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Society of Fire Protection Engineers (SFPE, NZ Chapter)

CLADDING COMPLIANCE

Michael James

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BACKGROUND

Polystyrene Sandwich Panels

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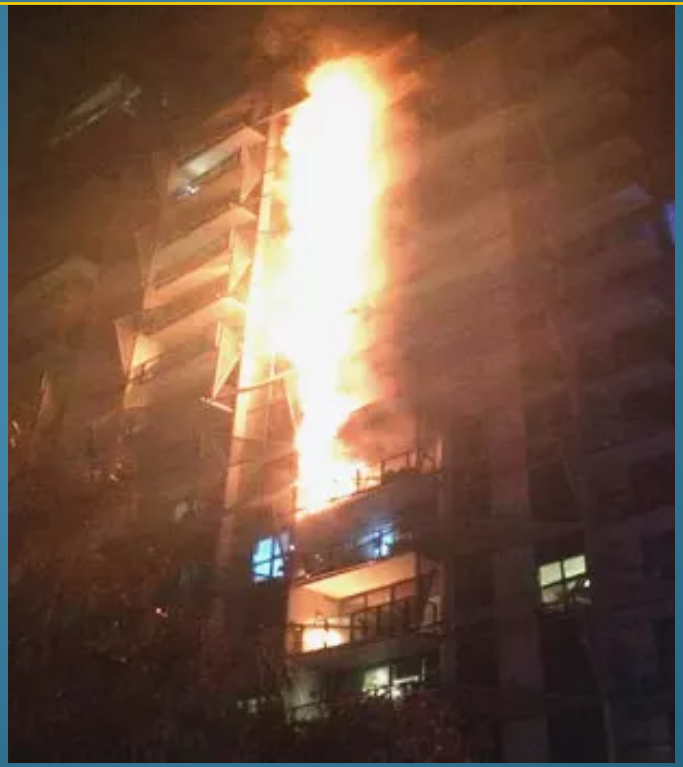
BACKGROUND

ACP Panels

– The Torch - Dubai



Lacrosse - Melbourne

Grenfell

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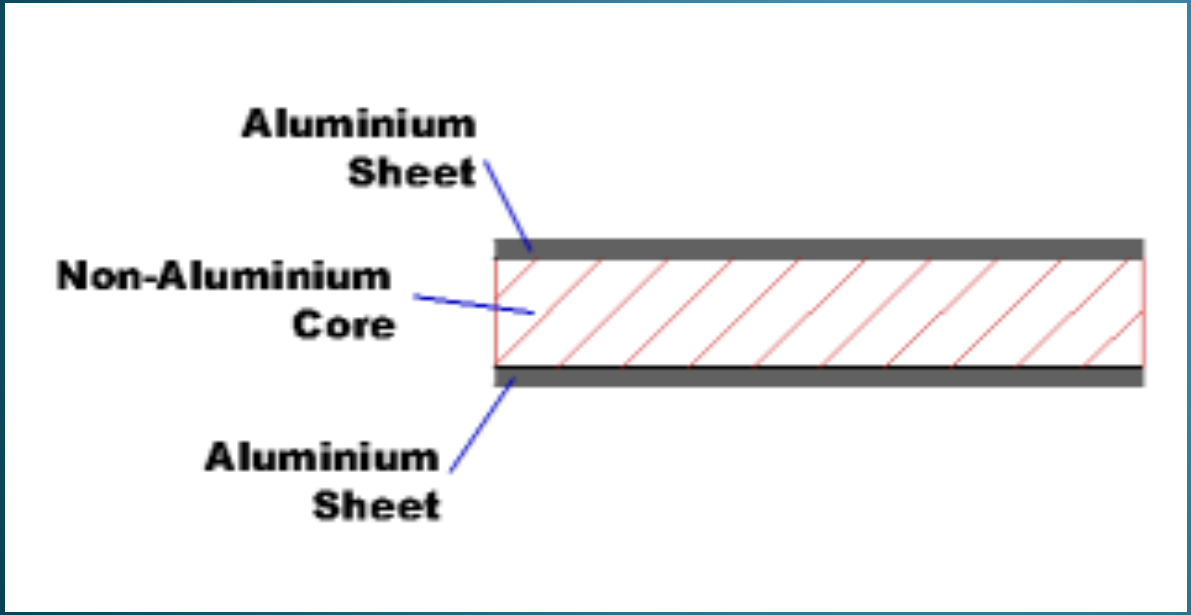
BACKGROUND

ACP Panels



Non Aluminium Core

- Polyethylene
- 70 – 90% mineral fibre plus polyethylene
- Aluminium honecomb
- No core

CLADDING PERFORMANCE IN A FIRE?

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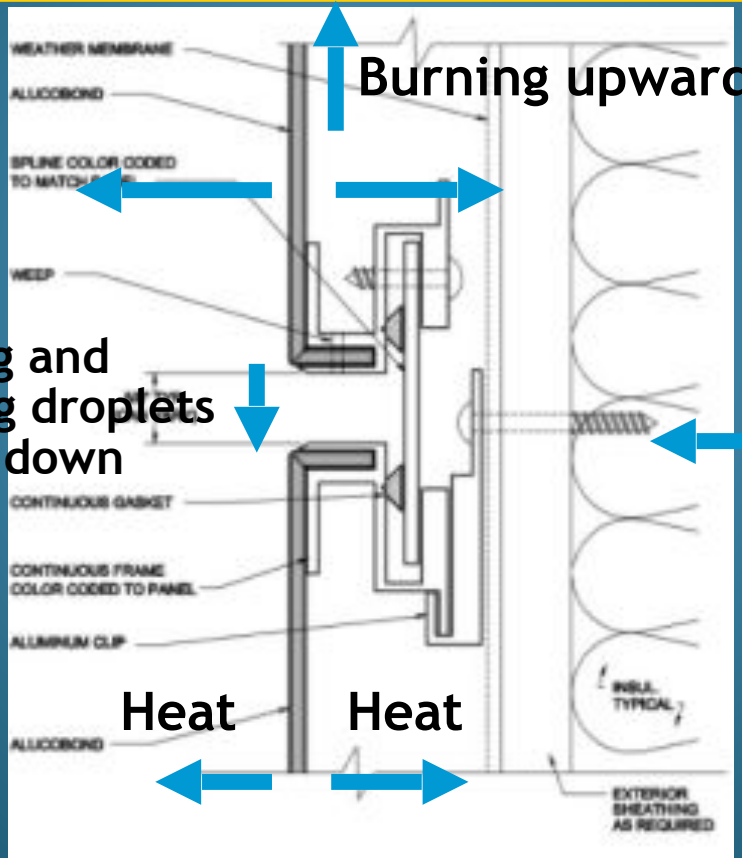

HOW DOES CLADDING PERFORM IN A FIRE?

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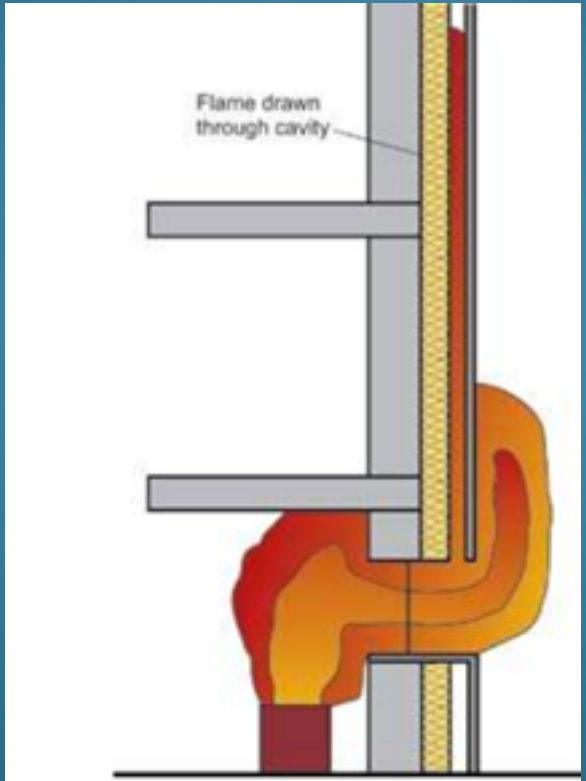

Figure 6: Fire spread through cavities

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HOW DOES CLADDING PERFORM IN A FIRE?
ACP Panels

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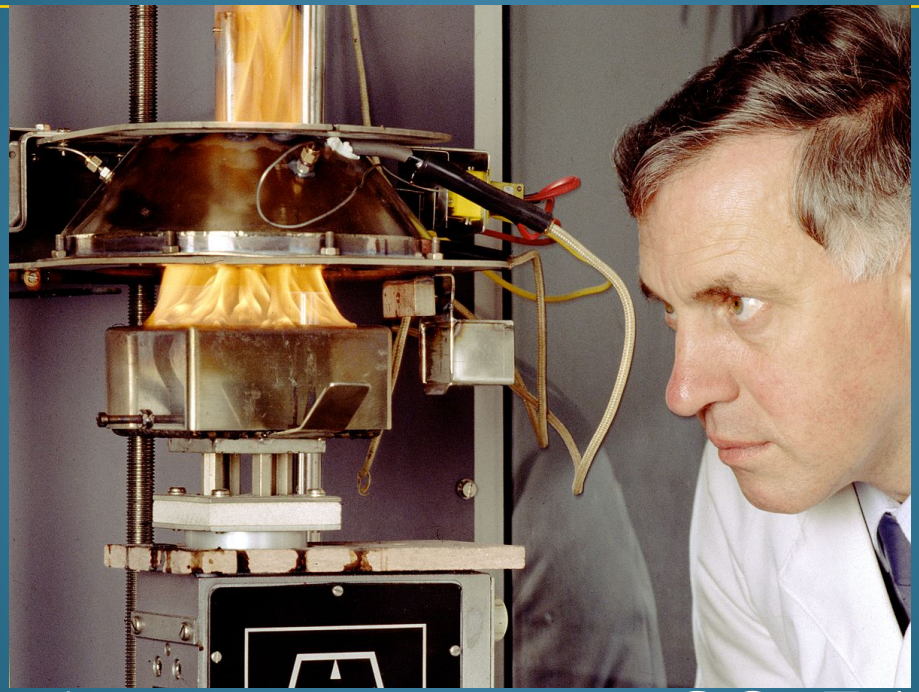
TESTING CLADDING SYSTEMS



Cone Calorimeter test - ISO 5660

Peak heat release rate & Total heat release rate

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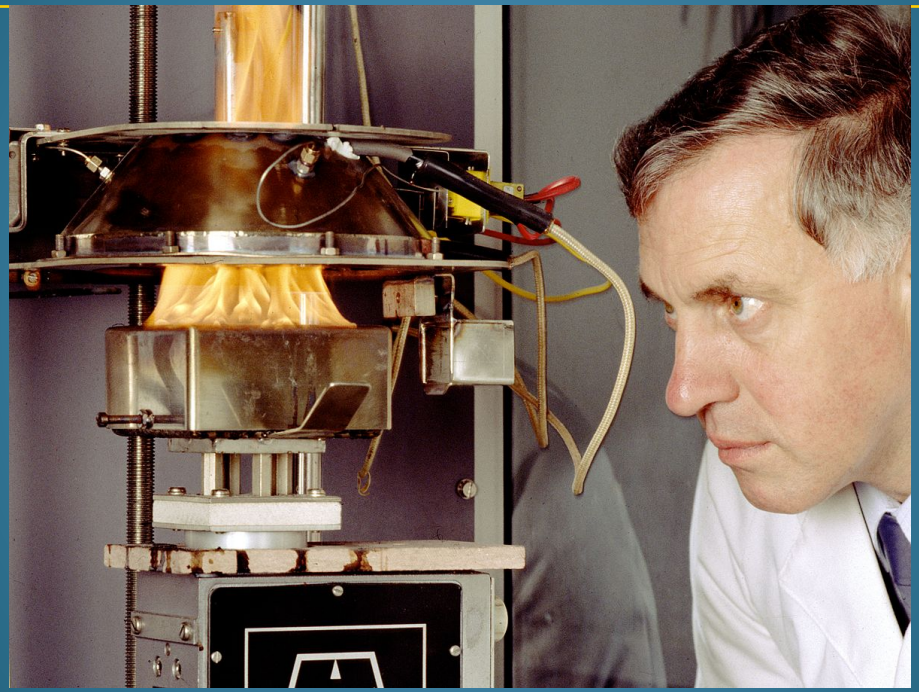
TESTING CLADDING SYSTEMS



"The cone calorimeter test is not a good indicator of performance of the whole wall System."

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TESTING CLADDING SYSTEMS

Intermediate/ full scale tests e.g NFPA 285

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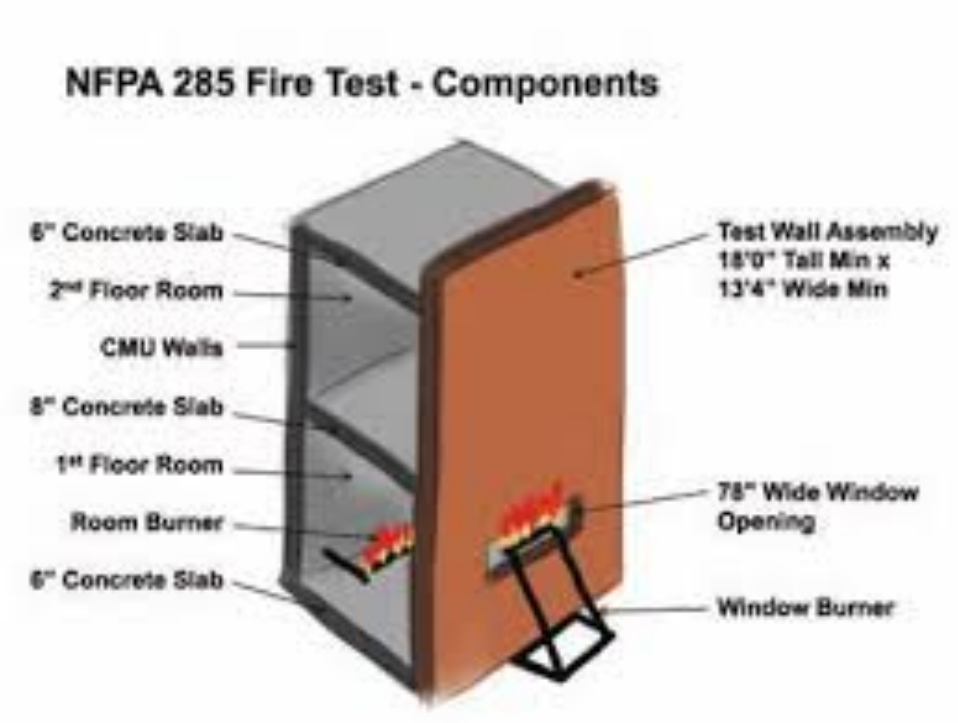
TESTING CLADDING SYSTEMS

"The American NFPA 285 test is based around American construction methods and in New Zealand we do not generally build our external wall systems the same, so it is **extremely difficult to extrapolate the performance of these tests to New Zealand conditions.**"



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TESTING CLADDING SYSTEMS

American vs NZ Base wall Construction

Fibre cement sheet, not fire rated plasterboard

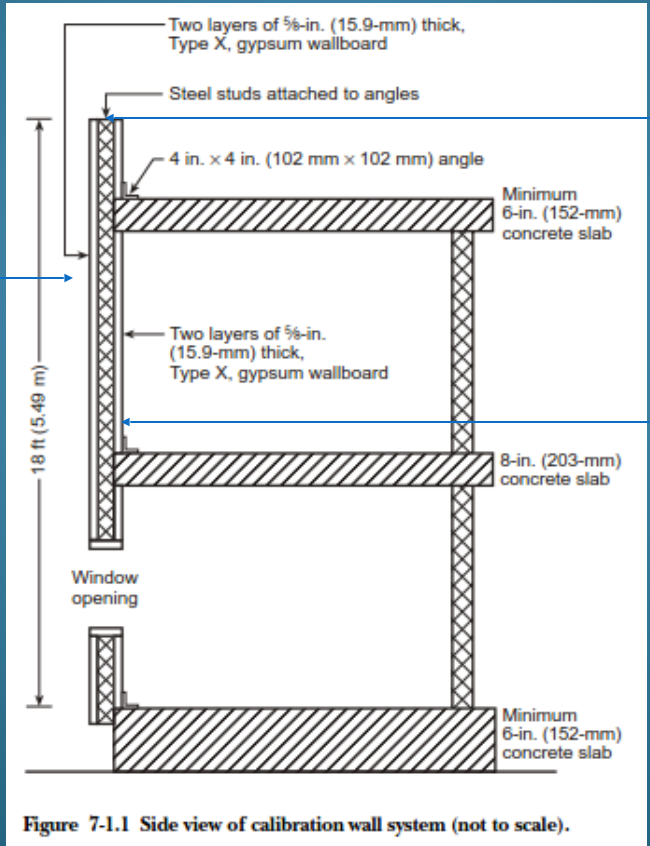

Figure 7-1.1 Side view of calibration wall system (not to scale).

Timber studs, not steel studs

10mm standard plasterboard not fire rated plasterboard.

TESTING CLADDING SYSTEMS

Non combustible construction

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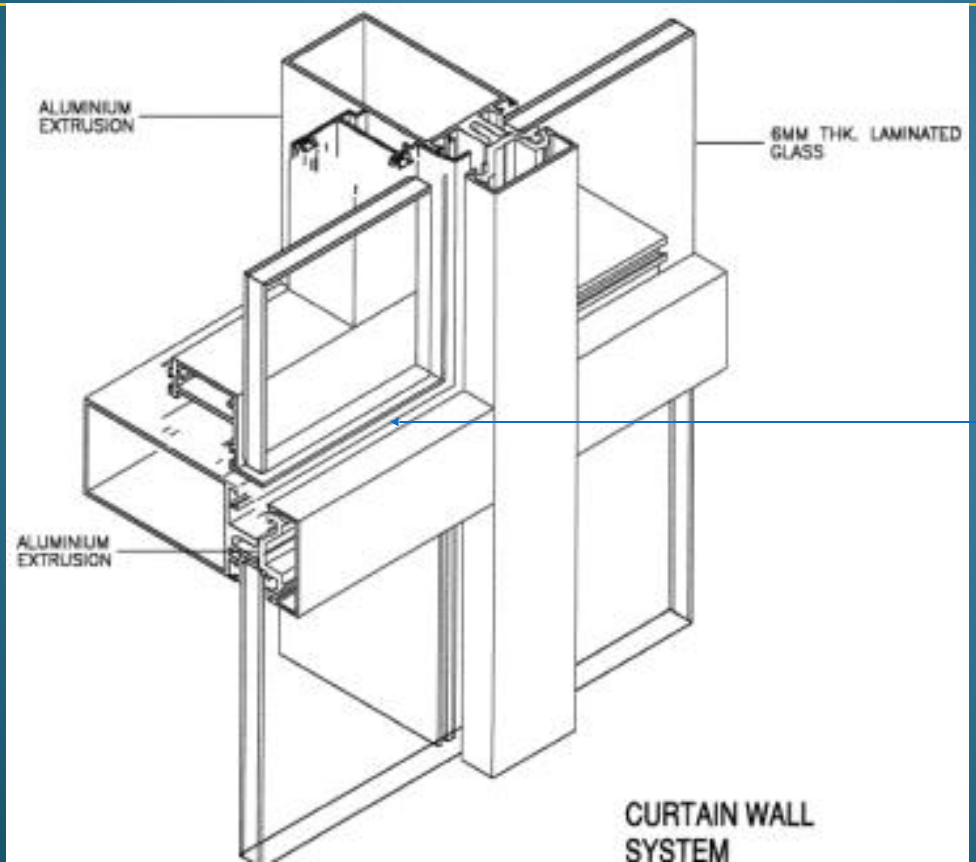

Rubber seals

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THE WAY FORWARD

Cladding systems are very complex.

- They need to be weathertight,
- keep the building occupants warm in winter
- and cool in summer,
- be durable,
- be low maintenance,
- be firesafe and
- cope with wind and seismic loads.

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THE WAY FORWARD

This complex problem can only be solved using a collaborative approach involving the Architect, facade engineer, structural engineer, fire engineer and material and product suppliers.

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SOLVING THE FIRE COMPONENT

Option 1 - Change our wall construction methods to more closely align with how systems are tested in the full-scale tests.

There are several products that are currently being tested for compliance in New Zealand for use as a rigid air barrier which would protect timber framing from becoming involved in a fire, so the base wall assembly could be considered non-combustible.

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SOLVING THE FIRE COMPONENT

Option 2 - Carry out full scale tests of the construction methods we use in New Zealand.

This is feasible but very expensive because the tests are currently carried out overseas and we are a small market with limited product consumption. We understand that Branz is currently undertaking a feasibility study on constructing a test rig in New Zealand.

SOLVING THE FIRE COMPONENT

Option 3 - Only build with non combustible construction. Concrete, brick or glass for example.

This is not realistic given the many types and styles of buildings being designed and built.

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SOLVING THE FIRE COMPONENT

Option 4 - Change or clarify the regulations to recognise that low risk buildings and occupancies do not warrant the same level of scrutiny on cladding performance as higher risk areas.

MBIE are currently looking at this.

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CONCLUSION

- Cladding compliance is a complex topic which requires input from multiple design professionals to achieve the right result.
- Since this is a global problem we are not on our own when it comes to understanding the problems and potential solutions.

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THANK YOU!