

FIRE ASSESSMENT REPORT

FC10129-01

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

CLIENT
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ASSESSMENT OBJECTIVE

To assess the fire resistance of SNAP metal retro collars applied to protecting penetrations with HDPE 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 40 mm to 160 mm diameter HDPE pipes, that may also include fittings within the collar, would achieve a FRL's of -/120/120 or -/120/90 as specified in the table below, if tested in accordance with AS 1530.4 – 2014 and AS 4072.1 – 2005.

Pipe Material	Pipe Diameter, mm	Collar Code	FRL
HDPE	160	HP150R	-/120/120
HDPE	125	HP150R	-/120/120
HDPE	110	LP100R-D	-/120/120
HDPE	90	LP100R-D	-/120/120
HDPE	75	LP100R-D	-/120/120
HDPE	63	LP65R	-/120/90
HDPE	56	LP65R	-/120/90
HDPE	50	LP65R	-/120/90
HDPE	40	LP65R	-/120/90

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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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 HDPE 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 HP and LP established in CSIRO fire resistance tests FSP 1807, FSP 1783 and FSP 1822 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
FSP1822	8	HP150R	160	HDPE	-/120/120
FSP1783	7	LP100R-D	110	HDPE	-/120/120
FSP1807	1	LP100R-D	75	HDPE	-/120/120
FSP1807	2	LP65R	63	HDPE	-/120/90
FSP1783	1	LP65R	40	HDPE	-/120/90

All three 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".

3. DISCUSSION

The test results in Table 1 are considered in assessing the FRL of five additional penetrations in a 75 mm Hebel panel wall intermediate HDPE pipe sizes with respective collars as listed in Table 2.

Table 2: Assessment with fittings as supported by the tested systems

Test Report	Pen. #	Product	Pipe dia, mm	Pipe type	FRL
Assessed	-	HP150R	125	HDPE	-/120/120
Assessed	-	LP100R-D	90	HDPE	-/120/120
Assessed	-	LP65R	56	HDPE	-/120/90
Assessed	-	LP65R	50	HDPE	-/120/90

For the four intermediate pipe sizes whereby pipe and collar combinations are between successfully tested systems, the larger and smaller collars were observed to successfully seal off the pipes and achieve the required FRL. It therefore follows that pipes of the same material within (same collars) will similarly be closed and achieve the required FRL.

Considering the assessments individually

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1. The HP150R collar protecting a 125 mm HDPE pipe. In test FSP 1822 penetration #8 with a larger 160 mm HDPE pipe was successfully closed by 12 minutes indicated by the observed cessation of smoke from the pipe stack and a peaking of the recorded temperature on the pipe wall 25 mm from the collar.

   A feature of the HP150R collar is that, in addition to the 112 mm wide x 8 mm thick intumescent material, the closing mechanism includes four 304 stainless steel springs bound with nylon fuse links. The observed closure was positive and the Fire Resistance achieved was Integrity 121 minutes NF (no failure) and Insulation 121 minutes NF, when the test was stopped.

   Given the positive closure of the HP150R collar with the assistance of the four springs it is likely that a smaller HDPE pipe of 125 mm will similarly be closed with the assistance of the springs a FRL of -/120/120 is likely to be achieved.

2. The LP100R-D collar protecting a 90 mm HDPE pipe. In tests FSP 1783 penetration #7 and FSP1807 penetration #1 the LP100R-D collar protected 110 mm and 75 mm HDPE pipes respectively.

   A feature of the LP100R-D collar is that, in addition to the 59 mm wide x 5 mm thick intumescent material, the closing mechanism includes four 304 stainless steel springs bound with nylon fuse links. The observed closure of the two test specimens at 6-8 minutes was positive and the Fire Resistance achieved was Integrity 121 minutes NF and Insulation 121 minutes NF, when the tests were stopped.

   Given the positive closure of the two LP100R-D collars with the assistance of the four springs it is likely that the intermediate sized HDPE pipe of 90 mm will similarly be closed with the assistance of the springs a FRL of -/120/120 is likely to be achieved.

3. The LP65R collar protecting 56 mm and 50 mm HDPE pipe. In tests FSP 1807 penetration #2 and FSP1783 penetration #1 the LP65R collar protected 63 mm and 40 mm HDPE pipes respectively.

   A feature of the LP65R collar is that, in addition to the 55 mm wide x 4 mm thick intumescent material, the closing mechanism includes three stainless steel springs bound with nylon fuse links. The observed closure of the two test specimens at 6-8 minutes was positive. The Fire Resistance achieved in FSP1807 for penetration #2 was Integrity 121 minutes NF and Insulation 91 minutes. The Fire Resistance achieved in FSP1783 for penetration #1 was Integrity 121 minutes NF and Insulation 114 minutes. In each case the Insulation failure was recorded on the Hebel wall, 25 mm from the collar.

   Given the positive closure of the two LP65R collars with the assistance of the three springs it is likely that the intermediate sized HDPE pipe of 56 and 50 mm will similarly be closed with the assistance of the springs a FRL of -/120/90 is likely to be achieved.

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4. CONCLUSION

It is considered that the SNAP collars fitted each side of a 75 mm thick Hebel panel wall protecting 40 mm to 160 mm diameter HDPE pipes and that may also include fittings within the collar would achieve a FRL's of -/120/120 or -/120/90 as specified in Table 3, if tested in accordance with AS 1530.4 – 2014 and AS 4072.1 - 2005

Table 3: Summary Table for SNAP Collars with HDPE pipes in a 75 mm Hebel panel wall

Pipe Material	Pipe Diameter, mm	Collar Code	FRL
HDPE	160	HP150R	-/120/120
HDPE	125	HP150R	-/120/120
HDPE	110	LP100R-D	-/120/120
HDPE	90	LP100R-D	-/120/120
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