



Fire assessment report

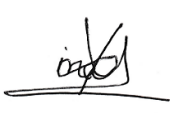


Penetrations protected by PROMASEAL® CFC 32 conduit collar

Sponsor: Promat Australia Pty Ltd

Report number: FAS220123 Revision: R1.0

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Quality management

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R1.0	Issue: 26 Jul 2022	Reason for issue	Initial issue		
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			Kimal Wasalathilake	Mahmoud Akl	Omar Saad
	Signature				

Executive summary

This report documents the findings of the assessment undertaken to determine the expected fire resistance level (FRL) of a series of service penetrations protected by PROMASEAL® CFC 32 conduit collar passing through plasterboard, Hebel and Speedpanel walls and concrete slabs in accordance with AS 1530.4:2014.

The analysis in section 5 of this report found that the proposed systems, together with the described variations, are expected to achieve the FRLs as shown in Table 1 to Table 10, in accordance with AS 1530.4:2014.

The variations and outcome of this assessment are subject to the limitations and requirements described in sections 2, 3 and 6 of this report. The results of this report are valid until 31 July 2027.

Table 1 Service penetrations in minimum 90 mm thick plasterboard wall (single layer of 13 mm fire rated plasterboard)

Service Penetration	Pipe diameter (mm)	Pipe thickness (mm)	Fire stopping system	FRL	Reference test report
PEX	20 – 32	2.17 – 2.9	PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/60/60	A-14-947
PEX/AL/PEX	16 – 20	3.1 – 3.2	PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/60/60	A-14-947
PP-R	20	3.15	PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/60/60	FP 6114
uPVC conduit filled with fibre optic cables (12 core 3 mode)	20	2.01	PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/60/60	A-15-959C
uPVC conduit with 2 × 2.5 mm ² 2C+E TPS cables	25	0.5	PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/60/60	FP 6114

Table 2 Service penetrations in minimum 116 mm thick plasterboard wall (two layers of 13 mm fire rated plasterboard)

Service Penetration	Pipe diameter (mm)	Pipe thickness (mm)	Fire stopping system	FRL	Reference test report
PEX	20	2.01 – 3.31	PROMASEAL® CFC 32 on the unexposed side and PROMASEAL®-AG sealant on the exposed side of the wall	-/120/90	A-16-012
PEX	20	2.01 – 3.31	PROMASEAL® CFC 32 on the exposed side and PROMASEAL®-AG sealant on the unexposed side of the wall	-/120/120	A-16-012

Service Penetration	Pipe diameter (mm)	Pipe thickness (mm)	Fire stopping system	FRL	Reference test report
PEX with an electrical cable	25	3.15	PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/120/90	A-16-012

Table 3 Service penetrations in 128 mm thick plasterboard wall (two layers of 16 mm fire rated plasterboard)

Service Penetration	Pipe diameter (mm)	Pipe thickness (mm)	Fire stopping system	FRL	Reference test report
Polybutylene pipe	22	N/A	PROMASEAL® CFC 32 on both side of the wall	-/240/180*	WRFA 41027
PE	32	3.4	PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/240/180*	FSP 0863
PEX (AUSPEX)	16 – 20	2 – 2.4	PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/180/180*	BWA 2253502
PEX (AUSPEX)	25	2.8	PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/180/120*	BWA 2253502
PEX-A	20	3.2	PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/180/180*	BWA 2257300
PEX-A	25 – 32	4 – 4.7	PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/180/120*	BWA 2257300
PEX/AL/PEX	16.4	3	PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/180/180*	BWA 2257300
PEX/AL/PEX	20	3	PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/180/60*	BWA 2257300
PEX/AL/PEX	25	4	PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/180/30*	BWA 2257300
PEX/AL/PEX	32	5	PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/180/60*	BWA 2257300
PEX/AL/PEX (DUOPEX)	32	3	PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/180/90*	BWA 2253502
PB (PRO-FIT IPLEX)	18 – 22	1.7 – 2.3	PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/180/180*	WRFA 41281

Service Penetration	Pipe diameter (mm)	Pipe thickness (mm)	Fire stopping system	FRL	Reference test report
PP-R (Aquatherm)	32	5.5	PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/240/120*	FSP 0863
REHAU HIS 311 XLPE	16 – 25	2.2 – 3.5	PROMASEAL® CFC 32 on both side and PROMASEAL®-A acrylic sealant on the exposed side of the wall	-/240/120*	WRFA 40908a
uPVC	25	2.3	PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/180/180*	A-13-852a
uPVC	32	2.2	PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/240/180*	FSP 0863
FUTURE K1 PEA/PE	20	2.5	PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/180/180*	WRFA 41281
FUTURE K2 PEXL	25	4	PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/180/180*	WRFA 41281
uPVC conduit with a Tycab low voltage Polypropylene electrical cable	32	3.24	PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/120/120	A-12-752

*The maximum FRL of the service will be governed by the established FRL of the 128 mm thick plasterboard wall.

Table 4 Service penetrations in 48 mm thick solid plasterboard wall (three layers of 16 mm fire rated plasterboard)

Service Penetration	Pipe diameter (mm)	Pipe thickness (mm)	Fire stopping system	FRL	Reference test report
PEX-A	18	2.84	PROMASEAL® CFC 32 installed flush on the unexposed side, annular gap on the unexposed side filled with PROMASEAL®-A acrylic sealant and gap between the pipe and collar filled with PROMASEAL® GRAF4T	-/120/60	A-13-848
PEX-A	20	4.07	PROMASEAL® CFC 32 installed 5 mm into the separating element from the unexposed side, annular gap on the unexposed side filled with PROMASEAL®-A acrylic sealant and the gap between the pipe and collar filled with PROMASEAL® GRAF4T	-/90/90	A-13-823
PEX-AL-PEX	20	3.35	Double PROMASEAL® CFC 32 at the centre, annular gap on the unexposed side filled with PROMASEAL®-A acrylic sealant and	-/120/90	A-13-848

Service Penetration	Pipe diameter (mm)	Pipe thickness (mm)	Fire stopping system	FRL	Reference test report
			the gap between the pipe and collar filled with PROMASEAL® GRAF4T		
PEX-AL-PEX	25	4.15	Double PROMASEAL® CFC 32 at the centre, annular gap on the unexposed side filled with PROMASEAL®-A acrylic sealant and the gap between the pipe and collar filled with PROMASEAL® GRAF4T	-/120/30	A-13-848
PB (PRO-FIT IPLEX)	18	2.66	PROMASEAL® CFC 32 installed flush on the unexposed side, annular gap on the unexposed side filled with PROMASEAL®-A acrylic sealant and the gap between the pipe and collar filled with PROMASEAL® GRAF4T	-/120/90	A-13-848
PB (PRO-FIT IPLEX)	22	2.56	PROMASEAL® CFC 32 installed flush on the unexposed side, annular gap on the unexposed side filled with PROMASEAL®-A acrylic sealant and the gap between the pipe and collar filled with PROMASEAL® GRAF4T	-/120/60	A-13-848

Table 5 Service penetrations in 75 mm thick Hebel wall

Service Penetration	Pipe diameter (mm)	Pipe thickness (mm)	Fire stopping system	FRL	Reference test report
REHAU PEX-A	20	3.66	PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/120/90	A-12-763A
REHAU PEX-A	20	6	Double PROMASEAL® CFC32 (One collar protrudes 40 mm on the exposed face and the other collar is flush with the unexposed face), annular gap on the unexposed side filled with PROMASEAL®-A acrylic sealant and the gap between the pipe and collar filled with PROMASEAL® GRAF4T	-/180/120*	A-12-761
REHAU PEX-A	20	3.44	Double PROMASEAL® CFC 32 at the centre, annular gap on the unexposed side filled with PROMASEAL®-AG sealant and the gap between the pipe and collar filled with PROMASEAL® GRAF4T	-/180/120*	A-13-816
REHAU PEX-A	20	3.44 – 4.26	Double PROMASEAL® CFC 32 at the centre, a piece of 20 mm thick PROMATECT® 40 fixed to the unexposed side, annular gap on the unexposed side filled with PROMASEAL®-A acrylic sealant and the gap between the pipe and collar filled with PROMASEAL® GRAF4T	-/180/180*	A-13-816
REHAU PEX-A	25	4.73	Double PROMASEAL® CFC32 (One collar protrudes 40 mm on the exposed face and the other collar is flush with the unexposed face),	-/120/90	A-12-763A

Service Penetration	Pipe diameter (mm)	Pipe thickness (mm)	Fire stopping system	FRL	Reference test report
			annular gap on the unexposed side filled with PROMASEAL®-A acrylic sealant and the gap between the pipe and collar filled with PROMASEAL® GRAF4T		
REHAU PEX-A	25	4.73	PROMASEAL® CFC 32 on both side of the wall, annular gap on the unexposed side filled with PROMASEAL®-A acrylic sealant and the gap between the pipe and collar filled with PROMASEAL® GRAF4T	-/120/90	A-12-763A
REHAU PEX-A	25	4.26	Double PROMASEAL® CFC 32 at the centre, annular gap on the unexposed side filled with Bostik Fireban One sealant and the gap between the pipe and collar filled with PROMASEAL® GRAF4T	-/180/90*	A-13-816
REHAU PEX-A	32	3.2	Double PROMASEAL® CFC 32 at the centre and PROMASEAL®-A acrylic sealant	-/180/180*	A-14-879a
PEX/AL/PEX	25	3.4	Double PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/180/60*	A-15-951A
PEX/AL/PEX	25 – 32	3.2 – 3.4	Double PROMASEAL® CFC 32 at the centre and PROMASEAL®-A acrylic sealant	-/180/60*	A-15-1038
Gas Plus HDPE/AL/PEX	16	1.6	Double PROMASEAL® CFC 32 at the centre, annular gap on the unexposed side filled with PROMASEAL®-A acrylic sealant and the gap between the pipe and collar filled with PROMASEAL® GRAF4T	-/180/120*	A-14-879a
PEX Plus PEX-A	16	1.6	Double PROMASEAL® CFC 32 at the centre, annular gap on the unexposed side filled with PROMASEAL®-A acrylic sealant and the gap between the pipe and collar filled with PROMASEAL® GRAF4T	-/180/120*	A-14-879a
IPELEX K1 (PEXc/Al/PE-HD)	20	3.13	Double PROMASEAL® CFC32 (One collar protrudes 40 mm on the exposed face and the other collar is flush with the unexposed face), annular gap on the unexposed side filled with PROMASEAL®-A acrylic sealant and the gap between the pipe and collar filled with PROMASEAL® GRAF4T	-/120/120	A-12-763A
IPELEX K1 (PEXc/Al/PE-HD)	20	3.13	PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/120/120	A-12-763A
uPVC	20	1.5	PROMASEAL® CFC 32 inserted 5 mm into the wall from the unexposed side, annular gap on the unexposed side filled with PROMASEAL®-A acrylic sealant and the gap between the pipe and collar filled with PROMASEAL® GRAF4T	-/180/180*	A-12-761

Service Penetration	Pipe diameter (mm)	Pipe thickness (mm)	Fire stopping system	FRL	Reference test report
uPVC	25	2.4	PROMASEAL® CFC 32 inserted 5 mm into the wall from the unexposed side, annular gap on the unexposed side filled with PROMASEAL®-A acrylic sealant and the gap between the pipe and collar filled with PROMASEAL® GRAF4T	-/120/120	A-12-761
*The maximum FRL of the service will be governed by the established FRL of the 75 mm thick Hebel wall.					

Table 6 Service penetrations in 51 mm thick Speedpanel wall

Service Penetration	Pipe diameter (mm)	Pipe thickness (mm)	Fire stopping system	FRL	Reference test report
PEX	25	2.01	PROMASEAL® CFC 32 at the centre and PROMASEAL®-A acrylic sealant on the exposed side	-/60/30	A-16-071
PEX	25	2.33	PROMASEAL® CFC 32 at the centre and PROMASEAL®-A acrylic sealant on both sides of the wall	-/60/60	A-16-071
PEX	25	2.09	Double PROMASEAL® CFC 32 at the centre and PROMASEAL®-A acrylic sealant on both sides of the wall	-/60/60	A-16-071
PEX/AL/PEX	25	3.41	Double PROMASEAL® CFC 32 at the centre and PROMASEAL®-A acrylic sealant on either side of the wall	-/60/30	A-16-071
PEX/AL/PEX	25	3.36	Double PROMASEAL® CFC 32 at the centre and PROMASEAL®-A acrylic sealant on both sides of the wall	-/60/30	A-16-071

Table 7 Service penetrations in 78 mm thick Speedpanel wall

Service Penetration	Pipe diameter (mm)	Pipe thickness (mm)	Fire stopping system	FRL	Reference test report
Rehau PEX	20	3.46	PROMASEAL® CFC 32, a piece of 25 mm thick PROMATECT® 100 and PROMASEAL® SupaMastic on both sides of the wall	-/120/30	A-12-777
Rehau PEX	25	4.05	PROMASEAL® CFC 32, a piece of 25 mm thick PROMATECT® 100 and PROMASEAL® SupaMastic on both sides of the wall	-/120/120	A-12-777
PEX/AL/PEX	16	3.3	PROMASEAL® CFC 32, a piece of 25 mm thick PROMATECT® 100 fixed on both sides of the wall. The annular gap on the unexposed side filled with PROMASEAL® SupaMastic and the gap between the pipe and collar filled with PROMASEAL® GRAF4T	-/240/180*	A-12-775A

Service Penetration	Pipe diameter (mm)	Pipe thickness (mm)	Fire stopping system	FRL	Reference test report
PEX/AL/PEX	20	3.8	PROMASEAL® CFC 32, a piece of 25 mm thick PROMATECT® 100 fixed on both sides of the wall. The annular gap on the unexposed side filled with PROMASEAL® SupaMastic and the gap between the pipe and collar filled with PROMASEAL® GRAF4T	-/240/240*	A-12-775A
PEX-A	16 – 20	2.01 – 1.61	PROMASEAL® CFC 32, a piece of 25 mm thick PROMATECT® 100 fixed on both sides of the wall.	-/120/120	A-14-906

*The maximum FRL of the service will be governed by the established FRL of the 78 mm thick Speedpanel wall.

Table 8 Service penetrations in 120 mm thick concrete slab

Service Penetration	Pipe diameter (mm)	Pipe thickness (mm)	Fire stopping system	FRL	Reference test report
PEX	16	2	PROMASEAL® CFC 32 on the exposed side and PROMASEAL®-A acrylic sealant	-/180/90	BWA 2253500
PEX	20	2.4	PROMASEAL® CFC 32 on the exposed side and PROMASEAL®-A acrylic sealant	-/180/180	BWA 2253500
PEX	25	2.8	PROMASEAL® CFC 32 on the exposed side and PROMASEAL®-A acrylic sealant	-/180/120	BWA 2253500
PEX-A	20.2	3.2	PROMASEAL® CFC 32 on the exposed side and PROMASEAL®-A acrylic sealant	-/180/120	BWA 2257301
PEX-A	32	5.4	PROMASEAL® CFC 32 on the exposed side and PROMASEAL®-A acrylic sealant	-/240/120	BWA 2257301
REHAU PEX-A	16	3	PROMASEAL® CFC 32	-/240/120	A-11-737
REHAU PEX-A	20 – 25	3.5 – 4	PROMASEAL® CFC 32	-/240/180	A-11-737
REHAU PEX-A	32	5	PROMASEAL® CFC 32	-/240/120	A-11-737
PEX/AL/PEX	16.2	3	PROMASEAL® CFC 32 on the exposed side and PROMASEAL®-A acrylic sealant	-/240/180	BWA 2257301
PEX/AL/PEX	20	3	PROMASEAL® CFC 32 on the exposed side and PROMASEAL®-A acrylic sealant	-/240/120	BWA 2257301

Service Penetration	Pipe diameter (mm)	Pipe thickness (mm)	Fire stopping system	FRL	Reference test report
PEX/AL/PEX	25	4	PROMASEAL® CFC 32 on the exposed side and PROMASEAL®-A acrylic sealant	-/240/90	BWA 2257301
PEX/AL/PEX	32	5	PROMASEAL® CFC 32 on the exposed side and PROMASEAL®-A acrylic sealant	-/180/120	BWA 2257301
PEX/AL/PE-HD	25	2.5	PROMASEAL® CFC 32 on the exposed side and PROMASEAL®-A acrylic sealant	-/240/120	FSP 1239
IPLEX FK1 Gas Class PN 20	25	2.7	PROMASEAL® CFC 32 on the exposed side and PROMASEAL®-A acrylic sealant	-/180/90	WRFA 2159700B.1
PB (PRO-FIT IPLEX)	18	1.7	PROMASEAL® CFC 32 on the exposed side and PROMASEAL®-A acrylic sealant	-/240/180	WRFA 41280.1
PB (PRO-FIT IPLEX)	22	2.3	PROMASEAL® CFC 32 on the exposed side and PROMASEAL®-A acrylic sealant	-/240/180	WRFA 41280.1
PP-R (Aquatherm)	25	3.6	PROMASEAL® CFC 32 on the exposed side and PROMASEAL®-A acrylic sealant	-/240/180	WRFA 2159700B.1
REHAU HIS 311 XLPE	32	4.4	PROMASEAL® CFC 32 on the exposed side and PROMASEAL®-A acrylic sealant	-/240/180	WRFA 40907a
PVC	32	2	PROMASEAL® CFC 32 on the exposed side and PROMASEAL®-A acrylic sealant	-/240/180	WRFA 41280.1

Table 9 Service penetrations in 150 mm thick concrete slab

Service Penetration	Pipe diameter (mm)	Pipe thickness (mm)	Fire stopping system	FRL	Reference test report
uPVC	32	1.3	PROMASEAL® CFC 32	-/240/240	FSP 1675
uPVC conduit half filled with twin & earth electrical cables	25	3.76	PROMASEAL® CFC 32 on the exposed side	-/120/120	A-16-011A

Table 10 Service penetrations in PROMASEAL® bulkhead sealer system friction fitted into a slab

Description	Service Penetration	Pipe diameter (mm)	Pipe thickness (mm)	Fire stopping system	FRL	Reference test report
Two layers of PROMASEAL® bulkhead sealer (50 mm thick) friction fitted, flushed with the unexposed face	PEX	16 – 25	2.1	PROMASEAL® CFC 32 and 22 mm wide PROMASEAL® IBS wrapped around the pipe flushed with the top batt. PROMASEAL®-A acrylic sealant on the exposed side	-/180/180	A-17-071
	uPVC conduit filled with 24 × fibre optic cables (6 mm each)	20	2.1	PROMASEAL® CFC 32 and 22 mm wide PROMASEAL® IBS wrapped around the pipe flushed with the top batt. PROMASEAL®-A acrylic sealant on the exposed side	-/180/180	
	uPVC conduit filled with 11 mm diameter electrical cables (3 × 2.5 mm copper core)	20	2.1	PROMASEAL® CFC 32 and 22 mm wide PROMASEAL® IBS wrapped around the pipe flushed with the top batt. PROMASEAL®-A acrylic sealant on the exposed side	-/180/60	

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1. Introduction

This report documents the findings of the assessment undertaken to determine the expected fire resistance level (FRL) of a series of service penetrations protected by PROMASEAL® CFC 32 conduit collar passing through plasterboard, Hebel and Speedpanel walls and concrete slabs in accordance with AS 1530.4:2014¹.

This report may be used as Evidence of Suitability in accordance with the requirements of the relevant National Construction Code (NCC) to support the use of the material, product, form of construction or design as given within the scope of this assessment report. It also references test evidence for meeting deemed to satisfy (DTS) provisions of the NCC as applicable to the assessed systems.

This assessment was carried out at the request of Promat Australia Pty Ltd.

The sponsor details are included in Table 11.

Table 11 Sponsor details

Sponsor	Address
Promat Australia Pty Ltd	1 Scotland Road Mile End SA 5031 Australia

2. Framework for the assessment

2.1 Assessment approach

An assessment is an opinion about the expected performance of a component or element of structure if it was subject to a fire test.

No specific framework, methodology, standard or guidance documents exists in Australia for doing these assessments. We have therefore followed the 'Guide to undertaking technical assessments of the fire performance of construction products based on fire test evidence' prepared by the Passive Fire Protection Forum (PFPF) in the UK in 2021².

This guide provides a framework for undertaking assessments in the absence of specific fire test results. Some areas where assessments may be offered are:

- Where a modification is made to a construction which has already been tested
- The interpolation or extrapolation of results of a series of fire resistance tests, or utilisation of a series of fire test results to evaluate a range of variables in a construction design or a product
- Where, for various reasons – eg size or configuration – it is not possible to subject a construction or a product to a fire test.

Assessments will vary from relatively simple judgements on small changes to a product or construction through to detailed and often complex engineering assessments of large or sophisticated constructions.

This assessment uses established empirical methods and our experience of fire testing similar products to extend the scope of application by determining the limits for the design based on the tested constructions and performances obtained. The assessment is an evaluation of the potential fire resistance performance if the elements were to be tested in accordance with AS 1530.4:2014.

¹ Standards Australia, 2014, Methods for fire tests on building materials, components and structures – Part 4: Fire-resistance tests for elements of construction, AS 1530.4:2014, Standards Australia, NSW.

² Passive Fire Protection Forum (PFPF), 2021, Guide to undertaking technical assessments of the fire performance of construction products based on fire test evidence, Passive Fire Protection Forum (PFPF), UK.

This assessment has been written using appropriate test evidence generated at accredited laboratories to the relevant test standard. The supporting test evidence has been deemed appropriate to support the manufacturer's stated design.

2.2 Compliance with the National Construction Code

This assessment report has been prepared to meet the Evidence of Suitability requirements of the NCC 2019, including amendments³ under A5.2 (1) (d).

This assessment has been written in accordance with the general principles outlined in EN 15725:2010⁴ for extended application reports on the fire performance of construction products and building elements. It also references test evidence for meeting a performance requirement or deemed to satisfy (DTS) provision of the NCC under A5.4 for fire resistance levels as applicable to the assessed systems.

This assessment report may also be used to demonstrate compliance with the requirements for Evidence of Suitability under NCC 2016, including amendments⁵.

2.3 Declaration

The 'Guide to undertaking technical assessments of the fire performance of construction products based on fire test evidence' prepared by the PFPF in the UK requires a declaration from the client. By accepting our fee proposal on 23 June 2022, Promat Australia Pty Ltd confirmed 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.
- They agree to withdraw this assessment from circulation if the component or element of structure is 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.
- 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 – they agree to ask the assessing authority to withdraw the assessment.

3. Limitations of this assessment

- The scope of this report is limited to an assessment of the variations to the tested systems described in section 4.3.
- This report details the methods of construction, test conditions and assessed results that are expected if the systems were tested in accordance with AS 1530.4:2014.
- This assessment is applicable to floor systems exposed to fire from below in accordance with the requirements of AS 1530.4:2014 where horizontal elements must be exposed to heat from the underside only.

This assessment is applicable to wall systems exposed to fire from each side in accordance with the requirements of AS 1530.4:2014 where vertical elements must be exposed to heat from the direction required to resist fire exposure.

- This report is only valid for the assessed system/s and must not be used for any other purpose. Any changes with respect to size, construction details, loads, stresses, edge or end conditions – other than those identified in this report – may invalidate the findings of this assessment. If there are changes to the system, a reassessment will need to be done by an

³ National Construction Code Volumes One and Two - Building Code of Australia 2019 including Amendments, Australian Building Codes Board, Australia

⁴ European Committee for Standardization, 2010, Extended application reports on the fire performance of construction products and building elements, EN 15725:2010, European Committee for Standardization, Brussels, Belgium.

⁵ National Construction Code Volumes One and Two - Building Code of Australia 2016 including Amendments, Australian Building Codes Board, Australia

Accredited Testing Laboratory (ATL) that is accredited to the same nominated standards of this report.

- The documentation that forms the basis for this report is listed in Appendix A.
- This report has been prepared based on information provided by others. Warringtonfire has not verified the accuracy and/or completeness of that information and will not be responsible for any errors or omissions that may be incorporated into this report as a result.
- This assessment is based on the proposed systems being constructed under comprehensive quality control practices and following appropriate industry regulations and Australian Standards on quality of materials, design of structures, guidance on workmanship and expert handling, placing and finishing of the products on site. These variables are beyond the control and consideration of this report.

4. Description of the specimen and variations

4.1 System description

The proposed systems consist of a series of service penetrations passing through plasterboard, Hebel and Speedpanel walls and concrete slabs. The services are locally protected with PROMASEAL® CFC 32 conduit collar.

4.2 Referenced test data

The assessment of the variation to the tested systems and the determination of the expected performance is based on the results of the fire tests documented in the reports summarised in Table 12. Further details of the tested systems are included in Appendix A.

Table 12 Referenced test data

Test Report number	Test sponsor	Test date	Testing authority
FSP 0863	Promat Australia Pty Ltd	31/08/2001	CSIRO
WFRA 40907a	Promat Australia Pty Ltd	12/02/2002	Warrington Fire Research
WFRA 40908a	Promat Australia Pty Ltd	8/03/2002	Warrington Fire Research
WFRA 41027-wa.2	Promat Australia Pty Ltd	23/12/2003	Warrington Fire Research
WFRA:41104as.1	Promat Australia Pty Ltd	6/09/2004	Warrington Fire Research
WFRA 2159700B.1	Promat Australia Pty Ltd	13/07/2006	Warrington Fire Research
WFRA 41280.1	Promat Australia Pty Ltd	13/07/2006	Warrington Fire Research
WFRA 41281.1	Promat Australia Pty Ltd	14/07/2006	Warrington Fire Research
FSP 1239	Promat Australia Pty Ltd	19/01/2007	CSIRO
BWA 2253502	Promat Australia Pty Ltd	26/05/2008	Bodycote Warringtonfire
BWA 2253500	Promat Australia Pty Ltd	27/05/2008	Bodycote Warringtonfire
BWA 2257300	Promat Australia Pty Ltd	16/06/2008	Bodycote Warringtonfire
BWA 2257301	Promat Australia Pty Ltd	17/06/2008	Bodycote Warringtonfire
FSRG A-11-737	Promat Australia Pty Ltd	19/08/2011	Fire Science Research Group
FSRG A-12-752	Promat Australia Pty Ltd	3/05/2012	Fire Science Research Group
FSRG A-12-761	Promat Australia Pty Ltd	12/06/2012	Fire Science Research Group
FSRG A-12-763A	Promat Australia Pty Ltd	5/07/2012	Fire Science Research Group
FSRG A-12-775a	Promat Australia Pty Ltd	16/08/2012	Fire Science Research Group
FSRG A-12-777	Promat Australia Pty Ltd	30/08/2012	Fire Science Research Group
FSRG A-13-816	Promat Australia Pty Ltd	21/03/2013	Fire Science Research Group

Test Report number	Test sponsor	Test date	Testing authority
FSRG A-13-823a	Promat Australia Pty Ltd	15/05/2013	Fire Science Research Group
FSRG A-13-848	Promat Australia Pty Ltd	11/10/2013	Fire Science Research Group
FSRG A-13-850a	Promat Australia Pty Ltd	18/10/2013	Fire Science Research Group
FSRG A-13-852a	Promat Australia Pty Ltd	8/11/2013	Fire Science Research Group
FSRG A-14-879a	Promat Australia Pty Ltd	12/06/2014	Fire Science Research Group
FSRG A-14-906	Promat Australia Pty Ltd	15/08/2014	Fire Science Research Group
FSRG A-14-947	Promat Australia Pty Ltd	16/12/2014	Fire Science Research Group
FSRG A-15-1038	Promat Australia Pty Ltd	21/01/2015	Fire Science Research Group
FSRG A-15-951A	Promat Australia Pty Ltd	21/01/2015	Fire Science Research Group
FSRG A-15-959C	Promat Australia Pty Ltd	25/02/2015	Fire Science Research Group
FSP 1675	Promat Australia Pty Ltd	27/02/2015	CSIRO
FSRG A-16-012	Promat Australia Pty Ltd	17/02/2016	Fire Science Research Group
FSRG A-16-011A	Promat Australia Pty Ltd	23/02/2016	Fire Science Research Group
FSRG A-16-071	Promat Australia Pty Ltd	30/09/2016	Fire Science Research Group
FSRG A-17-071	Promat Australia Pty Ltd	14/09/2017	Fire Science Research Group
FP 6114	Promat Australia Pty Ltd	2/11/2017	BRANZ

4.3 Variations to the tested systems

An identical system has not been subject to a standard fire test. We have therefore assessed the system using baseline test information for similar system. The variations to the tested systems – together with the referenced standard fire tests – are described in Table 13.

Table 13 Variations to tested systems

Item	Reference test	Description	Variations
Plastic pipes and electrical and telecommunication cables	FSRG A-14-947 FSRG A-15-959C FP 6114 FSRG A-16-012	Plastic pipes and electrical and telecommunication cables penetrating a plasterboard wall (single layer of 13 mm fire rated plasterboard) protected by PROMASEAL® CFC 32 conduit collars were tested in accordance with AS 1530.4:2005 ⁶ and AS 1530.4:2014.	It is proposed to determine the expected fire performance of the penetration services protected by PROMASEAL® CFC 32 conduit collars installed in various walls and floors if tested in accordance with AS 1530.4:2014.
Plastic pipes	FSP 0863 BWA 2253502 BWA 2257300 FSRG A-13-850a FSRG A-13-852a WFRA 41027 WFRA 40908a WFRA 41281.1	Plastic pipes penetrating a 116 mm thick plasterboard wall (two layers of 13 mm fire rated plasterboard) protected by PROMASEAL® CFC 32 conduit collars were tested in accordance with AS 1530.4:1997 ⁷ and AS 1530.4:2005.	
Plastic pipes	FSRG A-13-823a	Plastic pipes penetrating a 48 mm thick solid	

⁶ Standards Australia, 2005, Methods for fire tests on building materials, components and structures – Part 4: Fire-resistance tests for elements of construction, AS 1530.4:2005, Standards Australia, NSW.

⁷ Standards Australia, 1997, Methods for fire tests on building materials, components and structures – Part 4: Fire-resistance tests of elements of building construction, AS 1530.4:1997, Standards Australia, NSW.

Item	Reference test	Description	Variations
	FSRG A-13-848	plasterboard wall (three layers of 16 mm fire rated plasterboards) protected by PROMASEAL® CFC 32 conduit collars were tested in accordance with AS 1530.4:2005.	
Plastic pipes and electrical cables	BWA 2253500 BWA 2257301 FSRG A-11-737 FSP 1239 WFRA 41280.1 WFRA 2159700B.1 WFRA 41281.1 WFRA 40907a	Plastic pipes and electrical cables penetrating a concrete slab protected by PROMASEAL® CFC 32 conduit collars were tested in accordance with AS 1530.4:1997 and AS 1530.4:2005.	
Plastic pipes	FSRG A-12-763A FSRG A-12-761 FSRG A-13-816 FSRG A-14-879a FSRG A-15-951A FSRG A-15-1038	Plastic pipes penetrating a Hebel AAC wall protected by PROMASEAL® CFC 32 conduit collars were tested in accordance with AS 1530.4:2005.	
Plastic pipes	FSRG A-16-071 FSRG A-12-775a FSRG A-12-777	Plastic pipes penetrating a Speedpanel wall protected by PROMASEAL® CFC 32 conduit collars were tested in accordance with AS 1530.4:2005 and AS 1530.4:2014.	
Plastic pipes and electrical and telecommunication cables	A-17-071	Plastic pipes and electrical and telecommunication cables penetrating a PROMASEAL® bulkhead sealer system friction fitted into a slab were tested in accordance with AS 1530.4:2014.	

4.4 Test / Assessment standard

Section 2 of AS 1530.4:2014 specifies the general requirements for conducting fire resistance tests. Section 10 of AS 1530.4:2014 gives guidelines for determining the fire resistance of elements of construction penetrated by services.

AS 4072.1:2005⁸ sets out the minimum requirements for the construction, installation and application of fire resistance tests to sealing systems.

⁸ Standards Australia, 2005, Components for the protection of openings in fire-resistant separating elements: Service penetrations and control joints, AS 4072.1:2005, Standards Australia, NSW.

5. Assessment of plastic pipes and electrical and telecommunication cables

5.1 Description of variation

The tested systems included a series of plastic pipes, electrical and telecommunication cables protected by PROMASEAL® CFC 32 conduit collar penetrating through plasterboard, Hebel and Speedpanel walls and concrete slabs. The tests were conducted in accordance with AS 1530.4:1997 and AS 1530.4:2005. It has been proposed to assess the expected fire resistance performance of the tested systems in accordance with AS 1530.4:2014.

5.2 Methodology

The method of assessment used is summarised in Table 14.

Table 14 Method of assessment

Assessment method	
Level of complexity	Basic assessment
Type of assessment	Qualitative and comparative

5.3 Assessment

5.3.1 Relevance of AS 1530.4:1997 test data with respect to AS 1530.4:2014

The referenced fire resistance tests, FSP 0863, WFRA 41027 and WFRA 40908a, were conducted in accordance with AS 1530.4:1997, which differs slightly from AS 1530.4:2014. The differences in test methods considered capable of significantly altering specimen performance are discussed below.

Furnace temperature measurement

The specification for furnace thermocouples in AS 1530.4:2014 and AS 1530.4:1997 is not appreciably different.

Furnace temperature regime

AS 1530.4:2014 specifies furnace temperature to follow the following trend:

$$T_{AS1530.4-2014} = 345 \log_{10}(8t + 1) + 20$$

AS 1530.4:1997 specifies furnace temperature to follow the following trend:

$$T_{AS1530.4-1997} = 345 \log_{10}(8t + 1) + T_0, 10^\circ\text{C} \leq T_0 \leq 40^\circ\text{C}$$

The parameters outlining the accuracy of control of the furnace temperature in AS 1530.4:2014 and AS 1530.4:1997 are not appreciably different.

Furnace pressure regime

AS 1530.4:1997 specifies that when testing service penetrations through vertical elements, the furnace pressure level at the centre of the penetration shall be 15 Pa above the laboratory atmosphere. Similarly, AS 1530.4:2014 specifies that a pressure of 15 ± 3 Pa shall be established at the centre of the lowest penetration service.

It has been confirmed that for the specimens of interest in test reports FSP 0863, WFRA 41027 and WFRA 40908a, the pressure was more than 15 Pa for the test duration. The pressure conditions thus adhered to those prescribed by AS 1530.4:2014.

Specimen temperature measurement

AS 1530.4:2014 specifies specimen thermocouples as Type K, MIMS thermocouples with a stainless-steel sheaf, having a wire diameter not exceeding 0.5 mm and an overall diameter of 3 mm. The thermocouples shall be supported by a heat-resisting tube with the measuring junction protruding a

minimum of 25 mm. Each thermocouple shall have the tail of its measuring junction soldered to the centre of a 12 mm diameter × 0.2 mm thick copper disc. The disc shall be covered by 30 ± 0.5 mm × 30 ± 0.5 mm × 2.0 ± 0.5 mm thick inorganic insulating pad with a density of 900 ± 100 kg/m³.

AS 1530.4:1997 specifies specimen thermocouples as Type K, MIMS thermocouples with a stainless-steel sheaf, having a wire diameter not exceeding 0.5 mm and an overall diameter of 3 mm. The thermocouples shall be supported by a heat-resisting tube with the measuring junction protruding a minimum 25 mm. Each thermocouple shall have the tail of its measuring junction soldered to the centre of a 12 mm diameter × 0.2 mm thick copper disc. The disc shall be covered by an oven-dry pad, no less than 30 mm square, made from material of a value $\sqrt{(k\rho c)}$ not greater than 600 at 150 °C, and of such thickness as to give a thermal resistance ($R = t/K$) of 0.015 K/W – 0.025 K/W at 150 °C.

For penetrating elements installed in vertical separating elements, AS 1530.4:2014 requires thermocouples to be located as follows:

- At not less than two points located approximately 25 mm from the edge of the hole made for the passage of the service (one in uppermost vertical plane).
- At least two points 25 mm from the plane of the penetrated element and insulated topping, if any (one in the uppermost vertical plane). Where the insulation or packing is taped or stepped, two additional thermocouples beyond the end of the step or taper are required if higher temperatures are expected at these points.
- Where practicable, at two points on the packing around the penetrating service.
- Before/during the heating period, additional thermocouples at any point appearing hotter than the points being measured.

For the specimen constructions considered in this assessment, AS 1530.4:1997 differs only in that it does not require one of the thermocouples on the separating element and 25 mm from the plane of the separating element to be located in the uppermost vertical plane.

Specimen size

AS 1530.4:2014 prescribes that for plastic pipes, the penetrating services shall extend a minimum of 500 mm past the separating element into the furnace and a minimum of 2000 mm past the separating element away from the furnace. AS 1530.4:1997 standard has the same minimum 2000 mm extension requirement away from the furnace but prescribes only 100 mm minimum extension into the furnace. It is confirmed that some of the referenced test specimens did not meet the AS 1530.4:2014 requirement for length of extension into the furnace.

Since the pipes are plastic, and have a corresponding low melting temperature, the length of the pipe extending into the furnace is not considered important, as this length will melt away very early in the test. The important aspect of specimen size is the length of pipe extending away from the furnace, a requirement which is identical between AS 1530.4:1997 and AS 1530.4:2014 standards.

Integrity performance criteria

AS 1530.4:2014 deems integrity failure to have occurred upon collapse, sustained (10 seconds) flaming, ignition of an applied cotton pad, or if a 6 mm gap gauge can protrude into the furnace and can be moved 150 mm along the gap, or if a 25 mm gap gauge can protrude into the furnace.

AS 1530.4:1997 deems integrity failure to occur upon collapse, the development of cracks, fissures, or other openings through which flames or hot gases can pass.

It is possible for a gap or opening to form which does not allow a straight line of sight into the furnace but allows sufficient passage of hot gases to ignite a cotton wool pad. Nevertheless, there were no observations made for the specimen relevant to this assessment in FSP 0863, WFRA 41027 and WFRA 40908a, which are considered likely to have warranted the application of a cotton pad.

As those specimens which failed the integrity criterion were due to sustained flaming or the formation of a through gap with an uninterrupted view, the slight variations in integrity criterion would not be expected to significantly affect the integrity performance of the service penetrations in the referenced tests if tested in accordance with AS 1530.4:2014.

Insulation performance criteria

The insulation criteria specified in AS 1530.4:2014 are the same as those specified in AS 1530.4:1997.

Application of test data to AS 1530.4:2014

In WRFA 41027, only one thermocouple was located 400 mm from the partition instead of two as required by AS 1530.4:1997. This is not expected to have an adverse effect on the insulation rating of the test specimen since the thermocouples closer to the specimen are considered more critical and a roving thermocouple was available to check hot spots.

The minor variations in furnace heating regimes and specimen thermocouple specifications are not considered likely to significantly affect the behaviour of the specimens relevant to this assessment.

Based on the above, it is considered that the integrity and insulation behaviour of the specimens tested in FSP 0863, WRFA 41027, and WRFA 40908a can be used to assess the expected performance if the specimen were tested in accordance with AS 1530.4:2014.

5.3.2 Relevance of AS 1530.4:2005 test data with respect to AS 1530.4:2014

The fire resistance tests A-14-947, A-15-959C, A-16-012, BWA 2253502, BWA 2257300, A-13-852a, WRFA 41281, A-13-848, FSP 1675, A-16-011A, A-12-763A, A-12-761, A-13-816, A-14-879a, A-15-951A, A-15-1038, A-12-777 and A-12-775A were conducted in accordance with AS 1530.4:2005, which differs from AS 1530.4:2014. The effect these differences have on the fire resistance performance of the referenced test specimens is discussed below.

Furnace temperature measurement

The specifications for furnace thermocouples in AS 1530.4:2014 are the same as those specified in AS 1530.4:2005.

Furnace temperature regime

AS 1530.4:2005 and AS 1530.4:2014 specify furnace temperature to follow the following trend:

$$T_{AS1530.4:2014} = 345 \log_{10}(8t + 1) + 20$$

The parameters outlining the accuracy of control of the furnace temperature in AS 1530.4:2014 and AS 1530.4:2005 are not appreciably different.

Furnace pressure

The furnace pressure conditions for single and multiple penetration sealing systems in AS 1530.4:2005 and AS 1530.4:2014 are not appreciably different. The parameters outlining the accuracy of control of the furnace pressure in AS 1530.4:2014 and AS 1530.4:2005 are not appreciably different.

Furnace pressure regime

For vertical separating elements, AS 1530.4:2014 and AS 1530.4:2005 specify that a pressure of 15 ± 3 Pa shall be established at the centre of the lowest penetration service.

For horizontal separating elements, AS 1530.4:2014 and AS 1530.4:2005 specify that a pressure of 20 ± 3 Pa shall be maintained in the horizontal plane, 100 ± 10 mm below the underside of the supporting construction.

Specimen temperature measurement

The specification and location for specimen thermocouples in AS 1530.4:2014 are the same as those specified in AS 1530.4:2005.

Integrity performance criteria

AS 1530.4:2014 stipulates in addition to the 20 mm thick × 100 mm × 100 mm cotton pads, additional cotton pads shall be provided with a reduced 30 mm × 30 mm × 20 mm with an additional wire frame holder and shall be used to determine integrity failure.

Apart from the above variation, the failure criteria for integrity in AS 1530.4:2014 and AS 1530.4:2005 are not appreciably different.

Insulation performance criteria

The positions of thermocouples and failure criteria for insulation in AS 1530.4:2014 and AS 1530.4:2005 are not appreciably different.

Application of test data to AS 1530.4:2014

In the fire resistance tests BWA 2253502, BWA 2257300, A-13-850a, WRFA 41281 and A-11-737, there were some minor deviations from the furnace pressure limits prescribed by AS 1530.4:2005 during short time intervals. The higher pressure may have caused more furnace gasses to be forced onto the unexposed face; however, no flaming or cotton pad ignition occurred during this period. Hence, this fluctuation is not expected to have adversely affected the results of the fire resistance tests.

In the fire resistance tests A-15-959C and WRFA 40907a, the percentage deviation in the area of the curve of the average temperature recorded by the furnace thermocouples versus time from the standard time-temperature curve was at times greater than the standard permits. The short period of time for which this occurred did not significantly affect the fire resistance performance of the test specimens, which had potentially been subjected to a slightly more onerous fire resistance test.

In the fire resistance test A-13-852a, there was a malfunction on one of the furnace thermocouples during testing. This caused the average to be recorded outside the allowable upper and lower limits of the time temperature curve for a period of 10 minutes (from test time 43 min 45 sec to 53 min 45 sec). Although this caused an inaccurate measurement, the short period of time for which this occurred did not significantly affect the result of the test in a positive manner.

Based on the above discussion and in absence of any foreseeable integrity and insulation risk, it is concluded that the results relating to the integrity and insulation performance of the specimens – tested in A-14-947, A-15-959C, A-16-012, BWA 2253502, BWA 2257300, A-13-852a, WRFA 41281, A-13-848, FSP 1675, A-16-011A, A-12-763A, A-12-761, A-13-816, A-14-879a, A-15-951A, A-15-1038, A-12-777 and A-12-775A – can be used to assess the integrity and insulation performance in accordance with AS 1530.4:2014.

5.3.3 FP 6114 test data in accordance with AS 1530.4:2014

The fire resistance test FP 6114 was conducted in accordance with AS 1530.4:2014. However, there were some minor deviations in the pressure measurements outside the test standard limits prescribed in AS 1530.4:2014 at 5 and 15 minutes into the test, which are not considered likely to have affected the performance of the specimen. There was a much larger deviation from the test standard after 87 minutes. There were no failures of the specimen at the time of the deviation or in the few remaining minutes afterwards, it is therefore considered that the deviation from the test standard did not adversely affect the result of the test.

5.4 Conclusion

This assessment demonstrates that various penetration services protected by PROMASEAL® CFC 32 conduit collar are expected to achieve the FRLs given in Table 15 to Table 24 in accordance with AS 1530.4:2014.

Table 15 Service penetrations in minimum 90 mm thick plasterboard wall (single layer of 13 mm fire rated plasterboard)

Service Penetration	Pipe diameter (mm)	Pipe thickness (mm)	Fire stopping system	FRL	Reference test report
PEX	20 – 32	2.17 – 2.9	PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/60/60	A-14-947
PEX/AL/PEX	16 – 20	3.1 – 3.2	PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/60/60	A-14-947
PP-R	20	3.15	PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/60/60	FP 6114
uPVC conduit filled with fibre optic cables (12 core 3 mode)	20	2.01	PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/60/60	A-15-959C
uPVC conduit with 2 × 2.5 mm ² 2C+E TPS cables	25	0.5	PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/60/60	FP 6114

Table 16 Service penetrations in minimum 116 mm thick plasterboard wall (two layers of 13 mm fire rated plasterboard)

Service Penetration	Pipe diameter (mm)	Pipe thickness (mm)	Fire stopping system	FRL	Reference test report
PEX	20	2.01 – 3.31	PROMASEAL® CFC 32 on the unexposed side and PROMASEAL®-AG sealant on the exposed side of the wall	-/120/90	A-16-012
PEX	20	2.01 – 3.31	PROMASEAL® CFC 32 on the exposed side and PROMASEAL®-AG sealant on the unexposed side of the wall	-/120/120	A-16-012
PEX with an electrical cable	25	3.15	PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/120/90	A-16-012

Table 17 Service penetrations in 128 mm thick plasterboard wall (two layers of 16 mm fire rated plasterboard)

Service Penetration	Pipe diameter (mm)	Pipe thickness (mm)	Fire stopping system	FRL	Reference test report
Polybutylene pipe	22	N/A	PROMASEAL® CFC 32 on both side of the wall	-/240/180*	WRFA 41027
PE	32	3.4	PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/240/180*	FSP 0863

Service Penetration	Pipe diameter (mm)	Pipe thickness (mm)	Fire stopping system	FRL	Reference test report
PEX (AUSPEX)	16 – 20	2 – 2.4	PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/180/180*	BWA 2253502
PEX (AUSPEX)	25	2.8	PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/180/120*	BWA 2253502
PEX-A	20	3.2	PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/180/180*	BWA 2257300
PEX-A	25 – 32	4 – 4.7	PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/180/120*	BWA 2257300
PEX/AL/PEX	16.4	3	PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/180/180*	BWA 2257300
PEX/AL/PEX	20	3	PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/180/60*	BWA 2257300
PEX/AL/PEX	25	4	PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/180/30*	BWA 2257300
PEX/AL/PEX	32	5	PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/180/60*	BWA 2257300
PEX/AL/PEX (DUOPEX)	32	3	PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/180/90*	BWA 2253502
PB (PRO-FIT IPLEX)	18 – 22	1.7 – 2.3	PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/180/180*	WRFA 41281
PP-R (Aquatherm)	32	5.5	PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/240/120*	FSP 0863
REHAU HIS 311 XLPE	16 – 25	2.2 – 3.5	PROMASEAL® CFC 32 on both side and PROMASEAL®-A acrylic sealant on the exposed side of the wall	-/240/120*	WRFA 40908a
uPVC	25	2.3	PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/180/180*	A-13-852a
uPVC	32	2.2	PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/240/180*	FSP 0863
FUTURE K1 PEA/PE	20	2.5	PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/180/180*	WRFA 41281

Service Penetration	Pipe diameter (mm)	Pipe thickness (mm)	Fire stopping system	FRL	Reference test report
FUTURE K2 PEXL	25	4	PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/180/180*	WRFA 41281
uPVC conduit with a Tycab low voltage Polypropylene electrical cable	32	3.24	PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/120/120	A-12-752

*The maximum FRL of the service will be governed by the established FRL of the 128 mm thick plasterboard wall.

Table 18 Service penetrations in 48 mm thick solid plasterboard wall (three layers of 16 mm fire rated plasterboard)

Service Penetration	Pipe diameter (mm)	Pipe thickness (mm)	Fire stopping system	FRL	Reference test report
PEX-A	18	2.84	PROMASEAL® CFC 32 installed flush on the unexposed side, annular gap on the unexposed side filled with PROMASEAL®-A acrylic sealant and gap between the pipe and collar filled with PROMASEAL® GRAF4T	-/120/60	A-13-848
PEX-A	20	4.07	PROMASEAL® CFC 32 installed 5 mm into the separating element from the unexposed side, annular gap on the unexposed side filled with PROMASEAL®-A acrylic sealant and the gap between the pipe and collar filled with PROMASEAL® GRAF4T	-/90/90	A-13-823
PEX-AL-PEX	20	3.35	Double PROMASEAL® CFC 32 at the centre, annular gap on the unexposed side filled with PROMASEAL®-A acrylic sealant and the gap between the pipe and collar filled with PROMASEAL® GRAF4T	-/120/90	A-13-848
PEX-AL-PEX	25	4.15	Double PROMASEAL® CFC 32 at the centre, annular gap on the unexposed side filled with PROMASEAL®-A acrylic sealant and the gap between the pipe and collar filled with PROMASEAL® GRAF4T	-/120/30	A-13-848
PB (PRO-FIT IPLEX)	18	2.66	PROMASEAL® CFC 32 installed flush on the unexposed side, annular gap on the unexposed side filled with PROMASEAL®-A acrylic sealant and the gap between the pipe and collar filled with PROMASEAL® GRAF4T	-/120/90	A-13-848
PB (PRO-FIT IPLEX)	22	2.56	PROMASEAL® CFC 32 installed flush on the unexposed side, annular gap on the unexposed side filled with PROMASEAL®-A	-/120/60	A-13-848

Service Penetration	Pipe diameter (mm)	Pipe thickness (mm)	Fire stopping system	FRL	Reference test report
			acrylic sealant and the gap between the pipe and collar filled with PROMASEAL® GRAF4T		

Table 19 Service penetrations in 75 mm thick Hebel wall

Service Penetration	Pipe diameter (mm)	Pipe thickness (mm)	Fire stopping system	FRL	Reference test report
REHAU PEX-A	20	3.66	PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/120/90	A-12-763A
REHAU PEX-A	20	6	Double PROMASEAL® CFC32 (One collar protrudes 40 mm on the exposed face and the other collar is flush with the unexposed face), annular gap on the unexposed side filled with PROMASEAL®-A acrylic sealant and the gap between the pipe and collar filled with PROMASEAL® GRAF4T	-/180/120*	A-12-761
REHAU PEX-A	20	3.44	Double PROMASEAL® CFC 32 at the centre, annular gap on the unexposed side filled with PROMASEAL®-AG sealant and the gap between the pipe and collar filled with PROMASEAL® GRAF4T	-/180/120*	A-13-816
REHAU PEX-A	20	3.44 – 4.26	Double PROMASEAL® CFC 32 at the centre, a piece of 20 mm thick PROMATECT® 40 fixed to the unexposed side, annular gap on the unexposed side filled with PROMASEAL®-A acrylic sealant and the gap between the pipe and collar filled with PROMASEAL® GRAF4T	-/180/180*	A-13-816
REHAU PEX-A	25	4.73	Double PROMASEAL® CFC32 (One collar protrudes 40 mm on the exposed face and the other collar is flush with the unexposed face), annular gap on the unexposed side filled with PROMASEAL®-A acrylic sealant and the gap between the pipe and collar filled with PROMASEAL® GRAF4T	-/120/90	A-12-763A
REHAU PEX-A	25	4.73	PROMASEAL® CFC 32 on both side of the wall, annular gap on the unexposed side filled with PROMASEAL®-A acrylic sealant and the gap between the pipe and collar filled with PROMASEAL® GRAF4T	-/120/90	A-12-763A
REHAU PEX-A	25	4.26	Double PROMASEAL® CFC 32 at the centre, annular gap on the unexposed side filled with Bostik Fireban One sealant and the gap between the pipe and collar filled with PROMASEAL® GRAF4T	-/180/90*	A-13-816
REHAU PEX-A	32	3.2	Double PROMASEAL® CFC 32 at the centre and PROMASEAL®-A acrylic sealant	-/180/180*	A-14-879a

Service Penetration	Pipe diameter (mm)	Pipe thickness (mm)	Fire stopping system	FRL	Reference test report
PEX/AL/PEX	25	3.4	Double PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/180/60*	A-15-951A
PEX/AL/PEX	25 – 32	3.2 – 3.4	Double PROMASEAL® CFC 32 at the centre and PROMASEAL®-A acrylic sealant	-/180/60*	A-15-1038
Gas Plus HDPE/AL/PEX	16	1.6	Double PROMASEAL® CFC 32 at the centre, annular gap on the unexposed side filled with PROMASEAL®-A acrylic sealant and the gap between the pipe and collar filled with PROMASEAL® GRAF4T	-/180/120*	A-14-879a
PEX Plus PEX-A	16	1.6	Double PROMASEAL® CFC 32 at the centre, annular gap on the unexposed side filled with PROMASEAL®-A acrylic sealant and the gap between the pipe and collar filled with PROMASEAL® GRAF4T	-/180/120*	A-14-879a
IPEX K1 (PEXc/Al/PE-HD)	20	3.13	Double PROMASEAL® CFC32 (One collar protrudes 40 mm on the exposed face and the other collar is flush with the unexposed face), annular gap on the unexposed side filled with PROMASEAL®-A acrylic sealant and the gap between the pipe and collar filled with PROMASEAL® GRAF4T	-/120/120	A-12-763A
IPEX K1 (PEXc/Al/PE-HD)	20	3.13	PROMASEAL® CFC 32 on both side of the wall and PROMASEAL®-A acrylic sealant	-/120/120	A-12-763A
uPVC	20	1.5	PROMASEAL® CFC 32 inserted 5 mm into the wall from the unexposed side, annular gap on the unexposed side filled with PROMASEAL®-A acrylic sealant and the gap between the pipe and collar filled with PROMASEAL® GRAF4T	-/180/180*	A-12-761
uPVC	25	2.4	PROMASEAL® CFC 32 inserted 5 mm into the wall from the unexposed side, annular gap on the unexposed side filled with PROMASEAL®-A acrylic sealant and the gap between the pipe and collar filled with PROMASEAL® GRAF4T	-/120/120	A-12-761

*The maximum FRL of the service will be governed by the established FRL of the 75 mm thick Hebel wall.

Table 20 Service penetrations in 51 mm thick Speedpanel wall

Service Penetration	Pipe diameter (mm)	Pipe thickness (mm)	Fire stopping system	FRL	Reference test report
PEX	25	2.01	PROMASEAL® CFC 32 at the centre and PROMASEAL®-A acrylic sealant on the exposed side	-/60/30	A-16-071

Service Penetration	Pipe diameter (mm)	Pipe thickness (mm)	Fire stopping system	FRL	Reference test report
PEX	25	2.33	PROMASEAL® CFC 32 at the centre and PROMASEAL®-A acrylic sealant on both sides of the wall	-/60/60	A-16-071
PEX	25	2.09	Double PROMASEAL® CFC 32 at the centre and PROMASEAL®-A acrylic sealant on both sides of the wall	-/60/60	A-16-071
PEX/AL/PEX	25	3.41	Double PROMASEAL® CFC 32 at the centre and PROMASEAL®-A acrylic sealant on either side of the wall	-/60/30	A-16-071
PEX/AL/PEX	25	3.36	Double PROMASEAL® CFC 32 at the centre and PROMASEAL®-A acrylic sealant on both sides of the wall	-/60/30	A-16-071

Table 21 Service penetrations in 78 mm thick Speedpanel wall

Service Penetration	Pipe diameter (mm)	Pipe thickness (mm)	Fire stopping system	FRL	Reference test report
Rehau PEX	20	3.46	PROMASEAL® CFC 32, a piece of 25 mm thick PROMATECT® 100 and PROMASEAL® SupaMastic on both sides of the wall	-/120/30	A-12-777
Rehau PEX	25	4.05	PROMASEAL® CFC 32, a piece of 25 mm thick PROMATECT® 100 and PROMASEAL® SupaMastic on both sides of the wall	-/120/120	A-12-777
PEX/AL/PEX	16	3.3	PROMASEAL® CFC 32, a piece of 25 mm thick PROMATECT® 100 fixed on both sides of the wall. The annular gap on the unexposed side filled with PROMASEAL® SupaMastic and the gap between the pipe and collar filled with PROMASEAL® GRAF4T	-/240/180*	A-12-775A
PEX/AL/PEX	20	3.8	PROMASEAL® CFC 32, a piece of 25 mm thick PROMATECT® 100 fixed on both sides of the wall. The annular gap on the unexposed side filled with PROMASEAL® SupaMastic and the gap between the pipe and collar filled with PROMASEAL® GRAF4T	-/240/240*	A-12-775A
PEX-A	16 – 20	2.01 – 1.61	PROMASEAL® CFC 32, a piece of 25 mm thick PROMATECT® 100 fixed on both sides of the wall.	-/120/120	A-14-906

*The maximum FRL of the service will be governed by the established FRL of the 78 mm thick Speedpanel wall.

Table 22 Service penetrations in 120 mm thick concrete slab

Service Penetration	Pipe diameter (mm)	Pipe thickness (mm)	Fire stopping system	FRL	Reference test report
PEX	16	2	PROMASEAL® CFC 32 on the exposed side and PROMASEAL®-A acrylic sealant	-/180/90	BWA 2253500
PEX	20	2.4	PROMASEAL® CFC 32 on the exposed side and PROMASEAL®-A acrylic sealant	-/180/180	BWA 2253500
PEX	25	2.8	PROMASEAL® CFC 32 on the exposed side and PROMASEAL®-A acrylic sealant	-/180/120	BWA 2253500
PEX-A	20.2	3.2	PROMASEAL® CFC 32 on the exposed side and PROMASEAL®-A acrylic sealant	-/180/120	BWA 2257301
PEX-A	32	5.4	PROMASEAL® CFC 32 on the exposed side and PROMASEAL®-A acrylic sealant	-/240/120	BWA 2257301
REHAU PEX-A	16	3	PROMASEAL® CFC 32	-/240/120	A-11-737
REHAU PEX-A	20 – 25	3.5 – 4	PROMASEAL® CFC 32	-/240/180	A-11-737
REHAU PEX-A	32	5	PROMASEAL® CFC 32	-/240/120	A-11-737
PEX/AL/PEX	16.2	3	PROMASEAL® CFC 32 on the exposed side and PROMASEAL®-A acrylic sealant	-/240/180	BWA 2257301
PEX/AL/PEX	20	3	PROMASEAL® CFC 32 on the exposed side and PROMASEAL®-A acrylic sealant	-/240/120	BWA 2257301
PEX/AL/PEX	25	4	PROMASEAL® CFC 32 on the exposed side and PROMASEAL®-A acrylic sealant	-/240/90	BWA 2257301
PEX/AL/PEX	32	5	PROMASEAL® CFC 32 on the exposed side and PROMASEAL®-A acrylic sealant	-/180/120	BWA 2257301
PEX/AL/PE-HD	25	2.5	PROMASEAL® CFC 32 on the exposed side and PROMASEAL®-A acrylic sealant	-/240/120	FSP 1239
IPLEX FK1 Gas Class PN 20	25	2.7	PROMASEAL® CFC 32 on the exposed side and PROMASEAL®-A acrylic sealant	-/180/90	WRFA 2159700B.1
PB (PRO-FIT IPLEX)	18	1.7	PROMASEAL® CFC 32 on the exposed side and PROMASEAL®-A acrylic sealant	-/240/180	WRFA 41280.1

Service Penetration	Pipe diameter (mm)	Pipe thickness (mm)	Fire stopping system	FRL	Reference test report
PB (PRO-FIT IPLEX)	22	2.3	PROMASEAL® CFC 32 on the exposed side and PROMASEAL®-A acrylic sealant	-/240/180	WRFA 41280.1
PP-R (Aquatherm)	25	3.6	PROMASEAL® CFC 32 on the exposed side and PROMASEAL®-A acrylic sealant	-/240/180	WRFA 2159700B.1
REHAU HIS 311 XLPE	32	4.4	PROMASEAL® CFC 32 on the exposed side and PROMASEAL®-A acrylic sealant	-/240/180	WRFA 40907a
PVC	32	2	PROMASEAL® CFC 32 on the exposed side and PROMASEAL®-A acrylic sealant	-/240/180	WRFA 41280.1

Table 23 Service penetrations in 150 mm thick concrete slab

Service Penetration	Pipe diameter (mm)	Pipe thickness (mm)	Fire stopping system	FRL	Reference test report
uPVC	32	1.3	PROMASEAL® CFC 32	-/240/240	FSP 1675
uPVC conduit half filled with twin & earth electrical cables	25	3.76	PROMASEAL® CFC 32 on the exposed side	-/120/120	A-16-011A

Table 24 Service penetrations in PROMASEAL® bulkhead sealer system friction fitted into a slab

Description	Service Penetration	Pipe diameter (mm)	Pipe thickness (mm)	Fire stopping system	FRL	Reference test report
Two layers of PROMASEAL® bulkhead sealer (50 mm thick) friction fitted, flushed with the unexposed face	PEX	16 – 25	2.1	PROMASEAL® CFC 32 and 22 mm wide PROMASEAL® IBS wrapped around the pipe flushed with the top batt. PROMASEAL®-A acrylic sealant on the exposed side	-/180/180	A-17-071
	uPVC conduit filled with 24 × fibre optic cables (6 mm each)	20	2.1	PROMASEAL® CFC 32 and 22 mm wide PROMASEAL® IBS wrapped around the pipe flushed with the top batt. PROMASEAL®-A acrylic sealant on the exposed side	-/180/180	
	uPVC conduit filled with 11 mm diameter electrical cables (3 × 2.5 mm copper core)	20	2.1	PROMASEAL® CFC 32 and 22 mm wide PROMASEAL® IBS wrapped around the pipe flushed with the top batt. PROMASEAL®-A acrylic sealant on the exposed side	-/180/60	

6. Validity

Warringtonfire Australia does not endorse the tested or assessed product in any way. The conclusions of this assessment may be used to directly assess fire resistance, but it should be recognised that a single test method will not provide a full assessment of fire resistance under all conditions.

Due to the nature of fire 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.

This assessment is based on test data, information and experience available at the time of preparation. If contradictory evidence becomes available to the assessing authority, the assessment will be unconditionally withdrawn and the report sponsor will be notified in writing. Similarly, the assessment should be re-evaluated, if the assessed construction is subsequently tested since actual test data is deemed to take precedence.

The published procedures for the conduct of tests and the assessment of test results are subject to constant review and improvement. It is therefore recommended that this report be reviewed on, or before, the stated expiry date.

This assessment represents our opinion about the performance of the proposed systems expected to be demonstrated on a test in accordance with AS 1530.4:2014, based on the evidence referred to in this report.

This assessment is provided to Promat Australia Pty Ltd for their own specific purposes. This report may be used as Evidence of Suitability in accordance with the requirements of the relevant National Construction Code. Building certifiers and other third parties must determine the suitability of the systems described in this report for a specific installation.

Appendix A Summary of supporting test data

A.1 Test report – A-14-947

Table 25 Information about test report

Item	Information about test report
Report sponsor	Promat Australia Pty Ltd
Test laboratory	Fire Science Research Group, 1 Scotland Road, Mile End South, SA 5031, Australia
Test date	The fire resistance test was done on 16 December 2014.
Test standards	The test was done in accordance with AS 1530.4:2005.
Variation to test standards	None
General description of tested specimen	A fire test was conducted to determine the performance of various PEX and PEX/AL/PEX pipes through an 1800 mm × 1800 mm × 90 mm thick fire-resistant plasterboard wall partition in accordance with AS 1530.4:2005. The specimens A, B, C and D are considered in this assessment.
Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.4:2005.

The test specimen achieved the following results – see Table 26.

Table 26 Results summary for this test report

Specimen ID	Service	Pipe diameter (mm)	Pipe thickness (mm)	Local protection	Sealant	Integrity (minutes)	Insulation (minutes)	FRL
A	PEX/AL/PEX	20	3.2	PROMASEAL® CFC 32 (both faces)	PROMASEAL®-A acrylic sealant	68	65	-/60/60
B	PEX/AL/PEX	16	3.1	PROMASEAL® CFC 32 (both faces)	PROMASEAL®-A acrylic sealant	68	68	-/60/60
C	PEX	32	2.17	PROMASEAL® CFC 32 (both faces)	PROMASEAL®-A acrylic sealant	68	68	-/60/60
D	PEX	20	2.47	PROMASEAL® CFC 32 (both faces)	PROMASEAL®-A acrylic sealant	68	65	-/60/60

A.2 Test report – A-15-959C

Table 27 Information about test report

Item	Information about test report
Report sponsor	Promat Australia Pty Ltd
Test laboratory	Fire Science Research Group, 1 Scotland Road, Mile End South, SA 5031, Australia
Test date	The fire resistance test was done on 25 February 2015.
Test standards	The test was done in accordance with AS 1530.4:2005.
Variation to test standards	The percentage deviation in the area of the curve of the average temperature recorded by the furnace thermocouples versus times from the standard time-temperature curve was at time greater than the standard permits. It is not expected that this deviation would have impacted favourably on the results of the test.
General description of tested specimen	A fire test was conducted to determine the performance of various penetrations through an 1800 mm × 1800 mm × 90 mm thick fire-resistant plasterboard wall partition in accordance with AS 1530.4:2005. Only specimen B is considered in this assessment.
Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.4:2005.

The test specimen achieved the following results – see Table 28.

Table 28 Results summary for this test report

Specimen ID	Service	Pipe diameter (mm)	Pipe thickness (mm)	Local protection	Sealant	Integrity (minutes)	Insulation (minutes)	FRL
B	uPVC conduit filled with fibre optic cables (12 core 3 mode)	20	2.01	PROMASEAL® CFC 32 (both faces)	PROMASEAL®-A acrylic sealant	64	62	-/60/60

A.3 Test report – FP 6114

Table 29 Information about test report

Item	Information about test report
Report sponsor	Promat Australia Pty Ltd
Test laboratory	BRANZ, 1222 Moonshine Road, Judgeford, Porirua 5381, New Zealand
Test date	The fire resistance test was done on 4 August 2017.
Test standards	The test was done in accordance with AS 1530.4:2014.
Variation to test standards	There were some minor excursions in furnace pressure outside the test standard limits at 5 and 15 minutes into the test, which are not considered likely to have affected the performance of the specimen. There was a much larger deviation from the test standard after 87 minutes. There were no failures of the specimen at the time of the deviation or in the few remaining minutes afterwards. It is therefore considered that the deviation from the test standard did not adversely affect the result of the test.
General description of tested specimen	The test specimen consisted of various penetrations through a 1 hour plasterboard lined wall. The wall was constructed from a 90 mm × 45 mm timber stud frame with a single layer of 13 mm GIB Fyrelite plasterboard on each side, giving an overall thickness of 116 mm. The specimen 3, 4, and 5 are considered in this assessment.
Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.4:2014.

The test specimen achieved the following results – see Table 30.

Table 30 Results summary for this test report

Specimen ID	Service	Pipe diameter (mm)	Pipe thickness (mm)	Local protection	Sealant	Integrity (minutes)	Insulation (minutes)	FRL
3	uPVC conduit with 2 × 2.5 mm ² 2C+E TPS cables	25	0.5	PROMASEAL® CFC 32 (both faces)	PROMASEAL®-A acrylic sealant	92	64	-/60/60
4	PEX	4	20	PROMASEAL® CFC 32 (both faces)	PROMASEAL®-A acrylic sealant	92	55	-/60/60
5	PP-R	5	20	PROMASEAL® CFC 32 (both faces)	PROMASEAL®-A acrylic sealant	92	63	-/60/60

A.4 Test report – A-16-012

Table 31 Information about test report

Item	Information about test report
Report sponsor	Promat Australia Pty Ltd
Test laboratory	Fire Science Research Group, 1 Scotland Road, Mile End South, SA 5031, Australia
Test date	The fire resistance test was done on 17 February 2016.
Test standards	The test was done in accordance with AS 1530.4:2005.
Variation to test standards	None
General description of tested specimen	The fire resistance performance of penetration is protected by collars and sealant through an 1800 mm × 1800 mm × 116 mm thick fire rated plasterboard wall in accordance with AS 1530.4:2005. The specimens B, D, and E are considered in this assessment.
Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.4:2005.

The test specimen achieved the following results – see Table 32.

Table 32 Results summary for this test report

Specimen ID	Service	Pipe diameter (mm)	Pipe thickness (mm)	Local protection	Sealant	Integrity (minutes)	Insulation (minutes)	FRL
B	PEX	20	3.31	PROMASEAL® CFC 32 (exposed side)	Bostik Fireban One sealant (unexposed side)	123	123	-/120/120
D	PEX with an electric cable	25	3.15	PROMASEAL® CFC 32 (both faces)	N/A	122	97	-/120/90
E	PEX	20	2.01	PROMASEAL® CFC 32 (unexposed side)	Bostik Fireban One sealant (exposed side)	123	115	-/120/90

A.5 Test report – FSP 0863

Table 33 Information about test report

Item	Information about test report
Report sponsor	Promat Fyreguard Pty Ltd
Test laboratory	CSIRO, 14 Julius Avenue, Riverside Corporate Park, North Ryde NSW 2113
Test date	The fire resistance test was done on 31 August 2001.
Test standards	The test was done in accordance with AS 1530.4:1997.
Variation to test standards	None
General description of tested specimen	The specimen comprised plasterboard walls and a concrete slab floor penetrated by pipe service penetrations. The mounting frame was a 1150 mm × 1150 mm four-sided construction with two opposing double brick walls and two plasterboard walls. The top of the construction was closed off with a 120 mm thick reinforced concrete slab. The drywall was constructed of two layers of 16 mm fire rated plasterboard on each side of 64 CS 55 studs. The specimen E, F and H are considered in this assessment.
Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.4:1997.

The test specimen achieved the following results – see Table 34.

Table 34 Results summary for this test report

Specimen ID	Service	Pipe diameter (mm)	Pipe thickness (mm)	Local protection	Sealant	Integrity (minutes)	Insulation (minutes)	FRL
E	PE	32	3.4	PROMASEAL® CFC 32 (both faces)	PROMASEAL® acrylic sealant	240	186	-/240/180
F	uPVC	32	2.2	PROMASEAL® CFC 32 (both faces)	PROMASEAL® acrylic sealant	240	185	-/240/180
H	PP-R (Aquatherm)	32	5.5	PROMASEAL® CFC 32 (both faces)	PROMASEAL® acrylic sealant	240	160	-/240/120

A.6 Test report – BWA 2253502

Table 35 Information about test report

Item	Information about test report
Report sponsor	Promat Australia Pty Ltd
Test laboratory	Bodycote Warringtonfire, Unit 2, 409 – 411 Hammond Road, Dandenong, Victoria 3175, Australia
Test date	The fire resistance test was done on 26 May 2008.
Test standards	The test was done in accordance with AS 1530.4:2005.
Variation to test standards	For the first 25 minutes of the test duration and for the period of 190 to 195 minutes of the test duration, the furnace pressure was outside the limits prescribed in AS 1530.4:2005, however was maintained at a positive level. This variation was not likely to have had an adverse effect on the results of the test as there were no gaps or fissures around the pipes at the wall interface during this time.
General description of tested specimen	The test assembly comprised a nominal 1200 mm wide × 1200 mm high × 128 mm thick steel stud plasterboard wall penetrated by various diameter pipes. The specimens A, B, C and D are considered in this assessment.
Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.4:2005.

The test specimen achieved the following results – see Table 36.

Table 36 Results summary for this test report

Specimen ID	Service	Pipe diameter (mm)	Pipe thickness (mm)	Local protection	Sealant	Integrity (minutes)	Insulation (minutes)	FRL
A	PEX (AUSPEX)	16	2	PROMASEAL® CFC 32 (both faces)	PROMASEAL® AN acrylic sealant	211	208	-/180/180
B	PEX (AUSPEX)	20	2.4	PROMASEAL® CFC 32 (both faces)	PROMASEAL® AN acrylic sealant	211	201	-/180/180
C	PEX (AUSPEX)	25	2.8	PROMASEAL® CFC 32 (both faces)	PROMASEAL® AN acrylic sealant	211	137	-/180/120
D	PEX/AL/PEX (DUOPEX)	32	3	PROMASEAL® CFC 32 (both faces)	PROMASEAL® AN acrylic sealant	211	110	-/180/90

A.7 Test report – BWA 2257300

Table 37 Information about test report

Item	Information about test report
Report sponsor	Promat Australia Pty Ltd
Test laboratory	Bodycote Warringtonfire, Unit 2, 409 – 411 Hammond Road, Dandenong, Victoria 3175, Australia
Test date	The fire resistance test was done on 16 June 2008.
Test standards	The test was done in accordance with AS 1530.4:2005.
Variation to test standards	For the period of 160 to 170 minutes of the test duration, the furnace pressure was above the limits prescribed by AS 1530.4:2005. The higher pressure may have caused more furnace gasses to be forced to the unexposed face; however, no flaming or cotton pad ignition occurred during this period. The results of the test are considered to be valid and not significantly affected by the variation to the procedure.
General description of tested specimen	Fire resistance of various diameter pipes protected by retrofit collars fitted both sides, penetrating a 1200 mm wide × 1200 mm high × 128 mm thick steel framed plasterboard partition wall tested in accordance with AS 1530.4:2005.
Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.4:2005.

The test specimen achieved the following results – see Table 38.

Table 38 Results summary for this test report

Specimen ID	Service	Pipe diameter (mm)	Pipe thickness (mm)	Local protection	Sealant	Integrity (minutes)	Insulation (minutes)	FRL
A	PEX/AL/PEX	16.4	3	PROMASEAL® CFC 32 (both faces)	PROMASEAL® AN acrylic sealant	193	183	-/180/180
B	PEX-A	20	3.2	PROMASEAL® CFC 32 (both faces)	PROMASEAL® AN acrylic sealant	193	186*	-/180/180
C	PEX/AL/PEX	20	3	PROMASEAL® CFC 32 (both faces)	PROMASEAL® AN acrylic sealant	193	67	-/180/60
D	PEX-A	25	4	PROMASEAL® CFC 32 (both faces)	PROMASEAL® AN acrylic sealant	193	147	-/180/120
E	PEX/AL/PEX	25	4	PROMASEAL® CFC 32 (both faces)	PROMASEAL® AN acrylic sealant	193	59	-/180/30
F	PEX/AL/PEX	32	5	PROMASEAL® CFC 32 (both faces)	PROMASEAL® AN acrylic sealant	193	70	-/180/60

A.8 Test report – A-13-852a

Table 39 Information about test report

Item	Information about test report
Report sponsor	Promat Australia Pty Ltd
Test laboratory	Fire Science Research Group, 1 Scotland Road, Mile End South, SA 5031, Australia
Test date	The fire resistance test was done on 8 November 2013.
Test standards	The test was done in accordance with AS 1530.4:2005.
Variation to test standards	There was a malfunction on furnace thermocouple 1 during testing. This caused the average to be recorded outside the allowable upper and lower limits of the time temperature curve for a period of 10 minutes (from test time 43 min 45 sec to 53 min 45 sec). This gave an inaccurate measurement and did not affect the result of this test in a positive manner.
General description of tested specimen	A fire test was conducted to determine the performance of various types of pipes being protected with retrofit collars in a 1200 mm wide × 1200 mm high × 128 mm thick fire rated plasterboard partition, when tested in accordance with AS 1530.4:2005. The specimen A, and C are considered in this assessment.
Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.4:2005.

The test specimen achieved the following results – see Table 40.

Table 40 Results summary for this test report

Specimen ID	Service	Pipe diameter (mm)	Pipe thickness (mm)	Local protection	Sealant	Integrity (minutes)	Insulation (minutes)	FRL
A	PEX-A	32	4.7	PROMASEAL® CFC 32 (both faces)	PROMASEAL® AN acrylic sealant	181	139	-/180/120
C	uPVC	25	2.3	PROMASEAL® CFC 32 (both faces)	PROMASEAL® AN acrylic sealant	181	181	-/180/180

A.9 Test report – A-13-850a

Table 41 Information about test report

Item	Information about test report
Report sponsor	Promat Australia Pty Ltd
Test laboratory	Fire Science Research Group, 1 Scotland Road, Mile End South, SA 5031, Australia
Test date	The fire resistance test was done on 18 October 2013.
Test standards	The test was done in accordance with AS 1530.4:2005.
Variation to test standards	For the period of 160 to 170 minutes of the test duration, the furnace pressure was above the limits prescribed by AS 1530.4:2005. The higher pressure may have caused more furnace gasses to be forced to the unexposed face; however, no flaming or cotton pad ignition occurred during this period. The results of the test are considered to be valid and not significantly affected by the variation to the procedure.
General description of tested specimen	A fire test was conducted to determine the performance of PROMASTOP Unicollar and PROMASEAL CFC32 protecting various size of PHILMAC pipes in a 128 mm thick fire rated plasterboard partition, when tested in accordance with AS 1530.4:2005. The specimens C, and D are considered in this assessment.
Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.4:2005.

The test specimen achieved the following results – see Table 42.

Table 42 Results summary for this test report

Specimen ID	Service	Pipe diameter (mm)	Pipe thickness (mm)	Local protection	Sealant	Integrity (minutes)	Insulation (minutes)	FRL
C	PEX/AL/PEX	32	5.5	PROMASEAL® CFC 32 (both faces)	PROMASEAL® AN acrylic sealant	129	42	-/120/30
D	PEX-A	32	5.47	PROMASEAL® CFC 32 (both faces)	PROMASEAL® AN acrylic sealant	129	67	-/120/60

A.10 Test report – WRFA 41027

Table 43 Information about test report

Item	Information about test report
Report sponsor	Promat Australia Pty Ltd
Test laboratory	Warringtonfire Research, Unit 2, 409 – 411 Hammond Road, Dandenong, Victoria 3175, Australia
Test date	The fire resistance test was done on 12 August 2003.
Test standards	The test was done in accordance with AS 1530.4:1997.
Variation to test standards	Insufficient thermocouples were installed on the services at 400 mm from the partition. 1-off thermocouple was located 400 mm from the partition instead of 2-off as required by AS 1530.4:1997. This is not expected to have an adverse effect on the insulation rating of the test specimen since the thermocouples closer to the specimen are considered more critical and a roving thermocouple was available to check hot spots.
General description of tested specimen	A fire resistance test on various penetrations through a 1200 mm wide × 1200 mm high × 128 mm thick plasterboard partition wall in accordance with AS 1530.4:1997. Only specimen F is considered in this assessment.
Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.4:1997.

The test specimen achieved the following results – see Table 44.

Table 44 Results summary for this test report

Specimen ID	Service	Pipe diameter (mm)	Local protection	Integrity (minutes)	Insulation (minutes)	FRL
F	Polybutylene pipe	22	PROMASEAL® Conduit collar (UC20) (both faces)	241	231*	- /240/180

*Recorded on unexposed partition surface – no failures recorded on service pipes before these times.

A.11 Test report – WRFA 41281

Table 45 Information about test report

Item	Information about test report
Report sponsor	Promat Australia Pty Ltd
Test laboratory	Warringtonfire Research, Unit 2, 409 – 411 Hammond Road, Dandenong, Victoria 3175, Australia
Test date	The fire resistance test was done on 14 July 2006.
Test standards	The test was done in accordance with AS 1530.4:2005.
Variation to test standards	<p>Furnace pressure was measured in line with the lowest service and did not fall below 8 Pa (averaged over any ten minute period) for the duration of the test in accordance with AS 4072.1:2005 Appendix A2.</p> <p>The pressure variation during the test, however, did not comply with the limits specified in AS 1530.4:2005. The greatest differing margin to that specified was 6 Pa over a 5 minute period. This variation is due to pressure fluctuation within the furnace, and as the variation is of short duration, this fluctuation is unlikely to have affected the results of this fire resistance test. The average pressure over the duration of the fire resistance test was 14.3 Pa.</p> <p>The protrusion lengths into and away from the furnace was slightly less than those specified in AS 1530.4:2005 for some service penetrations, with the greatest variation of 50 mm less than that specified.</p>
General description of tested specimen	<p>A fire resistance test on various penetrations through a 1200 mm wide × 1200 mm high × 128 mm thick plasterboard partition wall in accordance with AS 1530.4:2005.</p> <p>The specimens A and B are considered in this assessment.</p>
Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.4:2005.

The test specimen achieved the following results – see Table 46.

Table 46 Results summary for this test report

Specimen ID	Service	Pipe diameter (mm)	Pipe thickness (mm)	Local protection	Sealant	Integrity (minutes)	Insulation (minutes)	FRL
A	PB (PRO-FIT IPLEX)	18	1.7	PROMASEAL® CFC 32 (both faces)	PROMASEAL®-A acrylic sealant	195	195	-/180/180
B	PB (PRO-FIT IPLEX)	22	2.3	PROMASEAL® CFC 32 (both faces)	PROMASEAL®-A acrylic sealant	195	195	-/180/180

A.12 Test report – WRFA 40908a

Table 47 Information about test report

Item	Information about test report
Report sponsor	Promat Fyreguard Pty Ltd
Test laboratory	Warringtonfire Research, Unit 2, 409 – 411 Hammond Road, Dandenong, Victoria 3175, Australia
Test date	The fire resistance test was done on 11 December 2001.
Test standards	The test was done in accordance with AS 1530.4:1997.
Variation to test standards	None.
General description of tested specimen	A fire resistance test on various penetrations through a 1200 mm wide × 1200 mm high × 128 mm thick plasterboard partition wall in accordance with AS 1530.4:1997. The specimens A and D are considered in this assessment.
Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.4:1997.

The test specimen achieved the following results – see Table 48.

Table 48 Results summary for this test report

Specimen ID	Service	Pipe diameter (mm)	Pipe thickness (mm)	Local protection	Sealant	Integrity (minutes)	Insulation (minutes)	FRL
A	REHAU HIS 311 XLPE	16	2.2	Promaseal 16-UniCollar (UC16) (both faces)	PROMASEAL®-A acrylic sealant (exposed face)	241	225*	-/240/180
D	REHAU HIS 311 XLPE	25	3.5	Promaseal 25-UniCollar (UC25) (both faces)	PROMASEAL®-A acrylic sealant (exposed face)	241	219*	-/240/180

*Recorded on unexposed partition surface - no failures recorded on collars or service pipes before these times.

A.13 Test report – A-13-848

Table 49 Information about test report

Item	Information about test report
Report sponsor	Promat Australia Pty Ltd
Test laboratory	Fire Science Research Group, 1 Scotland Road, Mile End South, SA 5031, Australia
Test date	The fire resistance test was done on 11 October 2013.
Test standards	The test was done in accordance with AS 1530.4:2005.
Variation to test standards	None.
General description of tested specimen	The test was conducted to determine the performance of PROMASEAL® CFC32, PROMASEAL® FlexiWrap and PROMASEAL® Wrap protecting various types of pipes and cable penetrating a 48 mm thick solid fire rated partition. The specimens A, B, C, G and H are considered in this assessment.
Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.4:2005.

The test specimen achieved the following results – see Table 50.

Table 50 Results summary for this test report

Specimen ID	Service	Pipe diameter (mm)	Pipe thickness (mm)	Local protection	Sealant	Integrity (minutes)	Insulation (minutes)	FRL
A	PEX-AL-PEX	20	3.35	Double PROMASEAL® CFC 32 (centre)	PROMASEAL® AN acrylic sealant (annular gap) and PROMASEAL GRAF 4T (between the pipe and collar)	121	91	-/120/90
B	PEX-A	18	2.84	PROMASEAL® CFC 32 (unexposed side)	PROMASEAL® AN acrylic sealant (annular gap) and PROMASEAL GRAF 4T (between the pipe and collar)	121	77	-/120/60
C	PB (PRO-FIT IPLEX)	18	2.66	PROMASEAL® CFC 32 (unexposed side)	PROMASEAL® AN acrylic sealant (annular gap) and PROMASEAL GRAF 4T (between the pipe and collar)	121	90	-/120/90
G	PB (PRO-FIT IPLEX)	22	2.55	PROMASEAL® CFC 32 (unexposed side)	PROMASEAL® AN acrylic sealant (annular gap) and	121	87	-/120/60

Specimen ID	Service	Pipe diameter (mm)	Pipe thickness (mm)	Local protection	Sealant	Integrity (minutes)	Insulation (minutes)	FRL
					PROAMSEAL GRAF 4T (between the pipe and collar)			
H	PEX-AL-PEX	25	4.15	Double PROMASEAL® CFC 32 (centre)	PROMASEAL® AN acrylic sealant (annular gap) and PROAMSEAL GRAF 4T (between the pipe and collar)	121	49	-/120/30

A.14 Test report – A-13-823

Table 51 Information about test report

Item	Information about test report
Report sponsor	Promat Australia Pty Ltd
Test laboratory	Fire Science Research Group, 1 Scotland Road, Mile End South, SA 5031, Australia
Test date	The fire resistance test was done on 15 May 2013.
Test standards	The test was done in accordance with AS 1530.4:2005.
Variation to test standards	None.
General description of tested specimen	The fire test was conducted to determine the fire resistance levels of uPVC and REHAU pipes protected by PROMASEAL® FCW and CFC32 collars through a 48 mm thick fire-resistant solid plasterboard partition. The specimens C and E are considered in this assessment.
Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.4:2005.

The test specimen achieved the following results – see Table 52.

Table 52 Results summary for this test report

Specimen ID	Service	Pipe diameter (mm)	Pipe thickness (mm)	Local protection	Sealant	Integrity (minutes)	Insulation (minutes)	FRL
C	PEX-A	20	4.07	PROMASEAL® CFC 32 (unexposed side)	PROMASEAL® AN acrylic sealant (annular gap) and PROAMSEAL GRAF 4T (between the pipe and collar)	119	96	-/90/90
E	PE-AL-PEX	20	4.33	PROMASEAL® CFC 32 (unexposed side)	PROMASEAL® AN acrylic sealant (annular gap) and PROAMSEAL GRAF 4T (between the pipe and collar)	118	29	-/90/-

A.15 Test report – A-12-763A

Table 53 Information about test report

Item	Information about test report
Report sponsor	Promat Australia Pty Ltd
Test laboratory	Fire Science Research Group, 1 Scotland Road, Mile End South, SA 5031, Australia
Test date	The fire resistance test was done on 5 July 2012.
Test standards	The test was done in accordance with AS 1530.4:2005.
Variation to test standards	None.
General description of tested specimen	The fire test on different installation methods of PROMASEAL® CFC32 collars protecting various sizes and types of pipes in a 75 mm thick AAC wall.
Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.4:2005.

The test specimen achieved the following results – see Table 54.

Table 54 Results summary for this test report

Specimen ID	Service	Pipe diameter (mm)	Pipe thickness (mm)	Local protection	Sealant	Integrity (minutes)	Insulation (minutes)	FRL
A	IPLEX K1 (PEXc/Al/PE-HD)	20	3.13	Double PROMASEAL® CFC32 (One collar protrudes 40 mm on the exposed face and the other collar is flush with the unexposed face)	PROMASEAL® AN acrylic sealant (annular gap) and PROAMSEAL GRAF 4T (between the pipe and collar)	153	153	-/120/120
B	Rehau PEX-a	25	4.73	Double PROMASEAL® CFC32 (One collar protrudes 40 mm on the exposed face and the other collar is flush with the unexposed face)	PROMASEAL® AN acrylic sealant (annular gap) and PROAMSEAL GRAF 4T (between the pipe and collar)	153	98	-/120/90
C	Rehau PEX-a	20	3.66	PROMASEAL® CFC32 (both faces)	PROMASEAL® AN acrylic sealant	153	113	-/120/90
D	IPLEX K1 (PEXc/Al/PE-HD)	20	3.13	PROMASEAL® CFC32 (both faces)	PROMASEAL® AN acrylic sealant	153	152	-/120/120

Specimen ID	Service	Pipe diameter (mm)	Pipe thickness (mm)	Local protection	Sealant	Integrity (minutes)	Insulation (minutes)	FRL
E	Rehau PEX-a	25	4.73	PROMASEAL® CFC 32 (both faces)	PROMASEAL® AN acrylic sealant	153	118	-/120/90

A.16 Test report – A-12-761

Table 55 Information about test report

Item	Information about test report
Report sponsor	Promat Australia Pty Ltd
Test laboratory	Fire Science Research Group, 1 Scotland Road, Mile End South, SA 5031, Australia
Test date	The fire resistance test was done on 21 June 2012.
Test standards	The test was done in accordance with AS 1530.4:2005.
Variation to test standards	The percentage deviation in the area of the curve of the average temperature recorded by the furnace thermocouples versus time from the standard time-temperature curve was at times below what the standard permits. It is not expected that this deviation would have impacted favourably on the results of the test.
General description of tested specimen	The fire test on different installation methods of PROMASEAL® CFC32 collars protecting various sizes and types of pipes in a 75 mm thick Hebel wall. The specimens A, B and F are considered in this assessment.
Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.4:2005.

The test specimen achieved the following results – see Table 56.

Table 56 Results summary for this test report

Specimen ID	Service	Pipe diameter (mm)	Pipe thickness (mm)	Local protection	Sealant	Integrity (minutes)	Insulation (minutes)	FRL
A	Rehau PEX-a	20	6	Double PROMASEAL® CFC 32 (One collar protrudes 40 mm on the exposed face and the other collar is flush with the unexposed face)	PROMASEAL® AN acrylic sealant (annular gap) and PROAMSEAL GRAF 4T (between the pipe and collar)	196	178	-/180/120
B	uPVC	25	2.4	PROMASEAL® CFC 32 (Inserted 5 mm into wall from the unexposed face)	PROMASEAL® AN acrylic sealant (annular gap) and PROAMSEAL GRAF 4T (between the pipe and collar)	147	144	-/120/120

Specimen ID	Service	Pipe diameter (mm)	Pipe thickness (mm)	Local protection	Sealant	Integrity (minutes)	Insulation (minutes)	FRL
F	uPVC	20	1.5	PROMASEAL® CFC 32 (Inserted 5 mm into wall from the unexposed face)	PROMASEAL® AN acrylic sealant (annular gap) and PROAMSEAL GRAF 4T (between the pipe and collar)	194	194	-/180/180

A.17 Test report – A-13-816

Table 57 Information about test report

Item	Information about test report
Report sponsor	Promat Australia Pty Ltd
Test laboratory	Fire Science Research Group, 1 Scotland Road, Mile End South, SA 5031, Australia
Test date	The fire resistance test was done on 21 March 2013.
Test standards	The test was done in accordance with AS 1530.4:2005.
Variation to test standards	None.
General description of tested specimen	The fire test on different installation methods of PROMASEAL® CFC32, PROMASEAL® FCW collars, and PROMASEAL® AN acrylic sealant protecting various sizes and types of pipes in a 75 mm thick Hebel wall. The specimens B, C, G and H are considered in this assessment.
Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.4:2005.

The test specimen achieved the following results – see Table 58.

Table 58 Results summary for this test report

Specimen ID	Service	Pipe diameter (mm)	Pipe thickness (mm)	Local protection	Sealant	Integrity (minutes)	Insulation (minutes)	FRL
B	Rehau PEX-a	20	3.44	Double PROMASEAL® CFC 32 (centre) (collar protrudes 20 mm on either side)	Bostik FIREBAN ONE (annular gap and end of collar on exposed face) and PROAMSEAL GRAF 4T (collar on both faces)	209	164	-/180/120
C	Rehau PEX-a	20	3.44	Double PROMASEAL® CFC 32 (centre) (collar protrudes 20 mm on the exposed side) and 20 mm thick PROMATECT® 40 (unexposed face)	PROMASEAL® AN acrylic sealant (annular gap) and PROAMSEAL GRAF 4T (between the pipe and collar)	209	181	-/180/180
G	Rehau PEX-a	25	4.26	Double PROMASEAL® CFC 32 (centre) (collar protrudes 20 mm on either side)	Bostik FIREBAN ONE (annular gap) and PROAMSEAL GRAF 4T (between the pipe and collar)	209	98	-/180/90
H	Rehau PEX-a	20	4.26	Double PROMASEAL® CFC 32 (centre) (collar protrudes 20 mm on the	PROMASEAL® AN acrylic sealant (annular gap) and PROAMSEAL	209	197	-/180/180

Specimen ID	Service	Pipe diameter (mm)	Pipe thickness (mm)	Local protection	Sealant	Integrity (minutes)	Insulation (minutes)	FRL
				exposed side) and 20 mm thick PROMATECT® 40 (unexposed face)	GRAF 4T (between the pipe and collar)			

A.18 Test report – A-14-879A

Table 59 Information about test report

Item	Information about test report
Report sponsor	Promat Australia Pty Ltd
Test laboratory	Fire Science Research Group, 1 Scotland Road, Mile End South, SA 5031, Australia
Test date	The fire resistance test was done on 12 June 2014.
Test standards	The test was done in accordance with AS 1530.4:2005.
Variation to test standards	None.
General description of tested specimen	A fire test was conducted to determine the performance of various penetrations through a 75 mm thick Hebel PowerPanel wall. The specimens A, G and H are considered in this assessment.
Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.4:2005.

The test specimen achieved the following results – see Table 60.

Table 60 Results summary for this test report

Specimen ID	Service	Pipe diameter (mm)	Pipe thickness (mm)	Local protection	Sealant	Integrity (minutes)	Insulation (minutes)	FRL
A	Gas Plus HDPE/AL/PEX	16	1.6	Double PROMASEAL® CFC 32 (centre)	PROMASEAL® AN acrylic sealant (annular gap) and PROAMSEAL GRAF 4T (between the pipe and collar)	187	172	-/180/120
G	PEX Plus PE-Xa pipe	16	1.6	Double PROMASEAL® CFC 32 (centre)	PROMASEAL® AN acrylic sealant (annular gap) and PROAMSEAL GRAF 4T (between the pipe and collar)	187	178	-/180/120
H	Rehau Pe-Xa	32	3.2	Double PROMASEAL® CFC 32 (centre)	PROMASEAL® AN acrylic sealant	187	183	-/180/180

A.19 Test report – A-15-951A

Table 61 Information about test report

Item	Information about test report
Report sponsor	Promat Australia Pty Ltd
Test laboratory	Fire Science Research Group, 1 Scotland Road, Mile End South, SA 5031, Australia
Test date	The fire resistance test was done on 21 January 2015.
Test standards	The test was done in accordance with AS 1530.4:2005.
Variation to test standards	None.
General description of tested specimen	A fire test was conducted to determine the performance of various penetrations through a 75 mm thick CSR Hebel PowerPanel wall. The specimens B, and E are considered in this assessment.
Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.4:2005.

The test specimen achieved the following results – see Table 62.

Table 62 Results summary for this test report

Specimen ID	Service	Pipe diameter (mm)	Pipe thickness (mm)	Local protection	Sealant	Integrity (minutes)	Insulation (minutes)	FRL
B	PEX/AL/PEX	32	3.2	Double PROMASEAL® CFC 32 (centre)	PROMASEAL®-A acrylic sealant	180	74	-/180/60
E	PEX/AL/PEX	25	3.4	Double PROMASEAL® CFC 32 (both faces)	PROMASEAL®-A acrylic sealant	180	84	-/180/60

A.20 Test report – A-15-1038

Table 63 Information about test report

Item	Information about test report
Report sponsor	Promat Australia Pty Ltd
Test laboratory	Fire Science Research Group, 1 Scotland Road, Mile End South, SA 5031, Australia
Test date	The fire resistance test was done on 21 January 2015.
Test standards	The test was done in accordance with AS 1530.4:2005.
Variation to test standards	None.
General description of tested specimen	A fire test was conducted to determine the performance of various penetrations through a 75 mm thick CSR Hebel PowerPanel wall. The specimen B and E are considered in this assessment.
Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.4:2005.

The test specimen achieved the following results – see Table 64.

Table 64 Results summary for this test report

Specimen ID	Service	Pipe diameter (mm)	Pipe thickness (mm)	Local protection	Sealant	Integrity (minutes)	Insulation (minutes)	FRL
B	PEX/AL/PEX	32	3.2	Double PROMASEAL® CFC 32 (centre)	PROMASEAL® A acrylic sealant	180	74	-/180/60
E	PEX/AL/PEX	25	3.4	Double PROMASEAL® CFC 32 (centre)	PROMASEAL® A acrylic sealant	180	84	-/180/60

A.21 Test report – A-16-071

Table 65 Information about test report

Item	Information about test report
Report sponsor	Promat Australia Pty Ltd
Test laboratory	Fire Science Research Group, 1 Scotland Road, Mile End South, SA 5031, Australia
Test date	The fire resistance test was done on 30 September 2016.
Test standards	The test was done in accordance with AS 1530.4:2014.
Variation to test standards	None.
General description of tested specimen	The fire resistance performance of PEX and PEX/AL/PEX pipes protected with PROMASEAL® CFC32 collars through a 51 mm thick Speedpanel wall partition.
Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.4:2014.

The test specimen achieved the following results – see Table 66.

Table 66 Results summary for this test report

Specimen ID	Service	Pipe diameter (mm)	Pipe thickness (mm)	Local protection	Sealant	Integrity (minutes)	Insulation (minutes)	FRL
A	PEX/AL/PEX	25	3.41	Double PROMASEAL® CFC 32 (centre)	PROMASEAL® AN acrylic sealant (unexposed face)	62	37	-/60/30
B	PEX	25	2.01	PROMASEAL® CFC 32 (centre)	PROMASEAL® AN acrylic sealant (exposed face)	62	52	-/60/30
C	PEX	25	2.33	PROMASEAL® CFC 32 (centre)	PROMASEAL® AN acrylic sealant (both faces)	62	62	-/60/60
D	PEX	25	2.09	Double PROMASEAL® CFC 32 (centre)	PROMASEAL® AN acrylic sealant (both faces)	62	62	-/60/60
E	PEX/AL/PEX	25	3.36	Double PROMASEAL® CFC 32 (centre)	PROMASEAL® AN acrylic sealant (both faces)	62	43	-/60/30
F	PEX/AL/PEX	25	3.31	Double PROMASEAL® CFC 32 (centre)	PROMASEAL® AN acrylic sealant (exposed face)	62	34	-/60/30

A.22 Test report – A-12-777

Table 67 Information about test report

Item	Information about test report
Report sponsor	Promat Australia Pty Ltd
Test laboratory	Fire Science Research Group, 1 Scotland Road, Mile End South, SA 5031, Australia
Test date	The fire resistance test was done on 30 August 2012.
Test standards	The test was done in accordance with AS 1530.4:2005.
Variation to test standards	None.
General description of tested specimen	Fire test using PROMASEAL® CFC32, PROMASEAL® FCW's and PROMASEAL® SupaMastic protecting various types of pipes and cables within a 75 mm thick Speedpanel partition. The specimens E and G are considered in this assessment.
Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.4:2005.

The test specimen achieved the following results – see Table 68.

Table 68 Results summary for this test report

Specimen ID	Service	Pipe diameter (mm)	Pipe thickness (mm)	Local protection	Sealant	Integrity (minutes)	Insulation (minutes)	FRL
E	Rehau PEX	25	4.05	PROMASEAL® CFC 32 (both faces) and 25 mm thick PROMATECT® 100 (both faces)	PROMASEAL® SupaMastic (both faces)	160	160	-/120/120
G	Rehau PEX	20	3.46	PROMASEAL® CFC 32 (both faces) and 25 mm thick PROMATECT® 100 (both faces)	PROMASEAL® SupaMastic (both faces)	160	34	-/120/30

A.23 Test report – A-12-775A

Table 69 Information about test report

Item	Information about test report
Report sponsor	Promat Australia Pty Ltd
Test laboratory	Fire Science Research Group, 1 Scotland Road, Mile End South, SA 5031, Australia
Test date	The fire resistance test was done on 16 August 2012.
Test standards	The test was done in accordance with AS 1530.4:2005.
Variation to test standards	None.
General description of tested specimen	Fire test using PROMASEAL® CFC32, PROMASEAL® FCW's and PROMASEAL® SupaMastic protecting various types of pipes and cables within a 75 mm thick Speedpanel partition. The specimens B and E are considered in this assessment.
Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.4:2005.

The test specimen achieved the following results – see Table 70.

Table 70 Results summary for this test report

Specimen ID	Service	Pipe diameter (mm)	Pipe thickness (mm)	Local protection	Sealant	Integrity (minutes)	Insulation (minutes)	FRL
B	PEX/AL/PEX	20	3.8	PROMASEAL® CFC 32 (both faces) and 25 mm thick PROMATECT® 100 (both faces)	The annular gap on the unexposed side filled with PROMASEAL® SupaMastic and the gap between the pipe and collar filled with PROMASEAL® GRAF4T	241	241	-/240/240
E	PEX/AL/PEX	16	3.3	PROMASEAL® CFC 32 (both faces) and 25 mm thick PROMATECT® 100 (both faces)	The annular gap on the unexposed side filled with PROMASEAL® SupaMastic and the gap between the pipe and collar filled with PROMASEAL® GRAF4T	241	237	-/240/180

A.24 Test report – A-14-906

Table 71 Information about test report

Item	Information about test report
Report sponsor	Promat Australia Pty Ltd
Test laboratory	Fire Science Research Group, 1 Scotland Road, Mile End South, SA 5031, Australia
Test date	The fire resistance test was done on 15 August 2014.
Test standards	The test was done in accordance with AS 1530.4:2005.
Variation to test standards	None.
General description of tested specimen	A fire test was conducted to determine the performance of various pipes with movement joints penetrating a 75 mm thick Speedpanel wall partition. The specimens A and C are considered in this assessment.
Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.4:2005.

The test specimen achieved the following results – see Table 72.

Table 72 Results summary for this test report

Specimen ID	Service	Pipe diameter (mm)	Pipe thickness (mm)	Local protection	Integrity (minutes)	Insulation (minutes)	FRL
A	PEX-A	20	2.01	PROMASEAL® CFC 32 (both faces) and 25 mm thick PROMATECT® 100 (both faces)	126	126	-/120/120
C	PEX-A	16	1.61	PROMASEAL® CFC 32 (both faces) and 25 mm thick PROMATECT® 100 (both faces)	126	124	-/120/120

A.25 Test report – BWA 2253500

Table 73 Information about test report

Item	Information about test report
Report sponsor	Promat Australia Pty Ltd
Test laboratory	Bodycote Warringtonfire, Unit 2, 409 – 411 Hammond Road, Dandenong, Victoria 3175, Australia
Test date	The fire resistance test was done on 27 May 2008.
Test standards	The test was done in accordance with AS 1530.4:2005.
Variation to test standards	None.
General description of tested specimen	Fire resistance test of various diameter pipes protected by retrofit collars fitted exposed side, penetrating a 120 mm thick concrete floor slab tested in accordance with AS 1530.4:2005. The specimen A, B and C are considered in this assessment.
Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.4:2005.

The test specimen achieved the following results – see Table 74.

Table 74 Results summary for this test report

Specimen ID	Service	Pipe diameter (mm)	Pipe thickness (mm)	Local protection	Sealant	Integrity (minutes)	Insulation (minutes)	FRL
A	PEX	16	2	PROMASEAL® CFC 32 (exposed face)	PROMASEAL® AN acrylic sealant	187	109	-/180/90
B	PEX	20	2.4	PROMASEAL® CFC 32 (exposed face)	PROMASEAL® AN acrylic sealant	187	182	-/180/180
C	PEX	25	2.8	PROMASEAL® CFC 32 (exposed face)	PROMASEAL® AN acrylic sealant	187	179	-/180/120

A.26 Test report – BWA 2257301

Table 75 Information about test report

Item	Information about test report
Report sponsor	Promat Australia Pty Ltd
Test laboratory	Bodycote Warringtonfire, Unit 2, 409 – 411 Hammond Road, Dandenong, Victoria 3175, Australia
Test date	The fire resistance test was done on 17 June 2008.
Test standards	The test was done in accordance with AS 1530.4:2005.
Variation to test standards	None.
General description of tested specimen	Fire resistance test of various diameter pipes protected by retrofit collars fitted on both sides, penetrating a 120 mm thick concrete floor slab tested in accordance with AS 1530.4:2005.
Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.4:2005.

The test specimen achieved the following results – see Table 76.

Table 76 Results summary for this test report

Specimen ID	Service	Pipe diameter (mm)	Pipe thickness (mm)	Local protection	Sealant	Integrity (minutes)	Insulation (minutes)	FRL
A	PEX/AL/PEX	16.2	3	PROMASEAL® CFC 32 (exposed face)	PROMASEAL® AN acrylic sealant	241	191	-/240/180
B	PEX-A	20.2	3.2	PROMASEAL® CFC 32 (exposed face)	PROMASEAL® AN acrylic sealant	201	177	-/180/120
C	PEX/AL/PEX	20	3	PROMASEAL® CFC 32 (exposed face)	PROMASEAL® AN acrylic sealant	241	169	-/240/120
D	PEX/AL/PEX	25	4	PROMASEAL® CFC 32 (exposed face)	PROMASEAL® AN acrylic sealant	241	117	-/240/90
E	PEX-A	32	5.4	PROMASEAL® CFC 32 (exposed face)	PROMASEAL® AN acrylic sealant	241	179	-/240/120
F	PEX/AL/PEX	32	5	PROMASEAL® CFC 32 (exposed face)	PROMASEAL® AN acrylic sealant	209	129	-/180/120

A.27 Test report – A-11-737

Table 77 Information about test report

Item	Information about test report
Report sponsor	Promat Australia Pty Ltd
Test laboratory	Fire Science Research Group, 1 Scotland Road, Mile End South, SA 5031, Australia
Test date	The fire resistance test was done on 19 August 2011.
Test standards	The test was done in accordance with AS 1530.4:2005.
Variation to test standards	Pressure consistency was not maintained during the test. There were times when the pressure exceeded the tolerances from AS 1530.4:2005, however this laboratory has determined that this would have affected the result in a positive manner. Thermocouples F1 and F2 have not been calibrated according to AS 1530.4:2005.
General description of tested specimen	Fire resistance test on PROMASEAL® CFC 32 collars and PROMASEAL® Green 40 collars protecting various sizes of REHAU PEX-A service penetrations within a 120 mm thick concrete slab in accordance with AS 1530.4:2005. The specimens E, F, G and H are considered in this assessment.
Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.4:2005.

The test specimen achieved the following results – see Table 78.

Table 78 Results summary for this test report

Specimen ID	Service	Pipe diameter (mm)	Pipe thickness (mm)	Local protection	Integrity (minutes)	Insulation (minutes)	FRL
E	REHAU PEX-A	32	5	PROMASEAL® CFC 32	242	176	-/240/120
F	REHAU PEX-A	25	4	PROMASEAL® CFC 32	242	199	-/240/180
G	REHAU PEX-A	20	3.5	PROMASEAL® CFC 32	242	194	-/240/180
H	REHAU PEX-A	16	3	PROMASEAL® CFC 32	242	162	-/240/120

A.28 Test report – FSP 1239

Table 79 Information about test report

Item	Information about test report
Report sponsor	Promat Australia Pty Ltd
Test laboratory	CSIRO, 14 Julius Avenue, Riverside Corporate Park, North Ryde NSW 2113
Test date	The fire resistance test was done on 29 September 2006.
Test standards	The test was done in accordance with AS 1530.4:2005.
Variation to test standards	None.
General description of tested specimen	Fire resistance test on retro-fitted fire collars for elements penetrating a 120 mm thick concrete slab in accordance with AS 1530.4:2005. Only specimen C is considered in this assessment.
Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.4:2005.

The test specimen achieved the following results – see Table 80.

Table 80 Results summary for this test report

Specimen ID	Service	Pipe diameter (mm)	Pipe thickness (mm)	Local protection	Sealant	Integrity (minutes)	Insulation (minutes)	FRL
C	PEX/AL/PE-HD	25	2.5	PROMASEAL® CFC 32 (exposed face)	Gaps were sealed with fire rated sealant	241	127	-/240/120

A.29 Test report – WRFA 2159700B.1

Table 81 Information about test report

Item	Information about test report
Report sponsor	Promat Australia Pty Ltd
Test laboratory	Warringtonfire Research, Unit 2, 409 – 411 Hammond Road, Dandenong, Victoria 3175, Australia
Test date	The fire resistance test was done on 13 July 2006.
Test standards	The test was done in accordance with AS 1530.4:2005.
Variation to test standards	None.
General description of tested specimen	Fire resistance test of various floor waste and stack pipes protected by various cast-in and retrofit collars penetrating a 120 mm thick concrete floor slab in accordance with AS 1530.4:2005. The specimen E and G are considered in this assessment.
Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.4:2005.

The test specimen achieved the following results – see Table 82.

Table 82 Results summary for this test report

Specimen ID	Service	Pipe diameter (mm)	Pipe thickness (mm)	Local protection	Sealant	Integrity (minutes)	Insulation (minutes)	FRL
E	PP-R (Aquatherm)	25	3.6	PROMASEAL® CFC 32 (exposed face)	PROMASEAL® acrylic sealant	241	186	-/240/180
G	IPLEX FK1 Gas Class PN 20	25	2.7	PROMASEAL® CFC 32 (exposed face)	PROMASEAL® acrylic sealant	229	107	-/180/90

A.30 Test report – WRFA 41280.1

Table 83 Information about test report

Item	Information about test report
Report sponsor	Promat Australia Pty Ltd
Test laboratory	Warringtonfire Research, Unit 2, 409 – 411 Hammond Road, Dandenong, Victoria 3175, Australia
Test date	The fire resistance test was done on 13 July 2006.
Test standards	The test was done in accordance with AS 1530.4:2005.
Variation to test standards	None.
General description of tested specimen	Fire resistance test in accordance with AS 1530.4:2005 and AS 4072.1:2005 as appropriate on a 120 mm thick concrete floor slab penetrated by various floor waste, plastic and copper pips penetrations protected by various cast-in and retrofit collars. The specimen A, B and F are considered in this assessment.
Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.4:2005.

The test specimen achieved the following results – see Table 84.

Table 84 Results summary for this test report

Specimen ID	Service	Pipe diameter (mm)	Pipe thickness (mm)	Local protection	Sealant	Integrity (minutes)	Insulation (minutes)	FRL
A	PB (PRO-FIT IPLEX)	18	1.7	PROMASEAL® CFC 32 (exposed face)	PROMASEAL® acrylic sealant	241	193	-/240/180
B	PB (PRO-FIT IPLEX)	22	2.3	PROMASEAL® CFC 32 (exposed face)	PROMASEAL® acrylic sealant	241	189	-/240/180
F	PVC	32	2	PROMASEAL® CFC 32 (exposed face)	PROMASEAL® acrylic sealant	241	206	-/240/180

A.31 Test report – WRFA 40907a

Table 85 Information about test report

Item	Information about test report
Report sponsor	Promat Fyreguard Pty Ltd
Test laboratory	Warringtonfire Research, Unit 2, 409 – 411 Hammond Road, Dandenong, Victoria 3175, Australia
Test date	The fire resistance test was done on 10 December 2001.
Test standards	The test was done in accordance with AS 1530.4:1997.
Variation to test standards	Control of the furnace temperature varied from the prescribed limits of variance from the time/temperature curve as stated in Clause 2.9.2 of AS 1530.4:1997. During the period of 21 minutes up to and including 25 minutes, one or more of the individual thermocouples varied from the prescribed standard curve by more than 100 K. The short period of time for which this occurred did not significantly affect the fire resistance performance of the test specimens, and had potentially been subjected to a slightly more onerous fire resistance test.
General description of tested specimen	Fire resistance test on XLPE and HDPE plastic pipe penetrations through a concrete floor slab in accordance with AS 1530.4:1997 and AS 4072.1:1992 as appropriate. Only specimen C is considered in this assessment.
Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.4:1997.

The test specimen achieved the following results – see Table 86.

Table 86 Results summary for this test report

Specimen ID	Service	Pipe diameter (mm)	Pipe thickness (mm)	Local protection	Sealant	Integrity (minutes)	Insulation (minutes)	FRL
C	REHAU HIS 311 XLPE	32	4.4	PROMASEAL® 32-UniCollar (UC32) (exposed face)	PROMASEAL® acrylic sealant	241	214	-/240/180

A.32 Test report – FSP 1675

Table 87 Information about test report

Item	Information about test report
Report sponsor	Promat Australia Pty Ltd
Test laboratory	CSIRO, 14 Julius Avenue, Riverside Corporate Park, North Ryde NSW 2113
Test date	The fire resistance test was done on 13 November 2014.
Test standards	The test was done in accordance with AS 1530.4:2005.
Variation to test standards	None.
General description of tested specimen	The specimen comprised an 1150 mm × 1150 mm × 150 mm thick reinforced concrete slab penetrated by two stack pipes protected by retrofit collars and a bundle of cables protected by mastic sealant. Only specimen 2 is considered in this assessment.
Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.4:2005.

The test specimen achieved the following results – see Table 88.

Table 88 Results summary for this test report

Specimen ID	Service	Pipe diameter (mm)	Pipe thickness (mm)	Local protection	Integrity (minutes)	Insulation (minutes)	FRL
2	uPVC	32	1.3	PROMASEAL® CFC 32	241	241	- /240/240

A.33 Test report – A-16-011A

Table 89 Information about test report

Item	Information about test report
Report sponsor	Promat Australia Pty Ltd
Test laboratory	Fire Science Research Group, 1 Scotland Road, Mile End South, SA 5031, Australia
Test date	The fire resistance test was done on 23 February 2016.
Test standards	The test was done in accordance with AS 1530.4:2005.
Variation to test standards	None.
General description of tested specimen	The fire resistance performance of pipes and cables being protected by PROMASEAL® PSS collars and PROMASEAL® CFC 32 collar through a 150 mm thick concrete slab in accordance with AS 1530.4:2005. Only specimen D is considered in this assessment.
Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.4:2005.

The test specimen achieved the following results – see Table 90.

Table 90 Results summary for this test report

Specimen ID	Service	Pipe diameter (mm)	Pipe thickness (mm)	Local protection	Integrity (minutes)	Insulation (minutes)	FRL
D	uPVC conduit half filled with twin & earth electrical cables	25	3.76	PROMASEAL® CFC 32 (exposed face)	122	122	- /120/120

A.34 Test report – A-17-071

Table 91 Information about test report

Item	Information about test report
Report sponsor	Promat Australia Pty Ltd
Test laboratory	Fire Science Research Group, 1 Scotland Road, Mile End South, SA 5031, Australia
Test date	The fire resistance test was done on 14 September 2017.
Test standards	The test was done in accordance with AS 1530.4:2014.
Variation to test standards	None.
General description of tested specimen	The fire test was conducted to determine the performance of PEX pipes and uPVC conduits protected by PROMASEAL® CFC 32 and PROMASEAL® A acrylic sealant through two layers of PROMASEAL® bulkhead sealer batts (100 mm thick).
Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.4:2014.

The test specimen achieved the following results – see Table 92.

Table 92 Results summary for this test report

Specimen ID	Service	Pipe diameter (mm)	Pipe thickness (mm)	Local protection	Sealant	Integrity (minutes)	Insulation (minutes)	FRL
A	PEX	20	2.1	PROMASEAL® CFC 32 and 22 mm wide PROMASEAL® IBS wrapped around the pipe flushed with the top batt	PROMASEAL® A acrylic sealant (unexposed face)	184	184	-/180/180
B	PEX	25	2.1	PROMASEAL® CFC 32 and 22 mm wide PROMASEAL® IBS wrapped around the pipe flushed with the top batt	PROMASEAL® A acrylic sealant (unexposed face)	184	184	-/180/180
C	PEX	16	2.1	PROMASEAL® CFC 32 and 22 mm wide PROMASEAL® IBS wrapped around the pipe flushed with the top batt	PROMASEAL® A acrylic sealant (unexposed face)	184	184	-/180/180
D	uPVC conduit filled with 24 x fibre optic	20	2.1	PROMASEAL® CFC 32 and 22 mm wide PROMASEAL® IBS wrapped around the pipe flushed with the top batt	PROMASEAL® A acrylic sealant (unexposed face)	184	184	-/180/180

Specimen ID	Service	Pipe diameter (mm)	Pipe thickness (mm)	Local protection	Sealant	Integrity (minutes)	Insulation (minutes)	FRL
	cables (6 mm each)							
E	uPVC conduit filled with 11 mm diameter electrical cables (three 2.5 mm copper core)	20	2.1	PROMASEAL® CFC 32 and 22 mm wide PROMASEAL® IBS wrapped around the pipe flushed with the top batt	PROMASEAL® A acrylic sealant (unexposed face)	184	86	-/180/60

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