OPEN STATE CAVITY FIRE BARRIER IN AUSTRALIA

FIRE SAFETY CHALLENGES & THE DEMAND FOR INNOVATION

What is happening on current projects?

Ventilation and drainage or fire resistance – a short-term issue or not?

INTRODUCTION

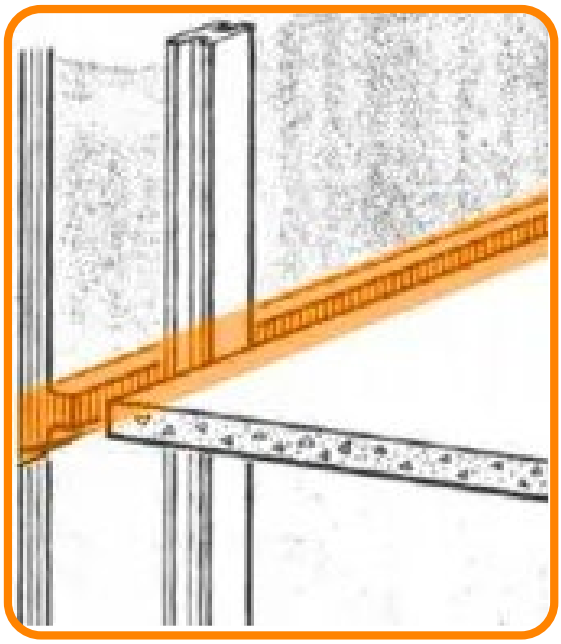
Building facades that incorporate rainscreen cladding results in a cavity or gap behind the cladding, which acts like a chimney and will result in rapid fire spread vertically up the building in case of fully developed fire.

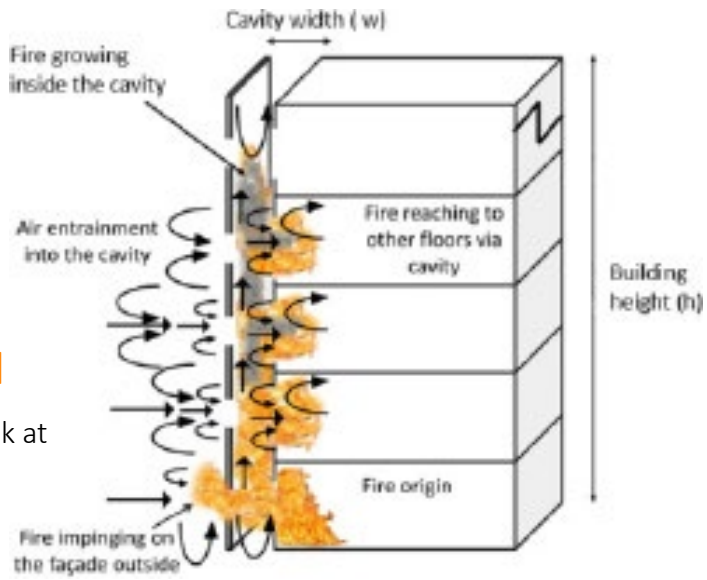
Sadly, we need part of this cavity to be open to allow air ventilation and water drainage; this helps keep the cavity dry, stop the build up of mould and the occurrence of rot/unwanted water damage.

So, in terms of the fire stopping or fire cavity barrier, this is where the following terms come from:

- Open state cavity (fire) barrier
- Ventilated cavity (fire) barrier →

Sounds simple and probably is simple, but at present, most buildings are requiring a Fire Safety Engineer and an alternative solution to approve the use of cavity fire barriers for building utilising rainscreen cladding as the façade of choice.





Best Practice Elsewhere in the World

Before we discuss Australia in more detail, let's look at other parts of the world...

What do horizontal open state or ventilating cavity (fire) barriers have to do functionally?

They need to allow ventilation and drainage in everyday state and in the event of a fire; stop the fire spread through the cavity gap.

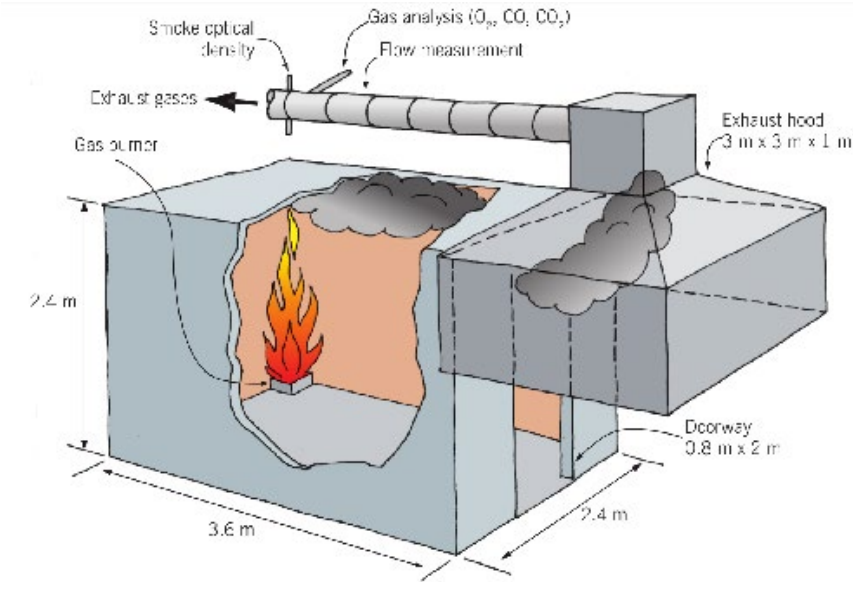
This means there needs to be a mechanical or chemical reaction to close off the openings that allowed ventilation and drainage in the everyday or non-fire mode state.

Vertical Cavity (fire) Barriers

Vertical cavity barriers do not need to drain and ventilate if horizontal cavity barriers are correctly selected, and can be closed state or friction fit, preferably mechanically fixed, non-combustible materials.

Full Scale Fire Testing

Full scale fire testing of the rainscreen assembly makes the most sense and we see fire test methods like BS8414 and NFPA285. The fire performance rating or characteristics are typically provided in a classification document such as BR135 and AS5113.



The Fire Dichotomy; how could or should we use a smaller scale fire test?

Many people consider the cavity gap is just a control, movement joint, or linear gap seal and want to use the same fire resistance/fire testing data prescriptive (or deemed to satisfy provisions) regulations use for these control joints.

Why can't we, or can we? What is different with rainscreen cavity barriers joints to conventional control joints?

A conventional control joint is **a gap between two fire rated elements** – example concrete to concrete.

A horizontal cavity barrier joint is typically a **gap between a one fire rated element (concrete slab edge) and a non-fire rated** rainscreen cladding material.

Smaller Scale Fire Testing

Smaller scale testing for control or movement joints, as we discussed earlier, are conducted between fire-to-fire barriers.

Although we have fire to non-fire barriers in the joint or cavity on a rainscreen cladding scenario; why can't we use the fire test data from smaller scale control joint fire tests; (linear gap seal for those in the UK).

We probably can?

The problem is that almost all fire resistance tests record integrity and insulation criteria from the start of a fire test. Those that wrote the fire test method were probably not considering fire stop systems that have to be open to allow ventilation and/or drainage in normal mode, and stop fire and pass both integrity and insulation criteria immediately.

Think of fire dampers and plastic pipes carrying water. The answers may lie in how we deal with them; we have a specific fire resistance test method and adapted failing criteria. It has been commonplace in the UK for example, to use openings and close them with intumescent materials.

Unless there is a concession on closure time, before we start applying integrity and insulation criteria, these products fail the standard fire resistance criteria and can be assigned a conventional fire rating or FRL before they close adequately.

This is why ASFP TGD19 was written; it is a standard fire test that allows 5 minutes for the cavity fire barrier to

What is happening at present in Australia in terms of compliance?

There is so much wasted time, and confusion, and fire safety engineers are being asked to deal with the cavity barriers and fire (& smoke?) spread through the slab edge cavity in their Fire Engineered (Alternative Solutions) reports.

Are they deemed to satisfy solutions (DTS) available?

Full scale testing should be DTS but at present the AS5113 pathway is not; why on earth not?

A joint test to AS1530 Part 4 with an FRL that matches the concrete slab FRL; tested concrete to concrete?

Is this a Yes or a No?

If you are a certifier, would you accept it? I might.

Remember, you need one for a open state cavity(fire) barrier...
A small scale ASFP TGD19 fire test with a 5 minute closure exemption is clearly not a DTS.

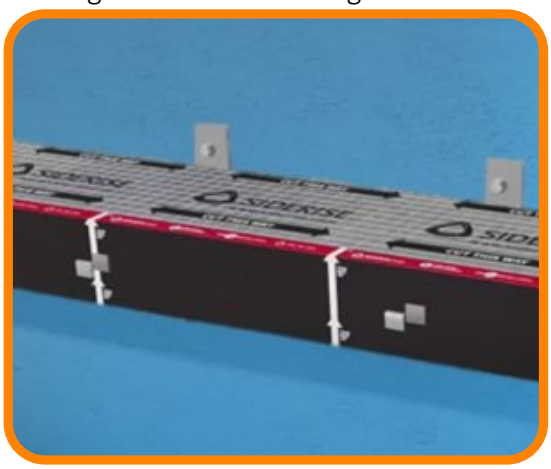
What products are seeing being used in Australia at present and why?

Please ask yourself the following question...

Should we make some concessions on fire performance and get adequate ventilation of drainage?
OR
Should we have best fire performance and compromise on ventilation and drainage?

Siderise RH open state cavity (fire barriers)

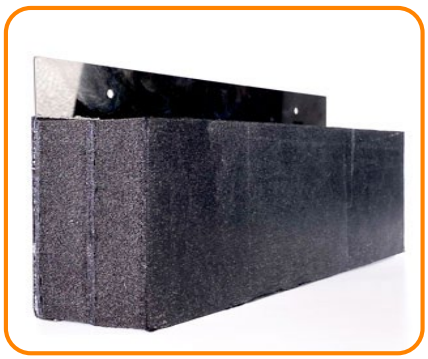
By far, the majority of buildings are using these world leading intumescent systems.



Fire Engineers are relying on full scale fire tested systems here to allow Siderise RH systems to be used under a Fire Engineering Report for the overall building.

Intumescent & Foam composite strips

For smaller cavity joints we are seeing these used on some buildings;



Do they adequately drain or does water get logged, heavy and fall out of the opening?

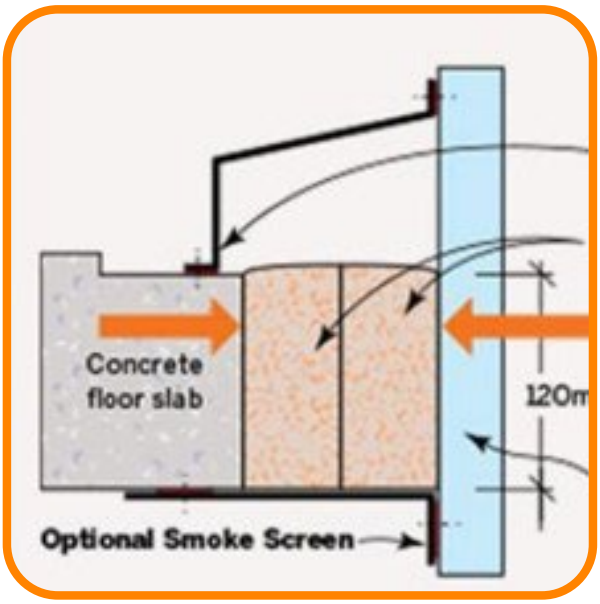
What ventilation will really occur through the open call foam, especially when compressed?

How do they cope with building movement and should they be mechanically fixed to the slab edge?

Why or why not?

Closed State Cavity (fire) Barrier

A very old curtain wall-only specification is often on the plans; no ventilation, no drainage, no movement capabilities; not suitable.



Leave the Slab Gap Open

Many buildings are unfortunately being built and approved this way at present. The NCC, depending on how one interprets it, may allow fire resistance to be ignored in the building's sprinkler protection.

A Short-term Opportunity for Innovation

Let's come up with an open state cavity fire barrier that can achieve an FRL and can also provide acceptable ventilation and drainage.

But the big question I have that no one I have spoken to can quantify adequately is....

> What is acceptable drainage and leakage?

I can hear my Kiwi friends reading this and saying there is one or might be one; at least for small gaps!

RYANMESH

Ryanfire Ryanmesh is a fire rated ventilated cavity closer. A lightweight, graphite infused fibre-glass mesh. It lies inert until exposed to fire upon which it will expand and close up the cavity to prevent the spreading of fire from one floor to another. Ryanmesh is designed to allow the free flow of air and moisture drainage within ventilate(

Click here to learn more

RYANFIRE PASSIVE FIRE PROTECTION