



**BRANZ**

1222 Moonshine Road  
Judgeford RD1  
Porirua 5381  
New Zealand  
T +64 4 237 1170  
F +64 4 237 1171  
branz@branz.co.nz  
www.branz.co.nz



# FIRE ASSESSMENT REPORT

## FAR 2251 ISSUE 2

FIRE RESISTANCE OF ECO BLOCK WALL SYSTEMS

**CLIENT**

Eco Block Pty Ltd  
PO Box 116  
Grange  
QLD 4051  
Australia

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## ASSESSMENT OBJECTIVE

To assess the fire resistance of ECO-Block wall systems in accordance with AS 1530.4-2014 and compliance with AS 3600-2009.

## CONCLUSION

It is considered that a concrete wall manufactured using the ECO-Block form system would provide at least the fire resistance in accordance with AS 1530.4-2014 as given in AS 3600-2009 for the appropriate concrete core thickness as shown in Table 1.

**Table 1: Eco Block Fire Resistance Levels**

ECO-Block core thickness (mm)	Fire Resistance Level (FRL)
100	90/90/90
120	120/120/120
150	180/180/180
170	240/240/240

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## SIGNATORIES



**Author**

E. Soja  
Senior Fire Safety Engineer



**Reviewer**

P. Chapman  
Senior Fire Testing Engineer

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# 1. INTRODUCTION

This report gives BRANZ's assessment of the fire resistance of ECO-Block wall systems in accordance with AS 1530.4-2014 and compliance with AS 3600-2009.

The wall system comprises insulating formwork manufactured from flame retarded expanded polystyrene with plastic webs. The core is filled with concrete of minimum thickness 100 mm. The wall is essentially concrete with the polystyrene on the outer faces.

# 2. BACKGROUND

In Omega Point Laboratories (USA) Project No. 16233-108915, three non-load bearing concrete block walls, nominal concrete thickness of 100 mm, 150 mm and 200 mm, manufactured using the ECO-Block form system were tested to ASTM E119-00 with the furnace following the ISO 834-1975 time temperature curve after 90 minutes. The tests were run for up to 343 minutes.

# 3. DISCUSSION

## 3.1 Fire Test Standard

The concrete walls manufactured using the ECO-Block form system were tested in accordance with ASTM E119-00 with the furnace following the ISO 834-1975 after 90 minutes. The differences between that standard and AS 1530.4-2014 are not considered to affect the result of the tests. These test methods are similar to AS 1530.4, and ISO 834-1975 was the basis for AS 1530.4. The results of the Omega Point Laboratories tests are therefore relevant to the performance of the wall in accordance with AS 1530.4-2014.

## 3.2 Fire Resistance level

The main issue is whether the plastic webs would cause early failure of the wall when they begin to melt.

The Omega Point Laboratories tests demonstrated that the plastic web was not detrimental to the fire resistance of the wall for the corresponding fire resistance as specified in AS 3600. For example, at 90 minutes there was no failure of the 100 mm wall, with burn through at a plastic web occurring at 157 minutes. For the 150 mm wall the burn through at a plastic web occurred after 343 minutes. For the 200 mm wall no failure was recorded at 270 minutes.

These results show that when failure occurred it did so at times in excess of the fire resistance level given in AS 3600.



It is therefore considered that the plastic webs and polystyrene would not be detrimental to the fire resistance of the ECO-Block wall system for periods of at least those specified for corresponding concrete wall thicknesses as specified in AS 3600.

Table 1 below gives the appropriate fire resistance levels.

## 4. CONCLUSION

It is considered that a concrete wall manufactured using the ECO-Block form system would provide at least the fire resistance in accordance with AS 1530.4-2014 as given in AS 3600-2009 for the appropriate concrete core thickness as shown in Table 1.

**Table 1: Eco Block Fire Resistance Levels**

<b>ECO-Block core thickness (mm)</b>	<b>Fire Resistance Level (FRL)</b>
100	90/90/90
120	120/120/120
150	180/180/180
170	240/240/240

