

## PART 2: FIRE RATED FLOOR/CEILING SYSTEMS

### Introduction

The NCC in Australia has made it clear; fire testing needs to be current and conducted in accordance with the latest version of the fire test standard, AS1530 Part 4-2104. This method includes a section dealing with fire rated ceiling systems that deals with floor / ceiling systems and how to fire test them and any opening in them, for access, mechanical ventilation or where services pass through the floor / ceiling system.

This article will explain the somewhat confusing requirement for so called Resistance to Incipient Spread of Fire, aka RISF and what it means and how the correct fire ratings are achieved.

### NCC Requirements

In many applications, the NCC requires a ceiling having a resistance to the incipient spread of fire (RISF) of not less than 60 minutes. The ONLY requirement is at least 60 minutes RISF.

#### What does this mean and how is it achieved?

These ceilings are really a floor / ceiling system; that is a suspended ceiling is hung from typically a lightweight timber floor for example. This floor/ ceiling system has a cavity, void or internal floor / ceiling space. A standard fire resistance test would measure the temperature of the top of the wooden floor, when fire tested with exposure from below, ignoring the temperature inside the floor/ceiling cavity or void. The NCC recognises this and has a special additional and more onerous fire requirement, called the Resistance to Incipient Spread of Fire (RISF)

#### The NCC definition is included below:

**Resistance to the incipient spread of fire**, in relation to a ceiling membrane, means the ability of the membrane to insulate the space between the ceiling and roof, or ceiling and floor above, so as to limit the temperature rise of materials in this space to a level which will not permit the rapid and general spread of fire throughout the space.

#### Explanatory information:

*Resistance to the incipient spread of fire* refers to the ability of a ceiling to prevent the spread of fire and thermally insulate the space between the ceiling and the roof or floor above. "*Resistance to the incipient spread of fire*" is superior to "fire-resistance" because it requires a higher standard of heat insulation.

#### This is a typical clause in the NCC that requires a ceiling with RISF

- (ii) a ceiling having a *resistance to the incipient spread of fire* of not less than 60 minutes separating the roof space or ceiling space in all areas surrounding the passageway within the *fire compartment*.

## A5.6 Resistance to the incipient spread of fire

A ceiling is deemed to have a *resistance to the incipient spread of fire* to the space above itself if—

- (1) it is identical with a prototype that has been submitted to the *Standard Fire Test* and the *resistance to the incipient spread of fire* achieved by the prototype is confirmed in a report from an *Accredited Testing Laboratory* that—
  - (a) describes the method and conditions of the test and form of construction of the tested prototype in full; and
  - (b) certifies that the application of restraint to the prototype complies with the *Standard Fire Test*; or
- (2) it differs in only a minor degree from a prototype tested under (1) and the *resistance to the incipient spread of fire* attributed to the ceiling is confirmed in a report from an *Accredited Testing Laboratory* that—
  - (a) certifies that the ceiling is capable of achieving the *resistance to the incipient spread of fire* despite the minor departures from the tested prototype; and
  - (b) describes the materials, construction and conditions of restraint that are necessary to achieve the *resistance to the incipient spread of fire*.

## Fire Testing Requirement for Access Panels to AS1530 Part 4 - 2014

The NCC in Clause C3.15 outlines the requirements for openings in fire rated barriers, whether access panels or service penetrations.

One can clearly see that tested systems are required and the test method is AS1530 Part 4, and there is reference to resistance to incipient spread an specific requirements when the NCC asks for a RISF rating.

### C3.15 Openings for service installations

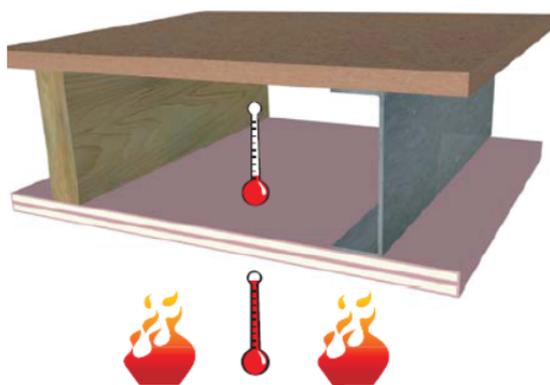
Where an electrical, electronic, plumbing, mechanical ventilation, air-conditioning or other service penetrates a building element (other than an *external wall* or roof) that is *required* to have an FRL with respect to *integrity* or *insulation* or a *resistance to the incipient spread of fire*, that installation must comply with any one of the following:

#### (a) Tested systems

- (i) The service, building element and any protection method at the penetration—
  - (A) are identical with a prototype assembly of the service, building element and protection method which has been tested in accordance with AS 4072.1 and AS 1530.4 and has achieved the *required* FRL or *resistance to the incipient spread of fire*; or

I used my old friend Google and found a nice little picture to help show the void or ceiling cavity for a floor / ceiling system and where additional temperatures are measured during as AS1530 Part 4- 2014 fire test. Nice little explanation Knauf I thank you and I hope you don't mind me sharing.

Floor/ceiling systems or roof systems with an FRL include the roof lining or flooring as part of the fire barrier. Ceilings with a Resistance to the Incipient Spread of Fire state the ability of a ceiling to limit the temperature rise in the ceiling cavity [shown below]. Ceilings with 60 minutes of RISF are specified by the BCA and are appropriate where the ceiling is the primary fire barrier that limits fire spread by way of the ceiling void.



An example of where this type of ceiling is required is a Class 2 residential building which has several apartments on the top floor. The apartments have fire resisting separating walls between them which finish at the ceiling under a shared roof space. The RISF 60 ceiling prevents fire spread from one apartment, up into the roof space and then down into a neighbouring apartment.

<https://blog.knauf.solutions/how-to-select-a-fire-rated-wall-or-ceiling>

# ARTICLE: PART 1: UNDERSTANDING FIRE RATED ACCESS PANELS

By John Rakic

## Trafalgar FyreSHIELD PLUS Access Panels & Fire Testing for RISF

We strongly suspect, we are the only company who have fire tested fire rated access panels to the new requirements for measuring cavity temperatures and determining the resistance to incipient spread of fire, RISF and achieving the required 60 minutes rating.

To achieve a RISF rating, you must build a floor / ceiling system over a fire resistance furnace. That is a fire rated ceiling membrane hanging from a representative timber floor structure and of course include your fire rated access panel.

The lower the timber floor structure, the smaller the cavity and the quicker it will heat up.

Trafalgar chose a narrow and practical cavity size for its fire testing to maximise the usability of the expensive fire test data.

As they say, pictures tell a thousand words, so let me walk you through some pre and post fire test photos from one of our recent fire tests. This is a 2 hour ceiling membrane with a very small cavity or void, requiring a RISF of at least 60 minutes.



*A view from the top during construction showing the membrane ceiling, supported by a timber structure, with a Trafalgar FyreSHIELD PLUS fire rated access panel installed. This is before the timber floor "lid" was installed.*

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*A view from the underside, which is obviously the fire exposure side, showing the Trafalgar FyreSHIELD PLUS fire rated access panel in the open position.*



*A view from the underside, which is obviously the fire exposure side, showing the Trafalgar FyreSHIELD PLUS fire rated access panel in the closed position.*

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*A view from the above, at 2 hours into the fire test. If you look carefully you will see the cables for the temperature measuring thermocouples, are measuring inside the cavity for the top of the ceiling membrane on the frame of the access panel and the top or back of the access panel itself.*



*A view after the 2 hour fire test is complete with the assembly being removed off the horizontal fire resistant furnace. You will note that some layers of the fire rated ceiling membrane have fallen off during the duration of the fire test; this is why there is multiple layers.*

## Are you specifying or buying and installing a compliant fire rated ceiling access panel?

Here is a really simple way to check and I urge you to do so:

- Ask for a fire test report
- Has it been conducted to AS1530 Part 4- 2014
- Is there a RISF rating provided?
- Is there photos of a timber / floor ceiling system inclusive of a cavity?
- Note - An RISF fire rating cannot be correctly applied from a fire test with no cavity, as the open air is not representative of real world cavities which heat up quickly if and when a fire starts below the ceiling membrane.
- I think I know the requirements as well as anyone and I suspect you might find you are buying something which may not fully comply if you are not buying a Trafalgar product.
- We spent the time to develop an innovative solution, apply for patent, invest in new manufacturing equipment, do all the required fire tests, so we can crow loudly from the roof (or ceiling) top.

For more information, visit either of [www.tfire.com.au](http://www.tfire.com.au) or [www.taccess.com.au](http://www.taccess.com.au)