



SFS Presentation 18.4.18
Combustible Cladding
Peter Gardner

Introduction

- Findings from the Safe Cladding & Buildings 2018 Conference
- Fire testing and fire safety engineering issues in the assessment of cladding systems

Background

- I have no vested interest
- My previous SFS cladding presentation on 18.6.14
- Full scale façade fire test

Need a tested system that works



Safe Cladding & Buildings 2018

- Not a DtS provision for every Performance Requirement, eg. weatherproofing and cladding

F1.0 Deemed-to-Satisfy Provisions

- (a) *Performance Requirement FP1.4*, for the prevention of the penetration of water through *external walls*, must be complied with.

There are no *Deemed-to-Satisfy Provisions* for this *Performance Requirement* in respect of *external walls*.

A0.1 Compliance with the NCC

Compliance with the NCC is achieved by satisfying the *Performance Requirements*.

A0.2 Meeting the Performance Requirements

The *Performance Requirements* can only be satisfied by a—

- (a) *Performance Solution*; or
- (b) *Deemed-to-Satisfy Solution*; or
- (c) combination of (a) and (b).

Safe Cladding & Buildings 2018

- Need a national framework
- National Building Act
- National accreditation

Safe Cladding & Buildings 2018

- A2 = 7% PE
- FR = 30% PE
- PE = 100% PE

????????????????

Safe Cladding & Buildings 2018

- PE definition is needed
- AIBS policy building regulatory reform
- Clerk of Works role
- BCA poorly understood and applied
- Education needed

Safe Cladding & Buildings 2018

- Criteria in AS 5113
- Debris
- Lacross – drenchers rejected due to uncertainties; wind, cavity fires

Safe Cladding & Buildings 2018

- Qld legislation
 - All in supply chain are liable
 - Can take action against individual
 - “Safe” and “reasonably practical” are defined
- NSW legislation
 - Owner is liable
 - Legislation is retrospective

Safe Cladding & Buildings 2018

- NSW
 - 10 point plan setting out government response
 - Taskforce – Councils
 - Over 1000 buildings potentially affected
 - Building Products (Safety) Act – products can be ‘banned’

Safe Cladding & Buildings 2018

- Insurance premium – based on amount of PE on building (%)
- Premiums increasing
- Buildings are insurable

Safe Cladding & Buildings 2018

- BRE Global Tests

Test	Date	ACP Filler	Insulation	Result
Test 1	23/07/2017	PE	PIR	Fail ☒
Test 2	30/07/2017	PE	Stone Wool	Fail ☒
Test 3	30/07/2017	FR	PIR	Fail ☒
Test 4	06/08/2017	FR	Stone Wool	Pass ☑
Test 5	06/08/2017	A2	PIR	Pass ☑
Test 6	16/08/2017	A2	Stone Wool	Pass ☑

VBA Guideline

- MG-14: Issue of building permits where building work involves the use of certain cladding products

The Guideline:

- › applies to mid-range 'Fire Retardant' products (i.e. "30% polyethylene or greater" not "greater than 30%"). This includes, but is not limited to the following products:
 - a. Alucobond Plus
 - b. Alpolic FR
 - c. Vitrabond FR
 - d. Larson FR
 - e. Cladex FR, and
 - f. Nu-Core FR.
- › applies to products that have a CodeMark Certificate of Conformity or Building Regulations Advisory Committee (BRAC) accreditations (i.e. these require a determination by the Building Appeals Board)
- › applies, notwithstanding the concessions of Specification C1.1 clauses 3.10 and 4.3 (i.e. these require a determination from the Building Appeals Board).

Section 10 of the *Building Act 1993* does not apply.

Existing buildings

- How to assess?
- Risk assessment?
- Benchmark?
- Need to remove cladding?
- Focus on engineering facts
- Not opinions, politics and marketing brochures

Benchmark

- NSW Cladding Taskforce letter
- EPA Act – Fire safety orders – when provision for fire safety or fire safety awareness is inadequate to: prevent fire, or suppress fire, or prevent the spread of fire. To ensure or promote the safety of persons in the event of fire.
- Council Notice / Order
- AS 4655-2005, Fire Safety Audits

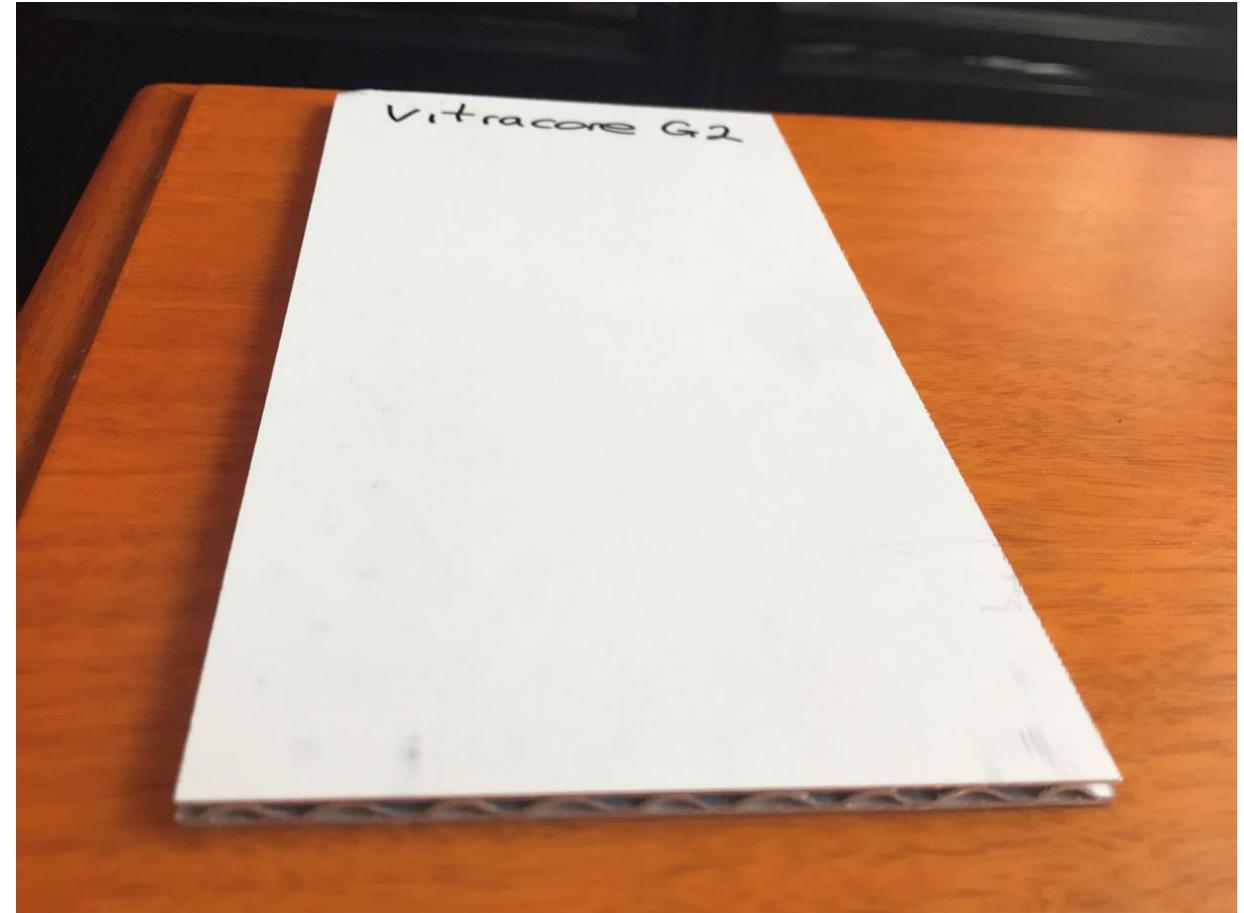
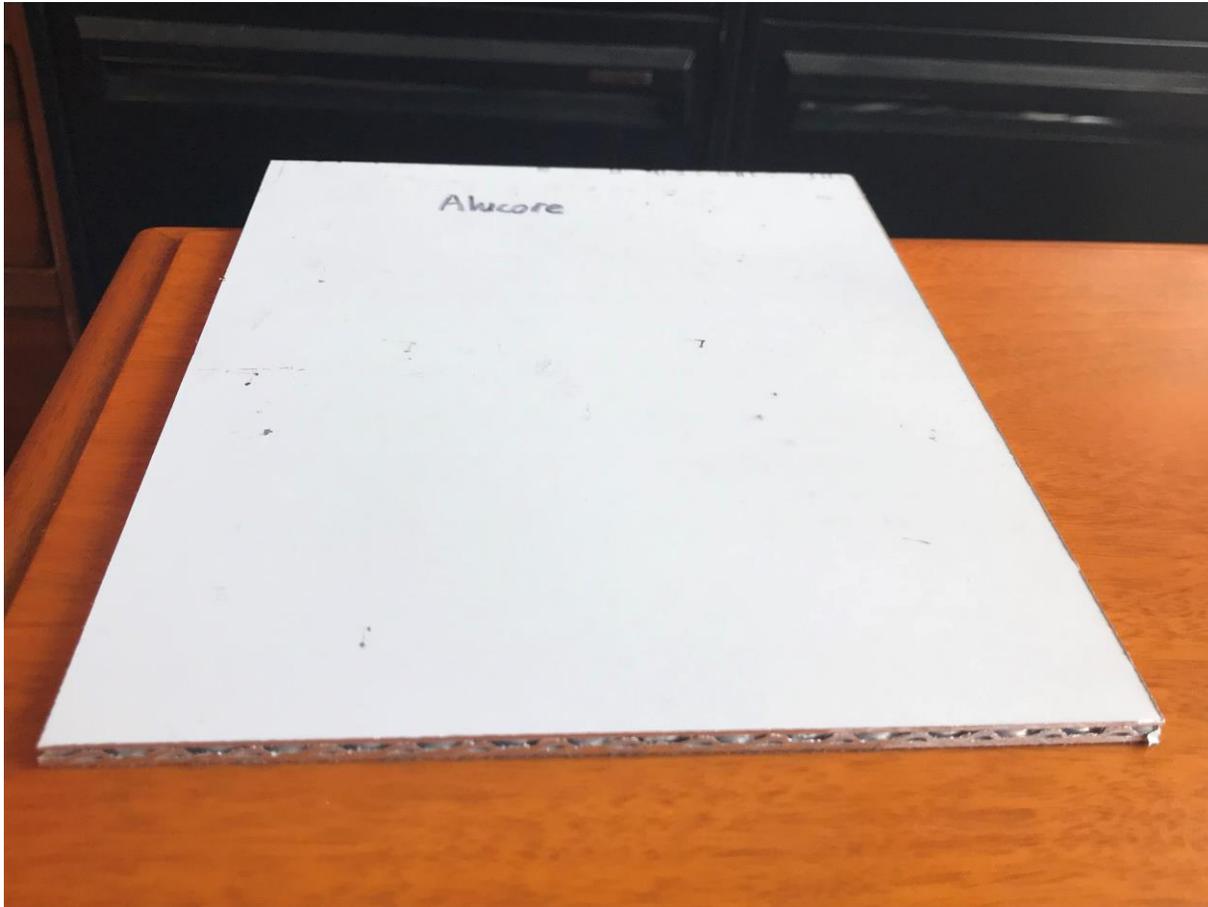
Benchmark

- Risk level in relation to the overall level of fire and life safety
- ISO 31000:2018, Risk management
- NFPA High Rise Buildings with Combustible Exterior Wall Assemblies: Fire Risk Assessment Tool
- PAS 79:2012, Fire risk assessment – Guidance and a recommended methodology

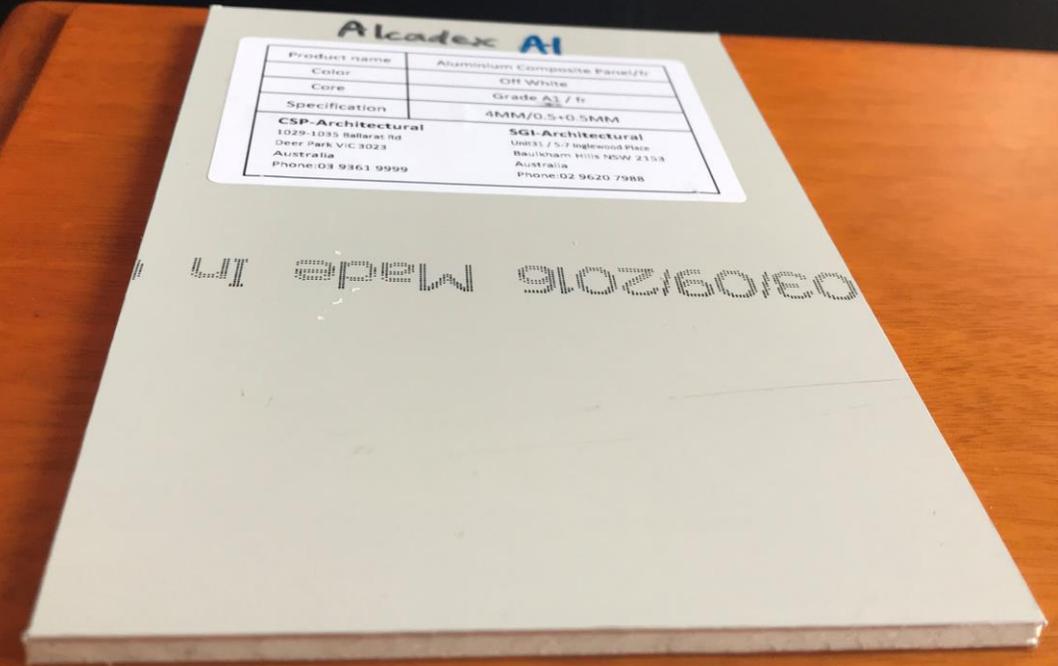
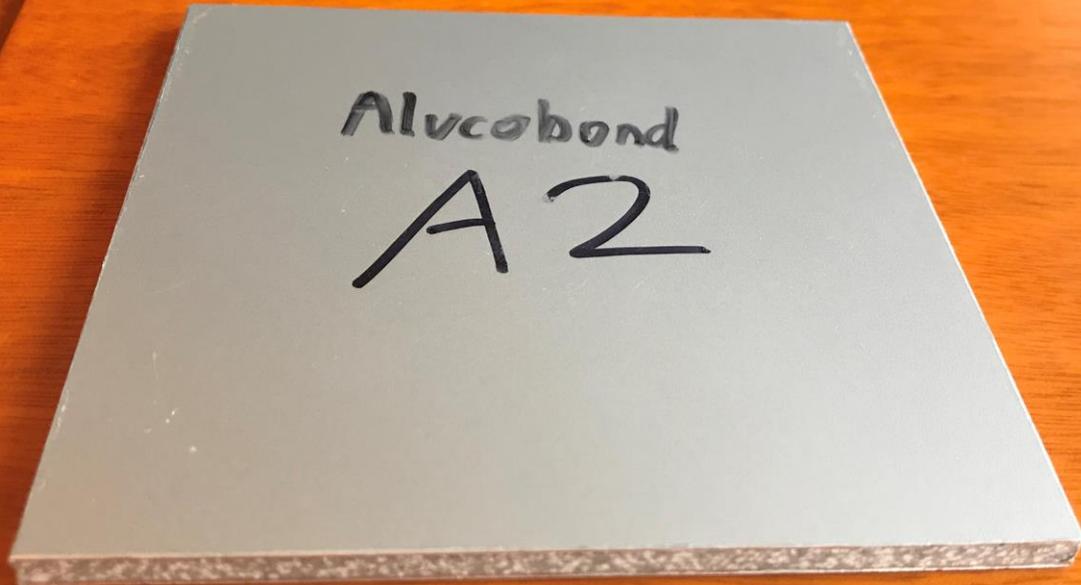
How to identify the product

- Installation certificate
- As built
- O&M manual
- Colour (PE is black, FR ?????? white, grey, etc)
- Weight: lighter = less mineral content and therefore less fire performance (ie. mineral is heavier than adhesive)

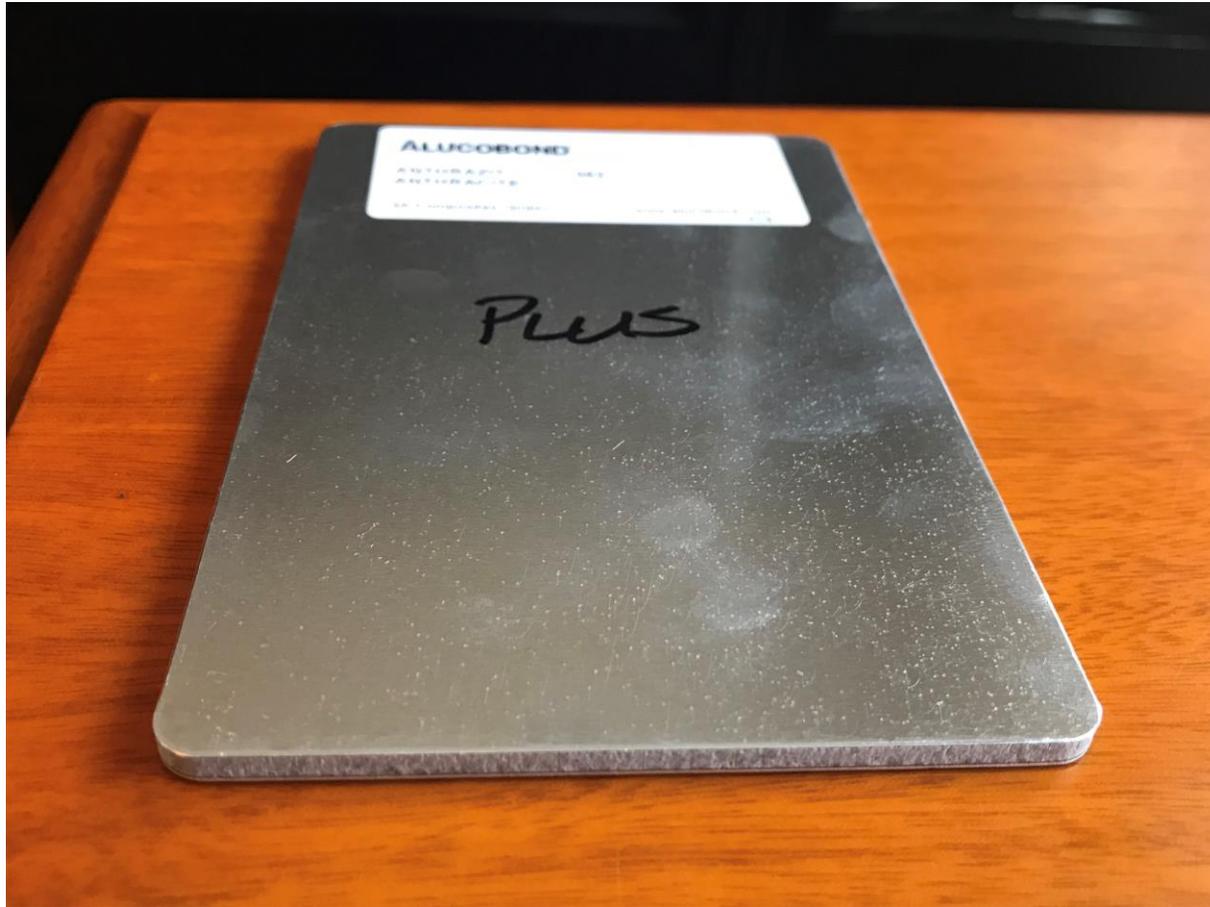
Identifying cladding



Identifying cladding



Identifying cladding



Identifying cladding



How to identify the product

- Lab tests
 - Fourier Transform Infra-Red Spectroscopy (FTIR) – evidence of fire retardant
 - Ash test with Scanning Electron Microscopy / Energy Dispersive X-Ray Spectroscopy (SEM/EDX) – % combustibles
- Someone else made the call

Considerations

- Certification
- Cladding types
- Attachment or external wall
- Fixing methods
- Cavity barriers
- CodeMark Certificate
- Fire tests
- Location on façade and distance to boundaries
- Cost benefit

Considerations

- Ignition sources
- Building classification
- Sprinklers
- Other fire safety measures
- Occupant evacuation
- Fire engineering Performance Solutions
- Sarking and insulation
- Fire brigade intervention
- Maintenance

CodeMark

- Voluntary third party building product certification scheme
- Supports new or innovative products
- Compliance with BCA
- Typically via a Performance Solution

CodeMark

- CodeMark scheme rules
- Additional to ISO/IEC 17065:2012 – Conformity assessment – requirements for bodies certifying products, processes and services
- Includes:-
 - Technical review
 - Quality review

CodeMark

- Risk assessments
- Factory audits / site reviews
- Supply chain reviews
- Quality manual reviews
- Technical reports review
- Liaison with JASANZ and ABCB
- Wording on certificates is highly regulated

Fire testing

- BRE 135 criteria – duration – 15 minutes from fire spread start time
- AS 5113 criteria – duration – ??? 60 minutes
- BRE 135 criteria – internal fire spread – 600 degrees C
- AS 5113 criteria – internal fire spread – 250 degrees C
- BRE Test 4 (FR with stone wool) and BRE Test 6 (A2 with stone wool) both passed BS 8414.1 / BRE 135 but fail AS 5113 as excessive external and internal fire temperatures after 15 minutes

Fire testing assessments

- Application of one tested system to another system – Caution!
- Differences in façade design, fixing methods, cavities, insulation, sarking, etc
- eg. fixing system comprising an open joint detail in lieu of a watertight caulked joint

Existing building examples

- PE spandrels?
- Cladding as an attachment to a sprinklered building?
- Fixed with 2 sided tape and a structural sealant (similar to glazing)?
- Above or adjacent to exits?
- How many storeys vertically?

Existing building examples

- Remove from ground floor?
- Ground floor and top floor is acceptable?
- Type of core?
- Signage and shopfronts?

Debris



Debris



End of façade tests – comparison



Conclusion

- Full scale façade fire test
- Tested **system**
- Keep risk profile of individual away from risk profile of the cladding on the building

Thank You

- Questions

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