

FIRE ASSESSMENT REPORT

FC10389-01

ASSESSMENT OF THE FIRE RESISTANCE OF SNAP METAL RETRO COLLARS APPLIED TO PROTECTING PENETRATIONS IN A HEBEL PANEL WALL WITH PEX-A AND PEX-B PIPES

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ASSESSMENT OBJECTIVE

To assess the fire resistance of SNAP metal retro collars applied to protecting penetrations with Pex-a and Pex-b pipes in a 75 mm thick Hebel panel wall.

CONCLUSION

It is considered that the SNAP collars fitted each side of a 75 mm thick Hebel panel wall protecting 16 mm to 32 mm diameter Pex-a and Pex-b pipes, would achieve a FRL's of -/120/120 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
32R	16	Pex-a	-/120/120	FC10389
32R	20	Pex-a	-/120/120	FC10389
32R	25	Pex-a	-/120/120	FC10389
32R	32	Pex-a	-/120/120	FC10389
32R	16	Pex-b	-/120/120	FSP1783
32R	20	Pex-b	-/120/120	FSP1807
32R	25	Pex-b	-/120/120	FC10389
32R	32	Pex-b	-/120/120	FSP1807

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.

This assessment report may only be quoted or reproduced in full.

TERMS AND CONDITIONS

This report is issued in accordance with the Terms and Conditions as detailed and agreed in BRANZ Services Agreement for this work.

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

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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 Pex-a and Pex-b pipes when installed in a 75 mm thick Hebel autoclaved aerated concrete (ACC) panel wall system.

2. BACKGROUND

This assessment is considered on the basis of the fire resistance performance of SNAP retrofit collars coded 32R established in CSIRO fire resistance tests FSP 1807, FSP 1783 and as summarised in Table 1.

Table 1: Summary of supporting test results of SNAP collars in a 75 mm thick Hebel panel wall

Test Report	Pen. #	Product	Pipe dia, mm	Pipe type	FRL
FSP1807	7	32R	32	Pex-b	-/120/120
FSP1807	8	32R	20	Pex-b	-/120/120
FSP1783	2	32R	16	Pex-b	-/120/120

The two fire tests were 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 collars on Pex-a and Pex-b pipes was established in BRANZ fire resistance test FR 5670 as shown in Table 2.

Table 2: Summary of supporting test results of SNAP collars in a 150 mm thick reinforced concrete slab with Pex-a and Pex-b pipes

Test Report	Pen. #	Product	Pipe dia, mm	Pipe type	FRL
FR 5670	10	32R	16	Pex-a	-/240/180
FR 5670	11	32R	20	Pex-a	-/240/240
FR 5670	12	32R	25	Pex-a	-/240/240
FR 5670	13	32R	16	Pex-b	-/240/240
FR 5670	14	32R	20	Pex-b	-/240/240
FR 5670	15	32R	25	Pex-b	-/240/240

Test FR 5670 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".

A further test result as shown in Table 3 was required to verify the performance of 32 mm Pex-a pipe.

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Table 3: Summary of supporting test result of SNAP collars in a plasterboard wall with Pex-a pipe

Test Report	Pen. #	Product	Pipe dia, mm	Pipe type	FRL
FSP1716	2	32R	32	Pex-a	-/180/180

3. DISCUSSION

The test results in Table 1, Table 2 and Table 3 are considered in assessing the FRL of five additional penetrations in a 75 mm Hebel panel wall using Pex-a and Pex-b pipes with the 32R collars as listed in Table 4.

Table 4: Assessment Pex-a and Pex-b pipe in 75 mm Hebel as supported by the tested systems

Test Report	Product	Pipe dia, mm	Pipe type
Assessed	32R	25	Pex-b
Assessed	32R	16	Pex-a
Assessed	32R	20	Pex-a
Assessed	32R	25	Pex-a
Assessed	32R	32	Pex-a

The FRL of the first penetration in Table 4, the 25 mm Pex-b pipe, is an intermediate size between successfully tested systems in Table 1. The larger and smaller collars were observed to successfully seal off the pipes and achieve the required FRL. It is therefore considered that the 25 mm pipe of the same material within the same 32R collars will similarly be closed and achieve the required FRL of -/120/120.

In the case of the next four systems using Pex-a pipe there is no fire performance data in 75 mm Hebel to base an assessment.

There is however BRANZ fire resistance test FR 5670 with applicable results shown in Table 2 for Pex-a and Pex-b pipes for sizes 16, 20 and 25 mm tested in a 150 mm thick concrete slab. The critical consideration is the closure of the pipes under the action of the 32R collar mounted on the underside of the concrete slab.

Time-temperature records for the 32R collar/pipe combinations listed in Table 2 above in all cases indicated a peak temperature rise, as measured on the pipe 25 mm from the unexposed surface, of about 30 K peaking at about 5 minutes followed by a reduction in temperature indicating that the collar had activated and closed the pipe.

From this it is concluded that there is no discernible performance difference between the 16, 20 and 25 mm Pex-a and Pex-b pipes. The difference between Hebel and a concrete slab is considered negligible at this early stage and is only likely to be a factor much later in a test.

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Closing performance data for the 32 mm Pex-a pipe is available in CSIRO test FSP1716 as detailed in Table 3. Although this test result is on a plasterboard wall it is not considered that this would affect the closure performance of the collar on the pipe and the results show that the temperature rise and closing time is similar to that for the Hebel and concrete slab.

In tests FSP1807 and FSP1873, the penetrations on the 75 mm Hebel wall achieved an FRL of at least -/120/120, therefore this assessment for all penetrations considered is limited to an FRL of -/120/120.

3.1 AS 1530.4-2005 vs AS 1530.4:2014

The test reports referenced in this assessment were tested 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.

4. CONCLUSION

It is considered that the 32R SNAP collars fitted each side of a 75 mm thick Hebel panel wall protecting 16 mm to 32 mm diameter Pex-a and Pex-b pipes would achieve an FRL of -/120/120 or, if tested in accordance with AS 1530.4:2014 and AS 4072.1 – 2005.

Table 5: Summary Table for 32R SNAP Collars with Pex-a and Pex-b pipes in a 75 mm Hebel panel wall

Product	Pipe dia, mm	Pipe type	FRL	Test or Assessment
32R	16	Pex-a	-/120/120	FC10389
32R	20	Pex-a	-/120/120	FC10389
32R	25	Pex-a	-/120/120	FC10389
32R	32	Pex-a	-/120/120	FC10389
32R	16	Pex-b	-/120/120	FSP1783
32R	20	Pex-b	-/120/120	FSP1807
32R	25	Pex-b	-/120/120	FC10389
32R	32	Pex-b	-/120/120	FSP1807

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