

**SPECIFICATIONS FOR DRY-BARREL FIRE HYDRANTS**

**ANSI/AWWA C502-05**

**REVISED DECEMBER 2011**

**1. SCOPE**

This product specification covers post-type, dry-barrel fire hydrants with compression shut off (opening against pressure) or gate shutoff for use in water supply service in all climates, including those where freezing occurs. All products furnished shall conform to the American National Standards Institute and American Water Works Association C502-05 Standard (ANSI/AWWA C502-05) or latest revision thereof and shall be ULFM approved.

**2. DEFINITIONS**

All definitions are defined according to ANSI/AWWA C502-05.

- a) Cosmetic Defect: A blemish that has no affect on the ability of a component to meet the structural design and production test requirements of this standard. Should the blemish or the activity of plugging, welding, grinding, or repairing such blemishes cause the component to fail these requirements, and then the blemish shall be considered a structural defect.
- b) Structural Defect: A flaw that causes a component to fail the structural design or test requirements of this standard. This includes but is not limited to imperfections that result in leakage through the walls of a casting, failure to meet minimum wall thickness requirements, or failure to meet production tests.
- c) Bury: The length of bury is the distance measured to the nearest ½ ft. from the bottom of the connecting pipe to the ground line of the hydrant.

**3. GENERAL REQUIREMENTS**

- a) The San Antonio Water System (SAWS) reserves the right to limit the purchase of fire hydrants from manufacturers and to the models specified, as shown on Attachment I, provided such fire hydrants conform to the provision contained herein.

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- b) Each hydrant shall be designed for a minimum working pressure of 200 psig.
- c) All parts of the hydrant shall be designed to withstand, without being functionally impaired or structurally damaged, a hydrostatic test of not less than 400 psig or twice the rated working pressure, whichever is greater, with the hydrant completely assembled and pressurized as follows:
  - i. With the nozzle caps in place, the main valve open, the hydrant inlet capped, and the test pressure applied to the interior of the hydrant.
  - ii. With the main valve closed, the hydrant inlet capped, and the test pressure applied at the hydrant inlet.
  - iii. The design safety factor of the operating mechanism shall not be less than 5 and shall be based on the foot-pounds of torque required for the closing and opening of the hydrant at a working pressure of 200 psig. Hydrants shall be functional and capable of being opened or closed without difficulty following an application of an operating torque of 200 lb-ft at the operating nut in the opening direction with the hydrant fully opened and the closing direction with the hydrant fully closed. The torque requirements apply only to hydrants of 5-ft bury or less.
- d) The length of bury shall be as specified.
- e) The fire hydrant shall have 2 hose nozzles and 1 pumper nozzle.
- f) The nominal inside diameter of the hose nozzle shall be 2 ½ inches.
- g) The nominal inside diameter for the pumper nozzle shall be 4 inches.

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- h) The outlet-nozzle threads are to conform to the National Fire Protection Association (NFPA) 2003, Standard for Fire Hose Connections.
- i) The nominal diameter of the main valve opening shall be 5 ¼ inches.
- j) The hydrant shoe shall be provided with a 6 inches mechanical joint connection to fit the connecting pipe.
- k) The fire hydrant shall open right (clockwise).
- l) The color of the finish paint above the ground line shall be aluminum; however, fire hydrants for private use shall be painted red.
- m) The fire hydrant shall have a non-rising stem.
- n) No more than one 6" stem extension shall be provided if required to make the base of the fire hydrant grade level.
- o) The bonnet section shall be designed so all bearing surfaces and stem threads are sealed in a lubricant reservoir. If oil is used as a lubricant, the reservoir shall be designed to allow for easy filling through a fitting or plug. Where grease is used as a lubricant, the reservoir will be sealed. The reservoir will be adequately sealed with "O" rings or other suitable sealing system approved by the San Antonio Water System.
- p) The fire hydrant shall have a safety flange or breakaway flange at the ground line as stipulated in Section 3.1 General Design of ANSI/AWWA C502-05 or latest revision thereof.
- q) Fire hydrant nozzle cap chains shall be required and shall be attached permanently to the fire hydrant as stipulated in Section 3.2 Detailed Design of ANSI/AWWA C502-05 or latest revision thereof.
- r) Parts that require lubrication and come into contact with water shall be lubricated with a non-toxic food grade lubricant that does not pose a health hazard to the public if consumed.

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**4. WORKMANSHIP**

- a) All foundry and machine work shall be performed in accordance with good standard practice for the class of work involved and in conformance with accepted drawings, if required. When assembled, hydrants manufactured in accordance with this specification shall be well fitted and shall operate smoothly. The body and shaft shall be watertight.
- b) All parts shall conform to the required dimensions and shall be free from defects that could prevent proper functioning of the hydrant.
- c) All castings shall be clean and sound without defects that will weaken their structure or impair their service.

**5. PAINTING**

- a) The exterior surface of the hydrant shall be coated with a coating that shall meet or exceed the requirements of Federal Specification TT-C-494b. A second coat of water based or oil based enamel paint aluminum in color will then be applied from the top of the hydrant to a point 18 to 20 inches below the center line of the pumper nozzle or down to the traffic safety flange connection at the ground line.
- b) All interior surfaces, machined surfaces, such as the threaded portion of the stem or stem nut, which must fit closely with the adjacent parts, shall be coated with a coating that shall meet or exceed Federal Specification TT-C-494b. Stem surfaces contained within a lubricant reservoir and not in contact with potable water may be free of coating.
- c) The interior and exterior of the hydrant shoe shall be coated with a fusion-bonded epoxy having a nominal dry film thickness of 8 mils, conforming to ANSI/AWWA C550-05, and certified to NSF 61.
- d) Coating shall be as close to holiday free as is technologically possible.

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**6. TESTING AND INSPECTION**

- a) Each assembled hydrant shall be subjected to two shop tests under a hydrostatic pressure of 400 psig or twice the rated working pressure, whichever is greater. One test shall be made with the entire interior of the hydrant under pressure and another test made with the main valve closed and the base under pressure from the inlet side. Under the test procedure, there shall be no leakage through the main valve or seals or through the castings or the joints of the assembled hydrant. Under the test conditions, the leakage through the drain valves shall not exceed 5 fl oz/min. Other leakage or other imperfections found in either test shall be corrected or the hydrant retested. The tests shall be conducted for a sufficient time to allow a check of all points of possible leakage and for a minimum of 30 seconds after all air has been exhausted.
- b) Each assembled hydrant shall be operated through a full open-close cycle when not under pressure. The torque required for performing this operation shall not exceed 20 lb-ft.
- c) All fire hydrant tests and inspections shall conform to ANSI/AWWA C502 Section 5.1 Production Testing, ANSI/AWWA C502 Section 5.2 Prototype Testing, and ANSI/AWWA C502-05 Section 5.3 Inspection and Rejection.
- d) The manufacturer shall provide an Affidavit of Compliance conforming to Section 1.7 Affidavit of Compliance of ANSI/AWWA C502-05 or latest revision thereof. review will ensue. If the review determines manufacturing non-conformance the manufacturer shall replace the fire hydrant according to size with a fire hydrant that meets the San Antonio Water System's specifications. The defective fire hydrant removed from the field will be returned to the manufacturer, freight collect, and the manufacturer shall replace the fire hydrant, freight prepaid. If the non-conformance product amounts are excessive and result in increased product replacement by San Antonio Water System field staff the manufacturer may be subject to time and material charges.

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**7. QUALITY ASSURANCE**

- a) Manufacturers shall have an ASME or I.S.O. 9001 registered commercial quality system or is in the process of achieving this certification by June 2001. Noncompliance to this registered commercial quality system requirement by June 2001 will result in removal of the manufacturer's product from Attachment I of this specification. If on receipt of fire hydrants they are found to be noncompliant the manufacturer shall replace the defective fire hydrants according to fire hydrant size with a fire hydrant that meets the San Antonio Water System's specifications. The defective fire hydrants will be returned to the manufacturer, freight collect, and the manufacturer shall replace the fire hydrant, freight prepaid. If San Antonio Water System audits, product inspection and performance data review in accordance with these specifications determine excessive fire hydrant non-compliance, the manufacturer will be subject to removal by the Products Standards Committee. If the fire hydrant becomes defective during the manufacturer's specified warranty period a San Antonio Water System quality assurance and manufacturer review will ensue. If the review determines manufacturing non-conformance the manufacturer shall replace the fire hydrant according to size with a fire hydrant that meets the San Antonio Water System's specifications. The defective fire hydrant removed from the field will be returned to the manufacturer, freight collect, and the manufacturer shall replace the fire hydrant, freight prepaid. If the non-conformance product amounts are excessive and result in increased product replacement by San Antonio Water System field staff the manufacturer may be subject to time and material charges.

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**SPECIFICATIONS NUMBER 21-30**

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**8. FIRE HYDRANT MAINTENANCE KITS**

The San Antonio Water System will attempt to use fire hydrant maintenance kits in the repair of the approved hydrants. Attachment II of this specification provides the product model numbers.

**9. REFERENCES**

- a) American National Standards Institute and American Water Works Association Standard C502-05 (ANSI/AWWA C502-05).
- b) American National Standards Institute and American Water Works Association Standard C550-05 (ANSI/AWWA C550-05)

**ATTACHMENT I**

**APPROVED MANUFACTURERS**

The manufacturers listed below are approved by the San Antonio Water System

<b><u>Manufacturer</u></b>	<b><u>Model</u></b>
a. American Darling	B84B 5-1/4" (w / metal weather cap)
b. Clow Valve Company	Medallion c.
Kennedy Valve Company	Guardian
d. M & H Valve Company	Reliant Model 929
e. Mueller Company	Super Centurion 250 f.
United States Pipe and Foundry, Inc.	Metropolitan
g. Waterous	Pacer 100
h. American AVK Company	Model 2780 Dry

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**ATTACHMENT II**

**APPROVED FIRE HYDRANT MAINTENANCE KITS**

The fire hydrant maintenance kits listed are the reference product model numbers.

<b><u>Manufacturer</u></b>	<b><u>Model</u></b>
a. American Darling	B84B 5-1/4" (w / metal weather cap)
b. Clow Valve Company	Medallion
c. Kennedy Valve Company	Guardian
d. M & H Valve Company	Reliant Model 929
e. Mueller Company	Super Centurion 250
f. United States Pipe and Foundry, Inc.	Metropolitan
g. Waterous	Pacer 100
h. American AVK Company	Model 2780 Dry

**Previous Specification**

APRIL 2000

SEPTEMBER 2005

DECEMBER 2011