

BUTTERFLY VALVES – 150B 3”-48”

PART 1 – GENERAL

1.01 SUMMARY

- A. This section includes materials, testing, and installation of manually operated butterfly valves.

1.02 RELATED SECTIONS

- A. The work in the following sections also applies to the work in this section. Other sections may also apply.

Section 01300	SUBMITTALS
Section 09900	PAINTING AND COATING
Section 01730	OPERATION AND MAINTENANCE INSTRUCTIONS
Section 15180	VALVE OPERATORS AND VALVE APPURTENANCES
Section 15100	VALVES

1.03 REFERENCES

- A. American National Standards Institute (ANSI) standards, most recent editions:

1. ANSI B16.1 – Cast Iron Pipe Flanges and Flanged Fittings
2. ANSI B93.10 – Static Pressure Rating Methods of Square Head Fluid Power Cylinders
3. NSF/ANSI 61 – Drinking Water System Components – Health Effects

- B. American Society of Testing and Materials (ASTM) standards, most recent editions:

1. ASTM A48 – Standard Specification for Gray Iron Castings
2. ASTM A126 – Standard Specification for Gray Iron Castings for Valves, Flanges and Pipe Fittings
3. ASTM A240 – Standard Specification for Heat-Resisting Chromium and Chromium Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels.
4. ASTM A536 – Standard Specification for Ductile Iron Castings

- C. American Water Works Association (AWWA) standards, most recent editions.

1. AWWA C504 – Rubber Seated Butterfly Valves
2. AWWA C550 – Protective Epoxy Interior Coatings for Valves and Hydrants

1.04 DESIGN REQUIREMENTS

- A. Meet or exceed the requirements of AWWA C504, NSF/ANSI 61, and the requirements of these specifications.

1.05 SUBMITTALS

- A. The following information shall be submitted for review in accordance with Section 01300.
 - 1 Submit valve manufacturers catalog data, descriptive literature and assembly drawings. Show dimensions, materials of construction by specification reference and grade, linings, and coatings.
 - 2 Submit manufacturer's affidavit of compliance with referenced standards.
 - 3 Submit coating application factory test records for measuring coating thickness and holiday detection for the valve interior linings and exterior coatings and repair procedure.
 - 4 Submit manufacturer's proof-of-design per AWWA C504.

1.06 QUALITY ASSURANCE

- A. Provide records of test performed on valves or component parts thereof that are required by AWWA Valve Standard specified in these Specifications if requested by Engineer within one year period after acceptance of work.
- B. Provide Affidavit of Compliance with AWWA C504 Valve Standard for each lot of valve size furnished for work.
- C. Install and test valves furnished in conformance with Drawings and Specifications.
- D. Test each valve body under test pressure equal to twice its design water-working pressure, unless specified otherwise. Leak test each valve at 150 psi for class 150B valves.

1.07 OPERATION & MAINTENANCE MANUALS

- A. Submit operation and maintenance (O&M) instructions in accordance with Section 01730 with a copy of Section 01730 with each paragraph check marked to show compliance. O&M instructions shall be submitted after all submittals specified in paragraph 1.03 above have been returned "NO EXCEPTIONS TAKEN" or "MAKE CORRECTIONS AS NOTED." O&M instructions shall reflect the approved materials and equipment.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Butterfly valves, butterfly valve operators and component parts as manufactured by:
 - 1. Mueller
 - 2. Henry Pratt
 - 3. Engineer pre-approved equal

2.02 COMPONENTS

A. Bodies: Valve bodies shall be constructed of ASTM A126, Class B cast iron for flanged, mechanical joint, push-on, mechanical x flanged, and push-on x flanged valves. Flanged valves shall be fully faced and drilled in accordance with ANSI Standard B16.1 Class 125.

B. Seats: Rubber body seats shall be of one piece construction, simultaneously molded and bonded into a recessed cavity in the valve body protecting the leading edge of the seat from the shearing force of the line flow. Seats may not be located on the disc or be retained by segments and/or screws. For wafer style valves, the seat shall cover the entire inner surface of the valve body and extend over the outside face of the valve body to form a flange gasket. Seats shall be retained in the valve body by mechanical means without retaining rings, segments, screws or hardware of any kind in the flow stream. If mechanical means are used to retain seats, all fasteners threaded in cast or ductile iron should be supplied with Monel inserts. (Prior to seat test, the manufacturer shall provide a torque test with individual fastener torque testing.) Seats shall be a full 360° without interruption and have a plurality of grooves mating with a spherical disc edge seating surface. Valve seats shall be field adjustable around the full 360° circumference and replaceable without dismantling the actuator, disc or shaft and without removing the valve from the line.

C. Bearings: Valve bearings shall be of a self-lubricating, nonmetallic material to effectively isolate the disc-shaft assembly from the valve body. Metal-to-metal thrust bearings in the flow stream are not allowed. Bearing load shall not exceed 1/5 of the compressible strength of the bearing or shaft material.

D. Disc: The disc shall be an on-center, lens-shaped design to afford minimal pressure drop and line turbulence. Materials of construction shall be: ASTM A126, Class B cast iron disc and a stainless steel type 316 edge with a minimum width equal to the width of disc edge.

Disc shall be retained by stainless steel pin, extending through the full diameter of the shaft to withstand the specified line pressure up to valve rating and the torque required to operate the valve. Disc stops located in the flow stream are not allowed.

On the 30" and larger disc designs, the disc must be of a flow-through design. All surfaces shall be visually inspected and measurable to assure all structural members are at full disc strength. Disc and shaft connection shall be made with stainless steel through pins. In the 30" and large valves, the disc and shaft connection shall be made with removable stainless steel taper pins.

E. Shafts: Valve shafts shall be of stainless steel type 304. At the operator end of the valve shaft, a packing gland utilizing "V" type chevron packing shall be utilized "O" ring and "U" cup packing is not allowed.

For 24" and larger valves, all shafts shall be turned, ground, polished and constructed of 18-8 type 304 or Type 316 stainless steel. Shafts shall be two-piece, stub type and keyed

for actuator connection. Shaft diameters shall meet minimum requirements established by the latest revision of AWWA Standard C504 for their class, where applicable.

F. Painting: All surfaces of the valve interior shall be clean, dry and free from grease before painting. The valve surfaces except for disc edge, rubber seat and finished portions shall be Valve interior and exterior surfaces except for seating shall be a minimum of 8 mils Ameron 370.

2.03 OPERATORS

- A. Operators and component parts: AWWA C504, unless otherwise specified in these Specifications.
- B. Provide with counter-clockwise opening manual operators.
 - 1. Compute operation torque of each valve and operator in accordance with Appendix of AWWA Standard C504 for velocity of 16 fps and applicable pressure drop across valve.
 - 2. Operators: Sized for bi-directional flow and 450 ft-lb input torque.
- C. Required input torque with maximum handwheel pull of:
 - 1. 80 lbs. for hand wheels and chain wheels, or
 - 2. 150 ft.-lbs. for operating nuts.
- D. Hand wheels shall have a maximum diameter of 24”.
- E. Totally enclosed, permanently lubricated and sealed gear reducers. A vent shall be provided between the valve trunnion and actuator base to prevent infiltration of fluid into the actuator.
 - 1. Self-locking with open and close stops provided to limit valve disc travel.
 - 2. Traveling nut type.
 - 3. Submit calculations for valve torque requirements to Engineer as part of Shop Drawing submittal package. Velocity for dynamic torque must be 16 fps.
 - 4. Valve operators, as manufactured by:
 - a. Mueller
 - b. Henry Pratt Company
- F. Provide butterfly valves 3 inches in diameter and larger, and butterfly valves which are not directly buried or submerged, with manual hand wheels and position indicators. Install valves with valve shaft in horizontal position unless otherwise specified.
- G. Provide butterfly valves which are directly buried or submerged with 2-inch square operating nut and do not equip with position indicator unless otherwise specified.
- H. Valves located in vaults: Provide adequate clearance for handwheel operation.
 - 1. Orientate handwheel and operating nut as shown in Drawings.
 - 2.

3.1 INSTALLATION

- A. Install valves as shown on drawings and in accordance with manufacturers’ and District requirements.