



Standard Test Method for Measuring the Night Vision Goggle-Weighted Transmissivity of Transparent Parts¹

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INTRODUCTION

Test Methods **D1003** and **F1316** apply to the transmissivity measurement of transparent materials, the former being for small flat samples, and the latter for any materials including larger, curved pieces such as aircraft transparencies. Additionally, in Test Method **D1003**, the transmissivity is measured perpendicular to the surface of test sample and both test methods measure only in the visible light spectral region. Night vision goggles (NVGs) are being used in aircraft and other applications (for example, marine navigation, driving) with increasing frequency. These devices amplify both visible and near-infrared (NIR) spectral energy. Overall visual performance can be degraded if the observer uses the NVGs while looking through a transparency that has poor transmissivity in the visible and NIR spectral regions. This test method describes both direct and analytical measurement techniques that determine the NVG-weighted transmissivity of transparent pieces including ones that are large, curved, or held at the installed position.

1. Scope

1.1 This test method covers apparatuses and procedures that are suitable for measuring the NVG-weighted transmissivity of transparent parts including those that are large, thick, curved, or already installed. This test method is sensitive to transparencies that vary in transmissivity as a function of wavelength.

1.2 Since the transmissivity (or transmission coefficient) is a ratio of two radiance values, it has no units. The units of radiance recorded in the intermediate steps of this test method are not critical; any recognized units of radiance (for example, watts/m²-str) may be used, as long as it is consistent.²

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.*

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

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² *RCA Electro-Optics Handbook*, RCA/Solid State Division/Electro Optics and Devices. Technical Series EOH-11. Lancaster, PA; 1974.

2. Referenced Documents

2.1 ASTM Standards:³

D1003 Test Method for Haze and Luminous Transmittance of Transparent Plastics

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

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

F1316 Test Method for Measuring the Transmissivity of Transparent Parts

3. Terminology

3.1 Definitions:

3.1.1 *analytical test method, n*—the test method that uses spectral transmissivity data of a transparent part collected by the use of either spectrophotometric or spectroradiometric instrumentation. The data are then examined using analytic methods to determine the NVG-weighted transmissivity of the part.

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.