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Attention: Mr Greg Parsons

GAP SEALING SYSTEMS
Assessment Number FCO-2662
Your e-mail of 8th of May.

INTRODUCTION

We have re-examined the information referenced by you on the likely fire performance of the various construction joint systems to determine the likely performance if tested in accordance with AS 1530.4-2005. The information included

- report numbered TE 88553 for a fire-resistance test on joint systems conducted on 14 January 1997 by the Loss Prevention Council, UK;
- report numbered TE 88551 for a fire-resistance test on joint systems conducted on 22 January 1997 by the Loss Prevention Council, UK;
- report numbered TE 88798 for a fire-resistance test on joint systems conducted on 2 April 1997 by the Loss Prevention Council, UK;
- report numbered TE 90158 for a fire-resistance test on joint systems conducted on 16 December 1997 by the Loss Prevention Council, UK; and
- Australian Standard 1530.4-2005.

We have retained this documentation.

ANALYSIS

On 14 January 1997 the Loss Prevention Council Laboratories (LPC) conducted a fire-resistance test in accordance with the conditions of BS 476: Part 20: 1987 on four 900-mm long vertical joints in a 210-mm thick lightweight concrete block wall referenced as Joints 5, 6, 7 and 8.

Joint 5 was 10-mm wide and incorporated Fire Rated Canister Foam (5034) installed flush with the unexposed face and a rebated 10-mm on the exposed face of the wall, filling the entire gap, with the rebate filled with Fire Rated Low Modulus Neutral Cure Silicone (3059).

Joint 6 was 20-mm wide and incorporated Fire Rated Canister Foam (5034) installed flush with the unexposed face and exposed face of the wall, filling the entire gap.

Joint 7 was 10-mm wide and incorporated Fire Rated Canister Foam (5034) installed flush with the unexposed face and exposed face of the wall, filling the entire gap.

Joint 8 was 20-mm wide and incorporated Fire Rated Canister Foam (5034) installed flush with the unexposed face and a rebated 10-mm on the exposed face of the wall, filling the entire gap, with the rebate filled with Fire Rated Low Modulus Neutral Cure Silicone (3059).

Joint 6 failed integrity and insulation at 257 minutes while all of the other joints had not failed any criteria for the full 300 minute duration of the test.

On 22 January 1997 the Loss Prevention Council Laboratories (LPC) conducted a fire-resistance test in accordance with the conditions of BS 476: Part 20: 1987 on three 1000-mm long linear joints in a 200-mm thick lightweight concrete slab system wall referenced as Joints 4, 5 and 6.

Joint 4 was 20-mm wide and incorporated Fire Rated Canister Foam (5034) installed flush with the top face and a rebated 10-mm on the exposed face of the slab filling the entire gap, with the rebate filled with Fire Rated Low Modulus Neutral Cure Silicone (3059).

Joint 5 was 20-mm wide and incorporated Fire Rated Canister Foam (5034) installed flush with the top face and a rebated 10-mm on the exposed face of the slab, filling the entire gap, with the rebate filled with Intumescent Acrylic Sealant (2731).

Joint 6 was 20-mm wide and incorporated Fire Rated Canister Foam (5034) installed flush with the top face and exposed face of the slab, filling the entire gap.

Joint 6 failed integrity and insulation at 206 minutes. **Joint 5** failed insulation and integrity at 244 minutes. **Joint 4** failed integrity and insulation at 244 minutes.

On 2 April 1997 the Loss Prevention Council Laboratories (LPC) conducted a fire-resistance test in accordance with the conditions of BS 476: Part 20: 1987 on three 900-mm long vertical joints in a 210-mm thick lightweight concrete block wall referenced as Joints 1, 2 and 3.

Joint 1 was 80-mm wide and incorporated Fire Rated Canister Foam (5034) installed flush with the unexposed face and exposed face of the wall, filling the entire gap.

Joint 2 was 60-mm wide and incorporated Fire Rated Canister Foam (5034) installed flush with the unexposed face and exposed face of the wall, filling the entire gap.

Joint 3 was 40-mm wide and incorporated Fire Rated Canister Foam (5034) installed flush with the unexposed face and exposed face of the wall, filling the entire gap.

Joint 1 failed integrity at 79 minutes and insulation at 78 minutes. **Joint 2** failed integrity at 106 minutes and insulation at 103 minutes. **Joint 3** failed integrity and insulation at 181 minutes.

Finally on 16 December 1997 the Loss Prevention Council Laboratories (LPC) conducted a fire-resistance test in accordance with the conditions of BS 476: Part 20: 1987 on four 900-mm long vertical joints in a 100-mm thick lightweight concrete block wall referenced as Joints 7, 8, 9 and 10.

Joint 7 was 10-mm wide and incorporated Fire Rated Canister Foam (5034) installed flush with the unexposed face and a rebated 10-mm on the exposed face of the wall, filling the entire gap, with the rebate filled with Intumescent Acrylic Sealant (2731).

Joint 8 was 10-mm wide and incorporated Fire Rated Canister Foam (5034) installed flush with the unexposed face and exposed face of the wall, filling the entire gap.

Joint 9 was 20-mm wide and incorporated Fire Rated Canister Foam (5034) installed flush with the unexposed face and a rebated 10-mm on the exposed face of the wall, filling the entire gap, with the rebate filled with Intumescent Acrylic Sealant (2731).

Joint 10 was 20-mm wide and incorporated Fire Rated Canister Foam (5034) installed flush with the unexposed face and exposed face of the wall, filling the entire gap.

Joint 7 did not fail integrity for the full 240 minute duration of the test but failed insulation at 175 minutes. **Joint 8** failed integrity at 135 minutes and insulation at 132 minutes. **Joint 9** failed integrity at 195 minutes and insulation at 105 minutes. **Joint 10** failed integrity at 73 minutes and insulation at 69 minutes.

LPC described all of these tests as ad-hoc tests because BS 476 Part 20 did not have a specific requirement for testing of joint systems in isolation from full-scale wall and floor tests. Section 10 of AS 1530.4, Service Penetrations and Control Joints, does however detail how to test and evaluated the performance of the joint systems. Section 10.4.2 specifies that the minimum length of the joint is to be 1000 mm. The joint systems reported in TE 88553, TE 88798 and TE 90158 were only 900-mm long but he specimen wall was 1000-mm high and in this case the discrepancy is not considered to be detrimental to the results. Section 10.5.3 stipulates that the thermocouples for the evaluation of the insulation performance of control joints shall be positioned on the unexposed face of the sealing system and the separating element. All of the LPC tests conformed to this requirement. The only other difference between BS476 Part 20 and AS 1530.4 is that in BS 476 insulation failure is deemed to have occurred upon integrity failure while AS 1530 treats them as isolated events. This variation has also been considered in the conclusion but as there is no indication of the application of a roving thermocouple over the hot spot the insulation failure has remained the same.

CONCLUSION

Based on the similarity of BS 476 Part 20 and AS 1530.4 with regard to the testing and instrumentation of these particular building elements it is the opinion of this Division that the joint systems as reported in TE 88551, TE 88553, TE 88798 and TE 90158 would be capable of achieving the following performances if tested in accordance with AS 1530.4-2005.

Test No	Joint	Integrity (minutes)	Insulation (minutes)	FRL
TE 88551	4	246	246	-/240/240
	5	244	244	-/240/240
	6	206	206	-/180/180
TE88552	5	300	300	-/240/240
	6	257	257	-/240/240
	7	300	300	-/240/240
	8	300	300	-/240/240
TE 88798	1	79	78	-/60/60
	2	106	103	-/90/90
	3	181	181	-/180/180
TE 90158	7	240	175	-/240/120
	8	135	132	-/120/120
	9	195	105	-/180/90
	10	73	69	-/60/60

For wall systems it is considered that the test direction was the most severe and the results tabulated above are applicable for fire from either side of the wall.

Additionally the use of the light weight concrete in the prototype testing of these systems means that the results are also applicable for normal weight concrete elements.

This assessment applies to the following products

- FR Canister Foam (5034) …….. Ramset FRF700
- Intumescent Acrylic FR sealant (2731)
- Low Modulus Neutral cure FR Silicone sealant (3059)

TERM OF VALIDITY

This assessment report will lapse on 31 July 2018. Should you wish us to re-examine this report 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 assessment in the light of new knowledge.

Yours sincerely

Brett Roddy
Team Leader, Fire Testing

19 July 2013