



## Standard Practice for Abrading Concrete<sup>1</sup>

This standard is issued under the fixed designation D 4259; 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 includes surface preparation of concrete to prepare the surface prior to the application of coatings.

1.2 This practice is intended to alter the surface profile of the concrete and to remove foreign materials and weak surface laitance.

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.* For specific hazard statements, see Section 5.

### 2. Referenced Documents

#### 2.1 ASTM Standards:

D 4258 Practice for Surface Cleaning Concrete for Coating<sup>2</sup>

D 4285 Test Method for Indicating Oil or Water in Compressed Air<sup>2</sup>

D 4541 Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers<sup>2</sup>

#### 2.2 Other Standard:

ACI-308 Recommended Practice for Curing Concrete<sup>3</sup>

### 3. Summary of Practice

3.1 This practice is intended to provide a clean, contamination-free, and roughened surface.

3.2 Acceptable surfaces shall be free of laitance, form release agents, curing agents, oil, grease, and other penetrating contaminants. The surface shall be free of fins, projections and loosely adhering concrete, dirt, and dust particles.

3.3 For some applications, a minimum concrete surface strength may be required for proper coating performance.

3.4 Acceptable methods of preparation include abrasive blasting (wet or dry), mechanical abrading, water blasting, and other similar procedures that will alter the surface profile of the concrete.

### 4. Significance and Use

4.1 This practice is used to prepare concrete for coatings where optimum bond is desired for service conditions such as continuous or intermittent immersion, temperature cycling, or mechanical loading.

### 5. Hazards

5.1 New concrete shall be cured in accordance with ACI-308.

### 6. Mechanical Abrading Procedure

6.1 *Suitable Surfaces*—Mechanical abrading is suitable for use on formed surfaces and floors and for the removal of fins and projections.

#### 6.2 Pre-Surface Preparation:

6.2.1 Remove grease, oil, and other penetrating contaminants. (See Practice D 4258.)

6.2.2 Concrete surfaces may be wet or dry as appropriate to the type of equipment to be used.

#### 6.3 Apparatus:

6.3.1 Typical apparatus covered by this method are rotary impact, vertical impact, and circular grinding equipment.

6.3.2 Use the equipment in accordance with the manufacturer's instructions in an organized manner in order to thoroughly cover the entire surface to be prepared.

#### 6.4 Appearance of Prepared Surface:

6.4.1 The intent is to remove sufficient material in order to achieve a sound concrete surface free of laitance, glaze, efflorescence and incompatible concrete curing compounds or form release agents.

6.4.2 The surface shall have a roughened, textured appearance. Aggregate may be exposed. A roughness standard may be established by mutual agreement.

6.4.3 The appearance will vary depending upon the equipment used and type of concrete.

6.5 *Post-Surface Preparation Cleaning*—Clean in accordance with Practice D 4258 to remove loose material.

### 7. Water Blast Cleaning

7.1 *Suitable Surfaces*—This method is suitable for use on formed surfaces and floors.

#### 7.2 Pre-Surface Preparation:

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<sup>2</sup> *Annual Book of ASTM Standards*, Vol 06.02.

<sup>3</sup> Available from American Concrete Institute, 22400 W. Seven Mile Rd., Detroit, MI 48219.

7.2.1 Remove grease, oil, and other penetrating contaminants (see Practice D 4258).

7.2.2 Correct fins and protruding irregularities by mechanical means.

7.2.3 Concrete surface may be wet or dry.

7.3 *Apparatus*—Typical apparatus covered by this method is a piston-type positive displacement pump, high-pressure water blasting unit. The cleaning medium shall be potable water.

7.4 *Appearance of Prepared Surface:*

7.4.1 The prepared surface shall be clean and free of dust, dirt, laitance and efflorescence.

7.4.2 The surface shall have a roughened textured appearance. A roughness standard may be established by mutual agreement.

7.5 *Post-Surface Preparation Cleaning*—Clean in accordance with Practice D 4258 to remove loose material.

## 8. Abrasive Blast Cleaning Procedure

8.1 *Pre-Surface Preparation:*

8.1.1 Remove grease, oil, and other penetrating contaminants (see Practice D 4258).

8.1.2 Correct fins and protruding irregularities by mechanical means.

8.1.3 Concrete surface may be wet or dry as appropriate to the type of equipment to be used.

8.2 *Suitable Surfaces*—This method is suitable for use on formed surfaces and floors.

8.3 *Apparatus:*

8.3.1 Typical methods are wet or dry open-blast cleaning with nozzles and self-contained recirculating blast-cleaning apparatus.

8.3.2 The air stream used for nozzle blast cleaning shall be free of oil. This may be verified using Test Method D 4285.

8.3.3 Use the equipment in accordance with the manufacturer's instructions.

8.4 *Appearance of Prepared Surface:*

8.4.1 The intent is to remove sufficient material in order to achieve a sound concrete surface free of laitance, glaze, efflorescence, and incompatible concrete curing compounds or form release agents.

8.4.2 The surface shall have a roughened textured appearance. A roughness standard may be established by mutual agreement.

8.4.3 Some aggregate may be exposed and bug holes shall be opened.

8.5 *Post-Preparation Cleaning*—Clean in accordance with Practice D 4258 to remove loose material.

## 9. Inspection

9.1 Visually examine the prepared surface for loose adhering concrete, thin crusts bridging voids, fins, and projections.

9.2 Visually examine the prepared surface for oil, grease, and markings.

9.3 If required, surface strength may be determined in accordance with Method D 4541 or other agreed upon method.

## 10. Acceptance

10.1 Acceptable surfaces shall be free of laitance, oil, grease, and other materials incompatible with the coating. The surface shall also be free of fins, projections and loosely adhering concrete, dirt, and dust particles.

10.2 The surface shall have a roughened, textured appearance. Aggregate may be exposed. Bug holes shall be opened.

10.3 The roughened textured appearance shall be similar to the roughness standard established by mutual agreement.

10.4 If specified, the treated surface shall meet the surface strength requirements.

## 11. Keywords

11.1 abrading; concrete; laitance; profile; surface preparation

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