

FIRE ASSESSMENT REPORT

FC17888-01-1

AN ASSESSMENT CONSIDERING THE USE OF ALTERNATIVE ADHESIVES USED IN THE CONSTRUCTION OF INTEGRA INTERTENANCY SYSTEM (IT WALLS)

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ASSESSMENT OBJECTIVE

To assess the use of alternative adhesives used in the construction of Integra Intertenancy System (IT Walls) as tested in BRANZ Fire Resistance test FR 6289, in accordance with AS 1530.4-2005/2014 for 120/120/120 FRL/FRR.

CONCLUSION

It is considered that the substitution of an adhesive used in the construction of the Integra Intertenancy System (IT Walls) as tested in BRANZ Fire Resistance test FR 6289 would not be detrimental to the established 120/120/120 FRL/FRR. The following Soudal adhesives have been assessed and are considered to be a suitable alternative adhesive.

- Soudal Gorilla Grip 2 Hour Cure Construction Adhesive
- Soudal Gorilla Grip 1 Hour Cure Construction Adhesive
- Soudal Gorilla Grip 10 Min Cure Construction Adhesive

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 on the use of an alternative adhesive used in the construction of Integra Intertenancy System (IT Walls) as tested in BRANZ Fire Resistance test FR 6289, in accordance with AS 1530.4-2005/2014 for 120/120/120 FRL/FRR.

2. BACKGROUND

BRANZ fire resistance test report FR 6289 details a full scale, loadbearing fire resistance test, conducted in accordance with AS 1530.4:2014 of a nominally 3,000 mm high x 3,000 mm wide Integra Intertenancy System (IT Walls).

The wall construction comprised a timber frame formed from 90 mm x 45 mm SG8 top and bottom plates, 90 mm x 45 mm SG8 studs spaced at nominally 600 mm centres and 90 mm x 45 mm SG8 nogs spaced at nominally 800 mm centres.

The exposed face of the framing was lined with a layer of 50 mm thick Integra AAC panels, the unexposed face of the framing was lined with a layer of 10 mm thick GIB® Standard plasterboard.

The Integra panels were fixed to the framing using 50 mm long, 75 mm x 50 mm x 3 mm thick aluminium angle brackets. Each panel was held in place with two brackets, one at each end at approximately mid-height of the panel. PSL Plaster Systems AAC Adhesive was applied at all horizontal and vertical Integra panel joints.

The wall was exposed to the fire conditions specified in AS 1530.4:2014 while subjected to an applied axial load of 18 kN (4.5 kN/stud) for a duration of 125 minutes and during this period there were no observed instances of Structural Adequacy, Integrity or Insulation failure.

3. DISCUSSION

3.1 AS 1530.4:2014 vs AS 1530.4-2005

At the time of writing this report the New Zealand building code approved documents references AS 1530.4-2005. A review of the two versions of the test standard (2005 and 2014) with respect to Section 3, walls - vertical separating elements has been undertaken and it is considered that the supporting evidence would achieve the same fire resistance to either the 2005 or 2014 versions of AS 1530.4.

3.2 Alternative Adhesive

It is proposed to change the adhesive used in the construction of the specimen tested in FR 6289 from PSL Plaster Systems AAC Adhesive, which is plaster based, to one of three variants of Soudal Gorilla Grip Construction Adhesive:

- Soudal Gorilla Grip 2 Hour Cure Construction Adhesive
- Soudal Gorilla Grip 1 Hour Cure Construction Adhesive
- Soudal Gorilla Grip 10 Min Cure Construction Adhesive

Examination of the Safety Data Sheets (SDS) show that the three variants are essentially the same formulation, all of which are polyurethane based.

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The Integra AAC panels are attached to the framing members with aluminium angle brackets. The adhesive is applied between the AAC panel joints to seal the joints and prevent differential movement of the panels.

The proposed Soudal Gorilla Grip Construction Adhesives are stated to be a solvent free polyurethane construction adhesive which would be expected to be more flammable than the tested plaster based adhesive.

However, as the wall construction comprises Integra AAC panels attached to the framing members which are lined on the opposite face with 10 mm thick GIB® Standard plasterboard, the effects of a more flammable adhesive would be limited to the cavity and the exposed face.

The maximum temperature rise recorded on the cavity side of the unexposed face plasterboard lining did not exceed 150 K during the 125 minute test duration. The maximum temperature rise recorded on the unexposed face of the plasterboard lining did not exceed 70 K during the 125 minute test duration. It can therefore be reasonably considered that the addition of a small quantity of flammable adhesive would not increase the temperature rise of the plasterboard enough to cause a failure of Insulation of the wall for at least 120 minutes.

The total axial contraction of the wall after a duration of 125 minutes was measured as 3 mm and post test observation of the timber framing indicated no signs of charring, it can be considered that slightly elevated cavity temperatures would not have a significant effect on the loadbearing ability of the wall for at least 120 minutes.

It is further considered that due to all of the plasterboard joints being located at stud or nog positions, slightly elevated cavity temperatures would not have a significant effect on the Integrity of the unexposed face of the wall for at least 120 minutes.

Therefore based on the discussion above, it can be considered that the substitution of the adhesive would not be detrimental to the established 120/120/120 FRL/FRR of the Integra Intertenancy System (IT Walls).

4. CONCLUSION

It is considered that the substitution of an adhesive used in the construction of the Integra Intertenancy System (IT Walls) as tested in BRANZ Fire Resistance test FR 6289 would not be detrimental to the established 120/120/120 FRL/FRR. The following Soudal adhesives have been assessed and are considered to be a suitable alternative adhesive.

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