

FIRE ASSESSMENT REPORT

FC12806-001

ASSESSMENT OF THE FIRE RESISTANCE OF SNAP CAST-IN COLLARS APPLIED TO PROTECTING PIPE PENETRATIONS THROUGH A CONCRETE FLOOR SLAB

CLIENT
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ASSESSMENT OBJECTIVE

To assess the fire resistance of SNAP cast-in collars protecting PVC, HDPE and Raupiano pipe penetrations through a 150 mm thick concrete floor slab.

CONCLUSION

It is considered that the SNAP collars cast-in to the underside of an at least 150 mm thick concrete floor slab protecting 15 mm to 315 mm diameter PVC pipes, 40 mm to 160 mm diameter HDPE pipes and 40 mm to 150 mm diameter Raupiano pipes, including variants as listed in the tables which may include pipes terminating to floor, waste and shower (FWS) grates and fittings within the collar, would achieve the FRL's as specified In Tables 1 to 7, if tested in accordance with AS 1530.4–2014 and AS 4072.1-2005.

LIMITATION

This report is subject to the accuracy and completeness of the information supplied.

BRANZ reserves the right to amend or withdraw this assessment if information becomes available which indicates the stated fire performance may not be achieved.

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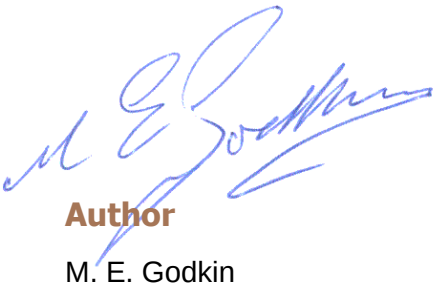

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1. INTRODUCTION

This report gives BRANZ's assessment of the fire resistance of a range of SNAP cast-in collars protecting a range of PVC, HDPE and Raupiano pipe penetrations passing through a 150 mm thick concrete floor slab.

2. BACKGROUND

2.1 General

The following gives the collar designation coding used in this report.

Prefix

- H = High profile
- L = Low profile

Suffix

- S = Used for stack assemblies only
- RR = Rubber ring
- FWS = Use with floor-waste & shower grate

2.2 Summary of Background Test and Assessment Data

This assessment is considered on the basis of the fire resistance performance of SNAP cast-in collars coded H and L installed in a 150 mm thick concrete floor slab protecting a range of PVC, HDPE and Raupiano pipe penetrations passing through the concrete floor slab as established in BRANZ and CSIRO fire resistance tests and assessments as summarised in the following tables. The fire resistance tests and assessments relevant to this assessment are listed in Appendix A.

Fittings are considered as a double thickness of pipe such as where a coupling or an elbow, fixed with a solvent based adhesive, is fitted to a straight pipe and it happens that the joint is within the collar.

In the tables the following refers to the colour coding of the listed FRLs:

- FRL in black denotes a test result as shown in Appendix A.
- FRL in blue denotes an assessed result from BRANZ assessment reports FAR 3528, FAR 3932 and FAR 4019.
- FRL highlighted in green denotes a result to be established in this assessment report.

Note: FWS = floor, waste and shower grate cast into the floor slab
PVC-SC = PVC pipe with sandwich construction

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Table 1: Summary of test and assessment results of SNAP cast-in collars protecting PVC pipes in a concrete floor slab

Material	Pipe diameter (mm)	Collar	Stack	Stack with fitting	Floor Waste & Shower	Floor Waste & Shower with fitting
PVC-SC	150	H150FWS-RR			-/240/240	-/240/240
PVC-SC	100	H150FWS-RR	-/240/240	-/240/240	-/240/240	-/240/240
PVC-SC	100	H100FWS/L100FWS	-/240/240	-/240/240	-/240/240	-/240/240
PVC	100	H100FWS/L100FWS	-/240/240	-/240/240	-/240/240	-/240/240
PVC	80	H100FWS/L80FWS	-/240/240	-/240/240	-/240/240	-/240/240
PVC	65	H100FWS/L65FWS	-/240/240	-/240/240	-/240/240	-/240/240
PVC	50	H100FWS/L100FWS	-/240/240	-/240/240	-/240/240	-/240/240
PVC	65	H65FWS	-/240/240	-/240/240	-/240/240	-/240/240
PVC	50	H65FWS	-/240/240	-/240/240	-/240/240	-/240/240
PVC	50	H50FWS/L50FWS	-/240/240	-/240/240	-/240/240	-/240/240
PVC	40	H50FWS/L50FWS	-/240/240	-/240/240	-/240/240	

Table 2: Summary of test and assessment results of SNAP cast-in collars protecting PVC pipes in a concrete floor slab – stack only range

Material	Pipe diameter (mm)	Collar	Stack	Stack with fitting
PVC	315	315C	-/180/180	
PVC	250	250C	-/180/180	
PVC-SC	150	H150FWS-RR	-/180/180	-/240/240
PVC-SC	150	H150S-RR	-/240/240	-/240/240
PVC-SC	100	H150FWS-RR	-/240/240	-/240/240
PVC-SC	100	H150S-RR	-/240/240	-/240/240
PVC-SC	100	H100S/L100S	-/240/240	-/240/240
PVC	100	H100S/L100S	-/240/240	-/240/240
PVC	90	H100S/L100S	-/240/240	-/240/240
PVC	80	H100S/L80S	-/240/240	-/240/240
PVC	65	H100S/L65S	-/240/240	-/240/240
PVC	65	H65S	-/240/240	-/240/240
PVC	50	H65S	-/240/240	-/240/240
PVC	50	H50S/L50S	-/240/240	-/240/240
PVC	40	H65S	-/240/240	-/240/240
PVC	40	H50S/L40S	-/240/240	-/240/240

Table 3: Summary of test and assessment results of SNAP cast-in collars protecting P-PVC pipes in a concrete floor slab – Floor Waste & Shower (FWS) range

Material	Pipe diameter (mm)	Collar	Stack
P-PVC	50	H 50FWS	-/240/240
P-PVC	40	H 50FWS	-/240/240
P-PVC	32	H 50FWS	-/240/240
P-PVC	25	H 50FWS	-/240/240
P-PVC	20	H 50FWS	-/240/240
P-PVC	15	H 50FWS	-/240/240

Table 4: Summary of test and assessment results of SNAP cast-in collars protecting HDPE pipes in a concrete floor slab – Floor Waste & Shower (FWS) range

Material	Pipe diameter (mm)	Collar	Stack	Floor Waste & Shower
HDPE	110	H100FWS/L100FWS	-/240/240	-/240/240
HDPE (Silent)	110	H100FWS/L100FWS	-/240/240	-/240/240
HDPE	90	H100FWS	-/240/240	-/240/240
HDPE	75	H100FWS	-/240/240	-/240/240
HDPE	63	H100FWS	-/240/240	-/240/240
HDPE	63	H65FWS	-/240/240	-/240/240
HDPE	56	H50FWS/L50FWS	-/240/240	-/240/240
HDPE	56	H65FWS	-/240/240	-/240/240
HDPE	50	H50FWS	-/180/180	-/180/180
HDPE	40	H50FWS	-/180/180	-/180/180

Table 5: Summary of test and assessment results of SNAP cast-in collars protecting HDPE pipes in a concrete floor slab – Stack Only (S Range)

Material	Pipe diameter (mm)	Collar	Stack
HDPE	160	H 150FWS-RR	-/180/180
HDPE	160	H150S-RR	-/180/120
HDPE	125	H 150FWS-RR	-/240/180
HDPE	125	H150S-RR	-/240/240
HDPE	110	H100S/L100S	-/240/240
HDPE (Silent)	110	H100S/L100S	-/240/240
HDPE	90	H100S	-/240/240
HDPE	75	H100S	-/240/240
HDPE	63	H100S	-/240/240
HDPE	63	H65S	-/240/240
HDPE	56	H50S/L50S	-/240/240

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Table 5 Continued

Material	Pipe diameter (mm)	Collar	Stack
HDPE	56	H65S	-/240/240
HDPE	50	H65S	-/240/240
HDPE	50	H50S	-/240/240
HDPE	40	H65S	-/240/240
HDPE	40	H50S	-/240/240

Table 6: Summary of test and assessment results of SNAP cast-in collars protecting Raupiano pipes in a concrete floor slab - FWS Range

Material	Pipe diameter (mm)	Collar	Stack	Stack with fitting	Floor Waste & Shower
Raupiano	110	H100FWS/L100FWS	-/240/240		-/240/240
Raupiano	90	H100FWS/L100FWS	-/240/240		-/240/240
Raupiano	75	H100FWS/L80FWS	-/240/240	-/240/240	-/240/240
Raupiano	50	H50FWS/L50FWS	-/240/240		-/240/240
Raupiano	40	H50FWS/L40FWS	-/240/240		

Table 7: Summary of test and assessment results of SNAP cast-in collars protecting Raupiano pipes in a concrete floor slab - Stack Only (S Range)

Material	Pipe diameter (mm)	Collar	Stack	Stack with fitting
Raupiano	150	H150FWS-RR	-/240/240	
Raupiano	150	H150S-RR	-/180/120	
Raupiano	110	H150FWS-RR	-/240/240	-/240/240
Raupiano	110	H150S-RR	-/240/180	-/240/180
Raupiano	110	H100S/L100S	-/240/240	-/240/240
Raupiano	90	H100S/L100S	-/240/240	-/240/240
Raupiano	75	H100S/L80S	-/240/240	-/240/240
Raupiano	50	H65S	-/240/240	-/240/240
Raupiano	50	H50S/L50S	-/240/240	-/240/240
Raupiano	40	H50S/L40S	-/240/240	-/240/240

2.3 CSIRO Assessment report FCO-3113

In CSIRO assessment report FCO-3113 consideration was given to the likely performance of new models of the SNAP cast-in collars manufactured from a moulded polypropylene (PP) body, in place of the polyethylene previously tested, and concluded that the proposed moulded plastic body would not detrimentally affect the fire resistance level (FRL) of the tested SNAP collars protecting concrete slabs penetrated by services.

3. DISCUSSION

3.1 Snap Cast-in Collars Description and Method of Operation

The range of SNAP cast-in collars has a variety of minor variations to the design of the collar. These include the following.

- H = High profile. The high-profile refers to the moulded PP top fitted to the collar body. This is used where the pipe is not fitted prior to pouring the concrete slab. The plastic top is trimmed off afterwards level with the slab surface.
- L = Low profile. The low-profile top refers to the moulded PP top that has a hole sized for the pipe it is used for. A section of pipe must be fitted prior to pouring the concrete slab.
- S = Stack assembly only. The moulded plastic cast in collars include three equally spaced springs with thermal triggers to assist with closure of the penetration. The collars used for floor waste applications are identified with the suffix FWS and include stainless steel grade 304 springs. Collars used for stack applications identified with the suffix (S) have galvanised steel springs.
- RR = Rubber ring. The rubber ring is an option used where it is necessary to reduce water ingress through the penetration during construction.

The cast in collars include an PP moulded body with a single layer of Intumesh intumescent and a layer of stainless steel mesh measuring 0.15 mm thick with 30 squares per inch sandwiched between the intumescent sleeve and the body of the collar. The height and thickness of the intumescent within the collar varies depending on the collar specification. On exposure to fire the intumescent material activates to close off the fire exposed end of the pipe as it burns back from the exposed face of the slab. The stainless steel mesh forms a lattice that helps to bind the activated intumescent within the collar and helps to prevent the intumescent from being consumed and falling away from the penetration prematurely. The collars are assisted by the springs to fold the intumescent into the penetration upon activation of the spring thermal link.

Where the high-profile collars were used for the pipe penetrations detailed in the listed reports, the annular gap between the pipe and the floor slab at the unexposed face was sealed with a bead of fire rated sealant or cement mortar.

It is considered that the test results on the SNAP cast in collars indicate that the minor variations of the High and Low profile collars and the inclusion or exclusion of the rubber ring, described above, have no discernible impact on the test result. Accordingly, any combination of these configurations may be used without affecting the FRL of the tested and assessed specimens.

3.2 Assessment

3.2.1 AS 4072.1-2005 Prerequisite Test Data

AS 4072.1-2005 Section 4 sets out the prerequisite test data required for assessing the variations to the tested specimen. When assessing plastic pipes other than PVC it is a requirement that the nominal 40 mm, 50 mm, 65 mm, 80 mm and 100 mm PVC pipe sizes have been tested in the collar assembly under consideration and have achieved the desired FRL. For the plastic pipe under consideration the maximum and minimum pipe size where the

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diameter Ø is (40 mm ≤ Ø ≤ 120 mm) must also be tested and have achieved the desired FRL. The intermediate pipe sizes can then be assessed. The test and assessment results shown in section 2.2 of this report give the required prerequisite test data for completing the assessment of PVC, HDPE and Raupiano pipes through a 150 mm thick concrete slab.

3.2.2 Method

The significant factor in initially sealing the pipe is considered to be the ability of the intumescent material to fully seal the cross-sectional area of the pipe. The spring assist collars force the intumescent and stainless mesh to close around the softening plastic pipe material thereby ensuring that the penetration is closed quickly. For the purposes of assessment for the performance of the cast-in collars with a variety of pipe materials and installation methods many of the collars have been tested with PVC pipes in floor waste installations. A further nineteen test specimens consisting of 110 mm to 315 mm diameter PVC pipes and up to 160 mm diameter HDPE and 150 mm diameter Raupiano pipes have been tested, in some cases fitted to floor waste and shower grates (FWS) and including fittings within the collars to double the thickness of the pipe within the collars. As the range of PVC pipes specified in AS 1530.4:2014 and AS 4072.1–2005 has been tested and achieved the FRLs stated, then intermediate diameter pipes would also be expected to achieve at least the same FRLs for the same material and collar fitted.

3.3 PVC-SC sandwich construction pipes

An examination of the BRANZ and CSIRO test reports shows consistent performance in the closing of the pipe collar combinations across the pipe sizes. From this it can be inferred that there is no difference between PVC and PVC-SC (sandwich construction) in terms of the ability and timing of closing as determined by temperature rises measured on the pipes.

3.4 Assessments of pipes with FWS grates without fittings

In the pipes with fittings the premise is that it may make it more difficult for the intumescent in the collar to close the double thickness of pipe. It therefore follows that for the same pipe size and collar combinations the time of closure of the collars on the pipes, without fittings, will likely be similar or earlier and thus maintain the FRL as tested.

Table 8 shows the three required assessments. These are supported by the tested systems in Table 1 and fit in between the pipe sizes 40 and 150 mm that were tested. For the pipe sizes listed these have been tested with fittings included in the collars and successfully sealed off the pipes to achieve the stated FRL. It is therefore considered that the same combination of pipe and collar will similarly be closed and achieve the required FRL when the fittings are not included.

Table 8: Assessment with FWS grates without fittings

Pipe type	Pipe diameter (mm)	Product	FRL
PVC sandwich con.	150	H150FWS-RR	-/240/240
PVC	65	H65FWS	-/240/240
PVC	50	H65FWS	-/240/240

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3.5 Assessment of pipes with fittings

For collars closing pipes terminating at a FWS grate in the floor slab it is generally accepted that this is a more severe arrangement than if the pipe continued through and above the floor. This is because when the floor grate is tested there is a greater likely hood that any gases passing through the pipe, before the collar closes and seals, will heat the grate beyond the insulation criteria whereas when a pipe only is fitted any hot gases passing through will require to heat the pipe wall before insulation failure occurs. This is expected to delay insulation failure. Hence where an FRL has been achieved with a collar closing a pipe terminating at a floor grate as shown in Table 1 it is expected that a collar closing a pipe continuing through the floor slab will achieve an FRL of at least the same as tested.

Table 9 shows the two required assessments. These are supported by the tested systems in Table 1 and fit in between the pipe sizes 40 and 150 mm that were tested. For the pipe sizes listed these have been tested connected to floor grates and with fittings included in the collars and successfully sealed off the pipes to achieve the stated FRL. It is therefore considered that the same combination of pipe and collar will similarly be closed and achieve the required FRL when the fittings are included.

Table 9: Assessment with fittings but without floor grate as supported by the tested systems

Pipe type	Pipe diameter (mm)	Product	FRL
PVC	65	H65FWS	-/240/240
PVC	50	H65FWS	-/240/240

3.6 Assessment of pipes without fittings (stack pipe only)

Given that the presence of fittings is likely to reduce the rate of compression and closure of PVC pipes under the action of the SNAP collars as tested and assessed as listed in Section 2 above it follows that the absence of the fittings in the pipes and a consequent reduced resistance to closure is unlikely to prejudice the respective FRL's already tested or assessed. It is therefore expected that the same FRL's will be achieved for the straight PVC pipes ranging in diameter from 40 mm to 160 mm when protected with the listed SNAP collars cast-in the concrete floor slab.

Table 10 shows the eleven required assessments. These are supported by the tested systems in Table 1 and fit in between the pipe sizes 40 and 160 mm that were tested. For the pipe sizes listed these have been tested connected to pipes with fittings included in the collars and successfully sealed off the pipes to achieve the stated FRL. It is therefore considered that the same combination of pipe and collar will similarly be closed and achieve the required FRL when the fittings are not included.

Table 10: Assessment of pipes without fittings as supported by the tested and assessed systems

Pipe type	Pipe diameter (mm)	Product	FRL
PVC	65	H65FWS	-/240/240
PVC	50	H65FWS	-/240/240
PVC sandwich con.	160	H150S-RR	-/240/180
PVC sandwich con.	100	H150S-RR	-/240/240
PVC	65	H65S	-/240/240
PVC	50	H65S	-/240/240
PVC	40	H65S	-/240/240
HDPE	63	H65FWS	-/240/240
HDPE	56	H65FWS	-/240/240
Raupiano	110	H150FWS-RR	-/240/240
Raupiano	110	H150S-RR	-/240/180

In addition, some pipe types and sizes and collar combinations have not been tested with fittings and/or FWS grates but fall between sizes which have been. As stated in Section 3.2 above, if a range of PVC pipes specified in AS 4072.1–2005 have been tested and achieved the FRLs stated, then intermediate diameter sizes of pipes would also be expected to achieve at least the same FRLs for the same material and with the same collar fitted.

A further combination of a H65S collar to protect 50 mm diameter Raupiano pipe is to be considered. This collar and the H50S/L50S collar have both successfully closed and sealed 50 mm diameter PVC and HDPE pipes with and without a fitting for an FRL of -/240/240. As the H50S/L50S has also successfully sealed a 50 mm diameter Raupiano pipe with a fitting for an FRL of -/240/240 it is expected that these two collars are at least equivalent and hence the H65S collar can seal a 50 mm diameter Raupiano pipe with or without a fitting for an FRL of at least -/240/240.

Table 11 shows the ten required assessments. These are supported by the tested systems in Table 1 and fit in between the pipe sizes 15 and 150 mm that were tested. For the pipe sizes listed these have been tested connected to pipes with and without fittings included in the collars and successfully sealed off the pipes to achieve the stated FRL. It is therefore considered that the same combination of collar and pipe of intermediate size will similarly be closed and achieve the required FRL.

Table 11: Assessment of additional pipes with and without fittings as supported by the tested and assessed systems

Pipe type	Pipe diameter (mm)	Product	FRL
P-PVC	40	H50FWS	-/240/240
P-PVC	25	H50FWS	-/240/240
P-PVC	20	H50FWS	-/240/180
HDPE	50	H65S	-/240/240
RAUPIANO	90 with FWS grate	H100FWS/L100FWS	-/240/240
RAUPIANO	75 with FWS grate	H100FWS/L80FWS	-/240/240
RAUPIANO	90 with fitting	H100S/L100S	-/240/240
RAUPIANO	75 with fitting	H100S/L80S	-/240/240
RAUPIANO	50 with or without fitting	H65S	-/240/240

4. CONCLUSION

It is considered that the SNAP collars cast-in to the underside of an at least 150 mm thick concrete floor slab protecting 15 mm to 315 mm diameter PVC pipes, 40 mm to 160 mm diameter HDPE pipes and 40 mm to 150 mm diameter Raupiano pipes, including variants as listed in the tables which may include pipes terminating to floor, waste and shower (FWS) grates and fittings within the collar, would achieve the FRL's as specified In Tables 1 to 7, if tested in accordance with AS 1530.4–2014 and AS 4072.1-2005.

Appendix A: Fire resistance tests and assessments relevant to this assessment

Report	Penetration #	Material	Pipe diameter (mm)	Collar	Application	FRL
FP 4640	5	PVC	50	H100FWS/L100FWS	FWS	-/240/240
	6	HDPE	56	H50S/L50S	S	-/240/240
FP 4837	5	PVC- Sandwich	100	H100S/L100S	S	-/240/240
	6	PVC- Sandwich	100	H100FWS/L100FWS	FWS-F	-/240/240
	7	PVC- Sandwich	100	H100FWS/L100FWS	S	-/240/240
FR 5670	4	PVC- Sandwich	160	H150S-RR	F	-/240/180
	5	HDPE	160	H150S-RR	S	-/180/120
	6	Raupiano	150	H150S-RR	S	-/240/180
	7	PVC- Sandwich	100	H150S-RR	F	-/240/240
	8	HDPE	125	H150S-RR	S	-/240/240
	9	Raupiano	110	H150S-RR	F	-/240/180
	28	HDPE	40	H65S	S	-/240/240
	29	P-PVC	32	H50FWS	S	-/240/240
FSP 1132	A	HDPE	160	H150FWS-RR	S	-/180/180
FSP 1144	A	PVC	315	315C	S	-/180/180
FSP 1146	1	HDPE	40	H50FWS	FWS	-/180/180
FSP 1564	1	Raupiano	40	H50S/L40S	S	-/240/240
	2	Raupiano	110	H100S/L100S	S	-/240/240
	3	Raupiano	110	H100FWS/L100FWS	FWS	-/240/240
	4	PVC	50	H50FWS/L50FWS	FWS-F	-/240/240
	5	Raupiano	50	H50FWS/L50FWS	FWS-F	-/240/240
FSP 1575	1	PVC	100	H100S/L100S	S	-/240/240
	3	PVC	65	H100S/L100S	S	-/240/240
	4	PVC	50	H50S/L50S	S	-/240/240
	5	PVC	40	H50S/L40S	S	-/240/240
FSP 1576	2	PVC	50	H50FWS/L50FWS	FWS	-/240/240
	3	PVC	80	H100FWS/L80FWS	FWS	-/240/240
	4	PVC- Sandwich	100	H100FWS/L100FWS	FWS	-/240/240
	5	PVC	40	H50FWS/L40FWS	FWS	-/240/240
FSP 1577	1	HDPE	110	H100S/L100S	S	-/240/240
	2	PVC- Sandwich	100	H100S/L100S	F	-/240/240
	3	PVC	65	H100FWS/L65FWS	FWS	-/240/240
	4	PVC- Sandwich	100	H100FWS/L100FWS	FWS-F	-/240/240
	5	PVC	40	H50S/L40S	F	-/240/240
FSP 1592	1	Raupiano	150	H150FWS-RR	S	-/240/240
	3	PVC- Sandwich	100	H150FWS-RR	FWS-F	-/240/240
	4	HDPE	110	H100FWS/L100FWS	FWS	-/240/240
	5	HDPE	56	H50FWS/L50FWS	FWS	-/240/240
FSP 1601	2	P-PVC	15	H50FWS	S	-/240/240
	4	P-PVC	50	H50FWS	S	-/240/240

Appendix A continued:

FSP 1614	1	Raupiano	110	H150FWS-RR	F	-/240/240
	2	Raupiano	75	H100FWS/L80FWS	F	-/240/240
	5	Raupiano	50	H50S/L50S	F	-/240/240
	6	Raupiano	40	H50S/L40S	F	-/240/240
FSP 1615	4	HDPE	125	H150FWS-RR	S	-/240/180
	5	HDPE	50	H50S	S	-/240/240
FSP 1641	2	PVC	250	250C	S	-/180/180
FSP 1696	1	PVC	65	H65S-RR	F	-/240/240
	2	PVC	65	H65FWS	FWS-F	-/240/240
	3	PVC	50	H65S	F	-/240/240
	4	PVC	63	H65FWS-RR	FWS-F	-/240/240
	5	HDPE	63	H65S	S	-/240/240
FSP 1700	1	HDPE	63	H65FWS	FWS	-/240/240
	2	HDPE	56	H65S	S	-/240/240
	3	HDPE	56	H65FWS	FWS	-/240/240
	5	PVC- Sandwich	150	H150S	FWS-F	-/240/240
FSP 1735	3	PVC	40	H65S-RR	F	-/240/240
FSP 1736	2	HDPE	40	H50S	S	-/240/240
FSP 1741	2	Raupiano	110	H100S/L100S	F	-/240/240
						-/240/240
FAR 3528	BRANZ assessments covering various penetrations					
FAR 3932						
FAR 4019						

Terminology:

FP & FR	=	BRANZ test reports
FSP	=	CSIRO test reports
HDPE	=	High density polyethylene pipe
PVC	=	Polyvinyl chloride pipe
PVC-Sandwich	=	Polyvinyl chloride pipe sandwich construction
S	=	Stack arrangement pipe only
F	=	Stack pipe including a pipe joint fitting within the collar
FWS	=	Fitted to a floor-waste and shower grate cast in the floor slab
FWS-F	=	Fitted to a floor-waste and shower grate cast in the floor slab and including a pipe joint fitting within the collar