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Compliance of Firecryl FR 4H with the Fire Safety Requirements of the New Zealand Building Code

Original signed by:

Author: **E. Soja**

Senior Fire Engineer

Original signed by:

Reviewer: **M. E. Godkin**

Senior Fire Testing Engineer

Contact: **BRANZ Limited**
Moonshine Road
Judgeford
Private Bag 50908
Porirua City
New Zealand
Tel: +64 4 237 1170
Fax: +64 4 237 1171
www.branz.co.nz

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Compliance of Firecryl FR 4H with the Fire Safety Requirements of the New Zealand Building Code

1. CLIENT

Holdfast Manufacturing Ltd
14 Avalon Drive
Hamilton
NEW ZEALAND

2. INTRODUCTION

This report gives BRANZ's assessment of the compliance of Firecryl FR 4H with the fire safety requirements of the New Zealand Building Code.

Firecryl FR 4H is a linear gap sealant for use in gaps between masonry or concrete walls with gaps up to 21 mm wide in walls 100 mm thick or 200 mm thick. The sealant is applied from both sides to a depth of up to 20 mm against two separate polyethylene backing rods. Table 1 gives the dimensions of the various wall thickness and gap widths.

3. BACKGROUND

In the University of Gent fire resistance test No. 9297 specimens of Firecryl FR 4H used as linear gap seals in masonry walls were found to satisfy the criteria of Insulation and Integrity in accordance with pr EN 1366-4 "Fire resistance tests for service installations-Part 4 Linear joint seals", as given in Table 1.

Table 1 Fire Test Performance of Firecryl FR 4H.

Wall Depth (mm)	Gap Width (mm)	Sealant Depth (mm) Both sides	Polyethylene Backing Rod (mm diameter) Both sides	Integrity (minutes)	Insulation* (minutes)
200	20	20	25	240	240
100	21	20	25	240	210
100	11	10	15	240	187

Note: *Insulation value is based on the performance of the seal.

Warrington Fire Research Centre assessment report WFRC No. C113610 considered that the sealant systems given in Table 1 would achieve similar Insulation and Integrity performances if subjected to a test using the heating conditions and general principles of BS 476:Part 20:1987.

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4. DISCUSSION

The New Zealand Building Code Acceptable Solution C/AS1, paragraphs C6.12 and C6.17 specify that fire stopping, of which the proposed linear gap seal is an example, must comply with the test method AS 4072.1-1992 given in paragraph C7.1 of Appendix C of C/AS1. AS 4072.1-1992 uses AS 1530.4-1997 as the test method.

University of Gent fire resistance test No. 9297 was carried out in accordance with pr EN 1366-4.

This test method differs from AS 1530.4 and AS 4072 in the following manner:

Time/temperature curve. This is similar in both AS 1530.4 and pr EN 1366-4.

Pressure. These are similar between AS1530.4 and pr EN 1366-4 with the centre of the specimen at 15 Pa.

Furnace Thermocouples. prEN 1366-4 uses plate thermocouples, whereas in AS 1530.4 the thermocouples are open. The effect of this is to cause the test to prEN 1366-4 to be more onerous.

Unexposed Face Thermocouples. The placement of these is sufficiently similar in both AS 1530.4 and prEN 1366-4 to give comparable results.

Integrity. prEN 1366-4, in addition to gap failures and flaming on the exposed face, as in AS 1530.4, uses the ignition of a cotton pad as a criteria to assess integrity failure. This is considered to offer a better method of determining Integrity than visual observation as specified in AS1530.4.

The similarities between prEN 1366-4 and AS1530.4 are considered to be sufficient for the test data to be used to provide an assessment in accordance with AS1530.4.

Additional comments on Insulation and Integrity.

The insulation values given in Table 1 refer to the seal itself and not to any supporting structure. For compliance with AS1530.4 the insulation value of the supporting structure up to 180 minutes, therefore applies as the seal has been shown to provide at least 180 minutes insulation.

The test results also show that the Integrity of all seals was at least 240 minutes. Therefore the seal will provide at least 240 minutes integrity in a masonry or concrete wall with at least 240 minutes Integrity.

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5. CONCLUSION

It is considered that the Firecryl FR 4H systems assessed herein would achieve similar Insulation and Integrity performances to that in test to prEN 1366-4, if subjected to a test in accordance with AS1530.4.

It is also considered that the Firecryl FR 4H linear gap sealant systems given in Table 1 can be used to meet the requirements of the New Zealand Building Code Acceptable Solution requirements for fire stopping linear gaps to at least the fire ratings given in Table 2 below.

Table 2

Wall Depth (mm)	Gap Width (mm)	Sealant Depth (mm) Both sides	Polyethylene Backing Rod (mm diameter) Both sides	Integrity (minutes)	Insulation* (minutes)
100 or greater	20	20	25	240	240
	21	20	25	240	Up to 180
	11	10	15	240	Up to 180

* Insulation value is the lesser of that given in Table 2 or that of the wall.

6. LIMITATIONS

This assessment report is provided on the basis of the accuracy and completeness of the information provided by Holdfast Manufacturing Ltd.

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