



Standard Test Method for Determining Chemical Compatibility of Thread Sealants with Thermoplastic Threaded Pipe and Fittings Materials¹

This standard is issued under the fixed designation F 2331; 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 is used for determining chemical compatibility of thread sealant compounds with threaded pipe and fittings materials. This procedure is generally applicable to thread sealant compounds which are either hard-cure, soft-cure or non-hardening paste at room temperatures (i.e. non-liquid or semi-liquid).

1.2 *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 to determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:²

F 1498 Specification for Taper Pipe Threads 60° for Thermoplastic Pipe and Fittings

D 638 Test Method for Tensile Properties of Plastics

2.2 ASME Standards:

B1.20.1 Pipe Threads, General Purpose (inch)

3. Summary of Test Method

3.1 The procedure uses tensile specimen test bars in a longitudinal tensile test geometry in a constant load (creep) method. All procedures are run at an ambient temperature of 73°F (23°C).

4. Significance and Use

4.1 These procedures can be used to evaluate thread sealants relative to causing environmental stress-cracking in thermoplastic materials. This testing results in determining time-to-failure vs. engineering stress. This procedure can also be used in stress-rupture regression analysis, where a variety of stress

levels are needed. The methodology can be readily adapted to conducting immersion tests in liquids.

5. Interferences

5.1 In these procedures, there may be interference effects due to differences in resin or the additives in the thermoplastic materials. Until such time as data is available to address this, the user should take this into consideration when applying this test method.

6. Apparatus

6.1 Apparatus for constant tensile method.

6.1.1 Constant-tensile-load test apparatus which maintains the load to within $\pm 1\%$ throughout the test duration.

6.1.2 Immersion vessels which can be mounted to the tensile-load apparatus (if applicable).

7. Test Specimen

7.1 Test bars may be either fabricated from compression molded plaques or injection molded. Test times and/or stress levels may be reduced by incorporating a knit-line into an injection-molded test bar. If a knit-line is present, the mold should be designed such that the knit-line occurs in the center of the bar, perpendicular to the longitudinal axis.

7.2 A Type IV specimen as shown in D 638 shall be used for referee testing. Other specimen geometries may be used if shown to provide equivalent results.

8. Calibration and Standardization

8.1 All test instrumentation shall be calibrated to standards traceable to the National Institute of Standards and Technology.

8.2 The test stress (tensile) shall be calibrated by use of a known aggressive chemical agent (positive control) to determine the stress needed to produce failures within 100 hours on at least 75 % of the specimens. This stress is then used for testing of the thread sealant under consideration.

NOTE 1—The known aggressive chemical agent is generally determined by causing premature failures as indicated in 9.2. Some agents may be known from previous experience with the materials being used for testing. For example, linseed and soybean oil have been used for this purpose with PVC and CPVC test materials.

¹ This test method is under the jurisdiction of ASTM Committee F17 and is the direct responsibility of Subcommittee F17.20 on Joining.

Current edition approved May 1, 2004. Published June 2004.

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.

