

SSPC: The Society for Protective Coatings

CONCRETE COATING TEXTURE STANDARD

Classification of Concrete Coating Finish Textures

1. Scope

This standard establishes a classification system for textures of finish coats of applied concrete flooring systems. When used in conjunction with a set of tactile comparators, it establishes a standard terminology that can be used by owners, specifiers, and concrete flooring installers to describe various coating surface textures. It is not intended to be used as a compliance verification tool.

This standard is not a slip resistance guide, nor does it assign a definitive “slip resistance” Coefficient of Friction (“COF”) to any texture finishes. Surface texture and its corresponding COF is only one factor to be considered in determining the “slipperiness” of a surface. Other factors affecting COF include maintenance, contaminants, and the floor coating resin. Appendix 1 provides a relative guide of COF for samples of each classification of Coating Finish Texture (“CFT”).

2. Tactile Texture Comparator Set

The tactile texture comparator set is a set of standardized coupons representing different levels of uniform texture. They are used to assist in determining the degree of texture required for a flooring project; to assist in determining when an installed flooring system has excess wear and requires a surface texture “refresh”; and to provide the installation contractor with a tactile representation of the intended texture.

3. Units of Measure

This standard provides both U.S. Customary units and IEEE/ASTM/SI 10, International Standards (SI) units^{(1),1}. All measurements and sample production were performed using U.S. Customary units, therefore these units are presented first. The measurements and CFT ranges provided in SI units have been furnished for practical application convenience; therefore, each system must be used independently of the other without combining in any way. Use of the tactile comparator coupons minimizes the requirement of physical measurement and provides a tactile understanding of profile.

⁽¹⁾ ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959, phone int+1-610-832-9500. For referenced ASTM standards, visit the ASTM website <<http://www.astm.org>>
IEEE Corporate Headquarters, 3 Park Avenue, 17th Floor, New York, NY 10016-5997 USA, Phone: +1 212 419 7900 <<https://www.ieee.org>>

This standard, developed by the SSPC C.7.5 Concrete Coating Texture Committee, was first issued in November 2018.

4. Definitions

Aggregate: For the purpose of this document, organic or inorganic construction materials of varying sizes manufactured for use with a floor coating system.

Average Peak Height: One method of determining the degree of roughness of a textured surface is determined by averaging several peak height readings in each test area using a surface profile gage. This process is repeated in multiple locations and the average values for each location are collectively averaged to calculate the Average Peak Height.

Coefficient of Friction (COF): n—The ratio between the lateral force necessary to move one surface horizontally over another and the perpendicular force that holds the two surfaces in contact. This coefficient is a measure of the relative difficulty with which the surface of one material will slide over an adjoining surface of the same or another material.

Static Coefficient of Friction (SCOF): The ratio of the horizontal component of force applied to a body that just overcomes the resistance to slipping to the vertical component of the weight of the object or force applied.

Eggshell: One of several descriptive words describing a gloss and texture finish similar to the shell of a chicken egg. Generally a value of 10-25 gloss units using a 60-degree reflective angle, according to the Master Painters’ Institute (MPI)⁽²⁾ gloss level chart.²

Flake: In this standard, the term refers to a small, flat, thin aggregate primarily used as a decorative broadcast.

Flat: When describing a level of gloss in this standard, *flat* is frequently synonymous with *matte*.

Gloss Meter: An instrument used to measure specular reflection gloss.

Gloss: Level of shininess. For the purpose of this document *matte*, *satin*, *semi-gloss* and *high gloss* will be used as determined by the Master Painters’ Institute (MPI) gloss level chart.

High Gloss: One of several descriptive words describing the level of gloss. Generally a value of >85 gloss units using a 60-degree reflective angle according to the MPI gloss level chart.

Matte: One of several descriptive words describing the level of gloss. Generally a value of ≤5 gloss units using a 60 degree reflective angle according to the MPI gloss level chart.

⁽²⁾ Master Painters Institute, 2800 Ingleton Ave. Burnaby, B.C. Canada V5C 5G7

Orange-Peel Finish: A bumpy surface that resembles the surface of the skin of an orange.

R: A single peak-to-valley height measurement of the surface profile as taken by a depth micrometer.

Random: In this standard, “random” means the inconsistent distribution of aggregate most frequently broadcast throughout applied resinous floorings or coatings.

Satin: One of several descriptive words describing the level of gloss. Generally a description of a value of 20 to 35 gloss units using a 60-degree reflective angle according to the MPI gloss chart.

Semi-Gloss: One of several descriptive words describing the level of gloss. Generally a description of a value of 35 to 70 gloss units using a 60-degree reflective angle according to the MPI gloss chart.

Slip Resistance: The relative force that resists the tendency of the shoe or foot to slide along the walkway surface. Slip resistance is related to a combination of factors including the walkway surface, the footwear bottom, and the presence of foreign materials between them.³

Smooth: Free from projections and uneven surface.

Stipple: A random pattern of small depressions created by the resin thixotropy and/or application method.

Surface Profile: The topographical contour of a concrete surface. In this standard, it may also refer to the texture of the coating finish.

Surface Profile Gage: A depth micrometer measurement device with a base that rests on the tops of the peaks of the surface profile and a spring loaded pointed probe that projects into a single valley.

Tactile Texture Comparator Set: A set of sample uniform texture coupons produced to help communicate various degrees of texture through vision and touch.

Texture: The height of the major peaks relative to the major valleys. The visual, and especially the tactile, characteristics of the surface.

Topcoat: The final coating applied in a multi-coat system.

Uniform: For the purpose of this document, *uniform* means the consistent, complete and even distribution of the coating surface texture. *Discussion: “Uniform distribution texture” is most frequently created by aggregate broadcast to refusal into the applied resinous flooring/coating, but may also be the result of resin formulation or underlying surface.*

5. COATING TEXTURE CLASSIFICATIONS

The finish texture of a concrete coating is a result of the material uses, the resin formulation, aggregates, application techniques, and in some cases the profile of the concrete being coated. Refer to Appendix A2 for additional background information regarding concrete coating texture. A smooth, uniformly textured, and random textured finish will vary throughout a coating installation. Refer to Appendix A3 for a discussion of project consistency and variation.

5.1 SMOOTH: Floor coatings and topcoats with fine aggregates or without aggregates protruding from the underlying surface often still display a slight texture. This classification of texture, designated *Smooth*, is measured with less than 2 mils (50 micrometers) texture, and is measured by the degree of light reflectance or gloss. See Appendix A4 for more detailed information regarding the Master Painters Institute (MPI) gloss and sheen standards, and for more information about the process for acquiring profile measurements.

5.2 TEXTURED SURFACES: Textured coatings are segmented into uniformly textured and randomly textured. Uniform texture describes an application with peaks and valleys generally consistent throughout the finished coating system. Typically, these systems are applied using trowel or broadcast-to-refusal applications. Random textures are generally achieved by light (“not-to-refusal”) aggregate broadcast.

5.2.1 Uniform Texture Classifications: There are various ways to achieve a uniform surface texture. In addition to average peak height, the density of the peaks influences the overall texture of the surface. For concrete coating texture with uniform distribution, the primary factors influencing peak density are the aggregate size and blend. Manufacturers of coating systems formulate these aggregate blends in combination with topcoat application thickness to achieve the desired texture designation as indicated in Table 1 and Figure 1. In general, small aggregates will provide lower texture with more frequent peaks, and larger aggregates will achieve higher texture with fewer peaks per unit area. Peak density is controlled by varying the aggregate blends and particle sizes.

This standard quantifies uniform textures according to the peak height measurement as discussed in the following section. Peak height is primarily influenced by aggregate size and shape. In addition to peak height, peak frequency will also affect the texture. It is assumed that when using a uniform aggregate blend and distribution method, the peak frequency will directly correspond to the aggregate shape and size.

TABLE 1
SUMMARY OF COATING FINISH TEXTURES

Designation	Finish texture (Average Peak Heights, mils)	Finish texture (Average Peak Heights, micrometers)
CFT-A	2 to 6	50 to 165
CFT-B	7 to 18	166 to 465
CFT-C	19 to 30	466 to 775
CFT-D	31 to 50	776 to 1270

5.2.1.1 Coating Finish Texture “A” (CFT-A): These coating finishes are intentionally designed to provide a slight surface texture. The texture results from the physical properties of the resin, an underlying texture of the substrate, a flat (flake) aggregate, or a fine aggregate contained within the coating. Measured texture ranges from 2 to 6 mils (50 to 165 micrometers).

Stipple finishes are uniformly textured finishes created by the resin itself or the application method of that resin. Stipple finishes are considered to be more rounded and rolling hills rather than the more aggressive peaks created by the addition of aggregate.

5.2.1.2 Coating Finish Texture “B” (CFT-B): Coating finishes defined as having a heavier texture with thixotropic resin and/or finer mesh aggregate either rounded or angular in nature. Measured texture ranges from 7 to 18 mils (166 to 465 micrometers).

5.2.1.3 Coating Finish Texture “C” (CFT-C): Coating finishes designed to provide more aggressive texture, especially for wet environments. Most frequently these systems are designed with sub-rounded or angular aggregates. Measured texture ranges from 19 to 30 mils (466 to 775 micrometers).

5.2.1.4 Coating Finish Texture “D” (CFT-D): Coating finishes designed for environments requiring aggressive texture, generally for conditions where deposition of heavy contamination between cleanings is expected. Most frequently, large angular aggregate is used. Measured texture ranges from 31 to 50 mils (776 to 1270 micrometers).

5.2.1.5 Coating Finish Textures with Average Peak Heights Greater than 50 mils (1270 micrometers): These textures are classified as greater than CFT-D (>CFT-D). These textures are considered extreme and are typically used in specialty applications.

5.2.2 Random Texture Classification: This texture is a result of sporadic distribution of aggregates in various aesthetic applications of widely dispersed decorative flakes where the remaining surface is flat, or of aggressive aggregate applications for vehicular traffic. Aggregate size, shape and distribution vary significantly and dictate the final texture achieved. Because of the “random” nature of this installation, it is the most difficult to describe and specify. Therefore, this type of application or the manufacturer’s technical literature must clearly specify the following variables:

Aggregate Shape: Flat, Angular, Semi-Angular, Rounded

Aggregate Size (range)

Distribution: Average particles per measurable defined area or aggregate volume/mass per square feet (square meters)

Acceptable variability

Maximum contiguous area with no aggregate

Minimum measurable peaks/aggregates within a 1- or 6-inch (25- or 150 cm) square sample; average number of peaks over 5 to 10 sample areas.

It is important that all specifications for this type of texture be confirmed with samples and/or mock-up applications to confirm desired texture.

5.3 TACTILE TEXTURE COMPARATOR SET: Coating texture is achieved using a variety of means of materials and applications. See Appendix A3 for a discussion of some of the variables associated with the various materials and methods used to produce a textured finish. This standard focuses on the finished texture of a coating or flooring system. To assist the communication process for new specifications and installations, this standard includes a series of tactile texture comparator coupons to be used as visual and tactile representations of the desired texture. Appendix A5 outlines the process by which these coupons are produced.

SSPC has reproduced 8 distinct texture representations on comparator coupons corresponding to the classifications defined in this document (Figure 2). Each coupon is labeled

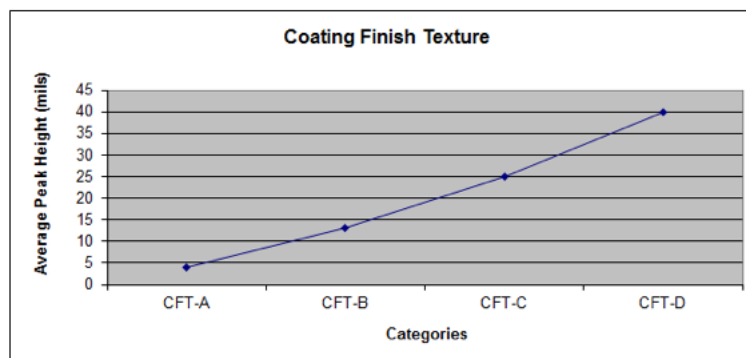


Figure 1. Coating Finish Texture Classes