ASSESSMENT REPORT

The likely fire resistance performance of Everbuild “Firemate/AC95/Fireseal300/LV” when protecting linear gap seals in walls and floors if tested in accordance with AS1530.4-2005 and AS1530.4-1997.

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Report Sponsor:

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CONTENTS

1 INTRODUCTION

This report presents an assessment of the likely fire resistance performance of wall-mounted and floor-mounted linear gap sealing systems if tested in accordance with AS1530.4-2005 and AS1530.4-1997.

This assessment report includes the results with respect to the test method AS1530.4-1997 for meeting the NZ building regulations that still directly reference AS1530.4-1997.

The tested prototypes described in Section 2 of this report, when subject to the proposed variations described in Section 3, are to perform satisfactorily if tested in accordance with the referenced test method described in Section 4. The conclusions of the report are summarised in Section 5.

The validity of this assessment is conditional on compliance with Sections 7, 8 and 9 of this report.

Summary of the test data on which this assessment is based are provided in Appendix A. A summary of the critical issues leading to the assessment conclusions including the main points of argument are included in Appendix B.

2 TESTED PROTOTYPES

This assessment is based on test report WF 181967 from the Bodycote Warringtonfire, UK which describes a fire resistance test performed on various linear gap sealing systems when installed in gaps within autoclaved aerated concrete wall and floor.

Permission has been granted from Everbuild Building Products for the data to be used in the preparation of this report.

For the purpose of this report, data considered from this fire resistance test is summarised in Appendix A

3 VARIATION TO TESTED PROTOTYPES

The proposed construction shall be as tested in WF 181967 with consideration given to the likely performance in accordance with AS 1530.4-2005 and AS1530.4-1997.

4 REFERENCED TEST PROCEDURES

This report is prepared with reference to the requirements of AS1530.4-2005 & AS4072.1-2005 and AS1530.4-1997 & AS4072.1-1992 for the determination of an FRL.

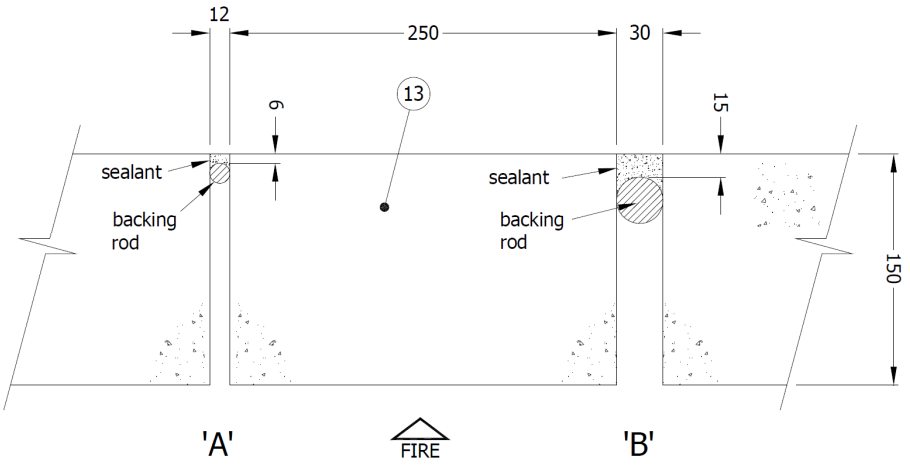
5 FORMAL ASSESSMENT SUMMARY

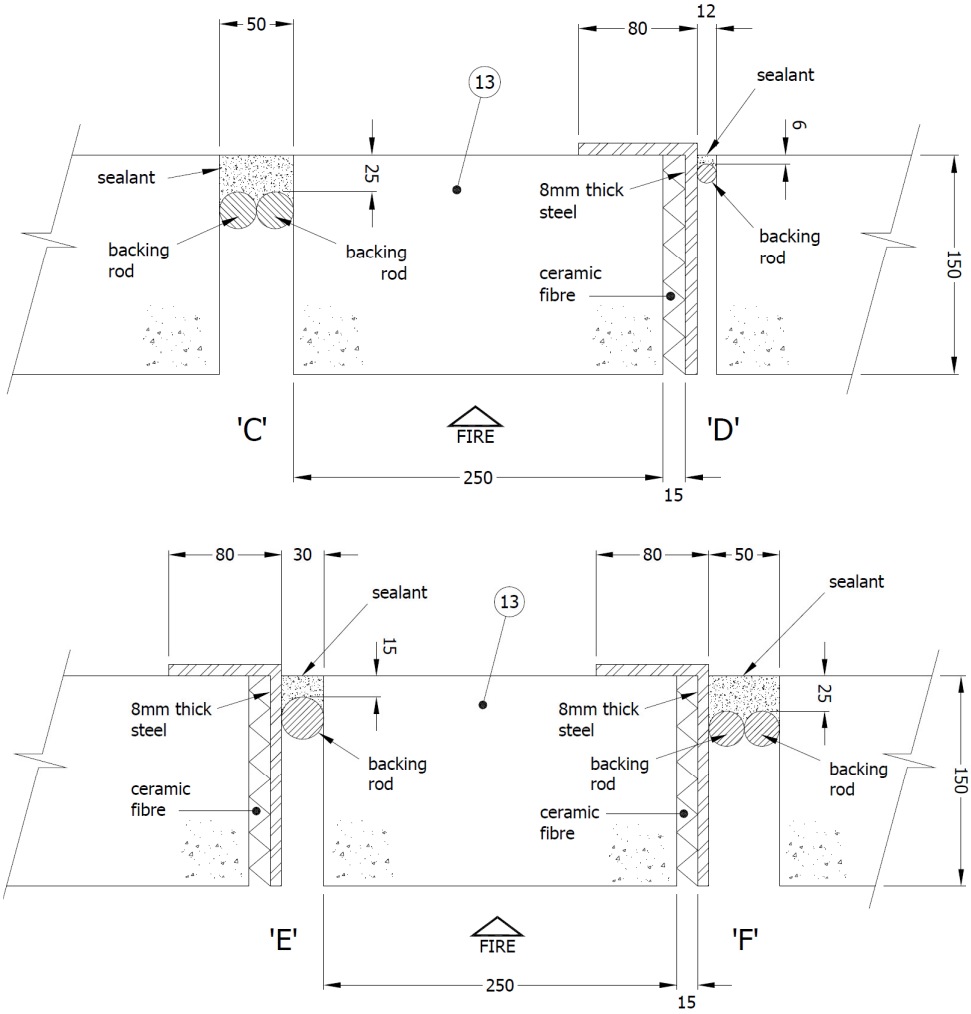
On the basis of the discussion presented in this report, it is the opinion of this testing authority that if the tested prototypes described in Section 2 had been varied as in Section 3, they would have been likely to achieve the fire resistance performances below if tested in accordance with the test method referenced in Section 4 and subject to the requirements of Section 7.

5.1 FLOORS

Table 1: Likely fire resistance performance of Everbuild Firemate/AC95/Fireseal300/LV for Autoclaved Aerated Concrete Floors of 670kg/m^3

ID	Wall Thick. (mm)	Gap Facing	Gap Width (mm)	Seal depth (mm)	Backing Material	Seal Positions	FRL AS1530. 4-2005	FRL AS1530. 4-1997
A	150	None	12	6	13mmØ PE	Unexposed face	-/240/180	-/240/180
B		None	30	15	30mmØ PE	Unexposed face	-/240/60	-/240/60
C		None	50	25	2 × 25mmØ PE	Unexposed face	-/240/60	-/240/60
D		Mild Steel Angle	12	6	13mmØ PE	Unexposed face	-/240/30	-/240/30
E		Mild Steel Angle	30	15	30mmØ PE	Unexposed face	-/240/30	-/240/30
F		Mild Steel Angle	50	25	2 × 25mmØ PE	Unexposed face	-/240/30	-/240/30

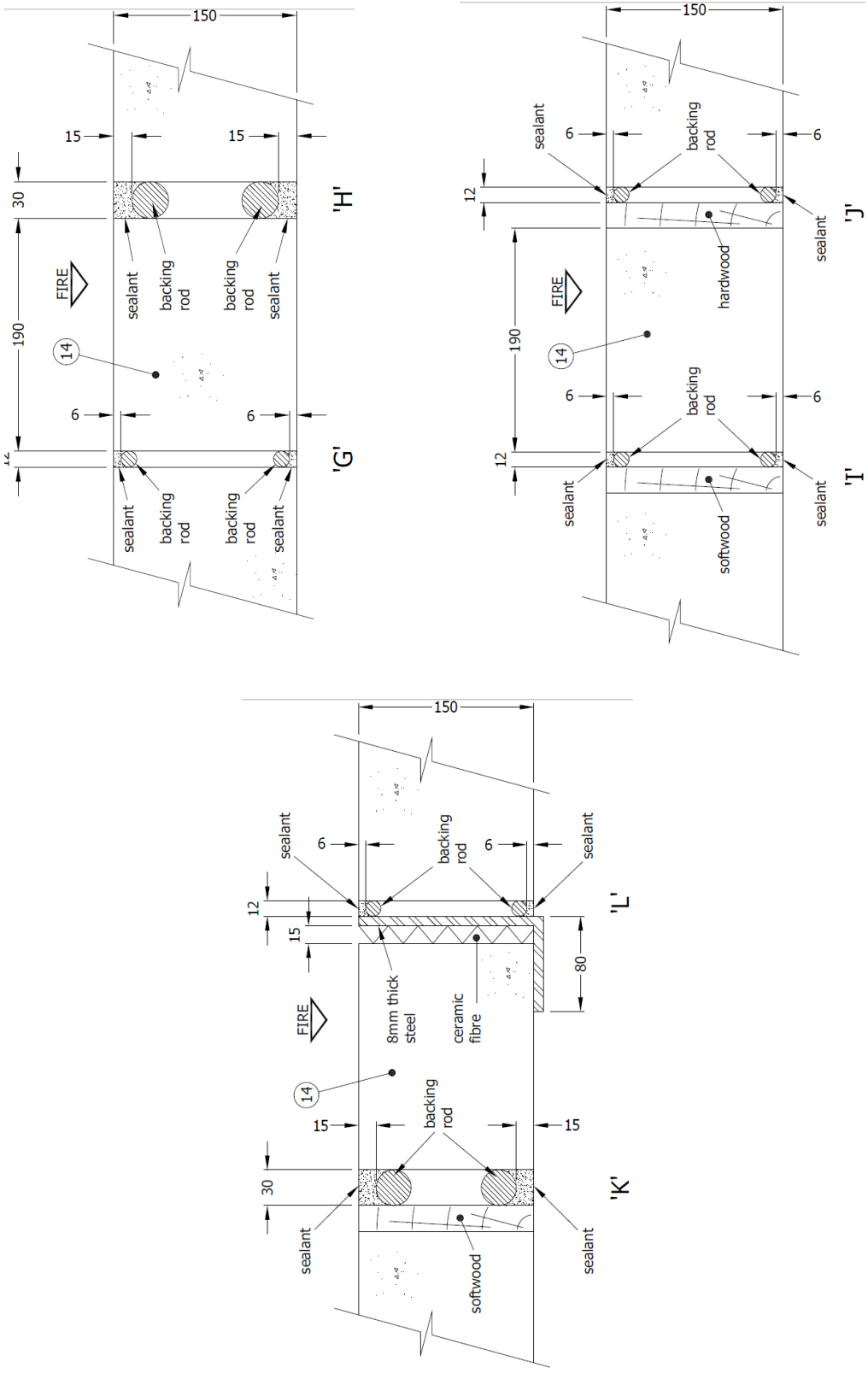




5.2 WALLS

Table 2: Likely fire resistance performance for Autoclaved Aerated Concrete Walls of 760kg/m^3

ID	Wall Thick. (mm)	Gap Facing	Gap Width (mm)	Seal depth (mm)	Backing Material	Seal Positions	FRL AS1530.4 -2005	FRL AS1530.4 -1997
G	150	None	6	12	13mmØ PE	Both faces	-/240/180	-/240/180
H		None	15	30	30mmØ PE	Both faces	-/240/240	-/240/240
I		Softwood	6	12	13mmØ PE	Both faces	-/90/60	-/90/60
J		Hardwood	6	12	13mmØ PE	Both faces	-/120/120	-/120/120
K		Softwood	15	30	30mmØ PE	Both faces	-/90/90	-/90/90
L		Mild Steel Angle	6	12	13mmØ PE	Both faces	-/240/60	-/240/60



Plan Section of Walls

6 DIRECT FIELD OF APPLICATION

The results of this assessment are applicable to walls exposed to fire from either side and floors exposed to fire from underside only.

7 REQUIREMENTS

This report details the methods of construction, test conditions and assessed results that would have been expected had the specific elements of construction described herein been tested in accordance with AS 1530.4-2005 and AS1530.4-1997.

The supporting wall and floor construction shall be capable of providing effective support of the proposed construction for the required fire resistance period (FRL).

Any further variations with respect to size, constructional details, loads, stresses, edge or end conditions, other than those identified in this report, may invalidate the conclusions drawn in this report.

8 VALIDITY

This assessment report does not provide an endorsement by Exova Warringtonfire Aus Pty Ltd of the actual products supplied.

The conclusions of this assessment may be used to directly assess the fire resistance performance under such conditions, but it should be recognised that a single test method will not provide a full assessment of the fire hazard under all fire conditions.

Because of the nature of fire resistance testing, and the consequent difficulty in quantifying the uncertainty of measurement, it is not possible to provide a stated degree of accuracy. The inherent variability in test procedures, materials and methods of construction, and installation may lead to variations in performance between elements of similar construction.

The assessment can therefore only relate only to the actual prototype test specimens, testing conditions and methodology described in the supporting data, and does not imply any performance abilities of constructions of subsequent manufacture. This assessment is based on information and experience available at the time of preparation. The published procedures for the conduct of tests and the assessment of test results are the subject of constant review and improvement and it is recommended that this report be reviewed on or, before, the stated expiry date.

The information contained in this report shall not be used for the assessment of variations other than those stated in the conclusions above. The assessment is valid provided no modifications are made to the systems detailed in this report.

All details of construction should be consistent with the requirements stated in the relevant test reports and all referenced documents.

9 AUTHORITY

9.1 APPLICANT UNDERTAKINGS AND CONDITIONS OF USE

By using this report as evidence of compliance or performance, the applicant(s) confirms that:

- to their knowledge the component or element of structure, which is the subject of this assessment, has not been subjected to a fire test to the Standard against which this assessment is being made, and
- they agree to withdraw this assessment from circulation should the component or element of structure be the subject of a fire test by a test authority in accordance with the Standard against which this assessment is being made and the results are not in agreement with this assessment, and
- they are not aware of any information that could adversely effect the conclusions of this assessment and if they subsequently become aware of any such information, agree to ask the assessing authority to withdraw the assessment.

9.2 GENERAL CONDITIONS OF USE

This report may only be reproduced in full without modifications by the report sponsor. Copies, extracts or abridgments of this report in any form shall not be published by other organisations or individuals without the permission of Exova Warringtonfire Aus Pty Ltd.

9.3 AUTHORISATION ON BEHALF OF EXOVA WARRINGTONFIRE AUS PTY LTD

Prepared by:	Reviewed by:	Reviewed by:
		
M. Kamal	K. Nicholls	S Kettle

9.4 DATE OF ISSUE

24th August 2010

9.5 EXPIRY DATE

30th April 2015

APPENDIX A - SUMMARY OF SUPPORTING DATA

A.1 TEST REPORT – WF 181967

A.1.1 Report Sponsor

A.1.1.1 Everbuild Building Products, Site 41, Knowsthorpe Way, Cross Green Industrial Estate, Leeds, LS9 0SW.

A.1.2 Test Laboratory

A.1.2.1 Bodycote Warringtonfire, Holmesfield Road, Warrington, WA1 2DS, UK.

A.1.3 Test Date

A.1.3.1 The test was conducted on 23 April 2009

A.1.4 Test standards prescribed

A.1.4.1 The test was conducted using the heating conditions and performance criteria described in BS EN 1363-1: 1999 and BS EN 1366-4: 2006.

A.1.5 Variations to Test Standard

A.1.5.1 None

A.1.6 Description of Tested Assembly

A.1.6.1 Six wall (referenced A, B, C, D, E & F) and six floor (referenced G, H, I, J, K & L) specimens of linear gap sealing systems were tested. The section of wall had overall dimensions of 1500mm high by 1500mm wide by 150mm thick and was made up of autoclaved aerated concrete blockwork arranged to provide four 12mm wide by 1000mm long, and two 30mm wide by 1000mm long, linear gaps. The section of floor had overall dimensions of 2240mm long by 1730mm wide by 150mm thick and was made up of autoclaved aerated concrete lintels arranged to provide two 12mm wide by 1000mm long, two 30mm wide by 1000mm long, and two 50mm wide by 1000mm long linear gaps.

A.1.6.2 Material specification is given below:

Sealant: Everbuild “Firemate/AC95/Fireseal300/LV” intumescent, acrylic based, cartridge gunned at unexposed face of cavity

Backing Rod Insulation: Polyethylene, friction fit.

Gap Facing (Specimen D, E, F only): 8mm thick steel fixed to masonry with 3 no. of 5.5mm diameter × 75mm long screws

Insulation Infill Material: Ceramic fibre, friction fit within void behind steel facing

Concrete Floor: Autoclaved aerated concrete lintels, 670kg/m^3, 150mm thick.

ID	Wall Thick. (mm)	Gap Facing	Gap Width (mm)	Seal depth (mm)	Sealant Reference	Backing Material	Seal Positions
A	150	None	12	6	Firemate/AC95/ Fireseal300/LV	13mmØ backing rod	Unexposed face
B		None	30	15		30mmØ backing rod	Unexposed face
C		None	50	25		2 × 25mmØ backing rod	Unexposed face
D		Mild Steel Angle	12	6		13mmØ backing rod	Unexposed face
E		Mild Steel Angle	30	15		30mmØ backing rod	Unexposed face
F		Mild Steel Angle	50	25		2 × 25mmØ backing rod	Unexposed face

Sealant: Everbuild “Firemate/AC95/Fireseal300/LV” intumescent, acrylic based, cartridge gunned at both faces of cavity

Backing Rod Insulation: Polyethylene, friction fit.

Gap Facing (Specimen I, K only): 22mm thick Softwood, fixed to masonry using 6 no. screw

Gap Facing (Specimen J only): 22mm thick Hardwood, fixed to masonry using 6 no. screw

Gap Facing (Specimen K only): 8mm thick steel fixed to masonry with 3 no. of 5.5mm diameter × 75mm long screws

Insulation Infill Material: Ceramic fibre, friction fit within void behind steel facing

Concrete Wall: Autoclaved aerated concrete blocks, 760kg/m^3, 150mm thick.

The wall specimens referred above are as follows:

ID	Wall Thick. (mm)	Gap Facing	Gap Width (mm)	Seal depth (mm)	Sealant Reference	Backing Material	Seal Positions
G	150	None	6	12	Firemate/AC95/ Fireseal300/LV	13mmØ backing rod	Both faces
H		None	15	30		30mmØ backing rod	Both faces
I		Softwood	6	12		13mmØ backing rod	Both faces
J		Hardwood	6	12		13mmØ backing rod	Both faces
K		Softwood	15	30		30mmØ backing rod	Both faces
L		Mild Steel Angle	6	12		13mmØ backing rod	Both faces

A.1.7 Test Results

The test was discontinued after 301 minutes and the specimens satisfied the integrity and insulation (maximum temperature) criteria specified in EN 1363-1: 1999 for the following period:

Specimen	Time to failure in minutes		
	Integrity		Insulation
	Cotton Pad	Sustained Flaming	
A	301*	301*	196
B	301*	301*	81
C	301*	301*	74
D	288	301*	43
E	301*	301*	41
F	290	301*	35
G	301*	301*	222
H	301*	301*	301*
I	97	108	75
J	153	153	152
K	114	114	114
L	301*	301*	80

* indicates test duration, without failure

APPENDIX B - ASSESSMENT OF SPECIFIC VARIATIONS

B.1 RELEVANCE OF TEST DATA WITH RESPECT TO AS1530.4-2005

B.1.1 General

B.1.1.1 The fire resistance test WF 181967 was conducted in accordance with EN 1366-4: 2006, which refers to the general requirements of EN1363-1: 1999. These standards differ from AS1530.4- 2005 and the significance of these differences is discussed below.

B.1.2 Discussion

Temperature Regime

B.1.2.1 The furnace temperature regime for fire resistance tests conducted in accordance with AS 1530.4-2005 follows the same trend as EN1363-1:1999.

B.1.2.2 The parameters outlining the accuracy of control of the furnace temperature in AS 1530.4-2005 and EN1363-1:1999 are not appreciably different.

Furnace Thermocouples

B.1.2.3 The furnace thermocouples specified in AS1530.4-2005 are type K, mineral insulated metal sheathed (MIMS) with a stainless steel sheath having a wire of diameter of less than 1.0mm and an overall diameter of 3mm. The measuring junction protrudes at least 25mm from the supporting heat resistant tube.

B.1.2.4 The furnace thermocouple specified in EN1363.1:1999 is made from folded steel plate that faces the furnace chamber. A thermocouple is fixed to the side of the plate facing the specimen with the thermocouple hot junction protected by a pad of insulating material.

- The plate part is to be constructed from 150 ±1 mm long by 100 ±1 mm wide by 0.7 ±0.1 mm thick nickel alloy sheet strips.
- The measuring junction is to consist of nickel chromium/nickel aluminium (Type K) wire as defined in IEC 60584-1, contained within mineral insulation in a heat-resisting steel alloy sheath of nominal diameter 1 mm, the hot junctions being electrically insulated from the sheath.
- The thermocouple hot junction is to be fixed to the geometric centre of the plate, by a small steel strip made from the same material as the plate. The steel strip can be welded to the plate or may be screwed to it to facilitate replacement of the thermocouple. The strip should be approximately 18 mm by 6 mm if it is spot-welded to the plate, and nominally 25 mm by 6 mm if it is to be screwed to the plate. The screw is to be 2 mm in diameter.
- The assembly of plate and thermocouple should be fitted with a pad of inorganic insulation material 97 ±1 mm by 97 ±1 mm by 10 ±1 mm thick with a density of 280 ±30 kg/m3.

B.1.2.5 The relative location of the furnace thermocouples for the exposed face of the specimen, for AS1530.4-2005 and EN1363.1:1999, is 100mm $\pm$10mm and 100mm $\pm$50mm respectively.

B.1.2.6 The furnace control thermocouples required by EN1363.1:1999 are less responsive than those specified by AS1530.4-2005. This variation in sensitivity can produce a potentially more onerous heating condition for specimens tested to EN1363.1:1999, particularly when the furnace temperature is changing quickly in the early stages of the test.

Specimen Thermocouples

B.1.2.7 For penetration sealing systems, thermocouples are fixed in generally similar locations on the unexposed face: on the supporting construction and/or seal and on the penetrating service adjacent at the plane of penetration.

B.1.2.8 AS1530.4-2005 specifies thermocouple locations for linear gap seals (control joints), as follows:

- At least three on the surface of the seal, with one thermocouple for each 0.3 m^2 of surface area, up to a maximum of five, uniformly distributed over the area (one thermocouple being located at the centre of the seal).
- On the surface of the seal 25 mm from the edge of the opening, with one thermocouple for each 500 mm of the perimeter.
- On the surface of the separating element 25 mm from the edge of the opening, with one thermocouple for each 500 mm of the perimeter.

If the unexposed face of the seal is recessed in the separating element, the thermocouples shall only be fitted to the seal if the joint width is greater than, or equal to, 12mm.

B.1.2.9 EN1366-4:2006 specifies that at least three specimen thermocouples be located at the centre line of the linear joint seals, and four on separating element only 15mm from the edge. Other thermocouples may be applied where the laboratory personnel consider it necessary, as evenly as possible, where the temperature reached is thought to be higher than elsewhere.

Furnace Pressure

B.1.2.10 It is a requirement of AS1530.4-2005 and for EN1363-1:1999 that for vertical elements, a furnace gauge pressure of 15$\pm$3 Pa is established at the centre of lowest penetration.

B.1.2.11 It is a requirement of AS1530.4-2005 and for EN1363-1:1999 that for horizontal elements, a furnace gauge pressure of 20Pa is established at a height 100mm below the floor soffit level.

B.1.2.12 Test report WF 181967 shows that pressure was between 18 Pa and 20 Pa at 100mm below the floor soffit level. Therefore the furnace pressure in the test satisfies the requirements of AS1530.4:2005.

B.1.2.13 The parameters outlining the accuracy of control of the furnace pressure in AS1530.4-2005 and EN1363-1:1999 are also not appreciably different.

Specimen Size

B.1.2.14 It is the requirement of AS1530.4-2005 that a control joint specimen be at least 1m long, this requirement is met by the specimen tested in WF 181967.

Performance Criteria

B.1.2.15 AS 1530.4-2005 specifies the following performance criteria for building materials and structures:

- Integrity
- Insulation

Integrity

B.1.2.16 The integrity criteria differ slightly between AS 1530.4-2005 and EN1363.1:1999.

B.1.2.17 While a specimen maintains its insulation performance, the specimen shall be deemed to have failed the integrity criterion in accordance with AS 1530.4-2005 if it collapses or sustains flaming or other conditions on the unexposed face, which ignite the cotton pad when applied for up to 30 seconds.

B.1.2.18 Specimens shall be deemed to have failed the integrity criterion in accordance with AS 1530.4-2005 when any of the following occur:

- sustained flaming for 10 seconds
- a gap forms that allows the passage of hot gases to the unexposed face and ignite the cotton pad when applied for up to 30 seconds.
- a gap forms that allows the penetration of a 25mm gap gauge anywhere on the specimen
- a gap forms that allows a 6mm x 150mm gap gauge to penetrate the specimen anywhere on the specimen.

B.1.2.19 Except for minor technical variations, the integrity criteria in EN1363.1:1999 are generally applied in a comparable manner.

Insulation

B.1.2.20 Failure in relation to insulation shall be deemed to have occurred when the temperature of any of the relevant thermocouples attached to the unexposed face of the test specimen rises by more than 180 K above the initial temperature.

B.1.2.21 The general insulation criteria of AS 1530.4-2005 and EN1363.1:1999 are not appreciably different.

B.1.3 Application of Test Data from WF 181967 to AS1530.4-2005

B.1.3.1 The variations in furnace heating regimes, furnace thermocouples and the responses of the different thermocouple types to the furnace conditions are not expected to have significant effect on the outcome of the referenced fire resistance test.

B.1.3.2 The relative locations of the specimen thermocouples are similar however; EN1366-4 requires three thermocouples located on each control joint, and four thermocouples on the seal separating element Junction. These thermocouples are 15mm from the edge whereas AS1530.4:2005 requires those to be 25mm from the edge of the seal.

B.1.3.3 Due to the closer location it will however make test results in accordance EN1366-4:2006 more onerous than those to AS1530.4-2005.

B.1.3.4 Based on the above discussion it is considered that the results relating to the integrity and insulation performance of the tested seals in WF 181967 can be safely and conservatively be used to assess the FRL in accordance with AS1530.4-2005 and AS4072.1-2005.

B.2 RELEVANCE OF TEST DATA WITH RESPECT TO AS1530.4-1997

B.2.1 General

B.2.1.1 The fire resistance tests WF 181967 was conducted in accordance with EN 1366-4: 2006 which refers to the general requirements of EN1363-1: 1999. These standards differ from AS1530.4- 1997 and the significance of these differences is discussed below.

B.2.2 Discussion

Temperature Regime

B.2.2.1 The heating regime in fire resistance tests conducted in accordance with EN1363-1:1999 follows a similar trend to that in AS 1530.4–1997. The specified heating rate in AS 1530.4–1997 is given by:

$$T_t - T_0 = 345\log_{10}(8t+1)$$

Where;

T_t = Furnace temperature at time t, in degrees Celsius.
T_o = Initial furnace temperature, in degrees Celsius, not less than 10°C nor more than 40°C.
t = Time into the test, measured from the ignition of the furnace, in minutes.

B.2.2.2 The heating regimes in EN1363-1:1999 and AS1530.4–1997 vary in that the latter is an expression of the temperature rise in the furnace above an initial ambient temperature, and the former, although similar, assumes that the initial furnace temperature (T_o) is 20°C irrespective of the actual ambient temperature. A test conducted in accordance with AS 1530.4–1997 on a warm day with an ambient temperature above 20°C could therefore be slightly more onerous than in accordance with EN1363-1:1999.

B.2.2.3 The parameters outlining the accuracy of control of the furnace temperature in AS 1530.4-2005 and EN1363-1:1999 are not appreciably different.

Furnace Thermocouples

B.2.2.4 The furnace thermocouples specified in AS1530.4-1997 are type K, mineral insulated metal sheathed (MIMS) with a stainless steel sheath having a wire of diameter of less than 1.0mm and an overall diameter of 3mm. The measuring junction protrudes at least 25mm from the supporting heat resistant tube.

B.2.2.5 The furnace thermocouple specified in EN1363.1:1999 is made from folded steel plate that faces the furnace chamber. A thermocouple is fixed to the side of the plate facing the specimen with the thermocouple hot junction protected by a pad of insulating material.

- The plate part is to be constructed from 150 ±1 mm long by 100 ±1 mm wide by 0.7 ±0.1 mm thick nickel alloy sheet strips.
- The measuring junction is to consist of nickel chromium/nickel aluminium (Type K) wire as defined in IEC 60584-1, contained within mineral insulation in a heat-resisting steel alloy sheath of nominal diameter 1 mm, the hot junctions being electrically insulated from the sheath.
- The thermocouple hot junction is to be fixed to the geometric centre of the plate, by a small steel strip made from the same material as the plate. The steel strip can be welded to the plate or may be screwed to it to facilitate replacement of the thermocouple. The strip should be approximately 18 mm by 6 mm if it is spot-welded to the plate, and nominally 25 mm by 6 mm if it is to be screwed to the plate. The screw is to be 2 mm in diameter.
- The assembly of plate and thermocouple should be fitted with a pad of inorganic insulation material 97 ±1 mm by 97 ±1 mm by 10 ±1 mm thick with a density of 280 ±30 kg/m3.

B.2.2.6 The relative location of the furnace thermocouples for the exposed face of the specimen, for AS1530.4-1997 and EN1363.1:1999, is 100mm $\pm$10mm and 100mm $\pm$50mm respectively.

B.2.2.7 The furnace control thermocouples required by EN1363.1:1999 are less responsive than those specified by AS1530.4-1997. This variation in sensitivity can produce a potentially more onerous heating condition for specimens tested to EN1363.1:1999, particularly when the furnace temperature is changing quickly in the early stages of the test.

Specimen Thermocouples

B.2.2.8 For penetration sealing systems, thermocouples are fixed in generally similar locations on the unexposed face: on the supporting construction and/or seal and on the penetrating service adjacent at the plane of penetration.

B.2.2.9 For control joints, AS4072.1-1992 specifies thermocouple locations for control joints, as follows:

- On the surface of the seal, with one thermocouple for each 2000 mm^2 of surface area, up to a maximum of five, uniformly distributed over the area (one thermocouple being located at the centre of the seal).
- On the surface of the seal 25 mm from the edge of the opening, with one thermocouple for each 500 mm of the perimeter.
- On the surface of the separating element 25 mm from the edge of the opening, with one thermocouple for each 500 mm of the perimeter.

If the unexposed face of the seal is recessed in the separating element, the thermocouples shall only be fitted to the seal if the joint width is greater than the distance of the seal from the non-fire side of the specimen.

B.2.2.10 EN1366-4: 2006 specifies that at least three specimen thermocouples be located at the centre line of the linear joint seals, and four on separating element only 15mm from the edge. Other thermocouples may be applied where the laboratory personnel consider it necessary, as evenly as possible, where the temperature reached is thought to be higher than elsewhere.

Furnace Pressure

B.2.2.11 It is a requirement of AS1530.4-1997 and for EN1363-1:1999 that for vertical elements, a furnace gauge pressure of 15$\pm$3 Pa is established at the centre of lowest penetration.

B.2.2.12 It is a requirement of AS1530.4-1997 and for EN1363-1:1999 that for horizontal elements, a furnace gauge pressure of 20Pa is established at a height 100mm below the floor soffit level.

B.2.2.13 Test report WF 181967 shows that pressure was between 18 Pa and 20 Pa at 100mm below the floor soffit level. Therefore the furnace pressure in the test satisfies the requirements of AS1530.4: 1997.

B.2.2.14 The parameters outlining the accuracy of control of the furnace pressure in AS1530.4-1997 and EN1363-1:1999 are also not appreciably different.

Performance Criteria

B.2.2.15 AS 1530.4-2005 specifies the following performance criteria for building materials and structures:

- Integrity
- Insulation

Integrity

B.2.2.16 The integrity criteria differ slightly between AS 1530.4-1997 and EN1363.1:1999

B.2.2.17 Specimens shall be deemed to have failed the integrity criterion in accordance with AS 1530.4-1997 when any of the following occur:

- Sustains flaming on the non-fire side in excess of 10 seconds,
- Development of openings through which flames and hot gases can pass

B.2.2.18 Except for minor technical variations, the integrity criteria in EN1363.1:1999 are generally applied in a comparable manner.

Insulation

B.2.2.19 The general insulation criteria of AS 1530.4-1997 and EN1363.1:1999 are not appreciably different.

B.2.3 Application of Test Data from WF 181967 to AS1530.4 -1997.

B.2.3.1 The variations in furnace heating regimes, furnace thermocouples and the responses of the different thermocouple types to the furnace conditions are not expected to have significant effect on the outcome of the referenced fire resistance test.

B.2.3.2 The relative locations of the specimen thermocouples are similar however; EN1366-4 requires three thermocouples located on each control joint, and four thermocouples on the seal separating element Junction. These thermocouples are 15mm from the edge whereas AS1530.4- 1997 requires those to be 25mm from the edge of the seal.

B.2.3.3 Due to the closer location it will however make test results in accordance EN1366-4:2006 more onerous than those to AS1530.4- 1997.

B.2.3.4 Based on the above discussion it is considered that the results relating to the integrity and insulation performance of the tested seals in WF 181967 can be safely and conservatively be used to assess the FRL in accordance with AS1530.4- 1997 and AS4072.1-1992.