



Standard Practice for Infrared Determination of the Temperature of Applied Coatings on Wood Products During the Curing Cycle¹

This standard is issued under the fixed designation D 3259; 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.

^{ε1} NOTE—Editorial changes made in Section 3 in February 2001.

1. Scope

1.1 This practice is intended to serve as a guide in measuring with infrared instruments the temperature during the curing process of coatings applied to wood products.

1.2 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

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.*

2. Significance and Use

2.1 The forest products finishing industry has encountered difficulties in measuring the temperature of painted surfaces prior to, during, and after the curing process. The use of thermocouples is not entirely satisfactory because the thermocouple wires tend to conduct heat away too rapidly from the area where the temperature is being measured. Infrared radiation thermometers that are simple to operate can circumvent this difficulty. After calibration they are aimed at the surface, switched on, and the temperature read directly from an indicating gage.

NOTE 1—Temperature-sensitive crayons, papers, and pellets may be successfully used to measure only the highest temperature reached by painted surfaces during the curing cycle.

2.2 There are several different types of infrared radiation thermometers, including those based on lead sulfide or thermistor sensors and those that are simple thermal voltaic transducers. As such they respond to different wavelengths of infrared radiation and have different areas of applicability.

¹ This practice is under the jurisdiction of ASTM Committee D-1 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of D01.52 on Factory Coated Wood Products.

Current edition approved Nov. 10, 1995. Published January 1996. Originally published as D 3259 – 73. Last previous edition D 3259 – 84 (1990)^{ε1}.

Only instruments that have been evaluated are included in this practice.

3. Apparatus

3.1 The method of measurement has changed to include virtually all non-surface contact measurement devices. Such devices may be portable (hand held) with nearly instantaneous readout or stationary with a remote readout.

3.2 Modern devices come equipped with an automatic emissivity compensation system.

4. Procedure

4.1 *Calibration*—Calibrate each instrument according to the instructions of the manufacturer. A standard blackbody capable of being controlled at various temperatures is almost essential for calibration. One such blackbody is a modified hot plate with a 13-mm (½-in.) thick aluminum plate and a ventilated cowling to minimize the effects of ambient drafts. A dial thermometer with its stem within the aluminum plate serves to monitor the temperature of the blackbody.

4.2 *Operation:*

4.2.1 Detailed instructions on the operation of each instrument are not included in this practice. Unless otherwise agreed follow the manufacturer's instructions in operating the equipment.

4.2.2 One general precaution is that the instrument must observe only the surface being measured and not stray radiation from infrared heaters, sunlight, electric lights, or other sources. The permissible distance from the surface to the sensor depends upon the area of surface, the viewing angle of the instrument and the wavelength that the sensor responds to. Instruments operating only in the long wavelength region of the infrared spectrum are affected much less by stray radiation and by color variations.

5. Keywords

5.1 cure temperature; infrared; paint surface temperature; temperature measurement; wood coating

 **D 3259**

The American Society for Testing and Materials takes no position respecting the validity of any patent rights asserted in connection with any item mentioned in this standard. Users of this standard are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, are entirely their own responsibility.

This standard is subject to revision at any time by the responsible technical committee and must be reviewed every five years and if not revised, either reapproved or withdrawn. Your comments are invited either for revision of this standard or for additional standards and should be addressed to ASTM Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee, which you may attend. If you feel that your comments have not received a fair hearing you should make your views known to the ASTM Committee on Standards, at the address shown below.

This standard is copyrighted by ASTM, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959, United States. Individual reprints (single or multiple copies) of this standard may be obtained by contacting ASTM at the above address or at 610-832-9585 (phone), 610-832-9555 (fax), or service@astm.org (e-mail); or through the ASTM website (www.astm.org).