



Standard Test Method for Measuring Thickness of Concrete Elements Using Drilled Concrete Cores¹

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 reappraisal. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reappraisal.

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.

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. Significance and Use

2.1 This test method is used to determine the compliance of concrete construction with design specifications. It is especially important in determining the thickness of pavements and other slab construction.

3. Apparatus

3.1 The apparatus shall consist of a 3-point caliper device that will measure 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 3.2 to 3.6.² An example of the apparatus is illustrated in Fig. 1.

3.2 The apparatus shall be so designed that the specimen will be held with its axis in a vertical position by three symmetrically placed supports bearing against the lower end. These supports shall be short posts or studs of hardened steel, and the ends that bear against the surface of the specimen 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.].

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

3.4 The caliper device shall be so designed that it will be possible to make a length measurement at the center of the upper end of the specimen, 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 and whose radius is not less than one half nor more than three fourths of the radius of the specimen.

3.5 The measuring rod or other device that makes contact with the end surface of the specimen for measurement shall be rounded to a radius of 3 mm [$\frac{1}{8}$ in.]. The scale on which the length readings are made shall be marked with clear, definite, accurately spaced graduations. The spacing of the graduations shall be 1.0 mm [0.10 in.] or a decimal part thereof.

3.6 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.

3.7 *Verification gages:* Suitable gages 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 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.]

¹ This test method is under the jurisdiction of ASTM Committee C09 on Concrete and Concrete Aggregates and is the direct responsibility of Subcommittee C09.61 on Testing for Strength.

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² For further information relating to the development of this test method and apparatus, reference should be made to the "Project Report on a Study of Methods of Measurement of the Length of Cores Drilled from Concrete Structures," prepared by L. W. Teller for Subcommittee VII on Methods and Apparatus for Testing Concrete, of Committee C09, see *Proceedings*, Am. Soc. Testing Mats., ASTM, Vol 42, 1942.

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