Product Testing and Compliance

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New Buildings In Bushfire Prone Areas
Principle of Test Methods

- What are the Construction Requirements
- How do you know they are met?
- What are the test methods about?
- What does the documentation look like?
- What are the next steps for industry?
New Buildings In Bushfire Prone Areas - Testing
Principle of Test Methods

NCC (BCA)
- Referenced by legislation
- Sets minimum technical requirements
- References AS3959 or other documents that reference AS3959
- Include state variations to regulations for bushfire

AS3959-2009
- Referenced by NCC (BCA)
- Sets out prescriptive construction requirements
- Sets out testing as an alternate approach to meet standard

Test Standards
- AS1530.8.1
- AS1530.8.2
- AS1530.4
- AS1530.2
- AS1530.1
- AS3837
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Principle of Test Methods

AS 1530.8 Part 1- Radiant Heat and Small Flaming Sources

• Called up by AS3959 for BAL 12.5-40 for all elements of construction

• Elements are to radiant heat, simulated burning debris and simulated burning embers.

• The response of the specimen is monitored during and for some time after the radiant exposure to detect the potential for re-ignition.
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**Exposure Sources** - Radiant Heat and a small high intensity heat source with a small ignition source if required.
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Monitor behaviour

Gap formation – 3mm Gap Gauges

Flaming – Visual

Radiation – Radiometer /temperature non fire side, Temperature – Thermocouples measure temperature of cavities and enclosed spaces
# New Buildings In Bushfire Prone Areas

**Principle of Test Methods**

<table>
<thead>
<tr>
<th>Exposure Condition</th>
<th>Time (mins)</th>
<th>0-10</th>
<th>10-20 mins</th>
<th>20-60 mins</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ignited Crib</td>
<td>-15s to 0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radiation</td>
<td>0-10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Small Gas Flame</td>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Performance Criteria</th>
<th>Time (mins)</th>
<th>0-10</th>
<th>10-20 mins</th>
<th>20-60 mins</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formation of through-gaps greater than 3 mm</td>
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<tr>
<td>Sustained flaming for 10 s on the non-fire side</td>
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<tr>
<td>Flaming on the fire-exposed side at the end of the 60 min test period</td>
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<tr>
<td>Radiant heat flux 365 mm from the non-fire side exceeding 15 kW/m²</td>
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<tr>
<td>Mean and maximum temperature rises greater than 140 K and 180 K</td>
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<tr>
<td>Radiant heat flux 250 mm from the specimen, greater than 3 kW/m² between 20 min and 60 min</td>
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</tbody>
</table>
New Buildings In Bushfire Prone Areas
Principle of Test Methods

AS 1530.8 Part 2 – Large Flaming Sources (BAL FZ)

• Called up by AS3959 for BAL FZ for all elements of construction.
• Utilizes the standard heating regime of AS 1530.4-2005 for 30 minutes.
• The response of the specimen is monitored during and for some time after the radiant exposure to detect the potential for re-ignition.
• A lot more severe exposure than AS1530.8.1
• A lot stricter failure criteria and AS1530.4
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General Principles AS1530.8.2

**Exposure** - The furnace burns Propane which uses added air as an oxidiser, theoretically this will produce an Adiabatic Flame Temperature of 2392°C.

**Monitor** – Gap formation, Temperature non fire side, temperature of cavities and enclosed spaces, flame and radiation on fire after exposure as for AS1530.8.1
Monitor – Gap formation, Flame/radiation/temperature non fire side, temperature of cavities and enclosed spaces, flame and radiation on fire after exposure as for AS1530.8.1
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Principle of Test Methods

AS 1530.4 – Fire resistance test of elements of construction

• Called up by AS3959 for as an alternate method for meeting BAL FZ requirements as -/30/-
• Standard heating regime of AS 1530.4-2005 is applied for 30 minutes, though NO RADIATION CRITERIA is included in AS1530.4-2005 for windows.
• The response of the specimen is monitored during test for 6mm x 150mm gaps, 25mm diameter gaps and flaming only.
• Less severe than AS1530.8.2
• Only suitable for FZ with more than 10m separation from vegetation

AS 1530.2 – Test for flammability of materials

• Called up by AS3959 for sarking and window seals
• Bench scale test intended for thin or woven materials that don’t melt
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Principle of Test Methods

AS 1530.1 – Combustibility test for Materials
• Called up by AS3959 where non combustible materials are required.
• Material “deemed non combustible” by the NCC are also acceptable.

AS 3837 – Test for Flammability of Timber Products
• Testing protocol reference by AS3959 Appendix F evaluating bushfire resistant timber.
• Requires two tests
• Materials that meet this criteria can be used where AS3959 requires “bushfire resistant timber”
# New Buildings In Bushfire Prone Areas

What Does Compliance Documentation Look Like

<table>
<thead>
<tr>
<th>Standard</th>
<th>Type of Construction Element</th>
<th>Type of Documentation to Expect</th>
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</table>
| AS3959 Construction Requirements | All                          | Highly variable  
• Some provide no guidance on product use and rely upon standard for limitations on use—very difficult for the rest of industry—*buyers beware*.  
• Some provide a detailed specification of how their product or element needs to be installed to meet the AS3959 requirements—*This helps everyone get it right*. |
| AS1530.8.1                | Building element, eg wall, window, deck, roof | Laboratory Report—*Includes a detailed specification of tested element* and applicability of results of tested element included in report.                          |
| AS1530.8.2                | Time Product                 | Laboratory Report relating to tests undertaken to criteria.                                                                                                   |
| AS1530.4                  | Material or Product          |  
Applicability of results as per AS3959                                                                                                                      |
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What is needed next

Improved Deemed to satisfy Requirements

• Performance based approaches can be expensive and difficult to administer on project by project basis.

• The building product industry has gone along way to verify the performance of “standard building products and materials” by testing them.

• What is needed is funding of development and Research into improved AS3959 construction details that deliver more cost effective solutions for building industry for everyone.
Thank you for your attention