Designation: D2672 – 20

An American National Standard

Standard Specification for Joints for IPS PVC Pipe Using Solvent Cement[1]

This standard is issued under the fixed designation D2672; 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 specification covers the socket produced for solvent cement joints on both pressure and non-pressure IPS pipe. It also covers the testing of the joints on both pressure and non-pressure pipe, and includes requirements for socket dimensions, burst pressure, and joint tightness tests of the solvent cemented joints. The tests described are not intended for routine quality control, but rather to evaluate the performance characteristics of the joint.

NOTE 1—On dual marked Schedule 40 DWV and potable water pipe, the socket bells must conform to the dimensional and physical requirements for pressure socket bells.

1.2 The text of this specification references notes, footnotes, and appendixes which provide explanatory material. These notes and footnotes (excluding those in tables and figures) shall not be considered as requirements of the specification.

1.3 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.

NOTE 2—Changes in ground, water, or air temperature will produce expansion or contraction forces in PVC piping, and these will result in longitudinal shear stresses in the solvent cement joints. These stresses must be considered in the design and operation of the system.

NOTE 3—See Practice D618 for information relating to this specification.

1.4 The following safety hazards caveat pertains only to the test method portion, Section 10, of this specification. *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.*

1.5 *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]

D618 Practice for Conditioning Plastics for Testing

D1599 Test Method for Resistance to Short-Time Hydraulic Pressure of Plastic Pipe, Tubing, and Fittings

D1600 Terminology for Abbreviated Terms Relating to Plastics

D1785 Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120

D2122 Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings

D2241 Specification for Poly(Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series)

D2565 Practice for Xenon-Arc Exposure of Plastics Intended for Outdoor Applications

D2665 Specification for Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings

D2855 Practice for the Two-Step (Primer and Solvent Cement) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets

F412 Terminology Relating to Plastic Piping Systems

F512 Specification for Smooth-Wall Poly(Vinyl Chloride) (PVC) Conduit and Fittings for Underground Installation

F656 Specification for Primers for Use in Solvent Cement Joints of Poly(Vinyl Chloride) (PVC) Plastic Pipe and Fittings

F3328 Practice for the One-Step (Solvent Cement Only) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets

2.2 *NSF Standard:*

Standard No. 14 for Plastic Piping Components and Related Materials[3]

[1] This specification is under the jurisdiction of ASTM Committee F17 on Plastic Piping Systems and is the direct responsibility of Subcommittee F17.20 on Joining.

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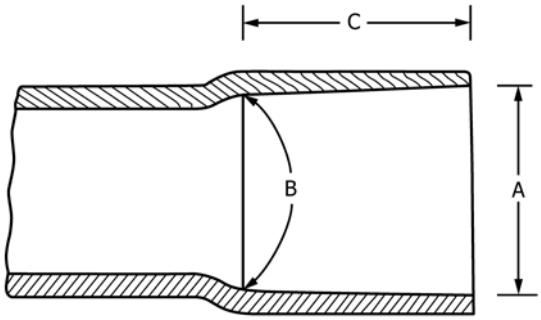
[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[3] Available from NSF International, P.O. Box 130140, 789 N. Dixboro Rd., Ann Arbor, MI 48113-0140, http://www.nsf.org.

***A Summary of Changes section appears at the end of this standard**

TABLE 1 Tapered Sockets for Bell-End Pipe, in. (mm)



Pipe Size, in.	A Socket Entrance Diameter, in. (mm)			B Socket Bottom Diameter, in. (mm)			C Socket Length, in. (mm), min[A]	
	Nominal Diameter	Tolerance on Nominal Diameter	Maximum Out-of-Round[B]	Nominal Diameter	Tolerance on Nominal Diameter	Maximum Out-of-Round[B]	Pressure	Non-Pressure[C]
⅛	0.417 (10.59)	±0.004 (±0.10)	0.024 (0.61)	0.401 (10.18)	±0.004 (±0.10)	0.024 (0.61)	0.500 (12.70)	. . .
¼	0.552 (14.02)	±0.004 (±0.10)	0.024 (0.61)	0.536 (13.61)	±0.004 (±0.10)	0.024 (0.61)	0.500 (12.70)	. . .
⅜	0.687 (17.45)	±0.004 (±0.10)	0.024 (0.61)	0.671 (17.04)	±0.004 (±0.10)	0.024 (0.61)	0.750 (19.05)	. . .
½	0.848 (21.54)	±0.004 (±0.10)	0.024 (0.61)	0.836 (21.23)	±0.004 (±0.10)	0.024 (0.61)	1.000 (25.40)	1.000 (25.40)
¾	1.058 (26.87)	±0.004 (±0.10)	0.028 (0.71)	1.046 (26.57)	±0.004 (±0.10)	0.028 (0.71)	1.250 (31.75)	1.000 (25.40)
1	1.325 (33.65)	±0.005 (±0.13)	0.030 (0.76)	1.310 (33.27)	±0.005 (±0.13)	0.030 (0.76)	1.500 (38.10)	1.000 (25.40)
1¼	1.670 (42.42)	±0.005 (±0.13)	0.034 (0.86)	1.655 (42.04)	±0.005 (±0.13)	0.034 (0.86)	1.750 (44.45)	1.250 (31.75)
1½	1.912 (48.56)	±0.006 (±0.15)	0.036 (0.91)	1.894 (48.11)	±0.006 (±0.15)	0.036 (0.91)	2.000 (50.80)	1.375 (34.92)
2	2.387 (60.63)	±0.006 (±0.15)	0.036 (0.91)	2.363 (60.02)	±0.006 (±0.15)	0.036 (0.91)	2.250 (57.15)	1.750 (44.45)
2½	2.889 (73.38)	±0.007 (±0.18)	0.044 (1.12)	2.861 (72.67)	±0.007 (±0.18)	0.044 (1.12)	2.500 (63.50)	2.000 (50.80)
3	3.516 (89.31)	±0.008 (±0.20)	0.046 (1.17)	3.484 (88.49)	±0.008 (±0.20)	0.046 (1.17)	3.250 (82.55)	2.875 (73.02)
3½	4.016 (102.01)	±0.008 (±0.20)	0.046 (1.17)	3.984 (101.19)	±0.008 (±0.20)	0.046 (1.17)	3.500 (88.90)	3.125 (79.37)
4	4.518 (114.76)	±0.009 (±0.23)	0.048 (1.22)	4.482 (113.84)	±0.009 (±0.23)	0.048 (1.22)	4.000 (101.60)	3.375 (85.72)
5	5.583 (141.81)	±0.010 (±0.25)	0.080 (2.03)	5.543 (140.79)	±0.010 (±0.25)	0.080 (2.03)	4.000 (101.60)	4.000 (101.60)
6	6.647 (168.83)	±0.011 (±0.28)	0.082 (2.08)	6.603 (167.72)	±0.011 (±0.28)	0.082 (2.08)	6.000 (152.40)	5.000 (127.00)
8	8.655 (219.84)	±0.015 (±0.38)	0.120 (3.05)	8.598 (218.39)	±0.015 (±0.38)	0.120 (3.05)	6.000 (152.40)	5.000 (127.00)
10	10.776 (273.71)	±0.015 (±0.38)	0.130 (3.30)	10.722 (272.34)	±0.015 (±0.38)	0.130 (3.30)	7.500 (190.50)	6.500 (165.10)
12	12.778 (324.56)	±0.015 (±0.38)	0.150 (3.81)	12.721 (323.11)	±0.015 (±0.38)	0.150 (3.81)	8.500 (215.90)	7.500 (190.50)
14	14.035 (356.49)	±0.015 (±0.38)	0.150 (3.81)	13.985 (355.22)	±0.015 (±0.38)	0.150 (3.81)	9.000 (228.60)	8.000 (203.20)
16	16.045 (410.08)	±0.015 (±0.38)	0.160 (4.06)	15.980 (405.89)	±0.015 (±0.38)	0.160 (4.06)	10.000 (254.00)	9.000 (228.60)
18	18.055 (458.60)	±0.020 (±0.51)	0.180 (4.57)	17.980 (456.69)	±0.020 (±0.51)	0.180 (4.57)	12.000 (304.80)	10.000 (254.00)
20	20.065 (509.65)	±0.025 (±0.64)	0.200 (5.08)	19.980 (507.49)	±0.025 (±0.64)	0.200 (5.08)	12.000 (304.80)	11.000 (279.40)
24	24.075 (611.51)	±0.030 (±0.76)	0.240 (6.10)	23.970 (608.84)	±0.030 (±0.76)	0.240 (6.10)	12.000 (304.80)	12.000 (304.80)

[A] All tolerances on minimum dimensions shall be on the plus side.
[B] "Out-of-round" is defined as the maximum measured diameter less the minimum measured diameter.
[C] Maximum length = +0.250 in. (6.350 mm).

3. Terminology

3.1 *Definitions*—Definitions are in accordance with Terminology F412 and abbreviations are in accordance with Terminology D1600, unless otherwise specified.

4. Materials

4.1 *General*—PVC plastics used to make the pipe, which are belled under this specification, are designated in PVC product standards referencing this standard.

4.2 Solvent cements must conform to the requirements of Specification D2565.

4.3 Primers must conform to the requirements of Specification F656.

5. Requirements

5.1 *Bell Socket Dimensions and Tolerances:*

5.1.1 *Diameters and Length*—The diameter, lengths, and tolerances of the bell sockets shall be as shown in Table 1 when measured in accordance with Test Method D2122.

5.1.2 *Wall Thicknesses*—The minimum wall thicknesses of the sockets (bell) shall not be less than 90 % of the minimums shown for the pressure pipe in the applicable ASTM specification. For non-pressure pipe, the integral socket (bell) shall be considered satisfactory when formed from pipe which meets the minimum wall thickness requirements of the applicable ASTM specification when measured in accordance with Test Method D2122.

5.2 *Joint Tests:*

5.2.1 *Burst Pressure*—The minimum burst pressures for pipe and (bell) socket on pressure pipe shall be as given for pressure pipe in the applicable ASTM specification when determined in accordance with 10.3.

5.2.2 *Joint Tightness*—The (bell) socket joint on non-pressure pipe shall not leak when tested in accordance with 10.4.

6. Workmanship

6.1 Each socket (bell) is required to be uniform in depth, circular in cross section concentric with the pipe, and to have an end as square as commercially practicable.

7. Retest and Rejection

7.1 If the results of any test(s) do not meet the requirements of this specification, the test(s) shall be conducted again only by agreement between the purchaser and the seller. Under such agreement, minimum requirements shall not be lowered, nor tests omitted, substituted, changed, or modified, nor shall specification limits be changed. If upon retest, failure occurs, the quantity of product represented by the test(s) does not meet the requirements of this specification.

8. Sampling and Test Specimens

8.1 Take at random a sample of the pipe with (bell) socket sufficient to determine conformance with this specification.

8.1.1 The test specimens for any pressure test shall have at least a part of the marking in their central sections. The central section is that portion of pipe which is at least one pipe diameter away from an end closure.

8.1.2 *Dry Fit of Joint*—Manually insert a chamfered or deburred pipe spigot into the socket (bell). There must be an interference between the spigot and bell after inserting the spigot one third to two thirds of socket (bell) depth.

9. Conditioning

9.1 Condition the test specimens at 73.4 ± 3.6 °F (23 ± 2 °C) and 50 ± 10 % relative humidity for not less than 40 h prior to test in accordance with Procedure A of Practice D618, for those tests requiring conditioning.

10. Test Methods

10.1 *Test Conditions*—Conduct the tests in the Standard Laboratory Atmosphere of 73.4 ± 3.6 °F (23 ± 2 °C) and 50 ± 10 % relative humidity, unless otherwise specified in Practice D618 or in this specification.

10.2 *Socket Joint Assembly*—Assemble the socket joint per Practice D2855, and condition at 73.4 °F (23 °C) for a minimum of 48 h.

10.3 *Burst Pressure Test of Joint Assembly*—Determine the burst pressure of one specimen in accordance with Test Method D1599. The assembled socket (bell) joint shall be within the middle 30 % of the overall specimen length. The time to failure of the specimen shall be between 60 and 70 s.

10.4 *Socket Joint Tightness Test*—Subject the assembly to an internal pressure of 25 psi (170 kPa) using water as the test medium. Maintain this pressure for at least 1 h. There shall be no leakage.

11. Marking and Quality Assurance

11.1 When pipe, made in accordance with Specifications D1785, D2241, D2665 and F512, is marked with ASTM designation D2672, in addition to the pipe standard, it affirms that the sockets (bell) were manufactured, inspected, sampled, and tested in accordance with this specification and have been found to meet the requirements of this specification. However, the designation marking, D2672, is not required.

APPENDIX

(Nonmandatory Information)

X1. SOLVENT CEMENTING JOINTS 10 IN. AND LARGER

X1.1 If it is necessary, cut the pipe to length, making sure the cut is square. Chamfer cut ends and remove all burrs.

X1.2 Examine bell and pipe end for damage before cementing joint.

X1.3 Clean the matting surfaces of the pipe and fitting to remove dirt and foreign matter immediately before proceeding to the next step. Mark the pipe end with a bell depth line which will show when full penetration has been achieved.

X1.4 Check the dry fit of pipe in bell. This is critical on larger sizes because tolerances increase as the diameters increase. If a slightly loose fit occurs, apply a second coat of cement to the pipe end before assembly.

X1.5 Prepare the joining surfaces by applying an approved primer. The surfaces are softened by this process. The primer takes longer to penetrate the surfaces at lower temperatures. Below 40°F, it may take three to four times as long to get good surface penetration. Penetration is satisfactory when 2 to 5 mils can be scraped from the surface. The interior surface of the bell should be given special attention because some silicone release agent residue may be present.

X1.6 Immediately after priming, apply the solvent cement using a wide bristle paint brush or a roller. Apply a heavy coat of solvent cement to the pipe end, and a light coat to the inside of the bell. *Both mating surfaces should be completely covered.* Apply sufficient cement to the mating surfaces to fill the gap between the pipe and the bell. If there are no finished surfaces below the joint, the cement may be poured on the pipe surface and inside the bell and spread with a brush. Use an extra-heavy-bodied cement to extend the working time when elevated temperature and low humidity conditions exist.