



Standard Test Method for Measuring Optical Reflectivity of Transparent Materials¹

This standard is issued under the fixed designation F 1252; 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 test method covers a procedure for measuring the reflectivity of transparent materials, hereafter known as specimens. The results are repeatable without specifying a particular brand name of instrumentation.

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.

1.3 The preferred units are acceptable metric units.

2. Terminology

2.1 Definitions:

2.1.1 *angle of incidence* (θ_i)—in the plane of the light source, specimen, and photometer, the angle of incidence is the angle between the incident light ray and the normal light ray to the surface (see Fig. 1).

2.1.2 *angle of reflection* (θ_r)—in the plane of the light source, specimen, and photometer, the angle of reflection is the angle between the reflected light ray and the normal light ray to the surface (see Fig. 1).

2.1.3 *field of view* (FOV)—the solid angle (degrees) that can be viewed through the photometer (see Fig. 2).

2.1.4 *light source*—unless otherwise specified, the National Institute of Standards and Technology (NIST) diffused nonpolarized Standard Illuminance C light source shall be used. The light source size will be such that there will be sufficient overlap of the front and rear images on the specimen to overfill the 1° field of view of the photometer. This overlap is illustrated in Fig. 3. (As angle of incidence and specimen thickness increase, the two images will diverge.) If a light source other than the NIST Illuminant C is used, it should be specified and reported as part of the test results.

2.1.5 *photometer*—any commercial photometer or photopic filtered radiometer with a field of view of 1° . A model with a viewfinder is recommended.

2.1.6 *pivot point*—the point in space at which the incident light ray and reflected light ray are to intersect (see Fig. 1).

2.1.7 *reflectivity*—the reflectivity of a transparent specimen is defined as the ratio of the luminance of the reflected image

¹ This test method is under the jurisdiction of ASTM Committee F-7 on Aerospace and Aircraft and is the direct responsibility of Subcommittee F07.08 on Transparent Enclosures and Materials.

Current edition approved Oct. 27, 1989. Published December 1989.

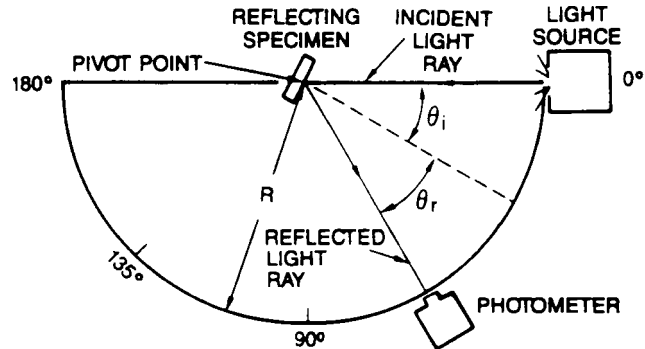


FIG. 1 Apparatus Set-Up

of a light source to the luminance of the light source. The reflectivity will depend upon several factors: the angle at which the reflected light is measured, the thickness, surface quality, and type of material of the specimen, whether the specimen is coated, the spectral distribution of the light source, and the spectral sensitivity of the measurement device. The reflectivity, as defined here, includes the small amount of scattered light that contributes to the luminance of the reflected image.

3. Summary of Test Method

3.1 The luminance of the standard source is determined by

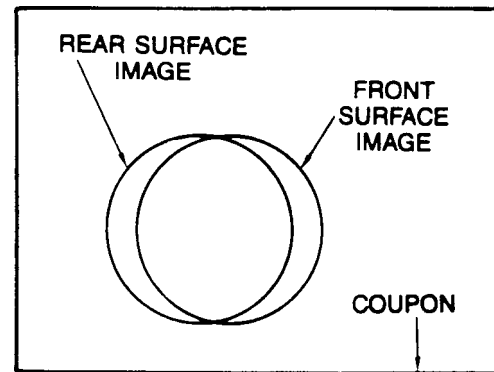


FIG. 2 Image Overlap

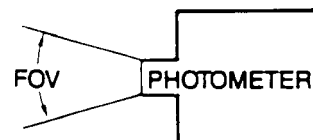


FIG. 3 Photometer Field of View