



Designation: C974 – 87 (Reapproved 2020)

# Standard Practice for Preparing Test Specimens from Basic Refractory Castable Products by Casting<sup>1</sup>

This standard is issued under the fixed designation C974; 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 a procedure for preparing test specimens from a basic refractory castable by casting prepared material in a mold. Specimens prepared in accordance with this procedure are intended for use in ASTM test methods.

1.2 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

## 2. Significance and Use

2.1 This practice defines a procedure that ensures consistent preparation of specimens for product testing and evaluation.

2.2 This practice can be used in the laboratories of producers, users, and general-interest parties for research and development or quality-control work. It is particularly useful for interlaboratory comparisons or products, for repetitive evaluations or comparisons of products or product quality, and in specifying a uniform preparation practice for specimens for acceptance testing.

2.3 In using this practice it must be recognized that the structure of laboratory-cast specimens may differ significantly from the structure of material cast in field applications.

## 3. Apparatus

3.1 *Mixer*, bench-type, Hobart or equivalent.

3.2 *Steel Molds*.

3.3 *Vibration Table*, spring or air-cushioned, with a pneumatic or electric driver.<sup>2</sup>

3.4 *Oven*, air circulating.

## 4. Procedure

4.1 Store the material to be tested at  $85 \pm 2$  °F ( $29.5 \pm 1$  °C) for 24 h prior to testing.

4.2 Reduce the sample to the desired batch size with a sample splitter or by quartering, taking precautions to prevent segregation. Sufficient material should be batched to provide at least a 10 % excess over test specimen requirements.

4.3 Add the weighed, dry batch to the mixer and dry-mix at low speed for 30 s. Continue to mix at low speed while adding the required amount of water (see 4.3.1) within 30 s. Wet-mix at low speed for 4 min.

4.3.1 Use the amount of water and mixing time (if different from above) recommended by the manufacturer. The water must be potable and at a temperature of  $85 \pm 2$  °F ( $29.5 \pm 1$  °C). Measure the water addition to the nearest 0.1 % by weight.

4.4 Specimens should be cast in a mold immediately after the batch is mixed so that all specimens made from a batch are cast at the same time. The mold should be securely clamped to the vibration table top. Fill the mold to overflowing, distributing the material uniformly between each cavity. Vibrate in accordance with the manufacturer's instructions. Approximately 15 s before the end of the vibration period, remove excess material (approximately flush with top of mold).

4.4.1 If the batch is too wet, water will run off the specimens, while if the batch is too dry, the material will not fill the mold. In either case, the batch must be discarded and another run made at a suitable water content.

4.5 Test specimens should be air-dried in the molds a minimum of 16 h and a maximum of 24 h, and then removed

<sup>1</sup> This practice is under the jurisdiction of ASTM Committee C08 on Refractories and is the direct responsibility of Subcommittee C08.09 on Monolithics.

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<sup>2</sup> Martin Engineering Model CV35 or Syntron Model VP-80 has been found suitable.

from the molds and dried for a minimum of 8 h at  $225 \pm 5$  °F ( $107 \pm 2.5$  °C) in a circulating air dryer prior to testing.

## **5. Calculation and Report**

5.1 In the report on specimen preparation, include the percent water addition, drying time, and test specimen size.

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