Designation: D7932 – 17 (Reapproved 2023)

Standard Specification for Printed, Pressure-Sensitive Adhesive Labels for Use in Extreme Distribution Environments[1]

This standard is issued under the fixed designation D7932; 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 specification provides a standard means to test and measure performance characteristics of printed, pressure-sensitive adhesive labels for containers, particularly containers to be used in extreme distribution environments (for example, hazardous materials labels, aerospace, military containers). For the purposes of this specification, an extreme distribution environment is one in which it can be reasonably expected to experience direct exposure to deteriorating chemicals, weather, elevated/cold temperatures, and other environmental and physical elements for an extended period of time.

1.2 *Units*—The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard.

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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

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:*[2]

A666 Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar

D374/D374M Test Methods for Thickness of Solid Electrical Insulation

D975 Specification for Diesel Fuel

D996 Terminology of Packaging and Distribution Environments

D1000 Test Methods for Pressure-Sensitive Adhesive-Coated Tapes Used for Electrical and Electronic Applications

D2244 Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates

D3611 Practice for Accelerated Aging of Pressure-Sensitive Tapes

D3951 Practice for Commercial Packaging

D4332 Practice for Conditioning Containers, Packages, or Packaging Components for Testing

D4814 Specification for Automotive Spark-Ignition Engine Fuel

D6210 Specification for Fully-Formulated Glycol Base Engine Coolant for Heavy-Duty Engines

D6252/D6252M Test Method for Peel Adhesion of Pressure-Sensitive Label Stocks at a 90° Angle

G195 Guide for Conducting Wear Tests Using a Rotary Platform Abraser

2.2 *Department of Defense Standards:*[3]

MIL-STD-810 Environmental Engineering Considerations and Laboratory Tests

MIL-STD-2073-1 Standard Practice for Military Packaging

MIL-DTL-83133 Turbine Fuel, Aviation, Kerosene Type, JP-8 (NATO F-34), NATO F-35, and JP-8+100 (NATO F-37)

2.3 *Society of Automotive Engineers Standards:*[4]

SAE J183 Engine Oil Performance and Engine Service Classification

SAE J300 Engine Oil Classification

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

Current edition approved Oct. 1, 2023. Published October 2023. Originally approved in 2014. Last previous edition approved in 2017 as D7932 – 17. DOI: 10.1520/D7932-17R23.

[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] Copies of these documents are available from DLA Document Services, Building 4/D, 700 Robbins Ave., Philadelphia, PA 19111-5094, http://quicksearch.dla.mil.

[4] Copies of these documents are available from Society of Automotive Engineers (SAE), 400 Commonwealth Dr., Warrendale, PA 15096-0001.

2.4 *Other:*

ISO/IEC 15415 Information Technology – Automatic Identification and Data Capture Techniques – Bar Code Print Quality Test Specification – Two Dimensional Symbols[5]

ISO/IEC 15416 Information Technology – Automatic Identification and Data Capture Techniques – Bar Code Print Quality Test Specification – Linear Symbols[5]

ISO/IEC 15426-1 Information Technology – Automatic Identification and Data Capture Techniques – Bar Code Verifier Conformance Specification – Part 1: Linear Symbols[5]

ISO/IEC 15426-2 Information Technology – Automatic Identification and Data Capture Techniques – Bar Code Verifier Conformance Specification – Part 2: Two-Dimensional Symbols[5]

ANSI MH10.8.1 Linear Bar Code & 2-Dimensional Symbols[6]

ANSI/ASQC Z1.4 Sampling Procedures and Tables for Inspection by Attributes[7]

3. Terminology

3.1 General definitions for packing and distribution environments are found in Terminology D996.

3.2 *Definitions:*

3.2.1 *porous*—possessing or full of pores or openings that permit solids, liquids, or gases to permeate or penetrate an outer surface or membrane.

3.2.2 *non-porous*—possessing a non-permeable outer surface or membrane that does not permit solids, liquids, or gases to penetrate an outer surface or membrane.

3.2.3 *printed, pressure-sensitive adhesive label*—the combination of a release liner, pressure-sensitive adhesive, and facestock (face material) which has been printed with an image.

3.2.4 *label sample*—used to describe a facestock and its pressure-sensitive adhesive while still adhered to its release liner only.

3.2.5 *test surface panel*—used to describe the solid material surface onto which the label samples are adhered for the purpose of testing (see 4.2).

3.2.6 *label test specimen*—used to describe a test surface panel with a label sample applied by way of its pressure-sensitive adhesive.

4. Significance and Use

4.1 Degradation of pressure-sensitive adhesive labels due to environmental and physical factors is a common occurrence during transportation and storage. This specification provides minimum performance requirements for printed, pressure-sensitive labels for use in extreme distribution environments. In addition, standard laboratory test methods are provided to simulate exposure to various conditions and measure associated degradation of required performance characteristics. The data from these methods can be used as acceptance criteria between a supplier and customer.

4.2 The test methods described in this specification are performed on standard stainless steel test surface panels. If specified by the customer, another material may be used for test surface panels in lieu of the standard stainless steel (see 10.3).

4.2.1 When a test surface panel other than stainless steel is specified, the customer shall also provide minimum acceptable performance criteria which may differ from the values provided in Tables 2 and 3.

4.3 Type I labels are intended for use on container outer surfaces where direct contact with physical and environmental factors is unavoidable. Material strength and resistance to abrasion, sunlight, rain, extreme temperatures, chemicals, and other deteriorating environmental elements are required. Type I labels may be used on porous surfaces (Class 1) or non-porous surfaces (Class 2).

4.4 Type II labels are intended for use on inner containers where there will be a physical barrier to outside elements, such as an overpack. Since not all barriers are hermetically sealed, material strength and resistance to abrasion, extreme temperatures, and other deteriorating environmental elements are required. Type II labels may be used on porous surfaces (Class 1) or non-porous surfaces (Class 2).

4.5 Type III labels are intended for applications not covered by Type I or II labels. The performance requirements and testing shall be tailored by the customer. Type III labels may be used on porous surfaces (Class 1) or non-porous surfaces (Class 2).

5. Classifications

5.1 *Type:*

5.1.1 *Type I*—Heavy Duty.

5.1.2 *Type II*—Medium Duty.

5.1.3 *Type III*—Custom requirements.

5.2 *Classes:*

5.2.1 *Class 1*—For use on porous surfaces.

5.2.2 *Class 2*—For use on non-porous surfaces.

6. Ordering Information

6.1 *The inquiry or order shall include the following:*

6.1.1 ASTM designation and date of issue.

6.1.2 Type and Class required (see Section 5).

6.1.3 *For Type III Labels*—Required tests from Table 1 and minimum performance criteria for each.

6.1.4 Label form (for example, in sheets, rolls, etc.).

6.1.5 Individual label size.

6.1.6 Printing requirements, as necessary.

6.1.7 When testing and inspection certification is required (see Section 13).

[5] Copies of these documents are available at www.iso.org or www.ansi.org or from the American National Standards Institute, 25 West 43rd Street, 4th Floor, New York, NY 10036.

[6] A copy of this document is available Available from American Architectural Manufacturers Association (AAMA), 1827 Walden Office Square, Suite 550, Schaumburg, IL 60173-4268, http://www.aamanet.org.at www.mhi.org or from the Material Handling Industry, 8720 Red Oak Boulevard, Suite 201, Charlotte, NC 28217-3992.

[7] A copy of this document is available from American Society for Quality (ASQ), 600 North Plankinton Ave., Milwaukee, WI 53203.