



Designation: C 1073 – 97a

Standard Test Method for Hydraulic Activity of Ground Slag by Reaction with Alkali¹

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1. Scope

1.1 This test method covers the rapid determination of hydraulic activity of ground-granulated iron blast-furnace slag. This test method measures the accelerated strength development of the slag by using sodium hydroxide solution as mixing water and curing at elevated temperature.

1.2 The values stated in SI units are to be regarded as the 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 and health practices and determine the applicability of regulatory limitations prior to use.* A specific precautionary statement is given in Section 6.

1.4 The text of this standard references notes and footnotes which provide explanatory information. These notes and footnotes (excluding those in tables) shall not be considered as requirements of this standard.

2. Referenced Documents

2.1 ASTM Standards:

- C 109/C 109M Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or 50-mm Cube Specimens)²
- C 125 Terminology Relating to Concrete and Concrete Aggregates³
- C 219 Terminology Relating to Hydraulic Cement²
- C 305 Practice for Mechanical Mixing of Hydraulic Cement Pastes and Mortars of Plastic Consistency²
- C 670 Practice for Preparing Precision and Bias Statements for Test Methods for Construction Materials²
- C 778 Specification for Standard Sand²
- C 989 Specification for Ground Blast-Furnace Slag for Use in Concrete and Mortars³

3. Terminology

3.1 Definitions:

¹ This test method is under the jurisdiction of ASTM Committee C09 on Concrete and Concrete Aggregates and is the direct responsibility of Subcommittee C09.27 on Ground Slag.

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² *Annual Book of ASTM Standards*, Vol 04.01.

³ *Annual Book of ASTM Standards*, Vol 04.02.

3.1.1 Definitions are given in Terminology C 125 and C 219.

3.2 Description of Term Specific to This Standard:

3.2.1 *slag, n*—granulated blast-furnace slag as defined in Terminology C 125 and ground to cement fineness.

4. Significance and Use

4.1 This test method can be used as a quality-control test for slag production from a single source after adequate correlation with tests stipulated in Specification C 989.

4.2 This test method may be used as an evaluation technique for slag, when an appropriate correlation with various finenesses of slags from a specific source ground in a specific laboratory mill has been previously developed.

4.3 The hydraulic activity as measured by this test method on ground-slag samples can provide guidance to a manufacturer as to fineness level required to maintain a certain level of hydraulic activity.

4.4 While this test method is intended primarily as a quality control test, some studies have shown that the test method is capable of evaluating the hydraulic activity of slags from different sources.

5. Apparatus

5.1 *Three-Gang Molds for 2-in. or 50-mm Cubes and Compression Test Machine* as specified in Test Method C 109 (Note 1).

NOTE 1—Silicone grease is recommended for protection of mold surfaces from the caustic solution in this test.

5.2 *Mixer*, as specified in Method C 305.

5.3 *Curing Chamber*, capable of maintaining a temperature of air or water bath of $55 \pm 2^\circ\text{C}$.

5.4 *Containers*, capable of holding one three-cube mold in an essentially vapor-tight condition. If polyethylene or other plastic bags are used, they shall have a closure of the zip type. If rigid containers are used, they shall have tight sealing covers (Note 2). The acceptability of containers shall be determined by measuring the water loss after curing in air or the gain after curing in water bath. Water loss shall be less than 15 mL in air curing or gain less than 5 mL in water-bath curing.

NOTE 2—Plastic boxes designed for household storage of celery with a bottom grid have given good service.