

Regulatory Information Report

RPF24066-2

**Fire resistance test for rectangular air duct
passing through timber-framed plasterboard
wall – External fire exposure**

Issued to:	Firestop Centre Ltd
Test method:	AS1530.4-2014
Report Date:	09/08/2024
Valid till:	09/08/2028
Test number:	PF24066-2

Table of Contents



1.1	Document revision schedule	3
1.2	Signatories	3
2.	Report Summary.....	4
3.	General Information	5
3.1	Testing Scope	5
3.2	Contact Details.....	5
3.3	Timeline	6
3.4	Use of the Report.....	6
4.	Specimen Description.....	7
4.1	Supporting Construction.....	7
4.2	Specimen 1 - Duct.....	7
5.	Additional temperature measurements	13
6.	Permissible variations to the tested specimen	14



1.1 Document revision schedule

Revision #	Date	Description
1	02/08/2024	Initial issue for Client review
2	09/08/2024	Issued to Client

1.2 Signatories

Report	Name	Signature	Date
Prepared by:	Alex Kokorin		09/08/2024
Authorised by:	Andrew Bain (Authorized signatory)		09/08/2024



All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

2. Report Summary

A rectangular air duct with dimensions of 1005mm by 500mm was installed, penetrating through a plasterboard wall and 90x45mm timber stud wall. On the exposed side of the separating element, 2 x 13mm FR Plasterboard sheets were installed, while 1 x 13mm FR Plasterboard was installed on the unexposed side. The supporting construction aperture was protected using a combination of steel angle collar, FR board, ceramic fibre and acrylic sealant. The duct was protected on the fire side with a 38mm thick Firestop Duct wrap, fixed using welded steel pins.

A rectangular access hatch protecting 315mm x 185mm (L x W) opening, was installed on the vertical surface of the duct at exposed side. It was protected by Firestop DuctWrap-38, FR board and FIRESTOP Ultra sealant.

Test results	
Structural adequacy	No Failure at 74 minutes
Integrity	No Failure at 74 minutes
Insulation	31 minutes
Fire resistance level (FRL)	60/60/30
Calculated difference in air temperature, temperature rise per meter	13.84 C°(K)/m

Access Hatch - Test results	
Structural adequacy	Not applicable
Integrity	No Failure at 74 minutes
Insulation	Failure at 43 minutes
Fire resistance level (FRL)	60/60/30

The conditions of the test complied with AS1530.4-2014 requirements.

There were no major observations related to the performance criteria during the test.

3. General Information

3.1 Testing Scope

Applicable Standards:

AS 1530.4-2014 Section 9 Air ducts – External fire

AS 1530.4-2014 Section 10 Service penetrations and control joints

Departures from Testing Method:

No departures from the testing method

Conditions of the test complied with AS1530.4-2014 requirements.

3.2 Contact Details

Accredited Testing Laboratory

Fire TS Lab - Passive Fire Inspection and Test Services Ltd

Accreditation Number - 1335

1/113 Pavilion Drive, Mangere, Auckland, 2022

New Zealand

Contact e-mail: tests@firelab.co.nz

Issued to:

Firestop Centre Ltd.

657 Great South Rd, Penrose, Auckland, 1061

New Zealand

Contact e-mail: info@firestopcentre.co.nz

3.3 Timeline

Testing date:

21/06/2024

Installation completion date:

20/06/2024

Termination of The Test:

The test was discontinued at 74 minutes.

3.4 Use of the Report

Regulatory information report was issued in addition to full test report PF24066-2. This provides the minimum information required for regulatory compliance.

The report is valid till 09/08/2028.

This report shall not be reproduced, except in full.

This report details the methods of construction, test conditions and the results obtained when the specific element of construction described herein was tested following the procedure outlined in AS 1530.4. Any significant variation with respect to size, constructional details, loads, stresses, edge or end conditions, other than that allowed under the field of direct application in the relevant test method, is not covered by this report.

Because of the nature of fire resistance testing and the consequent difficulty in quantifying the uncertainty of measurement of fire resistance, it is not possible to provide a stated degree of accuracy of the result.

The test results relate to the specimens of the product in the form in which they were tested. Differences in the composition or thickness of the product may significantly affect the performance during the test and may therefore invalidate the test results. Care should be taken to ensure that any product, which is supplied or used, is fully represented by the specimens, which were tested.

The specimens were supplied by the sponsor and the Laboratory was not involved in any of selection or sampling procedures.

The results of these fire tests may be used to directly assess fire hazard, but it should be recognized that a single test method will not provide a full assessment of fire hazard under all fire conditions.

4. Specimen Description

4.1 Supporting Construction

Separating element			
1.1	Item	A 90mm timber frame with two layers of 13mm fire-resistant (FR) plasterboard on the exposed side and one layer of 13mm FR plasterboard on the unexposed side.	
	Aperture	Rectangular aperture measuring 1065mm by 560mm.	
	Dimensions	Width / Height (W/H):	3211mm × 1490mm
		Wall Thickness (T):	129mm
Cavity:		90mm	

4.2 Specimen 1 - Duct

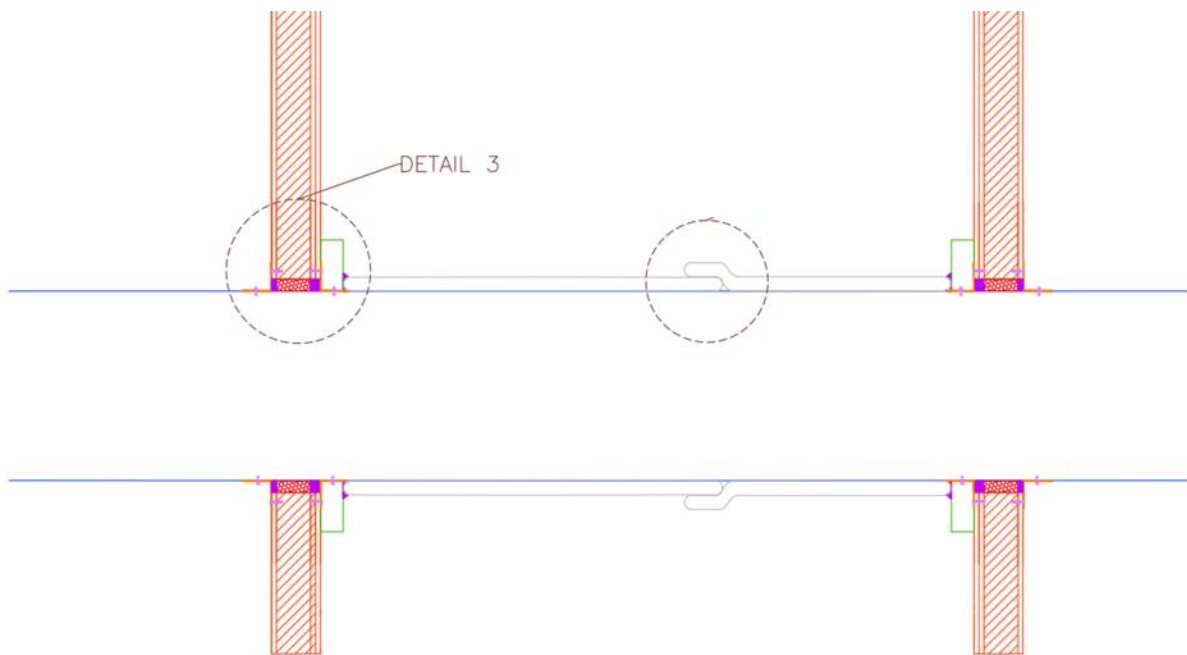


Figure 1a – Duct cross section

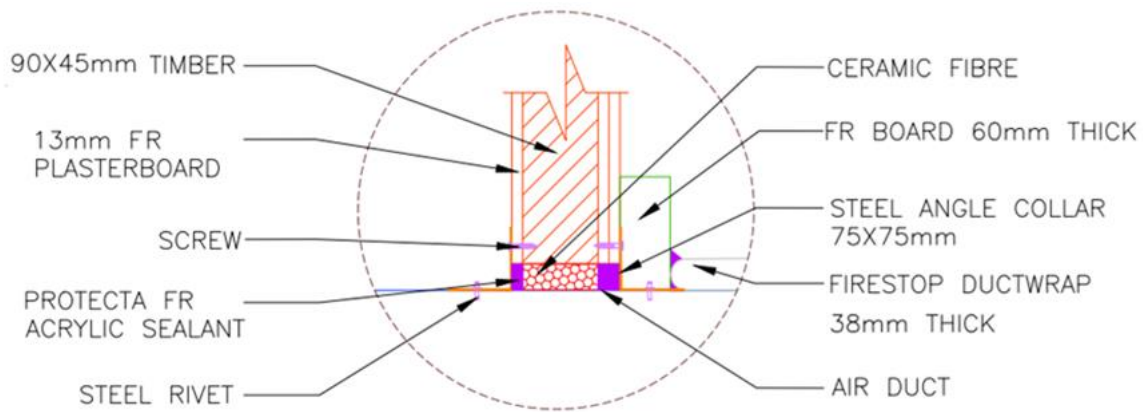


Figure 1b – Separating element detail (detail 3)

Specimen		
	Item	Air Duct
	Dimensions	Cross section Width and Height (W/H): 500mm x 1005mm
	Specimen Support	Steel angles were used to fix the duct to the separating element
	Aperture Size	560mm x 1065mm
	Annular Spacing	30mm
2.1	Installation	<p>Symmetrical - Protrudes 500mm from both unexposed faces of the separating element, with a distance of 2000mm between the two exposed faces.</p> <p>Duct wrap content was installed around the duct in the aperture, allowing 30mm recess for the sealant application. FR Acrylic Sealant was applied in the recess, aligned flush with the plasterboard on both exposed and unexposed faces.</p> <p>Steel equal angle collars were used to fix the duct to the plasterboard on both exposed and unexposed faces.</p> <p>Trimmed FR boards were placed on the steel angle collar on the exposed side only (100mm overlap with the separating element). The joints of the FR board and its interactions with the steel slotted angle collar and plasterboard were sealed with Protecta FR Acrylic Sealant.</p> <p>A single layer of duct wrap was installed around the duct with a nominal overlap of 100mm for both</p>

		longitudinal and transverse joints. The duct wrap was fixed with steel pins and terminated to the FR board.
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Wrap		
3.1	Item	Firestop Ductwrap – 38
	Dimensions	Thickness / Width / Length (T/W/L): 38mm x 1000mm x 5000mm
	Thickness	38mm
	Density	96 kg/m ³
	Installation	Used to wrap the Air duct.

Sealants / Coatings		
5.1	Item	Protecta FR Acrylic Sealant
	Dimensions	600ml tube
	Installation	Installed between the ceramic fibre and steel angle collar; separating element and FR boards, as well as between the FR board and steel angle collar.

Fixings		
6.1	Item	Drywall Screws
	Dimensions	6mm x 41mm
	Installation	Used to fix steel angle collar to plasterboard at 200mm centres
6.2	Item	Stainless Steel Blind Rivets
	Dimensions	10 x 5mm
	Installation	Used to fix the steel angle collar to duct at 100mm centres
6.3	Item	Steel Equal Angle 75mm x 75mm x 1.2mm (nominal)
	Dimensions	75mm
	Installation	Used to fix the duct to plasterboard
6.4	Item	Steel Pin
	Dimensions	Length: 38mm and 76mm

	Installation	Used to fix the duct wrap to the duct. Pins were attached to the duct using capacitive discharge welding. Pins were located 50mm from the ends of each wrap, and 200mm centres around the duct.
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Others		
7.1	Item	Protecta FR Board 2S
	Thickness	60mm
	Installation	Used to cover and protect the aperture from exposed faces.
7.2	Item	Plain Aluminium Foil Tape
	Dimensions	Width: 75mm
		Thickness: 50 microns
	Installation	Used to seal all cut ends of wrap. Applied to each overlap between wrap layers.

4.3 Specimen 2 – Access Hatch

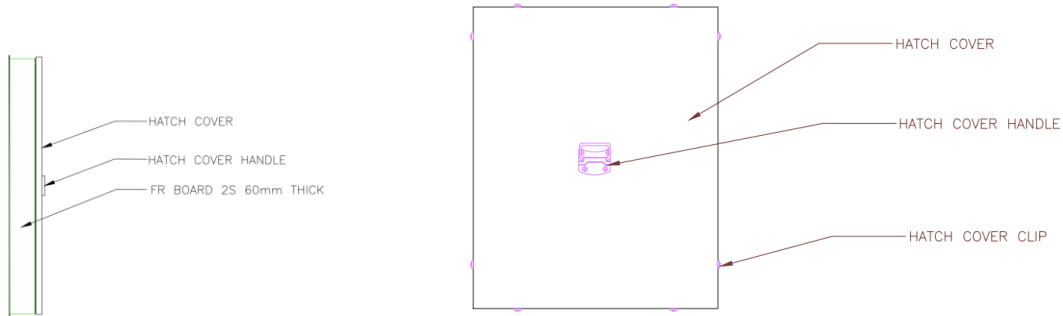


Figure 3 – Access hatch

Specimen		
1.1	Item	Access Hatch
	Dimensions	Hatch cover: 520mm x 390mm (nominal) Hatch without cover: 490mm x 360mm (nominal)
	Aperture Size	315mm x 185mm (nominal)

	Installation	<p>The hatch aperture was cut into the exposed side of the duct, positioned 1200mm from the inlet end and 250mm from the bottom. The FIRESTOP Ultra sealant was applied to the duct surface and the hatch was then placed over the aperture, and sealant was applied around it. Rivets were used to fix the hatch to the duct, spaced approximately 150mm apart.</p> <p>Trimmed FR Board was fitted into the gap between the duct and the hatch cover. All cut edges of the board were coated with sealant.</p> <p>The duct wrap was trimmed and firmly fixed around the FR Board.</p> <p>All gaps and joints were sealed with FIRESTOP Ultra sealant.</p>
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Wrap		
2.1	Item	Firestop Duct Wrap – 38
	Measurements	Thickness / Width / Length (T/W/L): 38mm x 1000mm x 5000mm
	Installation	Duct wrap was fixed around the FR Board. at exposed side.

Fixings		
3.1	Item	Stainless Steel Blind Rivets
	Measurements	10 x 5mm
	Installation	Used to fix the access hatch to duct at 100mm centres
3.2	Item	38mm Duct Pin
	Measurements	Length: 38mm
	Installation	Used to fix single layer of duct wrap to the duct. Pins were attached to the duct using Capacitive Discharge Welder.

Sealants / Coatings		
5.2	Item	FIRESTOP Ultra sealant
	Dimensions	600ml tube

	Installation	Used for the hatch installation
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Others		
7.1	Item	Protecta FR Board 2S
	Thickness	60mm
	Installation	Trimmed to fit into the gap between duct and the hatch cover.

5. Additional temperature measurements

Thermocouples were installed to the internal face of the duct to assess the performance of the duct wrap protection.

Location	Maximum temperature rise, deg C	
	30 min	60 min
Thermocouple inside the duct, attached to the surface of the duct in the furnace	179	286
External thermocouples at penetration seal and duct (non-fire side)	20	45

6. Permissible variations to the tested specimen

A test result obtained for the largest air duct in the range may be applied to all air ducts of the same type, provided the maximum dimensions do not exceed those tested and that the components remain in the same orientation as that tested.