



Designation: D3632 – 98 (Reapproved 2019)

Standard Test Method for Accelerated Aging of Adhesive Joints by the Oxygen-Pressure Method¹

This standard is issued under the fixed designation D3632; 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 test method describes how to estimate the relative resistance to deterioration of adhesive films and adhesive-bonded joints placed in a high-pressure oxygen environment. The instructions include both wood-to-wood and wood-to-metal joints as well as free film of adhesive. The effects of chemicals such as fire retardants, preservatives, or wood extractives, can be evaluated by using materials containing these chemicals for adherends.

1.2 This test method is primarily intended for elastomer-based construction adhesives, but is also applicable to other types of adhesives that may be susceptible to oxygen degradation. This accelerated test does not correlate exactly with the natural aging of the adhesive because of the varied conditions of natural aging and the absence of factors such as moisture and stress. The results of this accelerated test are only comparative and must be evaluated against the performance of bonded joints whose natural and accelerated aging characteristics are known.

1.3 The values stated in SI units are to be regarded as standard. The values given in parentheses after SI units are provided for information only and are not considered standard.

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

1.5 *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.*

¹ This test method is under the jurisdiction of ASTM Committee D14 on Adhesives and is the direct responsibility of Subcommittee D14.70 on Construction Adhesives.

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2. Referenced Documents

2.1 ASTM Standards:²

- D143 Test Methods for Small Clear Specimens of Timber
- D454 Test Method for Rubber Deterioration by Heat and Air Pressure
- D572 Test Method for Rubber—Deterioration by Heat and Oxygen
- D573 Test Method for Rubber—Deterioration in an Air Oven
- D907 Terminology of Adhesives
- D2339 Test Method for Strength Properties of Adhesives in Two-Ply Wood Construction in Shear by Tension Loading

3. Terminology

3.1 *Definitions*—Many definitions in this test method are defined in Terminology D907.

4. Summary of Test Method

4.1 This test method entails subjecting specimens with known physical properties to a controlled aging environment for specific time periods, then observing the physical properties again and noting any changes. The controlled environment consists of elevated temperature (70°C) (158°F) and oxygen at elevated pressure 2.07 MPa (300 psi).

4.2 Three types of test specimens are offered. The party requesting the adhesive evaluation will choose the type of specimen to be used.

Specimen Type	Configuration	Physical Property Tested
A	wood-to-wood lap	shear strength
B	wood-to-metal lap	shear strength
C	unsupported film	flexibility

4.3 Three different oxygen-pressure aging exposures are offered. Use any exposure with any of the above specimens. The party requesting the adhesive evaluation will choose the exposure to which the specimens are subjected.

4.3.1 Constant exposure for 500 h with a single test of the physical property at the end of 500 h.

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.