

**City of Milwaukee**  
**Department of Public Works**

**Milwaukee Water Works**

**Material Specifications for**  
**Butterfly Valves 20" Through 60"**



City of Milwaukee Specification No. 30-B-16  
Revised October 16, 2017

- I. **GENERAL REQUIREMENTS:** Vendors bidding through the Department of Administration – Business Operations Division, Procurement Services Section, shall comply with the latest version of City of Milwaukee Specification No. 70b-D-7, except as modified herein. **MATERIALS FURNISHED UNDER THIS SPECIFICATION SHALL COMPLY WITH AND BE CERTIFIED WITH THE PROVISIONS OF THE CITY OF MILWAUKEE ORDINANCE 310-18.9 AND THE AMERICAN IRON AND STEEL REQUIREMENT (AIS) OF THE DRINKING WATER STATE REVOLVING FUND (DWSRF).**
- II. **WARRANTY:** In addition to the warranty requirements specified in Section II of specification 70b-d-7, the following terms shall apply:
- A. This portion of the warranty applies to Valve Seat Adjustment only: The warranty shall be 100% Parts and Labor and shall remain in effect for a minimum of four (4) years from the date of acceptance or two (2) years from the date of installation, whichever occurs first. Under this provision the furnishing contractor agrees to adjust the valve seat within a reasonable time (not to exceed 4 weeks), at no cost to the City, during the warranty period.
- III. **TECHNICAL REQUIREMENTS**
- A. **Description** Butterfly valves as described herein shall be rubber seated iron bodied valves suitable for direct burial type installation in a water transmission system and shall be capable of being installed with normal pipeline installation methods.
- B. **NSF 61 Approval** All materials furnished to the Milwaukee Water Works and which will be in direct or indirect contact with potable drinking water shall be in compliance with NSF 61 Drinking Water System Components - Health Effects.
- C. **Standards** Unless otherwise stated, the valves shall conform to the latest revisions of the following American Water Works Standards:
1. AWWA C504 Standard for Rubber-Seated Butterfly Valves
  2. AWWA C111 Standard for Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
  3. AWWA C550 Standard for Protective Interior Coatings for Valves and Hydrants
  4. AWWA C110 Standard for Ductile-Iron and Gray-Iron Fittings
- D. **Valve Design** Butterfly valves shall be designed in accordance with the following requirements:
1. Class - All valves shall be Class 150B
  2. Valve Body - The valve body and disc shall be of gray or ductile iron.
  3. Installation Type - Buried
  4. Valve Ends - Valve ends shall be as specified on the bid form, and shall conform to the following appropriate requirements.

- a. Bell Ends for concrete pipe shall be dimensioned to fit the spigot of a standard rubber and steel joint for concrete pipe. Bell ends for valves 42 inches in diameter and smaller shall be suitable for the spigot ends of lined cylinder pipe as previously produced by Price Brothers (LCP) or Cretex (SP-5). Bell ends for valves 48 inches and larger shall be suitable for spigot ends of embedded cylinder pipe as previously produced by Price Brothers (ECP) or Cretex (SP-12). The bell depth on valves 48" and smaller shall be 4-1/2" (deep joint).
  - b. Mechanical joint ends and accessories shall conform to AWWA C111. Valves shall be furnished **complete with all accessories** - full body gray iron or ductile iron glands, plain rubber gaskets, nuts and tee-head bolts made of high-strength, low-alloy steel. The mechanical joint flange shall have full-drilled holes except where slots may be required in the vicinity of the valve shaft. When tapped holes are required in the flanges, the furnishing contractor shall furnish one 300 series 18-8 stainless steel stud and nut for each tapped hole.
  - c. Mechanical joint ends and accessories shall conform to C-110 dimensions of C-111.
5. Valve Shaft - The valve shaft shall be 300 Series 18-8 stainless steel or approved equal corrosion resistant material.
  6. Shaft Seals - Shall be the self-adjusting V-type, approved O-ring, or other approved type, in conformance with Section 4.2.7 of AWWA C504.
  7. Direction to open - The valves shall open by turning the operating nut to the right (**CLOCKWISE**).
  8. Journals - The journal surfaces which contact the valve bearing surfaces shall be of 300 series 18-8 stainless steel.
  9. Seat - For valves 30 inches and larger the adjustable side of the seat shall be on the right when facing the actuator end of the valve shaft, with the operating nut at the top.
    - a. The furnishing contractor shall conduct a valve seat adjustment and the valve leakage test at the factory prior to shipment of the valve.
    - b. All seats shall be constructed of rubber either Buna N or Buna S and shall be full circle 360-degree without interruption. Valve seats shall be mechanically attached to the valve disc or valve body.

- c. Valve seats shall be field adjustable and replaceable without dismantling the actuator, disc or shaft and without removing the valve from service.
10. Actuators - Butterfly valve actuators shall conform to the following requirements:
  - a. Type - Manual - Wrench nut
  - b. The actuator shall be furnished with a standard 2" square nut to accept manual wrench. The nut shall be positively secured to the actuator input shaft using a 300 series 18-8 stainless steel bolt or pin.
  - c. The actuator shall be self-locking, and the disc shall not creep or flutter under service conditions.
  - d. The actuator shall be furnished with a factory set stop at each end of its travel.
  - e. Actuator shall have a 300 series stainless steel external stop limiting device and travel adjustment, which must be able to be operated without removing the valve from service or removing the actuator cover. No internal travel adjustment devices will be acceptable.
  - f. The actuator case shall be completely watertight, sealed by means of approved gaskets, gasket compounds, O rings or threaded 300 series 18-8 stainless steel plugs.
  - g. The actuator shall be filled with a suitable oil or grease at the factory. If the actuator lubricant is oil, suitable fill and drain plugs of 300 series 18-8 stainless steel, low zinc bronze or approved corrosion resistant material shall be provided.
  - h. The operating input shaft shall be series 300 or series 400 stainless steel or an approved equal. If it is completely sealed from contact with ground water, the input shaft may be a properly designed high strength carbon steel.
11. Actuator Torque Strength - Actuators shall be designed and manufactured to withstand an input torque of 450 foot-pounds at the fully opened and fully closed positions without distortion of any kind.
12. Exterior Fasteners - All exterior bolts and nuts, plugs, pins, and external accessories shall be made from low zinc bronze or 300 series 18-8 stainless steel or approved equal corrosion resistant material.

- E. Coatings** The valve shall be lined and coated with one of the following acceptable options
1. Each ferrous surface, which will be exposed to either water internally or the soil externally, shall receive at least 2 coats of a coating that complies with Sec. 4.4.1 of AWWA C504; Or,
  2. Both inside and outside of the valve shall receive at least 6 mil thick epoxy coating in compliance with Sec. 5.1.2.2 of AWWA C 550.

- F. SUBMITTALS AFTER AWARD OF CONTRACT:** Shortly after the award of the contract the successful bidder shall submit three (3) sets of certified drawings for each size and type of valve being furnished to the Superintendent of Milwaukee Water Works for approval.

The drawing submittal shall show the following information:

1. Internal construction details, overall dimensions, materials of all valve components, actuator position, indication of the adjustable side of seat in case of 30" and larger diameter valves, recommended lubrication, and the weight of the valve complete.
2. Material specifications for all components.
3. Manufacturer's name and actuator designation.
4. Rated output torque of the actuator.
5. Maximum input torque required to develop the rated output torque of the actuator.
6. Number of turns of the operating nut to fully close the valve from the fully opened position.
7. Maximum input torque at the operating nut which the actuator will withstand without damage to the actuator or valve with the actuator at the stops.
8. Direction of rotation of the operating nut to open the valve.

One (1) set of drawings will be returned to the furnishing contractor marked "Reviewed – No Exceptions Taken", "Reviewed – Returned with Comments", "Reviewed – Revise and Resubmit", or "Rejected". All materials shall be furnished in accordance with these approved drawings.

- G. Manuals** After the bid opening, the successful bidder will be required to furnish four (4) copies of maintenance manuals and parts list to the Superintendent of Milwaukee Water Works for the valves being furnished.

- H. Affidavit and Certification** Upon request, the furnishing contractor shall submit in duplicate the following to the Superintendent of Milwaukee Water Works:

1. Manufacturer's affidavit of compliance in accord with Sec. 6.3 of AWWA C504.
2. Manufacturer's certification attesting to the valve being designed and manufactured to withstand the input torque at the fully opened and fully closed positions as required in this specification.
3. Manufacturer certification attesting to the valve being tested in compliance with Leakage tests in accordance with section 5.1.2 of AWWA C504.
4. Manufacturer certified copies of reports detailing the procedures and results of actuator proof of design testing per Section 5.1.4.5.5 of AWWA C504.

**IV. INSPECTION BY CITY:**

- A. All required drawings, manuals and certifications shall be furnished before any materials will be inspected and accepted.
- B. The Superintendent of Milwaukee Water Works or a duly authorized representative shall inspect and test the valves furnished under this specification, in accordance with AWWA Standard C504.
- C. Testing will be done on each valve provided.
- D. Any valve found not conforming to this specification subsequent to acceptance and/or installation will be rejected and must be replaced at no cost to the City including all freight costs.