



Standard Practice for Calculating Bending Strength Design Adjustment Factors for Fire-Retardant-Treated Plywood Roof Sheathing¹

This standard is issued under the fixed designation D6305; 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.

^{ε1} NOTE—Editorial corrections were made to [Appendix X1](#) in October 2015.

1. Scope

1.1 This practice covers procedures for calculating bending strength design adjustment factors for fire-retardant-treated plywood roof sheathing. The methods utilize the results of strength testing after exposure at elevated temperatures and computer-generated thermal load profiles reflective of exposures encountered in normal service conditions in a wide variety of continental United States climates.

1.2 Necessarily, common laboratory practices were used to develop the methods herein. It is assumed that the procedures will be used for fire-retardant-treated plywood installed using appropriate construction practices recommended by the fire retardant chemical manufacturers, which include avoiding exposure to precipitation, direct wetting, or regular condensation.

1.3 The heat gains, solar loads, roof slopes, ventilation rates, and other parameters used in this practice were chosen to reflect common sloped roof designs. This practice is applicable to roofs of 3 in 12 or steeper slopes, to roofs designed with vent areas and vent locations conforming to national standards of practice, and to designs in which the bottom side of the sheathing is exposed to ventilation air. These conditions may not apply to significantly different designs and therefore this practice may not apply to such designs.

1.4 Information and a brief discussion supporting the provisions of this practice are in the Commentary in the appendix. A large, more detailed, separate Commentary is also available from ASTM.²

1.5 The methodology in this practice is not meant to account for all reported instances of fire-retardant plywood undergoing premature heat degradation.

1.6 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.7 *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:*³

[D9 Terminology Relating to Wood and Wood-Based Products](#)

[D5516 Test Method for Evaluating the Flexural Properties of Fire-Retardant Treated Softwood Plywood Exposed to Elevated Temperatures](#)

3. Terminology

3.1 *Definitions:*

3.1.1 Definitions used in this practice are in accordance with Terminology [D9](#).

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *bin mean temperature*—10°F (5.5°C) temperature ranges having mean temperatures of 105 (41), 115 (46), 125 (52), 135 (57), 145 (63), 155 (68), 165 (74), 175 (79), 185 (85), 195 (91), and >200°F (93°C).

4. Summary of Practice

4.1 The test data determined by Test Method [D5516](#) are used to develop adjustment factors for fire-retardant treatments to apply to untreated-plywood design values. The test data are used in conjunction with climate models and other factors and the practice thus extends laboratory strength data measured after accelerated aging to design value recommendations.

¹ This practice is under the jurisdiction of ASTM Committee [D07](#) on Wood and is the direct responsibility of Subcommittee [D07.07](#) on Fire Performance of Wood. Current edition approved Sept. 1, 2015. Published October 2015. Originally approved in 1998. Last previous edition approved in 2008 as D6305 – 08. DOI: 10.1520/D6305-08R15E01.

² Commentary on this practice is available from ASTM Headquarters. Request File No. D07–1004.

³ 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.