



Standard Test Methods for Measurement of Gloss of High-Gloss Surfaces by Abridged Goniophotometry¹

This standard is issued under the fixed designation E430; 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 These test methods cover the measurement of the reflection characteristics responsible for the glossy appearance of high-gloss surfaces. Three test methods, A, B and C, are provided for evaluating such surface characteristics at specular angles of 30°, 20° and 30°, respectively. These test methods are not suitable for diffuse finish surfaces nor do they measure color, another appearance attribute.

1.2 As originally developed by Tingle and others (see Refs **1** and **2**),² the test methods were applied only to bright metals. Recently they have been applied to high-gloss automotive finishes and other nonmetallic surfaces.

1.3 The DOI of a glossy surface is generally independent of its curvature. The DOI measurement by this test method is limited to flat or flattenable surfaces.

2. Referenced Documents

2.1 ASTM Standards:³

D523 Test Method for Specular Gloss

D2457 Test Method for Specular Gloss of Plastic Films and Solid Plastics

E171 Practice for Conditioning and Testing Flexible Barrier Packaging

E177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods

E179 Guide for Selection of Geometric Conditions for Measurement of Reflection and Transmission Properties of Materials

E284 Terminology of Appearance

E308 Practice for Computing the Colors of Objects by Using the CIE System

¹ These test methods are under the jurisdiction of ASTM Committee **E12** on Color and Appearance and are the direct responsibility of Subcommittee **E12.03** on Geometry.

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² The boldface numbers in parentheses refer to the list of references at the end of this method.

³ 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.

E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method

E1347 Test Method for Color and Color-Difference Measurement by Tristimulus Colorimetry

3. Terminology

3.1 Definitions:

3.1.1 Appearance terms in this test method are in accordance with Terminology **E284**.

3.1.2 Terms that are defined in Terminology **E284**, but have a specific definition in this method are

3.1.3 *reflectance*, p , n —ratio of the reflected radiant or luminous flux to the incident flux in the given conditions. (**E284**)

3.1.3.1 *Discussion*—The term *reflectance* is often used in a general sense or as an abbreviation for *reflectance factor*. Such usage is not assumed in this method. The definition may require that the term be modified by adjectives denoting the spectral and geometric conditions of measurement.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *reflection haze*, H , n —for a specified specular angle, ratio of flux reflected at a specified angle (or angles) from the specular direction to the flux similarly reflected at the specular angle by a specified gloss standard.

3.2.1.1 *Discussion*—Modifiers may be used to specify the angles at which the haze is measured (for example, 2°, –5° or 15°); whether $-H$ or a logarithmic form is to be stated; or whether H is to be compensated for the luminance of the specimen by multiplication by Y_{specimen}/Y_n , where n denotes the reference white; or any combination of these.

3.2.2 *metallic brightness*, n —freedom of a metal surface from diffuse haze or texture.

3.2.3 *'with-machine' direction*, n —the axis of a specimen that is parallel to the direction of mill rolling or extrusion, or other surface-finish texture.

3.2.4 *'across-machine' direction*, n —the perpendicular to *'with-machine' direction*.

4. Summary of Test Method

4.1 Several geometrically different measures of light reflected by a surface are proposed for use in describing its gloss appearance.