

Standard Method of Test for SPECTRAL CHARACTERISTICS AND COLOR OF OBJECTS AND MATERIALS¹



A.S.T.M. Designation: D 307 - 44

ADOPTED, 1944.²

This Standard of the American Society for Testing Materials is issued under the fixed designation D 307; the final number indicates the year of original adoption as standard or, in the case of revision, the year of last revision.

Scope

1. This method of test is intended to determine the spectral characteristics of light-transmitting objects and of light-reflecting objects and materials, and to designate their colors.

NOTE 1.—The method of designating colors has come into wide acceptance since its recommendation in 1931 by the International Commission on Illumination.³ It is intended primarily for light-reflecting and light-transmitting specimens whose spectral characteristics have been determined by the spectrophotometer, but it is also applicable to the expression of color measurements by visual or photoelectric colorimeters.

NOTE 2.—If portions of a test specimen to which the measurement applies are homogeneous, the measurement is taken as characteristic of the material of the specimen; thus, a specimen consisting of an opaque paint film or an opaque

layer of paper is a specimen of material (paint or paper). But if the effective portions of the specimen consist of two or more materials so combined that the measurement depends upon their arrangement, the measurement characterizes, not a material, but objects which are constructed from the same materials in the same way; thus, a specimen consisting of an incompletely hiding paint film on a ground coat represents, not a material, but simply a group of objects made from the superimposition of a particular finishing coat on a particular ground coat. A specimen of light-reflecting material shall consist of a layer so thick that further increase in thickness will not cause a change in appearance.

Description of Terms and Symbols

2. (a) *Tristimulus Designations, X, Y, Z.*—The evaluations of the color as determined in accordance with this method.

NOTE.—The appearance of materials and objects is not completely defined by this evaluation of color, but may also be influenced by other properties such as texture and gloss.

(b) *Tristimulus Designations of a Spectrum of Unit Irradiance per Unit Wave Length, $\bar{x}_\lambda$, $\bar{y}_\lambda$, $\bar{z}_\lambda$.*—The functions of wave length which serve to define the X, Y, and Z scales.

¹ Under the standardization procedure of the Society, this method is under the jurisdiction of the A.S.T.M. Committee D-1 on Paint, Varnish, Lacquer, and Related Products.

² Prior to adoption as standard, this method was published as tentative from 1929 to 1930, being revised in 1930. It was adopted as standard in 1930, published as standard from 1930 to 1937, but revised and republished as tentative from 1937 to 1939, being revised in 1939. It was again adopted as standard in 1939, published as standard from 1939 to 1942, but revised and republished as tentative in 1942.

³ *Proceedings, Eighth Session, Commission Internationale de l'Éclairage, Cambridge, England, September, 1931, pp. 19-29.*