Designation: D6396 – 99 (Reapproved 2012)

Standard Test Method for Testing of Pipe Thread Sealants on Pipe Tees[1]

This standard is issued under the fixed designation D6396; 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 test method covers procedures used to assemble, evaluate and test pipe thread sealants.

1.2 Test procedures included in this test method are cure speed versus temperature, primer cure, instant seal/sealability, heat aging, solvent resistance, hot strength, steam resistance, and specimen preparation for high pressure testing.

1.3 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

1.4 *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 and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D907 Terminology of Adhesives

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

3. Terminology

3.1 *Definitions*—Many of the terms in this test method are defined in Terminology D907.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *removal torque, n*—the torque required to unseat an installed pipe plug from a pipe tee.

4. Summary of Test Method

4.1 Pipe tee and plug fittings, assembled with the sealant under test, are subjected to a variety of conditions and tested for sealability and removal torque, ½ in. cap, coupling and nipple assemblies are prepared with the sealant under test for high pressure testing (typically 10 000 psi).

5. Significance and Use

5.1 Many of the tests that have been employed in the past to evaluate thread sealant products have not consistently targeted the most significant product features of a thread sealant. For instance, one of a thread sealant's primary performance features is its ability to maintain a seal under a range of conditions. The procedures in this test method assess the important characteristic properties of a thread sealant.

5.2 Because of the variability of the test specimens and the techniques employed by each operator, the assembly and test procedures and the testing apparatus have been designed to reduce the variability of the test results.

6. Apparatus

6.1 *Torque Testing Device,* of suitable capacity, for testing assemblies.

NOTE 1—Using automated torque testers to test the assemblies generally produces more reproducible results.

6.2 *Torque Wrench,* of suitable capacity, for providing installation torque.

6.3 *Pipe Tee Assembly Block,* ⅜ in. (10 mm), as shown in Fig. 1, or equivalent.

6.4 *Pipe Tee Torque Test Block,* ⅜ in. (10 mm), as shown in Fig. 2, or equivalent.

NOTE 2—The pipe tee torque test block is designed to fit an automated torque tester, but it can also be used in a vise with a torque wrench.

6.5 *Pipe Tee Sealability Test Clamp,* as shown in Fig. 3.

6.6 *Temperature Chamber.*

6.7 *Pressurized Pots,* for solvent resistance and steam resistance testing.

7. Test Specimen

7.1 *Malleable Iron Pipe Tees,* ⅜ in. (10 mm).

7.2 *Forged Steel Pipe Plugs,* ⅜ in. (10 mm).

7.3 *Stainless Steel Pipe Tees,* ⅜ in. (10 mm), 304SS.

7.4 *Stainless Steel Pipe Plugs,* ⅜ in. (10 mm), 304SS.

7.5 *Brass Pipe Tees,* ⅜ in. (10 mm).

[1] This test method is under the jurisdiction of ASTM Committee D14 on Adhesives and is the direct responsibility of Subcommittee D14.80 on Metal Bonding Adhesives.

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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.

(All dimensions in inches unless otherwise stated)

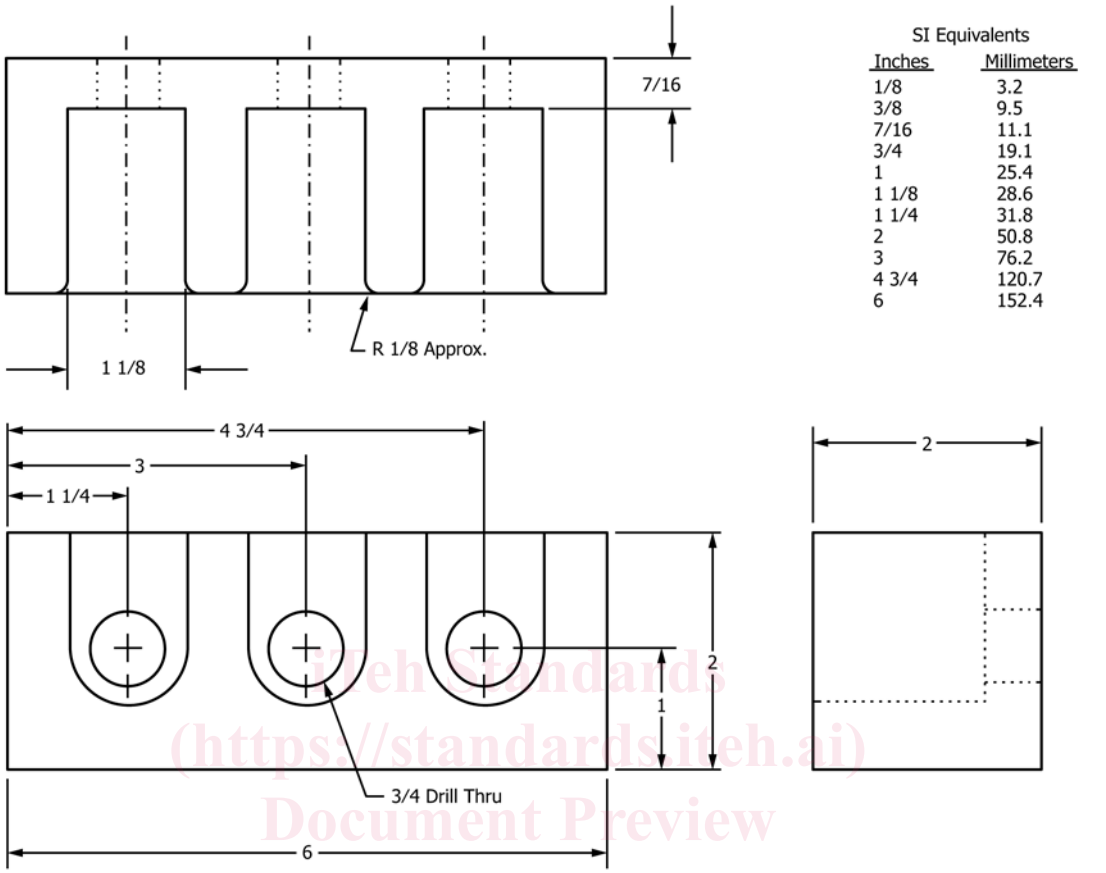

FIG. 1 ⅜ Pipe Tee Assembly Block

7.6 *Brass Pipe Plugs,* ⅜ in. (10 mm).

7.7 *Malleable Iron Pipe Tees,* ½ in. (13 mm), Class 300.

7.8 *Forged Steel Pipe Plugs,* ½ in. (13 mm).

7.9 *Hex Reducing Coupling,* ½ in. (13 mm) FNPT by ⅛ in. (3 mm) FNPT, 316 stainless steel.

7.10 *Cap,* ½ in. (13 mm) pipe cap.

7.11 *Hex Long Nipple,* 316SS.

8. Assembly

8.1 Assemble not less than three assemblies for each test.

8.2 Degrease all pipe tees and plugs. Allow specimens to cool to room temperature prior to sealant application.

8.3 Apply sealant as follows:

8.3.1 Apply sealant uniformly to the second through the sixth threads of the male fitting for each test joint.

8.3.2 Ensure that the average height of the sealant reaches the thread crown (major diameter), and that the sealant completely wets the thread roots.

8.3.3 Note any separation or visible defects with the products. Also note any problems with wettability or excessive running due to low viscosity or a low thixotropy level.

8.4 Assemble test specimens as follows:

8.4.1 Using a torque wrench and the pipe tee assembly block fixture, install two sealant coated pipe plugs for each pipe tee. Install with the application of 240 in.–lbs (27.1 N·m) of torque.

8.4.2 Remove excess sealant to avoid excess specimen weight loss that may be caused by charred sealant flaking off during initial heat exposure and in steam resistance tests.

9. Procedure

9.1 *Cure Speed Versus Temperature:*

9.1.1 Use ⅜ in. (10 mm) pipe tees and plugs.

9.1.2 Condition pipe tees and plugs in a temperature chamber at the cure temperature specified by the adhesive manufacturer for a minimum of 2 h.

NOTE 3—A temperature chamber is not needed for conditioning specimens for curing at room temperature.