Designation: D5105 – 05

Standard Practice for Performing Accelerated Outdoor Weathering of Pressure-Sensitive Tapes Using Concentrated Natural Sunlight[1]

This standard is issued under the fixed designation D5105; 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.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 This practice covers one procedure for the exposure of pressure-sensitive tapes to an accelerated outdoor weathering environment.

1.2 This practice describes sample preparation and an accelerated outdoor environment to which it shall be exposed. It does not specify what observations or tests are to be performed on the material following exposure.

1.3 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

1.4 *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. Referenced Documents

2.1 *ASTM Standards:*[2]

D3715/D3715M Practice for Quality Assurance of Pressure-Sensitive Tapes

G90 Practice for Performing Accelerated Outdoor Weathering of Nonmetallic Materials Using Concentrated Natural Sunlight

2.2 *Federal Specifications:*

QQ-A-250/5 Aluminum Alloy Alclad 2024, Plate and Sheet[3]

2.3 *SAE Document:*

SAE J576 Plastic Materials for Use in Optical Parts Such as Lenses and Reflectors of Motor Vehicle Lighting Devices—Recommended Practice[4]

3. Summary of Practice

3.1 The pressure-sensitive tapes are exposed to concentrated solar radiation in accordance with the conditions provided by the apparatus described in Practice G90, using spray Cycle 3. Following this exposure, the specimen is ready for any prescribed examination of appearance and physical characteristics by other standards as determined by the applicable material specification or other documents.

4. Significance and Use

4.1 This practice provides a means of qualitative assessments of outdoor weathering effects on pressure-sensitive tapes. The resistance of tapes to outdoor weathering is determined relative to the resistance of a control tape with known stability.

4.2 If tests described in this practice produce the same type of degradation as found in real-time exposures of the same materials, it is possible to use the results from these short-term tests to determine the quantitative effects of natural weathering.

4.3 The timing of exposure testing covering both outdoor conventional and outdoor accelerated exposure of this practice, using levels of ultraviolet solar radiation exposure (MJ/m^2) of UV (295 to 385 nm) is an improvement in the timing of exposure testing. Testing specific levels of solar radiant exposure (MJ/m^2) may be used to establish relative equivalent exposure, but the use of (MJ/m^2 of UV (295 to 385 nm)) is the preferred method.[4,5,6]

4.4 The radiant exposure (308 or 616 MJ/m^2) suggested in this practice approximates one and two years, respectively, of

[1] This practice is under the jurisdiction of ASTM Committee D10 on Packaging and is the direct responsibility of Subcommittee D10.14 on Tapes and Labels.

Current edition approved Oct. 1, 2005. Published October 2005. Originally approved in 1990. Last previous edition approved in 1999 as D5105 – 94 (1999). DOI: 10.1520/D5105-05.

[2] 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.

[3] Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.

[4] Available from the Society of Automotive Engineers, 400 Commonwealth Dr., Warrendale, PA 15096.

[5] G. A. Zerlaut, M. W. Rupp, and T. E. Anderson, DEST Laboratories, Inc., Phoenix, AZ, "Ultraviolet Radiation Timing Technique of Outdoor Weathering of Materials," SAE Technical Paper Series #850348 presented at the International Congress and Exposition, Detroit, MI, Feb. 25–March 1, 1985. Available from SAE.

[6] Bauer, D. R., Paputa Peck, M. C., and Carter III, R. O.," Evaluation of Accelerated Spectroscopy," *Journal of Coatings Technology*, Vol 59, No. 755, pp 103–109.