# Development Control Services

*'Working towards a Safer Community'*

# Window Protection

## Fast Facts 7/07

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This Fast Fact provides clarification on the position of the NSW Rural Fire Service (RFS) for window protection in bush fire prone areas. *Planning for Bush Fire Protection 2006* (PBP 2006) categorises bush fire attack in Table A3.3 for FDI 100, Table A3.4 for FDI 80 and Table A3.5 for FDI 50. These tables then specify the level of construction required as determined in Australian Standard *AS3959 Construction of buildings in bushfire-prone areas*. Section 3.6 of *AS3959* provides details on the requirements for windows for construction Levels 1, 2 and 3.

**Windows and Screening**

The main purpose of applying mesh screens to windows in areas identified as bush fire prone is to prevent the entry of embers into the building should the window be left open. It should also be noted that screens also act to reduce the total amount of radiant heat flux on the glazing.

The requirements of *AS3959 Construction of buildings in bushfire-prone areas* for the windows and screens for each level of construction are outlined below.

The purpose of Level 1 construction is to provide a degree of protection against ember attack and low levels of radiant heat (less than 12.5kW/$m^2$ - PBP 2006). The Australian Standard requires all open-able windows, including louvers for Level 1 construction to:

- Be screened with aluminium, bronze or non corrosive metal mesh;
- The mesh shall have a maximum aperture size of 1.8mm;
- The entire open-able portion of the window remains screened when the window is open.

*(AS3959 – 1999 incorporating Amendment Nos. 1 and 2, Construction of buildings in bushfire-prone areas, Standards Australia, June 2001)*

Note: AS3959 does not specify any glazing requirements for Level 1 construction.

The purpose of Level 2 construction is to provide a degree of protection against ember attack and an increased level of radiant heat (12.5kW/$m^2$ – 19kW/$m^2$ - PBP 2006). The Australian Standard requires all open-able windows, including louvers for Level 2 construction shall be as for Level 1 except that:

- Aluminium mesh shall not be used
- Timbers shall be fire retardant timber (see NSW Rural Fire Service Development Control Note 1) except where protected by non-combustible shutters
- Leadlight windows are to be protected by non-combustible shutters or toughened glass.

*(AS3959 – 1999 incorporating Amendment Nos. 1 and 2, Construction of buildings in bushfire-prone areas, Standards Australia, June 2001)*

Note: AS3959 does not specify any glazing requirements for Level 2 Construction. However, standard float glass may fail when exposed to the radiant heat loads experienced in Level 2 construction. The NSW Rural Fire Service would support the use of toughened glass or the screening of the entire glazed area for Level 2 construction.

The purpose of Level 3 construction is to provide a degree of protection against ember attack and a high level of radiant heat (19kW/$m^2$ – 29kW/$m^2$ - PBP 2006). The Australian Standard requires all open-able windows, including louvers for Level 3 construction shall be as for Level 2 except that:

- Windows shall be protected by non-combustible shutters or shall be glazed with toughened glass.



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*(AS3959 – 1999 incorporating Amendment Nos. 1 and 2, Construction of buildings in bushfire-prone areas, Standards Australia, June 2001)*

Note: Window systems for Level 3 construction should be capable of withstanding the modelled radiant heat load of up to 29kW/$m^2$.

It should be noted that the information above details the minimum requirements for each level of construction. The NSW Rural Fire Service encourages the implementation of construction standards that go beyond the requirements of the standard (e.g. application of toughened glass for Level 2 etc.). Applicants proposing to build within the flame zone need to demonstrate that the window system proposed for the development can withstand flame contact and the modelled radiant heat load when tested under AS1530.8.

**Corrosion**

Care should be taken in levels 2 and 3 constructions to avoid using different metals in direct contact with each other that can cause significant corrosion of the mesh and window frames. An example of this would be a bronze mesh directly fitted to an aluminium frame. In sea-side locations this could result in the frame and wire mesh corroding to the point of being ineffective in preventing the ingress of embers. Similarly non-corrosive steel mesh such as "Stainless Steel" (a high Nickel/Chrome Alloy) or "Coten Steel" (a weathering steel) should not be used in direct contact with an aluminium frame.

An insulating material that is non combustible or has a flammability index of less than or equal to 5 should be used to prevent an electrolytic contact between dissimilar metals. Alternatively the mesh, the screen frame and the window frame could be made of the same material thus avoiding the problem.

**Shutters**

In some cases, window shutters may be required to provide additional protection to the glazed areas. For Level 3 construction, window shutters may be of metal construction or one of the fire resistant timbers listed on the NSW Rural Fire Service web site.

Shutters for flame zone applications should be made of non combustible material capable of withstanding flame contact and the modelled radiant heat load when tested under AS1530.8. The applicant will need to demonstrate that the proposed shutters can satisfy this requirement.

Note: Melting point of Elemental Aluminium 660.32 °C [933.47°K, 1220.58°F, 1680°R]. Some grades of Aluminium melt at temperatures as low as 560 °C.

Shutters require maintenance to ensure that they are able to be closed and secured quickly and safely by people who are unfamiliar with their operation.

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