



FIRE ASSESSMENT REPORT

FAR 3921 ISSUE 3

FIRE RESISTANCE OF A BOSS BULKHEAD BATT BLANK SEAL AND LINEAR GAP SEAL

CLIENT

Boss Products (Australia) Pty Ltd
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ASSESSMENT OBJECTIVE

To assess the fire resistance to AS 1530.4:2014 of a previously tested blank seal and linear gap seal, with variation to the length of the linear gap seal.

CONCLUSION

It is considered that, in accordance with AS 1530.4:2014, the seals tested in Warringtonfire WF Report No. 304406/B would achieve at least the following fire resistance levels:

Seal	Integrity	Insulation
50 mm thick nominal 140 kg/m ³ Boss Bulkhead Batt blank seal	60	60
100 mm thick nominal 80 kg/m ³ Boss Bulkhead Batt linear gap seal	120	120

Provided that:

- The blank seal shall be no larger in any dimension than the blank seal tested,
- The linear gap seal shall be no wider than the linear gap seal tested, but may be any length, and
- The floor shall be of concrete at least 150 mm thick, with a fire resistance level for integrity and insulation at least equivalent to the seal.

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.

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1. INTRODUCTION

This report gives BRANZ's assessment on the fire resistance, in accordance with AS 1530.4:2014, of a previously tested blank seal and linear gap seal, with extension of the gap seal to unlimited length.

The required FRL is -/60/60 for the blank seal and -/120/120 for the linear gap seal.

2. BACKGROUND

Warringtonfire Report No. 304406/B reports on a fire resistance test in accordance with BS EN 1366-3:2009 and BS EN 1366-4:2006 of a blank seal and a linear gap seal. The seals were mounted in a floor of autoclaved aerated concrete 150 mm thick.

The blank seal was described as a 50 mm thick mineral fibre "Stopseal Fire Batt" of nominal 140 kg/m³ density, and achieved a fire resistance of Integrity 79 minutes, Insulation 63 minutes.

The linear gap seal was described as a 100 mm thick mineral fibre "Flexi-Board" of nominal 80 kg/m³ density which achieved a fire resistance of Integrity 132 minutes, Insulation 132 minutes without failure. The maximum temperature recorded at 132 minutes was 171 °C.

The client has advised that the tested mineral fibre batts are identical with "Boss Bulkhead Batts" of the same nominal densities.

3. DISCUSSION

3.1 Test Standard

The referenced BS EN standards are similar in terms of furnace temperature, pressure and failure criteria for the types of specimen considered in this assessment. There is a significant difference in the method of furnace temperature measurement, whereby the BS EN standards require plate thermometers where AS 1530.4:2014 requires mineral insulated metal sheathed (MIMS) thermocouples.

Research¹ has shown that the use of plate thermometers to control furnace temperature results in negligible change in heat exposure for insulating test specimens.

AS 1530.4:2014 requires the temperature to be measured at a number of locations near the edge of the seal, both on the seal and on the surrounding construction. As tested the temperatures were not measured at all the required locations. It is noted however that the temperatures that were measured close to the edge of the seals were all substantially lower than elsewhere on the seal. It is therefore reasonable to expect that no earlier failure would have been observed had the required measurements been taken.

It is therefore considered reasonable to apply the result of the BS EN test if the same construction were tested to AS 1530.4:2014.

¹ Van de Leur, P.H.E., Twilt, L., "Thermal Exposure in Fire Resistance Furnaces", Fire Safety Science – Proceedings of the Sixth International Symposium, pp. 1087-1098.



3.2 Blank Seal

Given the above discussion regarding the test standard, it is expected that the blank seal would achieve at least 60 minutes for integrity and insulation if tested in accordance with AS 1530.4:2014. The blank seal is to be of 50 mm thick Boss Bulkhead Batts of nominal density 140 kg/m³.

3.3 Linear Gap Seal

Similarly it is expected that the gap seal as tested would achieve at least 120 minutes for integrity and insulation if tested in accordance with AS 1530.4:2014.

AS 1530.4:2014 requires a minimum length of 1000 mm for a linear gap seal. The tested length of 2000 mm meets this requirement.

AS 4072.1-2005 allows extension of length of a linear gap seal provided that:

- The length as tested complies with AS 1530.4:2014
- There is no change in cross section over the length tested
- A horizontal test is carried out where the seal is to be used in this orientation
- A suitable distance is provided between adjacent seals as tested.

These conditions are met for the seal as tested; therefore the result may be considered to apply to any length of seal.

The seal is to be of 100 mm thick Boss Bulkhead Batts of nominal density 80 kg/m³.

3.4 Floor Construction

The seals as tested were installed in a floor of autoclaved aerated concrete 150 mm thick. The test report notes that the result may be applied to floors of concrete, blockwork or masonry of thickness and density equal or greater than that tested.

AS 1530.4:2014 allows results for sealing systems in concrete construction to be applied to similar types of concrete or masonry construction subject to the opinion of a registered testing authority.

It is noted that the temperatures measured near the edges of the tested seals, both on the seal and on the floor, were substantially less than those measured elsewhere on the seals. It is therefore considered reasonable to expect that the result would apply similarly to concrete floors at least 150 mm thick and having at least the same FRL for integrity and insulation as the seals.



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4. CONCLUSION

It is considered that in accordance with AS 1530.4:2014, the seals tested in Warringtonfire WF Report No. 304406/B would achieve at least the following fire resistance levels:

Seal	Integrity	Insulation
50 mm thick nominal 140 kg/m ³ Boss Bulkhead Batt blank seal	60	60
100 mm thick nominal 80 kg/m ³ Boss Bulkhead Batt linear gap seal	120	120

Provided that:

- The blank seal shall be no larger in any dimension than the blank seal tested,
- The linear gap seal shall be no wider than the linear gap seal tested, but may be any length, and
- The floor shall be of concrete at least 150 mm thick, with a fire resistance level for integrity and insulation at least equivalent to the seal.