



Designation: D4788 – 03 (Reapproved 2022)

Standard Test Method for Detecting Delaminations in Bridge Decks Using Infrared Thermography¹

This standard is issued under the fixed designation D4788; 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 test method covers the determination of delaminations in portland-cement concrete bridge decks using infrared thermography. This test method is intended for use on exposed and overlaid concrete bridge decks.

1.2 A Precision and Bias statement has not been developed at this time. Therefore, this standard should not be used for acceptance or rejection of a material for purchasing purposes.

NOTE 1—This test method can be used on asphalt or concrete overlays as thick as 4 in. (100 mm).

1.3 This test method uses an imaging infrared scanner and video recorder, mounted on a vehicle, to detect delaminations and debonded areas on bridge decks and to record the information.

1.4 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.

1.5 *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.*

1.6 *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.*

¹ This test method is under the jurisdiction of ASTM Committee D04 on Road and Paving Materials and is the direct responsibility of Subcommittee D04.32 on Bridges and Structures.

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2. Referenced Documents

2.1 *ASTM Standards:*²

D4580 Practice for Measuring Delaminations in Concrete Bridge Decks by Sounding

3. Summary of Test Method

3.1 The vehicle-mounted infrared scanner and video recorder are driven over the center of each lane of a bridge deck. The data from the scanner is recorded on video tape. Delaminations appear as white or “hot” areas on a gray or “cooler” background in the video image on a monochrome scanner system during daytime testing. During nighttime testing, the delaminations will appear as dark or “cooler” areas on a white or “warmer” background. Delaminations will appear as the warmer colors on color scanner systems during daytime testing. Calibration of thermal anomalies using sounding techniques are used to determine the colors associated with delaminations.

3.2 The conventional video image is used to edit the infrared image and separate those patches or surface defects that may be present and may appear as hot areas.

3.3 The video recording is used to map the delaminated areas at a suitable scale.

4. Significance and Use

4.1 This test method may be used in conjunction with other test methods in determining the general condition of a bridge deck.

4.2 Areas indicated as delaminated on overlaid bridge decks may be an indication of lack of bond between the overlay and the underlying bridge deck. This test method may be used in determining specific areas of delaminations requiring repair.

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.