

**1. Scope**

- 1.1. The purpose of this standard is to assign responsibilities to the various entities involved when smooth faced tilt-up concrete is field painted.
- 1.2. This standard defines criteria to determine if smooth faced tilt-up concrete has been properly prepared to receive field applied paint.
- 1.3. This standard assigns financial responsibilities to the various entities involved when smooth faced tilt-up concrete is field painted.

**2. Significance and Use**

- 2.1. Numerous paint failures have occurred when smooth faced tilt-up concrete is field painted.
- 2.2. The project documents are often unclear about the specific responsibilities of the various entities involved when smooth faced tilt-up concrete is field painted.
- 2.3. The painting and decorating contractor must have a frame of reference upon which to base the bid when smooth faced tilt-up concrete is field painted.
- 2.4. The purpose of this standard is to develop a reasonable protocol that painting and decorating contractors are recommended to follow when smooth faced tilt-up concrete is field painted.

**3. Reference Standards and Documents**

- 3.1. ASTM D 3359 Standard Test Method for Measuring Adhesion by Tape Test.
- 3.2. ASTM D 4262 Standard Test Method for pH of Chemically Cleaned or Etched Concrete Surfaces.
- 3.3. ASTM D 7234-05 Standard Test Method for Pull-Off Adhesion Strength of Coatings on Concrete Using Portable Pull-Off Adhesion Testers.
- 3.4. PCA Standard P1, Touch Up Painting and Damage Repair: Financial Responsibility.
- 3.5. PCA Standard P3, Designation of Paint Colors.
- 3.6. PCA Standard P4, Responsibilities for Inspection and Acceptance of Surfaces Prior to Painting and Decorating.
- 3.7. PCA Standard P5, Benchmark Sample Procedures for Paint and Other Decorative Coating Systems.
- 3.8. PCA Standard P7, Job Sequencing.
- 3.9. PCA Standard P9, Definition of Trade Terms.
- 3.10. Merriam-Webster's Collegiate Dictionary, Tenth Edition, Copyright 1993.

- 3.11. MPI, The Master Painter's Glossary – Painting and Decorating Terminology, 1997.
- 3.12. Tilt-Up Concrete Association, P.O. Box 204, Mount Vernon, IA 52314 (319) 895-6911, Tilt Tips-Painting Tilt-Up Panels, March 2000.
- 3.13. If there is a conflict between any of the references and this standard, then the requirements of this standard shall prevail.

#### 4. Definitions

- 4.1. BOND BREAKER: A general name for any number of materials that prevent the permanent adhesion of one material to another. Bond breaking film formers are commonly used to facilitate the removal of forms for poured-in-place and tilt-up concrete construction. [MPI]
- 4.2. BUG HOLES: Small surface cavities (usually not exceeding 15 mm in diameter) in formed concrete resulting from entrapment of air bubbles during placing, compaction, and curing. [MPI]
- 4.3. COATING: Generic term for paints, lacquers, enamels, printing inks, etc.; a liquid, liquefiable or mastic composition which is converted to solid protective, decorative or functional adherent film after application as a thin layer. It also refers to films applied to paper, plastics or foils. [FSCT]
- 4.4. COLOR: One aspect of appearance; a stimulus based on visual response to light, and consisting of three dimensions of hue, saturation and lightness. [FSCT]
- 4.5. COLORS TO BE SELECTED: The designation of paint colors in accordance with PCA Standard P3, Designation of Paint Colors. Allows for project pricing as long as the type and placement of colors and the product type have been clearly delineated. [PCA Standard P3]
- 4.6. 4.6. CONTRACTING ENTITY: The general contractor, owner of the property, construction manager, developer or other entity legally responsible for the agreement or authorized agent or any of the above. [PCA Standard P9]
- 4.7. DAMAGE BY OTHERS: Any marks, stains, scuffs, scratches or other damage to a newly painted surface that is caused by anybody other than the painter. Also known as damage caused by others. [MPI]
- 4.8. FLOATING: The act of spreading or smoothing a plaster or concrete surface for finishing [MPI]
- 4.9. HONEYCOMB: Voids in concrete. [MPI]
- 4.10. JOB SEQUENCE/SEQUENCING: An order of succession or continuity of progression of work activities. [PCA Standard P9]
- 4.11. LATENT DAMAGE, syn. LATENT DEFECTS: Damage to surfaces by cause beyond the control of the painting and decorating contractors. Examples of such include, but are not limited to, building settlement, earthquake damage, and nail and/or screw pops or expansion and/or contraction of substrate. [MPI]
- 4.12. MECHANICAL ADHESION: An interlocking of two materials because of shape, texture, etc., causing the two materials to remain affixed one to the other. [MPI]
- 4.13. NEUTRALIZATION: The process of reducing excess acidity or alkalinity from a material or

substrate such as concrete, masonry, or plaster. To bring the pH balance to neutral (7.0). [MPI]

- 4.14. PAINT SYSTEM: A succession of selected coats of materials applied in a prescribed order to protect a surface and provide a decorative finish. [MPI]
- 4.15. PAINTING AND DECORATING CONTRACTOR: The individual or company contracted to apply paints, coatings, wallcoverings and other decorative finishes. [PCA Standard P9]
- 4.16. pH: The measurement of the hydrogen ion activity in an aqueous solution. A measure of acidity or alkalinity. A pH of 7 is considered neutral, below 7 is acidic, above 7 is alkaline. The mathematical scale used is a logarithmic one, so a change of one pH unit represents a tenfold change in hydrogen ion activity. [MPI]
- 4.17. QUALITY OF APPEARANCE: Aesthetics; conception of beauty, a particular taste for or approach to what is pleasing to the senses and especially sight. [Merriam-Webster's]
- 4.18. SPECIFICATION: A clear accurate description of the technical requirement for material products, or services, which specifies the minimum requirement for quality and construction of materials and equipment necessary for an acceptable product. In general, specifications are in the form of written descriptions, drawings, prints, commercial designations, industry standards and other descriptive references. [FSCT]
- 4.19. SURFACE: An area, or substrate to which paints, coatings, or wall coverings are applied. The character of the area. [MPI]
- 4.20. SURFACE PREPARATION: The most important step in a painting operation. Any of a number of methods of treating a surface in preparation for painting. The process of ensuring that the surface substrate is clean, free of oil, grease, dust, dirt, loose rust, loose paint, mill scale and all foreign matter; and has a roughness appropriate for the type of coating that will be applied. [MPI]
- 4.21. TOUCH UP (TOUCH UP PAINTING): The act of repainting, by application of similar coating (i.e. from the uppermost coat e.g. primer or topcoat) (or finish coat – preferably from the same batch), to restore small areas of a painted surface to an integral or unbroken condition (to meet the definition of a properly painted surface) by the application of paint or coating. The appearance of a touch up should not be noticeable because of application method, color, sheen, or texture differences from the adjacent area not touched up. If noticeable, corner-to-corner or break-to-break repainting is necessary. Touch up should not be confused with deficiency correction, damage by others repair and correction, or latent damage repair and correction. [MPI]

## 5. Standard Specification

- 5.1. Bond breakers and curing oils that interfere with coating adhesion are often employed in the manufacture of smooth faced tilt-up concrete panels. The project documents should specify the surface preparation method necessary and the entity responsible for this operation. Unless directly specified otherwise, removal of bond breaker materials and curing oils is not the responsibility of the painting and decorating contractor.
- 5.2. The surface profile of the tilt-up concrete panels may be very smooth providing little, if any, mechanical adhesion of coatings. The project documents should specify the surface preparation method necessary and the entity responsible for rectifying this condition.

- 5.2.1. It is recommended that the painting and decorating contractor prepare a benchmark sample of the specified coating system on the surface of the smooth faced tilt-up concrete panels in accordance with PCA Standard P5-04. After the coating has cured, then adhesion by tests in accordance with ASTM D3359-02 or ASTM D7234-05 shall be conducted.
  - 5.2.2. If results obtained are deemed to be unsatisfactory, then additional surface preparation is necessary.
  - 5.2.3. Unless directly specified otherwise, scarification, abrasion, or roughening the surface of the concrete to provide mechanical adhesion of the coatings is the responsibility of an entity other than the painting and decorating contractor. If it is necessary for the painting and decorating contractor to perform remedial work to establish proper mechanical adhesion of coatings, then the painting and decorating contractor shall be compensated for this work. Upon receiving a change order and authorization to proceed on either a lump sum or time and material basis from the contracting entity, the painting and decorating contractor will proceed with the repair.
- 5.3. Prior to applying coatings, the painting and decorating contractor should determine the pH of the surface of smooth faced tilt-up concrete in accordance with ASTM D4262.
- 5.3.1. Coating application should not be initiated until the surface pH is within the coating manufacturer's recommended range for the specific coating system specified.
  - 5.3.2. Unless directly specified otherwise, neutralization of the surface of the concrete is the responsibility of an entity other than the painting and decorating contractor. If it is necessary for the painting and decorating contractor to perform remedial work to establish a proper pH range prior to the application of coatings, then the painting and decorating contractor shall be compensated for this work. Upon receiving a change order and authorization to proceed on either a lump sum or time and material basis from the contracting entity, the painting and decorating contractor will proceed with the repair.
- 5.4. When smooth faced tilt-up concrete panels are manufactured there are often small voids commonly referred to as bug holes or honeycomb which can affect the quality of appearance.
- 5.4.1. Unless directly specified otherwise, filling or sacking of these voids is the responsibility of an entity other than the painting and decorating contractor. If it is necessary for the painting and decorating contractor to perform remedial work to fill voids on smooth faced tilt-up concrete, then the painting and decorating contractor shall be compensated for this work. Upon receiving a change order and authorization to proceed on either a lump sum or time and material basis from the contracting entity, the painting and decorating contractor will proceed with the repair.

## 6. Comments

- 6.1. This standard establishes criteria for field painting of smooth faced tilt-up concrete.
- 6.2. This standard establishes financial responsibility for various work functions when smooth faced tilt-up

- 6.3. This standard is intended establish a consensus document for the painting industry's practices.

## **7. Notes**

- 7.1. PCA does not warrant or assume any legal liability or responsibility for the accuracy, completeness, or usefulness of any of the information contained herein.