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**PART 1        GENERAL**

**1.1            SUMMARY**

- .1        Butterfly valves.

**1.2            RELATED SECTIONS**

- .1        Section 01 33 00 – Submittal Procedures
- .2        Section 01 74 21 – Construction/Demolition Waste Management and Disposal.
- .3        Section 01 78 00 – Closeout Submittals.

**1.3            REFERENCES**

- .1        American National Standards Institute (ANSI)/American Society of Mechanical Engineers (ASME)
  - .1        ANSI/ASME B1.20.1, Pipe Threads, General Purpose (Inch.)
  - .2        ANSI/ASME B16.1, Cast Iron Pipe Flanges and Flanged Fittings.
  - .3        ANSI/ASME B16.5, Pipe Flanges and Flanged Fittings.
  - .4        ANSI/ASME B16.11, Forged Fittings, Socket-Welding and Threaded.
  - .5        ANSI/ASME B16.25, Buttwelding Ends.
  - .6        ANSI/ASME B16.34, Valves – Flanged, Threaded and Welding Ends.
- .2        American National Standards Institute (ANSI)/American Petroleum Institute (API).
  - .1        ANSI/API 609, Lug-and Water-Type Butterfly Valves.
- .3        American Society for Testing and Materials International, (ASTM)
  - .1        ASTM A 126, Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.
  - .2        ASTM B 62, Specification for Composition Bronze or Ounce Metal Castings.
  - .3        ASTM B 209M, Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- .4        Manufacturers Standardization Society of the Valve and Fittings Industry, Inc. (MSS).
  - .1        MSS SP-67, Butterfly Valves.

**1.4            SUBMITTALS**

- .1        Submittals in accordance with Section 01 33 00 – Submittal Procedures.

- .2 Product Data: submit WHMIS MSDS – Material Safety Data Sheets.
  - .1 Submit shop drawings and product data in accordance with Section 01 33 00 – Submittal Procedures.
  - .2 Submit product data in accordance with Section 01 33 00 – Submittal Procedures.
  - .3 Submit data for valves specified this section.
- .3 Closeout Submittals
  - .1 Submit maintenance data for incorporation into manual specified in Section 01 78 00 – Closeout Submittals.

## **1.5 DELIVERY, STORAGE AND DISPOSAL**

- .1 Waste Management and Disposal
  - .1 Separate and recycle waste materials in accordance with Section 01 74 21 – Construction/Demolition Waste Management and Disposal.
  - .2 Collect and separate for disposal, paper, plastic, polystyrene, corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.

## **1.6 MAINTENANCE**

- .1 Extra Materials
  - .1 Furnish following spare parts:
    - .1 Valve seats: one for every 10 valves each size. Minimum 1.
    - .2 Discs: one for every 10 valves, each size. Minimum 1.
    - .3 Stem packing: one for every 10 valves, each size. Minimum 1.
    - .4 Valve handles: 2 of each size.
    - .5 Gaskets for flanges: one for every 10 flanged joints.

## **PART 2 PRODUCTS**

### **2.1 BUTTERFLY VALVES - RESILIENT SEAT – 1.4 MPa.**

- .1 Except for specialty valves, to be of single manufacturer.
- .2 To be suitable for dead-end service.
- .3 Canadian Registration Number (CRN) required for products.
- .4 Sizes: Wafer or Lug type: NPS 2 to 30.
- .5 Pressure rating for tight shut-off at temperatures up to maximum for seat material.

- .1 NPS 2 - 12: 1.4 MPa CWP.
- .2 NPS 14 - 30: 1.4 MPa CWP.
- .6 Minimum seat temperature ratings to 135EC.
- .7 Application: On-off operation.
- .8 Full lug body (threaded).
- .9 Operators:
  - .1 NPS 2 - 6: Handles capable of locking in any of ten (10) positions - 0E to 90E. Handle and release trigger - ductile iron. Return spring and hinge pin: carbon steel. Latchplate and mounting hardware: cadmium plated carbon steel. Standard coating: Black laquer.
  - .2 NPS 8 - 30: Manual enclosed gear operator.
- .10 Designed to comply with MSS SP-67 and API 609.
- .11 Compatible with ANSI Class 125/Class 150 flanges.
- .12 Construction:
  - .1 Body: ductile iron.
  - .2 Disc: aluminum bronze.
  - .3 Seat: EPDM.
  - .4 Shaft: 416 stainless steel.
  - .5 Taper pin: 316 SS .
  - .6 Key: carbon steel stainless.
  - .7 O-Ring: Buna-N.
  - .8 Bushings: Luberized bronze Teflon.

## **2.2 BUTTERFLY VALVES - RESILIENT SEAT -1.97 MPa**

- .1 Sizes: Lug type: NPS 2 to 30.
- .2 Pressure rating: 1.97 MPa at 135EC.
- .3 Lug body: 150 ANSI bolt pattern.
- .4 Full lug body (threaded).
- .5 Application: for on-off service.
  - .1 Operators:
  - .2 NPS 2 - 6: Handles capable of locking in any of ten (10) positions - 0E to 90E. Handle and release trigger - ductile iron. Return spring and hinge pin: carbon steel. Latch plate and mounting hardware: cadmium plated carbon steel.

- .3 NPS 8 - 24: Manual enclosed gear operator.
- .4 Install parallel or perpendicular to pipeline.
- .6 Designed to comply with MSS SP-67 and API 609.
- .7 Compatible with ANSI B16.1 Class 125 (iron) and ANSI B16.5 Class 150 (steel) flanges.
- .8 Construction:
  - .1 Body: ductile iron.
  - .2 Disc: aluminum bronze.
  - .3 Seat: EPDM.
  - .4 Refer to manufacturer's literature for additional materials.
  - .5 Shaft: NPS 2 - 12: 416 stainless steel, NPS 14 - 48, 316 stainless steel.
  - .6 Taper pin: 316 SS.
  - .7 Blowout proof stem.
  - .8 O-Ring: Buna-N.
  - .9 Bushings: Teflon.
  - .10 Disc shall not be pinned to shaft.
  - .11 Bubble tight shutoff with downstream flanges removed, class 6 shutoff.

## **2.3 BUTTERFLY VALVES- 2.1 MPa**

- .1 Sizes: grooved ends, NPS-2-12.
- .2 Pressure rating: 2.1 MPa WOG.
- .3 Body: Ductile Iron to ASTM A-536 with polypropylene coating.
- .4 Disc: Ductile Iron to ASTM A-536.
- .5 Disc coating: EPDM.
- .6 Body coating: Polyphenylene Sulfide Blend
- .7 Drive Hub Adapter and Operation Bracket: hot rolled steel, enamel coated.
- .8 Upper bearing/lower Trunnion seals: EPDM
- .9 Upper bearing/lower Trunnion : Navel brass or Bronze alloy.
- .10 Bolts and washers: Cold rolled steel, zinc plated.
- .11 Operator:
  - .1 NPS 2-3: two position manual handle
  - .2 NPS 3-6: Manual level lock

- .3 NPS 8-12: Manual gear operator with handwheel
- .4 Handwheel with chain operator: on valves installed more than 2400 mm above floor in boiler rooms and mechanical equipment rooms.

## **2.4 MOUNTING FLANGES:**

- .1 Class 125 cast iron to ANSI B16.1 or Class 150 steel to B16.5 pipe flanges.

## **2.5 ELECTRIC ACTUATORS:**

- .1 Operation: Designed to provide precise quarter turn electric operation.
  - .1 Torque range: Up to 1.130 N-m and speed ranges from 10 seconds to 30 seconds to move from fully open to fully closed.
  - .2 Gear train within actuator to provide smooth continuous rotary power stroke for accurate automatic valve positioning. Factory-set, field adjustable cam-actuated travel limit switches to provide precise control of shaft rotation.
- .2 Construction:
  - .1 Castings: Heavy duty industrial grade for rugged use.
  - .2 Actuators: continuous duty with high efficiency single phase reversing capacitor motor with thermal overload protection.
  - .3 Gears and pinions constructed from hardened steel.
  - .4 Gear train to be permanently lubricated.
  - .5 Mechanical brake to ensure that gear is locked in precise position.
- .3 Electrical
  - .1 Standard voltage: 120 VAC. 60 Hz.
  - .2 Control options: 4-20 Ma DC or 0-10 V DC.
  - .3 CSA approved.
  - .4 Electrical rating: NEMA IV.

## **PART 3 EXECUTION**

### **3.1 PREPARATION**

- .1 Valve and mating flange preparation.
  - .1 Inspect adjacent pipeline, remove rust, scale, welding slag, other foreign material.
  - .2 Ensure that valve seats and pipe flange faces are free of dirt or surface irregularities which may disrupt flange seating and cause external leakage.
  - .3 Install butterfly valves with disc in almost closed position.
  - .4 Inspect valve disc seating surfaces and waterway and eliminate dirt or foreign material.

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### **3.2           INSTALLATION OF VALVES**

- .1       Install in accordance with manufacturer's instructions.
- .2       Do not use gaskets between pipe flanges and valves unless instructed otherwise by valve manufacturer.
- .3       Verify suitability of valve for application by inspection of identification tag.
- .4       Mount actuator on to valve prior to installation.
- .5       Handle valve with care so as to prevent damage to disc and seat faces.
- .6       Valves in horizontal pipe lines should be installed with stem in horizontal position to minimize liner and seal wear.
- .7       Ensure that valves are centered between bolts before bolts are tightened and then opened and closed to ensure unobstructed disc movement. If interference occurs due, for example to pipe wall thickness, taper bore adjacent piping to remove interference.

### **3.3           ACTUATOR INSTALLATION**

- .1       Air hoses or electrical connections to be made by actuator manufacturer.
- .2       Cycle valve operation from fully closed to fully open then back to fully closed.
- .3       At same time, check travel stop settings for proper disc alignment.

**END OF SECTION**