Designation: F 610/F 610M – 00a (Reapproved ~~2005~~)2009)

An American National Standard

Standard Test Method for Evaluating the Quality of Molded Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings by the Heat Reversion Technique[1]

This standard is issued under the fixed designation F 610/F 610M; 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 a procedure for evaluating the quality of molded poly(vinyl chloride) (PVC) plastic pipe fittings after exposure to heat.

1.2 The values stated in either ~~inch-pound~~SI units or ~~SI~~inch-pound units are to be regarded separately as standard. ~~Within the text, the SI units are shown in brackets.~~ The values stated in each system ~~are~~may not be exact equivalents; therefore, each system ~~must~~shall be used independently of the other. Combining values from the two systems may result in non-conformance with the ~~specification.~~ 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 and health practices and determine the applicability of regulatory limitations prior to use.*

2. Summary of Test Method

2.1 A representative sample of the fitting being produced is placed in a thermostatically controlled oven at 302 ± 5.4°F [150 ± 3°C] for 30 min. The acceptability of the fitting quality, after the required test time, is based or expressed as a percentage of the original wall thickness or surface area of the fitting.

3. Significance and Use

3.1 This test method is applicable to distinguish between properly and improperly molded PVC plastic pipe fittings. It can be used to:

3.1.1 Determine whether cold slugs or unfused areas are present (Note 1),

3.1.2 Determine the amount of molded-in stress produced by the molding process (Note 2),

3.1.3 Reveal contamination, and

3.1.4 Show the quality of the weld line.

NOTE 1—A cold slug is a piece of material that enters the mold at a significantly lower temperature than the rest of the mass.

NOTE 2—A stress-free part will generally have better properties and higher strength than those with a high degree of stress. Stress-free parts will generally react better when exposed to chemicals.

4. Apparatus

4.1 *Circulating Air Oven*, thermostatically controlled, capable of operating at 302 ± 5.4°F [150 ± 3°C] such that after insertion of the fittings to be tested the test temperature is regained within 15 min or less. (See Annex A1.)

NOTE 3—The oven should be vented to the outside of the building.

5. Conditioning

5.1 A specific conditioning period is not required although the fitting shall be at room temperature. This test can be performed on a particular fitting any time after it has been produced.

6. Procedure

6.1 Select the fittings to be tested and examine them for the following, making proper notation for the report:

6.1.1 The condition and appearance of both inner and outer surfaces of the fitting,

6.1.2 The condition and appearance of the weld lines and areas adjacent to them,

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6.1.3 The condition and appearance of the gate and area adjacent to it, and

6.1.4 The condition and appearance of the internal surface opposite the gate and gate area.

6.2 Place the fittings to be tested in the oven so that each fitting stands on one of its socket entrances and with sufficient separation between individual specimens so that the hot air can flow freely between them. Record the time when the air in the oven recovers to 302 ± 5.4°F [150 ± 3°C]. After an additional time as indicated in Table 1 at this temperature, remove the fittings, taking care not to distort or otherwise damage them.

6.2.1 When the fitting being tested has a body and branch wall that falls within two different exposure times, two fittings shall be tested. One will be tested using the lower exposure time, and the other will be tested using the longer exposure time.

6.3 Allow the fittings to cool to room temperature naturally in the air. When cool enough to handle, examine them for the following, making proper notation for the report:

6.3.1 The condition and appearance of both inner and outer surfaces of the fitting,

6.3.2 The condition and appearance of the weld lines and areas adjacent to them,

6.3.3 The condition and appearance of the gate and area adjacent to it, and

6.3.4 The condition and appearance of the internal surface opposite the gate and gate area.

7. Interpretation

7.1 A suggested interpretation of the results observed is given in Appendix X1. Refer to specific product standards for deviations from this suggested interpretation of results.

8. Report

8.1 The report shall include the following information:

8.1.1 Complete identification of the fitting, including the nominal size, material type and production codes such as part number, production date, shift, and machine number.

8.1.2 Condition and appearance of weld line and area adjacent to weld line before and after test.

8.1.3 Condition and appearance of the gate and of the area opposite the gate on the inner surface before and after the test.

8.1.4 Condition and appearance of the outer and inner surfaces before and after the test.

8.1.5 Type and extent of any delamination produced.

8.1.6 Extent and location of any peeling produced.

8.1.7 Maximum localized reduction of wall thickness expressed as a percentage of the original wall thickness at the immediately adjacent area.

8.1.8 Any other changes attributable to the test.

8.1.9 Date of test.

NOTE 4—Where cracks appear in the fitting, a 45° angle cut through the fitting at the crack may be made to facilitate examination of the depth of the crack.

9. Precision and Bias

9.1 No statement is made about either the precision or bias of Test Method F 610/F 610M for evaluating the quality of PVC fittings, since the result merely states whether there is conformance to the criteria for success specified in the procedure.

10. Keywords

10.1 evaluating; fittings; plastic; PVC; quality

TABLE 1 Exposure Time

Minimum Wall Thickness, e[A]	Exposure Time, min.
~~e ≤ 0.118 in. (3 mm)~~	~~15~~
e ≤ 0.118 in. [3 mm]	15
~~0.118 in. (3 mm) < e ≤ 0.393 in (10 mm)~~	~~30~~
0.118 in. (3 mm) < e ≤ 0.393 in. [10 mm]	30
~~0.393 in. (10 mm) < e ≤ 0.787 in (20 mm)~~	~~60~~
0.393 in. (10 mm) < e ≤ 0.787 in. [20 mm]	60
~~0.787 in. (20 mm) < e ≤ 1.181 in (30 mm)~~	~~140~~
0.787 in. (20 mm) < e ≤ 1.181 in. [30 mm]	140
~~1.181 in. (30 mm) < e ≤ 1.574 in (40 mm)~~	~~220~~
1.181 in. (30 mm) < e ≤ 1.574 in. [40 mm]	220
~~e > 1.574 in. (40 mm)~~	~~240~~
e > 1.574 in. [40 mm]	240

[A] Minimum wall thickness refers to the standard's specified minimum body wall thickness for the fitting being tested. If a minimum wall thickness is not specified in a standard, then the average body wall thickness shall be calculated to select the appropriate exposure time.