



Designation: D3964 – 04

Standard Practice for Selection of Coating Specimens for Appearance Measurements¹

This standard is issued under the fixed designation D3964; 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 provides a guide to selection of specimens for appearance measurement as well as a discussion of factors to be considered in their preparation for measurement. Standardized selection and presentation procedures will assist in achieving agreement between evaluations carried out in different laboratories as well as helping to achieve better correlations between visual evaluations and instrumental measurements.

NOTE 1—This standard is not a practice for preparation of test panels of coatings; see Practices D823.

1.2 *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. Referenced Documents

2.1 *ASTM Standards:*²

D823 Practices for Producing Films of Uniform Thickness of Paint, Varnish, and Related Products on Test Panels

E284 Terminology of Appearance

3. Terminology

3.1 *Definitions:*

3.1.1 For definitions of terms used in this practice, refer to Terminology E284.

4. Significance and Use

4.1 Many of the specimens that are regularly submitted to measurement depart in some degree from the ideal requirements. For this reason instrumental readings are affected importantly by the manner in which specimens are selected and

presented for measurement. Reproducible measurements are facilitated by standardization and control of test conditions.

5. General Requirements

5.1 *Selection*—In making appearance measurements it is important that the specimens selected be representative of the material of interest. Once selected, the specimens must be carefully examined to determine if they are suitable for measurement, and if not, they must be cleaned or otherwise prepared. Careful attention to these factors is necessary if the measurements are to be valid.

5.2 *Specimen Size*—The minimum size is dictated by the size of the specimen port of the instrument to be used for measurement. When an instrument provides a choice of specimen port sizes, use the largest port that can be completely covered by the specimen. A large measured area helps to minimize the effect of any small area nonuniformity and is therefore more likely to provide results that agree with the involuntary averaging that takes place when specimens are observed visually. In addition, a large specimen also permits the operator to make measurements on several areas of the specimen when desired, thereby providing further specimen averaging.

5.3 *Opacity*—For determination of gloss or color, an opaque specimen shall be selected whenever possible. When the specimen is translucent or transparent, the following practices shall be implemented:

5.3.1 *For Gloss Evaluation*—The specimen shall preferably be sufficiently thick that a secondary reflection from the back or second surface of the specimen cannot enter the receptor optics of the glossmeter. When thin transparent specimens must be measured, adopt one of the following procedures:

5.3.1.1 Back the specimen with a light-absorbing material of the same refractive index as the specimen, and in optical contact with it.

5.3.1.2 Use an agreed-upon specimen thickness, including coating and substrate, and place a black backing behind the specimen.

5.3.2 *For Color Evaluation*—The choice of backing of even slightly translucent specimens will affect their measurement. Use the most applicable of the backing techniques that follow.

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 D01.26 on Optical Properties.

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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.