Designation: D6904 – 03 (Reapproved 2022)

Standard Practice for Resistance to Wind-Driven Rain for Exterior Coatings Applied on Masonry[1]

This standard is issued under the fixed designation D6904; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This practice is for the evaluation of the ability of coatings to resist the passage of water through masonry block when exposed to water spray and air pressure.

1.2 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D1475 Test Method for Density of Liquid Coatings, Inks, and Related Products

D3924 Specification for Standard Environment for Conditioning and Testing Paint, Varnish, Lacquer, and Related Materials

D3925 Practice for Sampling Liquid Paints and Related Pigmented Coatings

2.2 *Federal Standard:*[3]

TT-C-555B Coating, Textured (For Interior and Exterior Masonry Surfaces)

3. Summary of Practice

3.1 Typically 8 by 16 by 2 in. masonry blocks are coated with block filler and then coated with the masonry paint and allowed to cure. The coated blocks are then secured to a test apparatus and exposed for 24 h to continuous water spray and air pressure or as agreed upon between manufacturer and supplier. Upon completion of the exposure, the blocks are removed, evaluated for visible water leaks or weight gain, or both.

4. Significance and Use

4.1 This practice is meant to simulate the ability of a coating system applied to a masonry block to withstand exposure to continuous water spray (rain) and a dynamic pressure equivalent to a 98 mph wind velocity without exhibiting water leaks or weight gain, or both.

5. Apparatus

5.1 The testing box is assembled from transparent plastic panels ½-in. thick and typically of the dimensions as shown in Fig. 1. Three openings on the side, 6 by 12 in., are provided so that the coated side of the three blocks may be positioned for test. The openings on the top of the apparatus for the air inlet and manometer connection shall not be less than 3 in. apart to make certain that air inlet turbulence will not effect the manometer readings. A spray tube shall be constructed from ½-in. plastic tubing with three fish-tail nozzles.[4] Attachment to the testing box includes a water-filled U-tube manometer, source of compressed air, clamps and angle irons for securely fastening the test panels to the box, and a drain outlet. Also,

[1] This practice is under the jurisdiction of ASTM Committee D01 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.47 on Concrete, Stone and Masonry Treatments.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[3] Available from U.S. Government Printing Office Superintendent of Documents, 732 N. Capitol St., NW, Mail Stop: SDE, Washington, DC 20401, http://www.access.gpo.gov.

[4] Federal Specification TT-C-555B, Amendment No. 1, dated August 5, 1975, U.S. Government Printing Office.

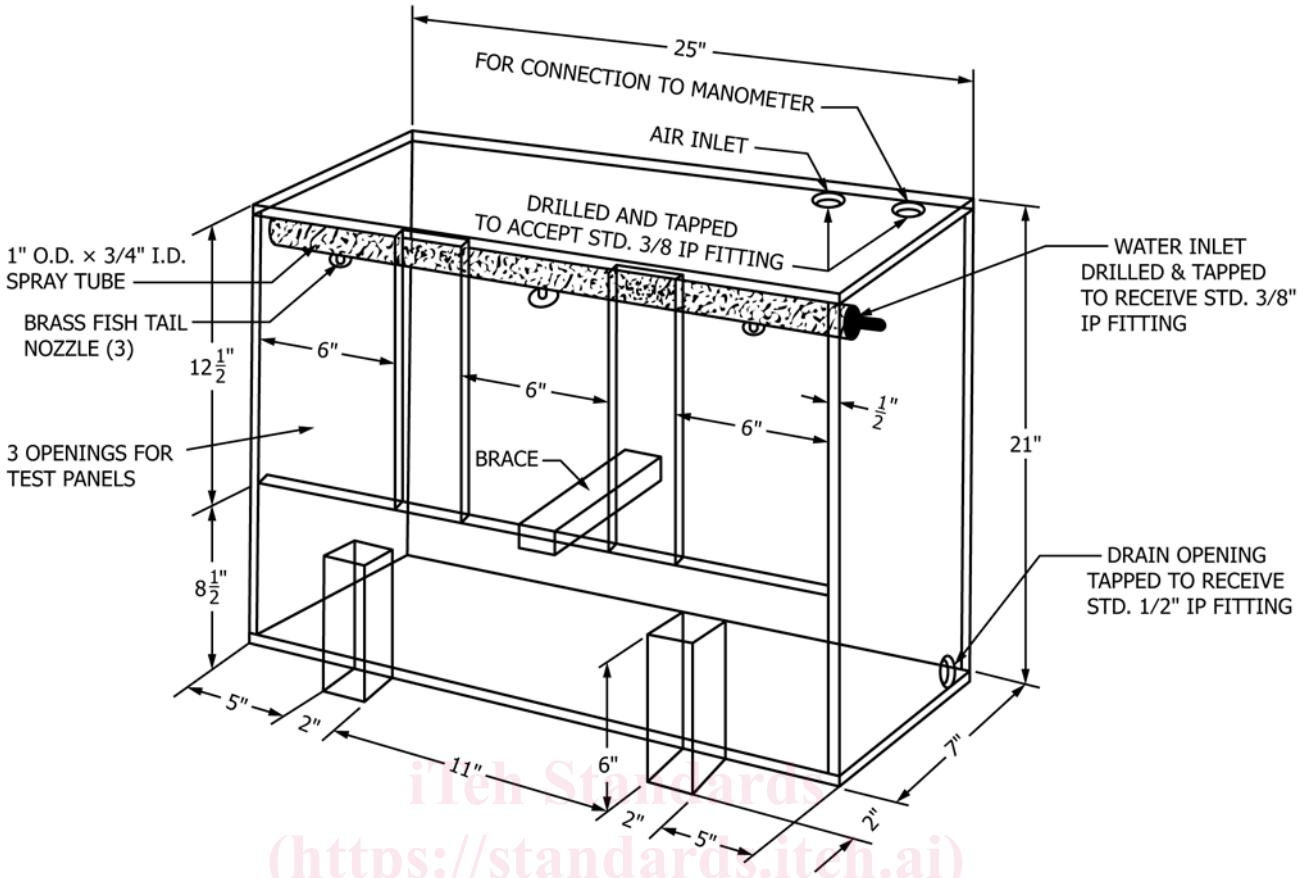

FIG. 1 Dimensions of Test Box

illustrated is a simple air pressure regulator consisting of a T-tube with the leg (foot) of the tube placed in a water filled beaker at a depth of slightly greater than 5 in. This set up is also a safety device. Any sudden increase in air pressure will be vented harmlessly. The apparatus outlined above was derived from that shown in Federal Specification TT-C-555B. Apparatus and substrates of other dimensions can be used as agreed upon between manufacturer and supplier. The duration of exposure and water pressure used will also be agreed upon between manufacturer and user.

6. Reagents and Materials

6.1 *Three 8 by 16 by 2 in. Patio Blocks.*

6.2 *Stiff Bristle Brush.*

6.3 *Mortite or Rubber Gasket,* to assure a tight fit of the patio blocks to the test apparatus.

6.4 *Clamps and Angle Irons.*

6.5 *Wind-Driven Rain Apparatus,* (an example is shown in Fig. 1).

6.6 *Source of Compressed Air.*

6.7 *Water Source.*

7. Sampling

7.1 Sampling of both block filler, if used, and topcoat shall be conducted in accordance with procedures outlined in Practice D3925.

8. Procedure

8.1 Prepare patio blocks by using a stiff bristle brush to remove any loose materials.

8.2 Assure that blocks are dried and have been stored in an area under standard conditions of 73.5 ± 3.5 °F (23 ± 2 °C) and 50 ± 5 % relative humidity as outlined in Specification D3924.

8.3 Apply block filler, if required, in accordance with manufacturers instructions or at a recommended spreading rate of 100 ± 10 ft^2/gal to three blocks. It may be advisable to use a scrub brush for this application to assure that all the voids in the block are filled before applying the test coat. Determine the density of the block filler in accordance with procedures outlined in Test Method D1475 and apply the coating at the spreading rate specified using the following equation:

$$\text{Grams of Paint Needed} = \frac{454 \times \text{Density (lb/gal)} \times \text{Area in.}^2\text{ (Block)}}{144 \times \text{Spreading Rate (ft}^2\text{/gal)}} \quad (1)$$

NOTE 1—A block filler may not be suitable for all coatings applications, such as clear water repellents.

8.4 Allow block filler to dry at least overnight or per manufacturers instructions.

8.5 Apply topcoat using a good quality nylon/polyester brush over the block filler at the manufacturers recommended spreading rate. Use the equation outlined in 8.3 to determine the amount of test paint needed.