



# **BRANZ** **Technical Opinion**

## **FAR 4534-TO [2015]**

### **FIRE RESISTANCE OF PENETRATIONS THROUGH A FIRE RATED PLASTERBOARD WALL USING RAMSET BLAZEBRAKE**

#### **CLIENT**

Ramset New Zealand  
23-29 Poland Road  
Glenfield  
Auckland 0632  
New Zealand



PROJECT NUMBER:

**FC4534**

ISSUE DATE:

**19 January 2016**

EXPIRY DATE:

**19 January 2021**

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# ASSESSMENT SUMMARY

## Objective

To assess the fire resistance of Ramset Blazebrake acrylic construction sealant sealing pipe and cable penetrations in a 60 minute fire rated plasterboard wall where the lining is at least 13 mm thick fire rated plasterboard for a fire resistance level if tested in accordance with AS 1530.4-2005 of up to -/30/30 or -/30/0 depending on the penetration.

## Client

Ramset New Zealand  
23-29 Poland Road  
Glenfield  
Auckland 0632  
New Zealand

## Conclusion

It is considered that the following Ramset Blazebrake penetrations would achieve at least the stated FRR if tested in accordance with AS 1530.4-2005 in fire rated steel stud wall lined with at least 13 mm thick fire rated plasterboard which has independently achieved an FRR of 60/60/60 or -/60/60:

Penetration	Gap/hole in wall	FRR
Deflection head	Up to 20 mm wide x 13 mm deep	-/30/30
Wall to masonry joint	Up to 15 mm wide x 13 mm deep	-/30/30
Control joint	Up to 20 mm wide x 13 mm deep	-/30/30
76 mm diameter copper/steel pipe – with screen 450 mm long	100 mm diameter with steel sleeve. Mastic at least 13 mm deep	-/30/30
76 mm diameter copper/steel pipe – without screen	100 mm diameter with steel sleeve. Mastic at least 13 mm deep	-/30/0
65 mm diameter bundle of cables	80 mm diameter. Mastic at least 13 mm deep	-/30/30



## LIMITATION

The results reported here relate only to the item/s described in this report.

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.

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## TERMS AND CONDITIONS

This report is issued in accordance with the Terms and Conditions as detailed and agreed in the BRANZ Services Agreement for this work.



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# SIGNATORIES



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# DOCUMENT REVISION STATUS

ISSUE NO.	DATE ISSUED	EXPIRY DATE	DESCRIPTION
1	19 January 2016	19 January 2021	Initial Issue



# 1. INTRODUCTION

This report gives BRANZ's assessment of the fire resistance of Ramset Blazebrake acrylic construction sealant sealing pipe and cable penetrations in a 30 minute fire rated plasterboard wall where the lining is at least 13 mm thick fire rated plasterboard which has achieve at least an fire resistance rating (FRR) of -/60/60 or 60/60/60.

# 2. BACKGROUND

In BRANZ fire resistance test FP 3698 a steel stud plasterboard wall lined with one layer of 16 mm thick fire rated plasterboard was tested in accordance with AS 1530.4-1990. The wall included various penetrations including pipes and cables and was subjected to a fire resistance test for 77 minutes. The specimens tested and results are given in Table 1:

**Table 1: Specimen summary FP 3698**

Specimen	Configuration	FRR
A	Deflection head	-/60/60
B	Wall to masonry joint	-/60/60
D	Control joint	-/60/60
E	80 mm diameter copper pipe – with full circumference screen	-/60/60
	80 mm diameter copper pipe – without screen	-/60/0
F	65 mm diameter bundle of cables	-/60/60

# 3. DISCUSSION

## 3.1 AS 1530.4-1990 vs AS 1530.4-2005

Fire resistance test FP 3698 was tested in accordance with AS 1530.4-1990 and AS 4072: 1992. The significant differences between how the specimens were tested and AS 1530.4-2005 are as follows:

Both test standards specify the same time/temperature curve except that AS 1530.4-2005 starts at 20°C rather than at ambient temperature in AS 1530.4-1990. In fire resistance test FP 3698 the ambient temperature at the start of the test was 15°C. As this is a minor difference in starting temperature it is considered that furnace temperature in FR 3698 would meet the requirements of AS 1530.4-2005.

The pressure requirements between versions of the standard is different for penetrations. AS 1530.4-1990/4072.1-1992 specifies 8 Pa at mid height of the lowest penetration. AS 1530.4-2005 specifies 15 Pa at mid height of the lowest penetration. In fire resistance test FP 3698 the pressure was set to the lowest penetration which was below the pipe and cable penetrations. Based on the pressure gradient in the furnace it is expected that the pipe and cable penetrations would have been subjected to a similar furnace pressure as required by AS 1530.4-2005 and therefore would have meet the pressure requirements of the standard.



The Integrity criteria has changed between versions of the test standard. AS 1530.4-1990 determines Integrity failure to be vision through the specimen into the furnace or flaming. AS 1530.4-2005 determines Integrity failure to be through ignition of a cotton pad, flaming or gap gauges. It is considered that as the penetrations maintained the Integrity criteria to AS 1530.4-1990 it is also likely to achieve a similar result to AS 1530.4-2005.

The Insulation criteria and location of specimen thermocouples is slightly different between versions of the test standard however it is considered the specimens as tested would also meet the requirements of AS 1530.4-2005.

### 3.2 General

In fire resistance test FP 3698 the wall system consisted of nominal 64 mm deep steel studs lined with one layer of 16 mm thick fire rated plasterboard to each face. The wall system tested had an established fire resistance rating (FRR) of at least -/60/60. The penetrations were sealed using Ramset Blazebrake acrylic sealant.

It is proposed to install the same penetrations as tested in FP 3698 in a fire rated plasterboard wall where the plasterboard is at least 13 mm thick and which also had independently achieved an FRR of at least 60/60/60 or -/60/60.

### 3.3 Edge details

The control joints tested in FP 3698 consist a deflection head (specimen A), a masonry-drywall joint (specimen B) and a control joint (specimen D). The width of the joints varied from 15 mm to 20 mm but all were nominally 13 mm deep. The three joint details maintained the Integrity and Insulation criteria for in excess of 60 minutes in the 16 mm thick fire rated plasterboard wall.

Based on the performance of the Ramset Blazebrake in the fire rated steel stud wall, and that there is no reduction in sealant thickness, it is considered that if the same jointing details up to the tested width were tested in a 30 minute fire rated wall of at least 13 mm thick plasterboard they would maintain at least an FRR of -/30/30 if tested in accordance with AS 1530.4-1990.

### 3.4 Pipes

In fire resistance test FP 3698 a copper pipe nominally 76 mm diameter was installed in a nominally 100 mm diameter hole in the plasterboard wall. A galvanised steel sleeve was installed spanning the wall linings then the annular gap between the pipe and sleeve was filled with a depth of 16 mm thick Ramset Blazebrake. The pipe also included a mesh radiation guard along the pipe. The pipe maintained the Insulation criteria for 18 minutes and did not fail the Insulation criteria for the duration of the test on the radiation guard.

If the pipe was installed as per FP 3698 but into a 30 minute fire rated wall with 13 mm thick plasterboard it is expected that the penetration would maintain at least an FRR of -/30/0 without the radiation guard and an FRR of -/30/30 with the full circumference radiation guard.



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Further to this it is considered that pipes of 76 mm or smaller may also be installed on the condition the installation details are the same (annular gap and depths of Ramset Blazebrake). The pipe may be either copper or steel construction.

### 3.5 Cables

In fire resistance test FP 3698 a bundle of cables with an outside diameter of 65 mm were installed into an 80 mm diameter hole through the plasterboard wall. The annular gaps between the cables and hole in the plasterboard were filled with Ramset Blazebrake to the full depth of the lining. All visible gaps between the cables in the bundle were also sealed with Ramset Blazebrake sealant. The penetration achieved an FRR of -/60/60.

In terms of the Insulation performance of the cables when the penetration did exceed the Insulation criteria it was measured on the cables 25 mm from the wall. Although it is expected that by reducing the wall thickness by 3 mm per side it is expected to reduce the Insulation performance of the penetration system. It is not expected to reduce it significantly. Therefore it is expected the cables installed into a 30 minute fire rated wall would maintain the Insulation criteria for at least 30 minutes.

In terms of the Integrity criteria the penetration system maintained the Integrity criteria for the 77 minute duration of the test. By reducing the thickness of the lining and sealant it is expected to reduce the Integrity performance of the system. However it is not expected to reduce it sufficiently to prejudice the fire resistance of the wall system. Therefore it is considered if the cable penetration as tested in FP 3698 was installed into a 60/60/60 or -/60/60 fire rated plasterboard wall lined with at least 13 mm thick fire rated plasterboard it would be expected to maintain the Integrity criteria for at least 30 minutes if tested in accordance with AS 1530.4.

Further to this it is considered if the annular gap and depth of sealant is maintained bundles of cables less than 65 mm diameter would be expected to achieve an FRR of -/30/30.





## 4. CONCLUSION

It is considered that the following Ramset Blazebrake penetrations would achieve at least the stated FRR if tested in accordance with AS 1530.4-2005 in fire rated steel stud wall lined with at least 13 mm thick fire rated plasterboard which has independently achieved an FRR of 60/60/60 or -/60/60:

Penetration	Gap/hole in wall	FRR
Deflection head	Up to 20 mm wide x 13 mm deep	-/30/30
Wall to masonry joint	Up to 15 mm wide x 13 mm deep	-/30/30
Control joint	Up to 20 mm wide x 13 mm deep	-/30/30
76 mm diameter copper/steel pipe – with screen 450 mm long	100 mm diameter with steel sleeve. Mastic at least 13 mm deep	-/30/30
76 mm diameter copper/steel pipe – without screen	100 mm diameter with steel sleeve. Mastic at least 13 mm deep	-/30/0
65 mm diameter bundle of cables	80 mm diameter. Mastic at least 13 mm deep	-/30/30



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# BRANZ Technical Opinion

## Summary

This is to certify that the specimen described below has been examined by BRANZ Ltd on behalf of

Ramset New Zealand  
23-29 Poland Road  
Glenfield  
Auckland 0632  
New Zealand

**Test standard:** AS 1530.4-2005

**Specimen name:** Ramset Blazebrake acrylic construction sealant

**Specimen description:** Ramset Blazebrake penetrations installed in a steel stud plasterboard wall lined with 13 mm fire rated plasterboard that has achieved an FRR or at least -/60/60 or 60/60/60.

Penetration	Gap/hole in wall	FRR
Deflection head	Up to 20 mm wide x 13 mm deep	-/30/30
Wall to masonry joint	Up to 15 mm wide x 13 mm deep	-/30/30
Control joint	Up to 20 mm wide x 13 mm deep	-/30/30
76 mm diameter copper/steel pile – with screen 450 mm long	100 mm diameter with steel sleeve. Mastic at least 13 mm deep	-/30/30
76 mm diameter copper/steel pipe – without screen	100 mm diameter with steel sleeve. Mastic at least 13 mm deep	-/30/0
65 mm diameter bundle of cables	80 mm diameter Mastic at least 13 mm deep	-/30/30

**Orientation:** Fire exposure from either side.

**A full description of the performance assessment is given in BRANZ Technical Opinion:**  
FAR 4534-TO [2015] issued 19 January 2016

**Regulatory authorities are advised to examine reports before approving any product.**

**Issue Date:**  
19 January 2016

**Expiry Date:**  
19 January 2021



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