



# Standard Test Method for Measuring Thickness of Concrete Elements Using Drilled Concrete Cores<sup>1</sup>

This standard is issued under the fixed designation C174/C174M; 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.

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

## 1. Scope\*

1.1 This test method covers the determination of the thickness of a concrete pavement, slab, or structural element ~~by measuring the length of a core drilled from a concrete structure using drilling cores.~~

1.2 The values stated in either SI units or inch-pound units are to be regarded separately as standard. Within the text, the inch-pound units are shown in brackets. The values stated in each system are not exact equivalents; therefore, each system shall be used independently of the other.

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:<sup>2</sup>

[C42/C42M Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete](#)

[C125 Terminology Relating to Concrete and Concrete Aggregates](#)

[C670 Practice for Preparing Precision and Bias Statements for Test Methods for Construction Materials](#)

### 2.2 AASHTO Standards:<sup>3</sup>

[AASHTO T148 Method of Test for Measuring Length of Drilled Concrete Cores](#)

## 3. Terminology

### 3.1 Definitions:

3.1.1 For definitions of terms used in this test method, refer to Terminology [C125](#).

## 4. Significance and Use

4.1 This test method is used to determine the compliance of concrete construction with design specifications. ~~It is especially important specifications and is commonly used in determining the thickness of pavements and other slab construction. This test method requires that at least one end of the core be a finished or formed surface.~~

## 5. Apparatus

5.1 The apparatus shall consist of a ~~3-point caliper device that will measure the base plate with three posts to support the core in a vertical direction, and top plate or other means of establishing a plane that is parallel to and a measured distance from the plane defined by the supporting posts.~~ The apparatus includes a measuring rod as described in [5.5](#) or other means to determine

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<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

<sup>3</sup> Available from American Association of State Highway and Transportation Officials (AASHTO), 444 N. Capitol St., NW, Suite 249, Washington, DC 20001, <http://www.transportation.org>.

\*A Summary of Changes section appears at the end of this standard

the length of axial elements of the core. While the details of the mechanical design are not prescribed, the apparatus shall conform to the requirements of 3.25.2 – 5.6 to 3.6. An example of the apparatus is illustrated in Fig. 1.

5.2 The base of the apparatus shall be so designed that the specimen core will be held with its axis in a vertical position by three symmetrically placed supports bearing against the lower end of the core. These supports shall be short posts or studs of hardened steel, and the ends that bear against the surface of the specimen core shall be rounded to a radius of not less than 6 mm [ $\frac{1}{4}$  in.] and not more than 13 mm [ $\frac{1}{2}$  in.].

5.3 The apparatus shall provide for the accommodation of specimen cores of different nominal lengths over a range of at least 100 to 250 mm [4 to 10 in.].

5.4 The caliper device top plate or other means of measuring shall be so designed that it will be possible to make a length measurement at the center of the upper end of the specimen core, and at eight additional points spaced at equal intervals along the circumference of a circle whose center point coincides with that of the end area of the specimen core and whose radius is not less than one half nor more than three fourths of the radius of the specimen core.

5.5 The measuring rod or other device that makes contact with the end surface of the specimen core for measurement shall be rounded to a radius of 3 mm [ $\frac{1}{8}$  in.]. The scale on which the length readings are made the measuring rod shall be marked with clear, definite, accurately spaced graduations. The spacing of the graduations shall be ~~1.0 mm~~ 1.0 mm [0.10 in.] or a decimal part thereof. The measuring rod shall be used to measure the distance from the bottom of the top plate to the top of the core (see Fig. 1).

5.6 The apparatus shall be stable and sufficiently rigid to maintain its shape and alignment without a distortion or deflection of more than 0.25 mm [0.01 in.] during all normal measuring operations.

5.7 Verification gages: Gages—Suitable gages gauges for verification are right circular cylinders with flat ends and a diameter approximately equal to the diameter of cores intending to be measured and a length in the range of the required measurements. To accommodate various core lengths, gages gauges are available in several lengths. To minimize uncertainty of measurement, the length of the cylinder at the perimeter shall be determined accurately to 0.05 mm [0.002 in.] using calibrated measuring instruments. The flatness of the ends shall not depart from a plane by more than 0.02 mm [0.001 in.] in any 150 mm [6 in.] of cylinders 150 mm [6 in.] in diameter or larger, or by more than 0.02 mm [0.001 in.] in the diameter of any smaller cylinder.

## 6. Test Specimens

6.1 Cores used for length measurement shall be obtained in accordance with Test Method C42/C42M. The core shall be drilled with the axis normal to the surface of the structure.

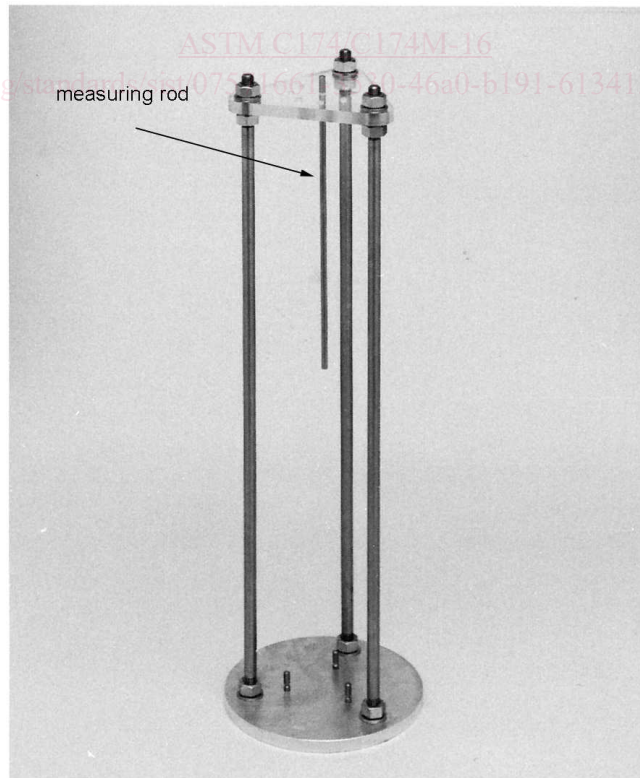


FIG. 1 – Core—An Example of Suitable Measuring Apparatus