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3M™ Fire Barrier Duct Wrap 615+

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3M™ Fire Barrier Duct Wrap 615+ Fire Resistant Enclosing Construction of Ducting – Installation Guide

Contents

Section 1 Introduction

3M™ Fire Barrier Duct Wrap 615+ Fire Resistant Enclosing Construction of Ducting

A fire-resistant construction element is classified by a Fire Resistance Level (FRL), determined by a Fire Endurance Test (AS1530.4), with the result given as duration. An FRL will be shown in the format of 30/30/30 through to 240/240/240, where the numbers represent the minutes for which the element can withstand the following criteria when subject to a standardised heating regime from AS1530.4:

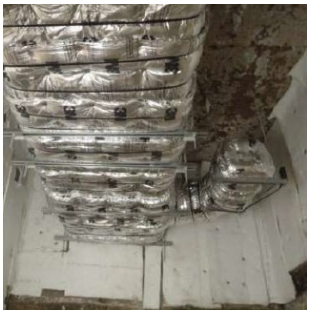
- Resists collapse — Structural Adequacy
- Resist passage of flames and hot gases passing from the fire exposed side to the unexposed side - Integrity
- Limits the transfer of heat from the fire exposed side to the unexposed side — Insulation

When electrical, plumbing services need to pass through these fire-resistant barriers (or fire separating elements), the fire resistance of the barrier is compromised, and the FRL needs to be restored. For ducts that pass through a fire separating element such as a wall or floor, the FRL of the element similarly needs to be restored. For many types of ducts, this can be achieved through use Fire Dampers, which close off the duct when impacted by fire.

For some ducts, fire dampers may interfere with normal duct operation, or the normal operation of the duct may damage fire damper and render it inoperable in fire mode. Or the duct must continue to operate and not “close off” during a fire. In these cases, fire dampers should not be included, examples include commercial kitchen and laboratory exhaust systems, zone pressurization systems and smoke exhausts. For these applications, fire-resistant enclosing construction with 3M Fire Barrier Duct Wrap 615+ provides a clean, simple, lightweight and tested method of restoring the fire separation of compartments and protects the ductwork from collapse or failure.

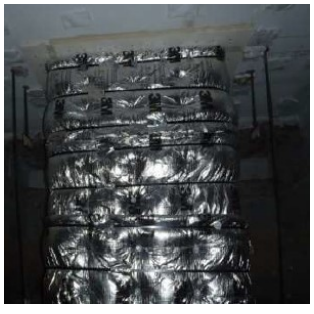
AS1530.4, Section 9 Ducts provides the configurations and methodology for determination of the FRL for the enclosing construction of ducts, with 4 different test configurations to be conducted:

Walls (Horizontal) – Internal Exposure



Walls (Horizontal) – External Exposure

Floors (Vertical) – Internal Exposure



Floors (Vertical) – External Exposure

3M 615+ duct wrap is a lightweight alternative to sprays and boards for the fire-resistant enclosure of ducts passing through different fire compartments via walls and floors with an FRL.

Section 2 Product Information & Technical Data

2.1 Product Description

3M™ Fire Barrier Duct Wrap 615+ is a flexible fire-resistant wrap consisting of an inorganic fiber blanket encapsulated with a scrim-reinforced foil. The product is 38 mm thick, 96 kg.m-3 density[1]. It is used as a Fire Resistant Enclosing Construction, as described in AS1668.1. With its excellent insulating capabilities, low weight and thin profile, it is a good choice for a duct enclosure system. This non-asbestos[2] wrap installs easily due to its high flexibility and strength.
[1]In accordance with the tolerances in ASTM C892 Standard Specification for HighTemperature FiberBlanket Thermal Insulation. [2]Has been demonstrated to be soluble in the lungs according to EU guideline 97/69/EG, for biopersistence.

2.2 Product Features

- High flexibility for installation ease
- Foil encapsulated for blanket protection, less dust, and high wrap strength
- Available in 609.6mm x 7.62m, 1220 mm x 7.62m rolls and 150 mm x 7.62m “collar”.
- Blanket adhered to foil scrim helps prevent wrap from slumping.
- Meets the requirements for WEL[3] for Halogenated Flame retardants, urea-formaldehyde and free from Asbestos.
- *[3]To our knowledge, which may be based in whole or in part on information from suppliers to 3M, halogenated flame retardants and urea-formaldehyde are not present at 100 ppm or greater in the above product.*

2.3 Applications

3M Fire Barrier Duct Wrap 615+ is a fire resistive enclosure for ductwork in accordance with AS1668.1 (2015) and the National Construction Code Volume 1 (2019). 3M™ Fire Barrier CP25WB+ and 3M Venture™ 1520CW Foil Tape is used in combination with 3M Fire Barrier Duct Wrap 615+ to firestop the duct when the duct penetrates fire-rated floor or wall assemblies. 3M Fire Barrier Duct Wrap 615+ also provides a firestop solution where the insulation criteria of service penetration must be met - see individual system test reports documents.

2.4 Specifications

Installation shall be in strict accordance with manufacture’s written instructions, as detailed in the 3rd Party laboratory reports. 3M Fire Barrier Duct Wrap 615+ is a high-temperature fibrous thermal insulation blanket encapsulated in a fiberglass-reinforced aluminized polyester foil. The density is nominally 96 kg/m3 and have a nominal 38 mm thickness.

2.5 3M Fire Barrier Duct Wrap 615+ helps contribute to credits under the following US Green Building Council’s Leadership in Energy and Environmental Design (LEED) v4 Standards:

- Packaging
- Indoor Environmental Quality (EQ) - Low Emitting Materials

2.5 Performance & Typical Physical Properties

Characteristic	Value
Scrim Colour:	Aluminium with Black Text
Blanket Colour	White
Blanket Weight:	4.38 kg/m^2
Surface Burning: Foil Encapsulated Blanket (ASTM E 84)	Flame Spread 0, Smoke Development 0
R-Value (per 38 mm layer) at 23°C ASTMC518/AS4859.1 CSIRO Report :XC3363_R2	1.1 m^2·K·W^{-1}
Linear Shrinkage (24 hrs at 1000°C)	1.2%
VOC	0%
Linear Shrinkage 24 Hour @ 2012°F (1100°C)	1.2%
Noise Reduction Coefficient – NRC (ASTM C423)	0.80
Mold and Mildew Resistance (ASTM C1338)	Devoid of growth
Duct Service Temperature (ASTM C411)	Maximum Operating Temperature: 121°C[4]

Thermal Conductivity	
W/m.K	Temperature
0.09	260°C
0.17	537°C
0.28	815°C
0.36	982°C

[4]For ducts that operate with a surface temperature exceeding 121°C, contact your local 3M representative for further installation considerations.

2.6 Packaging, Storage, Shelf Life

3M Fire Barrier Duct Wrap 615+ rolls are packaged in corrugated cardboard boxes. Product is stable under normal storage conditions. Normal stock and stock rotation practices are recommended. 3M Fire Barrier Duct Wrap 615+ shelf life is indefinite when stored in original unopened packaging in a dry warehouse environment. Pallets should not be stacked. 3M Fire Barrier CP25WB+ must be also stored in a dry warehouse environment.

2.7 Maintenance

No maintenance is expected when installed in accordance with the applicable third-party listed system and in accordance with 3M Fire Barrier Duct Wrap 615+ Installation Guidelines. Once installed, if any section of the 3M Fire Barrier Duct Wrap 615+ is damaged such that the blanket requires repair, the following procedure will apply:

1. If the blanket has not been damaged but the foil has ripped, seal the rips with 3M™ Venture Tape™ Aluminium Foil Tape 1520CW.
2. If the blanket has been damaged:

    a. The damaged section should be removed by cutting the steel banding or removing the clips holding it in place.
    b. A new section of the same dimension should be cut from a roll of 3M Fire Barrier Duct Wrap 615+, either 609mm or 1220 mm wide.
    c. The new section should be placed and fitted ensuring the same overlap that existed previously (i.e. the original installation method).
    d. The steel banding should be placed around the material and tensioned so as to sufficiently hold the 3M Fire Barrier Duct Wrap 615+ in place.

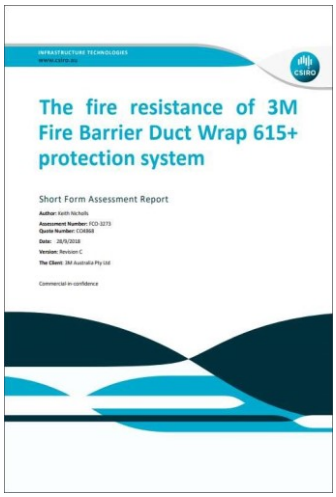
2.8 Safe Handling Information

Prior to handling or disposal, consult all relevant Safety Data Sheets (SDS).

Section 3 Test and reports relating to tests to AS1530.4

The parts in section 3 described as “No substitutions” must match the 3M brand and part number in order to match the tested prototypes, and therefore meet the requirements for FRL described in the test reports. In other cases (required or optional), materials only need to meet the generic description & performance specification. Installation is based on matching the detail described in the reports relating to tests in accordance with AS1530.4 (section 9) for both Internal and External exposure.
NOTE: If an installation or arrangement is outside of the detail described in the reports, the designer / installer shall seek independent advice from a fire engineer.

Configuration	Laboratory	FRL/ FRR	Report #	AS1530.4 Test Standard
Internal / Horizontal	CSIRO	60/60/60 and 120/120/120	FC03273 (D)	2014
External / Horizontal	BRANZ		FAR4433 & TO4812	2005
Internal / Vertical	CSIRO		FC03273 (D)	2014
External / Vertical	BRANZ		FAR4433 & TO4812	2005
Access Door	CSIRO		FC03273 (D) & FC4812	2005 & 2014



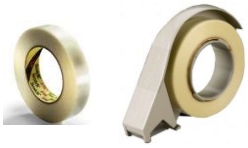
Test Reports

The above reports are assessment reports prepared by Accredited Testing Laboratories, that confirm that the FRL is capable of being achieved in accordance with a particular edition of AS1530.4 for the referenced tests, and certifies that the building element is capable of achieving the FRL despite the minor departures from the tested prototype; and describes the materials, construction and conditions of restraint which are necessary to achieve the FRL. Both CSIRO & BRANZ hold suitable accreditation for Fire Endurance Testing & Assessment per the NCC requirements. For further details, see the following publication from the Fire Protection Association Australia:

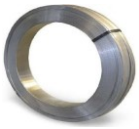
http://www.fpaa.com.au/media/274500/fpa_australia_-_ib_17_ncc_2019_note_on_as_1530.4.pdf

Important Note : This installation guide has been prepared based on the test reports, however this document is not evidence of suitability as required by the National Construction Code . It is not possible to test the vast array of duct configurations and sizes, and therefore it is not always possible to match an installation with a tested or assessed prototype described in the reports. Designers and installers are strongly encouraged to seek independent advice from a qualified fire engineer and certifier before proceeding with an installation.

Section 4 Parts & Accessories

Item	Specification	Description	
3M Fire Barrier Duct Wrap 615+ (blanket)	No Substitutions	Either 609 mm or 1220 mm wide by nom. 38 mm thick, 7.62m standard length.	
3M Fire Barrier Duct Wrap 615+ (Collar)	No Substitutions	For cover over 615+ butt joints. 152 mm wide by nom 38 mm thick by 7.62 m standard length. (alternative – cut 609 or 1220 mm 615+ to 150 mm for butt joint lap cover).	
Foil Tape	No Substitutions	3M Venture Tape Aluminium Foil Tape 1520CW, 99 mm width. Use for sealing cut edges on the 615+ wrap, and for sealing lap joints between butt joins and overlaps.	
3M eFIS	No Substitutions	3M™ Expantrol™ Flexible Intumescent Strip (E-FIS), 12.7 mm width, self adhesive strip. Applied to access door insultation cover.	
Filament Tape	Required	3M Scotch® Filament Tape 8981, 18 -24 mm & H12 Filament tape dispenser. Installation aid, assisting in holding the 615+ duct wrap in place before banding & pinning / or equivalent	
Sealant	No Substitutions	3M Fire Barrier Sealant CP 25WB+ - for sealing gaps in construction element penetration seals.	
Capacitive discharge Insulation Pin Welder	Required	For welding pins to the underside of the wrap on horizontal ducts, and 2 long sides of vertical ducts. Minimum specification - capable of welding 2.7 mm CD Pins, 38, 75 & 100 mm	
CD PIns	Required	Insulated cup head pins minimum 2.7 mm thick, 38, 75 & 100 mm length with min 30 mm head. Pins are applied using CD cuphead pin welder, welded through the 3M Fire barrier Duct wrap 615+ blanket.	

4. Parts & Accessories (continued)

Item	Specification	Description	
Retaining Angle	Required	50 x 50 or 50 x 75 mm, 2mm gauge steel angle (galvanised or mild steel)	
Fixings – to construction element	Required	Refer to individual construction element details in sections 5 & 6 of the installation guide for fasteners specific to wall & floor type.	
Fixings – Angle to duct	Required	5mm ø x 10mm length blind steel rivets	
Collar surround & Access door cover	Required	16 mm Fire Resistant Plasterboard or 30mm Glasroc F gypsum board	
Access Door	No Substitutions	DuctMate Ultimate, Door with Insulation Kit and Outer Plate, Size to suit required opening. Required for Horizontal Kitchen exhaust ducts to facilitate cleaning.	
Steel Banding	Required	Minimum 12.7 mm width, 0.5 mm thick galvanised or stainless steel banding.	
Banding wing seal clips	Required	Steel clips, to suit banding. When the steel banding is folded back, and the clip "wings" are folded over, the steel banding is secured.	
Banding Tensioner	Required	A tool designed for pull the steel banding taut but ensuring that the banding does not cut into the 615+ Wrap.	

Other Accessories

Item	Specified	Description	
Disposable Respirator	Required	P2 Particulate - example 3M Particulate Respirator 9322A+P2 or Equivalent	
Measuring Tape	Optional	Measuring length required for layers (circumferential)	
Banding Cutter	Required	Cutting steel banding, removal of excess steel banding.	
Cutter	Required	Cutting 3M Fire Barrier Duct Wrap 615+ blanket	
Long Nose pliers	Required	Pliers for folding back the wing clips that secure the steel banding	

Section 5 Installation detail for Horizontal Ducts Passing through 60/60/60 or 120/120/120 walls up to 1250 x 1000 mm (See appendix A for Ducts larger than 1250 x 1000 mm)

5.1 Penetration Detail

5.1.1 Plasterboard Walls

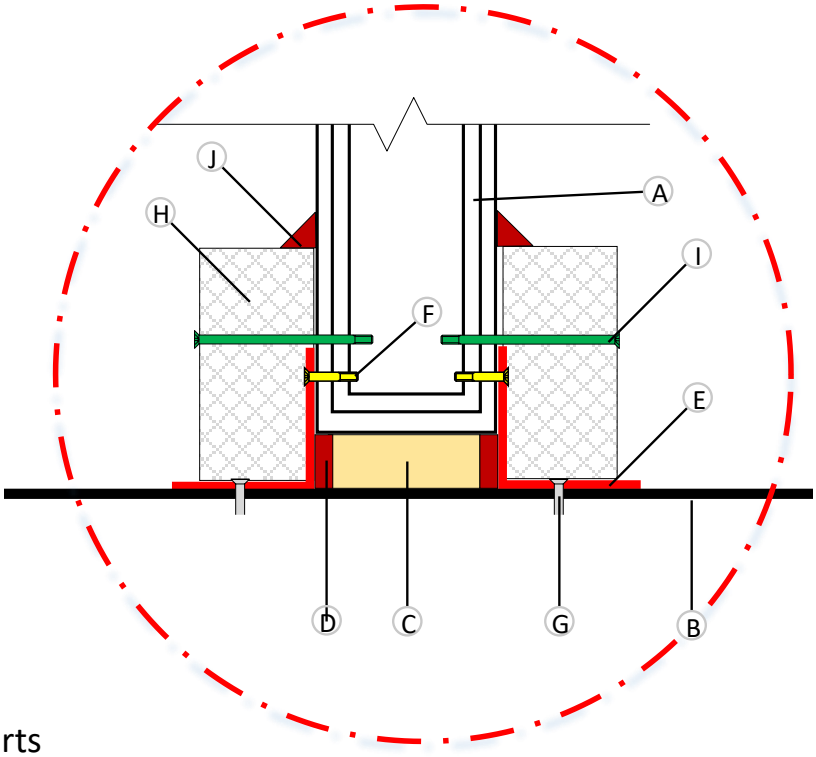


Figure 5.1 – Penetration Detail for Plasterboard walls

Table 5.1 – Legend / description of parts

Item	Description
A	**Plasterboard wall** – Min thickness 116mm, FRL 120/120/120. The opening shall be framed around the opening and lined with fire resistant plasterboard. Note: for Plasterboard walls 60/60/60, the wall thickness shall be built up proximal to the penetration to 116 mm.
B	**Duct Wall** - Steel duct constructed to AS 4254, pressure class 1000 Pa or higher.
C	**Duct / Wall Gap & gap packing** – compressed un-foiled contents of 3M Fire Barrier Duct Wrap 615+ fill the full width of the gap (15 mm recess depth for sealant) . For Ducts up to 900 x 900 mm, 20 – 35 mm gap. (Refer Appendix A for larger ducts)
D	**Seal around duct/wall and floor gap packing** - 3M Fire Barrier CP25WB+. 15mm minimum depth or a depth 50% of the joint width
E	**Steel Retaining angle:** • Ducts up to 900 x 900 mm, 50 x 75 x 2 mm • Ducts > 900 x 900 mm, 50 x 100 x 2 mm
F	**Retaining Angle Fastener (to wall)** - 8-gauge x 50mm flat-head plasterboard screw @ 200 mm centres (countersunk into steel angle).
G	**Retaining Angle Fastener (to duct)** - 5mm ø x 10mm length blind steel rivets @ 200 mm centres.
H	**Gypsum board Collar** - Min 60 mm thick fire resistant gypsum board (Four layers of 16mm fire grade plasterboard or 2 layers of 30 mm Glasroc F). For ducts 900 x 900 or less, the collar shall be 125 mm width. For larger ducts, the collar shall be 150 mm width . Collar may be constructed from 4 sections of board, butt jointed together , with all gaps sealed with 3M Fire Barrier CP25WB+.
I	**Collar Fixing Screws** - with 8 gauge x 100 mm plasterboard/wood screw @ 200 mm centres. All gaps sealed with 3M fire barrier 3M Fire Barrier CP25WB+.
J	Seal around Collar - 3M Fire Barrier CP25WB+, 10 mm fillet.

5.1.2 Concrete & Masonry Walls

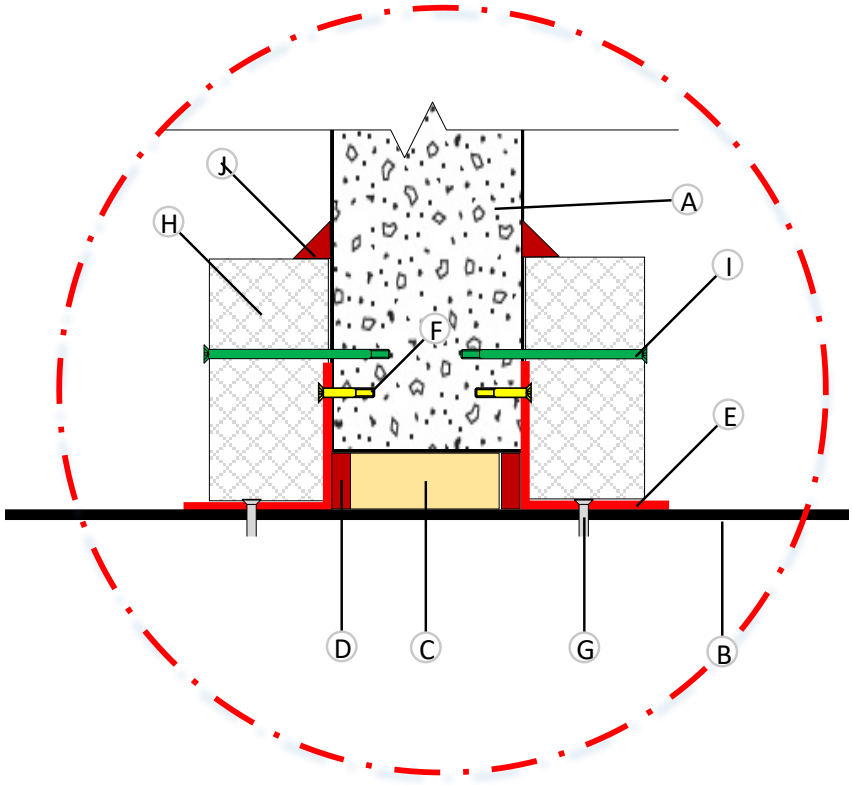


Figure 5.2 – Penetration Detail for Concrete & Masonry walls

Table 5.2 – Legend / description of parts

Item	Description
A	**Concrete & Masonry Wall** – Min thickness 100mm, FRL 120/120/120
B	**Duct Wall** - Steel duct constructed to AS 4254, pressure class 1000 Pa or higher.
C	**Duct / Wall Gap & gap packing** – compressed un-foiled contents of 3M Fire Barrier 615+ Duct Wrap fill the full width of the gap (15 mm recess depth for sealant) . For Ducts up to 900 x 900 mm, 20 – 35 mm gap. (Refer Appendix A for larger ducts).
D	**Seal around duct/wall and floor gap packing** - 3M Fire Barrier CP25WB+ . 15mm minimum depth or a depth 50% of the joint width
E	**Steel Retaining angle:** • Ducts up to 900 x 900 mm, 50 x 75 x 2 mm • Ducts > 900 x 900 mm, 50 x 100 x 2 mm
F	**Retaining Angle Fastener (to wall)** - 8-gauge x 50mm flat-head masonry screw @ 400 mm centres (countersunk into steel angle).
G	**Retaining Angle Fastener (to duct)** - 5mm ø x 10mm length blind steel rivets @ 200 mm centres.
H	**Gypsum board Collar** - Min 60 mm thick fire resistant gypsum board (Four layers of 16mm fire grade plasterboard or 2 layers of 30 mm Glasroc F). For ducts 900 x 900 or less, the collar shall be 125 mm width. For larger ducts, the collar shall be 150 mm width . Collar may be constructed from 4 sections of board, butt jointed together , with all gaps sealed with 3M Fire Barrier CP25WB+.
I	**Collar Fixing Screws** - with 8-gauge x 100 mm plasterboard/wood screw @ 200 mm centres. All gaps sealed with 3M fire barrier 3M Fire Barrier CP25WB+
J	**Seal around Collar** - 3M Fire Barrier CP25WB+, 10 mm fillet.

5.1.3 Autoclaved Aerated Concrete Walls

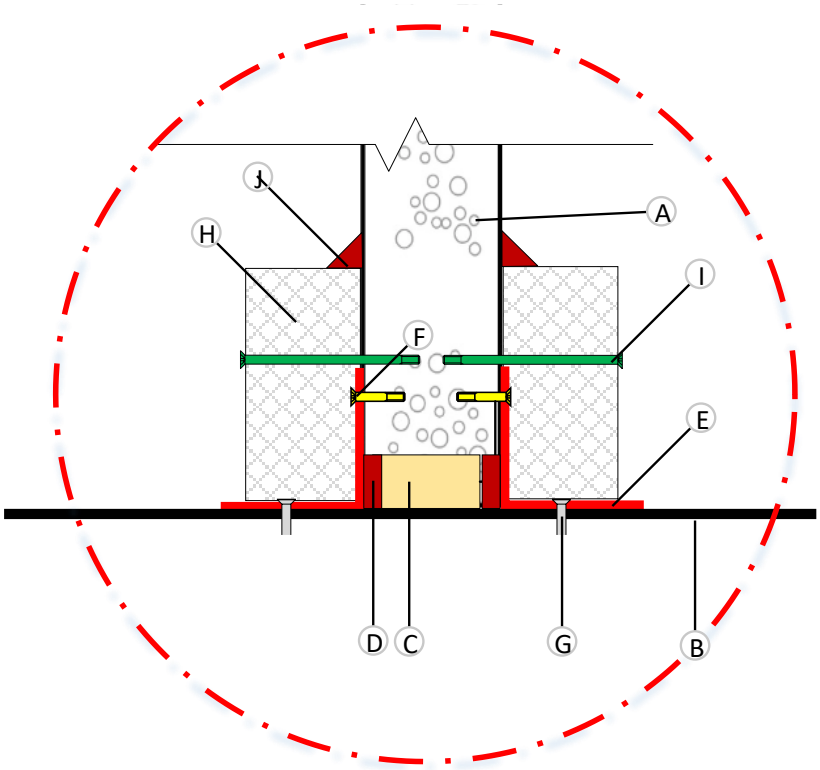


Figure 5.3 – Penetration Detail for Concrete & Masonry walls

Table 5.3 – Legend / description of parts

Item	Description
A	**Autoclaved Aerated Concrete (AAC) panel wall**, Min thickness 75mm, FRL 120/120/120
B	**Duct Wall** - Steel duct constructed to AS 4254, pressure class 1000 pa or higher.
C	**Duct / Wall Gap & gap packing** – compressed un-foiled contents of 3M Fire Barrier 615+ Duct Wrap fill the full width of the gap (15 mm recess depth for sealant) . For Ducts up to 900 x 900 mm, 20 – 35 mm gap. (Refer Appendix A for larger ducts)
D	**Seal around duct/wall and floor gap packing** - 3M Fire Barrier CP25WB+ . 15mm minimum depth or a depth 50% of the joint width
E	**Steel Retaining angle:** • Ducts up to 900 x 900 mm, 50 x 75 x 2 mm • Ducts > 900 x 900 mm, 50 x 100 x 2 mm
F	**Retaining Angle Fastener (to wall)** – 14 gauge x 50 mm flat top screw, 17TPI @ 200 mm centres (countersunk into steel angle).
G	**Retaining Angle Fastener (to duct)** - 5mm ø x 10mm length blind steel rivets @ 200 mm centres.
H	**Gypsum board Collar** - Min 60 mm thick fire resistant gypsum board (Four layers of 16mm fire grade plasterboard or 2 layers of 30 mm Glasroc F). For ducts 900 x 900 or less, the collar shall be 125 mm width. For larger ducts, the collar shall be 150 mm width . Collar may be constructed from 4 sections of board, butt jointed together , with all gaps sealed with 3M Fire Barrier CP25WB+.
I	**Collar Fixing Screws** - with 8 gauge x 100 mm plasterboard/wood screw @ 200 mm centres. All gaps sealed with 3M fire barrier 3M Fire Barrier CP25WB+
J	**Seal around Collar** - 3M Fire Barrier CP25WB+, 10 mm fillet

5.2 Layering requirements for Horizontal Ducts through Walls

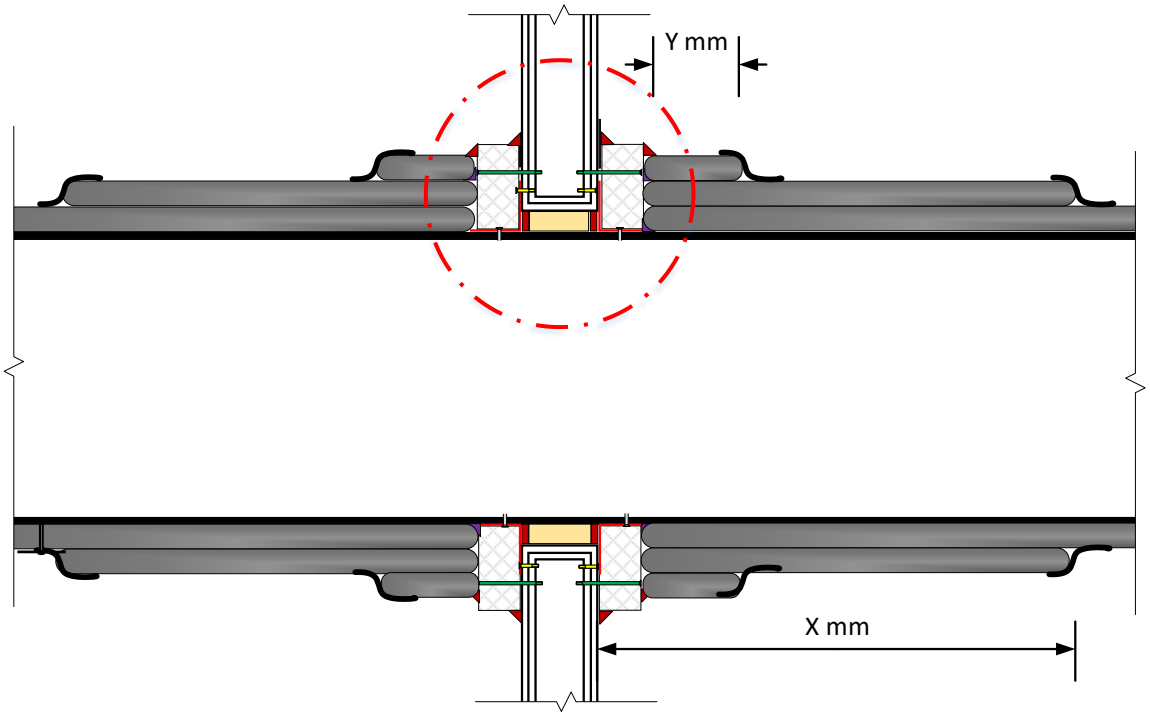


Figure 5.5 - General Layering configuration. Note – layering and penetration detail is symmetrical about the separating element

Duct Width (mm)	Duct Height (mm)	60/60/60		120/120/120	
		X (mm)	Y (mm)	X (mm)	Y (mm)
600	600	1000	None	2000	150
600	900	1100	None	2000	150
600	1200	1100	None	2000	150
900	900	1200	None	2000	150
900	1200	1200	None	2000	150
1200	1000	1200	None	2000	150

Table 5.1 - Dimensions for Layers 2 & 3 . Refer to Appendix A for Ducts larger than 1200 x 1000 mm

Note : CP25WB+ is applied in a min 15 mm fillet where the top layer of 3M Fire Barrier Duct Wrap 615+ interfaces with the gypsum board collar.

Section 6
Installation detail for Vertical Ducts Passing through 60/60/60 or 120/120/120 floors

6.1 – Penetration Detail

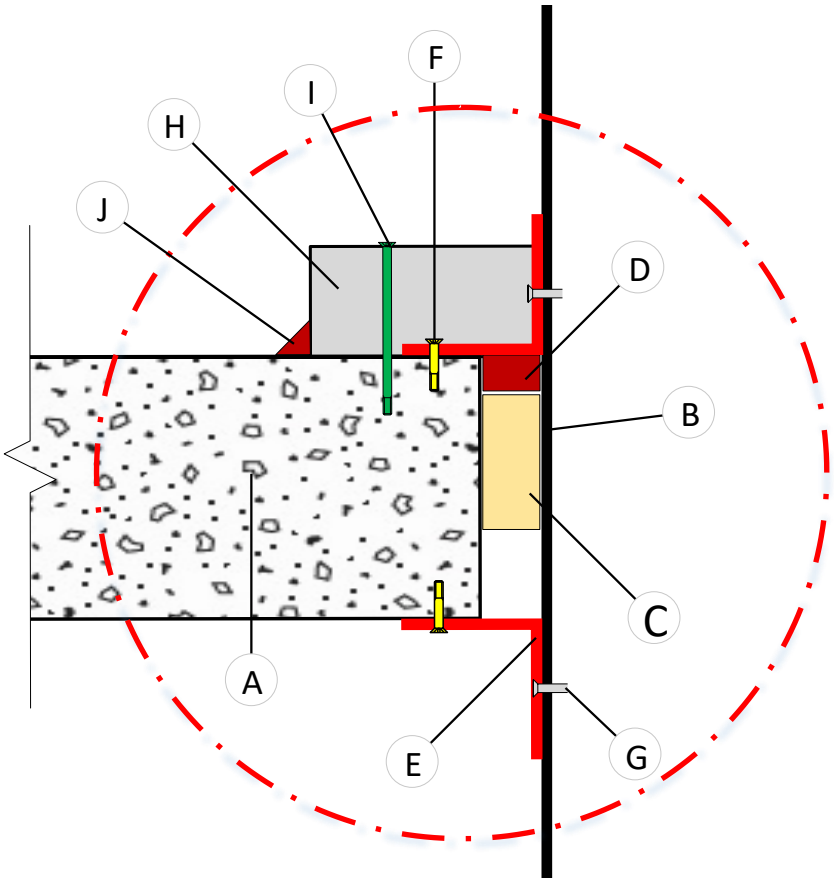


Figure 6.1 – Penetration Detail for Concrete & Masonry walls. (Note : penetration of floors is asymmetrical about the separating element)

Table 6.1– Legend / description of parts

Item	Description
A	**Concrete Slab,** FRL 120/120/120
B	**Duct Wall** - Steel duct constructed to AS 4254, pressure class 1500 pa or higher.
C	**Duct / Floor Gap & gap packing** – compressed un-foiled contents of 3M Fire Barrier 615+ Duct Wrap fill the full width of the gap (15 mm recess depth for sealant) . For Ducts up to 900 x 900 mm, 20 – 35 mm gap. (Refer Appendix A for larger ducts)
D	**Seal around duct/wall and floor gap packing** - 3M Fire Barrier CP25WB+ . 15mm minimum depth or a depth 50% of the joint width
E	**Steel Retaining angle:** • Ducts up to 900 x 900 mm, 50 x 75 x 2 mm • Ducts > 900 x 900 mm, 50 x 100 x 2 mm
F	**Retaining Angle Fastener (to Floor)** – 10 gauge x 30 mm flat head screw, 16TPI @ 200 mm centres (countersunk into steel angle).
G	**Retaining Angle Fastener (to duct)** - 5mm ø x 10mm length blind steel rivets @ 200 mm centres.
H	**Gypsum board Collar** - Min 60 mm of Gypsum board (Four layers of 16mm fire grade plasterboard or 2 layers of 30 mm Glasroc F). For ducts 900 x 900 or less, the collar shall be 125 mm width. For larger ducts , the collar shall be 150 mm width . Collar may be constructed from 4 sections of board , butt jointed tighter , with all gaps sealed with 3M CP25WB+
I	**Collar Fixing Screws** - 8 gauge x 50mm flat-head masonry screw @ 400 mm centres (countersunk into steel angle). All gaps sealed with 3M fire barrier 3M Fire Barrier CP25WB+
J	**Seal around Collar** - 3M Fire Barrier CP25WB+, 10 mm fillet

6.2 – Layering requirements for Vertical Ducts through Floors

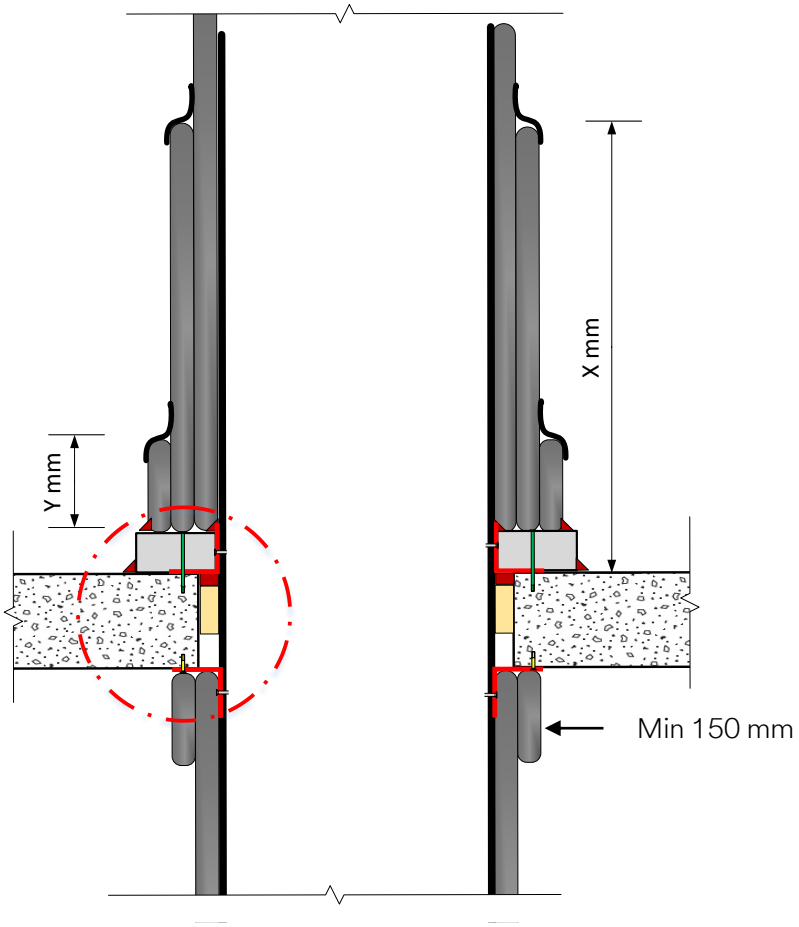


Figure 6.2 - General Layering configuration. Note – layering and penetration detail is asymmetrical about the separating element. Note : CP25WB+ is applied in a min 15 mm fillet where the top layer of 615+ duct wrap interfaces with the gypsum board collar.

Table 6.2 - Dimensions for Layers 2 & 3 (X /Y). Refer to Appendix A for Ducts larger than 1200 x 1000 mm

Duct Width (mm)	Duct Height (mm)	FRL 60/60/60		FRL 120/120/120	
		X	Y	X	Y
600	600	1100	150	2300	1000
600	900	1200	150	2500	1100
600	1200	1300	150	2600	1200
900	900	1400	150	2700	1200
900	1200	1400	150	2900	1300
1200	1000	1500	150	3000	1300

Section 7–Installation Techniques

7.1 Single Layer sections

To minimize waste, the 3M Fire Barrier Duct Wrap 615+ material should be rolled out tautly before measuring. The single layer of 3M™ Fire Barrier Duct Wrap 615+ blanket is wrapped around the perimeter of the duct and is cut to a length to overlap itself not less 100mm, this is known as the “circumferential” or “lateral” joint. The joint shall be sealed with 99 mm 1520CW foil tape. The interface between adjacent blankets forms the “longitudinal” joint , which may be either a butt joint with a duct wrap collar cover , or a telescopic type overlap joint , with a minimum overlap of 100mm. 3M Venture 1520CW aluminum foil tape is used to seal all cut edges of the blanket and any tears in the foil scrim.

As an installation aide, the blanket may be temporarily held in place using 3M 8981 filament tape. The 3M Fire Barrier Duct Wrap 615+ requires permanent fastening with steel banding, and rows of CD welded pins cup head pins.

7.2 Second layer sections

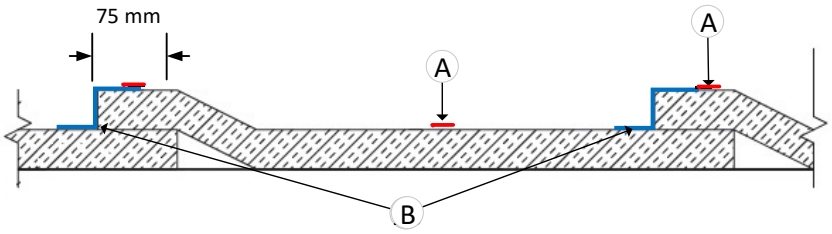
3M Fire barrier Duct Wrap 615+ should be rolled out tautly before measuring. The first layer of 3M™ Fire Barrier Duct Wrap 615+ blanket is wrapped around the perimeter of the duct and is cut to a length to either butt to itself or overlap itself not less 100mm . The interface between adjacent blankets forms the “longitudinal” joint. Inner layer longitudinal joints can be tightly butted joints or they should overlap onto adjacent blankets with a min. 100mm overlap. Venture 1520CW foil tape is used to seal all cut edges of the blanket and any tears in the foil scrim. This first layer is temporarily held in place using filament tape. The first layer does not require steel banding.

The second layer of 3M Fire Barrier Duct Wrap 615+ is wrapped around the perimeter of the previously installed first layer of 3M™ Fire Barrier Duct Wrap 615+. The other layer perimeter (lateral) joints should be offset a minimum 100mm from the inner layer perimeter joints. The perimeter joints should be a minimum 100mm overlap.

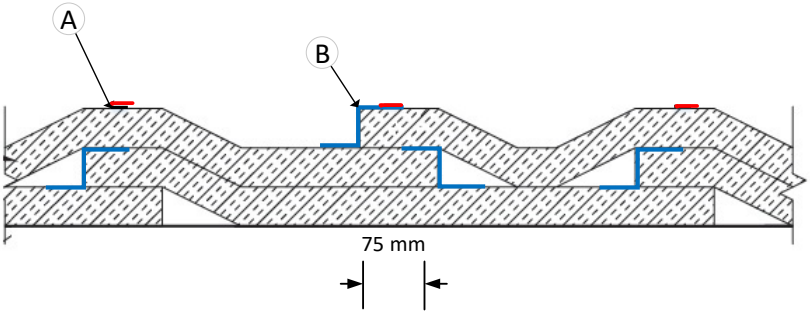
Offset the outer layer longitudinal joints a minimum 270 mm from the inner layer longitudinal joints. The outer layer longitudinal joints should be a minimum 100mm overlap or use the “Butt Joint with Collar Method” where it is permissible for the longitudinal joints to be tightly butted and then covered with a minimum 6" wide collar centered over it. These are available pre-made (3M™ Fire Barrier Duct Wrap 615+ Collar). The second layer of wrap can be temporarily held in place using filament tape. The second layer of wrap requires permanent fastening with steel banding and cup head CD weld pins.

7.3 Layering and Overlapping

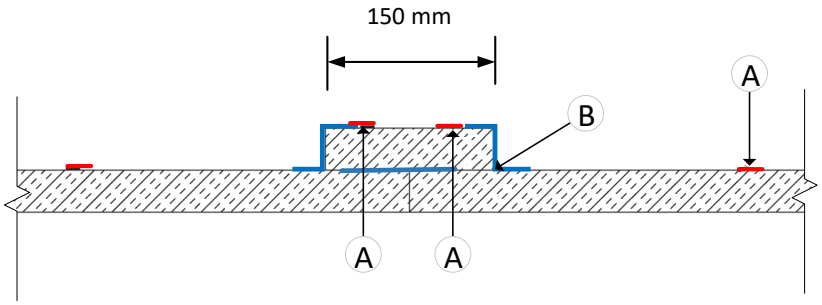
Telescopic Method – sections requiring a single Layer only



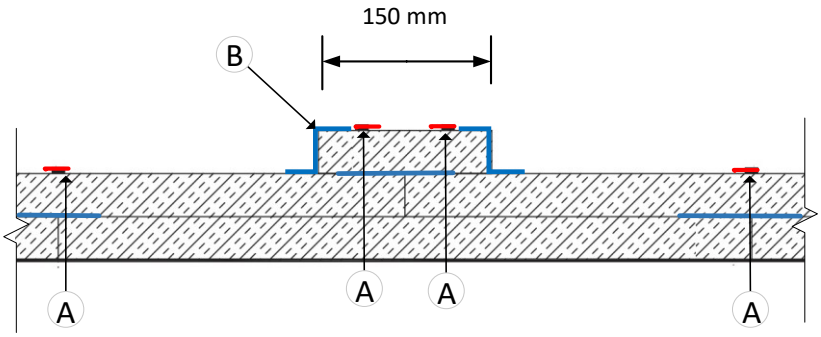
Telescopic Method – sections requiring a double layer.



Butt Joint Method – sections requiring a single Layer only



Butt Joint Method – sections requiring a double Layer.



Item	Description
A	Steel Banding (12.7 mm width , 0.5 mm thick) , positioned overlap joints and at a maximum of 300 mm spacing
B	3M Venture 1520CW aluminium foil tape – sealing all butt joins and lap joints

Note : On outer layers , lapping of joints must occur on both circumferential and longitudinal joints. Circumferential outer laps should be off-set from inner layer butt joints by 270 mm. 3M 8981 high strength filament tape can be used to secure duct wrap layers to the duct, and to other layers as an installation aid.

7.4 Pinning & Banding

Horizontal Ducts : The 3M Fire barrier Duct Wrap 615+ is to be fixed to the bottom surface of horizontal ducts using welded 2.7 mm Ø capped, insulated capacitor discharge weld pins applied with an appropriate pin welding gun, with the pin length corresponding with the appropriate number of 615+ wrap layers. Pins should be spaced nominally at 300 mm centres across the duct, starting within 170 mm of each edge of the duct.

Vertical Ducts : The 3M Fire barrier Duct Wrap 615+ is to be fixed to the 2 widest surface of vertical ducts using welded 2.7 mm Ø capped capacitor discharge (cd) weld pins (insulated) applied with an appropriate CD pin welding gun, with the pin length corresponding with the appropriate number of 615+ wrap layers. Pins should be spaced nominally at 300 mm centres across the duct, starting within 170 mm of each edge of the duct.

Additionally, the 615+ Duct Wrap is to be secured to the duct by means of bands of stainless steel min 12.7 mm wide x 0.5 mm thick, tightly clamped around the 3M Fire barrier Duct Wrap 615+ at mid width of each joint, and nominally mid width of each Duct Wrap band at 300 mm spacing , and over any circumferential overlaps. Note , where a 150 mm width 3M Fire barrier Duct Wrap 615+ collar is used to lap over butt joins , 2 bands are required , 50 mm from each edge of the collar.

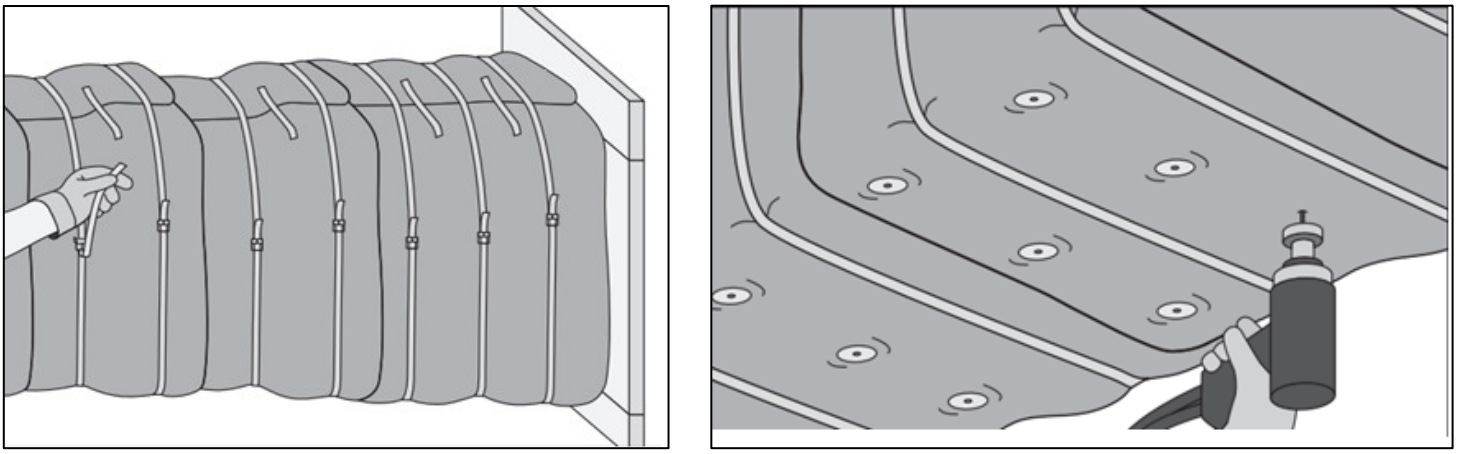
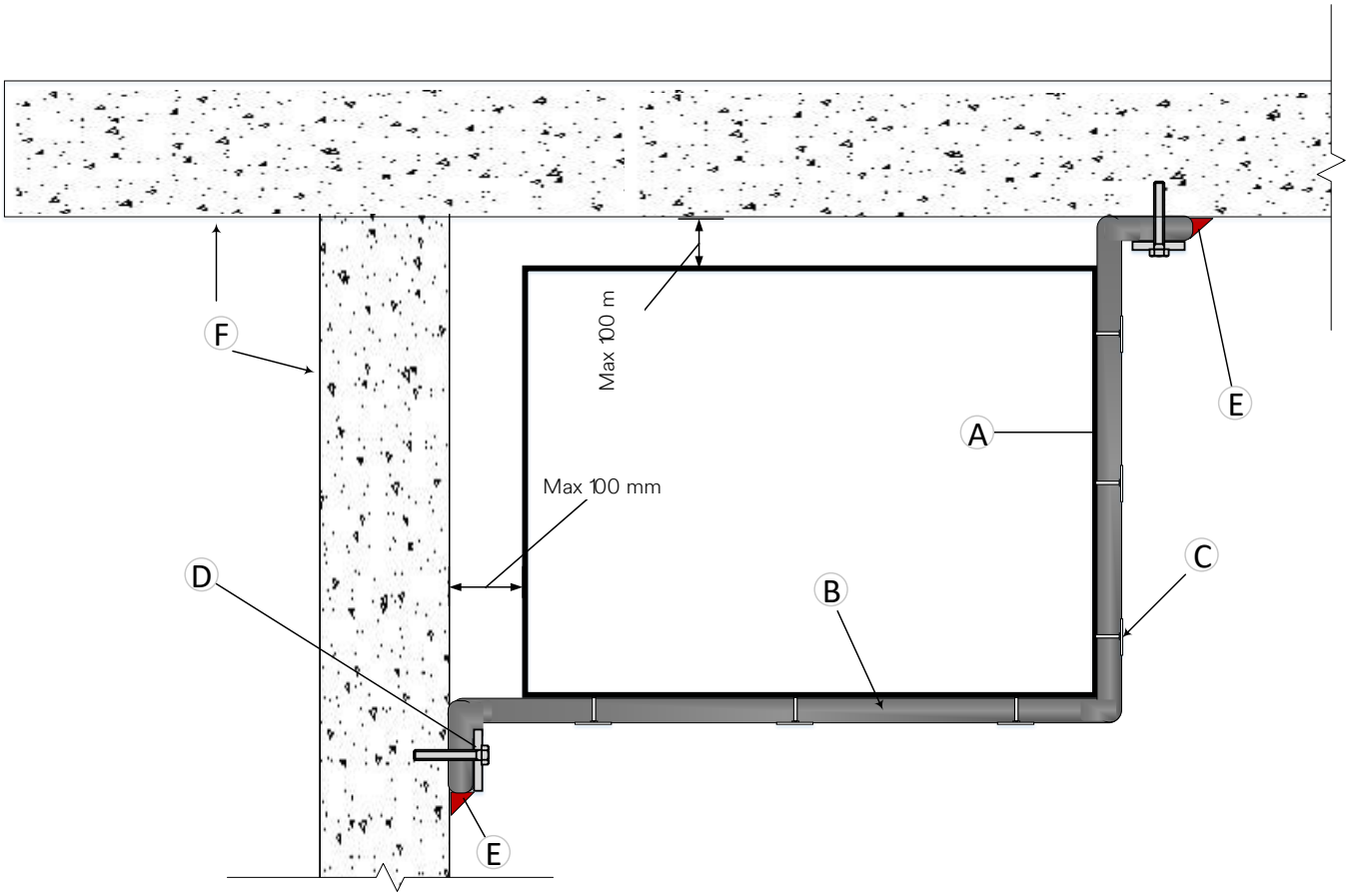


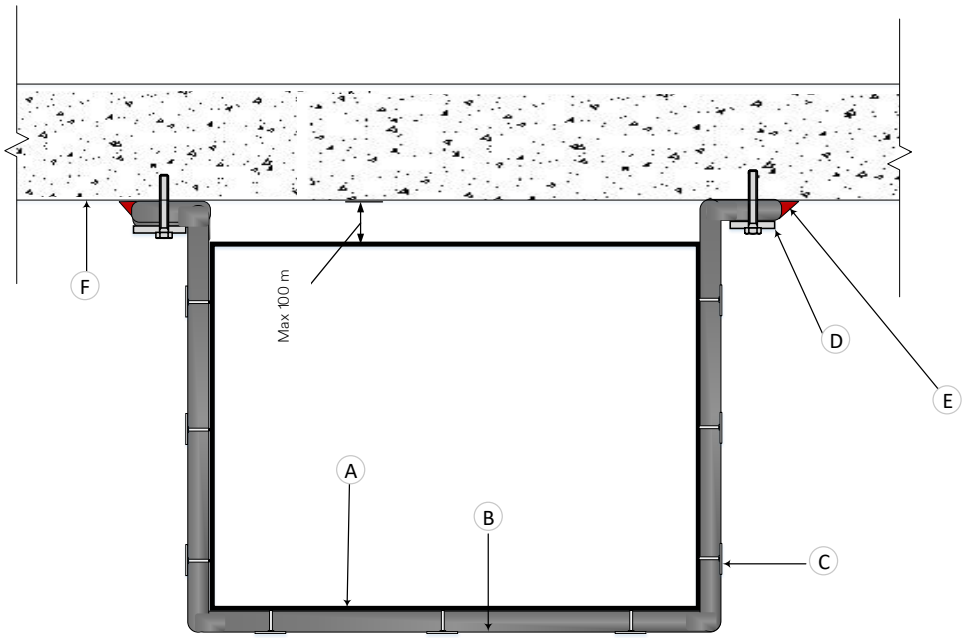
Figure 7.1 – General arrangement for pinning & Banding

7.5 2 Sided Installation



Item	Description
A	Steel duct constructed to AS 4254, pressure class 1000 pa or higher.
B	615+ Duct wrap (1 or 2 layers per section 5 & 6)
C	CD Pins – 38 or 75 mm to suit the number of layers of 615+ required for the nominated FRL and distance from the separation element . (Note – banding is not required)
D	Steel Flatbar, 50 x 2 mm , secured with M6 masonry anchors . Flat bar is used to secure a minimum 75 mm overlap of 615+ to the wall / ceiling
E	CP25WB+ sealant , continuously applied to the edge of the 615+ duct wrap and wall or ceiling.
F	Wall & Ceiling with FRL 60/60/60 or 120/120/120

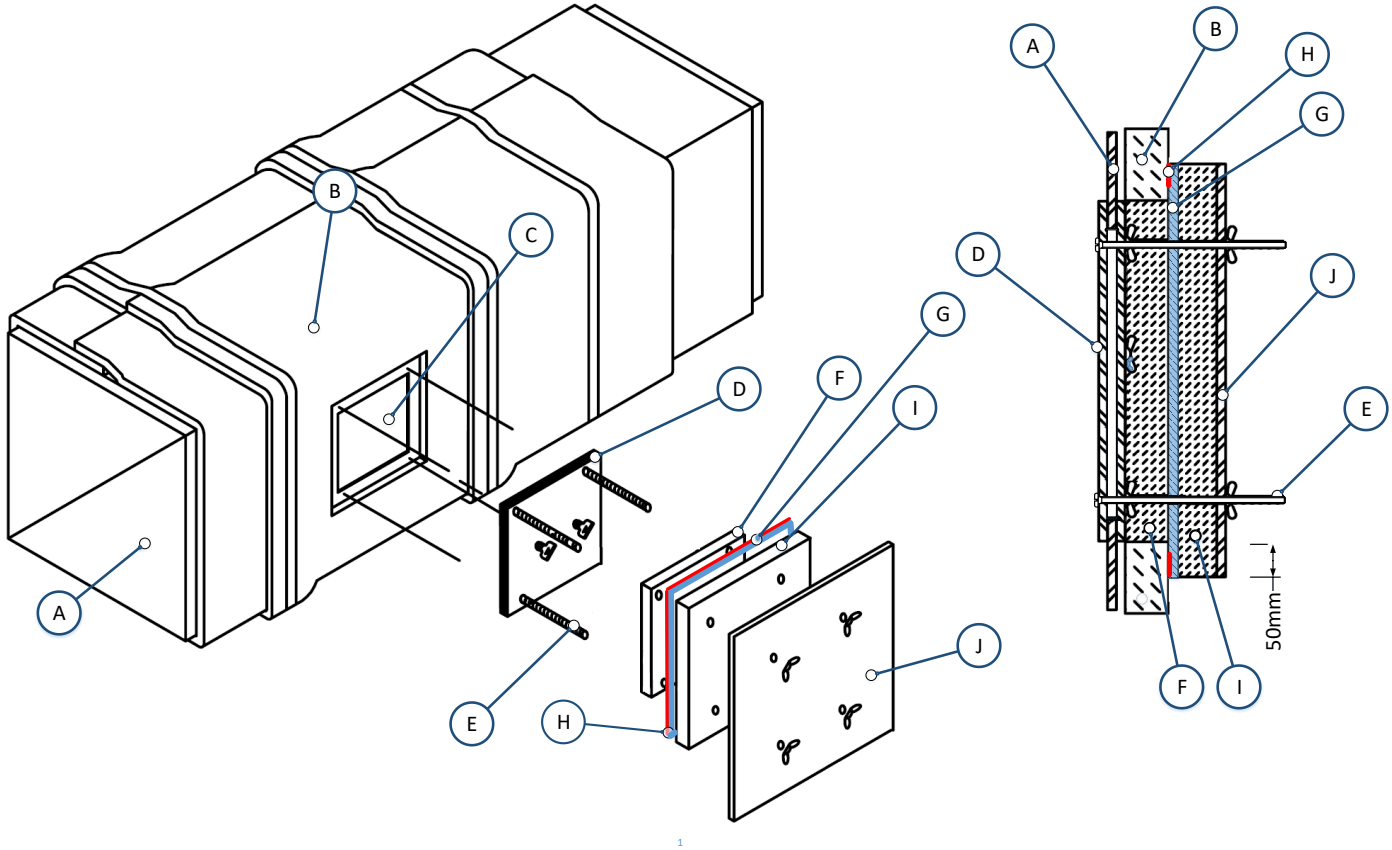
7.6 3 Sided Installation



Item	Description
A	Steel duct constructed to AS 4254, pressure class 1000 pa or higher.
B	615+ Duct wrap (1 or 2 layers per section 5 & 6)
C	CD Pins – 38 or 75 mm to suit the number of layers of 615+ required for the nominated FRL and distance from the separation element . (Note – banding is not required)
D	Steel Flatbar, 50 x 2 mm , secured with M6 masonry anchors . Flat bar is used to secure a minimum 75 mm overlap of 615+ to the wall / ceiling
E	CP25WB+ sealant , continuously applied to the edge of the 615+ duct wrap and wall or ceiling.
F	Floor/ Ceiling with FRL 60/60/60 or 120/120/120

Section 8 - Access doors for Horizontal Kitchen Exhaust

8.1 Access doors interfacing with Single Layer sections



Item	Description
A	Duct Wall - Steel duct constructed to AS 4254, pressure class 1000 pa or higher.
B	615+ Duct Wrap
C	Access panel Opening - Opening cut in the ductwork to suit the appropriate size of the access door. Cut the 615+ wrap layer applied to the duct, such that the opening in the wrap extends 25 mm beyond the access door.
D	Duct-Mate Ultimate Access Panel - Pre-fabricated, access door.
E	Bolt Kit - Duct mate ultimate insulation kit (extension bolt kit) , supplied with access door
F	615+Duct wrap infill – cut to fit snuggly withing the space .
G	16 mm thick plasterboard , cut to overlap F by 25 mm
H	3M Expantrol™ Flexible Intumescent Strip (12.7 mm width) , adhered to the perimeter of plasterboard , 10 mm in from the board edge.
I	615+Duct wrap cover – cut to lap 50mm over the opening in the duct wrap previously applied to the duct (B)
J	Steel Cover Plate supplied with Access door kit

8.3 General Procedure for installation of access door insulation

Note: The most efficient process for installing fire resistant access doors, it to have the door specified and installed by the duct manufacturer during duct fabrication. If this is done, then only addition layers of wrap need be installed on-site.

1. Cut an opening in the Duct Wrap System, 25 mm larger than the outside dimension of the access door.

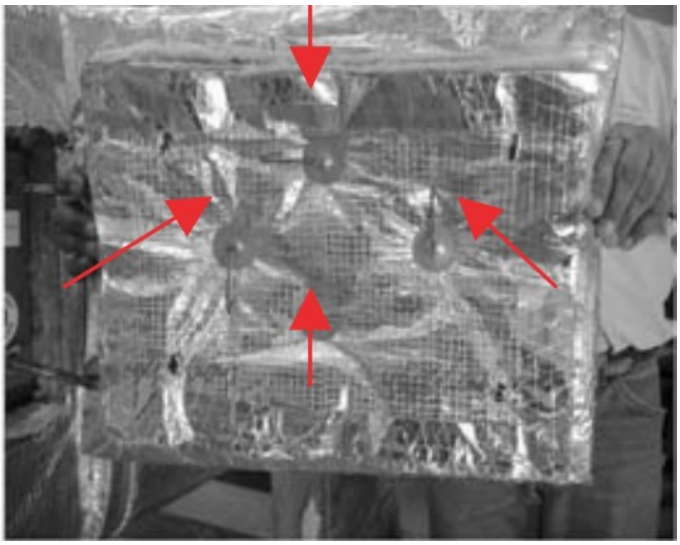
2. Remove the four corner thumb bolts and replace with the four threaded extension rods from the 3M Fire Barrier Grease Duct Access Door Hardware Extension Kit

3. Cut one or two piece(s) of duct wrap (depending on the corresponding layers of 615+ applied to the adjacent duct) , slightly larger than the opening around the access door. Seal the edges with 1520CW foil tape. Impale the cut piece(s) over the threaded rods so that the layer(s) fit snugly against the edges of the layers of 615+ on the duct .

4. Cut another piece of 615+ duct wrap and a piece of 16mm plasterboard so that the plasterboard & 615+ overlap the Duct Wrap opening by 50 mm on all sides. Lay the 615+ on top of the plasterboard , and seal the cut edges of both to create a single wrap /board cover panel. Apply a strip of 3M Expantrol Flexible Intumescent strip around the perimeter of the plasterboard , approximately 10 mm in from the panel edge.

5. To finish , place the steel cover plate . Holes in plate must align with the extension rods of the access door. The outer plate is pushed over the rods and secured in place with wing nuts and washers.

6. For easy removal and re-installation of the insulation and cover plate, the duct wrap and plasterboard layers may be mechanically fastened to inside of the cover plate. Use CD Cuphead insulation pins .



Section 9 Hangers & Support

Horizontal Ducts

Duct hanger rod size, hanger spacing, support, duct BMT, stiffeners, duct jointing shall be in accordance with AS4254.2-2012 as appropriate for Pressure Class 1000. External Exposure testing has demonstrated that M10 mild steel hangers are sufficient for up to 15 MPa without the need for fire protection. The designer shall assess the spacing of hangers and determine that not more than 10 MPa is applied to any single rod. If loads exceed 10 MPa, the additional hangers , or larger gauge threaded rod shall be included.

Vertical Ducts

Support additional to the 2 mm steel angle to be installed per AS4254.1 , and does not need additional fire protection provided stress in the support for steel elements does not exceed 10 MPa.

Section 10 Inspections & Maintenance

When installed in indoor environments and protected from sunlight and weathering , 3M Fire Barrier Duct Wrap 615+ is expected to remain stable and functional. It is however recommended that routine inspections are made to ensure that any of the installation components , such as foil tapes, banding and pinning are sound and intact. In the case that any components are observed to have come adrift ,these should be removed and replaced as part of an overall routine passive fire protection maintenance program .Small tears or rips in the 615+ scrim can be patched with 3M Venture 1520CW foil tape.

Appendix A - Layering requirements for Ducts Larger than 1200 x 1000 mm (Internal Exposure only)

For Horizontal Ducts > 1200 x 1200 mm , testing currently supports internal exposure for ducts up to 3600 x 3600 per tables X & Y . Designers shall involve a fire engineer for larger ducts.

Table X – Horizontal Duct configuration for FRL for Internal Exposure

Duct Width (mm)	Duct Height (mm)	Minimum Annular Gap (mm)	Maximum Annular Gap (mm)	60/60/60		120/120/120	
				X (mm)	Y (mm)	X (mm)	Y (mm)
Horizontal Ducts (Angle size: wall side = 100 mm , Duct side = 50 mm , Gypsum board collar width = 150 mm)							
900	1800	30	45	1300	N/A	2200	150
600	3000	40	55	1300	N/A	2200	150
600	3600	45	60	1300	N/A	2200	150
900	2400	35	50	1400	N/A	2300	150
1200	1800	30	45	1400	N/A	2300	150
900	3000	40	55	1400	N/A	2400	150
1200	2400	35	50	1400	N/A	2500	150
900	3600	45	60	1500	N/A	2500	150
1800	1800	30	45	1500	N/A	2500	150
1200	3000	40	55	1500	N/A	2600	150
1200	3600	45	60	1500	N/A	2600	150
1800	2400	35	50	1500	N/A	2700	150
1800	3000	40	55	1600	N/A	2800	150
2400	2400	40	50	1600	N/A	2900	150
1800	3600	45	60	1600	N/A	2900	150
2400	3000	40	55	1600	N/A	3000	150
2400	3600	45	60	1700	N/A	3100	150
3000	3000	50	55	1700	N/A	3100	150
3000	3600	50	60	1700	N/A	3200	150
3600	3600	60	60	1700	N/A	3300	150
Vertical Ducts (Angle size: wall side = 100 mm , Duct side = 50 mm , Gypsum board collar width = 100 mm							
900	1800	30	45	1600	150	3200	1400
600	3000	40	55	1500	150	3200	1400
600	3600	45	60	1600	150	3300	1400
900	2400	35	50	1600	150	3400	1500
1200	1800	30	45	1700	150	3400	1500
900	3000	40	55	1700	150	3600	1500
1200	2400	35	50	1700	150	3700	1600
900	3600	45	60	1700	150	3700	1600
1800	1800	30	45	1800	150	3800	1600
1200	3000	40	55	1800	150	3800	1600
1200	3600	45	60	1900	150	4000	1700
1800	2400	35	50	1900	150	4100	1700
1800	3000	40	55	2000	150	4200	1700
2400	2400	40	50	2000	150	4300	1700
1800	3600	45	60	2000	150	4400	1800
2400	3000	40	55	2000	150	4500	1800
2400	3600	45	60	2100	150	4700	1800
3000	3000	50	55	2100	150	4800	1800
3000	3600	50	60	2100	150	5000	1900
3600	3600	60	60	2200	150	5200	1900

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