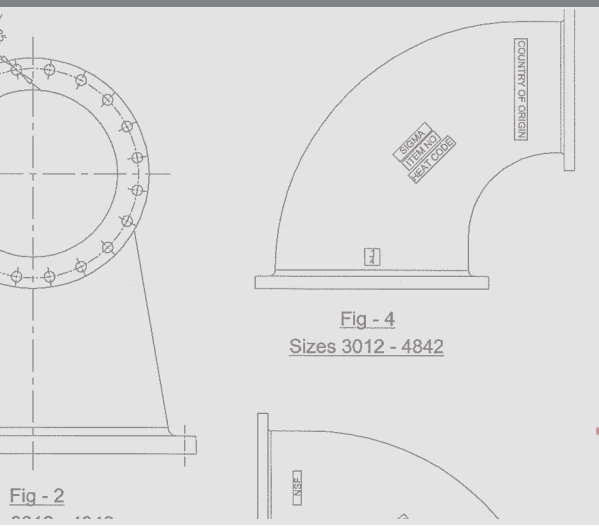
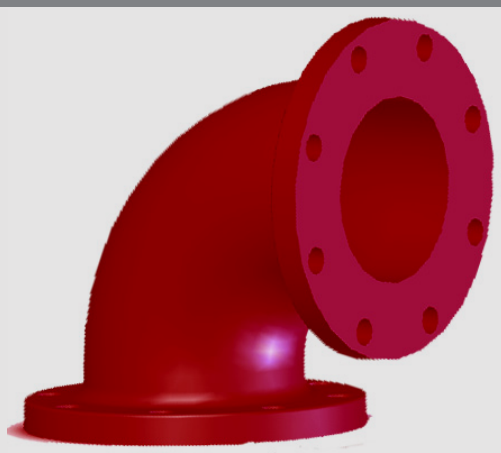
C110 Flanged Fittings





2” - 64” CAST IRON/DUCTILE IRON FLANGED FITTINGS
BASIC SPECIFICATIONS

MATERIAL:	Cast Iron: ASTM A48, Grade 25B (2” - 14”) / Grade 30B (16” - 54”) Ductile Iron ASTM A536
PRESSURE:	250 PSI Water Working Pressure for Cast Iron sizes 2” - 12” 250 PSI Water Working Pressure for Ductile Iron sizes 2” - 48” 150 PSI Water Working Pressure for Ductile Iron sizes 54” - 64” 150 PSI Water Working Pressure for Cast Iron sizes 14” - 54”
TESTING:	In accordance with ANSI / AWWA C110 / A21.10 where applicable. Other items are in accordance with manufacturer’s standards. 54” and above Flanged Fittings are manufactured as per AWWA C153/A21.53
LAYING LENGTH:	In accordance with ANSI / AWWA C110 / A21.10 where applicable. Other items are in accordance with manufacturer’s standards. 54” and above Flanged Fittings are manufactured as per AWWA C153/A21.53
CEMENT LINING:	In accordance with ANSI / AWWA C104 / A21.4 P401 Lining
COATING:	~~Tar coated (bituminous) inside in accordance with ANSI / AWWA C104 / A21.04~~ Red Primer Outside. For special conditions, other types of coatings and linings are available. Please specify when ordering.
APPROVALS:	2”-16” Underwriters Laboratories listed and Factory Mutual Approved.
STANDARDS:	ANSI / AWWA C110 / A21.10 Where applicable. Other items are in accordance with manufacturer’s standards. 54” and above Flanged Fittings are manufactured as per AWWA C153/A21.53

FM APPROVED

AWWA Member

UL

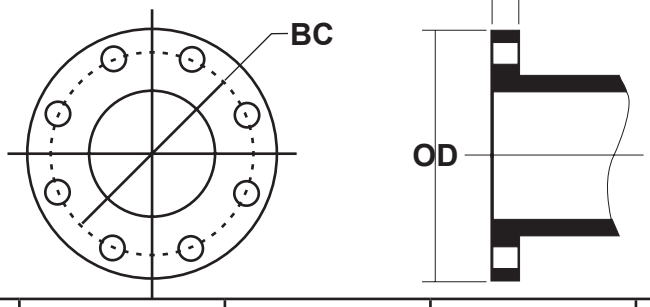
NSF Certified to ANSI/NSF 61

SIGMA Corporation
700 Goldman Drive
Cream Ridge, NJ 08514
800 999 2550 p
609 758 1163 f
crm-sales@sigmaco.com
www.sigmaco.com

Flanged Fittings

BENDS	
90 Deg Bends	2
45 Deg Bends	2
22 1/2 Deg Bends	2
11 1/4 Deg Bends	2
90 Deg Reducing Bends	3
90 Deg Long Radius Bends	3
90 Deg Base Bends	7
BLIND FLANGES - Solid and Tapped	10
CROSSES	
Size-on-size Crosses	6
Reducing Crosses	6
FLARES	
Straight Flare Pieces	11
90 Deg Flare Bends	11
90 Deg Flare Bends, Long Radius	11

REDUCERS	
Concentric Reducers	9
Eccentric Reducers	9
TEES	
Size-on-size Tees	4
Reducing Tees	5
Base Tees	7
Tees reducing on the run	4
Bullhead Tees	4
WYES	
45 Deg size-on-size Lateral Wyes	8
45 Deg Reducing Lateral Wyes	8
True Wyes	10
Boss and Tap Locations	12
Designation of Outlets	13



Size	OD	BC	T	Hole Dia.	Bolt Size	No. Bolts
2	6.00	4.75	0.62	0.75	5/8 x 2 1/2	4
3	7.50	6.00	0.75	0.75	5/8 x 2 1/2	4
4	9.00	7.50	0.94	0.75	5/8 x 3	8
5	10.00	8.50	0.94	0.88	3/4 x 3	8
6	11.00	9.50	1.00	0.88	3/4 x 3 1/2	8
8	13.50	11.75	1.12	0.88	3/4 x 3 1/2	8
10	16.00	14.25	1.19	1.00	7/8 x 4	12
12	19.00	17.00	1.25	1.00	7/8 x 4	12
14	21.00	18.75	1.38	1.12	1 x 4 1/2	12
16	23.50	21.25	1.44	1.12	1 x 4 1/2	16
18	25.00	22.75	1.56	1.25	1 1/8 x 5	16
20	27.50	25.00	1.69	1.25	1 1/8 x 5	20
24	32.00	29.50	1.88	1.37	1 1/4 x 5 1/2	20
30	38.75	36.00	2.12	1.37	1 1/4 x 6 1/2	28
36	46.00	42.75	2.38	1.62	1 1/2 x 7	32
42	53.00	49.50	2.62	1.62	1 1/2 x 7 1/2	36
48	59.50	56.00	2.75	1.62	1 1/2 x 8	44
54	66.25	62.75	3.00	2.00	1 3/4 x 8 1/2	44

PROTECTO 401

Ceramic Epoxy Lined Ductile Iron Fittings

SIGMA™

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PROTECTO 401™ CERAMIC EPOXY LINED DUCTILE IRON FITTINGS

Product Information Sheet




SIGMA's PROTECTO 401 Lined Ductile Iron Fittings with 40 mils dry film thickness provide excellent protection and the strength required to carry out the job in tough sewer pipe applications. PROTECTO 401 has been successfully used in thousands of sanitary sewer applications and has been proven with both laboratory testing and two decades of actual sewer service on all sizes of ductile Iron pipe and fittings.

PROTECTO 401 Ceramic Epoxy Lining was designed specifically for protection of ductile iron for sanitary sewer service by providing reliability similar to cement mortar lining in drinking water service but having the excellent chemical resistance of epoxy for septic sewer service.

Benefits:

Ceramic epoxy lining offers excellent resistance to abrasion, mechanical damage and chemical attack. In pipelines conveying slurries or septic sewage this coating can provide a robust effective protection enhancing the longevity of performance.

Ceramic Epoxy Coating Provides:

- High abrasion resistance
- Flexible film characteristics
- High corrosion resistance
- High dielectric strength
- Low permeability
- Class 1 fire and smoke rating
- Machinable film
- Acceptable for food contact

PROTECTO 401 has been tested and withstood:

- **Salt Spray Testing**

Two years with no undercutting on a scribed ductile iron panel when measured using ASTM B 117 and when rated using ASTM D 714 evaluating degrees of blistering.

- **20% Sulfuric Acid**

Two years with no effect when rated using ASTM D 714 evaluating degree of blistering.

- **25% Sodium Hydroxide Immersion**

At 140ºF two years with no effect when rated using ASTM D 714 evaluating degree of blistering.

- **Distilled Water Immersion**

At 160ºF two years with no effect when rated using ASTM D 714 evaluating degree of blistering.

- **Abrasion Resistance**

Less than .075mm (3 mils) loss after one million cycles on a plus 22.5º to minus 22.5º sliding aggregate slurry abrasion tester using a sharp natural siliceous gravel with a particle size between 2mm and 10 mm.

STANDARD SPECIFICATION FOR LINING DUCTILE IRON FITTINGS FOR SEWER SERVICE

I. Condition of ductile iron prior to surface preparation

All ductile iron pipe fittings shall be delivered to the application facility without asphalt, cement lining, or any other lining on the interior surface. Because removal of old linings may not be possible, the intent of this specification is that the entire interior of the ductile iron fittings shall not have been lined with any substance prior to the application of the specified lining material.

II. Lining material

The standard of quality is Protecto 401™ Ceramic Epoxy. The material shall be an amine cured novolac epoxy containing at least 20% by volume of ceramic quartz pigment. Any request for substitution must be accompanied d by a successful history of lining fittings for sewer service, a test report verifying the following properties, and a certification of the test results.

A. A permeability rating of 0.00 when tested according to Method A of ASTM E-96-66, Procedure A with a test duration of 30 days.

B. The following test must be run on coupons from factory lined ductile iron fitting:

- ASTM B-117 Salt Spray (scribed panel) - Results to equal 0.0 undercutting after two weeks.
- ASTM G-95 Cathodic Disbondment 1.5 volts @ 77°F. Results to equal no more than 0.5 mm undercutting after 30 days.
- Immersion testing rated using ASTM D-714-87.
  - 20% Sulfuric acid—No effect after two years.
  - 140°F 25% Sodium Hydroxide—No effect after two years.
  - 160°F Distilled Water—No effect after two years.
  - 120°F Tap Water (scribed panel) - 0.0 after undercutting after two years with no effect.
- ASTM G-22 90 Standard practice for determining resistance of Synthetic Polymeric materials to bacteria. The test should determine the resistance to growth of Acidithiobacillus Bacteria and should be conducted at 30 degrees centigrade for a period of 7 days on a minimum of 4 panels. The growth must be limited only to trace amounts of bacteria.

C. An abrasion resistance of no more than 3 mils

III. Application

Applicator

The lining shall be applied by a certified firm with a successful history of applying linings to the interior of ductile iron fittings. All applicators must be independently inspected at least two times per year to insure compliance with the requirements of this specification. This inspection must be coordinated and reviewed by the manufacturer of the lining material and any deviation from the application and/or quality requirements shall be corrected by the applicator. All inspections shall be in writing and a permanent record maintained.

Surface Preparation

Prior to abrasive blasting, the entire area to receive the protective compound shall be inspected for oil, grease, etc. Any areas with oil, grease, or any substance that can be removed by solvent, shall be solvent cleaned to remove those substances. After the surface has been made free of grease, oil or other substances, all areas to receive the protective compounds shall be abrasive blasted using sand or grit abrasive media. The entire surface to be lined shall be struck with the blast media so that all rust, loose oxides, etc., are removed from the surface. Only slight stains and tightly adhering oxide may be left on the surface. Any area where rust reappears before lining must be re-blasted.

Lining
After surface preparation and within 12 hours of surface preparation, the interior of the fitting shall receive 40 mils nominal dry film thickness. No lining shall take place when the substrate or ambient temperature is below 40°F. The surface also must be dry and dust free. If flange fittings are included in the project, the lining shall not be used on the face of the flange.

Coating of Bell Sockets and Spigot Ends
Due to the tolerances involved, the gasket area and spigot end up to 6 inches back from the end of the spigot end must be coated with 6 mils nominal, 10 mils maximum using Protecto 401™ Joint Compound. The Joint Compound shall be applied by brush to ensure coverage. Care should be taken that the Joint Compound is smooth without excess buildup in the gasket seat or on the spigot ends. Coating of the gasket seat and spigot ends shall be done after the application of the lining.

Number of Coats
The number of coats of lining material applied shall be as recommended by the lining manufacturer. However, in no case shall this material be applied above the dry thickness per coat recommended by the lining manufacturer in printed literature. The maximum or minimum time between coats shall be that time recommended by the lining material manufacturer. To prevent delamination between coats, no material shall be used for lining which is not indefinitely recoatable with itself without roughening of the surface.

Touch-Up and Repair
Protecto 401™ Joint Compound shall be used for touch-up or repair in accordance with manufacturer's recommendations.

IV. Inspection and certification

Inspection
All ductile iron fitting linings shall be checked for thickness using a magnetic film thickness gauge. The thickness testing shall be done using the method outlined in SSPC PA-2 Film Thickness Rating.

The interior lining of all fittings shall be tested for pinholes with a non-destructive 2,500 volt test. Any defects found shall be repaired prior to shipment. Each fitting shall be marked with the date of application of the lining system along with its numerical sequence of application on that date and records maintained by the applicator of his work.

Certification
The fitting manufacturer must supply a certificate attesting to the fact that the applicator met the requirements of this specification, and that the material used was as specified.

V. Handling

Lined fittings must be handled only from the outside of the pipe and fittings. No forks, chains, straps, hooks, etc. shall be placed inside the fittings for lifting, positioning, or laying. The fitting shall not be dropped or unloaded by rolling. Care should be taken not to let the fitting strike sharp objects while swinging or being off loaded.

Standards- Certificate of Compliance

Lonestar Pipe Fabrication's ductile iron pipe is manufactured to the following standards;

All flanged pipe is manufactured using class 53 pipe in accordance with ANSI A21.15/AWWA C115. Flanges will be drilled to meet ANSI B 16.1 Standard.

All fabricated pipe is manufactured in accordance with the requirements of AWWA C151 Standards.

Rigid grooves are the standard. Flex grooves are available when indicated. The groove depth dimension will comply with the requirements of ANSI/AWWA C606.

Cement lining is applied in accordance with the requirements of ANSI A21.4/ AWWA C104. Double cement available.

~~The exterior of the pipe will be coated with a NSF61 approved bituminous paint in accordance with ANSI A21.51, AWWA C151, AWWA C104.~~

Tnemec 66 Coating

All pipe can be coated with primer (several options available) if required. All coatings will be applied per paint manufacturer's recommendations or per contract specifications.

100% of 125# flanged pipe will be hydrostatically tested to 300 PSI prior to shipping.

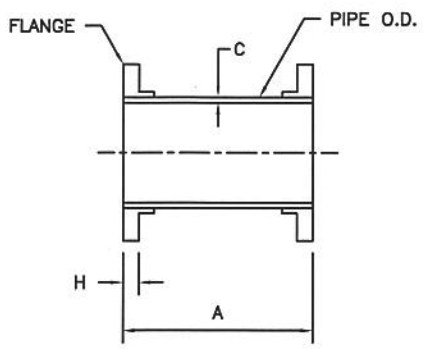
All Flanged DIP will be P401 Epoxy Lined.
P401 Information to follow.

Steven Mackenrodt
President

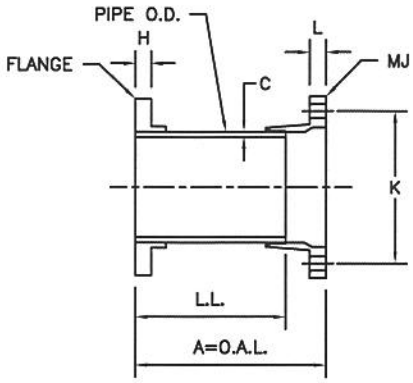
LONESTAR PIPE FABRICATION

211 Sansom Blvd, Saginaw, TX 76179 Phone: 817.439.5575 Fax: 817.439.3738 www.lonestarpipe.com

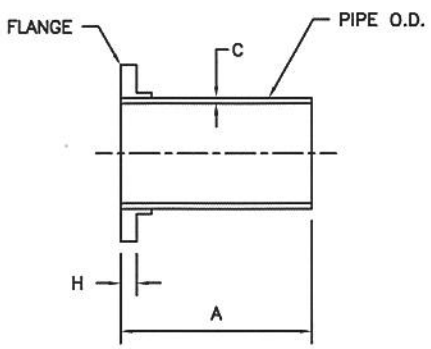
Fabricated Flanged Pipe



FLG X FLG



FLG X MJ



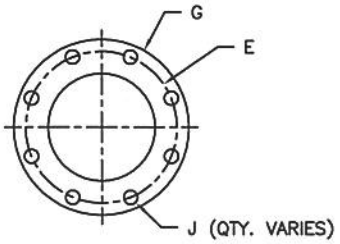
FLG X PE

SIZE	A	C	O.D.		E	G	H		NO. OF FLG'D BOLT HOLES	J	K		L	
			MIN.	MAX.			MIN.	MAX.			MIN.	MAX.	MIN.	MAX.
3	*	0.31	3.90	4.02	6.00	7.50	0.63	0.87	4	0.75	6.13	6.25	0.88	0.94
4	*	0.32	4.74	4.86	7.50	9.00	0.82	1.06	8	0.75	7.44	7.56	0.94	1.00
6	*	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	*	0.36	8.99	9.11	11.75	13.50	1.00	1.24	8	0.875	11.69	11.81	1.04	1.12
10	*	0.38	11.04	11.16	14.25	16.00	1.07	1.31	12	1.00	13.94	14.06	1.11	1.19
12	*	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
14	*	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
16	*	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
18	*	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
20	*	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
24	*	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
30	*	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

36" - 48" available upon request.

* As needed
** LL= lay length/ OAL= overall length

1. FLG x FLG tolerance on length +/- 0.125"
2. FLG x PE tolerance on length ≠ 0.25"
3. Ductile iron pipe will have threaded on ductile iron flanges.
4. The mechanical joint bell for 30" ductile iron pipe have thicknesses different from ANSI A21.11.
5. This is submittal material only.
6. 250 # flanges available upon request.
7. Wall rings available upon request



FLANGE DETAIL
APPLICABLE TO ALL 125 LB. FLANGES SHOWN ABOVE

LONESTAR PIPE FABRICATION

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INDURON
PROTECTIVE COATINGS
Look Beneath the Surface.

PROTECTO 401™ Ceramic Epoxy

STANDARD SPECIFICATION FOR LINING DUCTILE IRON PIPE FOR SEWER SERVICE

I. CONDITION OF DUCTILE IRON PRIOR TO SURFACE PREPARATION

All ductile pipe and fittings shall be delivered to the application facility without asphalt, cement lining, or any other lining on the interior surface. Because removal of old linings may not be possible, the intent of this specification is that the entire interior of the ductile iron pipe and fittings shall not have been lined with any substance prior to the application of the specified lining material and no coating shall have been applied to the first six inches of the exterior of the spigot ends.

II. LINING MATERIAL

The standard of quality is Protecto 401™ Ceramic Epoxy. The material shall be an amine cured novolac epoxy containing at least 20% by volume of ceramic quartz pigment. Any request for substitution must be accompanied by a successful history of lining pipe and fittings for sewer service, a test report verifying the following properties, and a certification of the test results.

A. A permeability rating of 0.00 when tested according to Method A of ASTM E-96-66, Procedure A with a test duration of 30 days.

B. The following test must be run on coupons from factory lined ductile iron pipe:

* ASTM B-117 Salt Spray (scribed panel) - Results to equal 0.0 undercutting after two years.
* ASTM G-95 Cathodic Disbondment 1.5 volts @ 77°F. Results to equal no more than 0.5 mm undercutting after 30 days.
* Immersion testing rated using ASTM D-714-87.
  —20% Sulfuric acid—No effect after two years.
  —140°F 25% Sodium Hydroxide—No effect after two years.
  —160°F Distilled Water—No effect after two years.
  —120°F Tap Water (scribed panel)—0.0 undercutting after two years with no effect.
* ASTM G-22 90 Standard practice for determining resistance of Synthetic Polymeric materials to bacteria. The test should determine the resistance to growth of Acidithiobacillus Bacteria and should be conducted at 30 degrees centigrade for a period of 7 days on a minimum of 4 panels. The growth must be limited only to trace amounts of bacteria.

C. An abrasion resistance of no more than 3 mils (.075 mm) loss after one million cycles using European Standard EN 598: 1994 Section 7.8 Abrasion Resistance.

III. APPLICATION

Applicator

The lining shall be applied by a certified firm with a successful history of applying linings to the interior of ductile iron pipe and fittings. All applicators must be independently inspected at least two times per year to insure compliance with the requirements of this specification. This inspection must be coordinated and reviewed by the manufacturer of the lining material and any deviation from the application and/or quality requirements shall be corrected by the applicator. All inspections shall be in writing and a permanent record maintained.

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Surface Preparation

Prior to abrasive blasting, the entire area to receive the protective compound shall be inspected for oil, grease, etc. Any areas with oil, grease, or any substance that can be removed by solvent, shall be solvent cleaned to remove those substances. After the surface has been made free of grease, oil or other substances, all areas to receive the protective compounds shall be abrasive blasted using sand or grit abrasive media. The entire surface to be lined shall be struck with the blast media so that all rust, loose oxides, etc., are removed from the surface. Only slight stains and tightly adhering oxide may be left on the surface. Any area where rust reappears before lining must be re-blasted.

Lining

After surface preparation and within 12 hours of surface preparation, the interior of the pipe shall receive 40 mils nominal dry film thickness. No lining shall take place when the substrate or ambient temperature is below 40°F. The surface also must be dry and dust free. If flange pipe or fittings are included in the project, the lining shall not be used on the face of the flange.

Coating of Bell Sockets and Spigot Ends

Due to the tolerances involved, the gasket area and spigot end up to 6 inches back from the end of the spigot end must be coated with 6 mils nominal, 10 mils maximum using Protecto 401™ Joint Compound. The Joint Compound shall be applied by brush to ensure coverage. Care should be taken that the Joint Compound is smooth without excess buildup in the gasket seat or on the spigot ends. Coating of the gasket seat and spigot ends shall be done after the application of the lining.

Number of Coats

The number of coats of lining material applied shall be as recommended by the lining manufacturer. However, in no case shall this material be applied above the dry thickness per coat recommended by the lining manufacturer in printed literature. The maximum or minimum time between coats shall be that time recommended by the lining material manufacturer. To prevent delamination between coats, no material shall be used for lining which is not indefinitely recoatable with itself without roughening of the surface.

Touch-Up and Repair

Protecto 401™ Joint Compound shall be used for touch-up or repair in accordance with manufacturer's recommendations.

IV. INSPECTION AND CERTIFICATION

Inspection

All ductile iron pipe and fitting linings shall be checked for thickness using a magnetic film thickness gauge. The thickness testing shall be done using the method outlined in SSPC PA-2 Film Thickness Rating.

The interior lining of all pipe barrels and fittings shall be tested for pinholes with a non-destructive 2,500 volt test. Any defects found shall be repaired prior to shipment.

Each pipe joint and fitting shall be marked with the date of application of the lining system along with its numerical sequence of application on that date and records maintained by the applicator of his work.

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Certification

The pipe or fitting manufacturer must supply a certificate attesting to the fact that the applicator met the requirements of this specification, and that the material used was as specified.

V. HANDLING

Lined pipe and fittings must be handled only from the outside of the pipe and fittings. No forks, chains, straps, hooks, etc. shall be placed inside the pipe and fittings for lifting, positioning, or laying. The pipe shall not be dropped or unloaded by rolling.

Care should be taken not to let the pipe strike sharp objects while swinging or being off loaded. Ductile iron pipe should never be placed on grade by use of hydraulic pressure from an excavator bucket or by banging with heavy hammers.

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Kennedy Swing Check Valves

A.W.W.A. C508 was developed in 1976 to set a standard for the manufacture, testing and application of Iron Body Bronze Mounted (IBBM) Check Valves. The valves are designed with an iron body and include either metal-to-metal or composition-to-metal seating.

Kennedy Swing Check Valves are designed and manufactured in conformance with A.W.W.A. C508 and are for use on water, oil and gas lines. Under certain circumstances where it is desirable to have more positive control of the closing of the disc, the valves can be supplied with either lever-and-spring or lever-and-weight. For restricted spacing requirements Kennedy Valve manufactures a Wafer Check Valve that also helps to control water hammer.

Features

Swing Check Valve-AWWA

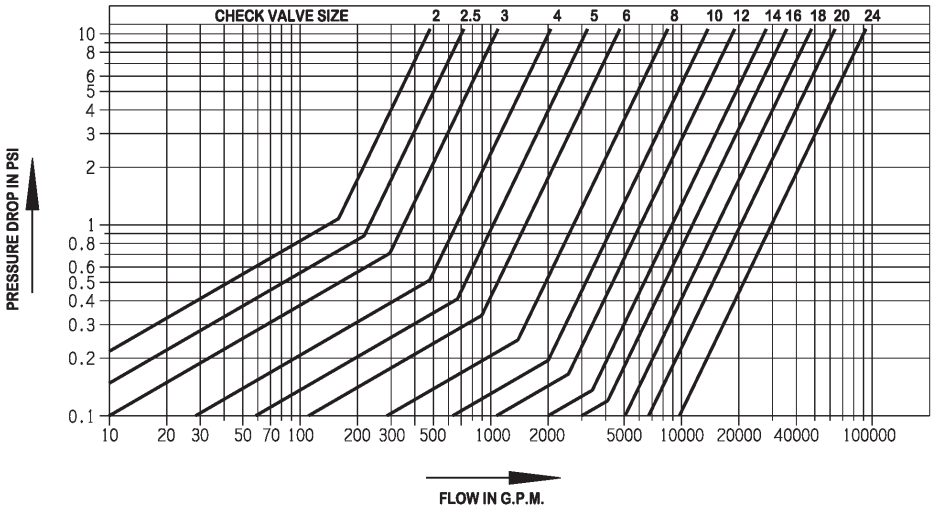
- Stainless steel hinge pin.
- Working parts are removable through the top of the valve.
- Tapped bosses available.
- Available with lever-and-spring or lever-and-weight.
- Double bronze side plug construction.
- Bodies are made of high strength cast iron with reinforced flanges - ANSI B 16.1/125 # flanges.
- May be installed in a vertical line with the flow up.

	2"-12"
• Figure #1106 Series	
Test Pressure - Seat and Shell	400 PSI
Working Pressure - non-shock CWP	200 PSI

	14"-24"
• Figure #106 Series	
Test Pressure - Seat and Shell	300 PSI
Working Pressure - non-shock CWP	150 PSI

FLOW VERSUS PRESSURE DROP

Data Representative of Kennedy Figure 1106 and 1106A Swing Check Valves



Certified to NSF/ANSI 61-G

Sizes 2" - 12"

KENNEDY CHECK VALVES

It is generally recommended, that when using Kennedy swing check valves, that you locate the valve at least 5 to 10 pipe diameters down stream from any flow disturbance or obstruction (valve, pump, elbow, reducer, etc.). Turbulence close to the check valve may result in valve "chatter" resulting in premature failure of the check valve.

As stated in AWWA C508, *"Conditions of water hammer, hydraulic pulsation, and excessive operating noise are results of system design rather than valve design and are beyond the scope of this standard and require special design and construction considerations."*

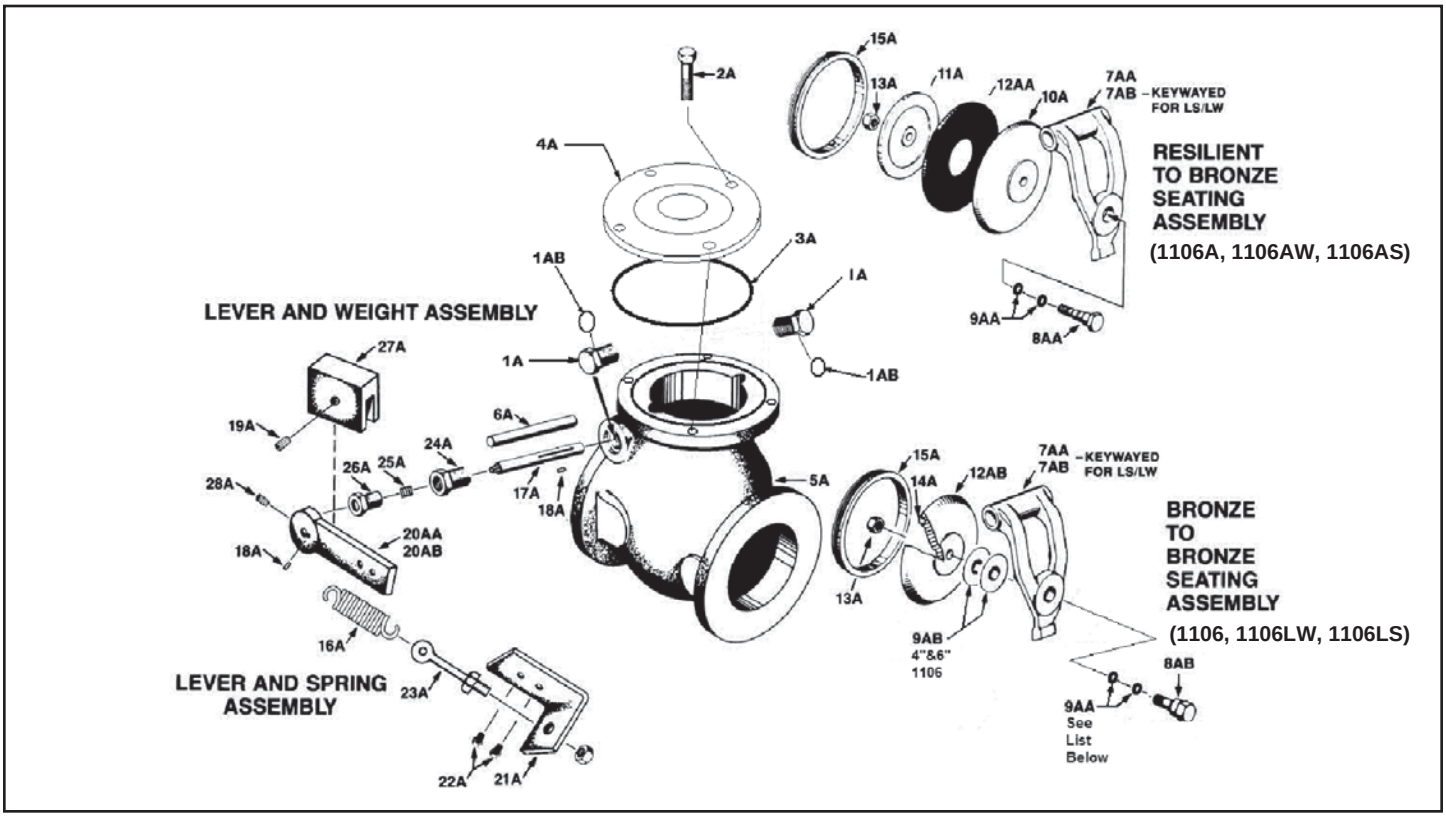
AWWA

SWING CHECK VALVES 2"-12"
TECHNICAL DATA & PARTS LIST

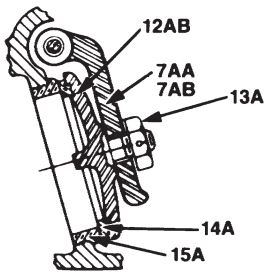
KENNEDY VALVE

Resilient/Bronze - Figure # 1106A, 1106AW, 1106AS

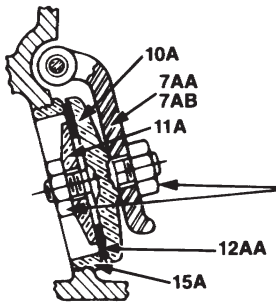
Bronze/Bronze - Figure # 1106, 1106LW, 1106LS



Disc Arrangement 2″- 3″



BRONZE DISC



RESILIENT DISC

Part No.	Qty.	Description	Material & ASTM Spec.
1A With 1AB (O-Ring)	2 1 for LS/LW	Side Plug With O-Ring	Bronze
2A	* SEE FOOT NOTE	Cap Bolts	Stainless Steel, ASTM F593C (18-8)
3A	1	O-Ring	Syn. Rubber
4A	1	Cap	Cast Iron, ASTM A126 Class B
5A	1	Body	Cast Iron, ASTM A126 Class B
6A	1	Hinge Pin	SS A-276 (304)
7AA	1	Hinge	Bronze (2'-3") D.I. A-536 (4"-12")
7AB	1	Hinge w/keyway for LS/LW	Bronze (2"-3") Ductile Iron ASTM A536 (4"-12")
8AA	1	Disc Bolt (4"-12")	Bronze (4"-12")
8AB	1	Disc Bolt (4"-12")	Bronze (10"-12") Steel (4"-8")
9AA	2	Disc Bolt O-Ring (4"-12" 1106A, 8"-12" 1106)	Syn. Rubber
9AB	2	Disc Bolt Gasket (4" & 8" 1106)	
10A	1	Disc Holder	Bronze (2"-3") *** Cast Iron, ASTM A126 Class B (4"-12")
11A	1	Disc Plate	Bronze
12AA	1	Disc	Nitrile (Buna N) Rubber
12AB**	1	Disc	Bronze (2"-3") *** Cast Iron, ASTM A126 Class B (4"-12")
13A	1 2 w/resilient disc (2"-3")	Disc Nut	Stainless Steel, ASTM F593C (18-8)
14A**	1	Disc Ring (4"-12") --- (2"-3")***	Bronze
15A	1	Seat Ring	Bronze
16A	1	Spring	Steel
17A	1	Extended Hinge Pin for LS/LW	Stainless Steel, ASTM A-276 (304)
18A	2	Key for LS/LW	Stainless Steel, ASTM A-276 (304
19A	1	Set Screw	Steel
20AA	1	Lever Arm for LS	Steel
20AB	1	Lever Arm for LW	Steel
21A	1	Bracket	Steel
22A	2	Hex Head Bracket Bolt	Steel
23A	1	Eye Bolt w/2 Hex Nuts	Steel
24A	1	Stuffing Box	Bronze
25A	-	Packing	Graphite Filled
26A	1	Gland	Bronze
27A	1	Weight	Cast Iron, ASTM A126 Class B
28A	1	Set Screw	Steel

* Qty of cover bolts, 2"-8" = 4 bolts, 10"-12" = 6 bolts.
** Denotes that part is available only as part of an assembly.
***Cast integral (2"-3").

Dimensional Data 2"-12" 1106/1106LW/106LS

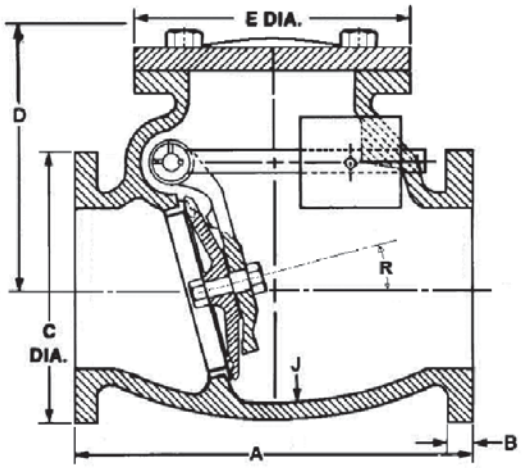
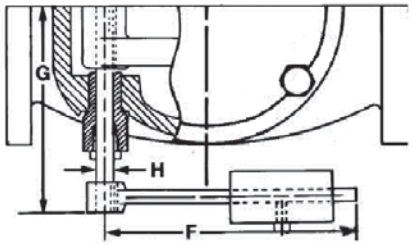


FIG. 1106LW SHOWN. SAME DIMENSIONS APPLY TO 1106 AND 1106LS

DETAIL LW/LS



L—BOLT CIRCLE DIA. END FLANGES
M—NO. OF BOLTS PER FLAT END FLANGES
N—BOLT HOLE DIA.
END FLANGES CONFORM TO ANSI B16.1

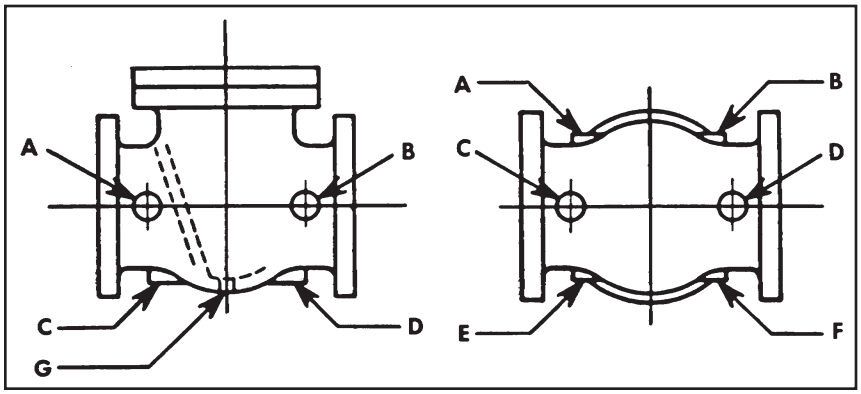
	*A		B		C		D		E		F		G		H		J		L		M		N		R	
SIZE	inch	*mm*	inch	*mm*	inch	*mm*	inch	*mm*	inch	*mm*	inch	*mm*	inch	*mm*	inch	*mm*	inch	*mm*	inch	*mm*	inch	*mm*	inch	*mm*	inch	*mm*
2"	8.00	*203*	0.65	*17*	6.00	*152*	6.00	*152*	6.56	*167*	6.50	*165*	4.72	*120*	0.50	*13*	0.34	*9*	4.75	*121*	4	*102*	0.75	*19*	10.00	*254*
2 1/2"	8.50	*216*	0.69	*18*	7.00	*178*	6.44	*164*	6.56	*167*	6.50	*165*	4.94	*125*	0.50	*13*	0.41	*10*	5.50	*140*	4	*102*	0.75	*19*	8.00	*203*
3"	9.50	*241*	0.78	*20*	7.50	*191*	6.85	*174*	6.56	*167*	6.50	*165*	5.34	*136*	0.50	*13*	0.44	*11*	6.00	*152*	4	*102*	0.75	*19*	8.00	*203*
4"	11.50	*292*	1.00	*25*	9.00	*229*	8.69	*221*	9.00	*229*	7.75	*197*	8.19	*208*	0.62	*16*	0.41	*10*	7.50	*191*	8	*203*	0.75	*19*	12.00	*305*
6"	14.00	*356*	1.03	*26*	11.00	*279*	10.51	*267*	11.00	*279*	9.75	*248*	9.00	*229*	0.75	*19*	0.43	*11*	9.50	*241*	8	*203*	0.87	*22*	15.00	*381*
8"	19.50	*495*	1.25	*32*	13.50	*343*	12.56	*319*	13.50	*343*	14.13	*359*	10.18	*259*	0.87	*22*	0.75	*19*	11.75	*298*	8	*203*	0.87	*22*	15.00	*381*
10"	24.50	*622*	1.31	*33*	16.00	*406*	14.07	*357*	16.75	*425*	18.00	*457*	11.62	*295*	1.00	*25*	0.81	*21*	14.25	*362*	12	*305*	1.00	*25*	15.00	*381*
12"	27.50	*699*	1.38	*35*	19.00	*483*	16.13	*410*	19.00	*483*	18.00	*457*	13.75	*349*	1.00	*25*	0.87	*22*	17.00	*432*	12	*305*	1.00	*25*	15.00	*381*

BODY MARKINGS

(ONE SIDE)	(OPPOSITE SIDE)
A.W.W.A. KENNEDY	FIG. NO. 200 W

CAP MARKINGS

YEAR
KENNEDY
SIZE



BOSS AND DRAIN TAPPING SCHEDULE

VALVE SIZE (In.)	2-3½	4-5	6	8,10,12
MAX. SIZE PIPE TAP (NPT)	¾	1	1¼	2

When ordering Check Valves tapped for by-pass or drain, specify exact location and size of tap using letters above for boss designation. These locations of drain and by-pass tappings conform to the Manufacturers Standardization Society (MSS SP-45 current edition).

PRATT®

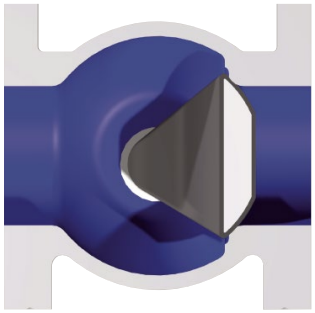
a MUELLER brand

BALLCENTRIC® PLUG VALVE

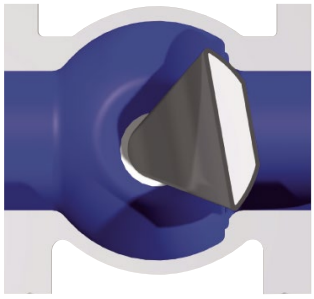
Engineering Creative Solutions for Fluid Systems Since 1901

MUELLER

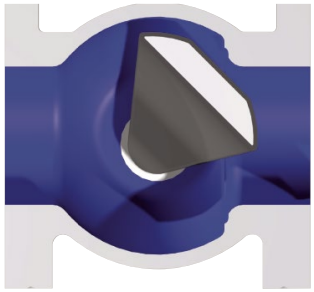
FEATURES AND BENEFITS



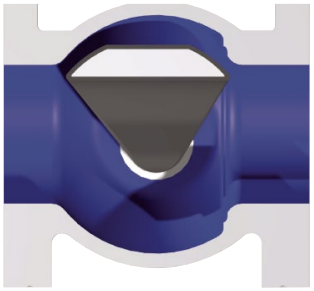
- Valve in closed position for bubble tight shut-off
- Normal flow direction gives pressure assisted sealing
- Torques are low even in reverse flow



- Plug rotates away from the seat for instant opening
- Seat wear and operating torque reduced
- No further seat contact until valve is closed again



- Design of Ballcentric® plug valve allows modulating control over the full 90° travel
- Ideally suited for balancing service
- Standard rotary valve provides control and tight shut off in one valve



- Plug is out of flow path when fully open
- Straight through, uninterrupted smooth flow
- Round port reduces turbulence and erosion, lowers pumping costs and can be "pigged" to clean the pipeline

INSTALLATION

The Ballcentric® plug valve is suitable for flow and shut-off in either direction. Seat end downstream is the preferred orientation and any reverse flow requirement should be stated at the time of order. For use on fluids with suspended solids, it is recommended that the valve should be installed with the seat upstream and the valve stem horizontal with plug rotation to the top of the valve ensuring smooth operation.

IN-LINE MAINTENANCE

In the unlikely event of stem leakage, the stem seals can be easily replaced without removing the bonnet. Access to the body for cleaning or inspection does not require removal from the line.

MODULAR CONSTRUCTION

Design of the bonnet and stem allows for on-site adaption of gear operators, power actuators, or extension devices on to standard valves. Conversion can be easily undertaken without removing the valve bonnet, thereby minimizing downtime.

POWER OPERATION

Pneumatic, electric or hydraulic operation is available, complete with accessories such as limit switches, solenoid valves and positioners when required.

DIMENSIONAL DATA

ORDERING INFORMATION

VALVE TYPES	DESIGNATION
Mechanical Joint Cast Iron	600
Mechanical Joint Ductile Iron	620
ANSI 125 Flanged Cast Iron Flat Face	601
ANSI 125 Flanged Ductile Iron Flat Face	611
ANSI 150 Flanged Ductile Iron Raised Face	621
ANSI 250 Flanged Ductile Iron Raised Face	602
ANSI 125 Grooved for Steel Pipe	606S
ANSI 125 Grooved for Ductile Pipe	606D
ANSI 150 Flanged 316SS	601S
SEAT	
Nickel (3″ & Larger)	N
Epoxy (2-1/2″ ONLY)	E
316SS (On Stainless Steel Valve ONLY)	S
Rubberlined	RL
Glasslined	GL
ELASTOMER TRIM	
EPDM	0
Buna-Nitrile	1
Viton	2
Neoprene	3
Natural	4
MANUAL OPERATORS	
Above Ground Gear and Handwheel	AGHW
Above Ground Gear with 2″ Nut	AGNUT
Buried Gear with 2″ Nut	BG
Memory Stop Gear with Handwheel	MGHW
Lever / Wrench (8″ & smaller)	L
Direct Nut (8″ & smaller)	TC

Example: 4″ 601N3AGHW = 4″ ANSI 125 Flanged, Nickel Seat, Neoprene plug with Above Ground Gear and Handwheel.

Valves are only tested for bi-directional shut-off if specified at time of order. Contact Pratt for bi-directional ratings.

Note: We recommend mechanical joint or buried flanged valves to have gear operators.

Note: We recommend valves for bi-directional service to have gear operators.

PRESSURE RATING		
12″ and Smaller	ANSI 125	175 psi
14″ and Larger	ANSI 125	150 psi
14″ and Larger	ANSI 150	235 psi
20″ and Smaller	ANSI 150	285 psi
12″ and Smaller	ANSI 250	400 psi
14″ and Larger	ANSI 250	300 psi

Body Hydrotest = 150% of Rated Pressure / Seat Test = 100% of Rated Pressure Testing per AWWA C517

ELASTOMERS AVAILABLE FOR BALLCENTRIC® PLUG VALVE

Natural rubber is also available.

NITRILE

A general purpose material sometimes referred to as BUNA-N or HYCAR with a –20°F to 212°F temperature range. Used on sewage, water, hydrocarbon and mineral oils.

EPDM

An excellent polymer for use on chilled water through to LP steam applications having a temperature range of –35°F to 250°F. Resistance to many acids, alkalies, detergents, phosphate esters, alcohols and glycols is an added benefit.

NEOPRENE

This versatile material shows outstanding resistance to abrasion and ozone. Chemical resistance to a wide range of petroleum base products and dilute acids and alkalies. Temperature range –20°F to 225°F.

VITON

Retention of mechanical properties at high temperature is an important feature of this elastomer: temperature range is –10°F to 300°F. It also has excellent resistance to oils, fuels, lubricants and most mineral acids and aromatic hydrocarbons.

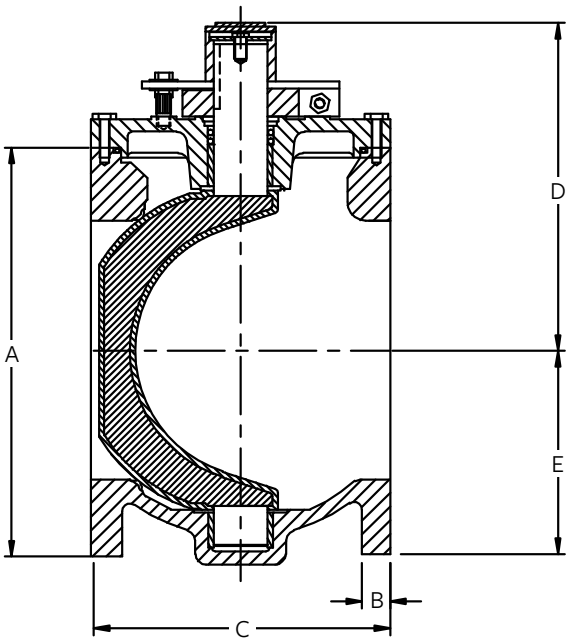
Note: Not for water or steam applications.

ELASTOMER SELECTION CHART

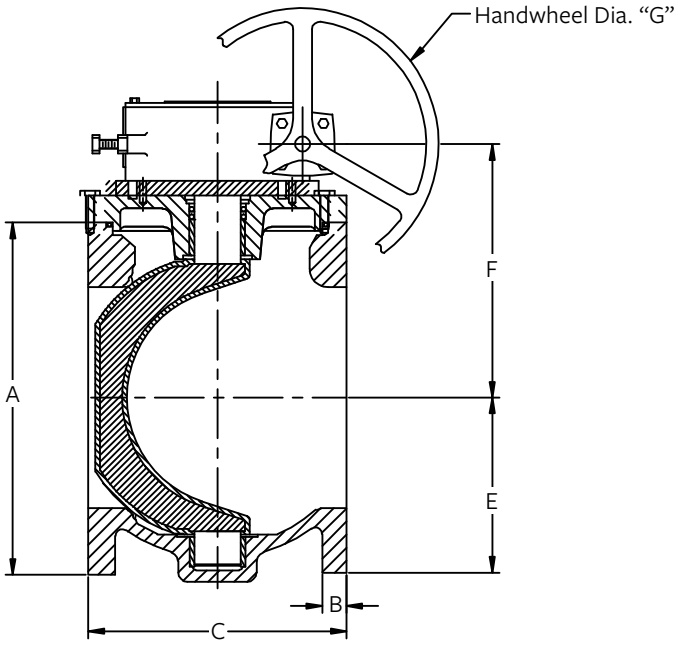
SERVICE	ELASTOMER	AVERAGE USEFUL TEMP. RANGE	SERVICE	ELASTOMER	AVERAGE USEFUL TEMP. RANGE	SERVICE	ELASTOMER	AVERAGE USEFUL TEMP. RANGE
Acetone	EPDM	–35°F to 250°F	Cement Slurry	EPDM	–35°F to 250°F	Oil, Animal	Nitrile	–20°F to 212°F
Alcohol AMYL	EPDM	0°F to 212°F	Copper Sulphate	EPDM	–35°F to 250°F	Oil, Mobil Therm Light	Viton	10°F to 250°F
Alcohol Aromatic	Viton	10°F to 250°F	Creosote (Coal)	Nitrile	–20°F to 212°F	Oil, Mobil Therm 600	Viton	10°F to 250°F
Alcohol Butyl	Neoprene	–20°F to 225°F	Coal Slurry	Nitrile	–20°F to 212°F	Oil, Mobil Therm 603	Nitrile	–20°F to 212°F
Alcohol Denatured	Nitrile	–20°F to 212°F	Diesel Fuel No. 3	Nitrile	–20°F to 212°F	Oil, Lubricating	Nitrile	–20°F to 212°F
Alcohol Ethyl	EPDM	–20°F to 250°F	Diethylene Glycol	EPDM	–35°F to 250°F	Oil, Vegetable	Nitrile	–20°F to 212°F
Alcohol Grain	Nitrile	–20°F to 212°F	Ethylene Glycol	EPDM	–35°F to 250°F	Paint, Latex	Nitrile	–20°F to 212°F
Alcohol Isopropyl	Neoprene	–20°F to 225°F	Fatty Acid	Nitrile	–20°F to 212°F	Phosphate Ester	EPDM	–35°F to 250°F
Alcohol Methyl	EPDM	–20°F to 250°F	Fuel Oil No. 2	Nitrile	–20°F to 212°F	Propane	Nitrile	–20°F to 212°F
Ammonia Anhydrous	Neoprene	–20°F to 225°F	Fertilizer Liquid H4N2O2	EPDM	–35°F to 250°F	Rape Seed Oil	EPDM	–35°F to 250°F
Ammonium Nitrate	EPDM	–20°F to 250°F	Gasoline Keg	Nitrile	–20°F to 212°F	Sewage with Oils	Nitrile	–20°F to 212°F
Ammonia, Water	EPDM	–20°F to 250°F	Gas Natural	Nitrile	–20°F to 212°F	Sodium Hydroxide 20%	EPDM	–35°F to 250°F
Animal Fats	Nitrile	–20°F to 212°F	Glue, Animal	Nitrile	–20°F to 212°F	Starch	EPDM	–35°F to 250°F
Black Liquor	EPDM	–20°F to 250°F	Green Liquor	EPDM	–20°F to 212°F	Steam to 250°F	EPDM	–35°F to 250°F
Blast Furnace Gas	Neoprene	–20°F to 225°F	Hydraulic Oil (Petro)	Nitrile	–20°F to 212°F	Stoddard, Solvent	Nitrile	–20°F to 80°F
Butane	Nitrile	–20°F to 212°F	Hydrogen	Nitrile	–20°F to 212°F	Sulphuric Acid 10% 50%	Neoprene	–20°F to 158°F
Bunker Oil "C"	Nitrile	–20°F to 212°F	JF4, JP5	Viton	–20°F to 212°F	Sulphuric Acid 100%	Viton	10°F to 300°F
Calcium Chloride	EPDM	–20°F to 250°F	Kerosene	Nitrile	0°F to 212°F	Trichloroethylene Dry	Viton	10°F to 300°F
Carbon Dioxide	EPDM	–20°F to 250°F	Ketone	EPDM	–35°F to 250°F	Triethanol Amine	EPDM	–35°F to 250°F
Carbon Monoxide (Cold)	Neoprene	–20°F to 150°F	Lime Slurry	EPDM	–35°F to 250°F	Varnish	Viton	10°F to 300°F
Carbon Monoxide (Hot)	Viton	10°F to 300°F	Methane	Nitrile	–20°F to 212°F	Water, Fresh	EPDM	–35°F to 250°F
Carbon Tetrachloride	Viton	10°F to 300°F	Methyl Ethyl Ketone	EPDM	–35°F to 250°F	Water, Salt	EPDM	–35°F to 250°F
Caustic Soda	EPDM	–35°F to 250°F	Naptha (Berzin)	Nitrile	–20°F to 212°F	Xylene	Viton	10°F to 300°F

Note: Above elastomer / temperature chart are guidelines only. Contact Pratt for specific applications.

FIG. 601 CAST IRON / 611 DUCTILE IRON – FLANGED END (175 PSI) / 621 DUCTILE IRON RAISED FACE (285 PSI) 2 1/2" – 12"



2-1/2" – 8" VALVES ONLY



2-1/2" – 12" VALVES

FLANGED END – ANSI 125

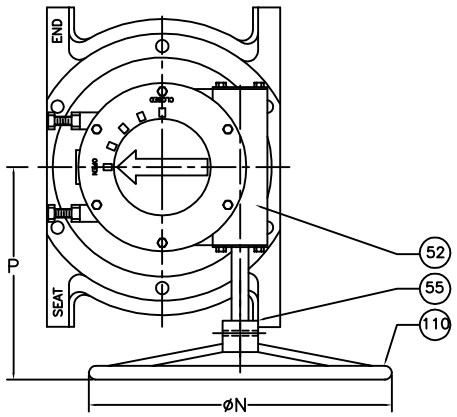
SIZE	2.50	3	4	5	6	8	10*	12*
A	7.00	7.50	9.00	10.00	11.00	13.50	16.00	19.00
B	.69	.75	.94	.94	1.00	1.13	1.19	1.25
C	7.50	8.00	9.00	10.00	10.50	11.50	13.00	14.00
D	6.19	6.19	7.25	8.38	8.38	10.69	—	—
E	3.50	3.75	4.50	5.75	5.75	7.63	8.88	10.00
F	5.35	5.35	6.31	7.56	7.56	9.63	11.13	12.81
G	6.00	6.00	6.00	6.00	6.00	12.00	12.00	12.00
WEIGHT (approx.)	30	40	70	105	115	190	345**	440**

*10" & above have gear operators as standard
**Weight includes gear operator
Note: Drawings are for information purposes only; please request certified drawings before preparing piping diagrams

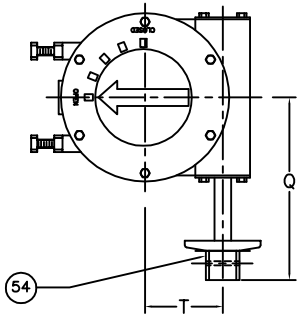
SIZE	GEAR	# OF TURNS
2.5"	30:1	7 1/2
3"	30:1	7 1/2
4"	30:1	7 1/2
5"	30:1	7 1/2
6"	30:1	7 1/2
8"	50:1	12 1/2
10"	80:1	20
12"	80:1	20

VALVE SIZE	GEAR SIZE & RATIO	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	S	T
2.5	M1 (30:1)	7.5	3.41	3.50	2.5	5.50	7.00	0.75	4	--	–	0.69	3	6	7.63	6.56	2.00	2.00
3	M1 (30:1)	8	3.41	3.75	3	6.00	7.50	0.75	4	--	–	0.75	3	6	7.63	6.56	2.00	2.00
4	M3 (30:1)	9	4.38	4.50	4	7.50	9	0.75	6	0.63	2	0.94	3	6	9.50	8	2.00	2.56
5	M3 (30:1)	10	5.63	5.75	5	8.50	10	0.88	6	0.75	2	0.94	3	6	9.50	8	2.00	2.56
6	M3 (30:1)	10.50	5.63	5.75	6	9.50	11	0.88	6	0.75	2	1	3	6	9.50	8	2.00	2.56
8	M5 (50:1)	11.50	7.56	7.63	8	11.75	13.50	0.88	6	0.75	2	1.13	6	12	11.25	8	2.25	3.16
10	M8 (80:1)	13	9.25	8.88	10	14.25	16	1	8	0.88	4	1.19	6	12	11.63	10	2.00	4.63
12	M8 (80:1)	14	10.88	10	12	17.00	19	1	8	0.88	4	1.25	6	12	11.63	10	2.00	4.63

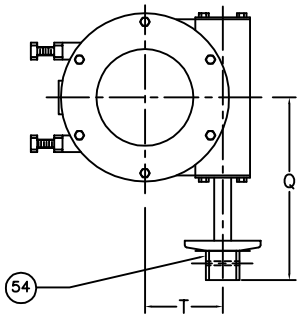
ABOVE GROUND GEAR W/ HANDWHEEL OPTION

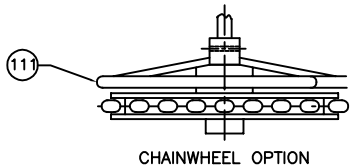


ABOVE GROUND GEAR W/ 2" NUT OPTION

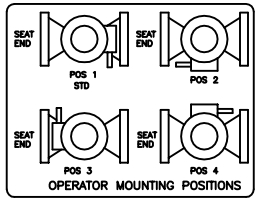


BURIED GEAR W/ 2" NUT OPTION

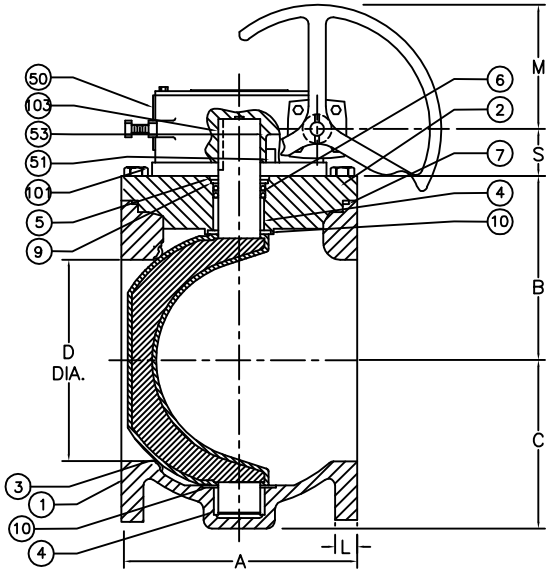


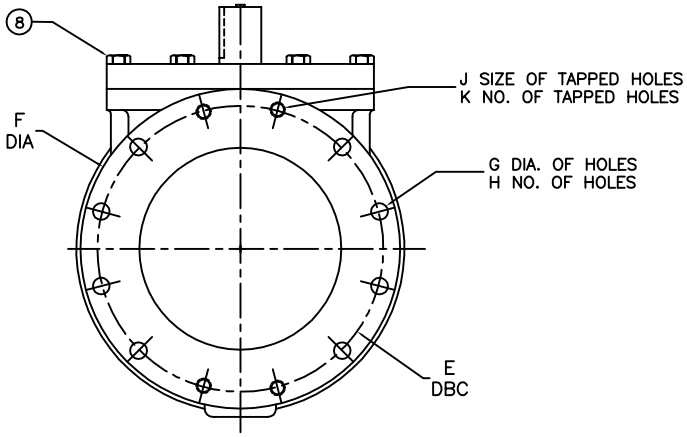


CHAINWHEEL OPTION



OPERATOR MOUNTING POSITIONS





*RISER RING IS ONLY ON 2-1/2" TO 8" VALVE

ITEM	QTY	DESCRIPTION	MATERIAL
111	1	CHAINWHEEL	DUCTILE IRON
110	1	SPRING PIN	STEEL
*103	1	KEY	STEEL
101	1	RISER RING	STEEL
55	1	HANDWHEEL	DUCTILE IRON
54	1	2" NUT	DUCTILE IRON
53	2	SLEEVE BEARING	BRONZE
52	1	WORM GEAR	STEEL
51	1	QUAD GEAR	DUCTILE IRON
50	1	HOUSING	
10	2	GRIT SEAL	PTFE
9	1	SEAL RETAINING RING	BRASS
8	AR	H.H. CAP SCREW	☐STEEL ☐STN. STEEL
7	1	O-RING	ELAS AS SPEC.
6	2	U-CUP SEAL	ELAS AS SPEC.
5	1	SNAP RING	SPRING STEEL
4	2	SLEEVE BEARING	STN. STEEL
3	1	PLUG ELASTOMER AS SPEC.	DUCTILE IRON
2	1	CAP	CAST IRON
1	1	BODY	CAST IRON

ISSUE NUM.

	DATE	REVISIONS	BY	CHK
4	02/10	ITEM 50 MATERIAL CHANGED FROM CAST TO DUCTILE IRON [ECR# 252]	JC	JC
5	09/10	REMOVED DATA FOR 14" [ECR # 354]	TF	TF
6	05/12	CORRECTION IN "B" & "S" DIM. [ECR# 584]	AA	AA
7	01/13	ADDED ITEM 10 AND BOM UPDATE	JC	JC
8	01/13	B.O.M. STANDARIZATION ITEM 10 NOW 8	AA	AA
9	08/17	ERROR IN 2.5 & 3 DIM TABLE	AA	AA
10	01/18	ADDED AG GEAR W/ NUT OPTION	JCL	JL

PRATT

BY	DATE	SCALE
CR	10/95	NONE
CHK'D		DIM.
AJ		INCHES

TITLE:

FIG.601
2-1/2" TO 12" MILLCENTRIC PLUG VALVE, FLANGED, GEAR OPERATED, w/HANDWHEEL, 2" NUT, OR CHAINWHEEL OPTION

DWG. NO. HP49110

TECHNICAL SPECIFICATION

Ballcentric® Series 601 / 600 Plug Valves

AWWA C-517 STANDARDS

Valves shall be of the non-lubricated eccentric type with an elastomer covering all seating surfaces. The elastomer shall be suitable for the service intended. Flanged valves shall be manufactured in accordance with **ANSI B16.1 Class 125 / 150** including facing, drilling and flange thickness. Mechanical joint ends shall be in compliance with **AWWA / ANSI C-111**. Grooved ends shall be manufactured to the dimensions of **ANSI / AWWA C606** for ductile or steel pipe as required. Ports shall be round on sizes 2-1/2″-12″ and rectangular port design on valves 14″ and larger. All valves shall be capable of being "pigged" with a soft pig when required.

Valve bodies shall be of **ASTM A-126 Class B** cast iron and thickness in accordance with **AWWA C-517 Section 4.4.1.4**. Valves 3″ and larger shall be furnished with a welded-in overlay seat of 1/8″ thick of not less than 99% nickel in accordance with **AWWA C-517, Section 4.3.3.4**. Sprayed, plated or screwed-in seats are not acceptable.

Plugs shall be of **ASTM A-536-Grade 65-45-12** for all sizes in compliance with **AWWA C-517 Section 4.3.3.2**. The plugs shall be of one piece solid construction with PTFE thrust bearings on the upper and lower bearing journals to reduce torque and prevent dirt and grit from entering the bearing and seal area.

Valves shall be furnished with replaceable sleeve type bearings conforming to **AWWA C-517, Section 4.3.3.6**. Bearings shall be of sintered, oil impregnated type stainless steel. Valve shaft seals shall be of the "U" cup type in accordance with **AWWA C-517 Section 4.4.7**. Seals shall be self adjusting and repackable without removing the bonnet from the valve.

Wrench operated valves 2-1/2″-8″ shall be capable of being converted to worm gear or automated operation without removing the bonnet or plug from the valve. All wrench operated valves shall be equipped with a 2″ square nut for use with removeable levers or extended "T" handles.

Worm gear operators, where required, shall be of the heavy duty construction with the ductile iron quadrant supported on the top and bottom by oil impregnated bronze bearings. The worm gear and shaft shall be manufactured of hardened steel and run on high efficiency roller bearings.

Valves shall be designed and manufactured to shut off bubble tight at 175 psi for valves 2-1/2″-12″ and 150 psi for valves 14″ and larger. Each valve shall be given a hydrostatic and seat test with the test results being certified when required by the customer. Certified copies of Proof-of-Design test reports shall be furnished as outlined in **AWWA C-517 Section 5.2.2** when requested.

Plug valves shall be Ballcentric® Plug Valve **Series 601 / 600** as manufactured by Pratt.

The original, and the definitive standard.

RESILIENT WEDGE GATE VALVES

4" THROUGH 20"
MODEL 2638

UL FM APPROVED

CLOW VALVE CO. MADE IN U.S.A.

AWWA C515 250 PSI • UL/FM Approved 200 PSI • NSF 61 Certified •
Full Water Way • Fusion Bond Epoxy Coated • 10 Year Limited Warranty

CLOW VALVE CO.

Clow Valve is a division of McWane, Inc.

www.clowvalve.com

McWANE

For Generations

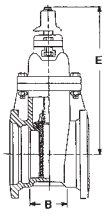
RESILIENT WEDGE VALVE

In 1975, Clow recognized the increased requirements and escalating maintenance cost of water systems in the United States.

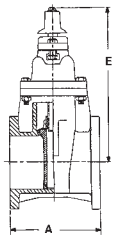
Clow responded by introducing the first R/W (Resilient Wedge) Valve in America. This introduction revolutionized the valve market in the U.S.

Clow is the first to introduce, and still leads in the design and technical development, of the bubble-tight resilient seating valve.

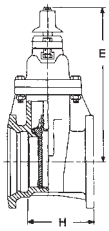
The Clow Resilient Wedge Valve, with its unique features and benefits, is the first to be manufactured with both AWWA and UL/FM approval for all water system requirements.



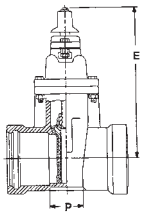
F-6100
MECHANICAL JOINT
4"– 20"



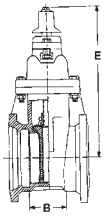
F-6102
FLANGED
4"– 20"



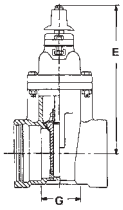
F-6106
FLANGED X
MECHANICAL JOINT
4"– 20"



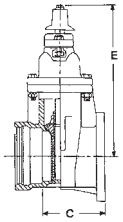
F-6110
PUSH ON FOR
SDR PVC
4"– 12"



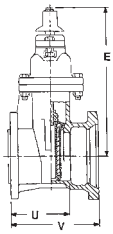
F-6111
MECHANICAL
CUTTING IN JOINT
4"– 12"



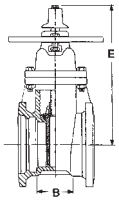
F-6112
TYTON ENDS FOR D.I.
AND C900 PVC PIPE
4"– 16"



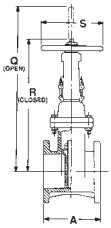
F-6113
FLANGED X TYTON
4"– 12"



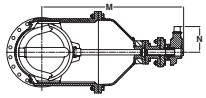
F-6114
MECHANICAL JOINT
FOR TAPPING
4"– 20"



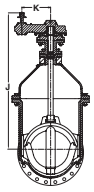
F-6120
MECHANICAL JOINT
POST INDICATOR VALVE
4"– 16"



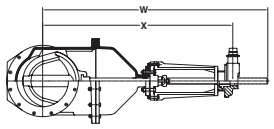
F-6136
FLANGED OS&Y
4"– 16"



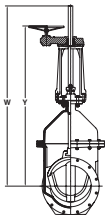
BEVEL GEARING
HORIZONTAL
INSTALLATION
ALL END STYLES
14"– 20"



SPUR GEARING
VERTICAL
INSTALLATION
ALL END STYLES
14"– 20"



OS&Y BEVEL GEARING
HORIZONTAL INSTALLATION
ALL END STYLES
14"– 20"



OS&Y SPUR
GEARING VERTICAL
INSTALLATION
ALL END STYLES
14"– 20"

NOTE:

It is recommended that valves be installed with stems vertical when used in raw sewage or sludge applications or in water with excessive sediment. Flanged end connections not recommended for buried service.

VALVE SIZE	A	B	C	E	G	H	J	K	M	N	P	Q	R	S	U	V	NO. OF TURNS TO FULL OPEN NO GEAR	NO. OF TURNS TO FULL OPEN GEARED	W	X	Y
4"	9	4-1/2	6-3/4	14-3/4	4-5/8	6-3/4	–	–	–	–	4-1/2	22-3/4	18-1/4	10	6-3/4	9-1/4	13-1/2	–	–	–	–
6"	10-1/2	5-1/2	7-7/8	19	5-1/4	8	–	–	–	–	5	30-1/8	23-3/4	12	8	10-1/2	19-1/2	–	–	–	–
8"	11-1/2	8-1/8	8-1/2	22-1/2	5-5/8	9-3/4	–	–	–	–	5-1/2	37-3/4	29-1/4	14	10-3/4	13-1/4	25-1/2	–	–	–	–
10"	13	10-1/2	10	26-1/2	7	11-3/4	–	–	–	–	7	45-3/4	35-3/8	18	11-3/4	14-7/8	31-1/2	–	–	–	–
12"	14	10-3/4	11-1/4	30	8-1/2	12-7/8	–	–	–	–	8-1/2	53-1/8	40-3/8	18	12-3/8	15	37-3/4	–	–	–	–
14"	15	10	–	37-3/4	10-1/2	13-1/2	52-1/8	8	48-5/8	9-1/8	–	74-3/4	59-3/4	22	13-1/4	16-3/4	52	100	76	59-7/8	64-1/2
16"	16	10	–	37-3/4	10-1/2	13	51-1/8	8	47-5/8	9-1/8	–	74-3/4	59-3/4	22	12-3/4	16-1/4	52	100	76	59-7/8	64-1/2
18"	17	11-3/4	–	–	–	14-7/8	58	12	55-3/4	10-1/8	–	–	–	–	14-5/8	18-1/8	–	189	90-7/8	70-1/8	74-5/8
20"	18	11	–	–	–	14-1/2	57	12	54-3/4	10-1/8	–	–	–	–	14-1/2	18	–	189	90-7/8	70-1/8	74-5/8

ENGINEERING FEATURES

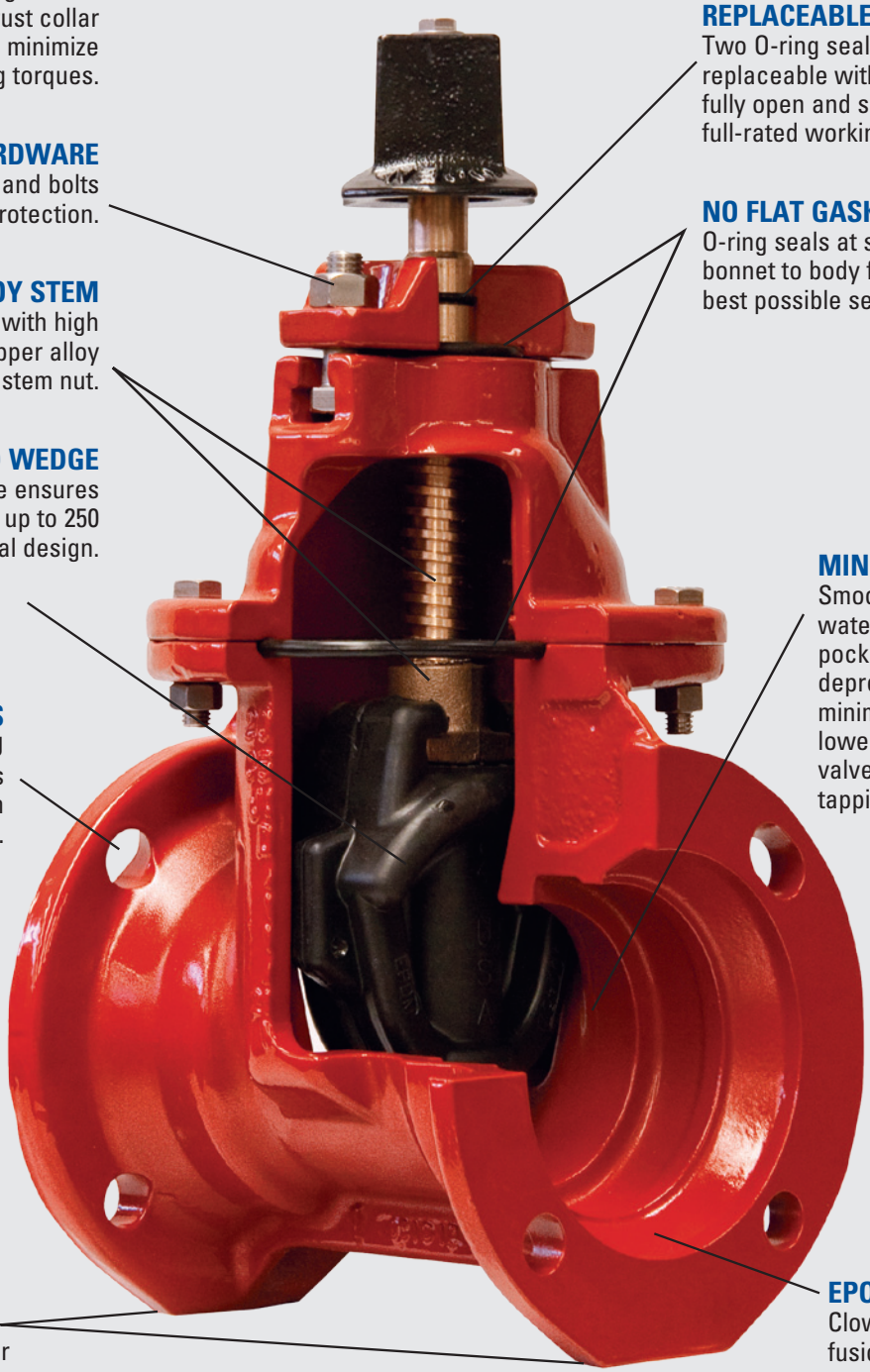
THRUST BEARINGS
Delrin thrust bearings above and below the thrust collar reduce friction and minimize operating torques.

STAINLESS STEEL HARDWARE
304 stainless steel nuts and bolts provide long-life corrosion protection.

COPPER ALLOY STEM
Long, trouble free life with high strength, non-corrosive copper alloy stem and stem nut.

100% COATED WEDGE
100% coated wedge ensures bubble-tight seal every time up to 250 PSI. With twin seal design.

ELLIPTICAL BOLT HOLES
Hole design on MJ connection eliminates the need for anti-rotation bolts (4"– 12").



REPLACEABLE O-RINGS
Two O-ring seals are replaceable with the valve fully open and subjected to full-rated working pressure.

NO FLAT GASKETS
O-ring seals at stuffing box and bonnet to body flanges to ensure the best possible seal.

MINIMAL FLOW LOSS
Smooth, unobstructed waterway is free of pockets, cavities, and depressions allowing for minimal flow loss and lower pumping costs. All valves accept full size tapping cutter.

EASY STORAGE
Pads on the bottom of all valves keep valve in upright position for easier storage and protection from the elements.

EPOXY COATING
Clow corrosion resistant fusion-bonded epoxy coating, conforming to AWWA C550 and NSF 61 Certified, protects both inside and outside of valve.

VALVE RATING: All valves are rated at 250 PSI for AWWA service and hydrostatically tested to 500 PSI. Valves through 16" are rated at 200 PSI for UL/FM service.

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

Size Range	Water Working Pressure psi	Bubble Tight Test psi	Hydrostatic Shell Test psi
AWWA 4"–48"	250	250	500
ULFM 4"–16"	200	200	400

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

Available End Connections & Size Range		Figure No.
FLG End (NRS)	4"–48"	F-6102
M.J.	4"–48"(except 2½")	F-6100
FLG & M.J.	4"–48"	F-6106
Push-on for PVC (SDR)	4"–12"	F-6110
FLG End (OS & Y)	4"–24"	F-6136
M.J. for Tapping	4"–24"	F-6114
Tyton for D.I. & C900 PVC	4"–12" & 16"	F-6112
M.J. Cutting-in	4"–12"	F-6111
Tyton for D.I. X FLG	4"–12"	F-6113

Accessories (Illustrated in the Gate Valve Section)

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

Floorstands (non-rising stem)

NOTE:
It is recommended that valves be installed with stems vertical when used in raw sewage or sludge applications or in water with excessive sediment.

MODEL 2638 AWWA C515 REDUCED WALL DUCTILE IRON

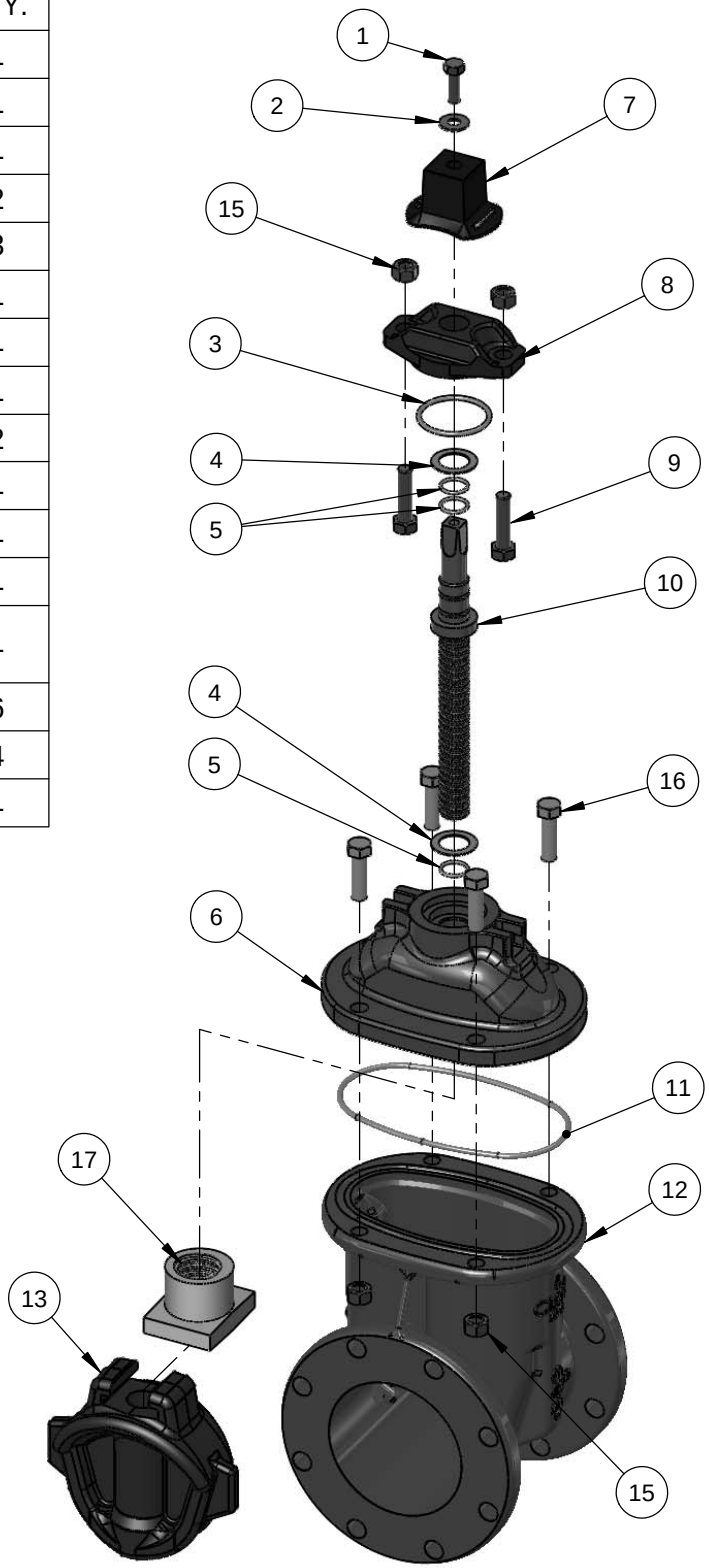
2638-99
C 6/18/14

4"-12" R/S VALVE NRS
EXPLODED VIEW MATERIAL LIST

CLOW VALVE COMPANY

MODEL 2638

ITEM NO.	DESCRIPTION	Material	QTY.
1	Hex Head Bolt	Stainless Steel	1
2	Flat Washer	Stainless Steel	1
3	O-Ring	Rubber	1
4	Thrust Washer	Delrin	2
5	O-Ring	Rubber	3
6	Cover	Ductile Iron	1
7	Operating Nut	Gray Iron	1
8	Follower Plate	Ductile Iron	1
9	Hex Head Bolt	Stainless Steel	2
10	Stem	Copper Alloy	1
11	O-Ring	Rubber	1
12	Body	Ductile Iron	1
13	Wedge	Ductile Iron / Rubber	1
15	Hex Nut	Stainless Steel	6
16	Hex Head Bolt	Stainless Steel	4
17	Stem Nut	Copper Alloy	1



COMMITTED TO ENVIRONMENTAL RESPONSIBILITY

CLOW VALVE COMPANY IS COMMITTED TO PROTECTING OUR NATURAL RESOURCES THROUGH ENVIRONMENTALLY RESPONSIBLE MANUFACTURING PRACTICES, INCLUDING THE USE OF 80+% RECYCLED CONTENT IN OUR HYDRANTS AND VALVES.

To learn more about our commitment to the environment, call 800-829-2569.

RECOMMENDED SPECIFICATIONS

1. Valves shall conform to the latest revision of AWWA Standard C515 covering resilient seated gate valves for water supply service.
2. The valves shall have a ductile iron body, bonnet, and O-ring plate. The wedge shall be totally encapsulated with rubber.
3. The sealing rubber shall be permanently bonded to the wedge per ASTM D429.
4. Valves shall be supplied with O-ring seals at all pressure retaining joints. No flat gaskets shall be allowed.
5. The valves shall be either non-rising stem or rising stem, opening by turning left or right, and provided with 2" square operating nut or a handwheel with the word "Open" and an arrow to indicate the direction to open.
6. Stems shall be cast copper alloy with integral collars in full compliance with AWWA. All stems shall operate with copper alloy stem nuts independent of wedge and of stem (in NRS valves).
7. Stems shall have two O-rings located above thrust collar and one O-ring below. Stem O-rings shall be replaceable with valve fully opened and subjected to full pressure. The stems on 4" – 20" shall also have two low torque thrust bearings located above and below the stem collar to reduce friction during operation.
8. Waterway shall be smooth, unobstructed and free of all pockets, cavities and depressions in the seat area. Valves 4" and larger shall accept a full size tapping cutter.
9. The body, bonnet and O-ring plate shall be fusion-bond epoxy coated, both interior and exterior on body and bonnet. Epoxy shall be applied in accordance with AWWA C550 and be NSF 61 Certified.
10. Each valve shall have maker's name, pressure rating, and year in which it was manufactured cast in the body. Prior to shipment from the factory, each valve shall be tested by hydrostatic pressure equal to the requirements of AWWA C515 (and UL/FM where applicable).
11. Valves shall have all component parts cast and assembled in the USA and shall be manufactured by the Clow Valve Company.

ISO 9001

www.clowvalve.com

CLOW VALVE CO.

902 South 2nd Street • Oskaloosa, Iowa 52577
PHONE 641-673-8611 FAX 641-673-8269

McWANE
For Generations

Clow Valve is a division of McWane, Inc.

Type F Adapters x NPT

adapter x male NPT

• Pressure rating is based on the seal of the mating part. See ratings on page 124.

Size	*356T6 Aluminum* Part #	*Aluminum Hard Coat* Part #	*Brass* Part #
½"	***50-F-AL***	---	***50-F-BR***
¾" x ½"	***7550-F-AL***	---	***7550-F-BR***
¾"	***75-F-AL***	---	***75-F-BR***
1"	***100-F-AL***	---	***100-F-BR***
1¼"	***125-F-AL***	---	***125-F-BR***
1½"	***150-F-AL***	***150-F-ALH***	***150-F-BR***
2"	***200-F-AL***	***200-F-ALH***	***200-F-BR***
2½"	***250-F-AL***	---	***250-F-BR***
3"	***300-F-AL***	***300-F-ALH***	***300-F-BR***
4"	***400-F-AL***	***400-F-ALH***	***400-F-BR***
5"	***500-F-AL***	---	---
6"	***600-F-AL***	***600-F-ALH***	***600-F-BR***
8" DIX	***800-F-AL*** [1]	---	---
8" BL	***801-F-AL*** [1]	---	---

[1] Dixon® and Boss-Lock™ cam & groove couplings *do not interchange in the 8" size*.

Size	*Unplated Malleable Iron* Part #	*Plated Malleable Iron* Part #	*316 Stainless Steel* Part #
½"	---	---	***50-F-SS***
¾" x ½"	---	---	***7550-F-SS***
¾"	---	***75-F-PM***	***75-F-SS***
1"	---	***100-F-PM***	***100-F-SS***
1¼"	---	---	***125-F-SS***
1½"	***150-F-MI***	***150-F-PM***	***150-F-SS***
2"	***200-F-MI***	***200-F-PM***	***200-F-SS***
2½"	---	---	***250-F-SS***
3"	***300-F-MI***	***300-F-PM***	***300-F-SS***
4"	***400-F-MI***	***400-F-PM***	***400-F-SS***
6"	---	***600-F-PM***	***600-F-SS***

356T6 aluminum

aluminum hard coat

brass

unplated malleable iron

plated malleable iron

316 stainless

Dixon® Type DC Dust Caps

356T6 aluminum


aluminum hard coat

brass

unplated malleable iron

316 stainless steel

Features:
- Buna-N gasket supplied standard, other gaskets available on pages 167 - 170.
- ½" Dixon® has only one cam arm.
- Pull rings are not supplied on ½" - 1" Dixon® couplings.

Size	*356T6 Aluminum* Part #	*Aluminum Hard Coat* Part #	*Brass* Part #
½"	***50-DC-AL***	---	***50-DC-BR***
¾"	***75-DC-AL***	---	***75-DC-BR***
1"	***100-DC-AL***	---	***100-DC-BR***
1½"	***150-DC-AL***	***150-DC-ALH***	***150-DC-BR***
2"	***200-DC-AL***	***200-DC-ALH***	***200-DC-BR***
2½"	***250-DC-AL***	---	---
3"	***300-DC-AL***	***300-DC-ALH***	***300-DC-BR***
4"	***400-DC-AL***	***400-DC-ALH***	***400-DC-BR***
5"	***500-DC-AL***	---	***500-DC-BR***
6"	***600-DC-AL***	***600-DC-ALH***	---
8"	***800-DC-AL*** [1, 2]	---	---

[1] Dixon® and Boss-Lock™ cam & groove couplings *do not interchange in the 8" size*.
[2] The 8" Dixon® dust cap has 2 cam arms.

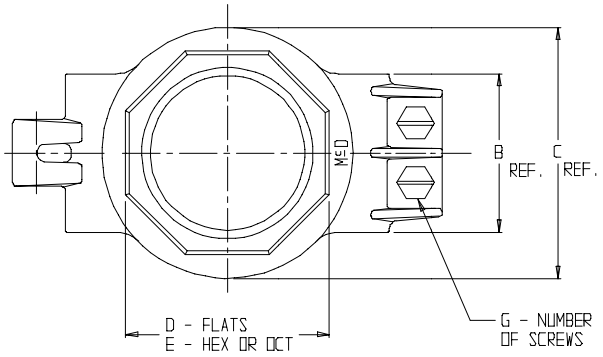
Size	*Unplated Malleable Iron* Part #	*316 Stainless Steel* Part #
½"	---	***50-DC-SS*** [1]
¾"	---	***75-DC-SS***
1"	---	***100-DC-SS***
1½"	---	***150-DC-SS***
2"	***200-DC-MI***	***200-DC-SS***
2½"	---	***250-DC-SS***
3"	***300-DC-MI***	***300-DC-SS***
4"	***400-DC-MI***	***400-DC-SS***
5"	---	***500-DC-SS***
6"	---	***600-DC-SS***

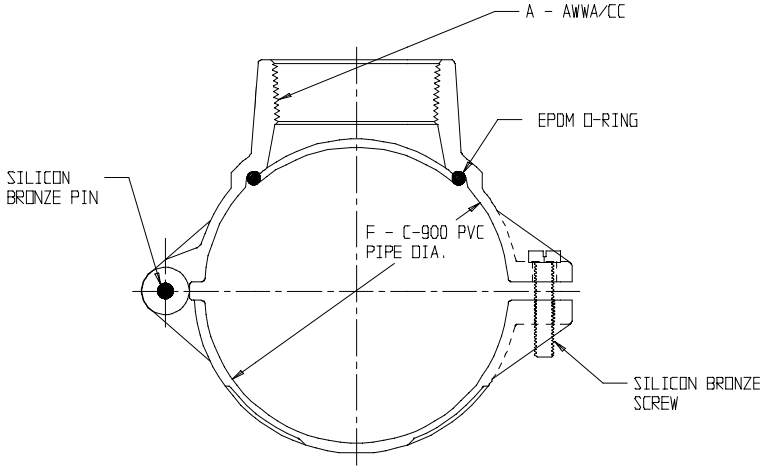
SUBMITTAL DATA SHEET

Hinged Saddle - 3895

C900 PVC x AWWA/CC

MODEL	SIZE	A	B	C	D	E	F	G
3895	4 X 1/2	1/2	2.00	2.56	1.69	HEX	4.800	1
3895	4 X 3/4	3/4	2.00	2.56	1.69	HEX	4.800	1
3895	4 X 1	1	2.00	2.56	1.69	HEX	4.800	1
3895	4 X 1 1/2	1 1/2	2.50	3.96	3.10	OCT	4.800	2
3895	4 X 2	2	2.50	3.96	3.10	OCT	4.800	2
3895	6 X 1/2	1/2	2.00	2.56	1.69	HEX	6.900	1
3895	6 X 3/4	3/4	2.00	2.56	1.69	HEX	6.900	1
3895	6 X 1	1	2.00	2.56	1.69	HEX	6.900	1
3895	6 X 1 1/2	1 1/2	2.50	3.96	3.10	OCT	6.900	2
3895	6 X 2	2	2.50	3.96	3.10	OCT	6.900	2
3895	8 X 1/2	1/2	2.00	2.56	1.69	HEX	9.050	1
3895	8 X 3/4	3/4	2.00	2.56	1.69	HEX	9.050	1
3895	8 X 1	1	2.00	2.56	1.69	HEX	9.050	1
3895	8 X 1 1/2	1 1/2	2.50	3.96	3.10	OCT	9.050	2
3895	8 X 2	2	2.50	3.96	3.10	OCT	9.050	2





SUBMITTAL INFORMATION

- Manufactured in compliance with ANSI/AWWA C800 (latest revision)
- Brass components conform to ASTM B62 and ASTM B584, UNS C83600 -85-5-5-5 (latest revision)
- Certified to NSF/ANSI 61
- Silicon Bronze hinge pin and bolt(s)
- EPDM o-ring
- Pipe and tap size, and thread type identified on saddle
- Outlet boss with large wrench flats
- Made in the United States of America

A.Y. McDonald Mfg. CO.
P.O. Box 508
Dubuque, IA 52004-508

Toll Free: 1-800-292-2737
Fax: 1-800-832-9296
Hours: 7:00 a.m. – 5:00 p.m., CST

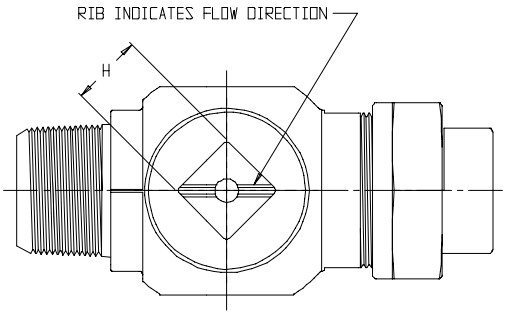
sales@aymcdonald.com
www.aymcdonald.com

Submitted by:

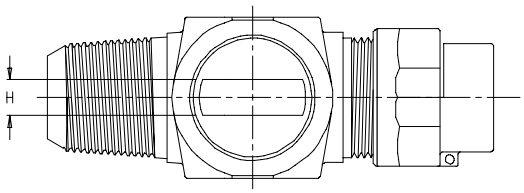
SUBMITTAL DATA SHEET

NL Plug Style Corporation Stop – 74701-22

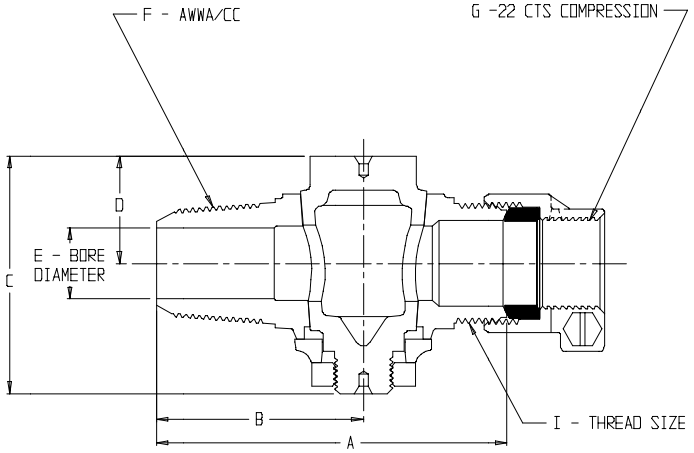
AWWA/CC x -22 CTS Compression



*NOTE: 1 1/2 & 2 INCH PLUGS HAVE SQUARE HEAD WRENCHING SURFACES



MODEL	SIZE	A	B	C	D	E	F	G	H	I
74701-22	1/2	2.98	1.73	2.28	1.12	.53	1/2	1/3	.34	1/2 AWWA FLARE
74701-22	5/8 X 3/4	3.38	2.02	2.33	1.10	.63	5/8	3/4	.34	3/4 AWWA FLARE
74701-22	3/4	3.66	2.15	2.50	1.13	.75	3/4	3/4	.38	3/4 AWWA FLARE
74701-22	3/4 X 1	3.87	2.15	2.50	1.13	.75	3/4	1	.38	1 AWWA FLARE
74701-22	1	4.25	2.40	2.89	1.41	1.00	1	1	.38	1 AWWA FLARE
74701-22	1 X 1 1/4	4.54	2.40	2.89	1.41	1.00	1	1 1/4	.38	1 1/4 AWWA FLARE
74701-22	1 1/4	5.31	2.94	3.44	1.67	1.25	1 1/4	1 1/4	.44	1 1/4 AWWA FLARE
74701-22	1 1/2	6.06	3.35	4.26	1.98	1.50	1 1/2	1 1/2	*1.13	2 1/8 - 16 SPECIAL
74701-22	2	7.30	3.97	4.80	2.39	2.00	2	2	*1.25	2 5/8 - 16 SPECIAL
74701-22FT	1 1/2	6.23	3.35	4.26	1.98	1.50	1 1/2	1 1/2	*1.13	1 1/2 AWWA FLARE
74701-22FT	2	7.30	3.97	4.80	2.39	2.00	2	2	*1.25	2 AWWA FLARE



SUBMITTAL INFORMATION

- Manufactured in compliance with ANSI/AWWA C800 (latest revision)
- Brass components in contact with potable water conform to ASTM B584, UNS C89833 (latest revision) and identified with "NL"
- Certified to NSF/ANSI 61 and NSF/ANSI 372
- Brass components not in contact with potable water conform to ASTM B62 and ASTM B584, UNS C83600 -85-5-5-5 (latest revision)
- Large wrench flats provided for proper installation
- Plug rotates 360°
- ½" – 1" rated for 100 PSIG water pressure
- 1 ¼" – 2" rated for 80 PSIG water pressure
- Made in the United States of America

A.Y. McDonald Mfg. Co.
P.O. Box 508
Dubuque, IA 52004-508

Toll Free: 1-800-292-2737
Fax: 1-800-832-9296
Hours: 7:00 a.m. – 5:00 p.m., CST

sales@aymcdonald.com
www.aymcdonald.com

Submitted by:

ADS POTABLE WATER SERVICE TUBING (CTS) PIPE SPECIFICATIONS

Scope
This specification describes ADS Potable Water Service Tubing (CTS) pipe SDR 9 for use in potable water service applications.

Pipe Requirements
ADS potable water service tubing shall meet the requirements of ASTM D2737, AWWA C901 and NSF Standards 14 and 61. Pipe dimensions shall meet Copper Tubing Size (CTS) standards.

Material Properties
Tubing material shall be high-density polyethylene conforming with the minimum requirements of cell classification 345464E as defined and described in ASTM D3350. The resin shall have a material designation code of PE3608 (formerly PE3408) by the Plastic Pipe Institute.

Disinfection/Maintenance
The active chlorine content of disinfecting solutions shall not exceed 12%. All disinfecting solution must be flushed from all lines within the system. Industry accepted procedures, like ANSI/AWWA C651 *Disinfecting Water Mains,* should be followed for both new and repaired potable water lines.

Installation
Installation is similar to other flexible tubing/pipe products. Methods including direct bury, plowing or pulling are applicable per local, state or federal guidelines for the application.

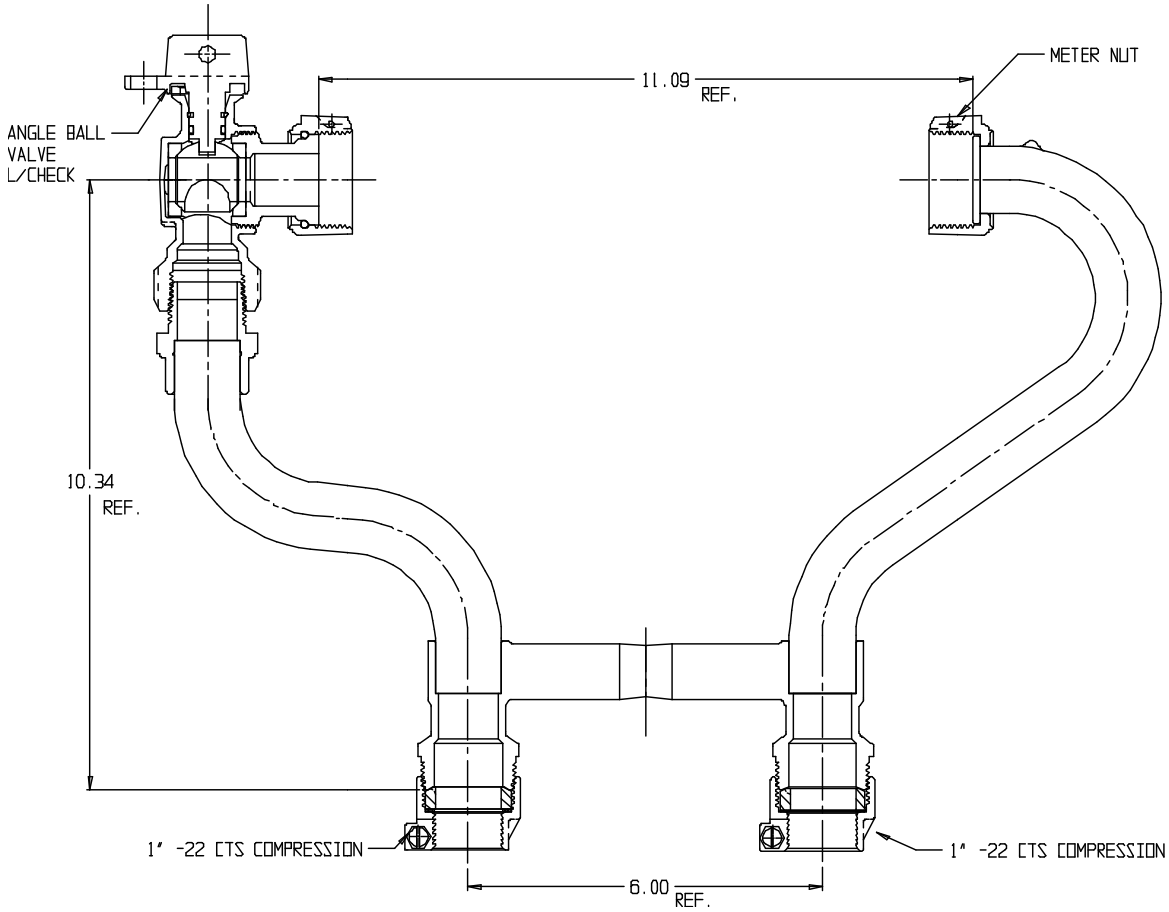
Tubing Properties

		3/4"	1"	1 1/4"	1 1/2"	2"
SDR 9	Outside Diameter, in (mm)	0.875 ±0.004 (22.2 ±0.10)	1.125 ±0.005 (28.6 ±0.13)	1.375 ±0.005 (34.9 ±0.13)	1.625 ±0.006 (41.3 ±0.15)	2.125 ±0.006 (54.0 ±0.51)
	Wall Thickness, in (mm)	0.097 +0.010 (2.5 +0.25)	0.125 +0.012 (3.2 +0.30)	0.153 +0.015 (3.9 +0.38)	0.181 +0.018 (4.6 +0.46)	0.236 +0.024 (6.0 +0.61)
	Pressure Rating @ 73^0F, psi (kPa)	200 (1379)	200 (1379)	200 (1379)	200 (1379)	200 (1379)
	Weight, gm/ft (gm/m)	46 ±2 (151 ±7)	78 ±3 (256 ±10)	125 ±4 (410 ±13)	162 ±4 (531 ±13)	275 ±5 (902 ±16)

SUBMITTAL DATA SHEET

NL Meter Setter – 732-4--HN22 44

-22 CTS Compression x -22 CTS Compression



SUBMITTAL INFORMATION

- Manufactured in compliance with ANSI/AWWA C800 (latest revision)
- Brass components in contact with potable water conform to ASTM B584, UNS C89833 (latest revision) and identified with "NL"
- Certified to NSF/ANSI 61 (reference height restrictions) and NSF/ANSI 372
- Brass components not in contact with potable water conform to ASTM B62 and ASTM B584, UNS C83600 -85-5-5-5 (latest revision)
- Copper tubing made in compliance with ASTM B75 or B88, UNS C12200 (latest revision)
- Lead free solder joints
- Designed to provide proper meter spacing for ease of installation
- Padlock wings standard on all valves
- Made in North America

A.Y. McDonald Mfg. Co.
P.O. Box 508
Dubuque, IA 52004-508

Toll Free: 1-800-292-2737
Fax: 1-800-832-9296
Hours: 7:00 a.m. – 5:00 p.m., CST

sales@aymcdonald.com
www.aymcdonald.com

Submitted by:

Kroy INDUSTRIES, INC.
Call Toll Free in the U.S. 888-477-5769 | International 402-362-6651 | 522 W. 26th Street, P. O. Box 309, York, Nebraska 68467 | FAX: 402-362-6566

PIP PVC Pipe

Belled End 50 Foot Head 22 PSI

Sold in standard lengths of 40 feet. Special lengths are available upon request.

Nominal Size	Weight/Foot	Outside Diameter	Inside Diameter	Wall Thickness
6	.96	6.140	6.000	.070
8	1.38	8.160	8.000	.080
10	2.15	10.200	10.000	.100
12	3.10	12.240	12.000	.120
14	4.22	14.280	14.000	.140
15	4.84	15.300	15.000	.150
16	5.40	16.000	15.680	.160

Belled End/Gasketed SDR-81 50 PSI

Sold in standard lengths of 40 feet. Special lengths are available upon request.
*Indicates Belled End Only.

Nominal Size	Weight/Foot	Outside Diameter	Inside Diameter	Wall Thickness
6	1.10	6.140	5.988	.076
8	1.77	8.160	7.958	.101
10	2.75	10.200	9.948	.126
12	3.89	12.240	11.938	.151
14*	5.32	14.280	13.928	.176
15	5.80	15.300	14.922	.189
16*	6.80	16.000	15.608	.196

Gasketed SDR-51 80 PSI

6", 8" & 10" sold in standard lengths of 20 & 40 feet. 12", 15", 18", 21" & 24" sold in standard lengths of 20 feet. Special lengths are available upon request.

Nominal Size	Weight/Foot	Outside Diameter	Inside Diameter	Wall Thickness
6	1.49	6.140	5.898	.120
8	2.64	8.160	7.840	.160
10	4.13	10.200	9.800	.200
12				.240
15				.300
18	14.14	18.701	17.967	.367
21	19.89	22.047	21.183	.432
24	25.28	24.803	23.831	.486

21" SDR-51 PIP Irrigation Pipe
Cut into 21"x24" Meter Pit

Gasketed SDR-41 100 PSI

6", 8" & 10" sold in standard lengths of 20 & 40 feet. 12", 15", 18", 21" & 24" sold in standard lengths of 20 feet. Special lengths are available upon request.

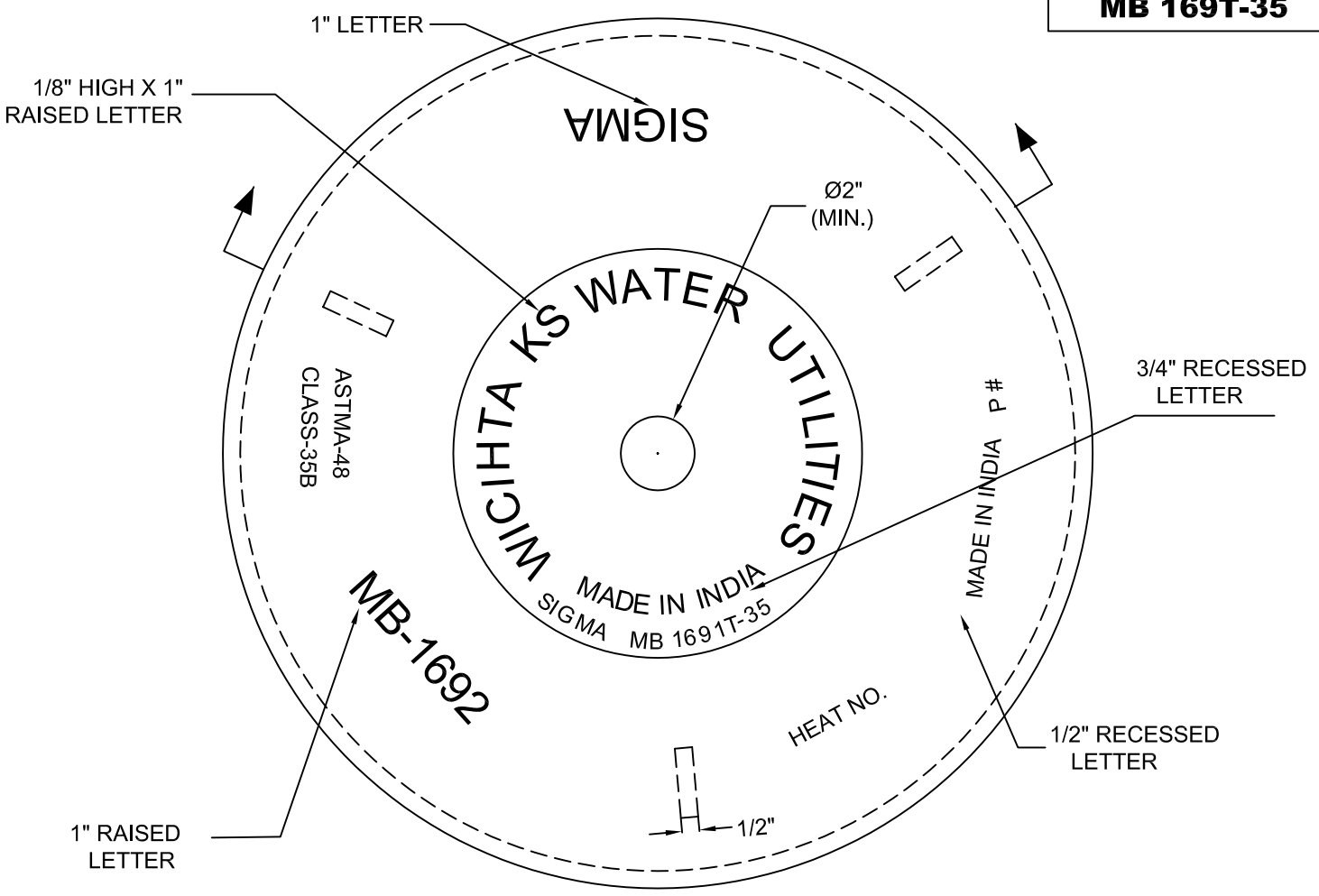
Nominal Size	Weight/Foot	Outside Diameter	Inside Diameter	Wall Thickness
6	1.85	6.140	5.840	.150
8	3.27	8.160	7.762	.199

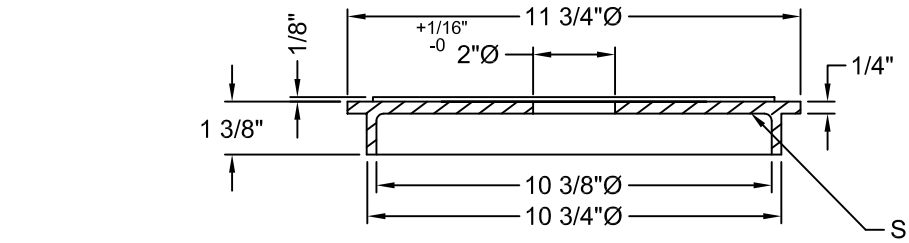
700 Goldman Drive
Cream Ridge,NJ 08514

SIGMA CORPORATION

REVISED DRG. FOR APPROVAL

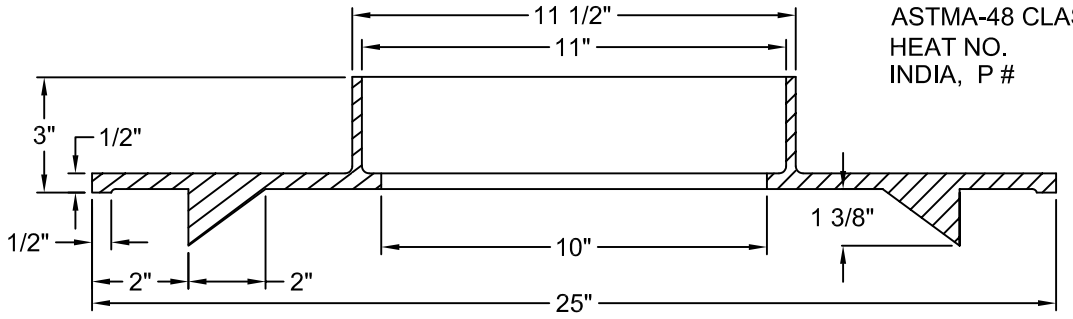
DRG. NO.
MB 169T-35





MB 1692-35 - 50 LBS
MB 1691T-35 - 9.5LBS

SIGMA
MB 1691T-35
ASTMA-48 CLASS-35B
HEAT NO.
INDIA, P #



TOLERANCE SHOULD BE ±1/16", UNLESS OTHERWISE SPECIFIED

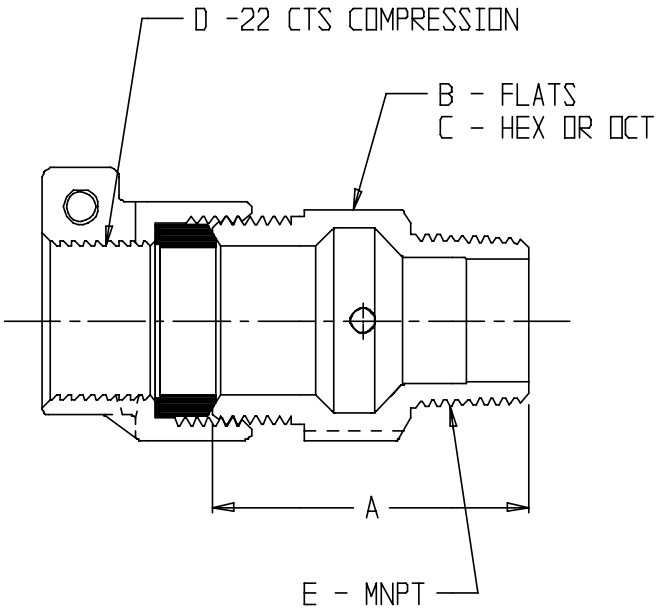
MATERIAL: Cast Iron ASTM A48 class 35B Meets H20 Loading standards	DESCRIPTION: **KCMO C & B 20" METER BOX FRAME & COVER WITH 2" TOUCH TONE HOLE MARKED "WICHITA KS WATER UTILITIES"**			REV.- **"1" E-MAIL DATE 22.05.08** LID DESIGN CHANGED AS PER E-MAIL. **REV. - "2" E-MAIL DATE 29.05.08** LID WT. CHANGED FROM 13 TO 9.5 LBS & TOTAL SET WET FROM 63 TO 59.5 LBS.
COATING: PAINTED				
DRN. BY: 28.05.08 T. BHOWMIK	CHECKED BY: ASHIS DEY	WEIGHT: **59.5 LBS.**	ISSUED ON: 29.05.08	APPVD. ON:

SUBMITTAL DATA SHEET

NL Service Fitting – 74753-22

-22 CTS Compression x MNPT

MODEL	SIZE	A	B	C	D	E
74753-22	1/2	1.64	1.06	HEX	1/2	1/2
74753-22	1/2 X 3/4	1.61	1.06	HEX	1/2	3/4
74753-22	3/4	1.91	1.34	OCT	3/4	3/4
74753-22	3/4 X 1/2	2.00	1.38	HEX	3/4	1/2
74753-22	3/4 X 1	1.95	1.32	OCT	3/4	1
74753-22	1	2.44	1.38	OCT	1	1
74753-22	1 X 3/4	2.18	1.38	OCT	1	3/4
74753-22	1 1/4	2.69	1.70	OCT	1 1/4	1 1/4
74753-22	1 1/4 X 3/4	2.50	1.85	OCT	1 1/4	3/4
74753-22	1 1/4 X 1	2.76	1.85	OCT	1 1/4	1
74753-22	1 1/4 X 1 1/2	2.69	1.69	HEX	1 1/4	1 1/2
74753-22	1 1/2	2.72	2.00	OCT	1 1/2	1 1/2
74753-22	1 1/2 X 1	2.75	1.85	OCT	1 1/2	1
74753-22	1 1/2 X 1 1/4	2.65	1.85	OCT	1 1/2	1 1/4
74753-22	2 X 1 1/2	2.70	2.44	OCT	2	1 1/2
74753-22	2	3.02	2.44	OCT	2	2
74753-22	2 1/2	2.93	3.09	OCT	2 1/2	2 1/2



SUBMITTAL INFORMATION

- Manufactured in compliance with ANSI/AWWA C800 (latest revision)
- Brass components in contact with potable water conform to ASTM B584, UNS C89833 (latest revision) and identified with "NL"
- Certified to NSF/ANSI 61 and NSF/ANSI 372
- Brass components not in contact with potable water conform to ASTM B62 and ASTM B584, UNS C83600 -85-5-5-5 (latest revision)
- Large wrench flats provided for proper installation
- Made in the United States of America

A.Y. McDonald Mfg. Co.
P.O. Box 508
Dubuque, IA 52004-508

Toll Free: 1-800-292-2737
Fax: 1-800-832-9296
Hours: 7:00 a.m. – 5:00 p.m., CST

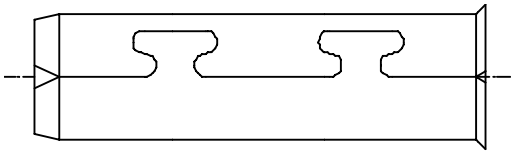
sales@aymcdonald.com
www.aymcdonald.com

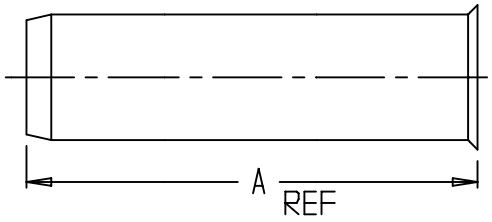
Submitted by:

SUBMITTAL DATA SHEET

Service Fitting – 6133T

CTS Insert Stiffener - Stainless Steel





MODEL	SIZE	A
6133T	3/4	2 3/8
6133T	1	2 3/8
6133T	1 1/4	2 3/8
6133T	1 1/2	2 3/8
6133T	2	2 3/8

SUBMITTAL INFORMATION

- 300 Series Stainless Steel
- Made in the United States of America

A.Y. McDonald Mfg. CO.
P.O. Box 508
Dubuque, IA 52004-508

Toll Free: 1-800-292-2737
Fax: 1-800-832-9296
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www.aymcdonald.com

Submitted by:

WOODFORD

Backflow Protected Automatic Draining Freezeless

Sanitary Yard Hydrant

Model S3

The Model S3 hydrant is designed for use anywhere potable water is required.

Unlike conventional hydrants which drain the water into the ground, the Model S3 employs a reservoir below frost line to contain the water. The hydrant is completely sealed to prevent surface and ground water from entering reservoir or service line. The valve, with it's unique venturi design, removes the stored water along with the water being used.

The Model S3 is equipped with a diverter spout, which allows the hydrant to be operated independently from the backflow preventer. When the hydrant is to be used with a hose, the diverter sleeve is pulled down during flow and water is automatically diverted to the backflow preventer hose connection. The diverter will work with or without a hose attached to the backflow preventer and will automatically release any time the hydrant is shut off.

An important feature of the S3 is easy maintenance. The entire working portion of the hydrant can be removed from the reservoir without any excavation.

SPECIFICATIONS:

HOSE CONNECTION BACKFLOW PREVENTER (BFP)

- NIDEL® Model 37HF
- ASSE 1052
- Field Testable (see instruction sheet)
- Two Check Valves

OPTIONAL: ASSE 1057 listed - Consists of NIDEL® Model 34HF Single Check Vacuum Breaker

Order example: S3-Bury Depth-SC

PATENT - U.S. Patent number 5246028 (Additional Patents Pending)

FEMALE INLET - 1" N.P.T.

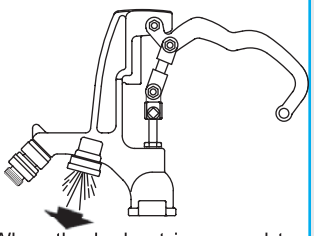
MIN PRESSURE - 20 psi

MAX PRESSURE - 100 psi

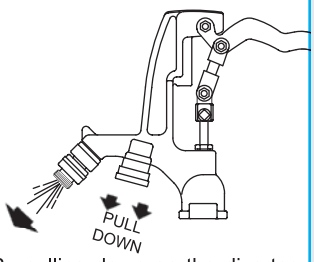
MAX TEMPERATURE - 120° F

FLOW RATES (GPM)

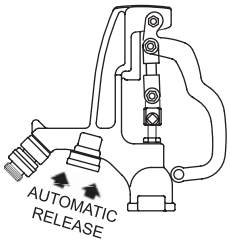
PSI	DIVERTER	BFP
20	4.5	1.5
30	5.5	3.0
40	6.5	4.0
50	7.0	5.0
60	8.0	6.0
70	8.5	7.0
80	9.0	7.5
90	9.5	8.0
100	10.0	8.5



When the hydrant is opened to an ON position, water will flow through the diverter spout.



By pulling down on the diverter sleeve during flow, water will be diverted through the backflow preventer (BFP), and allow use with a hose.



When the hydrant is closed to an OFF position, the diverter will automatically release, allowing the hydrant to drain into the reservoir. The hydrant will drain even if a pressurized or non pressurized hose is attached.

NOTICE

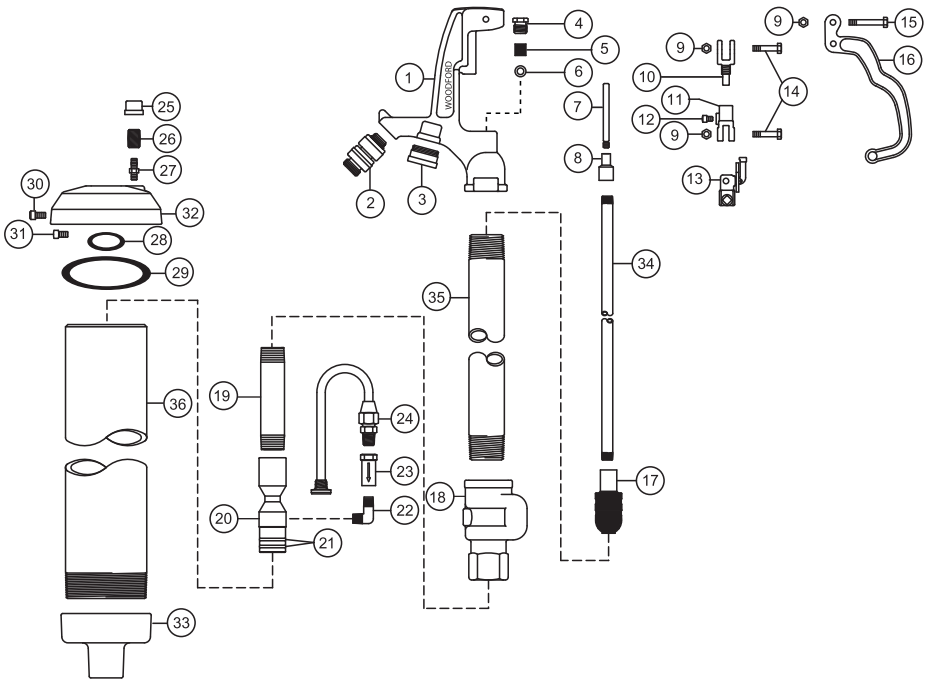
FOR WINTER USE: The hydrant must be operated at full flow, through the diverter, for a minimum of 30 seconds before and after each use to drain the hydrant and prevent freezing.

For Installation / Troubleshooting Instructions go to www.woodfordmfg.com or call 1-800-621-6032

When ordering, specify bury depth.

Rev. 1/11 Form No. S3.109

WOODFORD®

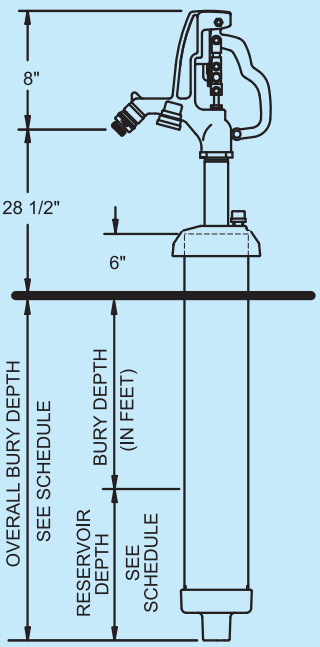


MODEL S3 PARTS LIST

ITEM	PART #	DESCRIPTION
	15219	S3 Head Assembly (Includes Items 1-16)
1	10449	Head
2	37HF-BR	37HF Backflow Preventer
3	15220	Diverter Assembly
4	10100	Packing Nut
5	10101	Packing
6	10102	Packing Support Washer
7	10104	Brass Rod Stem
8	10011	Reducing Coupling
9	10206	Hex Nut
10	10444	Upper Link
11	15211	Lower Link (with set screw 10019)
12	10019	Set Screw
13	15241	Cam and Clevis Assembly (blue)
14	10020	Link Bolt
15	10021	Lever Bolt
16	10443	Lever
17	10106	Plunger
18	10017	Valve Body (1" NPT Inlet)
19	**1" EXTENSION PIPE**	**(Bury Depth & Length)**
	10411	1' Bury (5 5/8" Long)
	10412	2' Bury (7" Long)
	10413	3' Bury (8 3/8" Long)
	10414	4' Bury (9 ¾" Long)
	10415	5' Bury (11 1/8" Long)
	10416	6' Bury (12 ½" Long)
	10417	7' Bury (13 7/8" Long)
20	15189	Venturi Assembly
21	10321	Valve Body O-Ring (2 Required)
22	10432	Brass Elbow
23	10408	Check Valve
24	15216	Siphon Tube Assembly
25	10446	Vent Cap
26	10445	3/8" Pipe Nipple
27	15136	Snifter Valve
28	10405	Hydrant O-Ring
29	10410	Reservoir O-Ring
30	10409	Reservoir Clamp Screw
31	10404	Hydrant Clamp Screw
32	15218	Casing Cover w/Warning Label
33	10401	Inlet Casting
	RK-Y1	Repair Kit (Includes Items 4-7 & 17)
	RK-SHL	Repair Kit (Includes Items 9-15)

ITEM	PART #	DESCRIPTION
34	**OPERATING PIPE**	**(Bury Depth & Length)**
	10023	1' Bury (35 ½" Long)
	10024	2' Bury (47 ½" Long)
	10025	3' Bury (59 ½" Long)
	10026	4' Bury (71 ½" Long)
	10027	5' Bury (83 ½" Long)
	10028	6' Bury (95 ½" Long)
	10029	7' Bury (107 ½" Long)
35	**1 ¼" PIPE CASING**	**(Bury Depth & Length)**
	10055	1' Bury (35 ½" Long)
	10056	2' Bury (47 ½" Long)
	10057	3' Bury (59 ½" Long)
	10058	4' Bury (71 ½" Long)
	10059	5' Bury (83 ½" Long)
	10060	6' Bury (95 ½" Long)
	10061	7' Bury (107 ½" Long)
36	**RESERVOIR PIPE**	**(Bury Depth & Length)**
	10421	1' Bury (26" Long)
	10422	2' Bury (39 ¼" Long)
	10423	3' Bury (52 ¾" Long)
	10424	4' Bury (66" Long)
	10425	5' Bury (79 ½" Long)
	10426	6' Bury (92 ¾ " Long)
	10427	7' Bury (106 ¼ " Long)
	15201	Warning Label Kit

Rough-In Dimensions



Bury Depth	1'	2'	3'	4' *	5' *	6' *	7' *
Reservoir Depth	10 1/2"	11 7/8"	13 1/4"	14 5/8"	16"	17 3/8"	18 3/4"
Overall Bury Depth	22 1/2"	35 7/8"	49 1/4"	62 5/8"	76"	89 3/8"	102 3/4"
Weight (lbs)	36	42	48	54	59	65	71

* Must ship by truck line due to length.

For more information contact...

WOODFORD MANUFACTURING COMPANY

2121 Waynoka Road, Colorado Springs, Colorado 80915 • **Phone:** (800) 621-6032 • **Fax:** (800) 765-4115

To view our complete product line visit: ***www.woodfordmfg.com*** *or email:* ***sales@woodfordmfg.com***

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