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检测
TESTING
CNAS L4743

Test Report

Report No.: AJFS2305003984RS

Date: JUN.13, 2023

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CLEAR FORM WALL SYSTEMS PTY LTD

26A HARPSTREET, CAMPSIE, NSW 2194

Sample Name: CLEAR FORM PVC WALL

Color: WHITE

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)	Loadbearing, (R)
≥ 240 min	≥ 240 min	≥ 240 min

Test Period:

Sample Receiving Date : MAY 19, 2023

Test Performing Date : MAY 19, 2023 TO MAY 30, 2023

Signed for and on behalf of

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

Echo

Echo Li

Approved Signatory



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

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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 240 min under loaded conditions.

The test was conducted on MAY 30, 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)	Loadbearing, (R)
≥ 240 min	≥ 240 min	≥ 240 min

3. Test Specimen

The specimen was received on MAY 19, 2023, and was stored in the laboratory until MAY 24, 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 29°C and 36% to 74% respectively. The specimen was installed on MAY 24, 2023 and the test was conducted on MAY 30, 2023

The specimen had overall dimensions of 3000mm wide by 3000 mm high by 200mm thick, and the structural drawing provided by test sponsor was shown in Figure 1.



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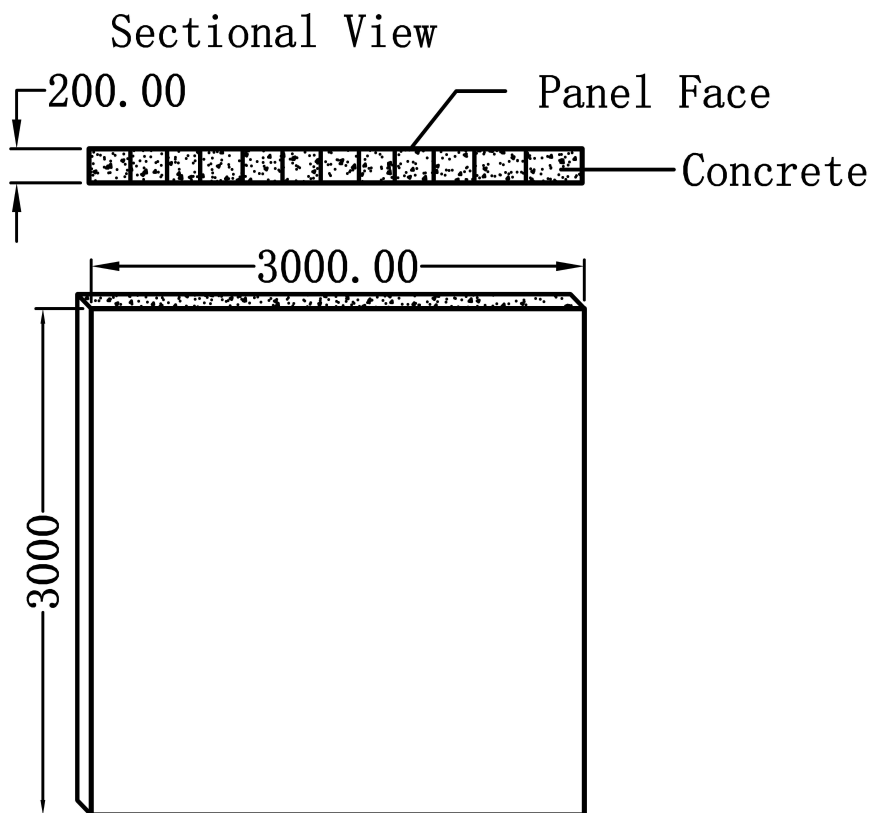


Figure 1 - Specimen structure (unit: mm)

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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 26°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.

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

According to the client's requirement, the load of 80000 kg was uniformly applied hydraulically to the bottom edge of the sample. Loading needs to be completed at least 15 minutes before the start of the test to achieve a stable state.

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

5. Test Results

The following data were recorded during the test:

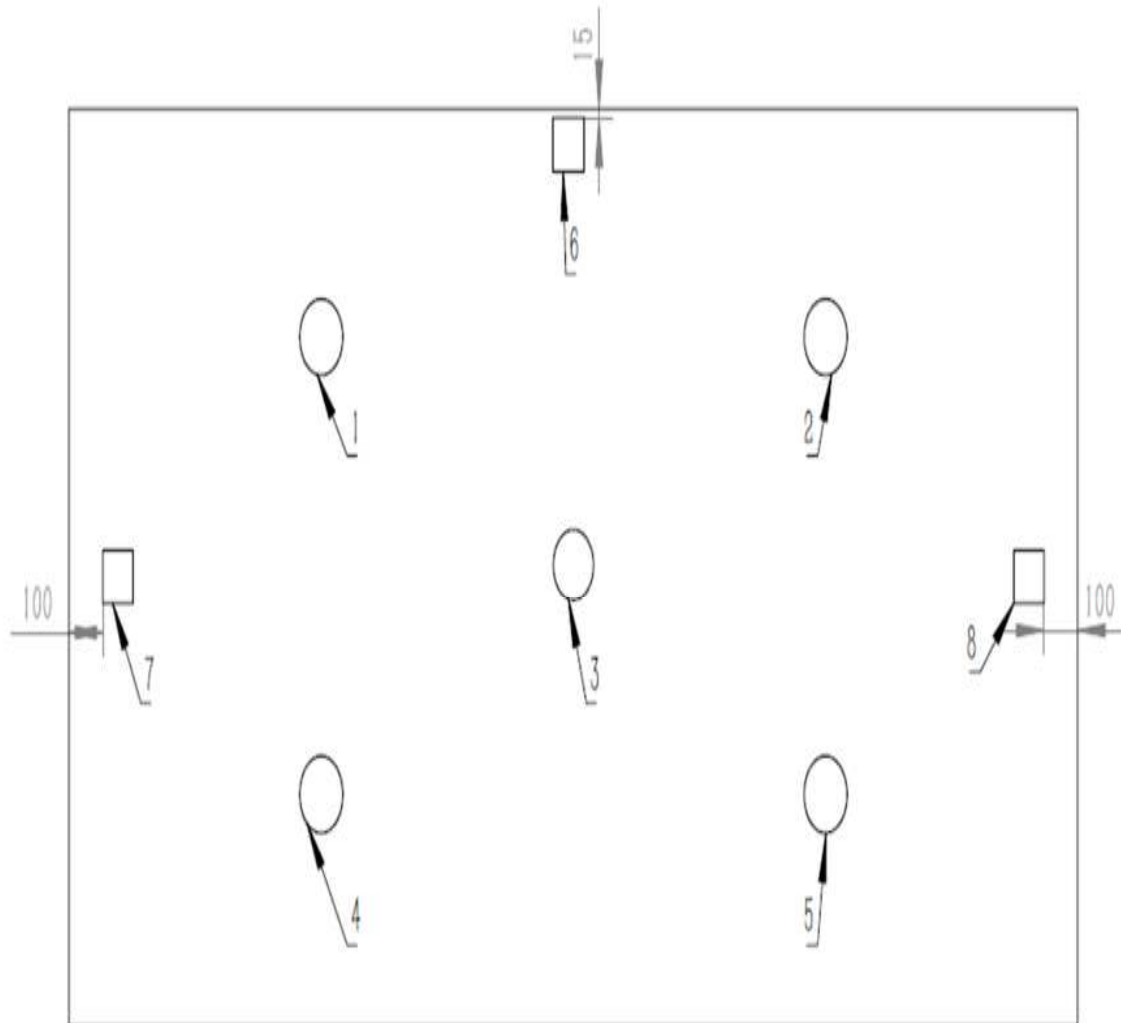
- The actual mean furnace temperature/time curve as well as the standard furnace temperature/ time curve, which were shown in Figure 3. The mean temperatures recorded within the furnace were shown in Table 1.
- The mean and maximum temperature rise of the unexposed face of the specimen was shown in Figure 4. The individual thermocouple temperature record on the unexposed surface of the specimen was shown in Table 2.
- The axial contraction deflection of the specimen was shown in Figure 5.
- The furnace pressures relative to laboratory atmosphere at the 500 mm above the bottom of specimen was shown in Figure 6.
- 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)

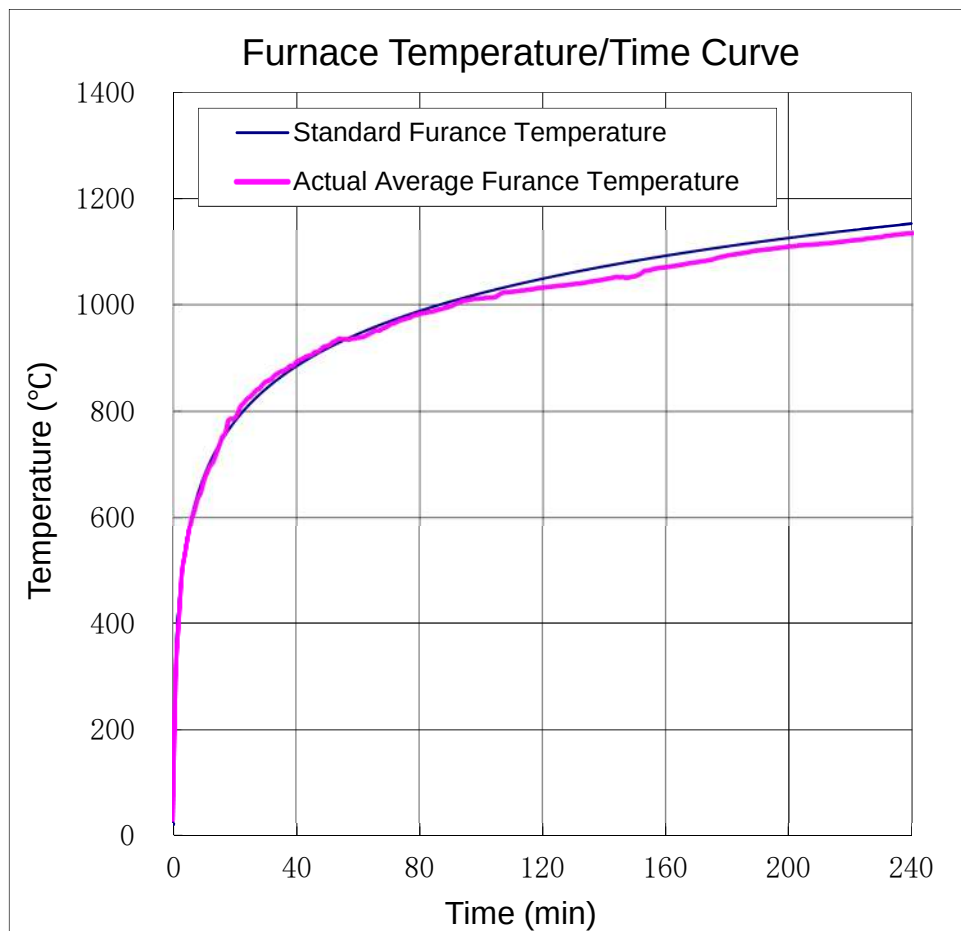


Figure 3 - Standard and actual mean furnace temperature / time curve



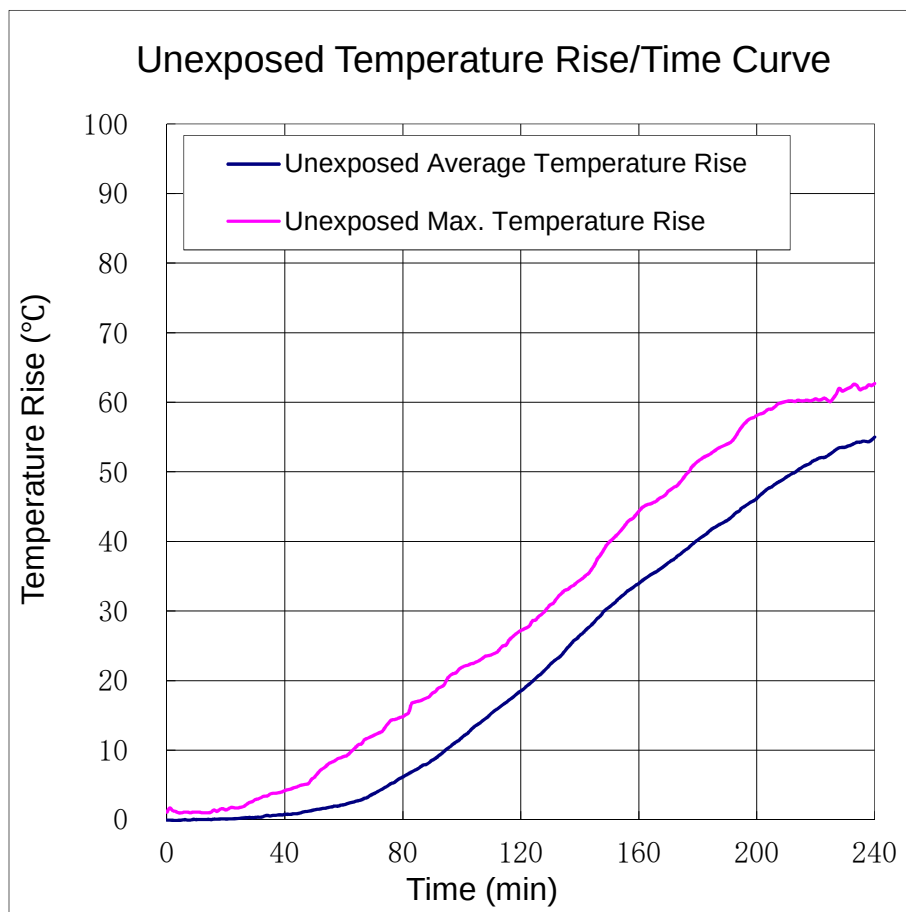


Figure 4 – the mean and maximum temperature rise / time curve

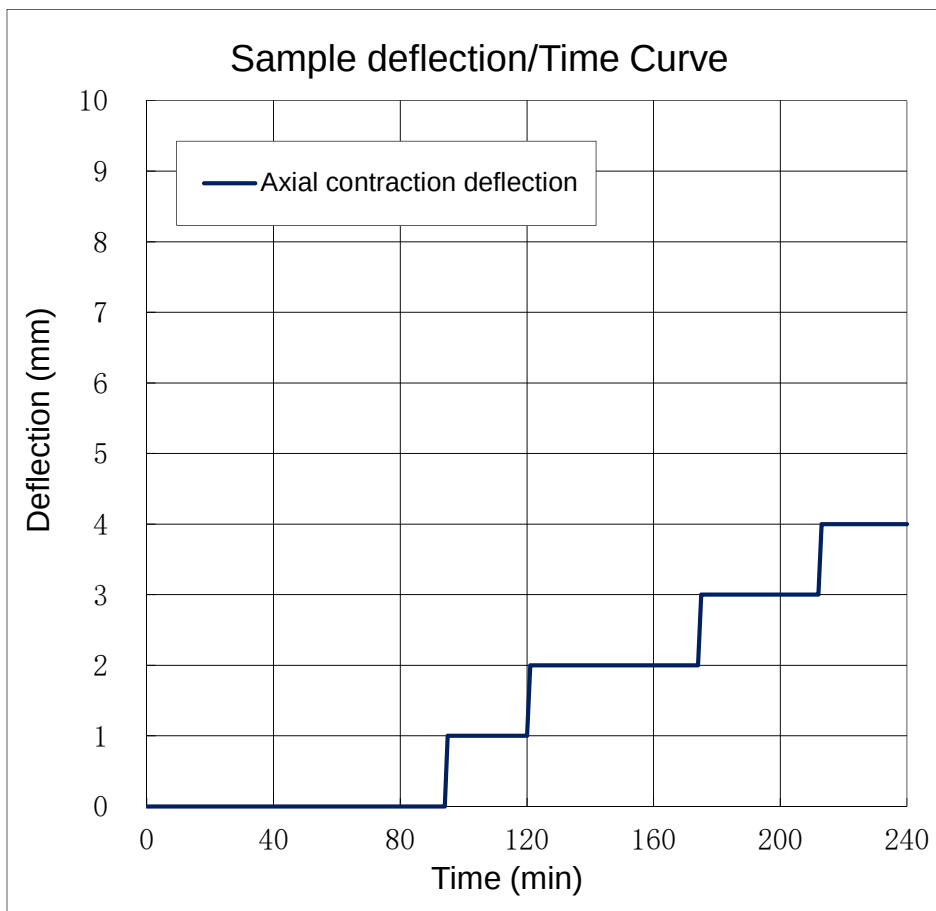


Figure 5 – The axial contraction deflection of the specimen

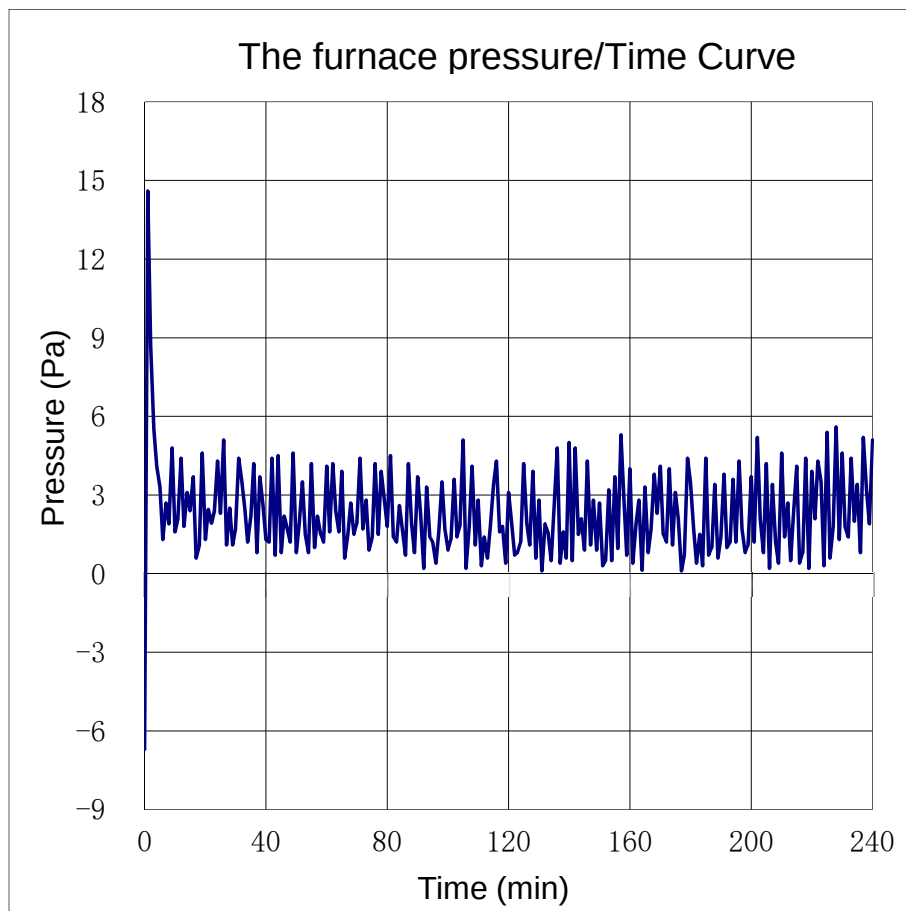


Figure 6 - Furnace pressure / time curve

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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	30.1		125	1055.1	1035.0	-0.6%
5	576.4	563.4	-5.3%	130	1061.0	1038.1	-0.6%
10	678.4	668.6	-3.2%	135	1066.7	1042.6	-0.7%
15	738.6	734.5	-2.5%	140	1072.1	1047.1	-0.8%
20	781.4	786.1	-1.5%	145	1077.4	1050.8	-0.8%
25	814.6	826.3	-0.8%	150	1082.4	1052.9	-0.9%
30	841.8	854.7	-0.3%	155	1087.4	1064.5	-0.9%
35	864.8	874.0	-0.1%	160	1092.1	1070.0	-1.0%
40	884.7	891.9	0.0%	165	1096.7	1074.3	-1.0%
45	902.3	905.0	0.1%	170	1101.2	1079.3	-1.1%
50	918.1	921.8	0.2%	175	1105.5	1084.2	-1.1%
55	932.3	934.7	0.2%	180	1109.7	1092.0	-1.1%
60	945.3	937.7	0.1%	185	1113.8	1096.5	-1.1%
65	957.3	948.6	0.0%	190	1117.8	1101.4	-1.1%
70	968.4	960.2	-0.1%	195	1121.7	1104.9	-1.1%
75	978.7	972.0	-0.1%	200	1129.2	1108.6	-1.2%
80	988.4	982.3	-0.1%	205	1129.2	1111.5	-1.2%
85	997.4	988.1	-0.2%	210	1132.8	1113.6	-1.2%
90	1006.0	996.2	-0.2%	215	1136.3	1116.2	-1.2%
95	1014.1	1007.2	-0.3%	220	1139.8	1119.7	-1.2%
100	1021.8	1011.3	-0.3%	225	1143.2	1123.5	-1.2%
105	1029.1	1015.0	-0.4%	230	1146.4	1126.5	-1.2%
110	1036.0	1023.7	-0.4%	235	1149.7	1131.0	-1.2%
115	1042.7	1027.5	-0.4%	240	1152.8	1133.6	-1.3%
120	1049.0	1031.4	-0.5%	/	/	/	/



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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#
0	25.8	26.5	26.2	25.4	25.9	25.3	26.3	27.1
5	25.8	26.5	26.1	25.4	25.9	25.8	26.4	27.0
10	25.8	26.6	26.2	25.6	25.9	26.8	26.7	27.1
15	25.8	26.6	26.3	25.5	25.9	27.1	26.6	27.0
20	25.9	26.6	26.5	25.6	25.9	27.4	26.8	27.1
25	26.1	26.8	26.5	25.7	26.0	27.8	27.2	27.1
30	26.3	26.9	26.7	25.8	26.0	28.9	27.3	27.2
35	26.4	27.0	26.9	25.9	26.1	29.7	26.5	27.1
40	26.5	27.2	27.3	26.1	26.3	30.2	27.7	27.2
45	26.8	27.4	27.3	26.3	26.5	30.9	28.1	27.3
50	27.2	27.7	27.6	27.1	26.8	32.1	28.5	27.4
55	27.5	27.9	28.1	27.7	27.4	34.1	29.0	27.8
60	27.9	28.3	28.2	28.2	28.2	35.1	29.8	28.1
65	28.4	28.7	28.7	29.2	28.9	36.8	30.7	28.7
70	28.9	29.2	29.3	30.9	30.3	38.1	31.9	29.7
75	29.7	29.8	30.3	32.8	32.0	39.8	33.1	30.1
80	30.3	30.3	31.5	34.7	34.0	40.8	34.6	31.4
85	30.8	30.9	32.4	36.7	35.7	43.0	36.4	32.2
90	32.8	31.5	32.9	38.1	37.6	44.2	38.1	33.3
95	34.3	33.3	33.3	40.5	39.6	46.2	40.4	34.9
100	36.2	34.9	34.4	42.2	41.4	47.9	42.2	36.8
105	38.2	36.6	36.2	43.6	43.4	48.7	44.3	38.5
110	40.3	38.5	37.2	44.9	45.5	49.7	46.8	42.9
115	42.6	40.2	37.9	46.0	47.5	51.1	49.1	44.6
120	44.9	41.9	38.5	47.6	49.6	53.2	51.6	46.0
125	47.0	43.6	40.2	48.9	51.8	54.7	53.9	48.3
130	49.1	45.4	42.0	50.4	54.8	56.9	56.3	49.6
135	51.2	47.1	43.7	51.6	57.8	59.0	58.5	50.8
140	54.5	48.8	46.2	52.8	60.1	60.3	60.4	53.1
145	57.2	50.4	48.4	53.7	62.6	61.9	61.5	55.0



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Time (min)	Thermocouple temperature (°C)							
	1#	2#	3#	4#	5#	6#	7#	8#
150	59.3	52.3	50.4	54.9	65.9	64.0	63.3	56.2
155	62.6	53.7	51.7	55.8	68.1	65.6	65.0	56.7
160	64.1	55.3	52.8	57.2	70.3	67.2	66.4	57.7
165	65.9	56.9	54.1	58.7	71.6	68.7	67.6	58.0
170	67.6	58.4	55.4	60.0	73.2	70.0	68.6	58.6
175	69.0	60.0	56.6	62.0	75.0	71.2	70.3	59.3
180	70.2	61.6	57.7	64.1	77.5	73.6	71.7	60.1
185	71.8	63.2	59.0	66.4	78.8	76.0	70.3	60.6
190	72.4	64.5	60.0	68.2	80.0	77.6	66.6	61.5
195	73.3	66.0	62.2	70.1	82.5	79.4	64.7	62.0
200	74.6	67.0	63.6	71.5	84.1	80.7	64.0	62.6
205	76.7	68.1	66.3	73.0	85.0	81.7	67.2	65.4
210	78.5	69.4	67.6	74.6	86.1	82.9	70.5	66.9
215	79.7	70.1	70.0	76.7	86.2	84.8	70.5	68.8
220	79.8	71.0	71.5	79.8	86.5	85.8	70.4	69.6
225	80.0	71.7	72.8	83.1	85.4	86.1	69.6	70.1
230	80.9	72.7	74.9	84.0	85.2	87.8	70.4	69.8
235	83.0	73.4	76.7	84.4	83.8	87.8	73.0	70.1
240	84.4	74.6	77.9	84.5	83.5	88.7	74.4	72.5



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Table 3 Observations Made during the Test

Time (min:sec)	Observations
00:00	Test was started.
30:00	No notable changes.
100:00	No notable changes.
150:00	A small amount of smoke was issued.
200:00	The plastic plate on the unexposed surface bulged and deformed.
240:00	During the whole test duration, there were no cracks or flame appeared on unexposed surface.
241:00	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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6.3 Loadbearing capability

Failure in relation to loadbearing capability shall be deemed to have occurred upon collapse, or when the following criteria has been exceeded:

Limiting axial contraction, $C = h/100 = 30\text{mm}$; and

Limiting rate of axial contraction, $dC/dt = 3h/1000 = 9\text{mm/min}$

Where, h = initial height = 3000mm.

7. Conclusion

During the heating period of 240 min, no collapse occurred, and there was no sustained flaming or cracks on the unexposed surface of the specimen. The limiting axial contraction was 4mm, the limiting rate of axial contraction was 1mm/min. At the end of 240 min, the average temperature rise on unexposed face of the specimen was 55.0K and the maximum temperature rise was 62.7K.

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

Integrity, (E)	Insulation, (I)	Loadbearing, (R)
$\geq 240 \text{ min}$	$\geq 240 \text{ min}$	$\geq 240 \text{ min}$

The test was terminated after a period of 241 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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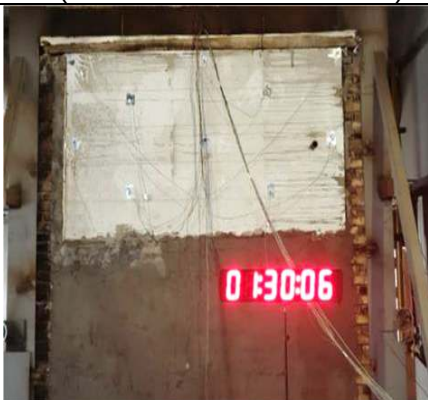
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Appendix - Photographs

	
Unexposed face before the test	Exposed face before the test
	
The unexposed face of the specimen (After test duration of 30 min)	The unexposed face of the specimen (After test duration of 60 min)
	
The unexposed face of the specimen (After test duration of 90 min)	The unexposed face of the specimen (After test duration of 120 min)



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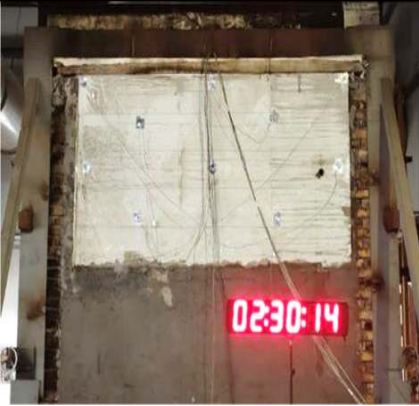
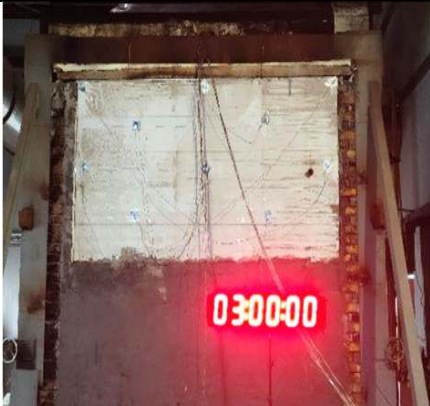
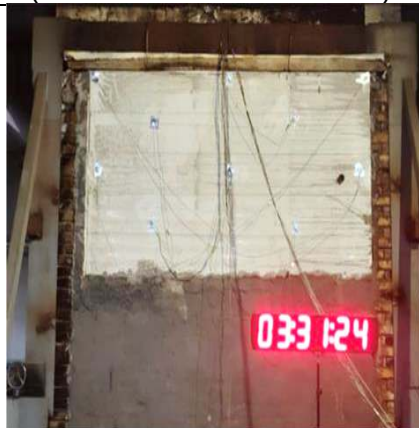
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The unexposed face of the specimen (After test duration of 150 min)	The unexposed face of the specimen (After test duration of 180 min)
	
The unexposed face of the specimen (After test duration of 211min)	The unexposed face of the specimen (After test duration of 240 min)
	
Unexposed face after the test	Exposed face after the test

SGS authenticate the photo on original report only

End of Report



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