



**Designation: D 1985 – 91 (Reapproved 1997)**

## **Standard Practice for Preparing Concrete Blocks for Testing Sealants, for Joints and Cracks<sup>1</sup>**

This standard is issued under the fixed designation D 1985; 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 practice covers the preparation of concrete blocks used for testing of joint and crack sealants for portland-cement concrete and asphaltic-concrete pavements. There are numerous standard material specifications that use concrete blocks prepared according to this practice. Refer to the specific standard material specification of interest to determine which tests apply and refer to the test methods for each specific test.

1.2 *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.*

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

### **2. Referenced Documents**

#### *2.1 ASTM Standards:*

C 33 Specification for Concrete Aggregates<sup>2</sup>

C 150 Specification for Portland Cement<sup>3</sup>

C 192 Practice For Making and Curing Concrete Test Specimens in the Laboratory<sup>2</sup>

E 171 Specification for Standard Atmospheres for Conditioning and Testing Flexible Barrier Materials<sup>4</sup>

### **3. Significance and Use**

3.1 It is intended that this practice may be used by manufacturers, users and testing agencies. The use of this practice establishes a uniform procedure for preparing concrete blocks for the testing of sealants. It is not intended to establish test procedures or conditions of test which are associated with each of the joint sealants.

### **4. Standard Conditions**

4.1 The laboratory atmospheric conditions, hereinafter referred to as standard conditions, shall be in accordance with Specification E 171, ( $73.4 \pm 3.6^\circ\text{F}$  ( $23 \pm 2^\circ\text{C}$ ) and  $50\% \pm 5\%$  relative humidity).

### **5. Concrete-Block Preparation<sup>5</sup>**

5.1 *Materials*—The aggregate shall conform to Specification C 33, except as specified herein. The aggregate grading shall be as shown in Table 1. The coarse aggregate shall consist of crushed limestone (plus 95 %  $\text{CaCO}_3$ ) having a water absorption of not more than 1.5 %. The fine aggregate shall consist of crushed limestone and shall be manufactured from the same parent rock as the coarse aggregate.<sup>6</sup> The portland cement shall conform to ASTM Specification C 150, Type II. The concrete shall have a water-cement ratio of 0.49, a cement factor of  $6.0 \pm 0.5$  bags of cement per cubic yard ( $335 \pm 30 \text{ kg/m}^3$ ), and a slump of  $2\frac{1}{2} \pm \frac{1}{2}$  in. ( $63 \pm 13 \text{ mm}$ ). The ratio of fine aggregate to total aggregate shall be approximately 40 % by solid volume. The air content shall be  $5.0 \pm 0.5\%$  and shall be obtained by the addition to the batch of an air-entraining agent such as a neutralized thermoplastic resin.<sup>7</sup> Prepare the concrete in accordance with the procedure described in Test Method C 192.

5.1.1 *Alternate Block Materials*—As an alternate to the materials specified in 5.1, the blocks may be prepared using a concrete mixture which meets local requirements for concrete pavements. Use the materials specified in 5.1 for all referee testing.

5.2 *Block Preparation*—Use a minimum 4 in. wide by 12 in. long by 3 in. deep (100 mm by 300 mm by 75 mm) mold, made from metal and provided with a metal base plate. Provide means for securing the base plate to the mold. Make the assembled mold and base plate water-tight and oil with mineral oil before use. Fill the mold with concrete, prepared in

<sup>1</sup> This practice is under the jurisdiction of ASTM Committee D-4 on Road and Paving Materials and is the direct responsibility of Subcommittee D04.33 on Formed-in-Place Sealants for Joints and Cracks in Pavements.

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<sup>2</sup> *Annual Book of ASTM Standards*, Vol 04.02.

<sup>3</sup> *Annual Book of ASTM Standards*, Vol 04.01.

<sup>4</sup> *Annual Book of ASTM Standards*, Vol 15.09.

<sup>5</sup> Blocks made to this specification are available from USAE Laboratory, Missouri River Division, 429 S18th Street, Omaha, NE 68101.

<sup>6</sup> Aggregate meeting this specification is available from Pete Lien & Sons Inc., P.O. Box 440, Rapid City, SD.

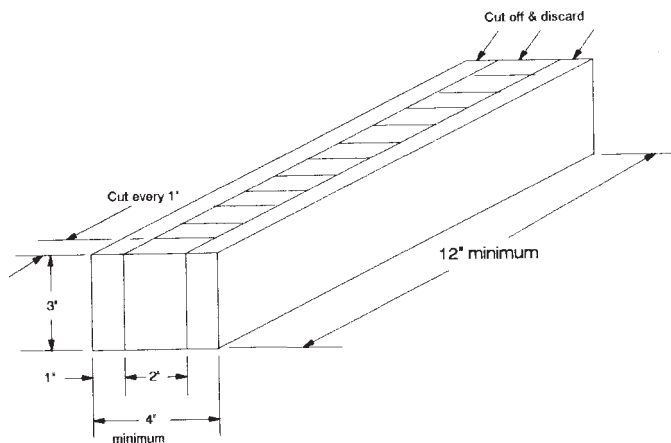
<sup>7</sup> Vinsol resin, made by Hercules Inc., has been used satisfactorily.

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**TABLE 1 Aggregate Grading**

Type	Sieve Size	% Passing
Coarse aggregate	¾ in. (19.0 mm)	97 to 100
	½ in. (12.5 mm)	63 to 69
	⅜ in. (9.5 mm)	30 to 36
	No. 4 (4.75 mm)	0 to 3
Fine aggregate	No. 4 (4.75 mm)	100
	No. 8 (2.36 mm)	82 to 88
	No. 16 (1.18 mm)	60 to 70
	No. 30 (600 μm)	40 to 50
	No. 50 (300 μm)	16 to 26
	No. 100 (150 μm)	5 to 9

accordance with 5.1 or 5.1.1, to overflowing and vibrate externally for 30 s. Scream (level) the concrete to a smooth surface with a wooden float and level off with a metal straightedge drawn across the top with a sawing motion. Cure as specified in Test Method C 192. After curing for not less than 14 days, cut the slab of concrete into individual blocks using a 40 by 60-grit diamond saw blade rotating at a peripheral speed of 10 000 ± 500 ft/min. (3050 ± 150 m/min) (see Fig. 1). Each test block should be 1 by 2 by 3-in. (25 by 50 by 75-mm), leaving 1 in. (25 mm) strips for discarding from the slab that were in contact with the vertical sides of the mold. While the blocks are still wet from the sawing operation, scrub



**FIG. 1 Concrete Block Slab (after removal from mold)**

the surfaces of the blocks lightly with a non-metallic stiff-bristle brush while holding under a stream of running water. Stocks of prepared blocks may be stored under standard conditions indefinitely, but immerse such blocks in fresh, lime-saturated water for not less than 7 days prior to use. During immersion, maintain the blocks in a vertical position and above any lime settlement.

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