



Standard Recommended Practice for EXPOSURE OF PLASTICS TO FLUORESCENT SUNLAMP¹

This Standard is issued under the fixed designation D 1501; 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.

This recommended practice has been approved for use by agencies of the Department of Defense to replace method 6024 of Federal Test Method Standard 406 and for listing in the DoD Index of Specifications and Standards.

1. Scope

1.1 This recommended practice² defines conditions for the exposure of plastic materials to radiant energy from fluorescent sunlamps, heat, and fog.

1.2 Three alternative procedures may be used:

Procedure A for exposure to light at ambient temperature,

Procedure B, for exposure to heat and light, and

Procedure C, which includes moisture as well as heat and light.

2. Significance

2.1 The various procedures are designed to simulate some aspects of outdoor exposure conditions on a laboratory scale. However, direct correlation between this recommended practice and actual exposure outdoors should not be expected since outdoor conditions are variable.

3. Apparatus

3.1 *Light-Exposure Unit*—A turntable shall be used in conjunction with five fluorescent sunlamp bulbs which have been in use at least 50 and less than 1050 h. The bank of lamps shall be mounted so as to be centered directly above the turntable, and so that the distance from the plane of the top of the specimens on the turntable to the plane of the bottom of the lamps shall be 70 mm. It is recommended that a single lamp be replaced every 200 h so that the respective ages in the five lamps would be 50, 250, 450, 650, and 850 h.

3.2 *Lamp*—A Type FS-20-T12 Westinghouse fluorescent sunlamp. The lamp is 610 mm long, has a nominal input of 20 W, operates at 110 V $\pm$ 1 percent, and fits into standard fluorescent light fixtures. The bulbs shall be mounted parallel to one another on 60-mm centers. A polished flat aluminum reflector, 380 by 460 mm, shall be mounted above the lamps so that the polished surface shall be 25 mm from the plane of the top of the bulbs. The reflector shall be centered over the lamps with the long side parallel to their length.

3.3 *Turntable*—The turntable shall rotate at 30 to 40 rpm, and shall be fitted with a disk of polished aluminum approximately 430 mm in diameter and 2.5 mm thick. Means shall be provided to hold the specimens above the metal disk so that there is an air space of at least 5 mm between the bottom of the specimens and the top surface of the disk.

NOTE 1.—Experience has shown that all areas of the top surface of the disk are equally effective so that the test specimens may be mounted anywhere on the disk.

3.4 *Heat Source*—A source of heated air for maintaining the desired chamber temperature.

3.5 *Thermometer*—An ASTM Partial

¹ This recommended practice is under the jurisdiction of ASTM Committee D-20 on Plastics and is the direct responsibility of Subcommittee D-20.50 on Permanence Properties.

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² See Hirt, R., et al., "Ultraviolet Spectral Energy Distributions of Natural Sunlight and Accelerated Test Light Sources," *Journal of the Optical Society of America*, JO-SAA, Vol. 50, 1960, pp. 706-713.