

Introduction

For Class 2 to 9 buildings (not applicable to Class 1a houses), the Building Code of Australia (BCA) 2006 introduced new requirements for assessing the fire hazard properties of:-

- (a) floor materials and floor coverings; and
- (b) wall and ceiling linings

BCA Specification C1.10a requires floor materials and floor coverings to comply with the required **critical radiant flux (CRF)** and wall and ceiling linings to have the required **material group number**.

Note:-The previous option of complying with the AS/NZS 1530.3 tests for smoke developed and spread of flame indices referred to in Specification C1.10 for these parts of a building have been deleted, but they still apply to other parts.

This Data Sheet provides CRF values and Material Group Numbers for a range of tested timber species to enable their assessment for compliance with the BCA 2006. Users of this data sheet are assumed to have an understanding and sound knowledge of the requirements of the BCA.

Definitions

Critical radiant flux (CRF) – means the critical heat flux at extinguishment as determined by AS ISO 9239.1

Material Group Number – means a number assigned to materials when exposed to different levels of irradiation for different periods of time when determined in accordance with AS ISO 9705 or AS/NZS 3837.

Floor Materials and Floor Coverings

BCA Specification C1.10a requires floor materials and floor coverings to have a CRF **not less** than that given in Table 1a, and for buildings that are not sprinklered, a maximum smoke development rate of 750%-minutes.

Table 1a Critical Radiant Flux (CRF kW/m²) of Floor Materials and Floor Coverings

| Class of building | General | | Fire-Isolated Exits |
|-------------------------------------------------------------------|-----------------------------------------------------|-------------------------------------------------|---------------------|
| | Building not fitted with compliant sprinkler system | Building fitted with compliant sprinkler system | |
| Class 2, 3, 5, 6, 7, 8 or 9b excluding accommodation for the aged | 2.2 | 1.2 | 2.2 |
| Class 3 Accommodation for the aged | 4.5 | 2.2 | 4.5 |
| Class 9a Patient care areas | 4.5 | 2.2 | 4.5 |
| Class 9a Areas other than patient care areas | 2.2 | 1.2 | 4.5 |
| Class 9c Resident use areas | - | 2.2 | 4.5 |
| Class 9c Areas other than resident use | - | 1.2 | 4.5 |

Table 1b provides species that have a CRF of 4.5kW/m² or greater and Table 1c species that have a CRF of more than 2.2 and less than 4.5 kW/m².

All species in Tables 1b and 1c have a **smoke development rate** less than 750%-min.

The test specimens were nominally 19 mm thick, tongued and grooved and with a dressed surface.

Table 1b Species with a Critical Radiant Flux (CRF) of 4.5 kW/m² or greater

| | | |
|------------------------|-----------------|---------------------|
| Beech, myrtle | Gum, red, river | Karri |
| Blackbutt, New England | Gum, spotted | Mahogany, red |
| Blackwood | Gum, sugar | Merbau |
| Bloodwood, red | Gum, yellow | Pine, white cypress |
| Box, brush | Ironbark, grey | Tallowwood |
| Box, grey | Ironbark, red | Turpentine |
| Gum, blue, Southern | Jarrah | Wattle, silver |

Table 1c Species with a Critical Radiant Flux (CRF) more than 2.2 and less than 4.5 kW/m²

| | | |
|----------------|-------------------|--------------------|
| Ash, alpine | Gum, blue, Sydney | Pine, celerytop |
| Ash, mountain | Gum, Manna | Pine, radiata |
| Ash, silvertop | Gum, rose | Stringybark, brown |
| Blackbutt | Gum, shining | |
| Brownbarrel | Messmate | |

Wall and Ceiling Lining

BCA Specification C1.10a requires wall and ceiling lining to be of a **Material Group** as given by Table 2a.

In addition, for a building that is not fitted with a BCA compliant sprinkler system, the materials used as a finish, surface, lining or attachment to a wall or ceiling shall have an **Average Specific Extinction Area** less than 250m²/kg.

Notes: For the table below:

1. 'Sprinklered', means fitted with a BCA compliant sprinkler system
2. 'Specific areas' means:
 - a) For Class 2 and 3 buildings, a sole occupancy unit.
 - b) For Class 5 buildings, open plan offices with a minimum floor dimension/floor to ceiling height ratio > 5.
 - c) For Class 6 buildings, open plan offices with a minimum floor dimension/floor to ceiling height ratio > 5.
 - d) For Class 9a health care buildings, patient care areas.
 - e) For Class 9b theatres, halls, etc, an auditorium.
 - f) For Class 9b schools, a classroom.
 - g) For Class 9c aged care buildings, resident use areas.

Table 2a Wall and Ceiling Lining Material Groups Permitted

| Class of building | Fire-isolated exits | Public corridors | | Specific areas | | Other areas |
|---------------------------------------------------------------------------------------------------|---------------------|------------------|---------|----------------|---------|--------------|
| | Wall/ceiling | Wall | Ceiling | Wall | Ceiling | Wall/ceiling |
| Class 2 or 3 - excluding accommodation for the aged, people with disabilities and children | | | | | | |
| Unsprinklered | 1 | 1, 2 | 1, 2 | 1, 2, 3 | 1, 2, 3 | 1, 2, 3 |
| Sprinklered | 1 | 1, 2, 3 | 1, 2, 3 | 1, 2, 3 | 1, 2, 3 | 1, 2, 3 |
| Class 3 or 9a - accommodation for the aged, people with disabilities and children | | | | | | |
| Unsprinklered | 1 | 1 | 1 | 1, 2 | 1, 2 | 1, 2, 3 |
| Sprinklered | 1 | 1, 2 | 1, 2 | 1, 2, 3 | 1, 2, 3 | 1, 2, 3 |
| Class 5, 6, 7, 8 and 9b schools | | | | | | |
| Unsprinklered | 1 | 1, 2 | 1, 2 | 1, 2, 3 | 1, 2 | 1, 2, 3 |
| Sprinklered | 1 | 1, 2, 3 | 1, 2, 3 | 1, 2, 3 | 1, 2, 3 | 1, 2, 3 |
| Class 9b other than schools | | | | | | |
| Unsprinklered | 1 | 1 | 1 | 1, 2 | 1, 2 | 1, 2, 3 |
| Sprinklered | 1 | 1, 2 | 1, 2 | 1, 2, 3 | 1, 2, 3 | 1, 2, 3 |
| Class 9c | | | | | | |
| Sprinklered | 1 | 1, 2 | 1, 2 | 1, 2, 3 | 1, 2, 3 | 1, 2, 3 |

The species of timber tested that are given in Table 2b are all **Material Group 3**.

All these species have a maximum **Average Extinction Area** less than 250m²/kg.

Except for Blackbutt WA, which was nominally 12mm thick, all the species tested were nominally 19 mm thick, tongued and grooved and with a dressed surface.

Table 2b Species tested with a Material Group Number 3

| | | |
|------------------------|---------------------|----------------------|
| Ash, alpine | Gum, blue, Sydney | Mahogany, red |
| Ash, mountain | Gum, blue, Southern | Marri |
| Ash, silvertop | Gum, Manna | Merbau |
| Beech, myrtle | Gum, red river | Messmate |
| Blackbutt | Gum, rose | Pine, radiata |
| Blackbutt, New England | Gum, shining | Pine, cypress, white |
| Blackbutt WA | Gum, spotted | Sheoak |
| Blackwood | Gum, sugar | Stringybark, yellow |
| Bloodwood, red | Gum, yellow | Tallowwood |
| Box, brush | Ironbark, grey | Turpentine |
| Box, grey | Ironbark, red | Wattle, silver |
| Box, grey, coast | Jarrah | |
| Brownbarrel | Karri | |

Test Report

The information contained in this Data Sheet on CRF and Material Group has been obtained from tests conducted by Warrington Fire Research (Aust) Pty Ltd.

A copy or the short form test report can be obtained from the members section of Timber Queensland's website www.timberqueensland.com.au

Additional Testing

The testing of additional timber species and products is continuing and as results become available, this Data Sheet will be updated accordingly.

References

1. BCA 2006 - Building Code of Australia, Volume 2 - Class 2 to Class 9 Buildings
2. Warrington Fire Research Short Form Report No. SFR 41117.2



TIMBER
QUEENSLAND

Timber Queensland Limited
ACN 092 686 756 • ABN 50 092 686 756
500 Brunswick Street, Fortitude Valley
Brisbane Queensland 4006
PO Box 2014, Fortitude Valley BC Qld 4006

Phone: (07) 3254 1989

Fax: (07) 3254 1964

Website: www.timberqueensland.com.au

Email: admin@timberqueensland.com.au

Whilst every effort is made to ensure the accuracy of advice given, Timber Queensland Limited cannot accept liability for loss or damage arising from the use of the information supplied.