

Technical Bulletin

1014 – Bushfire Attack Levels

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**Australian
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1014 – Bushfire Attach Levels

Cited national standards:

AS 3959:2018	Construction of Buildings in Bushfire Prone Areas
AS 1288:2006	Glass in Buildings – Selection and Installation
AS 1530.8.1:2018	Methods for fire tests on building materials, components & structures. Tests on elements of construction for buildings exposed to simulated bushfire attack – Radiant heat & small flaming sources
AS 1530.8.2:2018	Methods for fire tests on building materials, components & structures. Tests on elements of construction for buildings exposed to simulated bushfire attack – Large flaming sources

Bushfires represent a clear and present danger to occupants and structures in bushfire prone areas. AS 3959 details different bushfire attack levels and specifies several ways for door and window systems to comply with each BAL level. This technical bulletin concentrates primarily on the glass components of those window & door systems, and thereby serves to assist the reader in specifying and selecting the appropriate glass for each situation.

Bushfire Attack Levels (BAL)

Contained within AS 3959 is a means of calculating the BAL for locations, ranging from BAL-Low to BAL-FZ. These levels are summarised below.

- **BAL-Low** Insufficient risk to warrant specific construction requirements
- **BAL-12.5** Ember attack
- **BAL-19** Increasing levels of ember attack and burning debris ignited by windborne embers together with increasing heat flux between 12.5 and 19kW/m²
- **BAL-29** Increasing levels of ember attack and burning debris ignited by windborne embers together with increasing heat flux between 19 and 29kW/m²
- **BAL-40** Increasing levels of ember attack and burning debris ignited by windborne embers together with increasing heat flux and the increased likelihood of exposure to flames.
- **BAL-FZ** Direct exposure to flames from fire front in addition to heat flux and ember attack.

Glass Compliance by Bushfire Attack Level

For each BAL there are several options such as a specific glass make up, standard glass protected by screens/bushfire shutters or a tested system. In addition to bushfire requirements, all glass must comply with AS 1288. Whenever a double or triple glazed unit is used, BAL requirements only refer to the outer pane.

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Glass options with minimal protective screens/shutters.

BAL-Low	No consideration for bushfires is required for BAL-Low.
BAL-12.5	All standard glazing in windows within 400mm of ground level or other structures within 18 degrees of horizontal must be Grade A safety glass, minimum thickness 4mm. All standard glazing within doors must be Grade A safety glass, minimum thickness 4mm.
BAL-19	As per BAL-12.5 but Grade A safety glass components must be a minimum of 5mm.
BAL-29	All glass must be a minimum of 5mm toughened in windows and 6mm toughened in doors. Windows within 400mm of ground or other structures within 18 degrees of horizontal must be protected by external screens that meet the following criteria: manufacture from aluminium, bronze or corrosion resistant steel and be a mesh or perforated sheet with a maximum aperture of 2mm.
BAL-40	All glass must be a minimum of 6mm toughened. Windows, sidelights and sliding doors must be protected by external screens that meet the following criteria: manufacture from bronze or corrosion resistant steel and be a mesh or perforated sheet with a maximum aperture of 2mm.
BAL-FZ	There is no option for standard glazing in windows unless protected by a bushfire shutter, see below. Door glass does not require a bushfire shutter if the glass and frame together have a minimum Fire Resistance Level (FRL) of -/30/-. AGG's Pyroglass® range of fire rated products offer an FRL -/120/- option and is more than suitable for doors in a BAL-FZ.

Bushfire Shutters

In all Bushfire Attack Levels, standard glazing can be provided the glazing is protected by bushfire shutters that are compliant with the relevant clauses of AS 3959 or bushfire shutters tested to AS 1530.8.1/AS 1530.8.2. For BAL-FZ, no perforations are permitted in the shutter.

Protective screens

BAL-12.5	Glass complying with 1288 can be used provided it is protected by external screens comprised of bronze, aluminium or corrosion resistant steel and have apertures no larger than 2mm.
BAL-19	Glass complying with 1288 can be used provided it is protected by external screens comprised of bronze, aluminium or corrosion resistant steel and have apertures no larger than 2mm.
BAL-29	Door glass complying with 1288 can be used provided it is protected by external screens comprised of bronze, aluminium or corrosion resistant steel and have apertures no larger than 2mm. Window glass as per BAL-29 portion of standard glazing on previous page.
BAL-40	As per BAL-40 portion of standard glazing on previous page for all door types and windows.
BAL-FZ	Protective screens are not an option for BAL-FZ.

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Tested systems

For BAL levels 12.5, 19, 29 and 40, a system (inclusive of glass and joinery) can be tested and approved to AS 1530.8.1. For BAL-FZ, system must be tested and approved to AS 1530.8.2.

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