

# FIRE ASSESSMENT REPORT

## FC13367-01-2

**FIRE RESISTANCE OF A CELCRETE FIRE RATED WALL SYSTEM IN ACCORDANCE WITH AS 1530.4:2014**

**CLIENT**

Celcrete Cladding Systems NZ Ltd
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# ASSESSMENT OBJECTIVE

To assess the fire resistance of the Celcrete fire rated wall system as tested in fire resistance test FR 3971 in accordance with AS 1530.4:2014 with variations to construction.

# CONCLUSION

It is considered that the loadbearing timber framed Celcrete wall as tested in fire resistance test FR 3971 with the following lining configurations would achieve the FRR, from either direction, if tested in accordance with AS 1530.4:2014 as shown in the following table.

| External Lining | Internal Lining (GIB® system ref) | FRR |
|---|---|---|
| Celcrete 50 mm panel | 10 mm GIB Fyreline® (GBTL 30) | 30/30/30 |
| | 13 mm GIB® Standard (GBTL 30b) | |
| | 10 mm GIB® Standard (GBTL 30c) | |
| | 13 mm GIB Fyreline® (GBTL 60) | 60/60/60 |
| | 2 x 10 mm GIB Fyreline® (GBTL 60b) | |
| | 16 mm GIB Fyreline® (GBTL 90) | 90/90/90 |
| | 2 x 16 mm GIB Fyreline® (GBTL 120) | 120/120/120 |
| | 50 mm Celcrete panel | 180/180/180 |

# 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.

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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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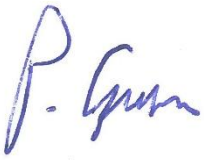
# SIGNATORIES



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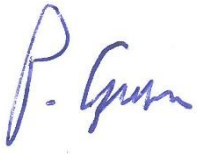

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# DOCUMENT REVISION STATUS

| ISSUE NO. | DATE ISSUED | REVIEW DATE | DESCRIPTION |
|---|---|---|---|
| 1 | 3 November 2020 | 3 November 2025 | Initial Issue |
| 2 | 21 April 2026 | NA | Update WWB references [BRANZ ref:21577] |



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# 1. INTRODUCTION

This report gives BRANZ's assessment on the fire resistance of the Celcrete fire rated wall system as tested in fire resistance test FR 3971 in accordance with AS 1530.4:2014 with the following variations:

- Fire exposure from each direction
- 30 minute to 180 minute wall configurations
- Celcrete cladding to both faces

# 2. BACKGROUND

In BRANZ fire resistance test FR 3971 a load bearing Celcrete wall system was tested in accordance with AS 1530.4-1997. The wall consisted of a 90 mm x 45 mm timber frame spaced at 600 mm centres which was insulated with R2.2 fibre glass insulation. On the fire exposed face the frame was lined with a Thermakraft Industries building wrap then timber battens nominal 40 mm x 40 mm x 200 mm long spaced at 600 mm centres. The nominal 600 mm x 50 mm thick Celcrete panels were installed horizontally and secured through the battens into the framing. The unexposed face of the framing was lined with 16 mm thick GIB Fyreline® plasterboard. The wall achieved the following fire resistance:

| | |
|---|---|
| Structural Adequacy | 185 minutes No failure |
| Integrity | 185 minutes No failure |
| Insulation | 185 minutes No failure |

Winstone Wallboards Limited has undertaken a number of fire resistance tests on load bearing and non-loadbearing timber framed plasterboard wall systems in accordance with AS 1530.4 in support of their BRANZ appraised technical manual:

*Winstone Wallboards Ltd GIB® Fire Rated Systems Specification and installation manual (September 2024).*

Winstone Wallboards Ltd have authorised access to their fire resistance test data in support of this opinion.

# 3. DISCUSSION

## 3.1 AS 1530.4-1997 vs AS 1530.4:2014

With respect to tests on a loadbearing wall system, the only significant differences between the 1997 and 2014 versions of the AS 1530.4 test standard is the additional requirement to use a cotton pad to detect flames or hot gases emanating from cracks or fissures on the unexposed face and the application of measurements to establish the collapse of a loaded wall. In the test described in Section 2 above the specimen maintained the Structural Adequacy and Integrity criteria for the duration of the test. There were no cracks or fissures observed and therefore the application of the cotton pad test would not have occurred. It is therefore considered that the wall tested in accordance with the 1997 version of the test standard are unlikely to achieve a lesser fire resistance if tested in accordance with the current test standard AS 1530.4:2014.





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## 3.2 Celcrete wall system

### 3.2.1 FR 3971 Fire exposure from the plasterboard face

In BRANZ fire resistance test FR 3971 the wall was exposed from the Celcrete panel face and achieved an FRR of 180/180/180. The wall to the unexposed face was lined with 16 mm GIB Fyreline® plasterboard. In the Winstone Wallboards Ltd GIB® Fire Rated Systems Specification and installation manual (September 2024) a timber framed wall lined with 16 mm GIB Fyreline® plasterboard to both sides (GBTL 90) is deemed to achieve an FRR of 90/90/90. In terms of the Structural Adequacy performance of a wall system the exposed lining will limit the rate of charring the studs would be exposed to. Based on the ability of the 16 mm GIB Fyreline® to maintain the structural adequacy criteria, it is concluded that fire resistance test FR 3971 would have achieved an FRR of 90/90/90 if tested from the plasterboard side if tested in accordance with AS 1530.4:2014.

### 3.2.2 Variations to the internal plasterboard linings

It is proposed to change the plasterboard linings from that tested in FR 3971 to provide an FRR from 30 minutes up to 120 minutes for fire exposure from inside the building (plasterboard face). From the Winstone Wallboards Ltd GIB® Fire Rated Systems Specification and installation manual (September 2024) the following systems are deemed to achieve the listed FRR as shown in Table 1.

**Table 1 GIB® fire rated systems**

| System | Internal Lining | FRR |
|---|---|---|
| GBTL 30 | 10 mm GIB Fyreline® | 30/30/30 |
| GBTL 30b | 13 mm GIB® Standard | |
| GBTL 30c | 10 mm GIB® Standard | |
| GBTL 60 | 13 mm GIB Fyreline® | 60/60/60 |
| GBTL 60b | 2 x 10 mm GIB Fyreline® | |
| GBTL 90 | 16 mm GIB Fyreline® | 90/90/90 |
| GBTL 120 | 2 x 16 mm GIB Fyreline® | 120/120/120 |

The Winstone Wallboards Ltd GIB® Fire Rated Systems listed in Table 1 have achieved the stated fire resistance when exposed from the plasterboard face. As discussed in Section 3.2.1 it is considered if the Celcrete fire rated wall system as tested in FR 3971, but with the plasterboard linings replaced, would achieve the corresponding FRR as shown in Table 1.

The Winstone Wallboards Ltd GIB® Fire Rated plasterboard shall be installed as specified in the Winstone Wallboards Ltd GIB® Fire Rated Systems Specification and installation manual (September 2024).



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### 3.2.3 Celcrete panel to both faces

In fire resistance test FR 3971 the Celcrete 50 mm thick panel was tested on the fire exposed face with 16 mm GIB Fyreline® plasterboard to the unexposed face and achieved an FRR of 180/180/180. It is proposed to replace the plasterboard with the Celcrete 50 mm thick panel. The Celcrete panel is to be installed as tested in FR 3871 to both sides of the timber framing. Based on the performance of the tested wall system it is considered when lined with nominal Celcrete 50 mm thick panel to both faces it would be expected to achieve an FRR of at least 180/180/180 if tested in accordance with AS 1530.4:2014.

# 4. CONCLUSION

It is considered that the loadbearing timber framed Celcrete wall as tested in fire resistance test FR 3971 with the following lining configurations would achieve the FRR, from either side, if tested in accordance with AS 1530.4:2014 as shown in the following table.

| External Lining | Internal Lining (GIB® system ref) | FRR |
|---|---|---|
| Celcrete 50 mm panel | 10 mm GIB Fyreline® (GBTL 30) | 30/30/30 |
| | 13 mm GIB® Standard (GBTL 30b) | |
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| | 13 mm GIB Fyreline® (GBTL 60) | 60/60/60 |
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| | 2 x 16 mm GIB Fyreline® (GBTL 120) | 120/120/120 |
| | 50 mm Celcrete panel | 180/180/180 |



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