

# Trade Guide HVAC&R

## Introduction

The National Construction Code (NCC) prioritises fire safety for occupants. The code mandates not only alerting people to a fire but also incorporating built-in measures to combat it. Smoke detectors and smoke alarms address the warning aspect, while sprinkler systems and fire hoses actively extinguish flames. But how do buildings themselves fight fire? In essence, they're designed with fire resistance in mind.

## Passive Fire Protection

Passive Fire Protection can be defined as features built into the structure to slow the spread of fire. It protects occupants by keeping the fire contained in its place of origin or delaying its progress to other parts by using a technique known as Compartmentation. The code legislates that buildings are subdivided into 'Fire Compartments' and dictates the FRL for each element within such compartments. This affects the choice of material used in fire resistant construction like concrete, clay bricks and plasterboard which are known to provide good 'Fire Resistance Level' (FRLs).

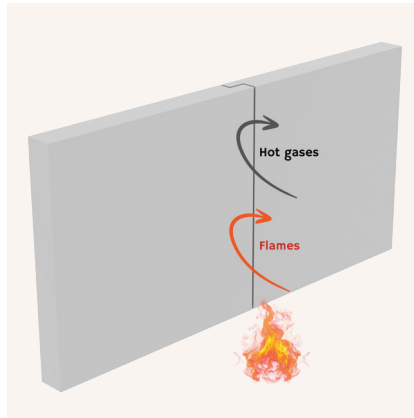
## What is an FRL?

FRL stands for 'Fire Resistance Level'. It is a grading period (of fire resistance) in minutes determined by the NCC for the following three criteria -

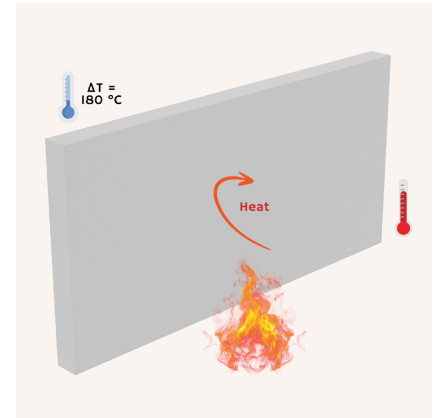
- 1. Structural Adequacy:** The NCC defines structural adequacy as the ability of a building element to maintain stability and adequate loadbearing capacity as determined by AS1530.4
- 2. Integrity:** The NCC definition of integrity is the ability of a building element to resist the passage of flames and hot gases specified in AS1530.4
- 3. Insulation:** The code states that insulation of a building element is its ability to maintain a temperature on the surface not exposed to the furnace below the limits specified in AS1530.4



Structural Adequacy



Integrity



Insulation

## Understanding FRL ratings

To illustrate the three components of an FRL, let's consider a concrete wall with an FRL rating of 120/120/120. Here's how the FRL rating is applicable to the concrete wall:

- 1. Holding up (Structural Adequacy - 120 minutes):** The wall must remain strong and stable for 120 minutes during a fire. This means it can support its own weight and any additional weight it carries (beams, floors) without collapsing or bending significantly.
- 2. Keeping flames out (Integrity - 120 minutes):** The wall needs to prevent flames and hot gases from passing through for 120 minutes. In simpler terms, it shouldn't develop cracks or holes that would allow fire to spread.
- 3. Blocking heat (Insulation - 120 minutes):** The wall should act as a barrier, slowing down heat transfer from the fire side to the other side. This ensures the non-fire side stays cool enough for a safe evacuation.

An FRL rating with a dash in the first position, eg. -/120/120, tells a different story. Here the focus is on fire resistance, not structural support. Take a plasterboard wall, for instance. With a -/120/120 rating, it doesn't need to have structural adequacy during a fire. However, it still needs to perform well in the other two aspects, 'Integrity' and 'Insulation'. Such elements are known as non-loadbearing elements.

## Service Penetrations

In theory, building elements with the right FRL rating should hold up well in a fire. But what about building services like pipes and cables that cut through firewalls? These penetrations weaken the firewall's FRL because they create openings for flames and hot gases to pass through. To address this issue, fire stopping systems are used to seal these gaps and restore the firewall's integrity. They use materials that transform on exposure to heat and fire and create seals that block the flames and hot gases. These systems are crucial for maintaining fire compartmentation, preventing flames from spreading to other parts of the building. The NCC requires that such fire stopping systems establish that they can restore the FRL of the building element they are breaching. This is done using AS1530.4 and AS4072.1.

## The importance of Australian Standards AS 1530.4 & AS 4072.1

**AS1530.4 (2014):** Method of fire test on building materials, components and structures. Part 4: Fire-resistance tests for elements of construction

**AS4072.1 (2005):** Components for the protection of openings in fire-resistant separating elements. Part 1: Service penetrations and control joints

AS1530.4 establishes the procedures for conducting fire resistance tests on building elements and AS4072.1 establishes the procedures for interpreting and documenting those results. Consequently, when determining the FRLs of building elements and service penetrations, these two standards go hand in hand.

### Every system is unique

Fire stopping isn't a one-size-fits-all solution. The best material depends on the type of service passing through the firewall. For example:

- **Plastic Pipes:** These melt in a fire, creating gaps in the firewall. Fire stopping for plastic pipes needs to be expandable to fill these gaps and act as a heat barrier, preventing flames from spreading.
- **Steel Pipes:** While steel won't melt easily, it can get very hot during a fire. This heat can transfer through the firewall and ignite combustible materials on the other side. For steel pipes, fire stopping focuses on two things -
  - a) **Plugging the gap:** Sealing the small space between the pipe and the firewall with a material that resists high temperatures
  - b) **Heat Containment:** Creating a barrier around the pipe to prevent heat transfer to nearby objects and stop the fire from spreading through the compartment

Understanding how different materials react to fire is crucial for choosing the right fire stopping solution. A single approach won't work for all situations.

### What does FIREFLY offer the HVAC&R industry?

We understand that not all pipes are created equal, and neither are their fire stopping needs. That is why we have rigorously tested and assessed hundreds of fire stopping systems specifically designed for pipes with different types of lagging and insulation, including

- Rock wool
- Glass wool
- Stone wool
- Nitrile rubber
- PIR foam insulation
- Polyolefin insulation
- Polyethylene (XLPE or CLPE)

With our extensive testing and experience, FIREFLY can ensure you have the right fire stopping system in place to protect your building from fire, regardless of the type of lagged pipe you use.

FIREFLY have developed firestopping systems in accordance with AS1530.4 (2014) and AS4072.1 (2005) that can be used to fire stop HVAC&R service penetrations in firewalls such as pair coils, lagged pipes, insulated pipes, bare pipes and ducts.

## The tried and trusted FIREFLY fire stopping range includes

### FIREFLYMastic

A water based acrylic fire rated sealant generally used around non-combustible services to maintain integrity.



### FIREFLYMasticHP

A high pressure exerting intumescent sealant, used to close off service penetration gaps and holes.



### FIREFLYStrap

A high pressure intumescent wrap used to wrap around thermally lagged metal and small plastic pipes.



### FIREFLYBatt

A high density mineral fibre batt, factory coated on both sides to a precise thickness with a durable fire resistant mastic.



### FIREFLY Penowrap

A highly insulative blanket wrap for metal pipes and to maintain fire resistance in building elements that have been penetrated by a structural or service penetration.



### FRF Fire Collars

Retrofit fire collars made from steel lined with high pressure intumescent strips. Used as multi-service collars to fire stop a variety of services including plastic pipes.



### FIREFLYMasticBG

A brush grade mastic used for sealing around services in substrates and FIREFLYBatt, and also for laminating layers of FIREFLYBatt together.



### FIREFLY Penowrap Gaskets

Mostly used around service penetrations in timber elements. They provide additional insulation to the timber substrate.



## HVAC&R services through FIREFLYBatt systems

Where larger openings are available in a firewall, services can be fire stopped using our FIREFLYBatt systems. Below are some examples of systems from our FAS190235 report of systems installed in FIREFLYBatt in vertical and horizontal orientations.



Nitrile rubber lagged copper and steel pipes, 8 mm up to 32mm OD. Insulation wall thickness 19 mm to 38mm

**Products**  
 FIREFLYBatt, FIREFLYMastic, FIREFLYStrap

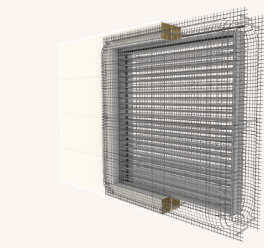
**V28A | -/120/120**



Nitrile rubber (WT 19 mm up to 38 mm) lagged copper and steel pipes, 8 mm up to 32mm OD.

**Products**  
 FIREFLYBatt, FIREFLYStrap

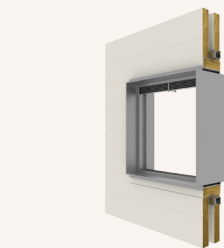
**V28B | -/90/90**



Lorient LVH44 or Kilargo IFD44 intumescent fire damper. Sizes 200mm x 200mm up to 450mm x 450mm.

**Products**  
 FIREFLYBatt, FIREFLYMastic

**V46A | -/120/120**



Bullock 4900 series dampers  
 Maximum size 2.4 m x 2.4 m

**Products**  
 FIREFLYBatt, FIREFLYMastic

**V47 | -/120/-**



(PE) Polyolefin (WT 19 mm up to 25mm) lagged copper pipe, 8 mm to 25 mm OD

**Products**  
 FIREFLYBatt, FIREFLYMasticHP

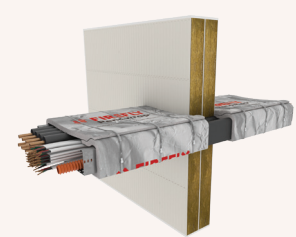
**V50 | -/120/60**



Nitrile rubber lagged copper pair coil bundle plus 18 mm drain hose and 2 TPS cables. Pipe (OD) 9.4 mm and 6.45 ladding (WT) 10 mm and 12.1 mm

**Products**  
 FIREFLYBatt, FIREFLYMasticHP

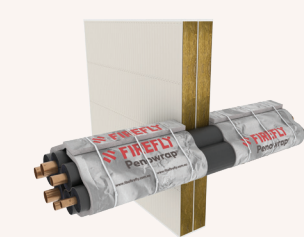
**V58 | -/180/90**



Up to 9 off Nitrile (WT 9 mm) lagged copper pipes (13 mm OD) plus 20 TPS cables and 16 mm flex drain hose

**Products**  
 FIREFLYBatt, FIREFLYMasticHP, FIREFLY Penowrap

**V61 | -/120/120**



Bundle of Nitrile rubber lagged copper pipes containing up to: Pipe (OD) 2 x 29 mm, 1 x 29 mm and 1 x 22 mm; Insulation (WT) 25 mm, 19 mm, and 19 mm

**Products**  
 FIREFLYBatt, FIREFLY-Penowrap, FIREFLYMasticHP

**V80 | -/120/120**



V119 | -/180/180

150 mm OD Lorient or Kilargo damper LVH44C with DuraVent flexible ducting

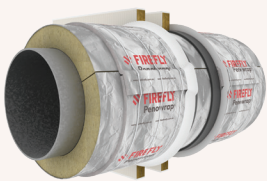
**Products**  
FIREFLYBatt, FIREFLYMastic



V120 | -/180/180

Copper pipe, up to 200 mm with stone wool foil faced continuous lagging 75 mm thick

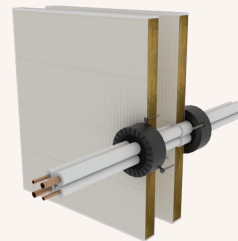
**Products**  
FIREFLYBatt, FIREFLYMastic, FIREFLYStrap, FIREFLY Penowrap



V121A | -/240/240

Steel pipe, up to 350 mm with continuous rock wool lagging 75 mm thick

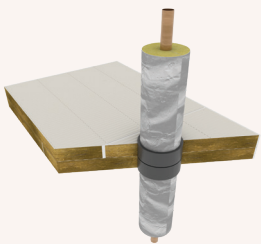
**Products**  
FIREFLYBatt, FIREFLYStrap  
FIREFLYMasticHP,  
FIREFLYMasticBG,  
FIREFLY Penowrap



V128A | -/120/120

CLPE lagged copper pair coil. Pipe (OD) 2 x 3/8" and 5/8"; Insulation 10 mm maximum

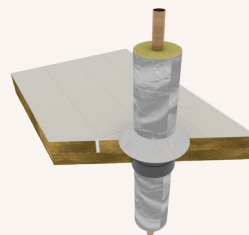
**Products**  
FIREFLYBatt,  
FIREFLYMasticHP, FIREFLY  
FRF Collar



H18C | -/90/90

Foil coated glass wool (WT 19 mm to 50 mm), lagged copper and steel pipes, 8 mm up to 32 mm OD.

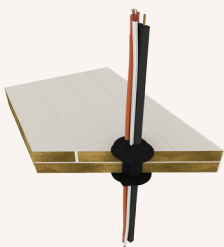
**Products**  
FIREFLYBatt, FIREFLYStrap



H18D | -/120/120

Foil coated rock wool (WT 20 mm to 50 mm), lagged copper and steel pipes, 8 mm up to 32 mm OD.

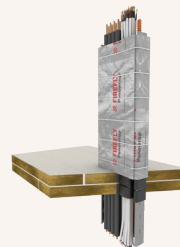
**Products**  
FIREFLYBatt, FIREFLYStrap,  
FIREFLYMastic



H40 | -/180/120

Nitrile rubber lagged copper pair bundle plus 18 mm drain hose and 2 TPS cables. Pipe (OD) 9.4 mm and 6.45 mm lagging (WT) 10 mm and 12.1 mm

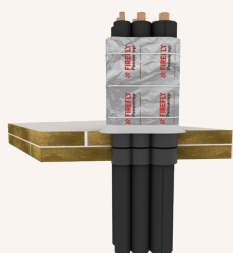
**Products**  
FIREFLYBatt,  
FIREFLYMasticHP



H42 | -/120/120

Up to 9 off Nitrile (WT 9 mm) lagged copper pipes (13 mm OD) plus 20 TPS cables and 16 mm flex drain hose

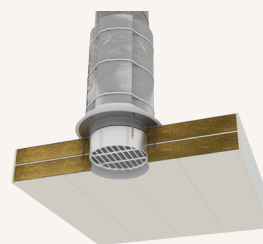
**Products**  
FIREFLYBatt,  
FIREFLYMasticHP,  
FIREFLY Penowrap



H56 | -/120/120

Bundle of Nitrile rubber lagged copper pipes containing up to: Pipe (OD) 2 x 35 mm, 1 x 29 mm and 2 x 19 mm; Insulation (WT) 25 mm, 19 mm and 19 mm

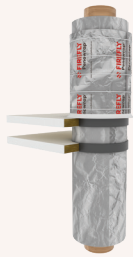
**Products**  
FIREFLYBatt, FIREFLY-  
Penowrap, FIREFLYMastic,  
FIREFLYMasticHP



H119 | -/180/180

150 mm OD Lorient or Kilargo damper LVH44C with DuraVent flexible ducting

**Products**  
FIREFLYBatt, FIREFLYMastic



Copper pipe, up to 200 mm with stone wool foil faced continuous lagging 75 mm thick

**Products**  
FIREFLYBatt, FIREFLYMastic, FIREFLYStrap, FIREFLY Penowrap

H120 | -/180/180



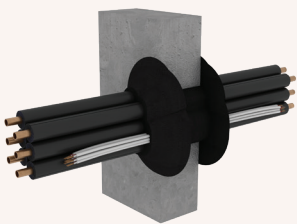
Steel pipe, up to 350 mm with continuous rock wool lagging 75 mm thick

**Products**  
FIREFLYBatt, FIREFLYStrap, FIREFLYMastic, FIREFLY Penowrap

H121A | -/240/240

## HVAC&R services through various substrates

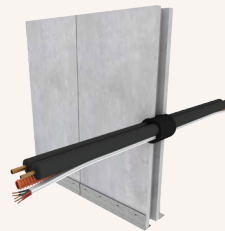
Where core holes are available in rigid and non-rigid substrates, HVAC&R services can be fire stopped using FIREFLY products tested and assessed to AS1530.4 and AS4072.1 in a variety of horizontal and vertical substrates. Below are a few examples from our FAS192036 core hole report.



Up to 6 off Nitrile (WT 9 mm) lagged copper pipes (13 mm OD) plus up to 6 TPS cables

**Products**  
FIREFLYMasticHP

V27 | -/120/120



Nitrile lagged copper pipe coil plus 2 TPS cables and 18 mm drain hose

**Products**  
FIREFLYMasticHP

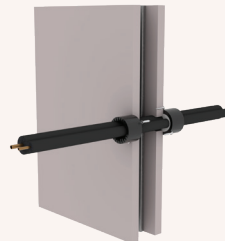
V75B | -/120/120



Nitrile lagged copper pair coil plus 2 TPS cables and 18 mm drain hose. Pipe (OD) 9.4mm and 6.45; Lagging (WT) 10 mm and 12.1 mm

**Products**  
FIREFLYMasticHP

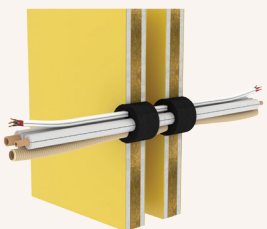
V106B | -/60/60



Nitrile lagged copper pair coil. Pipe (OD) 9.6 mm and 6.7; Lagging (WT) 16.4 mm and 9.4 mm

**Products**  
FIREFLY MasticHP, FIREFLY FRF Collar

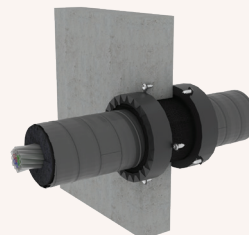
V137 | -/120/120



1 XLPE lagged copper pair coil (1/4" and 5/8") plus 2 2.5 mm<sup>2</sup> TPS cables and 18 mm OD flexi drain hose

**Products**  
FIREFLYMasticHP

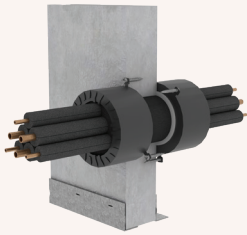
V138B | -/90/90



Insulated beer lines with up to 22 (8 mm OD x 5 mm ID) Ethylene Vinyl Acetate (EVA) pipes continuously wrapped in 25 mm thick Nitrile rubber insulation 51 mm (WT)

**Products**  
FIREFLYMastic, FIREFLY FRF Collar

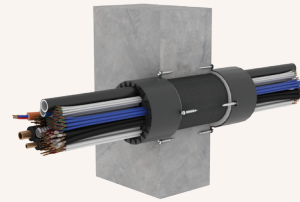
V206 | -/120/120



**V230** | -/120/120

3 insulated pair coils consisting of (up to 3/8 plus 5/8 copper pipes with Nitrile rubber lagging maximum WT 13 mm

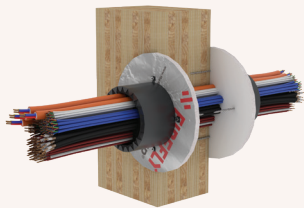
**Products**  
FIREFLYMastic,  
FIREFLY FRF Collar,  
FIREFLYMasticHP



**V249** | -/180/180

Multi service collar containing up to 3 insulated pair coils and multiple other services

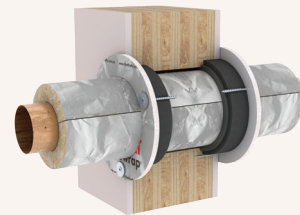
**Products**  
FIREFLYMastic,  
FIREFLY FRF Collar,  
FIREFLYMasticHP



**V304** | -/90/90

Multi service collar containing pair coil and other services

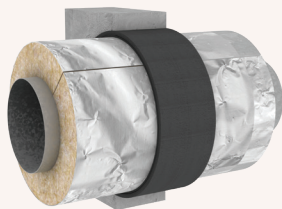
**Products**  
FIREFLY FRF Collar,  
FIREFLYMasticBG,  
FIREFLY Penowrap Gasket



**V421** | -/120/120

Copper pipe, up to 100mm, with stone wool foil faced continuous lagging 38 mm thick

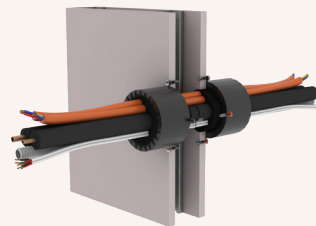
**Products**  
FIREFLYStrap,  
FIREFLYMasticBG,  
FIREFLY Penowrap Gasket



**V434** | -/240/240

Steel pipe, up to 350 mm with continuous rock wool lagging 75 mm thick

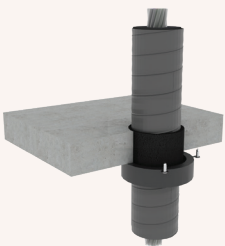
**Products**  
FIREFLYStrap,  
FIREFLYMasticBG,  
FIREFLY Penowrap Gasket



**V474** | -/90/90

1 of 3/8 + 5/8 FR pair coil 19 mm insulation and 2 6 mm<sup>2</sup> PVC 3C+E cable, 1 x 18 mm condensate hose and 2 2C+E 2.5 mm<sup>2</sup> TPS cable

**Products**  
FIREFLY FRF Collar,  
FIREFLYMasticHP



**H90** | -/120/120

Insulated beer lines with up to 22 (8 mm OD x 5 mm ID) Ethylene Vinyl Acetate (EVA) pipes continuously wrapped in 25 mm thick Nitrile rubber insulation 51 mm (WT)

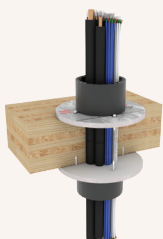
**Products**  
FIREFLYMastic,  
FIREFLY FRF Collar



**H138** | -/90/90

1 of 1/4 + 5/8 pair coil (19 mm and 21 mm insulation) plus 2 2C+E 1.5 mm<sup>2</sup> TPS cable plus 1 16 mm<sup>2</sup> PVC 3C+E cable

**Products**  
FIREFLYMasticHP,  
FIREFLYMasticBG,  
FIREFLY Penowrap Gasket



**H140** | -/90/90

Multi service collar containing pair coil and other services

**Products**  
FIREFLY FRF Collar,  
FIREFLYMasticBG,  
FIREFLY Penowrap Gasket

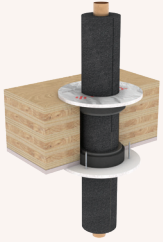


**H195** | -/120/120

Copper pipe, up to 100mm, with stone wool foil faced continuous lagging 38 mm thick

**Products**  
FIREFLYStrap,  
FIREFLYMasticBG,  
FIREFLY Penowrap Gasket

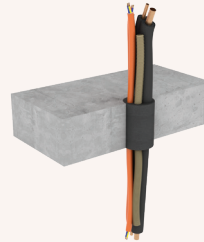




H203 | -/120/120

DN50 copper pipe with  
38 mm thick Nitrile insulation

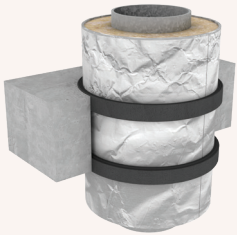
**Products**  
FIREFLYStrap,  
FIREFLYMasticBG,  
FIREFLY Penowrap Gasket



H208 | -/120/120

1 of 3/8 + 5/8 pair coil with  
19 mm Nitrile insulation plus  
2 6 mm² 3C+E cables plus 1  
Ø 18 mm condensate hose

**Products**  
FIREFLYMasticHP



H211A | -/240/120

Steel pipe, up to 350 mm with  
continuous rock wool lagging  
75 mm thick

**Products**  
FIREFLYStrap,  
FIREFLYMasticHP



H233 | -/180/120

2 3/8+5.8 FR pair coil with  
maximum 13 mm Nitrile  
rubber insulation

**Products**  
FIREFLYMasticHP,  
FIREFLY FRF Collar

Effortlessly manage Passive Fire Protection projects, generate reports, track progress and ensure DTS compliance - available for desktop and mobile.



### Filterable system search

Find what you need quickly with complex filtering including substrate orientation, substrate type, MIN FRL and more.



### Step-by-step installation guide

Step through guide for installations, new project creation and audits, plus project status overview.



### Bookmark systems

The ability to mark systems you use frequently as favourites to maximise workflow efficiency.



### Document compliance issues

Add UIN Numbers, location, description and photos of the compliance issues on your project.



### Add members

Collaborate seamlessly by adding other members to a project.



### Instant certification report numbers

Generate free custom reports for any project either from your construction site or from your office with ease.

## Getting Started

1. Download the app at the App store or Google Play or visit [www.tbafirefly.com.au/app](http://www.tbafirefly.com.au/app)
2. Create your profile and access your account across platforms
3. Sign in using your username and password to access 58,000+ tested and assessed systems, reports, project registers and more

Have a question about FIREFLY PFP, contact us today.

