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Attention: Mr Greg Parsons

USE OF CAST-IN FIRE COLLARS TO PROTECT A 150-MM THICK CONCRETE SLAB  
PENETRATED BY 50-mm AND 90-mm uPVC PIPES  
Assessment Number FCO-2611  
Your e-mail enquiry of 29 August 2007.

## INTRODUCTION

We have examined the information referenced by you on the performance of your cast-in fire collars protecting a reinforced concrete slab penetrated by PVC pipe services. The information included:

CSIRO Sponsored Investigation Report numbered FSP 1050;

Australian Standard 1530, Methods for fire tests on building materials, components and structures, Part 4: Fire-resistance of elements of building construction - 1997; and

Australian Standard 4072, Components for the protection of openings in fire-resistant separating elements, Part 1: Service penetrations and control joints - 1992.

We have retained these documents and information.

You wish to establish the performance of your cast-in fire collars; model numbers RFCH65S and RFCH100S installed with 50-mm and 90-mm uPVC pipes respectively, penetrating a 150-mm reinforced concrete slab.

## ANALYSIS

On 8 March 2004 this Division conducted a fire-resistance test on a 150-mm thick reinforced concrete slab penetrated by four pipe service penetrations designated as specimens A, B, C and D. The concrete slab was protected using four cast-in fire collars penetrated by PVC pipes. All PVC services were installed through the fire collars and extended at least 100-mm into the furnace chamber and 2000-mm above the unexposed face of the slab. All services were capped on the exposed end and were left uncapped on the unexposed end with the pipes supported by pipe clamps at 500-mm and 1500-mm above the unexposed face of the slab.

Specimen A comprised a Vinidex 100-mm PVC DWV FC foam pipe with a 110-mm OD and ID of 104-mm and a wall thickness of 3-mm penetrating a Ramset cast-in fire collar model number RFCH100S. The test was terminated at 240 minutes with no failures recorded in terms of Integrity or Insulation for Specimen A. Therefore Specimen A achieved an FRL of -/240/240 in accordance with the test requirements of AS1530.4-1997.

Specimen B comprised a Vinidex 40-mm uPVC pipe with a 43-mm OD and ID of 38-mm and a wall thickness of 3-mm penetrating a Ramset cast-in fire collar model number RFCH65S. The test was terminated at 240 minutes with no failures recorded in terms of Integrity or Insulation for Specimen B. Therefore Specimen B achieved an FRL of -/240/240 in accordance with the test requirements of AS1530.4-1997.

Specimen C comprised a Vinidex 80-mm uPVC pipe with a 83-mm OD and ID of 76-mm and a wall thickness of 3-mm penetrating a Ramset cast-in fire collar model number RFCH100S. The test was terminated at 240 minutes with no failures recorded in terms of Integrity or Insulation for Specimen B. Therefore Specimen B achieved an FRL of -/240/240 in accordance with the test requirements of AS1530.4-1997.

Specimen D comprised a Vinidex 65-mm uPVC pipe with a 69-mm OD and ID of 63-mm and a wall thickness of 3-mm penetrating a Ramset cast-in fire collar model number RFCH65S. The test was terminated at 240 minutes with no failures recorded in terms of Integrity or Insulation for Specimen B. Therefore Specimen B achieved an FRL of -/240/240 in accordance with the test requirements of AS1530.4-1997.

The results of this test are summarised in the table below.

Service type	Nom. Pipe Diameter (mm)	Wall thickness (mm)	Pipe Material	Fire collar model number	Penetrated element	Fire Resistance Level
Stack pipe	80	3	PVC FC foam	RFCH100S	150mm thick concrete slab	-/240/240
Stack pipe	100	3	uPVC	RFCH100S	150mm thick concrete slab	-/240/240
Stack pipe	40	3	uPVC	RFCH65S	150mm thick concrete slab	-/240/240
Stack pipe	65	3	uPVC	RFCH65S	150mm thick concrete slab	-/240/240

## CONCLUSION/ASSESSMENT

The results of the fire-resistance test reported on in our Sponsored Investigation report numbered FSP 1050, have demonstrated the minimum and maximum pipe diameters and pipe wall thicknesses used with your cast-in fire collar models RFCH65S and RFCH100S.

Therefore it is the assessment of this Division that these cast-in fire collars can be used with intermediate pipe sizes provided that the type of plastic pipe and the pipe wall thickness does not vary from that of the tested prototypes listed in the table above.

The table below indicates the intermediate pipe sizes appropriate to the model of cast-in fire collar along with the predicted Fire-Resistance Level (FRL), if the systems were subjected to a fire-resistance test in accordance with the requirements of AS1530.4-1997.

Service type	Nom. Pipe Diameter (mm)	Pipe wall thickness (mm)	Pipe material	Fire collar model number	Penetrated element	Fire Resistance Level
Stack pipe	50	3	uPVC	RFCH65S	150mm thick concrete slab	-/240/240
Stack pipe	90	3	uPVC	RFCH100S	150mm thick concrete slab	-240/240

#### TERM OF VALIDITY

This assessment report will lapse on 30 September 2012. 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

Garry E Collins  
Manager, Fire Testing and Assessment

21 September 2007