Material Specification – 5

Resilient Seated Gate Valves

1. **GENERAL**
   Resilient seated gate valves shall be designed and manufactured in accordance with
   AWWA C509 or AWWA C515, as applicable, with the following additional requirements
   or exceptions.

2. **SERVICE**
   Valves shall be suitable for frequent operation and for long periods of inactivity. Valves
   shall operate with flows in either direction and shall provide zero leakage past the seat;
   the operating pressure for 3-inch through 12-inch shall be 200 psi and 14-inch through
   20-inch shall be 150 psi. Components shall be suitable for exposure to chloraminated
   water.

3. **SIZES**
   This Specification covers resilient seated gate valves in 3-inch through 20-inch nominal
   diameters.

4. **VALVE DESCRIPTION**
   Valves shall be iron body, resilient seated gate valves with non-rising stems. If the
   resilient seats are bonded to the gates, the gates shall be completely encapsulated
   with the material, except for guide tabs or slots. Valve bodies shall be designed to
   allow for the lifting of the valves by the bonnet flange, gland flanges, or other
   appurtenances.
   Valves shall be supplied with 2-inch square wrench nuts. Valves shall open clockwise.
   Valves installed in the recycled water system shall have EPDM seats.

5. **INSTALLATION**
   Valves, 3-inch through 12-inch, shall be installed with the stem positioned vertically in
   buried horizontal water lines without gearing, bypasses, rollers, or tracks. Valves,
   14-inch through 20-inch, shall be installed horizontally in buried horizontal water lines
   without bypasses, rollers, or tracks. Horizontal installations shall include a bevel gear
   to rotate the input shaft vertical and provide a mechanical advantage. Valve bonnet
   shall be installed below frost line.

6. **GEARING**
   Bevel gear shall be bury duty rated, grease filled for life, totally enclosed gearing, and
   fully sealed with nitrile rubber O-rings. Bevel gear housing shall be DI and bevel gears
   shall be AISI/SAE 4340 steel with the input shaft supported by a ball bearing. Gear
   reduction sized to limit maximum input torque required to operate valve in all
   conditions to 80 lb-ft.

7. **VALVE STEMS**
   Valve stems shall be made of bronze in accordance with ASTM B 763, Copper Alloy No.
   C99500; stainless steel in accordance with ASTM A 276, Type 304, Type 316, or AISI
   420; or copper alloy in accordance with ASTM B 98, Copper Alloy No. C66100/H02.
   The stem seal shall consist of two O-rings.
8. **Bolting Material**
The bonnet gland bolts and nuts shall be in accordance with ASTM F 593, Type 304 stainless steel or electro-plated with zinc or cadmium. The hot-dip galvanized process is not acceptable.

9. **End Connections**
   A. Flanges shall be sized and drilled in accordance with ANSI B16.1, Class 125. Flanges shall be machined to a flat surface with a serrated finish in accordance with AWWA C207.
   B. Mechanical joint components shall be in accordance with AWWA C111 with tee-head bolts and hexagon nuts fabricated from a high-strength, low alloy steel known in the industry as Cor-Ten, Usalloy, or Durabolt.

   Accessories for the mechanical joint shall consist of the gasket, gland, and fasteners and shall be furnished and packaged separately from valves. Each package shall be labeled in a manner that provides for proper identification and the number of units listed per package or bundle.

10. **Testing**
    Each valve, after shop assembly, shall be operated and hydrostatic tested in accordance with AWWA C509 or AWWA C515.

11. **Coatings**
    Ferrous surfaces, except machined or bearing surfaces, shall be prepared in accordance with SSPC SP10. These surfaces shall then be coated with liquid epoxy in two or more uniform coats or with fusion-bonded epoxy to a minimum DFT of 10-mils in accordance with AWWA C550. Machined flange faces shall be shop-coated with a rust-preventive compound; they shall not be painted or coated with the same coating as the body.

12. **Quality Control**
    The Manufacturer shall submit a written statement that the inspection and all specified tests have been completed and that results comply with the requirements of these Standards. Components in contact with potable water shall be certified to comply with NSF/ANSI 61, and a copy of the NSF/ANSI 61 certification shall be provided to Denver Water, if requested. Resilient seated gate valves shall be UL listed, and a copy of the UL certification shall be provided to Denver Water, if requested.

13. **Approved Manufacturers**

<table>
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<tr>
<th>Manufacturers</th>
<th>AWWA C509</th>
<th>Size (Inch)</th>
<th>AWWA C515</th>
<th>Size (Inch)</th>
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