

Regulatory Information Report

RPF23083

**Fire resistance test for an air duct passing
through a plasterboard wall – Internal fire**

Issued to:	Firestop Centre Ltd
Test method:	AS1530.4-2014
Report Date:	19/01/2024
Valid till:	09/08/2028
Test number:	PF23083



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1.1 Document revision schedule

Revision #	Date	Description
1	13/12/23	Initial issue for Client review
2	19/01/23	Issued with Client comments

1.2 Signatories

Report	Name	Signature	Date
Prepared by:	Alex Kokorin		19/01/23
Authorised by:	Andrew Bain (Authorized signatory)		19/01/23



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



2. Report Summary

A 1000mm x 500mm (W/H) air duct was installed, penetrating through a 64mm steel stud wall, with 1 x layer of FR plasterboard on each side and around the aperture. The supporting construction aperture was protected using a combination of steel brackets, FR board and acrylic sealant. The duct was protected using 38mm thick FIRESTOP Duct Wrap-38, fixed using steel pins.

Test results

Structural adequacy	No Failure at 124 minutes
Integrity	No Failure at 124 minutes
Insulation	33 minutes
Fire resistance level (FRL)	60/60/30*

*The test was discontinued at 124 minutes, at which time the structural adequacy and integrity failure criteria had not been exceeded. AS1530.4 Clause 10.12 states that the supporting construction shall have an FRL equal to or greater than that of the proposed penetration and representative of that used in practice.

Therefore, the FRL of the tested system was reduced to match that of the supporting construction.

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 – Internal 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

Registered 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

Manufacturer:

Same as Client/Applicant

3.3 Timeline

Testing date:

24/11/2023

Installation completion date:

23/11/2023

Termination of The Test:

The test was discontinued at 124 minutes.

3.4 Use of the Report

Regulatory information report was issued in addition to full test report PF23083. 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	64mm Steel Stud with one layer 13mm FR plasterboard each side
	Aperture	1040mm x 545mm
		Lined with 1 layer of FR plasterboard
	Dimensions	Width / Height (W/H): 1200mm x 1200mm
		Wall Thickness (T): 90mm
		Cavity: 64mm

4.2 Specimen 1 - Duct

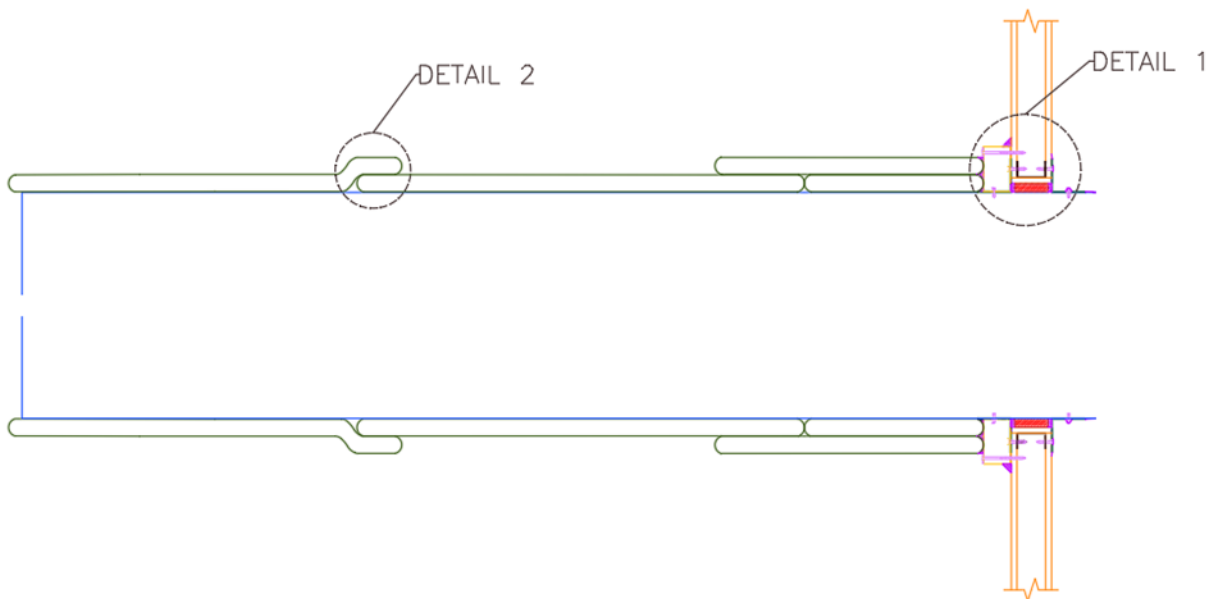


Figure 1a – Duct cross section

	Aperture Size	1040mm x 545mm
	Annular Spacing	20mm
	Installation	<p>Protrudes 100mm from exposed face, 2210mm from unexposed face.</p> <p>Four lengths of duct wraps were installed around the duct with nominal 100mm overlap for the longitudinal joints. Longitudinal joints were staggered and located minimum 200mm from the edge of the duct.</p> <p>The first wrap was 400mm wide, installed flush with the FR board. The second wrap was 1000mm wide, and butt-joined to the first layer. The third wrap was 1000mm wide, and was overlapped onto the first layer by 100mm. An additional layer of wrap was installed on top of the first and second wraps, extending 600mm from the FR Boards.</p> <p>Duct was fixed with pins (refer to item 6.7 section 4.2) and Tape (refer to item 6.3 Section 4.2)</p> <p>The duct was tested open on the fire side.</p>

Wrap		
3.1	Item	FIRESTOP Duct Wrap-38 – foil faced ceramic fibre blanket
	Measurements	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 on unexposed face. First length of wrap was trimmed to 400mm width. The second and third lengths 1000mm width, overlapping the previous length by approximately 100mm. The fourth wrap was 600mm wide.
3.2	Item	FIRESTOP Duct Wrap-38 with foil face removed
	Measurements	Thickness (T): 38mm
	Installation	Strips cut, then installed into annular gap between duct and separating element

Board		
4.1	Item	Protecta FR Board 2S
	Measurements	Length / Width (L/W): 1200mm x 600mm
	Thickness	Thickness (T): 60mm
	Installation	Cut to 100mm strips, installed around aperture on top of steel bracket.

Sealants / Coatings		
5.1	Item	Protecta FR Acrylic Sealant
	Measurements	310mL tube
	Installation	Installed to FR Board joints. Installed between separating element and FR Boards; Installed on backing rod in annular gap between duct and separating element, resulting in a 20mm x 30mm seal on both exposed and unexposed sides

Fixings		
6.1	Item	Screw 10g x 75mm
	Measurements	75mm
	Installation	Used to fix the FR Board to Plasterboard around duct at approximately 400mm centres
6.2	Item	Stainless steel Washer
	Measurements	OD: 32mm, ID: 6mm, Thickness 1.5mm
	Installation	Used to fix the FR Board to Plasterboard around duct at approximately 400mm centres
6.3	Item	Reinforced aluminium foil Tape (regular tape)
	Measurements	Width: 73mm
	Installation	Used to seal gaps between Ductwrap layers
6.4	Item	Self Tapping Screws 6mm x 41mm
	Measurements	41mm
	Installation	Used to fix steel angle to plasterboard at 100mm centres
6.5	Item	Stainless Steel Blind Rivets

	Measurements	10 x 5mm
	Installation	Used to fix the steel angle to duct at 100mm centres
6.6	Item	Steel Equal Angle 75mm x 75mm x 1.2mm
	Measurements	75mm
	Installation	Used to fix the duct to separating element
6.7	Item	Weld-Ons Di-Electric Duct Pins
	Measurements	Length: 1 ½ in (38mm)
		Length: 2 ½ in (63mm)
	Installation	Used to fix the ductwrap to the duct. Pins were attached to the duct using Capacitive Discharge Welder. Pins were located 50mm from the ends of each wrap, and 200mm centres around both the width and the length of the duct. The 38mm pins were used to fix areas with a single layer of wrap. The 63mm pins were used to fix areas with two layers of wrap

5. Additional temperature measurements

Additional thermocouples were installed to assess the performance of the duct wrap protection at different distances from the wall.

Layers of wrap	From the wall, mm	Maximum temperature rise, deg C			
		30 min	60 min	90* min	120* min
1	700	117	332	346	362
	1000	97	247	276	289
	1600	111	200	220	242
	1900	29	166	213	235
2	100*	50	142	204	236
	400*	39	163	187	203
	1500	38	106	125	135

* - The duct was tested in the separating element having FRL -/60/60. Separating element failed insulation criteria at 70 minutes and thermocouples readings were largely affected by the failure of the separating element.

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 (including any aspect ratio), provided the maximum dimensions do not exceed those tested and that the components remain in the same orientation as that tested.