# Regulatory Information Report

# RPF24066-1

## Fire resistance test for circular 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: | PF24066-1 |

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## 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<br>(Authorized signatory) |  | 09/08/2024 |

ACCREDITED
TESTING LABORATORY

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

## 2. Report Summary

A circular air duct with a diameter of 800mm was installed, penetrating through a plasterboard 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 slotted angle collar, FR board and acrylic sealant. The duct was protected on the fire side with one layer of 38mm thick Firestop Duct wrap, fixed using welded steel pins.

| 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** | **7.1 C°(K)/m** |

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

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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 PF24066-1. 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 | Circular aperture with a diameter of 860mm |
| | Dimensions | Width / Height (W/H): 3211mm × 1490mm |
| | | Wall Thickness (T): 129mm |
| | | Cavity: 90mm |

## 4.2 Specimen 1 - Duct

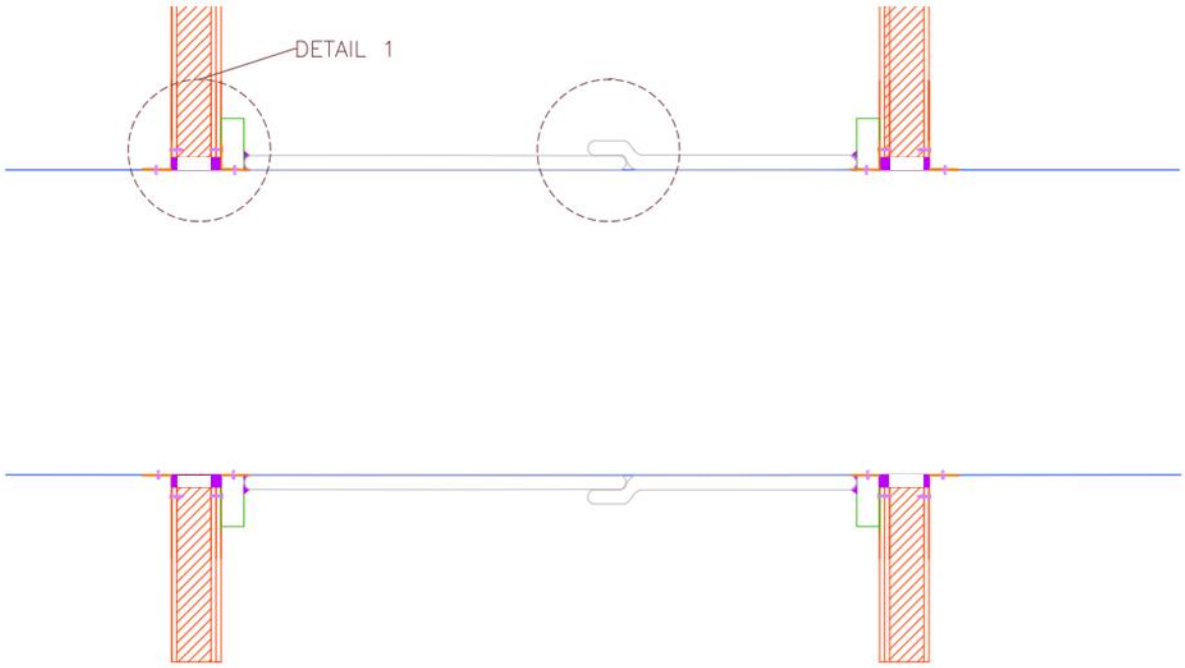


**Figure 1a – Duct cross section**

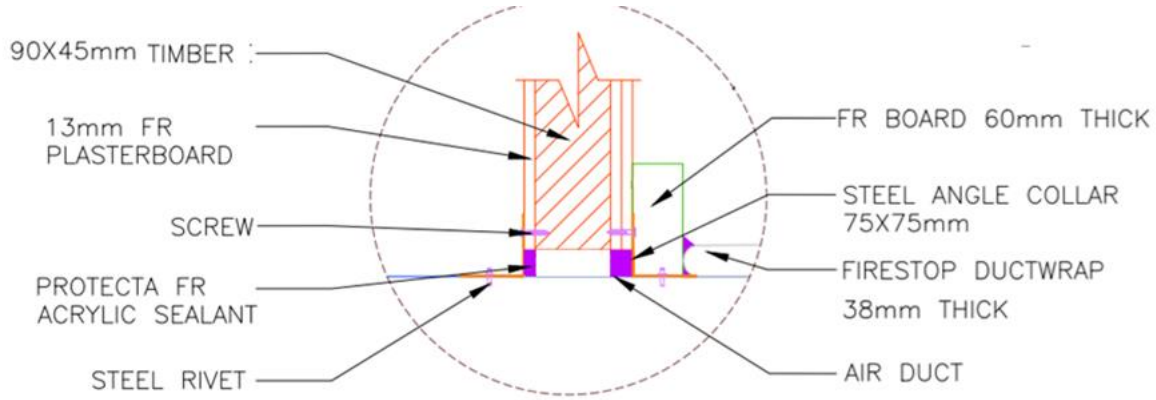


**Figure 1b – Separating element detail (detail 1)**

| **Specimen** | | |
|---|---|---|
| 2.1 | Item | Air Duct |
| | Dimensions | Diameter (D): 800mm |
| | Specimen Support | Steel slotted equal angles were used to fix the duct to the separating element |
| | Aperture Size | 860mm |
| | Annular Spacing | 30mm |
| | Installation | Symmetrical - Protrudes 400mm from both unexposed faces of the separating element, with a distance of 2000mm between the two exposed faces.<br><br>Protecta FR Acrylic Sealant was applied within the aperture to the thickness of the plasterboard on both exposed and unexposed faces.<br><br>Steel slotted angle collars were used to fix the duct to the plasterboard on both exposed and unexposed faces.<br><br>Trimmed FR boards were placed on the steel slotted angle collar on the fire side only. The joints of the FR board and its interactions with the steel slotted angle collar and plasterboard were sealed with Protecta FR Acrylic Sealant.<br><br>A single layer of duct wrap was installed around the duct with a nominal overlap of 100mm for both longitudinal and transverse joints. The duct wrap was |

| | | |
|---|---|---|
| | | fixed with welded steel pins and terminated at the top of the FR board. |

| **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 | Slotted Steel Angle 75mm x 75mm x 0.8mm (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. |

| **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. |

# 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 | 300 |
| External thermocouples at penetration seal and duct (non-fire side) | 23 | 44 |

## 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.