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Test Report

Report No.: AJFS2306004591FR

Date: JUL.13, 2023

Page 1 of 16

RESCOM® BUILDING PRODUCTS

6A KERRYL STREET KUNDA PARK QLD 4556

Sample Name: RESCOM® (CMC)

SGS Ref No.: IN-SH-CP-5627-23175

Buyer: ResCom BP

Material and Mark: RESCOM® ISO:8336

Product specification: ISO 8336 Magnesia Cement Board [Patent No. 2016240394] [Patent No. 2980948]
[Patent No. 2553700 B]

Manufacturer: SHANDONG HENGYI SCIENCE AND TECHNOLOGY CO, LTD (PCBBP GLOBAL BUILDING MEMBER)

Thicknesses: 9mm

The above sample(s) was / were submitted and identified on behalf of the client. SGS is not responsible for the authenticity, integrity and results of the data and information and / or the validity of the conclusion arising therefrom. Test results apply to the sample as received.

Test Requested:

AS 1530.4-2014 Method for fire tests on building materials, components and structures Part 4: Fire-resistance test of elements of construction, section 3 Walls - vertical separating elements.

Test Results: -- See attached sheet

Conclusion: The tested specimen satisfied the performance requirements specified in AS 1530.4:2014 for the following period:

Integrity, (E)	Insulation, (I)
68 min	68 min

Test Period:

Sample Received Date : MAY 31, 2023

Test Performing Date : MAY 31, 2023 TO JUN.05, 2023

Signed for and on behalf of

SGS-CSTC Standards Technical Services Co., Ltd. Anji Branch

Echo

Echo Li
Approved Signatory



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1. Introduction

Determine the fire resistance of the non-load bearing vertical separating elements in accordance with section 3 of AS 1530.4-2014: Method for fire tests on building materials, components and structures part 4:

Fire-resistance test of elements of construction.

The specified side of submitted specimen was exposed to a time-temperature curve as dictated by the clause 2.11 of AS 1530.4 for a period of 70 min under non-loaded conditions.

The test was conducted on JUN.05, 2023

2. Summary

The performance of the specimen was judged against the criteria for integrity and insulation as specified in AS 1530.4:2014, and the results obtained were as follows:

Integrity, (E)	Insulation, (I)
68 min	68 min

3. Test Specimen

The specimen was received on MAY 31, 2023, and was stored in the laboratory until JUN.05, 2023. During the storage of the specimen, the temperature and humidity of the laboratory were measured and recorded as being within a range of from 20°C to 28°C and 44% to 73% respectively. The specimen was installed on JUN.05, 2023, and the test was conducted on JUN.05, 2023.

The overall dimensions of the tested system furnace were 3000mm long by 3000mm wide and the tested system overall thickness was 90mm / 3.5 in.

The tested system was asymmetric, at the request of the test sponsor, the testing was carried out from one side only and the test system was mounted within a masonry wall construction such that the specified side material side was exposed to the heating conditions.

The tested system composed of a light gage metal frame with single layer of 9mm thick ResCom® (CMC) board with shiplap joint on the exposed side.

There was one layer of 10mm thick standard grade plasterboard / drywall on the unexposed side, and the cavity insulation as minimum 70mm thick R2.5 Earthwool / 50kg Rigid Mineral Wool.

The specification of the light gage metal frame system was 70mm x 35mm x 0.55bmt with vertical studs at a maximum of 600mm o/c.

ResCom® thermal resistant ceramic gauze tape was applied to both sides of the vertical stud, prior to the fixing of the 9mm ResCom® (CMC) Board and the 10mm Standard Plasterboard / Drywall.

The shiplap joint of the 9mm ResCom® (CMC) board was caulked with a standard industry rated FR rated caulking compound and joint was not taped.



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The joints to the 10mm Standard Plasterboard / Drywall were set and taped with standard drywall caulking compound.

The tested 9mm ResCom® Hybrid Separation Wall System installed as per the structural drawings provided by the test sponsor as shown in Figure 1.

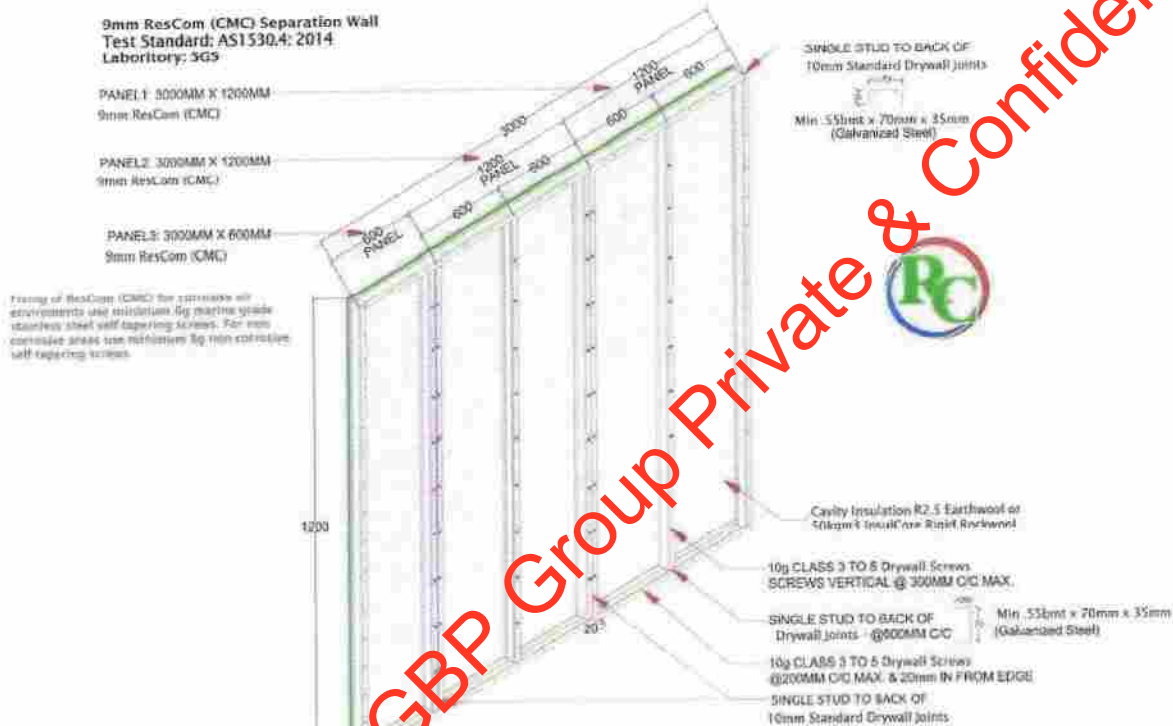


Figure 1(1) - Specimen structure

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9mm ResCom (CMC) Separation Wall System
 Tested Standard: AS1530.4:2014
 Laboratory: SGS

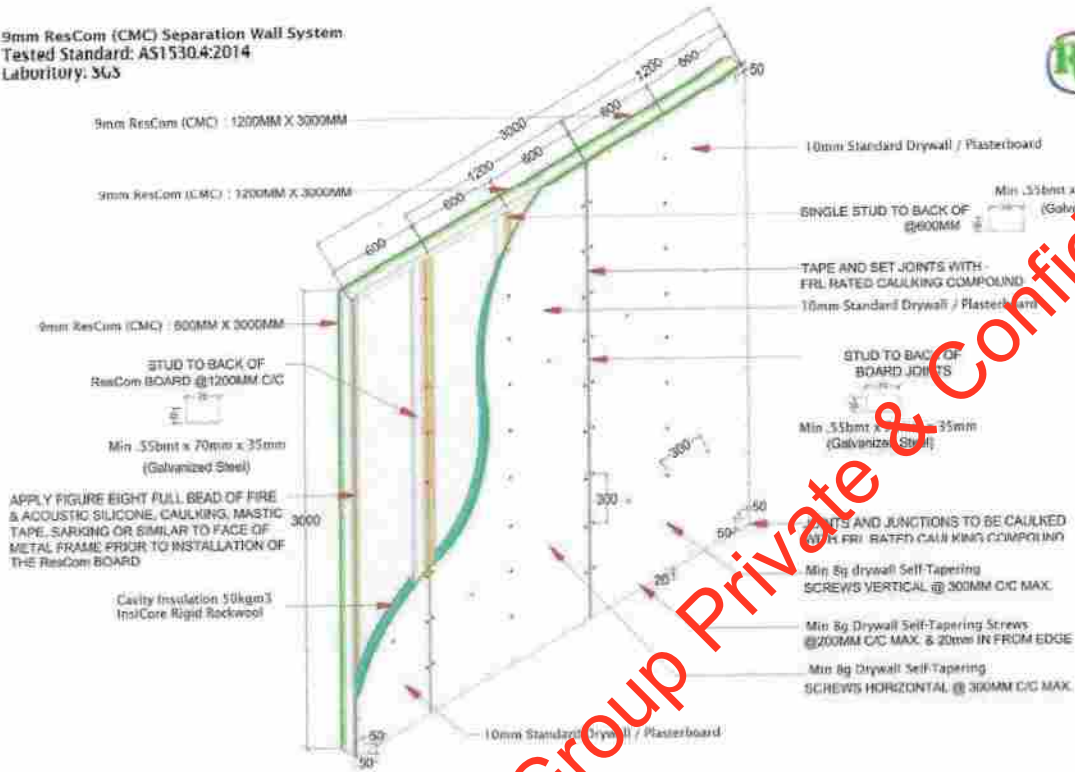


Figure 1(2) Specimen structure

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4. Test Procedure

The test was conducted in accordance with the procedure specified in AS 1530.4:2014, section 4.

The ambient temperature of test area was 27°C at commencement of test with variation of +1°C during the test.

The furnace was controlled so that the mean furnace temperature, deviation from the mean furnace temperature and uniformity of temperature distribution complied with the requirement of AS 1530.4:2014.

Sixteen furnace thermocouples were used to determine the mean furnace temperature.

The furnace pressure was controlled to comply with the requirements of AS 1530.4:2014, Clause 2.11.3. The furnace pressure shall be monitored and controlled. 5 min after the commencement of the test, the furnace pressure shall be 0 ± 5 Pa of the nominal pressure specified for the particular element under test; from 10 min onwards, it shall be 0 ± 3 Pa of the nominal pressure specified for the particular element under test at a height of approximately 500 mm above the notional floor level.

Cotton pads and gap gauges were used to determine the integrity. The sustained flaming on the unexposed surface was also checked to determine the integrity. The thermocouples specified in clause 2.2.3.1 were used to determine the insulation of specimen.

The layout of thermocouple on unexposed surface of the specimen was shown in Figure 2.

During the test, the temperatures and pressures were continuously monitored and were recorded at one-minute intervals.

5. Test Results

The following data were recorded during the test:

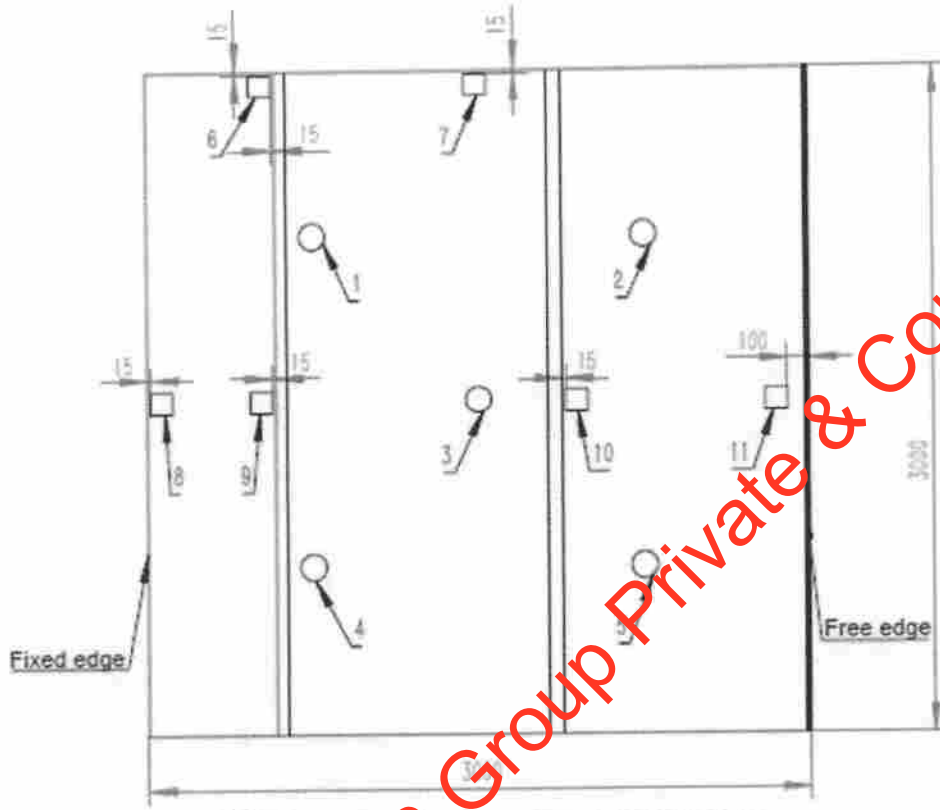
- The actual mean furnace temperature/time curve as well as the standard furnace temperature/ time curve, which were shown in Figure 3. The mean temperatures recorded within the furnace were shown in Table 1.
- The average and maximum temperature rise on unexposed face of the specimen was shown in Figure 4. The individual thermocouple temperature record on the unexposed surface of the specimen was shown in Table 2.
- The furnace pressures relative to laboratory atmosphere at the 500 mm above the bottom of specimen was shown in Figure 5.
- A summary of the observations made on the general behavior of the specimen was given in Table 3.



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○ Thermocouples for average temperature
 □ Thermocouples for maximum temperature
 No.1, 2, 4, 5 in the center of each quarter for specimen, No.3 in the center of the specimen.

Figure 2 - The layout of thermocouple on unexposed face of the specimen (Unit: mm)

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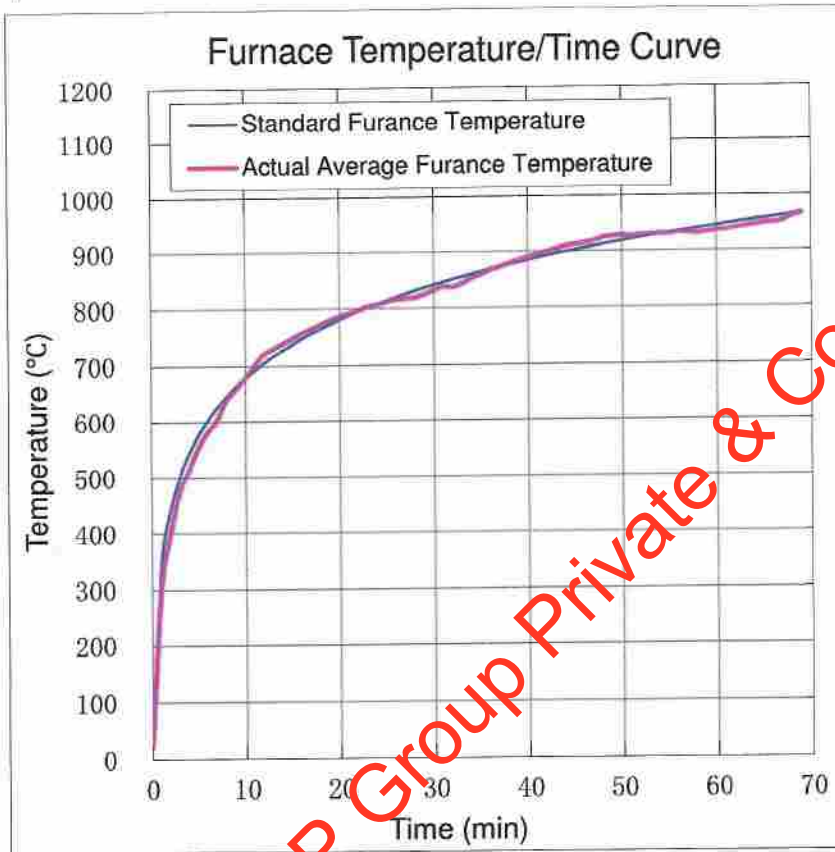


Figure 3 - Standard and actual mean furnace temperature / time curve

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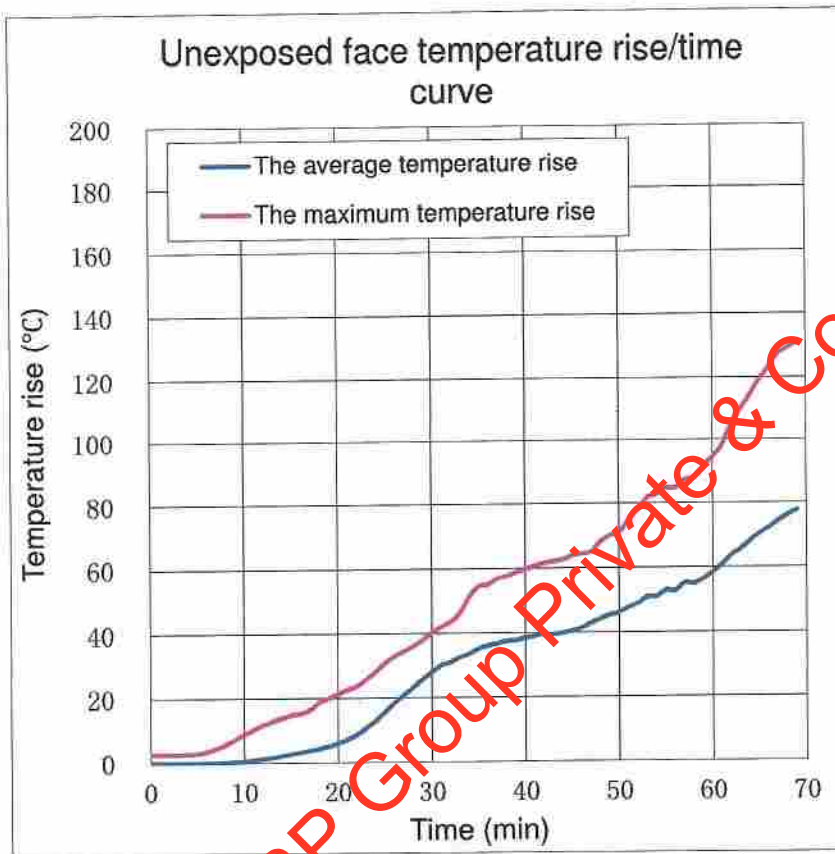


Figure 4 – the average and maximum temperature rise / time curve

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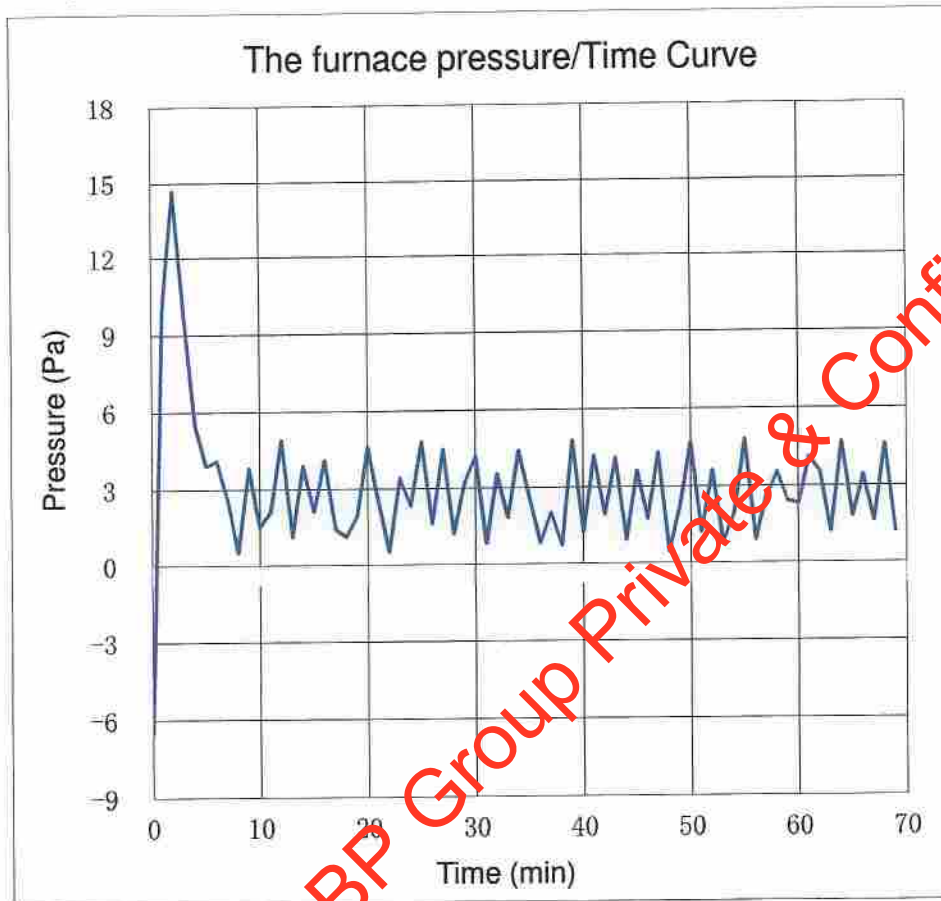


Figure 5 - Furnace pressure / time curve

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Table 1 Average temperatures recorded within the furnace

Time (min)	AS1530.4 Std Average (°C)	Furnace Average (°C)	Error (%)	Time (min)	AS1530.4 Std Average (°C)	Furnace Average (°C)	Error (%)
0	20.0	29.6		35	864.8	859.4	-0.9%
1	349.2	305.3	-9.3%	36	869.0	867.4	-0.9%
2	444.5	400.3	-10.5%	37	873.1	872.2	-0.9%
3	502.3	475.2	-9.2%	38	877.1	878.4	-0.9%
4	543.9	513.2	-8.0%	39	881.0	883.5	-0.8%
5	576.4	552.7	-7.2%	40	884.7	889.0	-0.8%
6	603.1	580.7	-6.5%	41	888.4	895.9	-0.8%
7	625.8	602.5	-5.9%	42	892.0	899.1	-0.7%
8	645.5	638.2	-5.4%	43	895.5	903.3	-0.7%
9	662.8	657.1	-4.8%	44	899.0	908.5	-0.6%
10	678.4	678.1	-4.2%	45	902.3	911.4	-0.6%
11	692.5	700.6	-3.7%	46	905.6	914.2	-0.5%
12	705.4	720.9	-3.1%	47	908.8	917.5	-0.5%
13	717.3	729.7	-2.6%	48	912.0	923.3	-0.5%
14	728.3	739.1	-2.2%	49	915.1	925.6	-0.4%
15	738.6	747.7	-1.9%	50	918.1	926.9	-0.4%
16	748.2	757.0	-1.7%	51	921.0	925.3	-0.4%
17	757.2	764.7	-1.5%	52	923.9	928.1	-0.3%
18	765.7	772.5	-1.3%	53	926.8	929.1	-0.3%
19	773.7	779.1	-1.2%	54	929.6	929.8	-0.3%
20	781.4	785.5	-1.1%	55	932.3	930.0	-0.3%
21	788.6	790.2	-1.0%	56	935.0	932.7	-0.3%
22	795.6	795.5	-0.9%	57	937.7	931.5	-0.3%
23	802.2	802.8	-0.9%	58	940.3	930.5	-0.3%
24	808.5	806.3	-0.8%	59	942.8	932.6	-0.3%
25	814.6	811.3	-0.8%	60	945.3	935.4	-0.4%
26	820.5	816.3	-0.8%	61	947.8	937.1	-0.4%
27	827.1	817.0	-0.8%	62	950.2	939.6	-0.4%
28	831.5	819.1	-0.8%	63	952.6	942.7	-0.4%
29	836.7	824.1	-0.9%	64	955.0	945.6	-0.4%
30	841.8	831.8	-0.9%	65	957.3	948.6	-0.4%
31	846.7	838.1	-0.9%	66	959.6	949.3	-0.4%
32	851.4	836.8	-0.9%	67	961.8	952.2	-0.4%
33	856.0	842.8	-0.9%	68	964.1	960.5	-0.4%
34	860.5	852.4	-0.9%	69	966.2	965.8	-0.4%

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Table 2 The individual thermocouple temperature record on the unexposed surface of the specimen

Time (min)	Thermocouple temperature (°C)										
	1#	2#	3#	4#	5#	6#	7#	8#	9#	10#	11#
0	23.6	22.4	22.7	22.0	21.1	23.8	25.1	23.3	23.4	25.2	22.3
1	23.6	22.4	22.7	22.0	21.1	23.8	25.1	23.3	23.5	25.1	22.3
2	23.5	22.3	22.7	21.9	21.1	23.8	25.0	23.2	23.5	25.1	22.3
3	23.5	22.3	22.7	21.9	21.2	23.9	25.0	23.2	23.4	25.1	22.3
4	23.5	22.3	22.7	21.9	21.2	24.0	25.2	23.2	23.4	25.0	22.3
5	23.5	22.2	22.7	21.9	21.3	24.0	25.4	23.2	23.4	25.1	22.4
6	23.5	22.3	22.8	22.0	21.2	24.1	26.0	23.2	23.4	25.1	22.6
7	23.5	22.2	22.9	22.1	21.3	24.1	27.0	23.3	23.5	25.1	22.7
8	23.7	22.3	23.0	22.1	21.4	24.1	28.2	23.3	23.5	25.2	22.9
9	23.7	22.4	23.3	22.3	21.6	24.2	29.7	23.5	23.7	25.4	23.1
10	23.8	22.5	23.7	22.5	21.9	24.2	31.3	23.8	24.0	25.8	23.3
11	24.1	22.8	24.1	22.9	22.3	24.4	32.7	24.2	24.2	26.2	23.6
12	24.4	23.1	24.6	23.3	22.7	24.6	34.2	24.7	24.6	26.7	24.1
13	24.7	23.5	25.2	23.8	22.9	24.8	35.3	25.2	25.1	27.3	24.5
14	25.2	24.1	25.8	24.4	23.3	25.0	36.3	25.8	25.6	28.0	25.0
15	25.7	24.7	26.4	24.9	23.8	25.4	37.2	26.4	26.3	28.7	25.7
16	26.3	25.2	27.2	25.4	24.4	25.8	37.7	27.1	26.8	29.2	26.6
17	26.9	25.9	27.7	25.9	25.0	26.3	38.8	27.7	27.4	29.9	27.4
18	27.4	26.4	28.2	26.4	25.7	27.0	41.1	28.2	28.1	30.5	28.1
19	28.0	27.0	29.1	26.9	26.5	27.6	42.4	28.9	29.1	31.3	28.8
20	28.6	27.9	30.2	27.5	28.0	28.1	43.7	29.6	30.8	32.3	29.6
21	29.4	28.9	31.1	28.3	29.2	28.9	45.0	30.8	32.2	33.8	30.7
22	30.4	30.3	31.9	29.2	30.5	29.3	46.1	32.4	34.5	35.8	33.7
23	31.7	32.3	38.6	30.4	32.8	30.1	48.2	34.4	36.1	36.5	34.3
24	33.3	34.7	42.4	31.8	35.1	31.6	50.7	36.8	37.8	36.8	35.1
25	35.2	37.4	46.0	33.5	38.3	33.3	53.3	39.6	39.5	37.0	36.4
26	37.5	40.1	49.4	35.5	41.6	34.8	55.4	42.3	42.1	37.1	37.9
27	39.9	42.4	52.4	37.2	44.8	35.1	56.9	44.9	46.6	37.3	38.3
28	42.0	44.4	54.7	39.5	47.3	37.3	58.6	47.6	50.3	37.6	40.5
29	45.0	46.3	57.1	42.2	50.0	38.1	60.4	50.1	53.6	37.9	41.9
30	47.7	48.1	59.3	44.5	52.6	39.3	62.7	52.3	57.0	38.2	43.5
31	50.6	50.1	60.9	46.8	53.9	40.4	64.5	53.8	60.4	38.8	45.6
32	50.6	52.7	62.1	47.0	54.7	42.0	66.1	54.4	65.9	39.0	47.3
33	52.5	54.6	62.5	48.9	56.0	43.1	68.6	55.0	68.0	39.9	48.6
34	54.4	55.5	62.4	49.9	57.8	43.9	70.5	55.0	73.6	40.9	49.4

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Time (min)	Thermocouple temperature (°C)										
	1#	2#	3#	4#	5#	6#	7#	8#	9#	10#	11#
35	57.4	56.1	62.1	53.9	58.7	44.2	72.7	54.9	76.7	41.7	50.2
36	59.0	57.1	61.7	55.9	59.5	44.7	74.8	54.6	77.3	42.3	51.6
37	59.9	56.4	60.8	57.3	61.6	45.6	75.4	54.2	79.1	42.7	52.3
38	61.5	56.3	60.2	59.0	62.8	46.5	76.1	53.8	80.0	43.0	53.4
39	61.0	56.1	59.2	59.7	64.7	46.9	76.9	53.3	81.1	44.4	54.6
40	60.8	55.4	58.3	63.2	66.6	48.3	77.5	52.6	82.1	44.7	55.8
41	60.1	55.2	57.4	66.0	68.4	49.4	78.2	51.8	83.0	45.6	56.3
42	58.7	54.3	56.8	69.9	70.1	50.0	79.3	51.1	83.8	47.3	58.1
43	58.1	53.5	55.2	70.6	71.8	50.7	80.0	50.5	84.3	48.7	60.3
44	58.1	52.6	54.4	73.7	73.0	51.0	80.9	50.0	84.8	49.3	62.2
45	59.2	51.5	52.3	77.7	74.1	51.8	81.5	49.6	86.0	50.4	63.7
46	60.4	50.3	51.4	82.3	75.1	52.4	82.2	50.0	86.6	52.8	64.8
47	62.4	49.1	51.4	87.2	77.1	53.0	82.9	50.6	87.2	53.7	65.3
48	64.7	48.2	50.9	90.3	79.1	54.6	83.3	51.6	87.7	54.7	66.2
49	67.0	47.7	50.5	92.2	81.3	54.9	84.4	53.0	88.6	56.4	67.9
50	69.5	46.7	50.7	93.3	82.2	55.2	85.0	54.8	89.0	58.5	68.3
51	73.0	46.1	51.0	97.2	82.9	56.1	86.6	56.8	89.6	62.4	69.6
52	75.8	45.5	51.4	100.5	83.4	57.2	88.8	58.1	90.0	64.7	72.4
53	81.9	45.3	51.3	104.1	83.7	58.7	90.3	60.3	91.7	65.7	74.8
54	82.3	44.9	51.0	105.2	83.8	59.7	90.4	62.3	92.6	67.0	76.1
55	90.2	44.5	50.1	107.1	84.2	61.0	91.6	64.8	93.1	67.7	77.3
56	90.0	44.3	49.5	107.2	84.6	61.9	92.3	66.1	94.0	70.8	78.0
57	98.2	44.2	50.4	109.8	84.9	62.2	94.9	68.3	95.2	72.6	78.6
58	96.6	44.4	49.2	110.5	85.3	62.9	95.9	70.0	96.3	73.1	79.4
59	99.8	45.1	49.9	113.8	85.3	63.2	96.5	71.6	97.4	74.0	80.6
60	104.4	47.2	50.1	116.7	85.7	64.6	97.6	73.6	98.2	75.2	82.2
61	108.0	50.4	50.3	120.7	86.2	65.3	98.1	76.7	100.5	76.3	84.1
62	111.5	52.6	51.0	127.4	86.7	68.8	98.2	80.5	102.3	77.4	85.9
63	114.3	53.0	53.0	132.1	87.1	71.6	99.5	72.4	104.7	78.2	87.4
64	116.7	57.9	53.1	136.8	87.4	77.7	103.0	77.0	107.4	80.5	89.3
65	119.6	62.0	53.0	141.4	87.6	78.1	104.6	80.1	110.3	82.3	92.4
66	122.8	64.2	52.6	145.4	88.1	86.0	106.2	82.6	111.4	84.7	95.6
67	125.7	66.9	52.9	149.7	88.9	85.8	108.2	90.6	112.8	87.4	98.2
68	128.9	69.3	53.2	151.5	89.8	94.0	111.0	97.7	115.0	90.3	104.7
69	134.5	66.4	55.6	153.2	90.4	92.4	114.2	97.0	116.3	91.4	110.2

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Table 3 Observations Made during the Test

Time (min:sec)	Observations
00:00	Test was started.
20:00	The center of the specimen concaved towards the furnace slightly.
25:00	A small amount of smoke was released.
40:00	No notable changes.
60:00	The tape applied on the right joint curled and some smoke was issued from it.
69:00	The specimen was burned through, the failure of integrity was deemed to occur.
70:00	The test was discontinued.

6. Performance Criteria (AS 1530.4:2014, Clause 2.13.2 and 2.13.3)

6.1 Integrity

Failure in relation to integrity shall be deemed to have occurred when evaluated as follows:

6.1.1 Cotton pad

The cotton pad in its frame shall be applied against the surface of the test specimen over the crack, fissure or flaming under examination, until ignition of the cotton pad (defined as glowing or flaming) or for a maximum of 30s.

6.1.2 Gap gauges

Gap gauges are used to evaluate the size of any opening in the surface of the test specimen at time intervals that will be determined by the apparent rate of the specimen deterioration.

- a) a 6mm gap gauge can be passed through the specimen so that the gap gauge projects into the furnace and the gauge can be moved a distance of 150 mm along the gap; or
- b) a 25mm gap gauge can be passed through the specimen so that the gap gauge projects into the furnace.

6.1.3 Flaming

Sustained flaming on the surface of the unexposed surface for 10s or longer constitutes integrity failure.

6.2 Insulation

Failure in relation to insulation shall be deemed to have occurred when measured by thermocouples on the unexposed surface, the specimen is deemed to have failed when:

- a) the mean temperature of the unexposed face of the test specimen exceeds the initial temperature by more than 140 K; or
- b) the temperature at any location on the unexposed face of the test specimen exceeds the initial temperature by more than 180 K.
- c) When integrity failure occurs.



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7. Conclusion

During the heating period of 70 min, the specimen was burned through and the 25mm gap gauge can be passed through the specimen at the 69th minute. At the end of 69 min, the average temperature rise on unexposed face of the specimen was 77.6K and the maximum temperature rise was 130.8K.

The fire resistance of the specimen was judged against the criteria for integrity and insulation as specified in clause 6 of this report, and the specimen satisfied the performance requirements for the following period:

Integrity, (E)	Insulation, (I)
68 min	68 min

The test was terminated after a period of 70 min.

8. STATEMENT

THE RESULTS OF THESE FIRE TESTS MAY BE USED TO DIRECTLY ASSESS FIRE HAZARD, BUT IT SHOULD BE RECOGNIZED THAT A SINGLE TEST METHOD WILL NOT PROVIDE A FULL ASSESSMENT OF FIRE HAZARD UNDER ALL FIRE CONDITIONS.

THIS REPORT DETAILS METHODS OF CONSTRUCTION, THE TEST CONDITIONS AND THE RESULTS OBTAINED WHEN THE SPECIFIC ELEMENT OF CONSTRUCTION DESCRIBED HEREIN WAS TESTED FOLLOWING THE PROCEDURE OUTLINED IN AS 1530.4. ANY SIGNIFICANT VARIATION WITH RESPECT TO SIZE, CONSTRUCTION DETAILS, LOADS, STRESSES, EDGE OR END CONDITIONS, OTHER THAN THAT ALLOWED UNDER THE FIELD OF DIRECT APPLICATION IN THE RELEVANT TEST METHOD, IS NOT COVERED BY THIS REPORT.

BECAUSE OF THE NATURE OF FIRE RESISTANCE TESTING AND THE CONSEQUENT DIFFICULTY IN QUANTIFYING THE UNCERTAINTY OF MEASUREMENT OF FIRE RESISTANCE, IT IS NOT POSSIBLE TO PROVIDE A STATED DEGREE OF ACCURACY OF THE RESULT.

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Appendix - Photographs

