ANSI 405-2018 (Ballot 2018-1)

**Ballot issue date: 10/10/2017 Ballot closing date: 11/10/2017**

**Ballot Instructions:**

1. All members are required to return the letter ballot. Failure to return 3 consecutive letter ballots will lead to the termination of the membership from this committee.
2. All votes shall be cast by marking the appropriate column of each ballot item.
3. Ballot items marked Negative or Affirmative-with-Comment shall be accompanied by a written explanation and proposed resolution that would address the negative/comment using the comment form at the end of this ballot form.

Exception: A written explanation and proposed resolution is not required for a recirculation or non-persuasive ballot.

1. Return ballot by e-mail to [borjen.yeh@apawood.org](mailto:borjen.yeh@apawood.org). Please attach the completed ballot and comments as a word processor file (e.g., Microsoft Word) to facilitate the collection of comments for committee actions.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
| Committee Member Name | | Signature (not required with e-mail) | | Date |

**Ballot** (Aff = affirmative; Aw/C = affirmative with comment; Neg = negative; Abst = abstention)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Item | Description | Aff | Aw/C | Neg | Abst |
| 2018-1-01 | Update references |  |  |  |  |
| 2018-1-02 | Revise Sections 2.1.2 and 2.1.5 |  |  |  |  |
| 2018-1-03 | Revise Section 3.5 |  |  |  |  |
| 2018-1-04 | Revise a Table 1 value |  |  |  |  |
| 2018-1-05 | Add CSA O177 Small Flame Test |  |  |  |  |

**Ballot Comment Form for ANSI 405-2018 (Ballot 2018-1)**

Required only for Negative or Affirmative-with-Comment

**Please attach this page to the e-mail ballot return**

|  |  |
| --- | --- |
| Item | Comments |
| 2018-1-01 |  |
| 2018-1-02 |  |
| 2018-1-03 |  |
| 2018-1-04 |  |
| 2018-1-05 |  |

Ballot 2018-1 (5 items in Total)

Notations: Inserted Text New Text

Deleted Text ~~Old Text~~

**Ballot Item 2018-1-01: Update references**

**Rationale:**  Update. ANSI 117 is not referenced in this standard and therefore it is proposed to be removed from the References section.

**Ballot:**

This Standard has been developed under the provision of the American National Standards Institute (ANSI) as a new consensus standard and a revision of ANSI 405-~~2008~~2013.

1. **SCOPE**

Adhesives approved for use in structural glued laminated timber under AITC 405-92 or ANSI/AITC A190.1-2002 prior to the release of this Standard are beyond its scope. It is the responsibility of the accredited inspection agencies, as defined in ANSI A190.1-~~2012~~2017, to establish policies regarding the continued use of adhesives previously approved for use under those standards.

**REFERENCES**

**AITC Test T107. ~~2004~~2007. Shear Test.** ~~Included in~~ *~~AITC 200-2004 Manufacturing Quality Control Systems Manual.~~* American Institute of Timber Construction. Centennial, Colorado.

**AITC 405-92. 1992.** *Standard for Adhesives for Use in Structural Glued Laminated Timber.* American Institute of Timber Construction. Englewood, Colorado.

**~~ANSI 117-2010. 2010.~~** *~~American National Standard for Standard Specification for Structural Glued Laminated Timber of Softwood Species. APA – The Engineered Wood Association,~~* ~~Tacoma, Washington.~~

**ANSI A190.1-~~2012~~2017. ~~2012~~2017.** *American National Standard for Wood Products – Structural Glued Laminated Timber.* APA – The Engineered Wood Association. Tacoma, Washington.

**ANSI/AITC A190.1-~~2007~~2002. ~~2007~~ 2002.** *American National Standard for Wood Products – Structural Glued Laminated Timber.* American Institute of Timber Construction. Centennial, Colorado.

**ASTM D905-08~~e1~~(2013). 2008** (Reapproved 2013)**.** *Standard Test Method for Strength Properties of Adhesive Bonds in Shear by Compression Loading.* ASTM International. West Conshohocken, Pennsylvania.

**ASTM D1151-00(2013). 2000** (Reapproved ~~2006~~2013). *Standard Practice for Effect of Moisture and Temperature on Adhesive Bonds.* ASTM International. West Conshohocken, Pennsylvania.

**ASTM D1183-03(2011). 2003** (Reapproved 2011). *Standard Practices for Resistance of Adhesives to Cyclic Laboratory Aging Conditions.* ASTM International. West Conshohocken, Pennsylvania.

**ASTM D2559-~~10a~~12ae1. ~~2010~~2012.** *Standard Specification for Adhesives for Bonded Structural Wood Products for Use under Exterior Exposure Conditions.* ASTM International. West Conshohocken, Pennsylvania.

**ASTM D3434-00(2013). 2000** (Reapproved ~~2006~~2013). *Standard Test Method for Multiple-Cycle Accelerated Aging Test (Automatic Boil Test) for Exterior Wet Use Wood Adhesives.* ASTM International. West Conshohocken, Pennsylvania.

**ASTM D5266-~~99~~13. ~~1999~~** ~~(Reapproved 2005)~~**2013**. *Standard Practice for Estimating the Percentage of Wood Failure in Adhesive Bonded Joints.* ASTM International. West Conshohocken, Pennsylvania.

**ASTM D7247-~~07ae1~~16. ~~2007~~2016.** *Standard Test Method for Evaluating the Shear Strength of Adhesive Bonds in Laminated Wood Products at Elevated Temperatures.* ASTM International. West Conshohocken, Pennsylvania.

**CSA O112.9-10. 2010** (Reaffirmed 2014)**.** *Evaluation of Adhesives for Structural Wood Products (Exterior Exposure).* Canadian Standards Association. Mississauga, Ontario, Canada.

**Forest Products Laboratory, U.S. Department of Agriculture, Forest Service. 2010.** *Wood Handbook – Wood as an Engineering Material.* General Technical Report FPL-GTR-190. Madison, Wisconsin.

**ISO/IEC 17025. 2005.** *General Requirements for the Competence of Testing and Calibration Laboratories.* International Organization for Standardization/International Electrotechnical Commission. Geneva, Switzerland.

**Ballot Item 2018-1-02: Revise Sections 2.1.2 and 2.1.5**

**Rationale:**  Revise “samples” to “specimens” based on the common understanding of the terms, such as the definitions provided in Section 16 of ANSI A190.1-2017 (copied below).

*Sample –* a group of specimens collected for testing.

*Specimen –* all or part of a sample that has been selected for testing

**Ballot:**

**2.1.2** All specimens are permitted to be the size and shape described in ASTM D905; however, modified ~~samples~~ specimens are permitted to be used.

**2.1.5** All specimens are permitted to be the size and shape described in ASTM D905, however modified ~~samples~~ specimens are permitted to be used.

**Ballot Item 2018-1-03: Revise Section 3.5**

**Rationale:**  This proposed change is intended for clarification. ASTM D1183 test is required to go through Designation “D”, which includes 4 cycles: (1) 48-hr drying at 71 ± 3°C, (2) 48-hr immersed in substitute ocean water @ 23 ± 1°C, (3) 8-hr freeze (-57 ± 3°C), and (4) 64-hr immersed in substitute ocean water @ 23 ± 1°C. In the end, the specimens are tested. The criteria specified in Section 3.5 of ANSI 405 are applied to the end results, but not every intermediate condition.

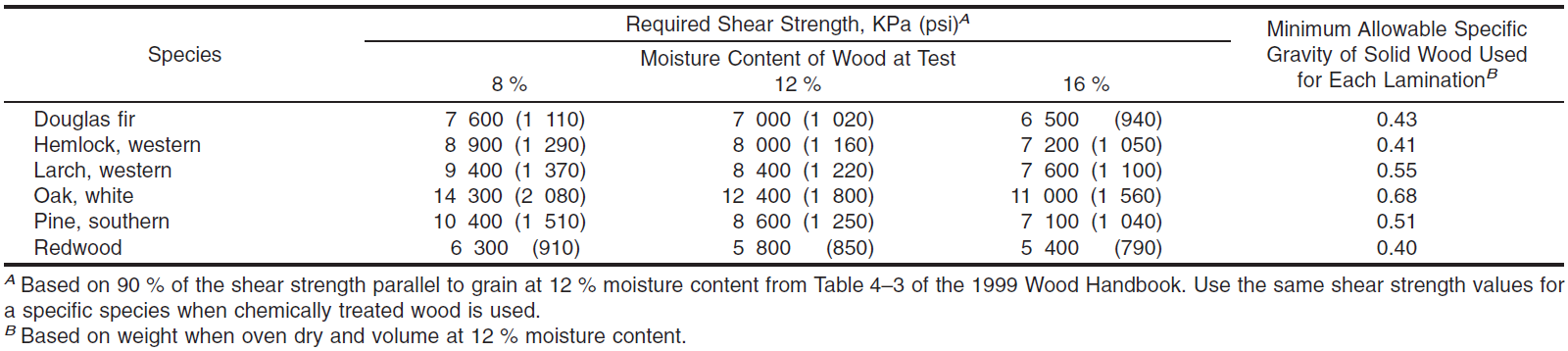
**Ballot:**

**3.5** The average strength of bonded specimens shall equal or exceed 90% of the average strength of the solid wood control ~~at every condition~~. The average wood failure of bonded specimens according to ASTM D5266 shall equal or exceed 75% ~~at every condition~~.

**Ballot Item 2018-1-04: Revise a Table 1 value**

**Rationale:**  This proposed change in intended to bring the criteria specified in this standard to be consistent with ASTM D2559, as shown (highlighted) below. It is believed the current value of 1,120 psi was a typo, as evidenced by the trending value between 14% and 16% MC.

Excerpt from ASTM D2559



**Ballot:**

Table 1. Required Average Shear Strength of Adhesive Joints in Laminated Constructions of Different Species at Various Moisture Contents

|  |  |  |  |
| --- | --- | --- | --- |
| Species | Required Average Shear Strength (psi) at Moisture Content of | | |
| 12% or less | Up to 14% | Up to 16% |
| Douglas fir | ~~1,120~~ 1,020 | 980 | 940 |
| Larch, Western | 1,220 | 1,160 | 1,100 |
| Pine, Southern | 1,250 | 1,150 | 1,040 |

**Ballot Item 2018-1-05: Add CSA O177 Small Flame Test to this standard**

**Rationale:**  Recent tests of some adhesives used in the manufacture of CLT have shown they are subject to heat delamination when exposed to fire. While these adhesives can pass ASTM E119 test, their propensity to exhibit heat delamination and secondary flashover means they do not self-extinguish when the fire source is removed as is assumed for glulam and solid wood. This also results in an increased char rate over that of glulam and solid wood. It is important that any new adhesive proposed for glulam not exhibit heat delamination when exposed to fire to justify the existing char rates provided in Chapter 16 of the NDS and to ensure they will perform in a manner similar to solid wood, such as when used in Type IV construction.

**Ballot:**

**2.1 Screening Tests**

For the purposes of the screening tests under Sections 2.1.1, 2.1.2, and 2.1.5, species within the groupings defined in ANSI A190.1 need not be approved separately. Treated lumber shall be considered separately under Sections 2.1.1, 2.1.2, and 2.1.5. For the screening tests under Sections 2.1.3, 2.1.4, ~~and~~ 2.1.6, and 2.1.7, either Douglas fir-Larch or Southern Pine shall be used. The wood used to make all test specimens shall be as required by ASTM D2559 or as required in the specific test standard.

**2.1.7 CSA Standard O177 – Section A.2 Small-Scale Flame Test**

This test shall be performed in its entirety.

*Note: In accordance with Section 2.1, either Douglas fir-Larch or Southern Pine shall be used for the completion of this test.*

**3.7 CSA Standard O177 – Section A.2 Small-Scale Flame Test**

Pass/fail criteria shall be as outlined within that standard.

**C2.1 Screening Tests**

ANSI A190.1 groups species with similar bonding and strength characteristics for in-plant qualification of an adhesive. These same groups are acceptable for the screening tests. For the ~~durability~~ tests in Sections 2.1.3, 2.1.4, ~~and~~ 2.1.6, and 2.1.7, either Douglas fir-Larch or Southern Pine specimens are permitted to be used. Either of these species is suitable to demonstrate the durability of the adhesive under the accelerated aging tests. Further durability testing on other species is not necessary as the purpose is to test the adhesive, not the substrate nor the durability of the species of wood. Section 2.1.7 is intended to qualify the adhesive to avoid delamination due to intensive heat, such as under fire exposures.

**C2.1.7 CSA Standard O177 – Section A.2 Small-Scale Flame Test**

See Section 2.1.

Add the following new reference to the REFERENCE section:

**CSA O177-06. 2006** (Reaffirmed 2015). *Qualification Code for Manufacturers of Structural Glued-Laminated Timber.* Canadian Standards Association. Mississauga, Ontario, Canada.