



# FIRE ASSESSMENT REPORT

## FC10395-001 ISSUE 2

**ASSESSMENT OF THE FIRE RESISTANCE OF SNAP METAL RETRO COLLARS APPLIED TO PROTECTING PVC, P-PVC AND HDPE PENETRATIONS IN A PLASTERBOARD WALL**

### **CLIENT**

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## ASSESSMENT OBJECTIVE

To assess the fire resistance of SNAP metal retro collars applied to protecting penetrations of PVC, P-PVC and HDPE pipes in a 96 mm thick fire rated plasterboard wall with 1 x 16 mm thick sheets each side of 64 mm steel studs.

## CONCLUSION

It is considered that the SNAP collars fitted each side of a 96 mm thick plasterboard wall with 1 x 16 mm thick sheets each side of 64 mm steel studs protecting 25 mm to 100 mm diameter PVC pipes, 15 to 25 mm diameter P-PVC pipes and 40 mm to 100 mm HDPE pipes, would achieve a FRL's of at least - /90/60 as specified in the table below, if tested in accordance with AS 1530.4: 2014 and AS 4072.1–2005.

Product	Pipe dia. mm	Pipe type	FRL	Test or Assessment
110R	100	PVC Sandwich Con.	-/90/60	FP 5663
110R	100	PVC	-/90/60	FC10395
65-80R	90	PVC	-/90/60	FC10395
65-80R	80	PVC	-/90/60	FP 5663
65-80R	65	PVC	-/90/60	FC10395
63R	65	PVC	-/90/60	FP 5663
50R	50	PVC	-/90/60	FP 5663
50R	40	PVC	-/90/60	FP 5663
32R	32	PVC	-/90/60	FC10395
32R	25	PVC	-/90/60	FP 5663
32R	25	PVC U*	-/90/60	FP 5663
32R	20	P*-PVC	-/90/60	FC10395
32R	15	P*-PVC	-/120/60	FSP 1723
110R	100	HDPE	-/90/60	FP 5663
110R	90	HDPE	-/90/60	FC10395 Issue 2
65-80R	75	HDPE	-/90/60	FC10395 Issue 2
63R	63	HDPE	-/90/60	FC10395 Issue 2
63R	56	HDPE	-/90/60	FC10395 Issue 2
63R	50	HDPE	-/90/60	FC10395 Issue 2
50R	56	HDPE	-/90/60	FC10395 Issue 2
50R	50	HDPE	-/90/60	FC10395 Issue 2
50R	40	HDPE	-/90/60	FP 5663

\* AS/NZS 1477: 2006. PVC pipes and fittings for pressure applications.



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## LIMITATION

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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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The results reported here relate only to the item/s described in this report.



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# DOCUMENT REVISION STATUS

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01	25 July 2019	25 July 2029	Initial Issue
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# 1. INTRODUCTION

This report gives BRANZ's assessment of the fire resistance in accordance with AS 1530.4:2014 and AS 4072.1 - 2005 of the fire resistance of a range of SNAP metal retro collars applied to protecting penetrations of PVC, P-PVC and HDPE pipes in a 96 mm thick plasterboard wall with 1 x 16 mm thick sheets each side of 64 mm steel studs.

# 2. BACKGROUND

This assessment is considered on the basis of the fire resistance performance of SNAP retrofit collars coded 110R, 65-80R, 63R, 50R and 32R established in BRANZ pilot fire resistance test FP 5663, as summarised in Table 1.

**Table 1: Summary of supporting test results of SNAP collars in a 96 mm thick plasterboard wall with 1 x 16 mm sheets each side of 64 mm steel studs**

Test	Pen #	Collar	Pipe type	Nominal pipe dia. mm	FRL
FP 5663	9	110R	PVC (Sandwich Construction)	100	-/90/60
FP 5663	8	65-80R	PVC	80	-/90/60
FP 5663	7	63R	PVC	65	-/90/60
FP 5663	6	50R	PVC	50	-/90/60
FP 5663	4	50R	PVC	40	-/90/60
FP 5663	3	32R	PVC Conduit	25	-/90/60
FP 5663	2	32R	PVC U*	25	-/90/60
FP 5663	10	110R	HDPE	100	-/90/60
FP 5663	5	50R	HDPE	40	-/90/60

\* AS/NZS 1477: 2006. PVC pipes and fittings for pressure applications.

The fire test was performed in accordance with AS 1530.4-2005 "Fire resistance Tests of Elements of Building Construction", and AS 4072.1-2005 "Service Penetrations and Control Joints".

Additional test data to compare the fire resistance performance of the 32R collar on P-PVC pipes was established in CSIRO fire resistance test FSP 1723 as shown in Table 2.

**Table 2: Summary of supporting test result of SNAP collar on P-PVC pipe in a 96 mm thick plasterboard wall with 1 x 16 mm thick sheets each side of 64 mm steel studs**

Test Report	Pen. #	Collar	Pipe type	Nominal pipe dia. mm	FRL
FSP 1723	9	32R	P*-PVC	15	-/120/60

\*AS/NZS 1477: 2006. PVC pipes and fittings for pressure applications.

Test FSP 1723 was performed in accordance with AS 1530.4-2005 "Fire resistance Tests of Elements of Building Construction", and AS 4072.1-2005 "Service Penetrations and Control Joints".

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### 3. DISCUSSION

#### 3.1 AS 1530.4-2005 vs AS 1530.4:2014

The test reports FP 5663 and FSP 1723 referenced in Section 2 above described fire resistance tests in accordance with AS 1530.4- 2005. A review has been undertaken between the 2005 and 2014 versions of AS 1530.4 with respect to penetration testing. Based on the review it is considered the changes in versions would not have changed the reported performance of the penetrations. Therefore, it is expected had the penetrations been tested in accordance with AS 1530.4:2014 a similar result for Integrity and Insulation would be expected.

#### 3.2 Additional penetrations

Time-temperature records for the R collar/pipe combinations listed in Table 1 and Table 2 above indicated peak temperature rises of varying amounts below 110 K , as measured on the pipe 25 mm from the unexposed surface, indicating that the collar had activated and closed the pipe. The closure behaviour did not indicate any significant differences between the three types of plastic materials.

These test results are considered in assessing the Fire Resistance Level (FRL) of five additional penetrations in a 96 mm thick plasterboard wall with 1 x 16 mm thick sheets each side of 64 mm steel studs using PVC, P-PVC and HDPE pipes with the R series collars as listed in Table 3.

**Table 3: Assessment PVC, P-PVC and HDPE pipes in a 96 mm thick plasterboard wall with 1 x 16 mm thick sheets each side of 64 mm steel studs**

Product	Nominal pipe dia, mm	Pipe type	FRL
110R	100	PVC	-/90/60
65-80R	90	PVC	-/90/60
65-80R	80	PVC	-/90/60
32R	32	PVC	-/90/60
32R	20	P-PVC	-/90/60
110R	90	HDPE	-/90/60
65-80R	75	HDPE	-/90/60
63R	63	HDPE	-/90/60
63R	56	HDPE	-/90/60
63R	50	HDPE	-/90/60
50 R	56	HDPE	-/90/60
50R	50	HDPE	-/90/60

The pipe sizes requiring assessment generally fit between examples of tested pipe/collar combinations, with the only exception being the 100 mm diameter PVC and that was matched by a tested example also at 100 mm diameter.

In each case the performance of the tested systems each side of the systems subject to assessment, showed consistent and reliable closing of the collars with no significant differences that would indicate closure of the intermediate pipe sizes and collars as being



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likely to be prejudiced. Furthermore, the variations in the pipe material between PVC sandwich construction, PVC, P-PVC and HDPE did not indicate any significant differences in the temperature rise behaviour while closing and up to and beyond 60 minutes, so it follows the Insulation performance is unlikely to be prejudiced.

Similarly, as no Integrity failures were observed in the supporting test results at and beyond 90 minutes in test FP 5663 or at and beyond 120 minutes in test FSP 1723. It is likely that the same Integrity would be achieved for the intermediate and same pipe sizes.

## 4. CONCLUSION

It is considered that the SNAP collars fitted each side of a 96 mm thick plasterboard wall with 1 x 16 mm thick sheets each side of 64 mm steel studs protecting 25 mm to 100 mm diameter PVC pipes, 15 to 25 mm diameter P-PVC pipes and 40 mm to 100 mm HDPE pipes, would achieve an FRL of at least -/90/60 as specified in the Table 4, if tested in accordance with AS 1530.4: 2014 and AS 4072.1–2005.

**Table 4: Summary Table for R series SNAP Collars with PVC, P-PVC and HDPE pipes in a 96 mm thick plasterboard wall with 1 x 16 mm thick sheets each side of 64 mm steel studs**

Product	Pipe dia. mm	Pipe type	FRL	Test or Assessment
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65-80R	65	PVC	-/90/60	FC10395
63R	65	PVC	-/90/60	FP 5663
50R	50	PVC	-/90/60	FP 5663
50R	40	PVC	-/90/60	FP 5663
32R	32	PVC	-/90/60	FC10395
32R	25	PVC	-/90/60	FP 5663
32R	25	PVC U*	-/90/60	FP 5663
32R	20	P*-PVC	-/90/60	FC10395
32R	15	P*-PVC	-/120/60	FSP 1723
110R	100	HDPE	-/90/60	FP 5663
110R	90	HDPE	-/90/60	FC10395 Issue 2
65-80R	75	HDPE	-/90/60	FC10395 Issue 2
63R	63	HDPE	-/90/60	FC10395 Issue 2
63R	56	HDPE	-/90/60	FC10395 Issue 2
63R	50	HDPE	-/90/60	FC10395 Issue 2
50R	56	HDPE	-/90/60	FC10395 Issue 2
50R	50	HDPE	-/90/60	FC10395 Issue 2
50R	40	HDPE	-/90/60	FP 5663

\* AS/NZS 1477: 2006. PVC pipes and fittings for pressure applications.