



Standard Test Method for Stress Crazeing of Acrylic Plastics in Contact with Liquid or Semi-Liquid Compounds¹

This standard is issued under the fixed designation F 484; 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.

This standard has been approved for use by agencies of the Department of Defense.

^{ε1} NOTE—Keywords were added editorially in October 1998.

1. Scope

1.1 This test method covers determination of the crazing effect that a liquid or semi-liquid test compound will have on transparent acrylic plastic material that is under bending stress.

1.2 Three types of acrylic material are covered. One, two, or all of the materials shall be used in the test, as specified by the procuring agency. When not specified otherwise, all three types of acrylic shall be used in the test.

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. Referenced Documents

2.1 ASTM Standards:

D 1193 Specification for Reagent Water²

2.2 Military Standards:

MIL-P-5425 Plastic Sheet, Acrylic, Heat Resistant³

MIL-P-8184 Plastic Sheet, Acrylic, Modified³

MIL-P-25690 Plastic Sheets and Parts, Modified, Acrylic-Basic, Monolithic, Crack Propagation Resistant³

3. Terminology

3.1 Definitions:

3.1.1 *craze*—a minute surface crack, sometimes hairline in size.

NOTE 1—Hairline craze cracks are very difficult to see except with careful inspection under properly oriented light.

3.1.2 *crack*—a fracture or tear.

¹ This test method is under the jurisdiction of ASTM Committee F-7 on Aerospace and Aircraft and is the direct responsibility of Subcommittee F07.07 on Qualification Testing of Aircraft Cleaning Materials.

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² *Annual Book of ASTM Standards*, Vol 11.01.

³ Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.

4. Types

4.1 *Type A*, cast acrylic material shall conform to MIL-P-5425, Finish A.

4.2 *Type B*, cast acrylic material shall conform to MIL-P-8184, Finish B.

4.3 *Type C*, stretched acrylic material shall conform to MIL-P-25690.

5. Apparatus

5.1 *Stress Apparatus*—The means of stressing the acrylic plastic test specimen bars shall be as shown in Fig. 1.

6. Test Specimens

6.1 The test specimens shall be machined from 0.25 ± 0.025 in. (6.4 ± 0.64 mm) thick polished acrylic plastic sheet conforming to the applicable specification.

6.2 The test specimens shall be 1 ± 0.03 in. (25.4 ± 0.8 mm) wide by 7 ± 0.05 in. (177.8 ± 1.27 mm) long by 0.25 ± 0.025 in. (6.4 ± 0.64 mm) thick. Edges shall be a smooth machined surface without cracks.

7. Conditioning

7.1 Do not anneal Type C acrylic specimens.

7.2 Anneal Type A and Type B acrylic test specimens after machining by heating in a circulating air oven at $195 \pm 5^\circ\text{F}$ ($91 \pm 3^\circ\text{C}$) for 5½ h. Cool the specimens to room temperature in the oven using a uniform cooling rate of 50°F (28°C)/h.

7.3 Condition all specimens at $75 \pm 10^\circ\text{F}$ and $50 \pm 5\%$ relative humidity for a minimum of 24 h just before testing.

8. Procedure

8.1 Test two specimens of each acrylic material specified for each of the test compounds being evaluated.

8.2 Conduct the test at a temperature of $75 \pm 10^\circ\text{F}$ ($23 \pm 5^\circ\text{C}$).

8.3 Carefully load the acrylic specimen as a cantilever beam as shown in Fig. 1. Unless otherwise specified, the following are recommended stress levels:

8.3.1 *Type A* specimens shall be stressed to an outer fiber