Designation: D2559 – 12a$^{\varepsilon 1}$

Standard Specification for Adhesives for Bonded Structural Wood Products for Use Under Exterior Exposure Conditions[1]

This standard is issued under the fixed designation D2559; 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 U.S. Department of Defense.

ε[1] NOTE—Paragraph 1.4 was corrected editorially in February 2016.

INTRODUCTION

This specification, which was initially approved in 1966, was developed to ensure that adhesives developed and used in structural glued laminated timber (glulam) are considered suitable for the intended application. This would include, as a maximum level of severity in the case of moisture effects, full and continuous exposure to the weather.

The use of adhesives for structural wood products has expanded beyond Glulam to include products such as Structural Composite Lumber, wood I-Joists and various composites adhesively bonded using a variety of materials. Although most structural glued wood products have traditionally specified an adhesive suitable for exterior exposure, the actual exposure of glued wood products to exterior conditions may range from exposure to the weather for brief periods of time, to continuous exposure to a marine environment.

A distinction between adhesive certification and product performance requirements is necessary to ensure the broadest possible acceptance of adhesive systems.

1. Scope*

1.1 This specification covers adhesives suitable for the bonding of wood, including treated wood, into structural wood products for general construction or other uses where a high-strength, durable adhesive bond is required.

1.2 This specification includes test methods that may be referenced by specific product standards for the evaluation and approval of structural wood adhesives. Methods are included to evaluate adhesives intended for use in exterior exposure.

NOTE 1—Consult the Commentary in Appendix X1 regarding the intent and limitations of each test method contained in this specification.

1.3 *Description of Bondline Performance*—It is recognized that structural wood adhesives are used in various applications and levels of severity in terms of moisture content, loading, cyclic and seasonal weather conditions, heat exposure and other use conditions. It is the intent of this standard to determine the suitability of an adhesive for use under various levels of severity and conditions with specific and appropriate test methods and requirements.

NOTE 2—This specification does not contain specific tests outlined for different chemical types of adhesives.

1.4 Strength and durability requirements of the adhesive are based on the performance of the adhesive in laminated wood as measured by:

1.4.1 Resistance to shear by compression loading after conditioning to the target moisture content indicated in 14.2.3 and meeting requirements in 14.4.

1.4.2 Resistance to delamination during exposure to three cycles of vacuum pressure wetting followed by drying at elevated temperature as indicated in 15.3 and meeting requirements in 15.4.

1.4.3 Resistance to creep under static load by subjecting test specimens to a specified shear stress and exposing one set of test specimens to an environment of elevated temperature and ambient humidity and another set to an environment of high humidity and meeting requirements set forth in 16.3.

1.4.4 For applications involving chemical treatment, the adhesive shall be evaluated using representative samples of treated wood.

NOTE 3—When using chemically treated wood, compatibility between the treatment, adhesive, and wood is to be considered and agreed upon between the chemical manufacture and the user.

[1] This specification is under the jurisdiction of ASTM Committee D14 on Adhesives and is the direct responsibility of Subcommittee D14.30 on Wood Adhesives.

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***A Summary of Changes section appears at the end of this standard**

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