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Standard Practice for Making Roller-Compacted Concrete in Cylinder Molds Using a Vibrating Table[1]

This standard is issued under the fixed designation C 1176/C 1176M; 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.

1. Scope*

1.1 This practice covers procedures for making cylindrical test specimens from concrete when the standard procedures of rodding and internal vibration, as described in Practice C 31, are not practicable. This practice is applicable to freshly mixed concrete, prepared in the laboratory and the field, having a nominal maximum size aggregate of 50 mm ~~(2 in.)~~[2 in.] or less. If the nominal maximum size aggregate is larger than 50 mm [2 in.], the practice is applicable only when performed on the fraction passing the 50-mm ~~(2-in.)~~[2-in.] sieve with the larger aggregate being removed in accordance with Practice C 172. This practice, intended for use in testing roller-compacted concrete, may be applicable to testing other types of concrete such as cement-treated aggregate and mixtures similar to soil-cement.

1.2 Two methods are provided for making concrete cylinders using a vibrating table:

1.2.1 Method A is a procedure for making test specimens in steel reusable molds attached to a vibrating table.

1.2.2 Method B is a procedure for making test specimens in single-use plastic molds that have been inserted into a metal sleeve attached to a vibrating table.

~~1.3The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information purposes only.~~

1.3 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the 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.*

2. Referenced Documents

2.1 *ASTM Standards:* [2]

C 31/C 31M Practice for Making and Curing Concrete Test Specimens in the Field
C 39/C 39M Test Method for Compressive Strength of Cylindrical Concrete Specimens
C 172 Practice for Sampling Freshly Mixed Concrete
C 192/C 192M Practice for Making and Curing Concrete Test Specimens in the Laboratory
C 470/C 470M Specification for Molds for Forming Concrete Test Cylinders Vertically
C 496/C 496M Test Method for Splitting Tensile Strength of Cylindrical Concrete Specimens
C 1170 Test Method for Determining Consistency and Density of Roller-Compacted Concrete Using a Vibrating Table
E 11 Specification for Wire Cloth and Sieves for Testing Purposes

3. Summary of Practice

3.1 This practice describes methods for making cylindrical concrete test specimens using a vibrating table. Test specimens are made in cylindrical molds that are attached to the vibrating table under a ~~20-lb (9.1-kg)~~9-kg [20-lb] surcharge to facilitate consolidation.

4. Significance and Use

4.1 This practice is intended to be used for stiff to extremely dry concrete mixtures commonly used in roller-compacted concrete

[1] This practice is under the jurisdiction of ASTM Committee C09 on Concrete and Concrete Aggregates and is the direct responsibility of Subcommittee C09.45 on Roller-Compacted Concrete.

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[2] 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.

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

construction. This practice is used instead of rodding or internal vibration, which cannot properly consolidate concrete of this consistency (Note 1).

NOTE 1—Further description of this concrete consistency is given in ACI 207.5 Roller-Compacted Mass Concrete[3] and 211.3 Guide for Selecting Proportions for No-Slump Concrete[3]. The consistency of roller-compacted concrete may be determined in accordance with Test Method C 1170.

5. Apparatus

5.1 *Molds*:

5.1.1 *Type A Mold*— A cylindrical mold conforming to the requirements of Specification C 470 for ~~6-in. (152-mm)~~150-mm [6-in.] diameter by ~~12-in. (305-mm)~~300-mm [12-in.] high reusable molds. Molds shall be made of steel or other hard metal not readily attacked by the cement paste. Aluminum molds shall not be used. Molds shall be equipped with permanently affixed metal slotted brackets on the baseplate so the molds can be rigidly clamped to a vibrating table. The top rim of the mold shall be smooth, plane, and parallel to the bottom of the mold. The bottom of the mold shall provide a watertight seal.

5.1.2 *Type B Mold*— A single-use plastic, cylindrical mold ~~6 in. (152 mm)~~150 mm [6 in.] in diameter and ~~12 in. (305 mm)~~300 mm [12 in.] in height. The mold specifications shall conform to Specification C 470 for single-use plastic molds.

5.1.2.1 *Mold Sleeve*— A Type B cylindrical mold shall be inserted into a rigid cylindrical sleeve with a bottom baseplate that is clamped to the vibrating table. The mold sleeve shall be made of steel or other hard metal that does not react with concrete containing portland or other hydraulic cement. The sleeve shall be capable of firmly and vertically holding the plastic mold in place without deformation and shall be slotted vertically with adjustable clamps for tightening around the mold. The sleeve shall be hinged so that it can be opened to remove the mold (Fig. 1) and shall also have permanently affixed slotted metal brackets so the sleeve may be rigidly clamped to the vibrating table. The mold sleeve shall have a minimum wall thickness ~~of⅛ in. (3.2 mm),~~ of 3 mm [⅛ in.], and a minimum baseplate thickness ~~of¼ in. (6.4 mm).~~ of 6 mm [¼ in.]. The inside diameter of the mold sleeve shall be 3 ± 1.5 mm [⅛ ± 1/16 ~~in. (3.2±1.6 mm) larger than the outside diameter of the Type B mold and have a height½~~ in.] larger than the outside diameter of the Type B mold and have a height 6 to 13 mm [½ to ¼ ~~in. (12.8±6.4 mm)~~ in.] less than the height of the Type B mold.

5.2 *Vebe Vibrating Table*—A vibrating table with a~~¾-in. (19-mm)~~ a 20-mm [¾-in.] thick steel deck with dimensions of approximately ~~15 in. (381 mm)~~380 mm [15 in.] in length, ~~10¼ in. (260 mm)~~260 mm [10 ¼ in.] in width, and ~~12 in. (305 mm)~~300

[3] *ACI Manual of Concrete Practice, Part 1, Materials and General Properties of Concrete*, 2005, American Concrete Institute (ACI), P.O. Box 9094, Farmington Hills, MI 48333.

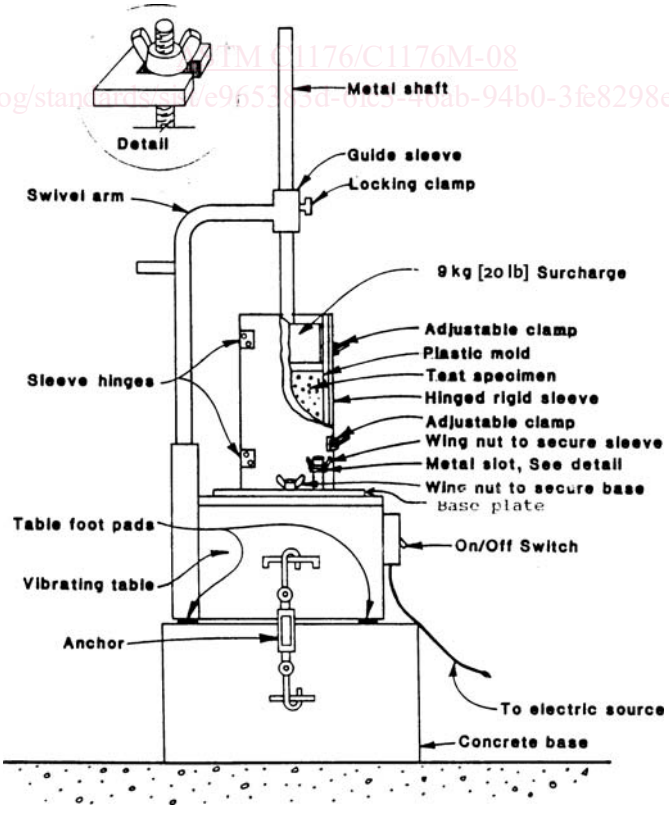

FIG. 1 Vibrating Table—Cylinder Preparation (Type B Mold)