



# Standard Test Method for Nonvolatile Ultraviolet (UV) Absorbing Extractables from Microwave Susceptors<sup>1</sup>

This standard is issued under the fixed designation F1349; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This test method covers the determination of nonpolar and relatively polar ultraviolet (UV) absorbing components that may migrate from microwave susceptor packaging into food simulants, such as corn oil and Miglyol 812.

1.2 This test method has been collaboratively studied using bilaminate susceptors constructed of paperboard, adhesive, and a layer of polyethylene terephthalate polymer (PETE) susceptor. Adhesive and PETE related compounds were quantitated using this test method.

1.3 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

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.* Specific warning statements are given in 4.3.2.3.

## 2. Referenced Documents

2.1 *ASTM Standards:*<sup>2</sup>

F874 Test Method for Temperature Measurement and Profiling for Microwave Susceptors

F1317 Test Method for Calibration of Microwave Ovens

## 3. Apparatus and Reagents

3.1 *Microwave Oven*, 700  $\pm$  35 W, calibrated. Refer to Test Method F1317.

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee F02 on Flexible Barrier Packaging and is the direct responsibility of Subcommittee F02.15 on Chemical/Safety Properties.

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<sup>2</sup> 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.

3.2 *High-Pressure Liquid Chromatograph (HPLC)*, consisting of:

3.2.1 *Pump*, capable of 1.5 mL/min with flow precision  $\pm 2$  %.

3.2.2 *Injector*, loop-type, equipped with 20- $\mu$ L loop.

3.2.3 *Guard Column*, C<sub>8</sub>, 5  $\mu$ m.

3.2.4 *Analytical Column*, C<sub>8</sub>, 5  $\mu$ m, 250 by 4.6 mm.

3.2.5 *Detector-UV Absorbance*, set for 254 nm. Adjust sensitivity to give a 70 to 100 % of full scale peak for the 5-ppm dimethylterephthalate DMT standard.

3.2.6 *Gradient Program*, 4 to 60 % Mobile Phase B in 8 min; 60 to 70 % B in 9 min; 70 to 100 % B in 7 min; 100 % B for 11 min; 100 to 4 % B in 5 min; 4 % B for minimum of 5 min. Where Mobile Phase A (v/v) is 85 + 15 + 0.25 % water:acetonitrile:acetic acid, and Mobile Phase B (v/v) is 15 + 85 % water:acetonitrile.

3.2.7 *Peak Area Integration System*—Initialize data acquisition or integration system, or both, from 5 to 35 min during the separation.

3.3 *Hexane*, LC/UV grade.

3.4 *Acetonitrile*, LC/UV grade.

3.5 *Corn Oil*—Obtain corn oil that is as pure and fresh as possible to minimize peaks in nonvolatiles extractables chromatogram. Alternatively, Miglyol 812 (a fractionated coconut oil) or synthetic fat simulant HB 307 can be used as a substitute for corn oil.

3.6 *Dimethylacetamide (DMAC)*, LC/UV grade.

3.7 *Conical Bottom Test Tubes*, 50 mL, graduated.

3.8 *Bishydroxyethyleneterephthalate (BHET)*.

3.9 *Diethylterephthalate (DET)*.

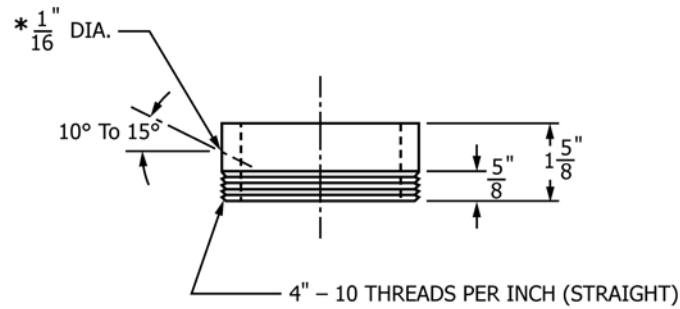
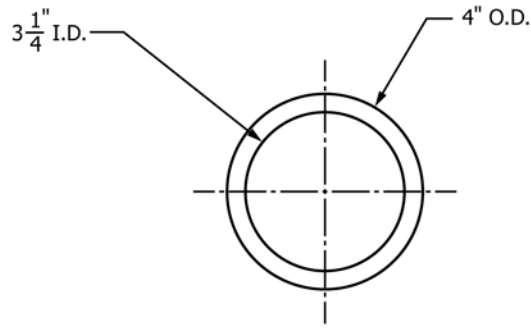
3.10 *Dimethylterephthalate (DMT)*.

3.11 *Fluoroptic Thermometry System*.

3.12 *Temperature Probes*, four, high temperature.

3.13 *Glass Beads*, 3 to 4 mm, clean thoroughly by rinsing with methylene chloride followed by soaking for 30 min in acetonitrile. Dry thoroughly before using.

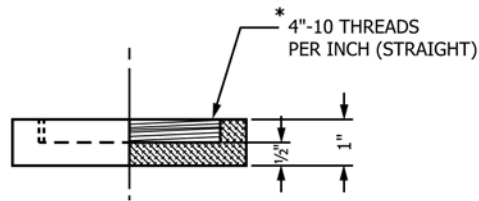
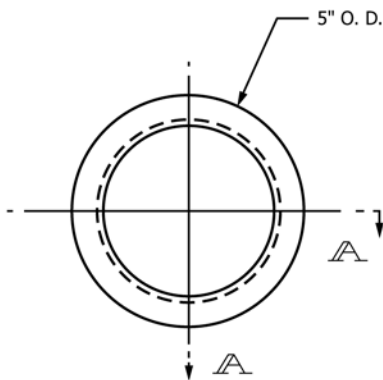
COLLAR



NOTE 1—The 1/16-in. (1.6-mm) diameter hole is for a Luxtron MIW temperature sensing probe. Number of holes and location may vary by application.

**FIG. 1 Collar Section of Waldorf Polytetrafluoroethylene Microwave Nonvolatile Extraction Cell**

CAP



SECTION - A-A

NOTE 1—Relieve thread at bottom. Collar must seal to bottom of cap.

**FIG. 2 Cap Section of Waldorf Polytetrafluoroethylene Nonvolatile Extraction Cell**