



ASSESSMENT REPORT

The fire resistance performance of service penetrations protected by iPassive FR Collar if tested in accordance with AS1530.4-2014 and assessed in accordance with AS4072.1-2005

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iPassive
B: HIVE Building
Smales Farm
Takapuna, Auckland
0622, New Zealand

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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 802, 383 Kent 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

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1 INTRODUCTION

This report presents an assessment of the fire resistance performance of service penetrations protected by iPassive FR Collar if tested in accordance with AS1530.4-2014 and AS4072.1-2005.

The tested prototypes described in Section 2 of this 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 this assessment is conditional on compliance with Sections 7, 8 and 9 of this report.

Summaries of the test data along with the summary of critical issues leading to the assessment conclusions including the main points of argument are provided in the Appendices of the original assessment report.

2 TESTED PROTOTYPES

The assessment report is based on referenced tests WF 372505, F16151, WF 377302, WF 375800, F16029, WF 375797, WF 376483, WF 380963, WF 380112 and WF 369908 describing fire resistance testing of fire seals and service penetration protection in various fire separating elements, tested in accordance with BSEN 1363-1: 2012, BSEN 1366-3: 2009 and BSEN 1366-4: 2006 The tests were sponsored by iPassive and conducted by Exova Warringtonfire UK.

3 VARIATION TO TESTED PROTOTYPES

None

4 REFERENCED TEST PROCEDURES

This report is prepared with reference to the requirements of AS1530.4-2014 and AS4072.1-2005.

5 FORMAL ASSESSMENT SUMMARY

Based on the discussion presented in the referenced assessment 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

This assessment report provides a discussion permitting the translation of referenced test reports from EN1366 to AS1530.4-2014 as applicable.

The iPassive FR Collar is defined as a fire resisting penetration sealing systems to be used to reinstate the performance of walls and/ or floors.

The iPassive FR collar consists of a split red coated, circular steel casing designed to fit around plastic pipes. The collars have a secure and simple locking device. The steel frame contains a graphite based swelling material that reacts to heat and fills the opening from the melting plastic through-penetration in case of a fire. It can be fitted on walls and floors.

Support of services in floors and walls shall be maintained as per AS1530.4-2014 and AS4072.1-2005 requirements.

The specific elements of construction that the system iPassive FR Collar may be used to provide a penetration seal in, are as follows:

- a. Flexible walls: The wall must have a minimum thickness of 75mm or as otherwise specified and comprise steel or timber studs on both faces with a minimum 1 layer of 13mm thick boards, wall are required to be otherwise tested or assessed by other. Apertures are not required to be lined. Further, wall cavity insulation is optional.
- b. Rigid Walls: The wall must have a minimum thickness of 75mm or as otherwise specified and comprise concrete, aerated concrete or masonry, with a minimum density of 650 kg/m³, wall elements are required to be otherwise tested or assessed by others.
- c. Rigid Floors: (Both options are applicable)
 - a. A floor of thickness of 150mm (as tested) and comprise aerated concrete with a minimum density of 650 kg/m³, floors are required to be otherwise tested or assessed by others to achieve FRL of 240/240/240 or -/240/240.
 - b. A floor of minimum thickness of 60mm and comprise aerated concrete with a minimum density of 650 kg/m³, floors are required to be otherwise tested or assessed by others to achieve a nominated FRL. In cases, where the FRL of the floor is less than the penetration protecting the overall system, the FRL will be derated accordingly.

FR collars are tested oversize-i.e. the internal diameter of the collar can be larger than the pipe. An oversize collar can therefore be used in situations where the penetration size is greater than the pipe diameter and/or where the pipe is inserted at an angle.

FR Collar should be attached with steel screws, anchors or fixings that are suitable for the substrate that the pipe collar will be fitted to." Gaps between pipe and surroundings construction should be sealed with FR Acrylic Sealant. Further, for visual integrity, gaps between pipe and collar may optionally be sealed with a thin bead of FR Acrylic Sealant.

AS1530.4-2014 stipulates that for general pipe systems, the fire side capped/ non-fire side open configuration shall be adopted. That being said, the assessment was prepared as per the following:

- C/U cases were found compliant to the requirements of AS1530.4-2014, hence, FRL was given accordingly
- C/C cases were qualified to cover closed systems applications only.

Refer to Appendix A for the assessed FRL given to each construction configuration.

6 DIRECT FIELD OF APPLICATION

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

The results of the assessment report are based on actual test data and the scope is necessarily limited to the specifications indicated Section 3 and discussed in the Appendices of the assessment.

7 REQUIREMENTS

This 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 AS1530.4-2014.

Any further variations with respect to size, constructional details, loads, stresses, edge or end conditions, other than those identified in this report, may invalidate the conclusions drawn in this 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 AS1530.4-2014.

8 VALIDITY

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

The conclusions of this 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.

This 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 this report be reviewed on or, before, the stated expiry date.

The information contained in this 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 this 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

This report may only be reproduced in full without modifications by the report sponsor. Copies, extracts or abridgments of this report in any form shall not be published by other organisations or individuals without the permission of Exova Warringtonfire Aus Pty Ltd.

9.3 AUTHORISATION ON BEHALF OF EXOVA WARRINGTONFIRE AUS PTY LTD

Prepared by:



M. Akl

Reviewed by:



O. Saad

9.4 DATE OF ISSUE

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9.5 EXPIRY DATE

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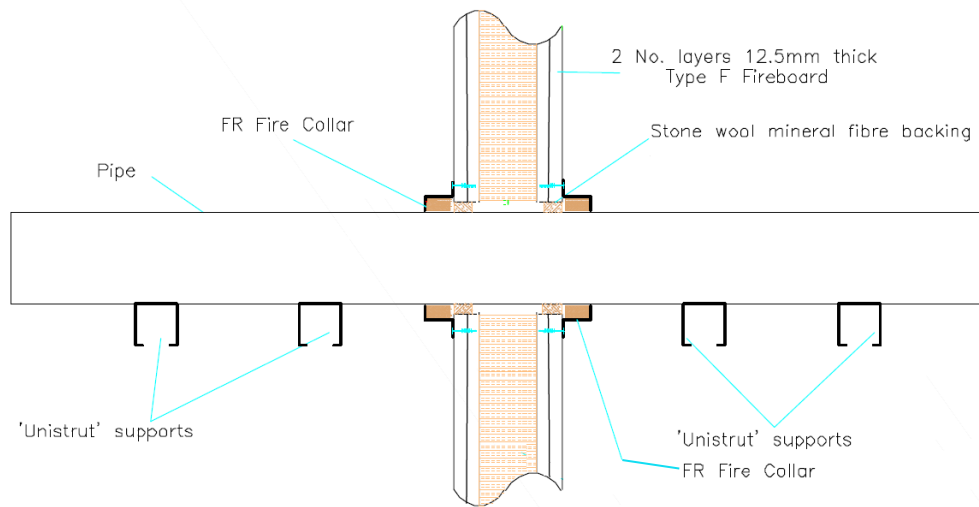
APPENDIX A – FIRE RESISTANCE PERFORMANCE OF iPASSIVE FR COLLAR & FIELD OF APPLICATION

A.1 FLEXIBLE OR RIGID WALL CONSTRUCTIONS WITH WALL THICKNESS OR 100MM

A.1.1 Penetration seals, in dry walls and concrete/masonry walls

Penetration Seal: Combustible pipes fitted with iPassive FR Collar, to both sides of the wall.

Construction Details:



Services	Collar Inlay	FRL
PVC-U pipe		
Diameter 32 mm, wall thickness 1.2-3.7 mm	30x 3.0 mm	-/90/60**
Diameter 40 mm, wall thickness 1.2-3.7 mm		
Diameter 50 mm, wall thickness 1.2-3.7 mm		
Diameter 55 mm, wall thickness 2.7-6.6 mm	30 x 3.2 mm	-/60/60**
Diameter 63 mm, wall thickness 2.7-6.6 mm	30 x 3.6 mm	
Diameter 75 mm, wall thickness 2.7-6.6 mm	30 x 4.2 mm	
Diameter 82 mm, wall thickness 2.7-6.6 mm	30 x 4.6 mm	
Diameter 90 mm, wall thickness 2.7-6.6 mm	30 x 5.0 mm	
Diameter 110 mm, wall thickness 2.7-6.6 mm	30 x 6.0 mm	
Diameter 125 mm, wall thickness 3.2-9.5 mm	50 x 9.0 mm	
Diameter 140 mm, wall thickness 3.2-9.5 mm	50 x 11.5 mm	
Diameter 160 mm, wall thickness 3.2-9.5 mm	50 x 15.0 mm	-/90/90**
Diameter 32 mm, wall thickness 2.4-4.6 mm	30 x 3.0 mm	-/90/60
Diameter 40 mm, wall thickness 2.4-4.6 mm		
Diameter 50 mm, wall thickness 2.4-4.6 mm		
Diameter 55 mm, wall thickness 2.7-6.6 mm	50 x 3.2 mm	
Diameter 63 mm, wall thickness 2.7-6.6 mm	50 x 3.6 mm	
Diameter 75 mm, wall thickness 2.7-6.6 mm	50 x 4.2 mm	
Diameter 82 mm, wall thickness 2.7-6.6 mm	50 x 4.6 mm	
Diameter 90 mm, wall thickness 2.7-6.6 mm	50 x 5.0 mm	
Diameter 110 mm, wall thickness 2.7-6.6 mm	50 x 6.0 mm	
Diameter 125 mm, wall thickness 3.2-9.5 mm	60 x 9.0 mm	-/60/60
Diameter 140 mm, wall thickness 3.2-9.5 mm	60 x 11.5 mm	
Diameter 160 mm, wall thickness 3.2-9.5 mm	60 x 15.0 mm	
Diameter 315mm, Wall thickness 9.2mm	75 x 18.0mm	-/60/60**

** FRL given is applicable to closed systems only

Services	Collar Inlay	FRL
PE pipe		
Diameter 32 mm, wall thickness 3.0-5.6 mm	30 x 3.0 mm	-/90/60**
Diameter 40 mm, wall thickness 3.0-5.6 mm		
Diameter 50 mm, wall thickness 3.0-5.6 mm		
Diameter 55 mm, wall thickness 3.4-10.0 mm	30 x 3.2 mm	-/60/60**
Diameter 63 mm, wall thickness 3.4-10.0 mm	30 x 3.6 mm	
Diameter 75 mm, wall thickness 3.4-10.0 mm	30 x 4.2 mm	
Diameter 82 mm, wall thickness 3.4-10.0 mm	30 x 4.6 mm	
Diameter 90 mm, wall thickness 3.4-10.0 mm	30 x 5.0 mm	
Diameter 110 mm, wall thickness 3.4-10.0 mm	30 x 6.0 mm	
Diameter 125 mm, wall thickness 6.2-9.5 mm	50 x 9.0 mm	
Diameter 140 mm, wall thickness 6.2-9.5 mm	50 x 11.5 mm	
Diameter 160 mm, wall thickness 6.2-9.5 mm	50 x 15.0 mm	
Diameter 32 mm, wall thickness 3.0-4.6 mm	30x 3.0 mm	-/90/30
Diameter 40 mm, wall thickness 3.0-4.6 mm		
Diameter 50 mm, wall thickness 3.0-4.6 mm		
Diameter 55 mm, wall thickness 3.4-10.0 mm	50 x 3.2 mm	
Diameter 63 mm, wall thickness 3.4-10.0 mm	50 x 3.6 mm	
Diameter 75 mm, wall thickness 3.4-10.0 mm	50 x 4.2 mm	
Diameter 82 mm, wall thickness 3.4-10.0 mm	50 x 4.6 mm	
Diameter 90 mm, wall thickness 3.4-10.0 mm	50 x 5.0 mm	
Diameter 110 mm, wall thickness 3.4-10.0 mm	50 x 6.0 mm	
Diameter 125 mm, wall thickness 4.9-14.6 mm	60 x 9.0 mm	-/90/60
Diameter 140 mm, wall thickness 4.9-14.6 mm	60 x 11.5 mm	
Diameter 160 mm, wall thickness 4.9-14.6 mm	60 x 15.0 mm	-/90/90
Diameter 200mm, wall thickness 18.2mm	75 x 10.8mm	-/60/60**
Diameter 250mm, wall thickness 22.7mm	75 x 12.6mm	

**FRL is applicable to closed systems only.

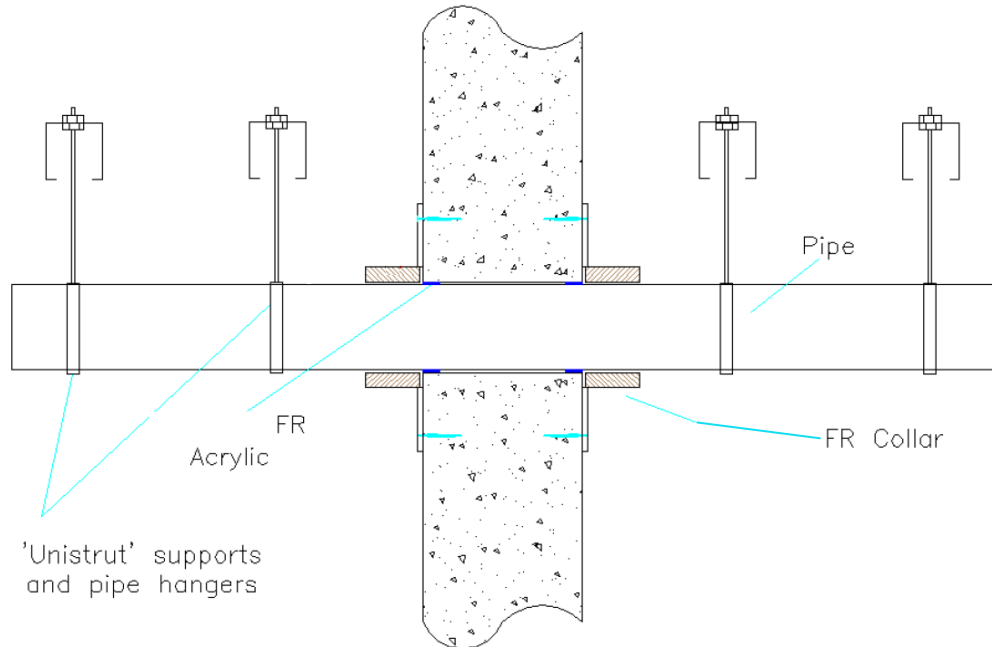
Services	Collar Inlay	FRL
PP pipe		
Diameter 32 mm, wall thickness 3.0-5.6 mm	30 x 3.0 mm	-/90/60**
Diameter 40 mm, wall thickness 3.0-5.6 mm		
Diameter 50 mm, wall thickness 3.0-5.6 mm		
Diameter 55 mm, wall thickness 3.4-6.3 mm	30 x 3.2 mm	
Diameter 63 mm, wall thickness 3.4-6.3 mm	30 x 3.6 mm	
Diameter 75 mm, wall thickness 3.4-6.3 mm	30 x 4.2 mm	
Diameter 82 mm, wall thickness 3.4-6.3 mm	30 x 4.6 mm	
Diameter 90 mm, wall thickness 3.4-6.3 mm	30 x 5.0 mm	
Diameter 110 mm, wall thickness 3.4-6.3 mm	30 x 6.0 mm	
Diameter 125 mm, wall thickness 4.9-14.6 mm	50 x 9.0 mm	
Diameter 140 mm, wall thickness 4.9-14.6 mm	50 x 11.5 mm	
Diameter 160 mm, wall thickness 4.9-14.6 mm	50 x 15.0 mm	
Diameter 32 mm, wall thickness 1.8-4.6 mm	30 x 3.0 mm	-/90/60
Diameter 40 mm, wall thickness 1.8-4.6 mm		
Diameter 50 mm, wall thickness 1.8-4.6 mm		
Diameter 55 mm, wall thickness 3.4-6.6 mm	50 x 3.2 mm	
Diameter 63 mm, wall thickness 3.4-6.6 mm	50 x 3.6 mm	
Diameter 75 mm, wall thickness 3.4-6.6 mm	50 x 4.2 mm	
Diameter 82 mm, wall thickness 3.4-6.6 mm	50 x 4.6 mm	
Diameter 90 mm, wall thickness 3.4-6.6 mm	50 x 5.0 mm	
Diameter 110 mm, wall thickness 3.4-6.6 mm	50 x 6.0 mm	
Diameter 125 mm, wall thickness 4.9-14.6 mm	60 x 9.0 mm	
Diameter 140 mm, wall thickness 4.9-14.6 mm	60 x 11.5 mm	
Diameter 160 mm, wall thickness 4.9-14.6 mm	60 x 15.0 mm	

A.2 RIGID WALLS CONSTRUCTIONS WITH WALL THICKNESS OF MINIMUM 150MM

A.2.1 Penetration seals, in concrete/masonry walls

Penetration Seal: Combustible pipes fitted with iPassive FR Collar, to both sides of the wall.

Construction details:



Services	Collar Inlay	FRL
PVC-U pipe		
Diameter 32 mm, wall thickness 2.0-3.7 mm	50 x 3.0 mm	-/240/180
Diameter 40 mm, wall thickness 2.0-3.7 mm		
Diameter 50 mm, wall thickness 2.0-3.7 mm		
Diameter 55 mm, wall thickness 2.7-6.6 mm	50 x 3.2 mm	-/180/180
Diameter 63 mm, wall thickness 2.7-6.6 mm	50 x 3.6 mm	
Diameter 75 mm, wall thickness 2.7-6.6 mm	50 x 4.2 mm	
Diameter 82 mm, wall thickness 2.7-6.6 mm	50 x 4.6 mm	
Diameter 90 mm, wall thickness 2.7-6.6 mm	50 x 5.0 mm	
Diameter 110 mm, wall thickness 2.7-6.6 mm	50 x 6.0 mm	-/240/240
Diameter 125 mm, wall thickness 4.0-9.5 mm	60 x 9.0 mm	
Diameter 140 mm, wall thickness 4.0-9.5 mm	60 x 11.5 mm	
Diameter 160 mm, wall thickness 4.0-9.5 mm	60 x 15.0 mm	-/120/120**
Diameter 315mm, wall thickness 9.2mm	75x 18mm	

Services	Collar Inlay	FRL
PE pipe		
Diameter 32 mm, wall thickness 3.0-4.6 mm	50 x 3.0 mm	-/240/240
Diameter 40 mm, wall thickness 3.0-4.6 mm		
Diameter 50 mm, wall thickness 3.0-4.6 mm		
Diameter 55 mm, wall thickness 3.4mm	50 x 3.2 mm	-/240/180
Diameter 63 mm, wall thickness 3.4 mm	50 x 3.6 mm	
Diameter 75 mm, wall thickness 3.4mm	50 x 4.2 mm	
Diameter 82 mm, wall thickness 3.4 mm	50 x 4.6 mm	
Diameter 90 mm, wall thickness 3.4 mm	50 x 5.0 mm	
Diameter 110 mm, wall thickness 3.4 mm	50 x 6.0 mm	-/180/180
Diameter 125 mm, wall thickness 4.9-9.5 mm	60 x 9.0 mm	
Diameter 140 mm, wall thickness 4.9-9.5 mm	60 x 11.5 mm	
Diameter 160 mm, wall thickness 4.9-9.5 mm	60 x 15.0 mm	
Diameter 200mm, wall thickness 18.2mm	75 x 18mm	-/60/60**
Diameter 250mm, wall thickness 22.7mm	75 x 12.6mm	-/120/90**

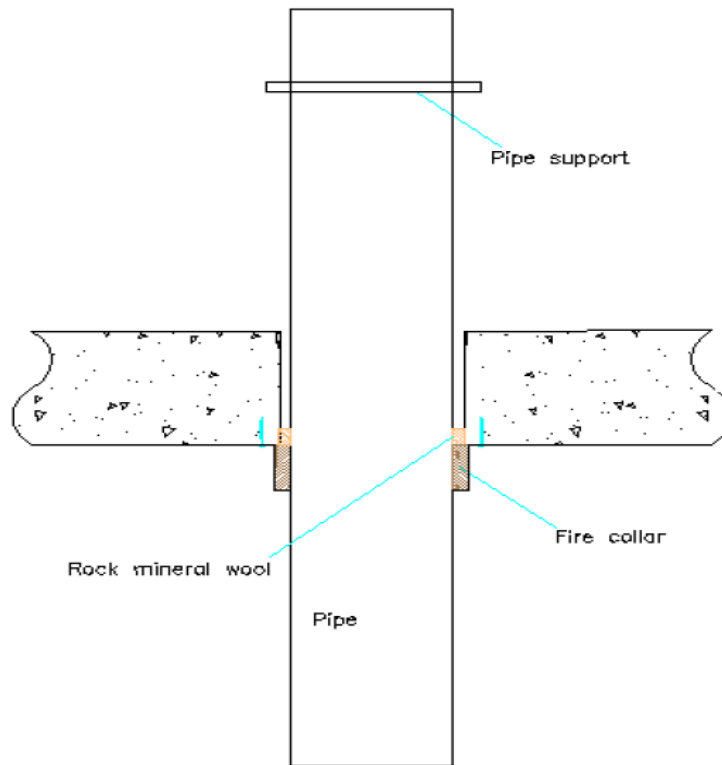
Services	Collar Inlay	FRL
PP pipe		
Diameter 32 mm, wall thickness 1.6-5.5 mm	50 x 3.0 mm	-/240/240**
Diameter 40 mm, wall thickness 1.6-5.5 mm		
Diameter 50 mm, wall thickness 1.6-5.5 mm		
Diameter 55 mm, wall thickness 2.7-10.0 mm	50 x 3.2 mm	
Diameter 63 mm, wall thickness 2.7-10.0 mm	50 x 3.6 mm	
Diameter 75 mm, wall thickness 2.7-10.0 mm	50 x 4.2 mm	
Diameter 82 mm, wall thickness 2.7-10.0 mm	50 x 4.6 mm	
Diameter 90 mm, wall thickness 2.7-10.0 mm	50 x 5.0 mm	
Diameter 110 mm, wall thickness 2.7-10.0 mm	50 x 6.0 mm	
Diameter 125 mm, wall thickness 4.9-14.6 mm	60 x 9.0 mm	
Diameter 140 mm, wall thickness 4.9-14.6 mm	60 x 11.5 mm	
Diameter 160 mm, wall thickness 4.9-14.6 mm	60 x 15.0 mm	
Diameter 32 mm, wall thickness 1.6-5.5 mm	30 x 3.0 mm	-/240/240
Diameter 40 mm, wall thickness 1.6-5.5 mm		
Diameter 50 mm, wall thickness 1.6-5.5 mm		
Diameter 55 mm, wall thickness 2.7-10.0 mm	50 x 3.2 mm	-/240/60
Diameter 63 mm, wall thickness 2.7-10.0 mm	50 x 3.6 mm	
Diameter 75 mm, wall thickness 2.7-10.0 mm	50 x 4.2 mm	
Diameter 82 mm, wall thickness 2.7-10.0 mm	50 x 4.6 mm	
Diameter 90 mm, wall thickness 2.7-10.0 mm	50 x 5.0 mm	
Diameter 110 mm, wall thickness 2.7-10.0 mm	50 x 6.0 mm	
Diameter 125 mm, wall thickness 4.9-14.6 mm	60 x 9.0 mm	
Diameter 140 mm, wall thickness 4.9-14.6 mm	60 x 11.5 mm	
Diameter 160mm, wall thickness 4.9-14.6 mm	60 x 15.0 mm	-/240/180
** FRL given is applicable to closed systems only		

A.3 RIGID FLOOR CONSTRUCTIONS WITH FLOOR THICKNESS 150MM

A.3.1 Penetration seals, surface mounted on concrete floors

Penetration seal: Combustible pipes fitted with iPassive FR Collar, to the soffit of the floor

Construction Details:



Services	Collar Inlay	FRL
PVC-U pipe		
Diameter 32 mm, wall thickness 2.0-3.7 mm	50 x 3.0 mm	-/120/120**
Diameter 40 mm, wall thickness 2.0-3.7 mm		
Diameter 50 mm, wall thickness 2.0-3.7 mm		
Diameter 55 mm, wall thickness 6.3 mm	50 x 3.2 mm	
Diameter 63 mm, wall thickness 6.3 mm	50 x 3.6 mm	
Diameter 75 mm, wall thickness 6.3 mm	50 x 4.2 mm	
Diameter 82 mm, wall thickness 6.3 mm	50 x 4.6 mm	
Diameter 90 mm, wall thickness 6.3 mm	50 x 5.0 mm	
Diameter 110 mm, wall thickness 6.3 mm	50 x 6.0 mm	
Diameter 125 mm, wall thickness 4.0-9.5 mm	60 x 9.0 mm	
Diameter 140 mm, wall thickness 4.0-9.5 mm	60 x 11.5 mm	
Diameter 160 mm, wall thickness 4.0-9.5 mm	60 x 15.0 mm	
Diameter 160 mm, wall thickness 3.2-9.5 mm	50 x 15.0 mm	-/180/90**
Diameter 32 mm, wall thickness 1.9-3.7 mm	30 x 3.0 mm	-/90/60
Diameter 40 mm, wall thickness 1.9-3.7 mm		
Diameter 50 mm, wall thickness 2.0-3.7 mm		
Diameter 55 mm, wall thickness 3.2-6.6 mm	30 x 3.2 mm	-/60/60
Diameter 63 mm, wall thickness 3.2-6.6 mm	30 x 3.6 mm	
Diameter 75 mm, wall thickness 3.2-6.6 mm	30 x 4.2 mm	
Diameter 82 mm, wall thickness 3.2-6.6 mm	30 x 4.6 mm	
Diameter 90 mm, wall thickness 3.2-6.6 mm	30 x 5.0 mm	
Diameter 110 mm, wall thickness 3.2-6.6 mm	30 x 6.0 mm	
Diameter 125 mm, wall thickness 3.2-9.5 mm	60 x 9.0 mm	
Diameter 140 mm, wall thickness 3.2-9.5 mm	60x 11.5 mm	
Diameter 160 mm, wall thickness 3.2-9.5 mm	60 x 15.0 mm	

Services	Collar Inlay	FRL
PE pipe		
Diameter 32 mm, wall thickness 3.0-4.6 mm	50 x 3.0 mm	-/120/120**
Diameter 40 mm, wall thickness 3.0-4.6 mm		
Diameter 50 mm, wall thickness 3.0-4.6 mm		
Diameter 55 mm, wall thickness 3.4-10.0 mm	50 x 3.2 mm	
Diameter 63 mm, wall thickness 3.4-10.0 mm	50 x 3.6 mm	
Diameter 75 mm, wall thickness 3.4-10.0 mm	50 x 4.2 mm	
Diameter 82 mm, wall thickness 3.4-10.0 mm	50 x 4.6 mm	
Diameter 90 mm, wall thickness 3.4-10.0 mm	50 x 5.0 mm	
Diameter 110 mm, wall thickness 3.4-10.0 mm	50 x 6.0 mm	
Diameter 125 mm, wall thickness 4.9-14.7 mm	50 x 9.0 mm	
Diameter 140 mm, wall thickness 4.9-14.7 mm	50 x 11.5 mm	
Diameter 160 mm, wall thickness 4.9-14.7 mm	50 x 15.0 mm	-/180/120**
Diameter 32 mm, wall thickness 3.0-4.6 mm	30 x 3.0 mm	-/60/60
Diameter 40 mm, wall thickness 3.0-4.6 mm		
Diameter 50 mm, wall thickness 3.0-4.6 mm		
Diameter 55 mm, wall thickness 3.4-10.0 mm	50 x 3.2 mm	
Diameter 63 mm, wall thickness 3.4-10.0 mm	50 x 3.6 mm	
Diameter 75 mm, wall thickness 3.4-10.0 mm	50 x 4.2 mm	
Diameter 82 mm, wall thickness 3.4-10.0 mm	50 x 4.6 mm	
Diameter 90 mm, wall thickness 3.4-10.0 mm	50 x 5.0 mm	
Diameter 110 mm, wall thickness 3.4-10.0 mm	50 x 6.0 mm	
Diameter 125 mm, wall thickness 4.9-14.6 mm	60 x 9.0 mm	
Diameter 140 mm, wall thickness 4.9-14.6 mm	60 x 11.5 mm	
Diameter 160 mm, wall thickness 4.9-14.6 mm	60 x 15.0 mm	

Services	Collar Inlay	FRL
PP pipe		
Diameter 32 mm, wall thickness 1.9-2.9 mm	30 x 3.0 mm	-/120/120**
Diameter 40 mm, wall thickness 1.9-2.9 mm		
Diameter 50 mm, wall thickness 1.9-2.9 mm		
Diameter 55 mm, wall thickness 2.7-6.6 mm	50 x 3.2 mm	
Diameter 63 mm, wall thickness 2.7-6.6 mm	50 x 3.6 mm	
Diameter 75 mm, wall thickness 2.7-6.6 mm	50 x 4.2 mm	
Diameter 82 mm, wall thickness 2.7-6.6 mm	50 x 4.6 mm	
Diameter 90 mm, wall thickness 2.7-6.6 mm	50 x 5.0 mm	
Diameter 110 mm, wall thickness 2.7-6.6 mm	50 x 6.0 mm	
Diameter 125 mm, wall thickness 9.5-14.6 mm	50 x 9.0 mm	
Diameter 140 mm, wall thickness 9.5-14.6 mm	50 x 11.5 mm	
Diameter 160 mm, wall thickness 9.5-14.6 mm	50 x 15.0 mm	
Diameter 125 mm, wall thickness 4.9-14.6 mm	60 x 9.0 mm	-/120/120**
Diameter 140 mm, wall thickness 4.9-14.6 mm	60 x 11.5 mm	
Diameter 160 mm, wall thickness 4.9-14.6 mm	60 x 15.0 mm	-/180/180**
Diameter 32 mm, wall thickness 1.8-4.6 mm	30 x 3.0 mm	-/120/120
Diameter 40 mm, wall thickness 1.8-4.6 mm		
Diameter 50 mm, wall thickness 1.8-4.6 mm		
Diameter 55 mm, wall thickness 2.7-6.6 mm	50 x 3.2 mm	-/60/60
Diameter 63 mm, wall thickness 2.7-6.6 mm	50 x 3.6 mm	
Diameter 75 mm, wall thickness 2.7-6.6 mm	50 x 4.2 mm	
Diameter 82 mm, wall thickness 2.7-6.6 mm	50 x 4.6 mm	
Diameter 90 mm, wall thickness 2.7-6.6 mm	50 x 5.0 mm	
Diameter 110 mm, wall thickness 2.7-6.6 mm	50 x 6.0 mm	

APPENDIX B – SUMMARY OF SUPPORTING DATA

B.1 TEST REPORTS

B.1.1 Discussion

B.1.1.1 This assessment report is prepared based on referenced test WF 380112 describing fire resistance testing of fire seals and service penetration protection in various fire separating elements, tested in accordance with BSEN 1363-1:2012, BSEN 1366:3 2009 and BSEN 1366-4:2006. The tests were sponsored by iPassive and conducted by Exova Warringtonfire UK. Refer to Test Reports for full access to information.

B.2 RELEVANCE OF BSEN 1363-1:2012 TEST DATA WITH RESPECT TO AS1530.4-2014.

B.2.1 General

B.2.1.1 The fire resistance test WF380112 was conducted in accordance with BSEN1366-3:2009 and BSEN 1363-1:2012. These standards differ from AS1530.4-2014. The effect of these differences has on the fire resistance performance of test specimens is discussed below.

Specimen Configuration

B.2.1.2 AS1530.4-2014 specifies that the service(s) shall be installed so that it projects a minimum 500mm on each side of the supporting construction, of which at least 200mm shall extend beyond the extremities of the penetration sealing system. The penetration sealing system shall include any coating, wrapping or other protections to the services. The length of unprotected service on the unexposed face shall not be greater than 500mm. For plastic pipes, the external projection away from the furnace shall be increased to a minimum of 2000mm. The measurements shall not include any part of the plug or cap used to seal a pipe within the furnace.

B.2.1.3 Construction specimens in referenced test reports were checked and it was confirmed that there are no significant differences between relevant part of the tested construction and the specification in AS1530.4-2014.

Furnace Temperature Measurement

B.2.1.4 The furnace thermocouples specified in AS1530.4-2014 are type K, mineral insulated metal sheathed (MIMS) with a stainless steel sheath having a wire of diameter of less than 1.0mm and an overall diameter of 3mm. The measuring junction protrudes at least 25mm from the supporting heat resistant tube.

B.2.1.5 The furnace thermocouples specified in BSEN 1363-1:2012 is made from folded steel plate that faces the furnace chamber. A thermocouple is fixed to the side of the plate facing the specimen with the thermocouple hot junction protected by a pad of insulating material.

B.2.1.6 The plate part is to be constructed from 150 ±1mm long by 100 ±1 mm wide by 0.7 ±0.1mm thick nickel alloy sheet strips.

B.2.1.7 The measuring junction is to consist of nickel chromium / nickel aluminium (Type K) wire as defined in IEC 60584-1, contained with mineral insulation in a heat-resisting steel alloy sheath of nominal diameter 1mm, the hot junctions being electrically insulated from the sheath.

B.2.1.8 A thermocouple hot junction is to be fixed to the geometric centre of the plate, by a small steel strip made from the same material as the plate. The steel strip can be welded to the plate or may be screwed to it to facilitate replacement of the thermocouple. The strip should be approximately 18mm by 6mm if it is spot-welded to the plate, and nominally 25mm by 6mm if it is to be screwed to the plate. The screw is to be 2mm in diameter.

B.2.1.9 The assembly of plate and thermocouple should be fitted with a pad of inorganic insulation material 97 ±1mm by 97±1 mm by 10±1mm thick with a density of 280 ±30kg/m³.

B.2.1.10 The relative location of the furnace thermocouples for the exposed face of the specimen, for AS1530.4-2014 and BSEN 1363-1:2012, is 100mm +10mm and 100mm +50mm respectively.

B.2.1.11 The furnace control thermocouples required by EN1363-1:2012 are less responsive than those specified by AS1530.4-2014. This variation in sensitivity can produce a potentially more onerous heating condition for specimens tested to EN 1363-1:2012, particularly when the furnace temperature is changing quickly in the early stages of the test.

Furnace Temperature Regime

B.2.1.12 The furnace temperature regime for fire resistance tests conducted in accordance with AS1530.4-2014 follows the same trend as EN1363-1:2012

B.2.1.13 The parameters outlining the accuracy of control of the furnace temperature in AS 1530.4-2014 and BSEN1363-1:2012 are not appreciably different.

Furnace Pressure Regime

B.2.1.14 It is a requirement of AS1530.4-2014 that for vertical elements, a furnace gauge pressure of 15+3Pa is established at the centre of lowest penetration. In contrast, EN1366-3:2009 requires minimum 10Pa at the lowest point of lowest service.

B.2.1.15 It is a requirement of AS1530.4:2014 and for EN1363-1:2012 that for horizontal elements, a furnace gauge pressure of 20Pa is established at a height of 100mm below the floor soffit level.

B.2.1.16 The parameters outlining the accuracy of control of the furnace pressure in AS1530.4:2014 and EN1363-1:2012 are also not appreciably different.

Integrity Performance Criteria

B.2.1.17 The integrity criteria differ slightly between AS 1530.4:2014 and BS EN 1363-1:2012

B.2.1.18 While a specimen maintains its insulation performance, the specimen shall be deemed to have failed integrity criterion in accordance with AS1530.4-2014 if it collapses or sustains flaming or other conditions on the unexposed face, which ignite cotton pad when applied for up to 30 seconds.

B.2.1.19 Specimens shall be deemed to have failed the integrity criterion in accordance with AS 1530.4-2014 when any of the following occur:

- Sustained flaming for 10 seconds
- A gap form that allows the passage of hot gases to the unexposed face and ignite the cotton pad when applied for up to 30 seconds
- A gap forms that allows the penetration of a 25mm gap gauge anywhere on the specimen
- A gap forms that allows a 6 x 150mm gap gauge to penetrate the specimen (anywhere on the specimen)

B.2.1.20 Except for minor technical variations, the integrity criteria in EN1363.1:2012 are generally applied in a comparable manner.

Specimen Temperature Measurement

B.2.1.21 The specimen thermocouple specification of service penetrations is generally the same for AS1530.4-2014 and BSEN1366-3.

B.2.1.22 For the penetration construction considered. AS 1530.4-2014 specifies the following locations for thermocouples to be placed.

- At not less than two points approximately 25mm from the edge of the hole made for the passage of the service (one in uppermost vertical plane).
- On the surface of the penetrating service, at least two thermocouples located approximately 25mm from the plane of the general surface of the penetrated element (one in uppermost vertical plane).
- At least two positions 25mm from the interface of the separating element and main penetration seal.

B.2.1.23 For penetrating sealing systems, BSEN 1363-1:2012 specifies thermocouples are fixed in generally similar locations on the unexposed face: on the supporting construction and/or seal and on the penetrating service adjacent at the plane of penetration, and on the penetrating service some distance from the plane of penetration.

- B.2.1.24** Based on the above, the effect of the differences on the thermocouple locations of the tested construction and the specifications in AS1530.4-2014 discussed on case by case basis.

Insulation Performance Criteria

- B.2.1.25** The general insulation criteria of AS 1530.4-2014 and EN1363.1:2012 are not appreciably different.

B.2.2 Application of Test Data to AS 1530.4-2014

- B.2.2.1** The variations in furnace heating regimes, furnace thermocouples and the responses of the different thermocouples types to the furnace conditions are not expected to have significant effect on the outcome of the referenced fire resistance test.

- B.2.2.2** In the referenced tests, some specimens were not in accordance with AS1530.4-2014 especially the capping arrangement of pipes. Hence, those specimens were not given FRL (Refer to Appendix A for details)

- B.2.2.3** Based on the above discussion, it is considered that the results relating to the integrity and insulation performance of the referenced tests can be used as a basis to assess the FRL of the specimens if tested in accordance with AS1530.4-2014

B.3 VARIATION TO PLASTERBOARD LINED WALL

- B.3.1.1** It is proposed that the plasterboard wall partition tested in the referenced tests shall include the option of lining with two layers of 13mm thick fire grade plasterboard that has otherwise been tested or assessed as a wall to achieve a FRL -/120/120 on each side of steel or timber framed wall.

- B.3.1.2** It is also proposed that the tested 50mm thick stone wool cavity insulation shall be omitted.

- B.3.1.3** With reference to tested configurations in the mentioned tests, although the wall was insulated with 50mm thick stone wool in the wall cavity, no stone wool insulation was placed 100mm around the openings in the flexible wall.

- B.3.1.4** When tested, the temperature rise measured on the unexposed side of the wall 25mm from the seal edge in WF 375339 was 21K at 120 minutes, this observation is also in line with the overall unexposed side temperature measurements on other locations of the wall specimen.

- B.3.1.5** Based on the above observation, it is expected that the insulation performance of the plasterboard lined wall without wall cavity would still be maintained for at least 120 minutes.

- B.3.1.6** It is therefore, considered the proposed construction such variation is thus positively assessed.

B.4 APPLICABILITY TO MASONRY, AAC OR CONCRETE WALLS

- B.4.1.1** The scope of AS 1530.4-2014 Clause 10.12.2 (c), allows the application of test results obtained in plasterboard-lined partitions to be applied to solid of hollow masonry or normal weight concrete walls of the same or greater thickness.

- B.4.1.2** The proposed construction also comprises bare walls have minimum thickness of 75mm and minimum two layers of 13mm or 16mm thick fire grade plasterboard strips minimum 100mm wide are fixed on each side of the wall and to make the wall partition to be minimum 100mm thick around the aperture.

- B.4.1.3** The seal depth therefore maintains at least 25mm deep as tested, it is hence considered the performance of the penetrations will not be detrimentally affected if installed in bare walls less than 100mm thick

- B.4.1.4** Even though the proposed rigid wall thickness is less than the tested frame wall system, they are required to be tested or otherwise assessed by other to have equal or better established FRL of the separating wall element.

The proposed construction includes such variations and is thus positively assessed.