



Designation: E1256 – 17

Standard Test Methods for Radiation Thermometers (Single Waveband Type)¹

This standard is issued under the fixed designation E1256; 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 The test methods described in these test methods can be utilized to evaluate the following six basic operational parameters of a radiation thermometer (single waveband type):

	Section
Calibration Accuracy	8
Repeatability	9
Field-of-View	10
Response Time	11
Warm-Up Time	12
Long-Term Stability	13

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 term single waveband refers to radiation thermometers that operate in a single band of spectral radiation. This term is used to differentiate single waveband radiation thermometers from those termed as ratio radiation thermometers, two channel radiation thermometers, two color radiation thermometers, multiwavelength radiation thermometers, multichannel radiation thermometers, or multicolor radiation thermometers. The term single waveband does not preclude wideband radiation thermometers such as those operating in the 8–14 μm band.

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:

E2758 Guide for Selection and Use of Wideband, Low Temperature Infrared Thermometers

¹ These test methods are under the jurisdiction of ASTM Committee E20 on Temperature Measurement and are the direct responsibility of Subcommittee E20.02 on Radiation Thermometry.

Current edition approved May 1, 2017. Published June 2017. Originally approved in 1988. Last previous edition approved in 2015 as E1256 – 15. DOI: 10.1520/E1256-17.

2.2 IEC Documents

IEC/TS 62492-1 ed 1.0 TS Industrial Process Control Devices—Radiation Thermometers—Part 1: Technical Data for Radiation Thermometers

3. Terminology

3.1 Definitions:

3.1.1 *blackbody*, *n*—the perfect or ideal source of thermal radiant power having a spectral distribution described by the Planck equation.

3.1.1.1 *Discussion*—The term blackbody is often used to describe a furnace or other source of radiant power which approximates the ideal.

3.1.2 *center wavelength*, *n*—a wavelength, usually near the middle of the band of radiant power over which a radiation thermometer responds, that is used to characterize its performance.

3.1.2.1 *Discussion*—The value of the center wavelength is usually specified by the manufacturer of the instrument.

3.1.3 *field-of-view*, *n*—a usually circular, flat surface of a measured object from which the radiation thermometer receives radiation.²

NOTE 1—*Field-of-view* traditionally has been referred to as *target size*.

3.1.4 *measuring distance*, *n*—distance or distance range between the radiation thermometer and the target (measured object) for which the radiation thermometer is designed.²

NOTE 2—*Measuring distance* traditionally has been referred to as *target distance*.

3.1.5 *radiation thermometer*, *n*—a radiometer calibrated to indicate the temperature of a blackbody.

3.1.6 *radiometer*, *n*—a device for measuring radiant power that has an output proportional to the intensity of the input power.

3.1.7 *target distance*, *n*—see *measuring distance*.

3.1.8 *target plane*, *n*—the plane, perpendicular to the line of sight of a radiation thermometer, that is in focus for that instrument.

3.1.9 *target size*, *n*—see *field-of-view*.

² IEC 62492-1.