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PENETRATIONS AND CLOSURES IN GIB® FIRE RATED WALL SYSTEMS

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PENETRATIONS AND CLOSURES IN GIB® FIRE RATED WALL SYSTEMS

1. CLIENT

Holdfast NZ Ltd
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2. PROPOSAL

This report gives BRANZ's assessment of the fire resistance, in accordance with AS 1530.4-1997 and AS 4072.1-1992, of a range of penetrations and Holdfast closures when used in conjunction with Winstone Wallboards Limited Gib® fire rated wall systems.

3. BACKGROUND

In BRANZ fire resistance test FP3271, conducted on the 11 May 2004, a non-loadbearing timber framed partition wall with two penetrations was tested in accordance with AS 1530.4-1997 and AS 4072.1-1992. The wall was lined on each face with one layer of 13 mm thick Gib® Fyreline plasterboard. The wall contained a single steel pipe penetration and a cable penetration consisting of four bundles of cables on a cable tray.

The steel pipe had a measured outside diameter of 152 mm and wall thickness of 4.9 mm and passed through a steel sleeve spanning the thickness of the wall in a 186 mm diameter hole in each facing. The gap between the pipe and the steel sleeve was filled with Holdfast Firecryl FR acrylic sealant to a depth of 15 mm on each face of the wall and with Holdfast Firestop one click and fix system gun foam, manufactured by Soudal, for the remaining depth of the wall.

The cables complied with Figure D1 of Appendix D of AS 4072.1-1992 and were installed on a 300 mm wide steel cable tray within a rectangular steel sleeve spanning the depth of the wall. The largest single cable included was 65 mm diameter and the largest bundle of cables was approximately 80 mm x 40 mm overall. The gap between the cables and the steel sleeve was filled with Holdfast Firecryl FR acrylic sealant to a depth of 15 mm on each face of the wall and with Holdfast Firestop one click and fix system gun foam, manufactured by Soudal, for the remaining depth of the wall.

The relevant specimens achieved Integrity of 62 minutes without failure and Insulation ranging from 23 to 61 minutes. Details of the specimens tested and the results achieved are given in BRANZ test report FP3271, dated 24 May 2004.

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4. DISCUSSION

4.1 Application of Systems Tested in BRANZ fire resistance test FP3271

In BRANZ fire resistance Test FP3271 the penetrations of nominal 150 mm diameter steel pipe and bundles of power cables demonstrated that the fire stopping system could achieve Integrity of at least 60 minutes. The cable bundles and supporting tray achieved Insulation of at least 30 minutes but the Insulation achieved by the pipe was less than 30 minutes and is considered to be at least 15 minutes.

Based on these results and in conjunction with the variations permitted in AS 4072.1, it is considered that:

a) The penetration fire stopping system described in the test report for protecting metal pipes can be used for single pipes of cast iron or steel of nominal sizes equal or less than 150 mm diameter and wall thicknesses equal or greater than 4.9 mm, passing through the separating elements described in c) below, would be likely to achieve a fire resistance of at least 60 minutes Integrity and 15 minutes Insulation.

b) The penetration fire stopping systems described in the test report for protecting bundles of power cables on steel cable trays passing through the separating elements described in c) below would achieve fire resistance of at least 60 minutes Integrity and 30 minutes Insulation.

c) The conclusions drawn in a) and b) above can be applied to plasterboard partitions constructed from Gib Fyreline facings comprising a minimum of one layer of 13 mm thick board on each face of at least 90 mm deep timber studs and having an established fire resistance of at least 60 minutes.

4.2 Application of Systems Tested in Alternative Wall Systems

The penetrations of metal pipe and cables on metal trays tested in BRANZ fire resistance Test FP 3271 all achieved Integrity in excess of 60 minutes and failure of insulation occurred on the cables, trays or pipe rather than on the wall lining adjacent to the penetration. The seals were all installed within a supporting steel sleeve and hence are not dependent on the thickness of the wall lining to retain the seal in place. Therefore, it is considered that these same penetrations will not prejudice the established Integrity up to 60 minutes for other fire rated plasterboard lined wall systems. It is therefore considered that the penetrations and sealing systems can be used in conjunction with the Winstone Wallboards Limited fire rated wall systems listed in their Gib® Fire Rated Systems catalogue, dated August 2001.

5. CONCLUSION

It is considered that the fire resistance, in accordance with AS 1530.1-1997, of the penetrations and associated fire stopping systems listed in the following Table 1 will achieve the fire resistance stated when used in association with the Winstone Wallboards Limited, Gib® fire rated wall systems listed.

6. LIMITATIONS

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Table 1

Description of penetration and seal system	FRR	Suitable for Installation in
Single pipes of cast iron or steel of nominal sizes equal or less than 150 mm diameter and pipe wall thicknesses equal or greater than 4.9 mm passing through a steel sleeve of diameter not more than 35 mm larger than the diameter of the pipe and sealed to a depth of 15 mm with Holdfast Firecryl sealant filling the gap between the pipe and sleeve on both faces of the wall. The gap between the pipe and the sleeve in the remaining depth of the wall is filled with Holdfast Firestop one, click and fix system gun foam, manufactured by Soudal.	-/15/15	GBT15, GBTL15, GBSL15
	-/30/15	GBT30a, GBTL30, GBT30b, GBTL30b, GBS30, GBSL30a, GBSL30b
	-/60/15	GBT60a, GBTL60, GBT60b, GBTLA60, GBS60, GBSL60a, GBSL60b
Power cables up to 65 mm overall passing through a steel sleeve of dimension not more than 35 mm larger than the dimension of the largest single cable or bundle of cables and sealed to a depth of 15 mm with Holdfast Firecryl sealant filling the gap between the cables and sleeve on both faces of the wall. The gap between the cables and the sleeve in the remaining depth of the wall is filled with Holdfast Firestop one, click and fix system gun foam, manufactured by Soudal.	-/15/15	GBT15, GBTL15, GBSL15
	-/30/30	GBT30a, GBTL30, GBT30b, GBTL30b, GBS30, GBSL30a, GBSL30b
	-/60/30	GBT60a, GBTL60, GBT60b, GBTLA60, GBS60, GBSL60a, GBSL60b

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