



Our Ref: FCO-2598/4122

SNAP Fire Systems Pty Ltd
Unit 3, 26 Navigator Place
HENDRA QLD 4011

Attention: Mr Richard Cooke

SNAP FIRE COLLAR SYSTEMS
Assessment Number FCO-2598
Your e-mail of 3 April 2012

INTRODUCTION

We have examined the information referenced by you with regard to the fire performance of your various fire collar systems. The information included

- our test report numbered FSP 0908 for a full-scale fire-resistance test conducted on 12 August 2002;
- our test report numbered FSP 0951 for a full-scale fire-resistance test conducted on 24 February 2003; and
- our test report numbered FSP 0958 for a full-scale fire-resistance test conducted 25 February 2003;
- our test report numbered FSP 0941 for a full-scale fire-resistance test conducted on 14 November 2002;
- our test report numbered FSP 0901 for a full-scale fire-resistance test conducted on 21 June 2002;
- our test report numbered FSP 0983 for a full-scale fire-resistance test conducted on 20 June 2003;
- our test report numbered FSP 1053 for a full-scale fire-resistance test conducted on 5 April 2004;
- our test report numbered FSP 1054 for a full-scale fire-resistance test conducted on 6 April 2004;
- our test report numbered FSP 1055 for a full-scale fire-resistance test conducted on 7 April 2004;
- our test report numbered FSP 1056 for a full-scale fire-resistance test conducted on 8 April 2004; and
- test report numbered FP 4640 for a full-scale fire-resistance test conducted on 18 October 2011 by BRANZ Ltd.

THIS ASSESSMENT SUPERSEDES ASSESSMENT NUMBERED FCO-2598 DATED 20 APRIL 2012

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We have retained these documents and information.

ANALYSIS

CSIRO has conducted a number of full-scale fire-resistance tests and these are listed, along with the configuration and performance criteria in Appendix A and Appendix C. Additionally numerous previous assessment reports have been issued related to extensions of the test results to cover alternative installations and pipes (see Appendix B).

As the result of the full-scale testing the following performance has been established

Cast-In Stack Application

Material	Diameter (mm)	Collar	Result	Report
HDPE	150	FS3S-150A	-/180/180	FSP 1132
HDPE	110	FSC100A	-/240/120	FSP 1053
HDPE	110	FSC100A	-/240/120	FSP 1062
HDPE	100	FS2S-100H	-/240/180	FSP 1091
HDPE	65	FS2S-100H	-/120/120	FSP 1116
HDPE	50	H505	-/240/240	FP 4640
PVC	315	FS3S-315A	-/180/180	FSP 1144
PVC	100	FSC100A	-/120/120	FSP 0983
PVC	100	FSC100A	-/240/180	FSP 1053
PVC	100	FSC100A	-/240/180	FSP 1062
PVC	100	FS2S-100A	-/240/240	FSP 1091
PVC	100	FS2S-100A	-/240/240	FSP 1091
PVC	65	FSC100A	-/120/120	FSP 0983
PVC	65	FS2S-100A	-/240/180	FSP 1116
PVC	50	FSC50A	-/120/120	FSP 0983
PVC	50	FSC50A	-/240/180	FSP 1053
PVC	50	FSC50A	-/240/180	FSP 1062
PVC	50	FS2S-50A	-/240/240	FSP 1116
PVC	50	FSC50A	-/180/180	FSP 1118
PVC	50	FS2S-50A	-/180/180	FSP 1134
Silent	100	FS2S-100H	-/240/240	FSP 1091

Cast-In Floor Waste Application

Material	Diameter (mm)	Collar	Result	Report
HDPE	100	FS2S-100H	-/180/180	FSP 1134
HDPE	100	FS2S-100HFW	-/180/180	FSP 1134
HDPE	50	FSC50A	-/180/180	FSP 1118
HDPE	50	FS2S-50HFW	-/180/180	FSP 1146
PVC	100	FSC100A	-/180/120	FSP 1053
PVC	100	FSC100A	-/180/120	FSP 1062
PVC	100	FS2S-100A	-/180/180	FSP 1132
PVC	100	FS2S-100AFW	-/180/180	FSP 1132
PVC	80	FS2S-100A	-/180/180	FSP 1120
PVC	80	FS2S-100AFW	-/180/180	FSP 1120
PVC	50	FS2S-50A	-/180/180	FSP 1120
PVC	50	FS2S-50AFW	-/180/180	FSP 1120
PVC	50	FS2S-50A	-/180/180	FSP 1134
PVC	50	FS2S-50AFW	-/180/180	FSP 1134
PVC	40	FS2S-50A	-/180/180	FSP 1120
	40	FS2S-50AFW	-/180/180	FSP 1120
Silent	80	FSC100A	-/180/180	FSP 1118
Silent	50	FS2S-50HFW	-/180/180	FSP 1146

Retro-Fit Stack Application

Material	Diameter (mm)	Collar	Result	Report
HDPE	110	FSC100B	-/180/180	FSP 1054
HDPE	110	FSC100B	-/180/180	FSP 1063
HDPE	100	FSC100B	-/90/90*	FSP 1130
HDPE	50	FSC50B	-/90/90*	FSP 1130
PVC	100	FSC100B	-/180/120	FSP 1054
PVC	100	FSC100B	-/180/180	FSP 1055
PVC	100	FSC100B	-/120/120*	FSP 1056
PVC	100	FSC100B	-/180/120	FSP 1063
PVC	100	FSC100B	-/180/180	FSP 1064
PVC	100	FSC100B	-/120/120*	FSP 1065
PVC	100	FSC100B	-/90/90*	FSP 1140
PVC	50	FSC50B	-/180/180	FSP 1054
PVC	50	FSC50B	-/180/180	FSP 1055
PVC	50	FSC50B	-/120/120*	FSP 1056
PVC	50	FSC50B	-/180/180	FSP 1063
PVC	50	FSC50B	-/180/180	FSP 1064
PVC	50	FSC50B	-/120/120*	FSP 1065
PVC	50	FSC50B	-/90/90*	FSP 1140
PVC	40	FSC50B	-/180/180	FSP 1054
PVC	40	FSC50B	-/180/180	FSP 1063

* Penetration systems listed as -/120/120 and -/90/90 were tested in framed wall systems and are discounted for the purpose of this assessment.

SNAP primarily utilise two collar sizes, a 100-mm collar used for the protection of 65/80/90/100-mm diameter pipes and a 50-mm collar used for the protection of 40/50-mm pipes. Two additional tests have been conducted, one on a 150-mm diameter HDPE pipe protected by a 150-mm diameter collar designated FS3S-150A and a 315-mm diameter PVC pipe protected by a 315-mm diameter collar designated FS3S-315A.

Due to the relative consistency of the collar performance a degree of interpolation is possible provided the collars are divided into cast-in and retrofit collars and stack and floor waste applications as required by Clause 10.4.5 of AS 1530.4-2005

OPINION/CONCLUSION

Based on the demonstrated performance of a range of collar and pipe configurations as detailed above it is the opinion of this Division that the following systems, using Snap Fire Systems designation, installed into concrete slabs or masonry walls would be capable of achieving the listed fire-resistance levels if tested in accordance with AS 1530.4-2005

Cast-In Stack Application

Material	Diameter (mm)	Collar	Result
HDPE	150	Snap Metal 150	-/180/180
HDPE	100	SNAP (H/L) (65-100) FWS	-/240/180
HDPE	90	SNAP (H/L) (65-100) FWS	-/120/120
HDPE	80	SNAP (H/L) (65-100) FWS	-/120/120
HDPE	65	SNAP (H/L) (65-100) FWS	-/120/120
HDPE	50	SNAP (H/L) (40-50) FWS	-/240/240
PVC	315	Snap Metal 315C	-/180/180
PVC	100	SNAP (H/L) (65-100) FWS	-/240/240
PVC	90	SNAP (H/L) (65-100) FWS	-/240/180
PVC	80	SNAP (H/L) (65-100) FWS	-/240/180
PVC	65	SNAP (H/L) (65-100) FWS	-/240/180
PVC	50	SNAP (H/L) (40-50) FWS	-/180/180
PVC	40	SNAP (H/L) (40-50) FWS	-/180/180
Silent	100	SNAP (H/L) (65-100) FWS	-/240/240

Cast-In Floor Waste Application

Material	Diameter (mm)	Collar	Result
HDPE	100	SNAP (H/L) (65-100) FWS	-/180/180
HDPE	50	SNAP (H/L) (40-50) FWS	-/180/180
HDPE	40	SNAP (H/L) (40-50) FWS	-/180/180
PVC	100	SNAP (H/L) (65-100) FWS	-/180/180
PVC	90	SNAP (H/L) (65-100) FWS	-/180/180
PVC	80	SNAP (H/L) (65-100) FWS	-/180/180
PVC	65	SNAP (H/L) (65-100) FWS	-/180/180
PVC	50	SNAP (H/L) (40-50) FWS	-/180/180
PVC	40	SNAP (H/L) (40-50) FWS	-/180/180
Silent	80	SNAP (H/L) (65-100) FWS	-/180/180
Silent	50	SNAP (H/L) (40-50) FWS	-/180/180
Silent	40	SNAP (H/L) (40-50) FWS	-/180/180

TERM OF VALIDITY

This assessment report will lapse on 31 July 2017. Should you wish us to re-examine this assessment with a view to the possible extension of its term of validity, would you please apply to us three to four months before the date of expiry. This division reserves the right at any time to amend or withdraw this report in the light of new knowledge.

Yours faithfully



for Garry E Collins
Manager, Fire Testing and Assessments

13 July 2012

Appendix A

Document	Product code	Type	Product size	Application	Pipe	Pipe diameter	Pipe particulars	Performance	Result
FSP0908	FD150A	Cast-in	150 mm	200 mm concrete slab					-/240/240
FSP0941	FD100A		100 mm	230 mm masonry wall					-/240/240
FSP0951	FD150D		150 mm	Timber-stud plasterboard ceiling					-/60/60
FSP0963	FD150B		150 mm	Timber-stud plasterboard wall					-/120/120
FCO2249	FD150D		150 mm	Timber-stud plasterboard ceiling					-/60/60
	FD100D		100 mm	Steel-stud plasterboard ceiling					-/60/60
	FD100D		100 mm	Steel-stud plasterboard ceiling					-/60/60
	FD100A		100 mm	150 mm concrete wall					-/240/240
	FD100B		100 mm	100 mm concrete wall					-/240/240
	FD150B		150 mm	100 mm concrete wall					-/240/240
	FD150B		150 mm	150 mm concrete slab					-/240/240
FCO2252	FD100D		100 mm	Plasterboard floor/ceiling system	PVC	100 mm	straight		-/60/60
	FD150D		150 mm	Plasterboard floor/ceiling system	PVC	150 mm	straight		-/60/60
FSP0983	FSC50A	Cast-in	50 mm	150 mm concrete slab	PVC	50 mm	straight		-/120/120
	FSC100A	Cast-in	100 mm	150 mm concrete slab	PVC	100 mm	straight		-/120/120
	FSC100A	Cast-in	100 mm	150 mm concrete slab	PVC	100 mm	straight		-/120/120
	FSC100A	Cast-in	100 mm	150 mm concrete slab	PVC	100 mm	straight	-/240/188	-/240/180
	FSC100A	Cast-in	100 mm	150 mm concrete slab	HDPE	110 mm	straight	-/240/179	-/240/180
	FSC100A	Cast-in	100 mm	150 mm concrete slab	PVC	50 mm	90° bend	-/205/144	-/180/120
FSP1054	FSC100B	Retrofit surface mounted	100 mm	120 mm concrete slab	PVC	100 mm	straight	-/180/176	-/180/120
	FSC100B	Retrofit surface mounted	100 mm	120 mm concrete slab	HDPE	110 mm	straight	-/180/180	-/180/180
	FSC50B	Retrofit surface mounted	50 mm	120 mm concrete slab	PVC	50 mm	straight	-/180/180	-/180/180
	FSC100B	Retrofit surface mounted	100 mm	120 mm concrete slab	PVC	40 mm	straight	-/199/199	-/180/180
	FSC100B	Retrofit surface mounted	100 mm	220 mm masonry wall	PVC	100 mm	straight	-/199/199	-/180/180
FSP1055	FSC100B	Retrofit surface mounted	100 mm	220 mm masonry wall	PVC	50 mm	straight	-/121/121	-/120/120
	FSC100B	Retrofit surface mounted	100 mm	Timber-stud plasterboard wall	PVC	100 mm	straight	-/121/121	-/120/120
FSP1056	FSC100B	Retrofit surface mounted	100 mm	Timber-stud plasterboard wall	PVC	50 mm	straight	-/121/121	-/120/120
	FSC100B	Retrofit surface mounted	50 mm	Timber-stud plasterboard wall	PVC	50 mm	straight	-/240/188	-/240/180
FSP1062	FSC100A	Cast-in	100 mm	150 mm concrete slab	PVC	100 mm	joinder	-/240/179	-/240/180
	FSC100A	Cast-in	100 mm	150 mm concrete slab	HDPE	110 mm	straight	-/240/179	-/240/180
	FSC50A	Cast-in	50 mm	150 mm concrete slab	PVC	50 mm	90° bend	-/240/214	-/240/180
	FSC100A	Cast-in	100 mm	150 mm concrete slab	PVC	100 mm	floor/waste	-/205/144	-/180/120
FSP1063	FSC100A	Cast-in	100 mm	150 mm concrete slab	PVC	100 mm	floor/waste	-/205/144	-/180/120
	FSC100B	Retrofit surface mounted	100 mm	120 mm concrete slab	PVC	100 mm	straight	-/180/176	-/180/120
	FSC100B	Retrofit surface mounted	100 mm	120 mm concrete slab	HDPE	110 mm	straight	-/180/180	-/180/180
	FSC50B	Retrofit surface mounted	50 mm	120 mm concrete slab	HDPE	110 mm	straight	-/180/180	-/180/180
	FSC50B	Retrofit surface mounted	50 mm	120 mm concrete slab	PVC	50 mm	straight	-/180/180	-/180/180
	FSC100B	Retrofit surface mounted	100 mm	120 mm concrete slab	PVC	40 mm	straight	-/180/180	-/180/180
FSP1064	FSC100B	Retrofit surface mounted	100 mm	230 mm masonry wall	PVC	100 mm	straight	-/199/199	-/180/180
	FSC50B	Retrofit surface mounted	50 mm	230 mm masonry wall	PVC	50 mm	straight	-/199/199	-/180/180
FSP1065	FSC100B	Retrofit surface mounted	100 mm	Timber-stud plasterboard wall	PVC	50 mm	straight	-/199/199	-/180/180
	FSC50B	Retrofit surface mounted	50 mm	Timber-stud plasterboard wall	PVC	50 mm	straight	-/121/121	-/120/120

Appendix B

FCO2337	FSC100B	Retrofit surface-mounted or recessed	100 mm	120 mm concrete slab	PVC	65 mm	straight, with or without join	-1800/20	FSP1054
	FSC100B	Retrofit surface-mounted or recessed	100 mm	120 mm concrete slab	PVC	80 mm	straight, with or without join	-1800/20	FSP1054
	FSC100B	Retrofit surface-mounted or recessed	100 mm	120 mm concrete slab	PVC	90 mm	straight, with or without join	-1800/20	FSP1054
	FSC100B	Retrofit surface-mounted or recessed	100 mm	120 mm concrete slab	PVC	100 mm	straight, with or without join	-1800/20	FSP1054
	FSC50A	Cast-in	50 mm	150 mm concrete slab	PVC	40 mm	straight, with or without join	-2400/80	FSP1053
	FSC50A	Cast-in	50 mm	150 mm concrete slab	PVC	50 mm	straight, with or without join	-2400/80	FSP1053
	FSC100A	Cast-in	100 mm	150 mm concrete slab	PVC	65 mm	straight, with or without join	-2400/80	FSP1053
	FSC100A	Cast-in	100 mm	150 mm concrete slab	PVC	80 mm	straight, with or without join	-2400/80	FSP1053
	FSC100A	Cast-in	100 mm	150 mm concrete slab	PVC	90 mm	straight, with or without join	-2400/80	FSP1053
	FSC100A	Cast-in	100 mm	150 mm concrete slab	PVC	100 mm	straight, with or without join	-2400/80	FSP1053
	FSC100B	Retrofit surface-mounted or recessed	100 mm	150 mm concrete slab	PVC	65 mm	straight, with or without join	-1800/20	FSP1054
	FSC100B	Retrofit surface-mounted or recessed	100 mm	150 mm concrete slab	PVC	80 mm	straight, with or without join	-1800/20	FSP1054
	FSC100B	Retrofit surface-mounted or recessed	100 mm	150 mm concrete slab	PVC	90 mm	straight, with or without join	-1800/20	FSP1054
	FSC100B	Retrofit surface-mounted or recessed	100 mm	150 mm concrete slab	PVC	100 mm	straight, with or without join	-1800/20	FSP1054
	FSC50A	Cast-in	50 mm	200 mm concrete slab	PVC	40 mm	straight, with or without join	-2400/240	FSP1053
	FSC50A	Cast-in	50 mm	200 mm concrete slab	PVC	50 mm	straight, with or without join	-2400/240	FSP1053
	FSC100A	Cast-in	100 mm	200 mm concrete slab	PVC	65 mm	straight, with or without join	-2400/240	FSP1053
	FSC100A	Cast-in	100 mm	200 mm concrete slab	PVC	80 mm	straight, with or without join	-2400/240	FSP1053
	FSC100A	Cast-in	100 mm	200 mm concrete slab	PVC	90 mm	straight, with or without join	-2400/240	FSP1053
	FSC100A	Cast-in	100 mm	200 mm concrete slab	PVC	100 mm	straight, with or without join	-2400/240	FSP1053
	FSC100A	Cast-in	100 mm	150 mm concrete slab	PVC	100 mm	straight, with or without join	-1800/20	FSP1053
	FSC100A	Cast-in	100 mm	150 mm concrete slab	PVC	80 mm	straight, with or without join	-1800/20	FSP1053
	FSC100A	Cast-in	100 mm	150 mm concrete slab	PVC	65 mm	straight, with or without join	-1800/20	FSP1053
	FSC50B	Retrofit on both sides of wall	50 mm	220 mm masonry wall	PVC	40 mm	straight	-1800/20	FSP1053
	FSC50B	Retrofit on both sides of wall	50 mm	220 mm masonry wall	PVC	50 mm	straight	-1800/20	FSP1053
	FSC100B	Retrofit on both sides of wall	100 mm	220 mm masonry wall	PVC	65 mm	straight, with or without join	FRL of wall system	FSP1055
	FSC100B	Retrofit on both sides of wall	100 mm	220 mm masonry wall	PVC	80 mm	straight, with or without join	FRL of wall system	FSP1055
	FSC100B	Retrofit on both sides of wall	100 mm	220 mm masonry wall	PVC	90 mm	straight, with or without join	FRL of wall system	FSP1055
	FSC100B	Retrofit on both sides of wall	100 mm	220 mm masonry wall	PVC	100 mm	straight, with or without join	FRL of wall system	FSP1055
	FSC50B	Retrofit on both sides of wall	50 mm	Timber-stud plasterboard wall	PVC	40 mm	straight	FRL of wall system	FSP1056
	FSC50B	Retrofit on both sides of wall	50 mm	Timber-stud plasterboard wall	PVC	50 mm	straight	FRL of wall system	FSP1056
	FSC100B	Retrofit on both sides of wall	100 mm	Timber-stud plasterboard wall	PVC	65 mm	straight, with or without join	FRL of wall system	FSP1056
	FSC100B	Retrofit on both sides of wall	100 mm	Timber-stud plasterboard wall	PVC	80 mm	straight, with or without join	FRL of wall system	FSP1056
	FSC100B	Retrofit on both sides of wall	100 mm	Timber-stud plasterboard wall	PVC	90 mm	straight, with or without join	FRL of wall system	FSP1056
	FSC100B	Retrofit on both sides of wall	100 mm	Timber-stud plasterboard wall	PVC	100 mm	straight, with or without join	FRL of wall system	FSP1056
	FSC50B	Retrofit surface-mounted or recessed	50 mm	120 mm concrete slab	HDPE	65-110 mm	straight	-1800/20	FSP1054
	FSC50B	Retrofit surface-mounted or recessed	50 mm	120 mm concrete slab	PVC	40 mm	straight, with or without join	-1800/80	FSP1054
	FSC100A	Cast-in	100 mm	120 mm concrete slab	PVC	40 mm	straight, with or without join	-1800/80	FSP1054
	FSC100A	Cast-in	100 mm	150 mm concrete slab	HDPE	65-110 mm	straight	-2400/80	FSP1053
	FSC100A	Cast-in	100 mm	200 mm concrete slab	HDPE	65-110 mm	straight	-2400/240	FSP1053
FCO2397	FSC100A	Cast-in	100 mm	200 mm concrete slab	PVC	100 mm	straight, with or without join	-2400/240	FSP1053
	FSC100A	Cast-in	100 mm	200 mm concrete slab	PVC	90 mm	straight, with or without join	-2400/240	FSP1053

Appendix B (cont)

FSC100A	Cast-in	100 mm	200 mm concrete slab	PVC	80 mm	straight, with or without join	-J240/240	FSP1053
FSC100A	Cast-in	100 mm	200 mm concrete slab	PVC	65 mm	straight, with or without join	-J240/240	FSP1053
FSC100A	Cast-in	100 mm	200 mm concrete slab	HDPE	65-110 mm	straight, with or without join	-J240/240	FSP1053
FSC100A	Cast-in	100 mm	150 mm concrete slab	PVC	100 mm	straight, with or without join	-J240/180	FSP1053
FSC100A	Cast-in	100 mm	150 mm concrete slab	PVC	90 mm	straight, with or without join	-J240/180	FSP1053
FSC100A	Cast-in	100 mm	150 mm concrete slab	PVC	80 mm	straight, with or without join	-J240/180	FSP1053
FSC100A	Cast-in	100 mm	150 mm concrete slab	PVC	65 mm	straight, with or without join	-J240/180	FSP1053
FSC100A	Cast-in	100 mm	150 mm concrete slab	HDPE	65-110 mm	straight, with or without join	-J240/180	FSP1053
FSC100A	Cast-in	100 mm	150 mm concrete slab	PVC	100 mm	floor waste	-J180/120	FSP1053
FSC100A	Cast-in	100 mm	150 mm concrete slab	PVC	90 mm	floor waste	-J180/120	FSP1053
FSC100A	Cast-in	100 mm	150 mm concrete slab	PVC	80 mm	floor waste	-J180/120	FSP1053
FSC100A	Cast-in	100 mm	150 mm concrete slab	PVC	65 mm	floor waste	-J180/120	FSP1053
FSC100B	Retrofit surface-mounted or recessed	100 mm	150 mm concrete slab	PVC	65 mm	floor waste	-J180/120	FSP1054
FSC100B	Retrofit surface-mounted or recessed	100 mm	150 mm concrete slab	PVC	90 mm	floor waste	-J180/120	FSP1054
FSC100B	Retrofit surface-mounted or recessed	100 mm	150 mm concrete slab	PVC	80 mm	floor waste	-J180/120	FSP1054
FSC100B	Retrofit surface-mounted or recessed	100 mm	150 mm concrete slab	PVC	65 mm	floor waste	-J180/120	FSP1054
FSC100B	Retrofit surface-mounted or recessed	100 mm	120 mm concrete slab	PVC	100 mm	straight, with or without join	-J180/120	FSP1054
FSC100B	Retrofit surface-mounted or recessed	100 mm	120 mm concrete slab	PVC	90 mm	straight, with or without join	-J180/120	FSP1054
FSC100B	Retrofit surface-mounted or recessed	100 mm	120 mm concrete slab	PVC	80 mm	straight, with or without join	-J180/120	FSP1054
FSC100B	Retrofit surface-mounted or recessed	100 mm	120 mm concrete slab	PVC	65 mm	straight, with or without join	-J180/120	FSP1054
FSC100B	Retrofit surface-mounted or recessed	100 mm	120 mm concrete slab	HDPE	65-110 mm	straight, with or without join	-J180/120	FSP1054
FSC100B	Retrofit on both sides of wall	100 mm	220 mm masonry wall	PVC	100 mm	straight, with or without join	FRL of wall system	FSP1055
FSC100B	Retrofit on both sides of wall	100 mm	220 mm masonry wall	PVC	90 mm	straight, with or without join	FRL of wall system	FSP1055
FSC100B	Retrofit on both sides of wall	100 mm	220 mm masonry wall	PVC	80 mm	straight, with or without join	FRL of wall system	FSP1055
FSC100B	Retrofit on both sides of wall	100 mm	220 mm masonry wall	PVC	65 mm	straight, with or without join	FRL of wall system	FSP1055
FSC100B	Retrofit on both sides of wall	100 mm	Timber-stud plasterboard wall	PVC	100 mm	straight, with or without join	FRL of wall system	FSP1056
FSC100B	Retrofit on both sides of wall	100 mm	Timber-stud plasterboard wall	PVC	90 mm	straight, with or without join	FRL of wall system	FSP1056
FSC100B	Retrofit on both sides of wall	100 mm	Timber-stud plasterboard wall	PVC	80 mm	straight, with or without join	FRL of wall system	FSP1056
FSC100B	Retrofit on both sides of wall	100 mm	Timber-stud plasterboard wall	PVC	65 mm	straight, with or without join	FRL of wall system	FSP1056
FSC50A	Cast-in	50 mm	200 mm concrete slab	PVC	50 mm	straight, with or without join	-J240/240	FSP1053
FSC50A	Cast-in	50 mm	200 mm concrete slab	PVC	40 mm	straight, with or without join	-J240/240	FSP1053
FSC50A	Cast-in	50 mm	150 mm concrete slab	PVC	50 mm	straight, with or without join	-J240/180	FSP1053
FSC50A	Cast-in	50 mm	150 mm concrete slab	PVC	40 mm	straight, with or without join	-J240/180	FSP1053
FSC50B	Retrofit surface-mounted or recessed	50 mm	120 mm concrete slab	PVC	50 mm	straight, with or without join	-J180/180	FSP1054
FSC50B	Retrofit surface-mounted or recessed	50 mm	120 mm concrete slab	PVC	40 mm	straight, with or without join	-J180/180	FSP1054
FSC50B	Retrofit on both sides of wall	50 mm	220 mm masonry wall	PVC	50 mm	straight, with or without join	FRL of wall system	FSP1055
FSC50B	Retrofit on both sides of wall	50 mm	220 mm masonry wall	PVC	40 mm	straight, with or without join	FRL of wall system	FSP1055
FSC50B	Retrofit on both sides of wall	50 mm	Timber-stud plasterboard wall	PVC	50 mm	straight, with or without join	FRL of wall system	FSP1056
FSC50B	Retrofit on both sides of wall	50 mm	Timber-stud plasterboard wall	PVC	40 mm	straight, with or without join	FRL of wall system	FSP1056

Appendix C

FSP1091	FS2S-100A	Cast-in	65/60/90/100 mm	150 mm concrete slab	PVC	100 mm	straight	-/240/240
	FS2S-100A	Cast-in	65/60/90/100 mm	150 mm concrete slab	PVC	100 mm	90° bend	-/240/240
	FS2S-100H	Cast-in	65/60/90/100 mm	150 mm concrete slab	HDPE	100 mm	straight	-/240/180
	FS2S-100H	Cast-in	65/60/90/100 mm	150 mm concrete slab	Silent	100 mm	straight	-/240/240
FSP1116	FS2S-100H	Cast-in	65/60/90/100 mm	150 mm concrete slab	HDPE	65 mm	straight	-/120/120
	FS2S-100A	Cast-in	65/60/90/100 mm	150 mm concrete slab	PVC	65 mm	straight	-/240/180
	FS2S-50A	Cast-in	65/60/90/100 mm	150 mm concrete slab	PVC	50 mm	90° bend	-/240/240
FSP1118	FSC-100A	Cast-in	65/60/90/100 mm	150 mm concrete slab	Silent	80 mm	straight with floor grate	-/180/180
	FSC-50A	Cast-in	40/50 mm	150 mm concrete slab	PVC	50 mm	straight	-/180/180
	FSC-50A	Cast-in	40/50 mm	150 mm concrete slab	HDPE	50 mm	straight with floor grate	-/180/180
FSP1120	FS2S-50A	Cast-in	40/50 mm	150 mm concrete slab	PVC	40 mm	straight with floor grate	-/180/180
	FS2S-50AFW	Cast-in	40/50 mm	150 mm concrete slab	PVC	40 mm	straight with floor grate	-/180/180
	FS2S-50A	Cast-in	40/50 mm	150 mm concrete slab	PVC	50 mm	bend with floor grate	-/180/180
	FS2S-50AFW	Cast-in	40/50 mm	150 mm concrete slab	PVC	50 mm	bend with floor grate	-/180/180
	FS2S-100A	Cast-in	65/60/90/100 mm	150 mm concrete slab	PVC	80 mm	trap and floor grate	-/180/180
	FS2S-100AFW	Cast-in	65/60/90/100 mm	150 mm concrete slab	PVC	80 mm	trap and floor grate	-/180/180
FSP1130	FSC-100B	Retrofit to ceiling	65/60/90/100 mm	Timber-frame plasterboard ceiling	HDPE	100 mm	trap and floor grate	-/90/90
	FSC-50B	Retrofit to ceiling	40/50 mm	Timber-frame plasterboard ceiling	HDPE	50 mm	straight	-/90/90
FSP1132	FS3S-150A	Cast-in	150 mm	150 mm concrete slab	HDPE	150 mm	straight	-/180/180
	FS2S-100A	Cast-in	65/60/90/100 mm	150 mm concrete slab	PVC	100 mm	trap and floor grate	-/180/180
	FS2S-100AFW	Cast-in	65/60/90/100 mm	150 mm concrete slab	PVC	100 mm	trap and floor grate	-/180/180
FSP1134	FS2S-50A	Cast-in	40/50 mm	150 mm concrete slab	PVC	50 mm	trap and floor grate	-/180/180
	FS2S-50AFW	Cast-in	40/50 mm	150 mm concrete slab	PVC	50 mm	trap and floor grate	-/180/180
	FS2S-100H	Cast-in	65/60/90/100 mm	150 mm concrete slab	HDPE	100 mm	trap and floor grate	-/180/180
	FS2S-100HFW	Cast-in	65/60/90/100 mm	150 mm concrete slab	HDPE	100 mm	trap and floor grate	-/180/180
	FS2S-50A	Cast-in	40/50 mm	150 mm concrete slab	PVC	50 mm	trap and floor grate	-/180/180
FSP1140	FSC-100B	Retrofit to ceiling	65/60/90/100 mm	Timber-frame plasterboard ceiling	PVC	100 mm	straight	-/90/90
	FSC-50B	Retrofit to ceiling	40/50 mm	Timber-frame plasterboard ceiling	PVC	50 mm	straight	-/90/90
FSP1144	FS3S-315A	Cast-in	315 mm	150 mm concrete slab	PVC	315 mm	straight	-/180/180
FSP1146	FS2S-50HFW	Cast-in	40/50 mm	150 mm concrete slab	HDPE	50 mm	trap and floor grate	-/180/180
	FS2S-50HFW	Cast-in	40/50 mm	150 mm concrete slab	Silent	50 mm	trap and floor grate	-/180/180

Appendix B

FCO2337	FSC100B	Retrofit surface-mounted or recessed	100 mm	120 mm concrete slab	PVC	65 mm	straight, with or without join	-1800/20	FSP1054
	FSC100B	Retrofit surface-mounted or recessed	100 mm	120 mm concrete slab	PVC	80 mm	straight, with or without join	-1800/20	FSP1054
	FSC100B	Retrofit surface-mounted or recessed	100 mm	120 mm concrete slab	PVC	90 mm	straight, with or without join	-1800/20	FSP1054
	FSC100B	Retrofit surface-mounted or recessed	100 mm	120 mm concrete slab	PVC	100 mm	straight, with or without join	-1800/20	FSP1054
	FSC50A	Cast-in	50 mm	150 mm concrete slab	PVC	40 mm	straight, with or without join	-2400/80	FSP1053
	FSC50A	Cast-in	50 mm	150 mm concrete slab	PVC	50 mm	straight, with or without join	-2400/80	FSP1053
	FSC100A	Cast-in	100 mm	150 mm concrete slab	PVC	65 mm	straight, with or without join	-2400/80	FSP1053
	FSC100A	Cast-in	100 mm	150 mm concrete slab	PVC	80 mm	straight, with or without join	-2400/80	FSP1053
	FSC100A	Cast-in	100 mm	150 mm concrete slab	PVC	90 mm	straight, with or without join	-2400/80	FSP1053
	FSC100A	Cast-in	100 mm	150 mm concrete slab	PVC	100 mm	straight, with or without join	-2400/80	FSP1053
	FSC100B	Retrofit surface-mounted or recessed	100 mm	150 mm concrete slab	PVC	65 mm	straight, with or without join	-1800/20	FSP1054
	FSC100B	Retrofit surface-mounted or recessed	100 mm	150 mm concrete slab	PVC	80 mm	straight, with or without join	-1800/20	FSP1054
	FSC100B	Retrofit surface-mounted or recessed	100 mm	150 mm concrete slab	PVC	90 mm	straight, with or without join	-1800/20	FSP1054
	FSC100B	Retrofit surface-mounted or recessed	100 mm	150 mm concrete slab	PVC	100 mm	straight, with or without join	-1800/20	FSP1054
	FSC50A	Cast-in	50 mm	200 mm concrete slab	PVC	40 mm	straight, with or without join	-2400/240	FSP1053
	FSC50A	Cast-in	50 mm	200 mm concrete slab	PVC	50 mm	straight, with or without join	-2400/240	FSP1053
	FSC100A	Cast-in	100 mm	200 mm concrete slab	PVC	65 mm	straight, with or without join	-2400/240	FSP1053
	FSC100A	Cast-in	100 mm	200 mm concrete slab	PVC	80 mm	straight, with or without join	-2400/240	FSP1053
	FSC100A	Cast-in	100 mm	200 mm concrete slab	PVC	90 mm	straight, with or without join	-2400/240	FSP1053
	FSC100A	Cast-in	100 mm	200 mm concrete slab	PVC	100 mm	straight, with or without join	-2400/240	FSP1053
	FSC100A	Cast-in	100 mm	150 mm concrete slab	PVC	100 mm	straight, with or without join	-1800/20	FSP1053
	FSC100A	Cast-in	100 mm	150 mm concrete slab	PVC	80 mm	straight, with or without join	-1800/20	FSP1053
	FSC100A	Cast-in	100 mm	150 mm concrete slab	PVC	65 mm	straight, with or without join	-1800/20	FSP1053
	FSC50B	Retrofit on both sides of wall	50 mm	220 mm masonry wall	PVC	40 mm	straight	-1800/20	FSP1053
	FSC50B	Retrofit on both sides of wall	50 mm	220 mm masonry wall	PVC	50 mm	straight	-1800/20	FSP1053
	FSC100B	Retrofit on both sides of wall	100 mm	220 mm masonry wall	PVC	65 mm	straight, with or without join	FRL of wall system	FSP1055
	FSC100B	Retrofit on both sides of wall	100 mm	220 mm masonry wall	PVC	80 mm	straight, with or without join	FRL of wall system	FSP1055
	FSC100B	Retrofit on both sides of wall	100 mm	220 mm masonry wall	PVC	90 mm	straight, with or without join	FRL of wall system	FSP1055
	FSC100B	Retrofit on both sides of wall	100 mm	220 mm masonry wall	PVC	100 mm	straight, with or without join	FRL of wall system	FSP1055
	FSC50B	Retrofit on both sides of wall	50 mm	Timber-stud plasterboard wall	PVC	40 mm	straight	FRL of wall system	FSP1056
	FSC50B	Retrofit on both sides of wall	50 mm	Timber-stud plasterboard wall	PVC	50 mm	straight	FRL of wall system	FSP1056
	FSC100B	Retrofit on both sides of wall	100 mm	Timber-stud plasterboard wall	PVC	65 mm	straight, with or without join	FRL of wall system	FSP1056
	FSC100B	Retrofit on both sides of wall	100 mm	Timber-stud plasterboard wall	PVC	80 mm	straight, with or without join	FRL of wall system	FSP1056
	FSC100B	Retrofit on both sides of wall	100 mm	Timber-stud plasterboard wall	PVC	90 mm	straight, with or without join	FRL of wall system	FSP1056
	FSC100B	Retrofit on both sides of wall	100 mm	Timber-stud plasterboard wall	PVC	100 mm	straight, with or without join	FRL of wall system	FSP1056
	FSC50B	Retrofit surface-mounted or recessed	50 mm	120 mm concrete slab	HDPE	65-110 mm	straight	-1800/20	FSP1054
	FSC50B	Retrofit surface-mounted or recessed	50 mm	120 mm concrete slab	PVC	40 mm	straight, with or without join	-1800/80	FSP1054
	FSC100A	Cast-in	100 mm	120 mm concrete slab	PVC	40 mm	straight, with or without join	-1800/80	FSP1054
	FSC100A	Cast-in	100 mm	150 mm concrete slab	HDPE	65-110 mm	straight	-2400/80	FSP1053
	FSC100A	Cast-in	100 mm	200 mm concrete slab	HDPE	65-110 mm	straight	-2400/240	FSP1053
FCO2397	FSC100A	Cast-in	100 mm	200 mm concrete slab	PVC	100 mm	straight, with or without join	-2400/240	FSP1053
	FSC100A	Cast-in	100 mm	200 mm concrete slab	PVC	90 mm	straight, with or without join	-2400/240	FSP1053

Appendix B (cont)

FSC100A	Cast-in	100 mm	200 mm concrete slab	PVC	80 mm	straight, with or without join	-/240/240	FSP1053
FSC100A	Cast-in	100 mm	200 mm concrete slab	PVC	65 mm	straight, with or without join	-/240/240	FSP1053
FSC100A	Cast-in	100 mm	200 mm concrete slab	HDPE	65-110 mm	straight, with or without join	-/240/240	FSP1053
FSC100A	Cast-in	100 mm	150 mm concrete slab	PVC	100 mm	straight, with or without join	-/240/180	FSP1053
FSC100A	Cast-in	100 mm	150 mm concrete slab	PVC	90 mm	straight, with or without join	-/240/180	FSP1053
FSC100A	Cast-in	100 mm	150 mm concrete slab	PVC	80 mm	straight, with or without join	-/240/180	FSP1053
FSC100A	Cast-in	100 mm	150 mm concrete slab	PVC	65 mm	straight, with or without join	-/240/180	FSP1053
FSC100A	Cast-in	100 mm	150 mm concrete slab	HDPE	65-110 mm	straight, with or without join	-/240/180	FSP1053
FSC100A	Cast-in	100 mm	150 mm concrete slab	PVC	100 mm	floor waste	-/180/20	FSP1053
FSC100A	Cast-in	100 mm	150 mm concrete slab	PVC	90 mm	floor waste	-/180/20	FSP1053
FSC100A	Cast-in	100 mm	150 mm concrete slab	PVC	80 mm	floor waste	-/180/20	FSP1053
FSC100A	Cast-in	100 mm	150 mm concrete slab	PVC	65 mm	floor waste	-/180/20	FSP1053
FSC100B	Retrofit surface-mounted or recessed	100 mm	150 mm concrete slab	PVC	65 mm	floor waste	-/180/20	FSP1054
FSC100B	Retrofit surface-mounted or recessed	100 mm	150 mm concrete slab	PVC	100 mm	floor waste	-/180/20	FSP1054
FSC100B	Retrofit surface-mounted or recessed	100 mm	150 mm concrete slab	PVC	90 mm	floor waste	-/180/20	FSP1054
FSC100B	Retrofit surface-mounted or recessed	100 mm	150 mm concrete slab	PVC	80 mm	floor waste	-/180/20	FSP1054
FSC100B	Retrofit surface-mounted or recessed	100 mm	150 mm concrete slab	PVC	65 mm	floor waste	-/180/20	FSP1054
FSC100B	Retrofit surface-mounted or recessed	100 mm	120 mm concrete slab	PVC	100 mm	straight, with or without join	-/180/20	FSP1054
FSC100B	Retrofit surface-mounted or recessed	100 mm	120 mm concrete slab	PVC	90 mm	straight, with or without join	-/180/20	FSP1054
FSC100B	Retrofit surface-mounted or recessed	100 mm	120 mm concrete slab	PVC	80 mm	straight, with or without join	-/180/20	FSP1054
FSC100B	Retrofit surface-mounted or recessed	100 mm	120 mm concrete slab	PVC	65 mm	straight, with or without join	-/180/20	FSP1054
FSC100B	Retrofit surface-mounted or recessed	100 mm	120 mm concrete slab	HDPE	65-110 mm	straight, with or without join	-/180/20	FSP1054
FSC100B	Retrofit on both sides of wall	100 mm	220 mm masonry wall	PVC	100 mm	straight, with or without join	FRL of wall system	FSP1055
FSC100B	Retrofit on both sides of wall	100 mm	220 mm masonry wall	PVC	90 mm	straight, with or without join	FRL of wall system	FSP1055
FSC100B	Retrofit on both sides of wall	100 mm	220 mm masonry wall	PVC	80 mm	straight, with or without join	FRL of wall system	FSP1055
FSC100B	Retrofit on both sides of wall	100 mm	220 mm masonry wall	PVC	65 mm	straight, with or without join	FRL of wall system	FSP1055
FSC100B	Retrofit on both sides of wall	100 mm	Timber-stud plasterboard wall	PVC	100 mm	straight, with or without join	FRL of wall system	FSP1056
FSC100B	Retrofit on both sides of wall	100 mm	Timber-stud plasterboard wall	PVC	90 mm	straight, with or without join	FRL of wall system	FSP1056
FSC100B	Retrofit on both sides of wall	100 mm	Timber-stud plasterboard wall	PVC	80 mm	straight, with or without join	FRL of wall system	FSP1056
FSC100B	Retrofit on both sides of wall	100 mm	Timber-stud plasterboard wall	PVC	65 mm	straight, with or without join	FRL of wall system	FSP1056
FSC50A	Cast-in	50 mm	200 mm concrete slab	PVC	50 mm	straight, with or without join	-/240/240	FSP1053
FSC50A	Cast-in	50 mm	200 mm concrete slab	PVC	40 mm	straight, with or without join	-/240/240	FSP1053
FSC50A	Cast-in	50 mm	150 mm concrete slab	PVC	50 mm	straight, with or without join	-/240/180	FSP1053
FSC50A	Cast-in	50 mm	150 mm concrete slab	PVC	40 mm	straight, with or without join	-/240/180	FSP1053
FSC50B	Retrofit surface-mounted or recessed	50 mm	120 mm concrete slab	PVC	50 mm	straight, with or without join	-/180/180	FSP1054
FSC50B	Retrofit surface-mounted or recessed	50 mm	120 mm concrete slab	PVC	40 mm	straight, with or without join	-/180/180	FSP1054
FSC50B	Retrofit on both sides of wall	50 mm	220 mm masonry wall	PVC	50 mm	straight, with or without join	FRL of wall system	FSP1055
FSC50B	Retrofit on both sides of wall	50 mm	220 mm masonry wall	PVC	40 mm	straight, with or without join	FRL of wall system	FSP1055
FSC50B	Retrofit on both sides of wall	50 mm	Timber-stud plasterboard wall	PVC	50 mm	straight, with or without join	FRL of wall system	FSP1056
FSC50B	Retrofit on both sides of wall	50 mm	Timber-stud plasterboard wall	PVC	40 mm	straight, with or without join	FRL of wall system	FSP1056

Appendix C

FSP1091	FS2S-100A	Cast-in	65/60/90/100 mm	150 mm concrete slab	PVC	100 mm	straight	-/240/240
	FS2S-100A	Cast-in	65/60/90/100 mm	150 mm concrete slab	PVC	100 mm	90° bend	-/240/240
	FS2S-100H	Cast-in	65/60/90/100 mm	150 mm concrete slab	HDPE	100 mm	straight	-/240/180
	FS2S-100H	Cast-in	65/60/90/100 mm	150 mm concrete slab	Silent	100 mm	straight	-/240/240
FSP1116	FS2S-100H	Cast-in	65/60/90/100 mm	150 mm concrete slab	HDPE	65 mm	straight	-/120/120
	FS2S-100A	Cast-in	65/60/90/100 mm	150 mm concrete slab	PVC	65 mm	straight	-/240/180
	FS2S-50A	Cast-in	65/60/90/100 mm	150 mm concrete slab	PVC	50 mm	90° bend	-/240/240
FSP1118	FSC-100A	Cast-in	65/60/90/100 mm	150 mm concrete slab	Silent	80 mm	straight with floor grate	-/180/180
	FSC-50A	Cast-in	40/50 mm	150 mm concrete slab	PVC	50 mm	straight	-/180/180
	FSC-50A	Cast-in	40/50 mm	150 mm concrete slab	HDPE	50 mm	straight with floor grate	-/180/180
FSP1120	FS2S-50A	Cast-in	40/50 mm	150 mm concrete slab	PVC	40 mm	straight with floor grate	-/180/180
	FS2S-50AFW	Cast-in	40/50 mm	150 mm concrete slab	PVC	40 mm	straight with floor grate	-/180/180
	FS2S-50A	Cast-in	40/50 mm	150 mm concrete slab	PVC	50 mm	bend with floor grate	-/180/180
	FS2S-50AFW	Cast-in	40/50 mm	150 mm concrete slab	PVC	50 mm	bend with floor grate	-/180/180
	FS2S-100A	Cast-in	65/60/90/100 mm	150 mm concrete slab	PVC	80 mm	trap and floor grate	-/180/180
	FS2S-100AFW	Cast-in	65/60/90/100 mm	150 mm concrete slab	PVC	80 mm	trap and floor grate	-/180/180
FSP1130	FSC-100B	Retrofit to ceiling	65/60/90/100 mm	Timber-frame plasterboard ceiling	HDPE	100 mm	trap and floor grate	-/90/90
	FSC-50B	Retrofit to ceiling	40/50 mm	Timber-frame plasterboard ceiling	HDPE	50 mm	straight	-/90/90
FSP1132	FS3S-150A	Cast-in	150 mm	150 mm concrete slab	HDPE	150 mm	straight	-/180/180
	FS2S-100A	Cast-in	65/60/90/100 mm	150 mm concrete slab	PVC	100 mm	trap and floor grate	-/180/180
	FS2S-100AFW	Cast-in	65/60/90/100 mm	150 mm concrete slab	PVC	100 mm	trap and floor grate	-/180/180
FSP1134	FS2S-50A	Cast-in	40/50 mm	150 mm concrete slab	PVC	50 mm	trap and floor grate	-/180/180
	FS2S-50AFW	Cast-in	40/50 mm	150 mm concrete slab	PVC	50 mm	trap and floor grate	-/180/180
	FS2S-100H	Cast-in	65/60/90/100 mm	150 mm concrete slab	HDPE	100 mm	trap and floor grate	-/180/180
	FS2S-100HFHW	Cast-in	65/60/90/100 mm	150 mm concrete slab	HDPE	100 mm	trap and floor grate	-/180/180
	FS2S-50A	Cast-in	40/50 mm	150 mm concrete slab	PVC	50 mm	straight	-/180/180
FSP1140	FSC-100B	Retrofit to ceiling	65/60/90/100 mm	Timber-frame plasterboard ceiling	PVC	100 mm	straight	-/90/90
	FSC-50B	Retrofit to ceiling	40/50 mm	Timber-frame plasterboard ceiling	PVC	50 mm	straight	-/90/90
FSP1144	FS3S-315A	Cast-in	315 mm	150 mm concrete slab	PVC	315 mm	straight	-/180/180
FSP1146	FS2S-50HFHW	Cast-in	40/50 mm	150 mm concrete slab	HDPE	50 mm	trap and floor grate	-/180/180
	FS2S-50HFHW	Cast-in	40/50 mm	150 mm concrete slab	Silent	50 mm	trap and floor grate	-/180/180