

BUILDING CONNECTION

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SPECIAL
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FACTORY BUILT

IS IT THE FUTURE OF AUSTRALIAN HOUSING?

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FIRE RATED FOAM: DOES IT COMPLY? | ACCESS RULES: PART 1 | WATERPROOFING: REGIONAL QUIRKS

FIRE RATED FOAM - A KILLER?

THE USE OF SO-CALLED 'FIRE RATED' FOAMS FOR FIRE STOPPING OF SERVICE PENETRATIONS OR CONTROL JOINTS IS SADLY BECOMING MORE PREVALENT HERE IN AUSTRALIA. THIS TREND COULD LEAD TO DEATHS IF A SERIOUS FIRE HAPPENS IN A BUILDING WHERE THEY'RE USED, WRITES JOHN RAKIC.

As someone who knows better, I find myself appalled and disappointed that those selling these products continue to do so, knowing full well that these products have very limited fire stopping properties. I truly think it's a case of wishful thinking that sees these products used; they do provide a convenient means of doing the work, but we can effectively say they don't have the fire stopping properties many people believe they do.

WHAT DO WE MEAN BY 'FIRE RATED FOAMS'?

The fire rated foams we're talking about are those that are delivered by way of an aerosol can or canister, which foam up when they're dispensed - much like canned shaving cream.

They're typically polyurethane based, and my understanding is they might all be coming from the same factory overseas, imported under many different product brands. To add to the problem, many are now dyed red to signify their suitability for fire stopping applications.

I've thought long and hard about naming some of the brands being sold in Australia, but in this first article I think it might be wise not to, in case I find a solicitor's letter on my desk. I do wonder though - can I get in trouble for telling the truth? Who knows these days, with the legal system operating the way it does?

UNDERSTANDING FIRE RATINGS

I often get sick of the sound of my own voice when I do Accredifire (www.accredifire.com.au) full day training courses where I define passive fire protection, fire ratings and so-called



Fire ratings apply to an 'as-tested' system or tested configuration, not just a particular product.

Fire Resistance Levels (or FRLs). It never ceases to amaze me how little building practitioners actually know about such an important subject - especially considering that it could easily be a matter of life and death.

I hear myself explaining that products don't have fire ratings.

I say things like "There is no such thing as a one hour fire door. Who thinks I'm wrong in making this comment? Surely there are one hour fire doors?"

I see confused looks from those attending the Accredifire training courses - and I suspect some readers may be getting a bit interested at this point...

Let me clarify what I mean.

A fire rating applies to an 'as fire tested' system, or an otherwise approved configuration.

Only when a particular (and I must add proprietary) brand of product is installed in an identical way to the approved configuration does the entire system or configuration achieve the fire rating.

We see in marketing literature the words 'up to four hour fire rating'. What they mean, though, is 'systems with up to four hour ratings'.

Let's look at the example of the fire door, and also of so-called four hour fire rated foams to demonstrate the important distinction I'm making here

about products and systems, and of course their fire ratings.

THE FIRE DOOR EXAMPLE

A proprietary fire door leaf – known to many of us in the industry as a one hour door, mini fire door, or unit entry door – can only achieve the nominated one hour fire rating when it's installed into an approved wall type, in the approved door frame type complete with the necessary fixings. The door frame needs to be backfilled appropriately, and the door needs to be installed correctly, hung on the required hinges and fitted with the required door lock and door closer. On top of all that, the requisite, correct perimeter gaps or clearances have to be in place.

Only when all of the above is done properly does the fire doorset or fire door assembly achieve a one hour fire rating [i.e. an FRL of ~/60/30]. The door leaf on its own can't achieve a fire rating.

[Note – **AS1905 Part 1 – Fire resistant doorsets** uses the terms 'doorset' which it defines as a complete assembly.]

It's even more complicated than this though. There are overall size limitations for each proprietary door leaf, and there are also restrictions on the types of door skins or facings that can be used.

Additional items of hardware such as door viewers, secondary locks for security and acoustic seals all need to be considered in terms of the 'as fire tested and approved' configuration which, for fire doorsets, results in an 'as tagged and certified' fire door assembly.

THE FIRE RATED FOAM EXAMPLE

Now let's look at the so-called four hour foam – or the foam with up to a four hour fire rating. This is the generic product this article is about...

Again, the foam on its own doesn't have a fire rating of four hours – or any duration.

Only when it's installed in the exact manner it was fire tested in, or in other specific, approved configurations will the entire system achieve the so-called fire rating.

[Note – **AS4072 Part 1 – Fire resistance of service penetrations and control joints** clarifies that fire rating apply to the complete assembly, and not the products.]

Foam used in control joints:

For a so-called fire rated foam used in a control joint or a movement joint, the fire rating is dependent on:

- the type of barrier,
- the thickness of the barrier,
- the joint width or size,
- the depth of foam used and
- any other items that were installed to assist the foam in achieving the fire rating [e.g. fire rated sealant].

All of the fire test data I've been able to find – and it's scarce, let me tell you – requires as much as 200mm of foam, and in most instances, additional mineral fibre backing materials or the additional use of a fire rated sealant [in conjunction with the foam] to achieve any fire rating.

How many 200mm thick joints do we really see in typical buildings? Not many.

Have you been using these foams for protection of joints of less than 200mm? If so, were you aware that you probably needed other products to properly achieve the desired fire rating? Probably not. Oops...

Foam used in service penetrations:

By service penetrations, we mean fire rated walls or floors where services such as pipes or cables pass through an opening formed in the wall or floor, for which a fire stopping product [or more typically, a combination of several products] is used to maintain the fire rating of the wall or floor.

The fire test data for service penetrations is even harder to find for these so-called fire rated foams.

I found one fire test for a small 34mm copper pipe, passing through an 80mm circular aperture or core hole in a 150mm thick block work wall that did not require the use of additional fire rated sealant. This involved 150mm thickness of foam [or foam for the entire depth and width of the opening] – and this particular foam failed integrity at 84 minutes.

That is to say, flames and/or hot gases passed through this opening at 84 minutes.

I haven't been able to find any other fire testing on service penetrations, and judging by the results of the control joints and this particular copper pipe, any cables or other combustible services will not achieve any fire rating, irrespective of the wall or floor type, or the thickness of the foam being used.

BUT FIRE RATED FOAM'S EVERYWHERE – HOW CAN THIS BE?

I know that there are many of you who'll be a bit uncomfortable at this point. Good; that's why I wrote this article.

Perhaps you're using some of this so-called fire rated foam in your current project? Perhaps you are installing or have been installing some of it? Perhaps you're selling it?

I've seen it used in many buildings, and I continue to be concerned and appalled by its use – and I do think it's a disaster waiting to happen.

SO HOW HAS IT HAPPENED?

I think it's a case of wishful thinking. I also think a bit of misleading marketing and product branding is at fault here. Who's to blame – and what can we do to change this practice?

I blame those selling these materials primarily in the first instance, as they should know these products have very limited or effectively no practical use as a fire rated product – and they really shouldn't be selling them.

I also blame the contractors who install the material, as they should ➤

know more about fire stopping and fire ratings if they want to do this work. If they don't, they should subcontract this work to those who do. I'm being hard when I say this, but when lives are at stake we need to be assertive and serious.

I also have to blame the certification process. This should be a last gap measure to pick up these kinds of issues, but it's not easy for building surveyors to know everything; they're partly relying on builders and sub-contractors to provide paperwork to say that they've used fire tested and approved materials for all fire stopping works. Again, I'm being hard but I think it's necessary.

WHAT CAN I USE INSTEAD OF FIRE RATED FOAM?

There are many fire tested products which, when installed in correct configurations, can provide a compliant fire rating or FRL. To answer this question properly, we need to ask more questions.

For service penetrations, we need to know the following:

1. The fire barrier orientation
2. The fire barrier construction and requisite FRL
3. The opening size
4. The service penetration types and quantities passing through the opening
5. The proximity of these services to each other and the perimeter of the opening
6. The support of these services on either side of the opening
7. Movement requirements (building movement)
8. Whether further services are likely to be put through the opening at a later date

RELEVANT CONCLUSIONS

As I've already mentioned, products don't have fire ratings in their own right; it's the entire 'as installed' system that can be classified as having a fire rating.

There's very little or no practical fire test data for so-called fire rated foams, and they really shouldn't be sold in Australia.

Collectively, the construction industry has a duty to educate against and eliminate poor practices - especially those that may put lives at risk.

Peak bodies like AIBS, AIRAH and FPA Australia should be advising the people who are buying and using these products that there may be some serious issues for their use as compliant fire stopping products here in Australia.

“THERE'S VERY LITTLE OR NO PRACTICAL FIRE TEST DATA FOR SO-CALLED FIRE RATED FOAMS, AND THEY REALLY SHOULDN'T BE SOLD IN AUSTRALIA.”

SO HOW DO YOU DO THE RIGHT THING?

There are many different fire stopping products which have been fire tested and have system approvals to correctly protect openings in fire barriers and maintain the appropriate fire rating / FRL.

The bottom line is that most of these products should be installed by specialist fire protection contractors who know about the fire tested and approved configurations, and who can make sure that things are done correctly and provide necessary compliance paperwork.

I don't want to sound like I'm writing this article just to promote my own gear - but we make a product that's gaining acceptance in the market

called the Trafalgar Fyreclamp. These Fyreclamps are installed into the wall or floor, and allow for services to be passed through them and allow for additions, moves and changes as services need re-routing due to changes of usage within the building. Our Fyreclamps are hinged which also allows for them to be put into the opening after the services are already installed.

If careful planning is made, for example if a neat core hole is drilled in the wall, a circular fire clamp can be fitted by a plumber or electrician and the fire stopping can be completed correctly.

I personally believe that Fyreclamps are the closest thing to a reliable do-it-yourself fire stopping, but would encourage anyone tasked with fire stopping to do a little research into the available options.

Get detailed installation instructions and check that the wall, floor or ceiling and services in question are approved for the fire rating you need before installing any given product. Whichever product you choose, get the company's field engineers to come out and demonstrate how to do it, or arrange to get a specialist contractor to do it for you. ■

John Rakic is a professional, qualified Fire Safety Engineer with over 25 years of experience working in passive fire protection and associated fields. John has written many guides and articles, and made many presentations on fire stopping at conferences here in Australia and around the world. John has been the chairman of many committees and sub-committees for Australian Standards relating to fire testing and passive fire protection systems. Since 2009, John has been the Owner and Technical Director of Trafalgar Fire Containment Solutions - a manufacturer and supplier of fire stopping products.