



## Designation: C 895 – 87 (Reapproved 1998)

AMERICAN SOCIETY FOR TESTING AND MATERIALS  
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# Standard Test Method for Lead and Cadmium Extracted from Glazed Ceramic Tile<sup>1</sup>

This standard is issued under the fixed designation C 895; 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 precise determination of lead and cadmium extracted by acetic acid from glazed ceramic tile that are intended for use in areas of food preparation. The procedure of extraction may be expected to accelerate the release of lead from the glaze and to serve, therefore, as a severe test that is unlikely to be matched under the actual conditions of usage of such ceramic tile. This test method is specific for lead and cadmium.

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

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:

C 738 Test Method for Lead and Cadmium Extracted from Glazed Ceramic Surfaces<sup>2</sup>

C 1034 Test Method for Lead and Cadmium Extracted from Glazed Ceramic Cookware<sup>2</sup>

C 1035 Specification for Lead and Cadmium Extracted from Glazed Ceramic Cookware<sup>2</sup>

## 3. Summary of Test Method

3.1 The lead and cadmium extracted from the article under test, by acetic acid at 20 to 24°C (68 to 75°F) after 24 h of leaching, are measured by atomic absorption spectrophotometry using specific hollow-cathode lamps for lead and cadmium, respectively.

## 4. Significance and Use

4.1 There are several test methods available to measure the lead and cadmium release from dinnerware and cookware (see Test Methods C 738 and C 1034 and Specification C 1035).

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee C-21 on Ceramic Whitewares and Related Products and is the direct responsibility of Subcommittee C21.06 on Ceramic Tile.

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<sup>2</sup> *Annual Book of ASTM Standards*, Vol 15.02.

These standards are used as a control to ensure the protection of the population against a possible health hazard.<sup>3</sup> This potential hazard arises with improperly formulated, applied, fired glazes, and decorations. This test method deals specifically with ceramic tile that are intended to come in contact with food during its preparation (for example, counter top tile).

## 5. Interferences

5.1 Since specific hollow-cathode lamps for lead and cadmium are used, there are no interferences.

## 6. Apparatus

6.1 *Atomic Absorption Spectrophotometer*, equipped with a 4-in. (102-mm) single slot or Boling burner head and digital concentration readout attachment (DCR) if available.<sup>4</sup> This instrument should have a sensitivity of about 0.5 ppm of lead for 1 % absorption and a sensitivity of about 0.25 ppm of cadmium for 1 % absorption. Use the operating conditions as specified in the instrument manufacturer's analytical methods manual.

NOTE 1—1 ppm = 1 mg/L or one part per million is one milligram per litre.

6.2 *Hollow-Cathode Lead Lamp*, with wavelength set at 283.3 or 217.0 nm.

6.3 *Hollow-Cathode Cadmium Lamp*, with wavelength set at 228.8 nm.

6.4 *Glassware* of chemically resistant borosilicate glass to make reagents and solutions.

6.5 *Test Cell*—Chemically resistant borosilicate glass cylinder to contain the leaching solution. An open-ended cell approximately 80 mm in length and 60 mm in internal diameter has proven suitable.

## 7. Reagents

7.1 *Purity of Reagents*—Reagent grade chemicals shall be used in all tests. Unless otherwise indicated, it is intended that

<sup>3</sup> "Lead Industries, Inc.," *Proceedings, International Conference on Ceramic Foodware Safety*, 1975, pp. 8-17.

<sup>4</sup> Perkin-Elmer Model 303 and Jarrell-Ash Model 82546 have been found suitable for this determination. Other makes of atomic absorption spectrophotometers having comparable sensitivity and accuracy and with background correction are also suitable.