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Standard Practice for Physical Characterization of Paint Brushes[1]

This standard is issued under the fixed designation D5301; 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 practice covers the dimensions, terminology, materials and characteristics generally considered of importance to those within, or dealing with paint brushes, and describes methods of determining these parameters. This practice is not meant to be a definitive analytical method to deformulate brushes.

1.2 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

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.*

2. Terminology

2.1 *Definitions:*

2.1.1 *chisel (or chiseled), n*—a description of the configuration of the tip of the brush as being of a more or less convex shape across the thickness dimension.

2.1.2 *flat tip, n*—a description of the configuration of the tip of the brush as being flat or of uniform length across the thickness dimension.

2.1.3 *flagged, n*—a term describing the tip of a filament or bristle as being split resulting in a multiplicity of filament ends.

2.1.4 *tipped, n*—a term describing the tip of a filament or bristle as coming to a point.

2.1.5 *microtome, n*—a device for holding a number of filament or bristle materials in a rigid state for a cross sectional examination under a microscope (see Fig. 1).

3. Significance and Use

3.1 It is important to recognize that a brush can be a mixture of several chemically different filaments or bristles, or both, in several cross sections, thicknesses and lengths. The following procedures will be helpful in identifying brush composition.

4. Determination of Head Dimensions

4.1 *Width*—Determine the width by measuring the brushing material adjacent to the ferrule in the wide or broad dimension, using any accurate linear measuring device. Report dimensions to the nearest 3 mm (⅛ in.).

4.2 *Thickness*—Determine the thickness by measuring the brushing material adjacent to the ferrule, in the narrow dimension, using any accurate linear measuring device. Report dimensions to the nearest 1 mm (1⁄16 in.).

4.3 *Length Clear (Length Out)*—Determine the length by measuring the exposed filament or bristle length from the edge of the ferrule to its tip, using any accurate linear measuring device. Measure the brush on each end of the width and average the measurements so obtained to give the mean value. Report dimensions to the nearest 1 mm (1⁄16 in.).

NOTE 1—In the case of an angular sash brush, indicate whether the ferrule is angular or straight.

5. Brush Tip Configuration

5.1 Describe the configuration at the tip of the head as chiseled or flat (see 2.1.1 and 2.1.2).

6. Brushing Material Characteristics

6.1 *Cross-Sectional Shape*—Determine the cross-sectional shape of the filaments or bristles by inserting a representative sample of brushing material into the slot of a microtome, cutting the material flush with the surface of the microtome with a razor blade, and examining it visually with a 30× or greater microscope. Report the observations of filament shapes for example, round, solid, hollow or others.

6.2 *Filament or Bristle Length*—Determine the lengths of the filaments or bristles used in a brush by opening the ferrule and removing the filaments from that portion of the brush unaffected by the chisel. Measure a representative number of specimens to the nearest 1 mm (1⁄16 in.), and report the length or various lengths.

6.3 *Filament or Bristle Thickness and Profile*—Remove a representative sample of filaments or bristles (10 to 20) from the brush as described in 6.2 and measure their thickness or

[1] This practice is under the jurisdiction of ASTM Committee D01 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.61 on Paint Application Tools.

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