

Bushfire safety - suitability of timber

This updates the previous *Practice Note 2005-46* issued June 2005.

1. Summary

The suitability of timber products for external use in bushfire-prone areas depends on their ability to withstand fire conditions. Research and testing has determined the suitability of different high-density timbers. Some of these high-density timbers may be used as an alternative to fire-retardant treated timbers.

2. Background

Councils determine bushfire-prone areas under regulation 804 of the Building Regulations 2006 (the Regulations). All Class 1, 2 or 3 buildings to be constructed in a bushfire-prone area are subject to the building control provisions relating to bushfires.

Construction requirements for medium (Level 1 construction) and high (Level 2 construction) categories of bushfire attack were referenced under AS 3959-1999 in the Building Code of Australia (BCA) in January 2000. Additional construction requirements were added for extreme bushfire attack (Level 3 construction) in Amendment No 1 to AS 3959, which was referenced in the BCA in January 2001.

3. Suitability of timber

In certain cases, e.g. for external cladding, AS 3959 does not allow the use of exposed timber on sites which fall into the medium, high or extreme categories of bushfire attack, unless the timber is suitably fire-retardant.

The test criteria for determining the suitability of fire-retardant treated timber in bushfire attack was changed in an amendment to AS 3959 (BCA July 2001) from ignitability under AS 1530.3 to ignition and heat release rate under AS/NZS 3837.

Currently there are no readily available fire-retardant-treated timber products that satisfy the requirements for fire-retardant-treated timber under AS 3959.

Research

The National Timber Development Council sponsored testing of a number of timber species by Victoria University (VU). The aim of the testing was

to determine which timber species met the requirements for fire-retardant-treated timber under AS 3959 without any fire-retardant treatment. Only species having a seasoned density of at least 800 kg/m³ were tested.

Warrington Fire Research (Aust) Pty Ltd (WFRA) reviewed the test results and their report is available on the Internet through the Forrest and Wood Products Research and Development Corporation website at www.timber.org.au.

Deemed-to-Satisfy timbers

The following timbers were found to satisfy the requirements without any fire-retardant treatment, provided they have a thickness greater than 18 mm:

- ▶ Blackbutt
- ▶ Kwila (Merbau)
- ▶ Red Ironbark
- ▶ River Red Gum
- ▶ Silver-top Ash
- ▶ Spotted Gum
- ▶ Turpentine

Testing and Alternative Solutions

The test criteria for fire-retardant-treated timber currently involves measuring the heat release rate after ignition. The WFRA report proposes a new criterion which would take into account the design fire front duration and the time to ignition.

Under the proposal, any materials that do not ignite in the first 10 minutes of the test, when exposed to an irradiance level of 25 kW/m², would comply. The Commission and the Country Fire Authority (CFA) support the proposed 10-minute test period set out in the WFRA report.

The new criterion however, does not take direct flame contact into account and therefore should not be used to determine the suitability of timber for use in an extreme bushfire attack area.

The following timbers meet this criterion without any fire-retardant treatment, provided they have a thickness of greater than 18 mm. They may be considered to be acceptable as part of an Alternative Solution that meets Performance Requirements Clause GP5.1 (BCA Volume 1) or Clause P2.3.4 (BCA Volume 2):

- ▶ Balau
- ▶ Forest Red Gum
- ▶ Jarrah
- ▶ Tallowwood
- ▶ Yellow Stringybark

Other untested timbers that have a density of at least 800 kg/m³ may be considered under the Performance Requirement but would require additional evidence to support their use as set out under Clause A2.2 of Volume 1 of the BCA or Clause 1.2.2 of Volume 2 of the BCA.

4. Role of the Building Appeals Board

Many timbers commonly used for construction are not acceptable under AS 3959 as fire-retardant-treated timber. However, practitioners having appropriate expertise may determine compliance with the Performance Requirements of the BCA.

Alternatively, the Building Appeals Board (BAB) can determine compliance with the BCA or determine that a provision of the BCA or AS 3959 does not apply or can be modified or varied. For example, a modification could be sought to allow certain building elements not to fully comply with AS 3959, e.g. timber that does not fully comply with the testing requirements referred to in the Standard. More cost-effective solutions may be considered by the BAB subject to other forms of construction or protection being offered on a trade-off basis.