



Standard Test Method for Thermal Compatibility Between Concrete and an Epoxy- Resin Overlay¹

This standard is issued under the fixed designation C 884/C 884M; 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.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 This test method covers the determination of which epoxy-resin formulations are subject to debonding when used as overlays for concrete when the combination of the two is subjected to temperature changes that may be met in the field.

1.2 The values stated in either inch-pound units or SI units are to be regarded separately as standard. Within the text, the SI 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. Combining values from the two systems may result in nonconformance with the specification.

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 hazard statement is given in Section 7.

2. Referenced Documents

2.1 ASTM Standards:

C 33 Specification for Concrete Aggregates²

C 150 Specification for Portland Cement³

C 260 Specification for Air-Entraining Admixtures for Concrete²

C 672 Test Method for Scaling Resistance of Concrete Surfaces Exposed to Deicing Chemicals²

C 778 Specification for Standard Sand³

C 881 Specification for Epoxy-Resin-Base Bonding Systems for Concrete²

3. Summary of Test Method

3.1 A layer of epoxy-sand mortar is applied to a slab of cured and dried concrete. After the epoxy has cured, the sample is subjected to five cycles of temperature change between 77°F

[25°C] and – 6°F [–21°C]. Cracks near the bond line between the concrete and the epoxy mortar constitute failure of the test.

4. Significance and Use

4.1 This test method applies to materials used in making epoxy-mortar overlays for concrete pavement. When debonding occurs between the overlay and the pavement, the material is unsuitable.

5. Apparatus

5.1 *Molds*, in conformance with Test Method C 672.

5.2 *Freezer*, in conformance with Test Method C 672, except that the temperature of the freezer shall be $-6 \pm 3^\circ\text{F}$ [$-21 \pm 2^\circ\text{C}$].

5.3 *Retaining strips*, to retain the epoxy-mortar overlay. Pieces of wood or steel that can be attached to the 12 by 12 by 3-in. [300 by 300 by 75-mm] concrete block so as to enclose completely the top surface of the block and rise above it a uniform distance of 0.5 in. [15 mm].

6. Materials

6.1 *Portland Cement*, Type I or Type II, meeting the requirements of Specification C 150.

6.2 *Standard Sand*, meeting the requirements of Specification C 778.

6.3 *Aggregates*—Fine and coarse aggregate meeting the requirements of Specification C 33. The coarse aggregate shall be durable under freezing exposure and shall have a maximum size of 1 in. [25 mm]. The fine aggregate shall be a natural sand.

6.4 *Air-Entraining Admixture*, meeting the requirements of Specification C 260.

7. Hazards

7.1 **Warning**—Epoxy resins contain irritants, especially to the skin, eyes, and respiratory system. Persons handling these materials shall use appropriate protective clothing, including rubber or plastic gloves. If an epoxy resin should contact the skin, it shall be removed immediately with a dry cloth or paper towel, and the area of contact shall be washed thoroughly with soap and water. Solvents shall not be used, because they carry

¹ This test method is under the jurisdiction of ASTM Committee C-9 on Concrete and Concrete Aggregates, and is the direct responsibility of Subcommittee C09.25 on Organic Materials for Bonding, Patching, and Sealing.

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² *Annual Book of ASTM Standards*, Vol 04.02.

³ *Annual Book of ASTM Standards*, Vol 04.01.

