**REGULATORY INFORMATION REPORT**

The fire resistance performance of Hilti Firestop Intumescent Sealant CFS-IS/CP 611A protecting PE-X pipes in plasterboard lined walls and solid walls if tested in accordance with AS1530.4-2005 and assessed in accordance with AS4072.1-2005

**EWFA Report No:**

RIR 33136700.4

**Report Sponsor:**

Hilti (Aust.) Pty Ltd
1G Homebush Bay Drive,
Rhodes, NSW, 2138
Australia

AND

Hilti (New Zealand) Ltd
P.O, Box 112030
Penrose, Auckland 1642,
New Zealand

Testing. Advising. Assuring.

# DOCUMENT REVISION STATUS

| Date Issued | Issue No | Description |
|---|---|---|
| 3/02/2015 | RIR 33136700 | Initial Issue |
| 20/03/2015 | RIR 33136700.1 | Revised PE-X pipe wall thickness |
| 29/06/2015 | RIR 33136700.2 | Revised to include large aperture size in 100mm or thicker 2hr support walls |
| 1/02/2016 | RIR 33136700.3 | Revised to include additional construction details |
| 17/02/2016 | RIR 33136700.4 | Revised product reference and beading clarification |

# CONTACT INFORMATION

**Exova Warringtonfire Aus Pty Ltd –** ABN 81 050 241 524

**NATA Registered Laboratory**

Unit 2, 409-411 Hammond Road
Dandenong Victoria 3175
Australia

T: +61 (0)3 9767 1000
F: +61 (0)3 9767 1001

**New South Wales**

Suite 2002a, 44 Market Street
Sydney NSW 2000
Australia

T: +61 (0)2 8270 7600
F: +61 (0)2 9299 6076

**Victoria**

Unit 2, 409-411 Hammond Road
Dandenong Victoria 3175
Australia

T: +61 (0)3 9767 1000
F: +61 (0)3 9767 1001

**Queensland**

Northpoint, Unit 29, Level 6
231 North Quay
Brisbane QLD 4000
Australia

T: +61 (0)7 3238 1700
F: +61 (0)7 3211 4833

# CONTENTS

# 1 INTRODUCTION

This report contains the minimum information required for regulatory compliance for the Assessment report EWFA 33136700.4.

The referenced report presents an assessment of the fire resistance performance of Hilti Firestop Intumescent Sealant CFS-IS/CP 611A protecting PE-X pipes in plasterboard lined walls and solid walls if tested in accordance with AS1530.4-2005 and assessed in accordance with AS4072.1-2005.

The tested prototypes described in Section 2 of the referenced report, when subject to the proposed variations described in Section 3 and tested in accordance with the referenced test method described in Section 4. The conclusions of the report are summarised in Section 5.

The validity of the referenced assessment is conditional on compliance with Sections 7, 8 and 9 of the referenced report.

# 2 TESTED PROTOTYPES

The referenced assessment is based on referenced test FR 3317 describing test of PE-X pipes protected with various Hilti products penetrating plasterboard lined wall construction and tested in accordance with AS1530.4-1997. The test was sponsored by Hilti (New Zealand) Limited and was conducted by BRANZ.

The assessment also refers to tests No. 14244A and EWFA 2626600.4 tested in accordance with EN1366-3:2009 and AS1530.4-2005 respectively. The tests were sponsored by Hilti and were conducted by EFECTIS France and Exova Warringtonfire Aus Pty Ltd respectively.

# 3 VARIATION TO TESTED PROTOTYPES

The proposed construction is for PE-X pipes penetrations protected with Hilti Firestop Intumescent Sealant CFS-IS/CP 611A in walls shall be tested in test FR 3317 as specimen 10 subject to the following variations:

- Hilti Firestop Intumescent Sealant CP 611A is stated by the manufacturer to be identical to Hilti Firestop Intumescent Sealant CFS-IS and the only difference is the trade name. For the purpose of this assessment the product will be referred to as CP 611A .
- The PE-X pipes shall have the outside diameters of Ø16mm, Ø20mm and Ø25mm.
- For pipe and aperture sizes listed in table 1, the gap between the pipe and plasterboard shall be filled with Hilti Firestop Intumescent sealant CP 611A on each side.
- For pipe and aperture sizes listed in table 2, the gap between the pipe and plasterboard shall be filled with Hilti Firestop Intumescent sealant CP 611A on each side and the cavity shall be filled with mineral wool insulation.
- Specimen 10 shall optionally include Hilti Firestop Collar CP 644/CFS-C P as tested in EWFA 2626600 and be fixed on each side of wall replacing the plasterboard beading (build up detail). The collar shall fully filled with Hilti Firestop Intumescent sealant CP 611A.
- The wall construction shall optionally be concrete, AAC, solid or hollow masonry wall, Speedpanel wall, Speedwall wall or plasterboard lined wall.
- The plasterboard lined wall shall be constructed from minimum one layer of 13mm or 16mm thick fire grade plasterboard each side with a minimum wall thickness of 90mm that has been tested or otherwise assessed to achieve an FRL of -/60/60 or 60/60/60.
- The plasterboard lined wall shall be constructed from minimum two layers of 13mm or 16mm thick fire grade plasterboard each side with a minimum wall thickness of 100mm that has been tested or otherwise assessed to achieve an FRL of -/120/120 or 120/120/120.
- The assessed construction is summarised in sections 3.1, 3.2 and 3.3.

## 3.1 DISTANCE REQUIREMENTS

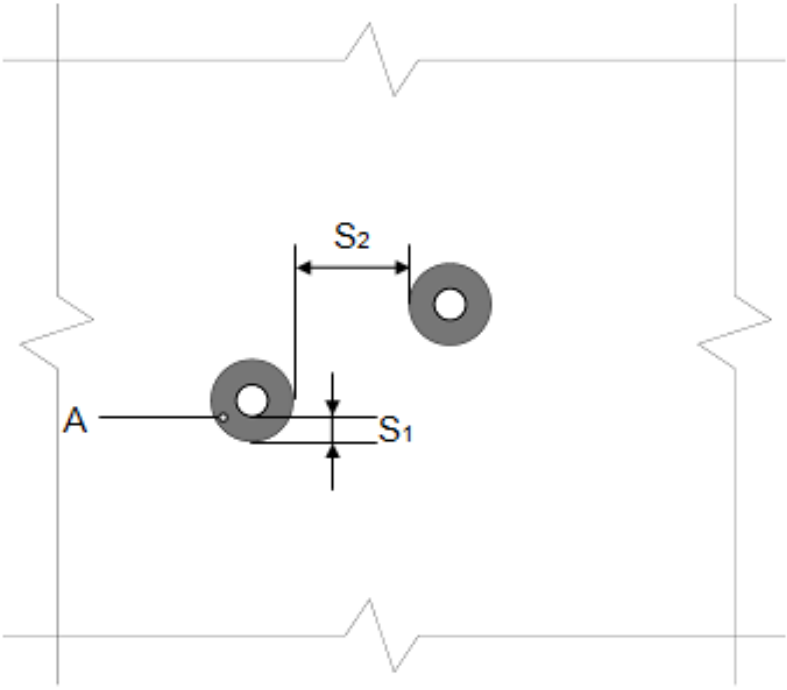


**Figure 1** – Distance Requirements of Penetrations

**Distance Requirements in Walls**

| Minimum distance valid for installations of services | Wall (mm) |
|---|---|
| Distance between pipe and seal edge | $S_1 = 0$ |
| Distance between penetrations | $S_2 = 40$ |

**Table 1 – Aperture Sizes for Sealant CP 611A (A) without Backfilling Material**

| Pipe Outside Diameter | Min. Aperture Diameter | Max. Aperture Diameter |
|---|---|---|
| Ø16mm | Ø26mm | Ø36mm |
| Ø20mm | Ø30mm | Ø40mm |
| Ø25mm | Ø35mm | Ø45mm |

**Table 2 – Aperture Sizes for Sealant CP 611A (A) with Backfilling Material (B)**

| Pipe Outside Diameter | Min. Aperture Diameter | Max. Aperture Diameter |
|---|---|---|
| Ø16mm | Ø36mm | Ø150mm |
| Ø20mm | Ø40mm | Ø150mm |
| Ø25mm | Ø45mm | Ø150mm |

Note 1: The dimensions in Table 2 refer to the applications shown in figures 5(b) & 8(b).

**Sealant backed with Backing Rod**

In cases without backing material (B) or cavity insulation ($E_2$), depth of Hilti Firestop Intumescent Sealant CP 611A (A) may be controlled with polyethylene backing rod installed within or between flexible or rigid wall constructions.

**Size of Polyethylene Backing Rod**

| Max. gap width around PE-X Pipes ($S_1$) (mm) | Size of PE rod (mm) |
|---|---|
| 8 | 10 |
| 12 | 15 |
| 16 | 20 |
| 20 | 25 |
| 30 | 40 |

**Aperture Beading Details for walls**

For walls with a wall thickness ($t_E$) of less than that stated in Section 3.2 and 3.3, a beading shall be used.

**Beading**

13mm or 16mm fire rated plasterboard strips at least 100mm wide are installed around the opening with the necessary number of layers to form frames (or a frame if only on one side) with sufficient thickness so that total thickness of wall is greater than or equal to $t_E$.

**Penetration Seal**

For aperture hole sizes listed in Table 1, Hilti Firestop Intumescent Sealant CP 611A (A) shall be installed on each side to a thickness of 25mm.

For aperture hole sizes listed in Table 2, Hilti Firestop Intumescent Sealant CP 611A (A) shall be installed on each side to a thickness of 25mm and mineral wool insulation (B) shall be tightly compressed as backfilling material. (Gap filled completely).

**Additional Protection for Penetrations**

Additional protection material (AP) is utilised for some applications and comprises the following:

- **AP1:** Hilti Firestop Collar CP 644/CFS-C P that are installed on each side of the wall and fixed with Hilti anchors as outlined in the Hilti Anchor Table below. The gap between Hilti Firestop collars (AP1) and PE-X pipes (C) shall be fully filled with Hilti Firestop Intumescent Sealant CP 611A (A) to the full depth of collar.
- **AP2:** Additional layers of 13mm or 16mm fire rated plasterboard strip, at least 100mm wide added to both sides of the wall and fixed with drywall screws.

**Table 3 - PE-X Pipe Sizes and Hilti Firestop Collar Size**

| Pipe Outside Diameter | Pipe Wall Thickness | Collar Code |
|---|---|---|
| Ø16mm | 1.2 – 2.4mm | Hilti CP644/CFS-C P -50/1.5 |
| Ø20mm | 2.3 – 3.4mm | |
| Ø25mm | 2.8 – 3.9mm | |

**Table 4 - Hilti Anchor Types for Hilti Retrofit Firestop Collar**

| Anchoring Solution | | Minimum Size | Flexible Walls (Plasterboard lined) | Aerated Concrete Wall (Hebel) | Solid Concrete Walls |
|---|---|---|---|---|---|
| Screw anchors | HUS | M6 | | x | x |
| Expansion anchors | HSA | | | | x |
| | HST | | | | x |
| | DBZ 6/45 | | | | x |
| Internally threaded anchor | HKD | | | | x |
| Hollow core | HTB-S | | x | | |
| | HHD-S | | x | | |
| Other | Laminating/ Drywall/ Plasterboard Screws, at least 38mm in length, with steel washers of at least 19mm in diameter | 10g | x | | |
| | Threaded rods with nuts and washer | M6 | x | x | x |

## 3.2 PENETRATIONS IN FLEXIBLE WALLS

**1hr Flexible Wall (E)**

The wall shall have a minimum thickness of 90mm ($t_E$) and comprise of steel studs lined on both faces with a minimum of one layer of 13mm or 16mm thick fire grade plasterboard and has been tested or otherwise assessed to achieve an FRL of -/60/60 or 60/60/60 with or without cavity insulation ($E_2$).

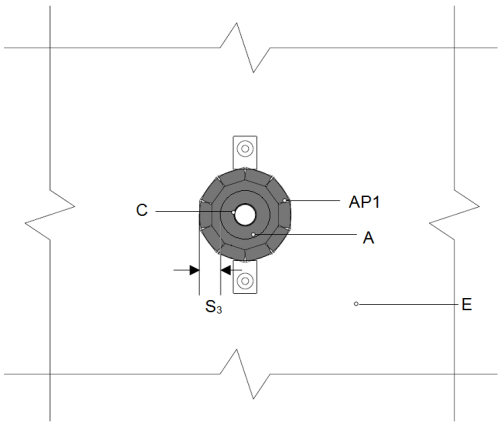


**Figure 2** – Elevation View of PE-X Pipes with Hilti Firestop Collar

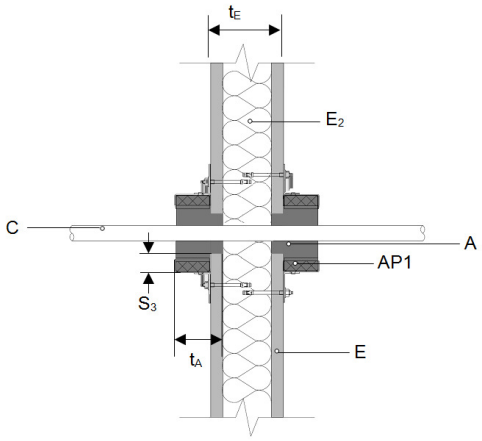


**Figure 3 -** Details for PE-X Pipes with additional protection AP1. $E_2$ is optional.

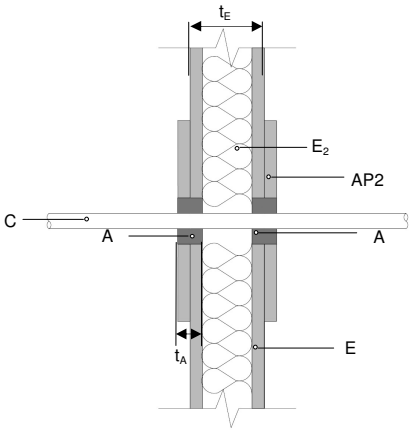


**Figure 4 -** Details for PE-X Pipes with additional protection AP2. $E_2$ is optional.

| Item | Description | Item | Description |
|---|---|---|---|
| A | Hilti Firestop Intumescent Sealant CP 611A | AP1 | Hilti Firestop Collar CP 644/CFS-C P 50/1.5 |
| E<br>$E_2$ | **E:**Support construction element<br>**$E_2$:** Wall cavity insulation (optional) | AP2 | 13mm or 16mm thick fire grade plasterboard, at least 100mm wide |
| $t_A$ | Thickness (Depth) of penetration seal | C | Single PE-X pipe |
| $t_E$ | Thickness of the building element | $S_3$ | Gap between edge of penetration and outside collar edge shall be a minimum of 5mm |

**2hr Flexible Wall (E)**

The wall shall have a minimum thickness of 100mm ($t_E$) and comprise of steel studs lined on both faces with a minimum of two layers of 13mm or 16mm thick fire grade plasterboard and has been tested or otherwise assessed to achieve an FRL of -/120/120 or 120/120/120 with or without cavity insulation ($E_2$).

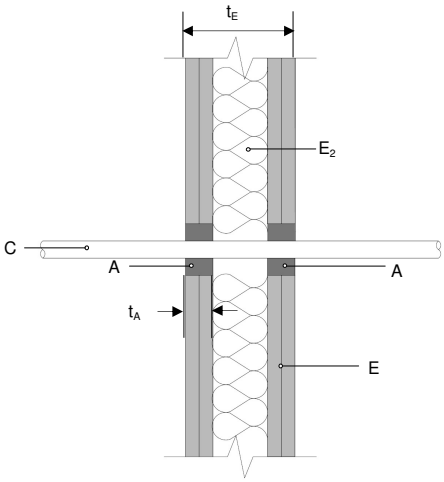


**Figure 5(a) -** Details for PE-X Pipes, $E_2$ is optional.

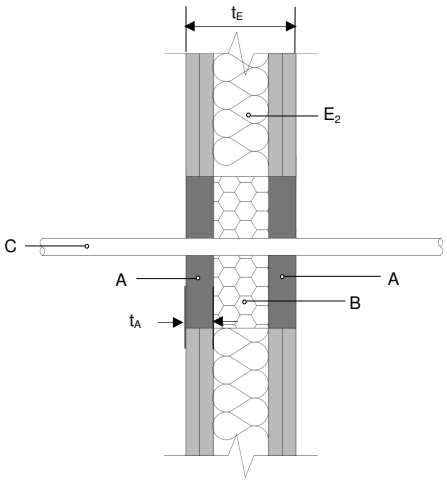


**Figure 5(b) -** Details for PE-X Pipes, $E_2$ is optional.

| Item | Description | Item | Description |
|---|---|---|---|
| A | Hilti Firestop Intumescent Sealant CP 611A | AP1 | Hilti Firestop Collar CP 644/CFS-C P 50/1.5 |
| B | Backfilling material:<br>• Heralan LS<br>• Isover loose wool SL<br>• Isover Universal-Stopfwolle<br>• Rockwool RL<br>• Paroc Pro Loose Wool | AP2 | 13mm or 16mm thick fire grade plasterboard, at least 100mm wide |
| E<br>$E_2$ | **E:**Support construction element<br>**$E_2$:** Wall cavity insulation (optional) | C | Single PE-X pipe |
| $t_A$ | Thickness (Depth) of penetration seal | $t_E$ | Thickness of the building element |

## 3.3 PENETRATIONS IN RIGID WALLS

**75mm Rigid Walls with Beading (E)**

The bare wall (E) must have a minimum thickness of 75mm and comprise of concrete, aerated concrete, Speedpanel panel, Speedwall panel or solid or hollow masonry with a minimum density of 550kg/m$^3$. If the bare wall thickness is less than 100mm thick a beading (AP2) shall be applied to result in a total thickness $t_E \geq 100$mm.

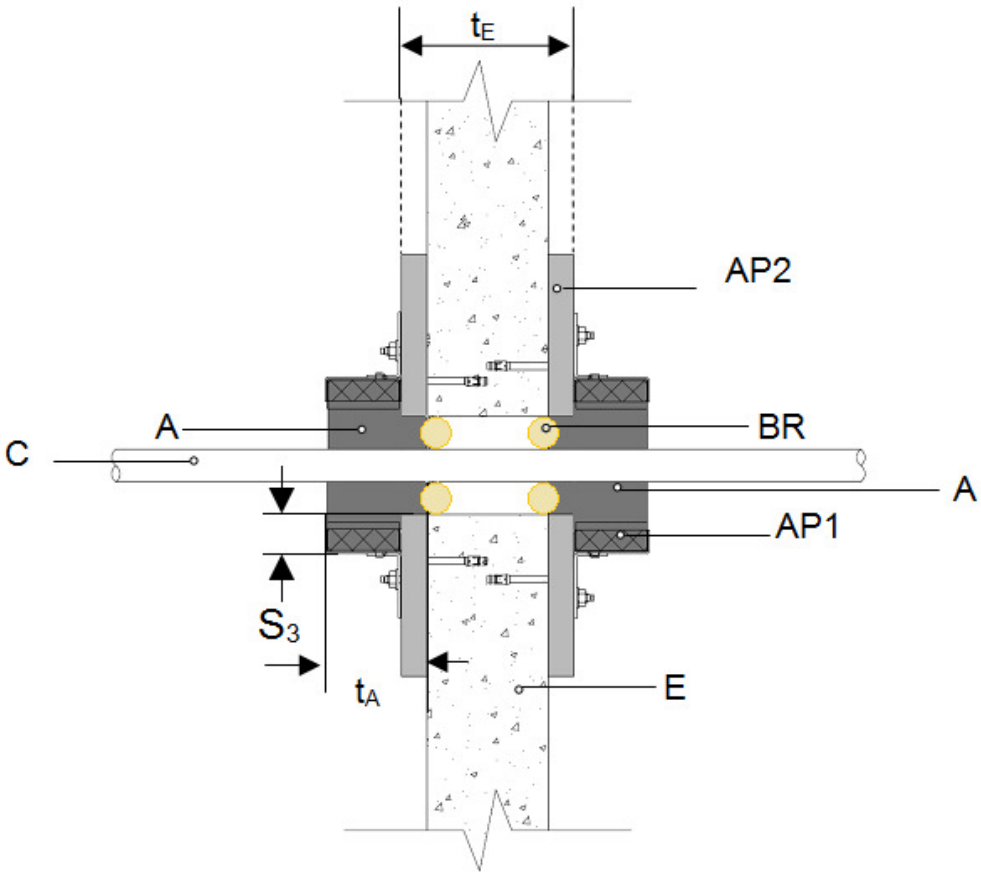


**Figure 6** - Details for PE-X Pipes in 75mm rigid wall with additional protection AP1 + AP2.

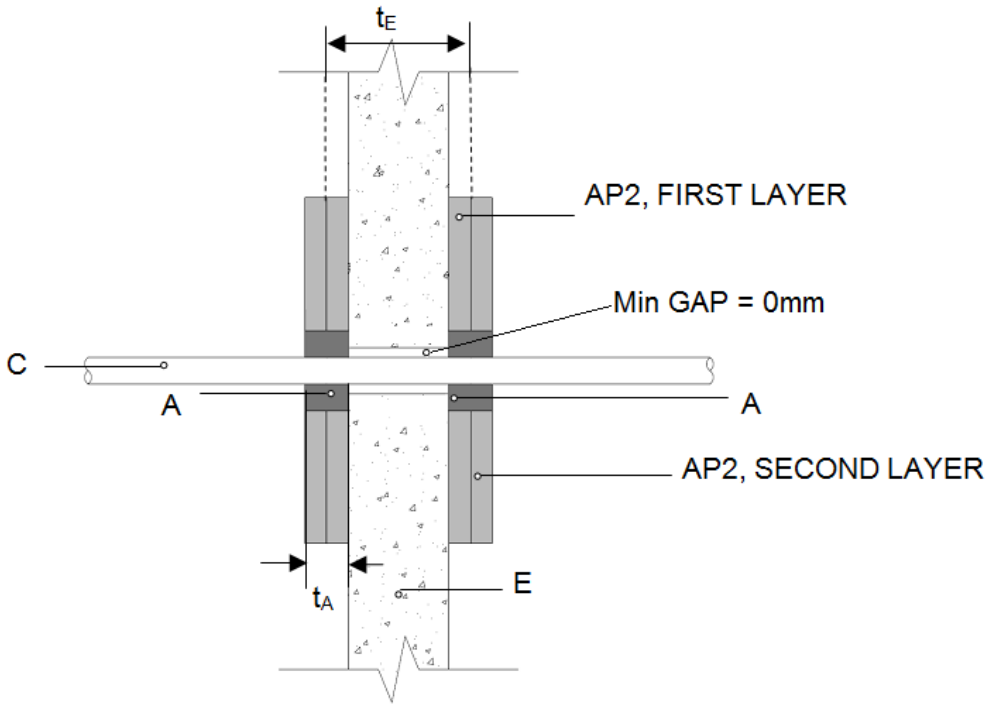


**Figure 7(a) -** Details for PE-X Pipes in 75mm rigid wall with additional protection 2 × AP2.

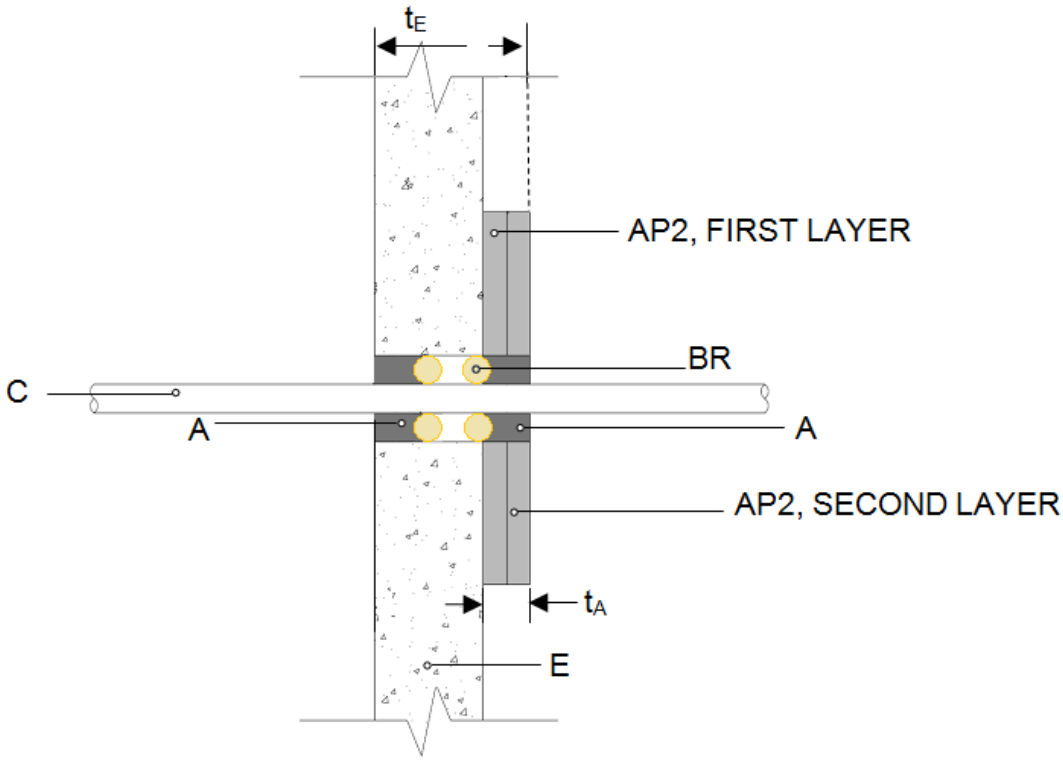


**Figure 7(b) -** Details for PE-X Pipes in 75mm rigid wall with additional protection 2 × AP2 (one side only)

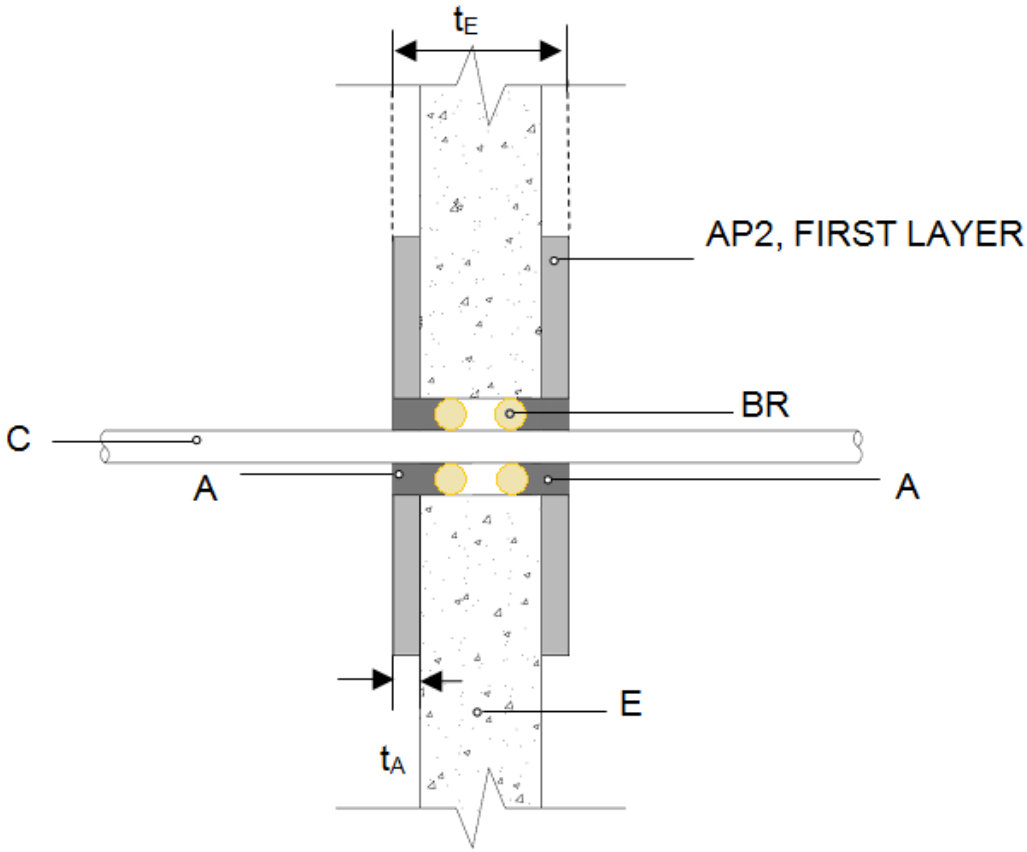


**Figure 7(c) -** Details for PE-X Pipes in 75mm rigid wall with additional protection 1 × AP2

**100mm Rigid Walls or Greater (E)**

The bare wall (E) must have a minimum thickness of 100mm and comprise of concrete, aerated concrete or solid or hollow masonry with a minimum density of 550kg/m3, $t_E \geq 100$mm.

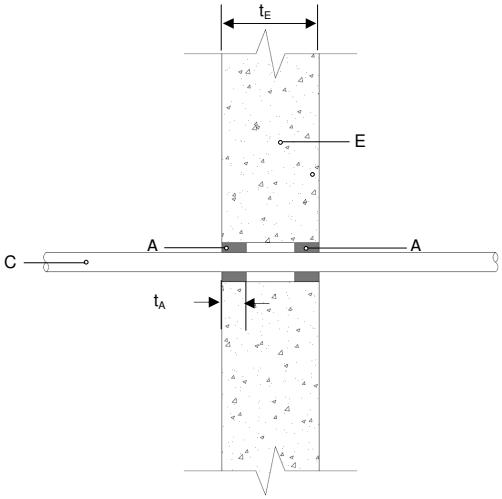


**Figure 8(a) -** Details for PE-X Pipes in Rigid Walls greater than 100mm thick

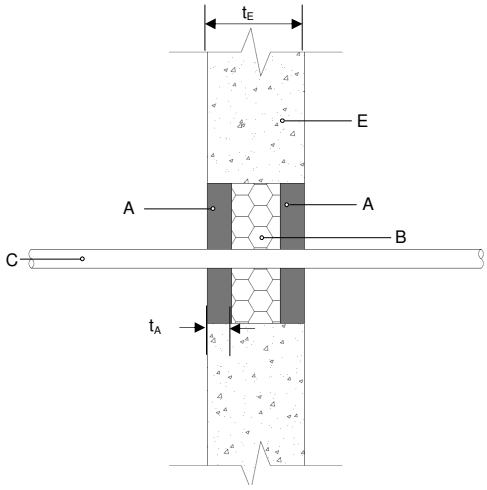


**Figure 8(b) -** Details for PE-X Pipes in Rigid Walls greater than 100mm thick

| Item | Description | Item | Description |
|---|---|---|---|
| A | Hilti Firestop Intumescent Sealant CP 611A | AP1 | Hilti Firestop Collar CP 644/CFS-C P 50/1.5 |
| B | Backfilling material:<br>• Heralan LS<br>• Isover loose wool SL<br>• Isover Universal-Stopfwolle<br>• Rockwool RL<br>• Paroc Pro Loose Wool | AP2 | 13mm or 16mm thick fire grade plasterboard , at least 100mm wide |
| E | **E:**Support construction element | C | Single PE-X pipe |
| $t_A$ | Thickness (Depth) of penetration seal | $S_3$ | Gap between edge of penetration and outside collar edge shall be a minimum of 5mm |
| $t_E$ | Thickness of the building element | BR | PE Backing Rod. Optionally included to control depth of sealant ($t_A$) where required |

# 4 REFERENCED TEST PROCEDURES

The referenced report is prepared with reference to the requirements of AS1530.4-2005 and AS4072.1-2005.

# 5 FORMAL ASSESSMENT SUMMARY

Based on the discussion presented in the referenced report, it is the opinion of this testing authority that if the specimen described in section 1 had been modified within the scope of section 3, it will achieve the performance as stated below if tested in accordance with the test method referenced in Section 4 and subject to the requirements of Section 7:

**Table 5.1 –PE-X Pipe in 1hr Flexible Walls specified in Section 3.2, $t_E \geq 90$mm**

| Pipe OD | Pipe Wall Thick-ness | Sealant in Annular Gap | Lining Thickness | Additional Protection | Min. Sealant Depth ($t_A$) | Refer Figure, Table | FRL |
|---|---|---|---|---|---|---|---|
| Ø16mm | 1.2-2.4mm | Hilti Firestop Intumescent Sealant CP 611A | 1 × 13mm or 1 × 16mm | AP1 – Hilti Firestop Collar CP 644/CFS-C P 50/1.5 | 25mm | Figures 2 and 3 & Table 1 | -/60/60 |
| Ø20mm | 2.3-3.4mm | | | | | | -/60/60 |
| Ø25mm | 2.8-3.9mm | | | | | | -/60/60 |
| Ø16mm | 1.2-2.4mm | | | AP2 – one layer of 13mm or 16mm thick fire grade plasterboard | 25mm | Figure 4 & Table 1 | -/60/60 |
| Ø20mm | 2.3-3.4mm | | | | | | -/60/60 |
| Ø25mm | 2.8-3.9mm | | | | | | -/60/60 |

**Table 5.2 –PE-X Pipe in 2hr Flexible Walls specified in Section 3.2, $t_E \geq 100$mm**

| Pipe OD | Pipe Wall Thick-ness | Sealant in Annular Gap | Lining Thickness | Additional Protection | Min. Sealant Depth ($t_A$) | Refer Figure, Table | FRL |
|---|---|---|---|---|---|---|---|
| Ø16mm | 1.2-2.4mm | Hilti Firestop Intumescent Sealant CP 611A | 2 × 13mm or 2 × 16mm | - | 25mm | Figure 5(a) & Table 1 | -/120/120 |
| Ø20mm | 2.3-3.4mm | | | | | | -/120/120 |
| Ø25mm | 2.8-3.9mm | | | | | | -/120/120 |
| Ø16mm | 1.2-2.4mm | Hilti Firestop Intumescent Sealant CP 611A and Mineral wool backfilling material (B) | | | | Figure 5(b) & Table 2 | -/120/120 |
| Ø20mm | 2.3-3.4mm | | | | | | -/120/120 |
| Ø25mm | 2.8-3.9mm | | | | | | -/120/120 |

**Table 5.3 –PE-X Pipe in 75mm Rigid Walls with Beading specified in Section 3.3, total $t_E \geq 100$mm**

| Pipe OD | Pipe Wall Thick-ness | Sealant in Annular Gap | Additional Protection | Min. Sealant Depth ($t_A$) | Refer Figure, Table | FRL |
|---|---|---|---|---|---|---|
| Ø16mm | 1.2-2.4mm | Hilti Firestop Intumescent Sealant CP 611A | AP1 – Hilti Firestop Collar CP 644/CFS-C P 50/1.5 and AP2 - one layer of 13mm or 16mm thick fire grade plasterboard | 25mm | Figure 6 & Table 1 | -/120/120 |
| Ø20mm | 2.3-3.4mm | | | | | -/120/120 |
| Ø25mm | 2.8-3.9mm | | | | | -/120/120 |
| Ø16mm | 1.2-2.4mm | | 2 × AP2 – two layers of 13mm or 16mm thick fire grade plasterboard | 25mm | Figure 7(a), 7(b), 7(c) & Table 1 | -/120/120 |
| Ø20mm | 2.3-3.4mm | | | | | -/120/120 |
| Ø25mm | 2.8-3.9mm | | | | | -/120/120 |

**Table 5.4 –PE-X Pipe in 100mm Rigid Walls or Greater specified in Section 3.3, $t_E \geq 100$mm**

| Pipe OD | Pipe Wall Thick-ness | Sealant in Annular Gap | Additional Protection | Min. Sealant Depth ($t_A$) | Refer Figure | FRL |
|---|---|---|---|---|---|---|
| Ø16mm | 1.2-2.4mm | Hilti Firestop Intumescent Sealant CP 611A | - | 25mm | Figure 8(a) & Table 1 | -/120/120 |
| Ø20mm | 2.3-3.4mm | | | | | -/120/120 |
| Ø25mm | 2.8-3.9mm | | | | | -/120/120 |
| Ø16mm | 1.2-2.4mm | Hilti Firestop Intumescent Sealant CP 611A and Mineral wool backfilling material (B) | | | Figure 8(b) & Table 2 | -/120/120 |
| Ø20mm | 2.3-3.4mm | | | | | -/120/120 |
| Ø25mm | 2.8-3.9mm | | | | | -/120/120 |

# 6 DIRECT FIELD OF APPLICATION

The referenced assessment applies to penetrations in walls exposed to fire from either side.

# 7 REQUIREMENTS

The referenced report details the methods of construction, test conditions and assessed results that would have been expected had the specific elements of construction described herein been tested in accordance with AS1530.4.

Any further variations with respect to size, constructional details, loads, stresses, edge or end conditions, other than those identified in the referenced report, may invalidate the conclusions drawn in the referenced report.

It is required that the supporting construction be otherwise tested or assessed to achieve the required FRL of the penetration seal in accordance with AS1530.4-2005.

# 8 VALIDITY

The referenced assessment report does not provide an endorsement by Exova Warringtonfire Aus Pty Ltd of the actual products supplied.

The conclusions of the referenced assessment may be used to directly assess the fire resistance performance under such conditions, but it should be recognised that a single test method will not provide a full assessment of the fire hazard under all fire conditions.

Because of the nature of fire resistance testing, and the consequent difficulty in quantifying the uncertainty of measurement, it is not possible to provide a stated degree of accuracy. The inherent variability in test procedures, materials and methods of construction, and installation may lead to variations in performance between elements of similar construction.

The assessment can therefore only relate only to the actual prototype test specimens, testing conditions and methodology described in the supporting data, and does not imply any performance abilities of constructions of subsequent manufacture.

The referenced assessment is based on information and experience available at the time of preparation. The published procedures for the conduct of tests and the assessment of test results are the subject of constant review and improvement and it is recommended that the referenced report be reviewed on or, before, the stated expiry date.

The information contained in the referenced report shall not be used for the assessment of variations other than those stated in the conclusions above. The assessment is valid provided no modifications are made to the systems detailed in the referenced report. All details of construction should be consistent with the requirements stated in the relevant test reports and all referenced documents.

# 9 AUTHORITY

## 9.1 APPLICANT UNDERTAKINGS AND CONDITIONS OF USE

By using this report as evidence of compliance or performance, the applicant(s) confirms that:

- to their knowledge the component or element of structure, which is the subject of this assessment, has not been subjected to a fire test to the Standard against which this assessment is being made, and
- they agree to withdraw this assessment from circulation should the component or element of structure be the subject of a fire test by a test authority in accordance with the Standard against which this assessment is being made and the results are not in agreement with this assessment, and
- they are not aware of any information that could adversely affect the conclusions of this assessment and if they subsequently become aware of any such information, agree to ask the assessing authority to withdraw the assessment.

## 9.2 GENERAL CONDITIONS OF USE

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## 9.3 AUTHORISATION ON BEHALF OF EXOVA WARRINGTONFIRE AUS PTY LTD

| Prepared by: | Reviewed by: |
|---|---|
|  |  |
| D. Nicholson | K Nicholls |

## 9.4 DATE OF ISSUE

17/02/2016

## 9.5 EXPIRY DATE

28/02/2020