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AMERICAN SOCIETY FOR TESTING AND MATERIALS
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Standard Practice for Infrared Determination of the Temperature of Applied Coatings on Wood Products During the Curing Cycle[1]

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.

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

3. Apparatus

3.1 The method of measurement has changed to virtually all non-surface contact measurement devices. Such devices may be portable (land 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 ½-in. (13-mm) 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

[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.

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