

Test Report

No. SDFS2408005695FR

Date: Aug.23, 2024

Page 1 of 49

DURAGREEN LIGHTING UK LTD

9 BEECH STREET LEICESTER LE5 0DF UNITED KINGDOM

Sample Description: LED RECESSED LUMINAIRE

Style / Item No.: AFL50; AFL50-TL; AFL57; AFL57-TL; AFL68; AFL68-TL; AFL78; AFL78-TL; EFL03; EFL06; EFL09

Country of Destination: UK

Manufacturer: DURAGREEN LIGHTING UK LTD

Supplier: DURAGREEN LIGHTING UK LTD

The above data and information was / were submitted and identified on behalf of the sponsor. SGS is not responsible for the authenticity, integrity and results of the data and information and / or the validity of the conclusion.

Sample Receiving Date: Aug.05, 2024

Test Performing Date: Aug.05, 2024 to Aug.21, 2024

Test Requested:

The fire resistance performance of a loadbearing timber floor assembly protected by a plasterboard ceiling, incorporating eleven LED Recessed Luminaire, in accordance with EN 1363-1:2020 fire resistance tests - Part 1: General requirements and EN 1365-2:2014 Fire resistance tests for loadbearing elements -Part 2: Floors and roofs.

Test Results: -- See attached sheet --

Signed for and on behalf of
Shunde Branch
SGS-CSTC Co., Ltd.

Ada



Ada Liu
Approved signatory



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CONTENTS

1. INTRODUCTION	3
2. SUMMARY	3
3. SPECIMEN CONSTRUCTION AND INSTALLATION	3
4. TEST PROCEDURE	20
5. TEST DATA AND OBSERVATION	21
6. PERFORMANCE CRITERIA	34
7. CONCLUSION.....	35
8. LIMITATION	35
APPENDIX PHOTOS.....	36



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1. INTRODUCTION

Determine the fire resistance performance of a loadbearing timber floor assembly protected by a plasterboard ceiling, incorporating eleven LED Recessed Luminaire, when tested in accordance with EN 1365-2:2014 Fire resistance tests for loadbearing elements part 2: Floors and roofs.

The ceiling face of the floor assembly was exposed to elevated temperatures as dictated by the EN 1363-1:2020 time-temperature curve for a period of 60 minutes under loadbearing condition.

The test was conducted on Aug.13, 2024.

2. SUMMARY

The ceiling incorporated eleven LED Recessed Luminaire satisfied the performance requirement for the following periods:

PERFORMANCE CRITERIA	RESULTS
Loadbearing capacity	60 minutes
Integrity	60 minutes
Insulation	60 minutes

The test was terminated after a period of 61 minutes as requested by the sponsor.

3. SPECIMEN CONSTRUCTION AND INSTALLATION

The timber floor had overall nominal dimensions of 4500 mm long by 3500 mm wide and comprised softwood timber joists at 562.5 mm centres. The upper surface of the floor comprised one layer nominally 18 mm thick Egger chipboard flooring.

The floor assembly was protected on its underside by a direct fixed ceiling, formed from two layers of 12.5 mm thick Knauf plasterboard, both layers were screw fixed to the underside of the floor joists.

One layer of 50mm thick rockwool was filled within the cavity between the floor and the ceiling.

The floor supported an evenly distributed load of 23 kg/m². The load that was applied as specified by the sponsor of the test.



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No. SDFS2408005695FR

Date: Aug.23, 2024

Page 4 of 49

The ceiling incorporated eleven LED Recessed Luminaire referenced as follows:

Specimen No.	Model	Description
A	AFL50	Dimensions: ϕ 55.5*H81.5mm Ceiling cut-out: 50mm
B	AFL50-TL	Dimensions: ϕ 84*H 81.5mm Ceiling cut-out: 50mm
C	AFL57	Dimensions: ϕ 62.5*H 81mm Ceiling cut-out: 57mm
D	AFL57-TL	Dimensions: ϕ 92*H 81mm Ceiling cut-out: 57mm
E	AFL68	Dimensions: ϕ 74*H 86mm Ceiling cut-out: 68mm
F	AFL68-TL	Dimensions: ϕ 99*H 86mm Ceiling cut-out: 68mm
G	AFL78	Dimensions: ϕ 84*H 91mm Ceiling cut-out: 78mm
H	AFL78-TL	Dimensions: ϕ 117*H 91mm Ceiling cut-out: 78mm
I	EFL03	70X32X40mm Ceiling cut-out: 65X25mm
J	EFL06	133X32X40mm Ceiling cut-out: 130X25mm
K	ELF09	197X32X40mm Ceiling cut-out: 194X25mm

SCHEDULE OF COMPONENTS

(Refer to Figures 1 to 13)

(All other details are as stated by the sponsor)

ITEM DESCRIPTION

1. Timber Floor

1.1 Floor Joists

Materials	:	Softwood Timber Joists
Over section size	:	50 mm thick by 200 mm deep
Density	:	About 600 kg/m ³
Joint centres	:	562.5 mm



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No. SDFS2408005695FR

Date: Aug.23, 2024

Page 5 of 49

ITEM

DESCRIPTION

1.2 Floor boards

Manufacturer	:	Egger
Materials	:	Egger Chipboard, E1
Thickness	:	1 layer, 18 mm thick
Density	:	About 700 kg/m ³
Fixing method	:	All board screw fixed to all joists using drywall steel screws 55 mm long by 3.9 mm diameter screws, at 200 mm centres along joints and 150 mm centres align perimeter of floor.

1.3 Ceiling boards

Manufacturer	:	Knauf
Materials	:	Gypsum plasterboard
Thickness	:	2 layers, 12.5 mm thick
Density	:	About 720 kg/m ³
Fixing method	:	All board joints staggered with respect to adjacent layer and screw fixed to all joists using drywall steel screws, 35 mm long by 3.9 mm diameter screws for first layer and 55 mm long by 3.9 mm diameter screws for second layer, at 200 mm centres along joints and 150 mm centres align perimeter of ceiling.

1.4 Insulation

Materials	:	Rockwool
Thickness	:	50 mm
Density	:	About 68 kg/m ³
Fixing method	:	Filled into the cavity between the floor and the ceiling

2. Specimen "A"

Product code	:	AFL50
Overall dimensions and construction	:	See Figure 2 for detail
Cut out size	:	50 mm

3. Specimen "B"

Product code	:	AFL50-TL
Overall dimensions and construction	:	See Figure 3 for detail
Cut out size	:	50 mm



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Test Report

No. SDFS2408005695FR

Date: Aug.23, 2024

Page 6 of 49

4. Specimen "C"

Product code : AFL57
Overall dimensions and construction : See Figure 4 for detail
Cut out size : 57 mm

5. Specimen "D"

Product code : AFL57-TL
Overall dimensions and construction : See Figure 5 for detail
Cut out size : 57 mm

6. Specimen "E"

Product code : AFL68
Overall dimensions and construction : See Figure 6 for detail
Cut out size : 68 mm

7. Specimen "F"

Product code : AFL68-TL
Overall dimensions and construction : See Figure 7 for detail
Cut out size : 68 mm

8. Specimen "G"

Product code : AFL78
Overall dimensions and construction : See Figure 8 for detail
Cut out size : 78 mm

9. Specimen "H"

Product code : AFL78-TL
Overall dimensions and construction : See Figure 9 for detail
Cut out size : 78 mm

10. Specimen "I"

Product code : EFL03
Overall dimensions and construction : See Figure 10 for detail
Cut out size : 65 mm x 25 mm



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Test Report

No. SDFS2408005695FR

Date: Aug.23, 2024

Page 7 of 49

11. Specimen "J"

Product code : EFL06
Overall dimensions and construction : See Figure 11 for detail
Cut out size : 130 mm x 25 mm

12. Specimen "K"

Product code : EFL09
Overall dimensions and construction : See Figure 12 for detail
Cut out size : 194 mm x25 mm

The preparation of tested assembly took place in the test laboratory over a total combined time of 1 day. Throughout this period of time both the temperature and the humidity of the laboratory were measured and recorded as being within a range of from 32.6°C to 36.3°C and 60% to 67% respectively.

The tested sample was supported on the horizontal furnace with an opening of the 3950 mm by 3100 mm. At the request of sponsor, the sample was mounted such that ceiling face of the floor assembly towards to the heating conditions of the test.



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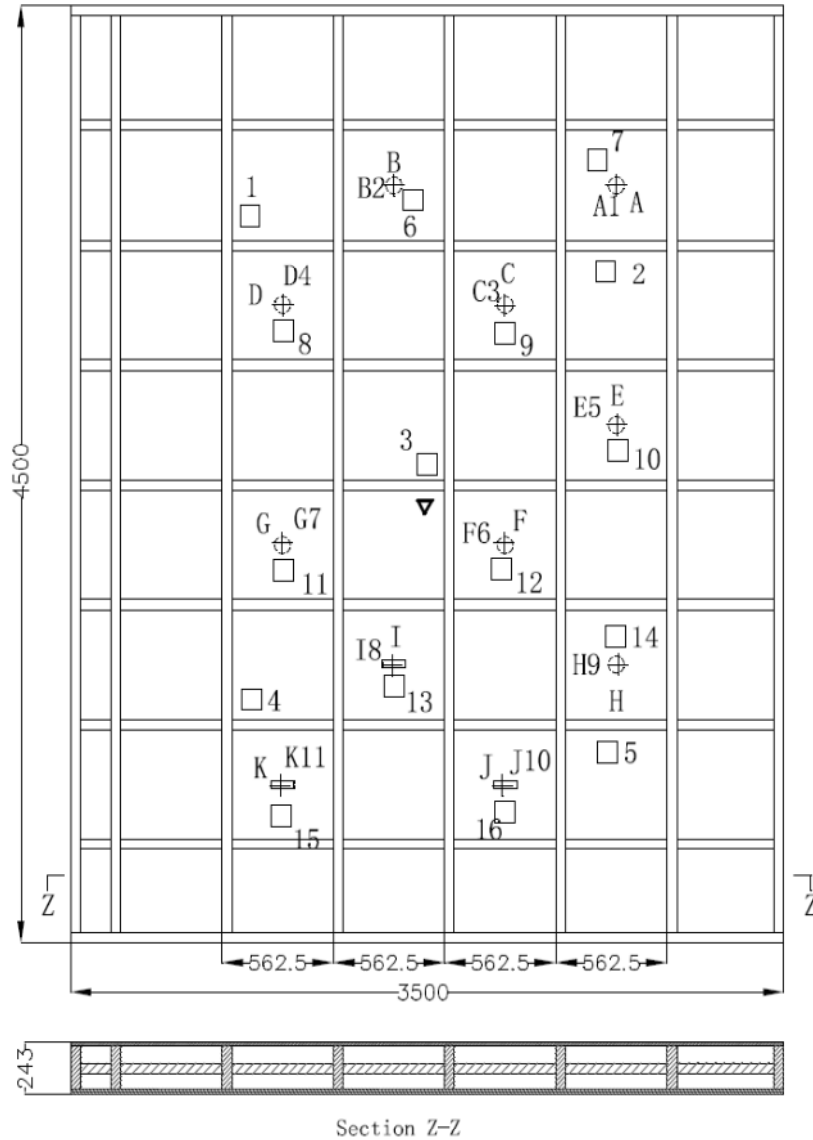
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Figure 1 - General Plan of Test Sample from Unexposed Face and Thermocouple Positions



- surface mounted thermocouples on upper surface of floorboards(1-16)
- + mineral insulated thermocouples at mid-cavity, adjacent to each downlight(A1-K11)
- Sample A~H
- Sample I~K
- ▼ Deflection measurement point

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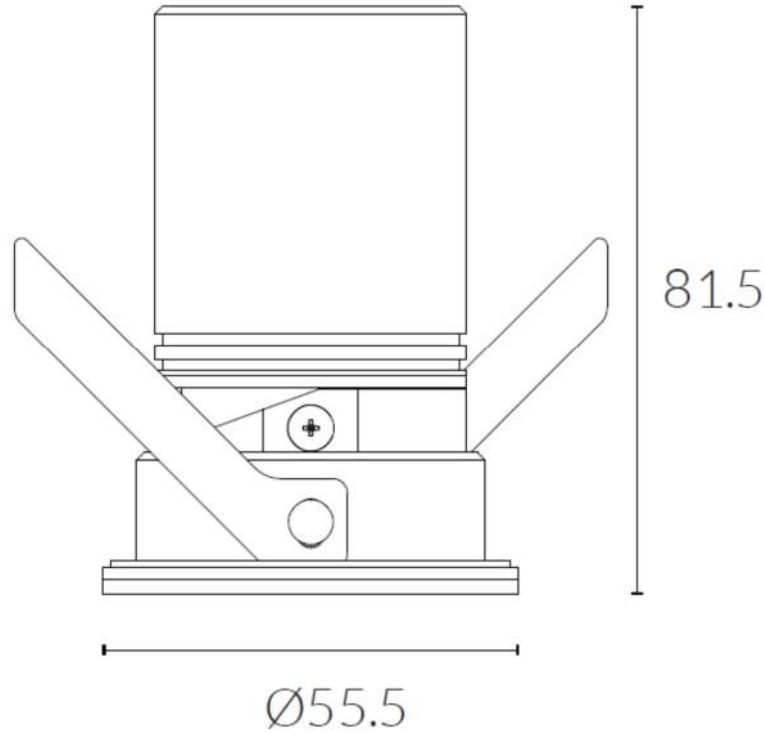
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Figure 2 - Details of Downlights Specimen 'A'



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Figure 3 - Details of Downlights Specimen 'B'

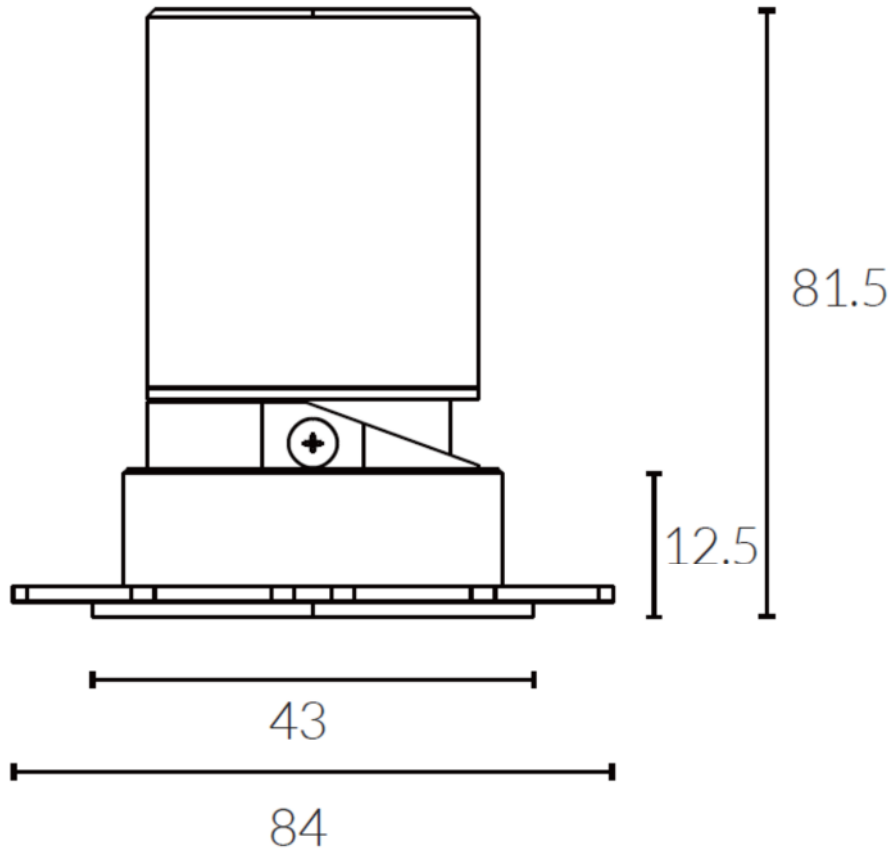


Figure 4 - Details of Downlights Specimen 'C'

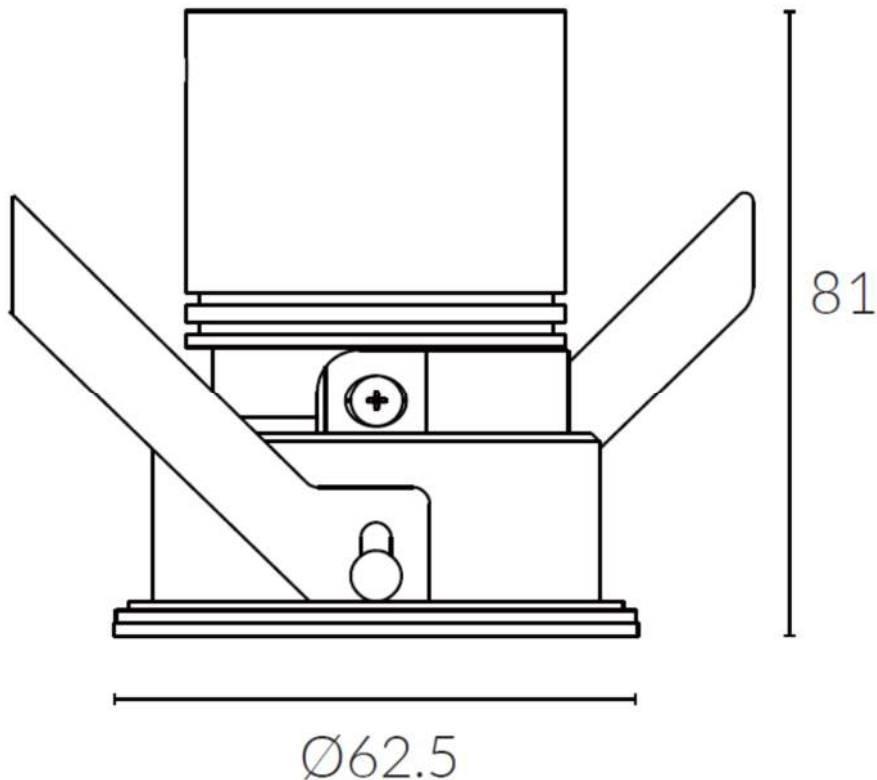
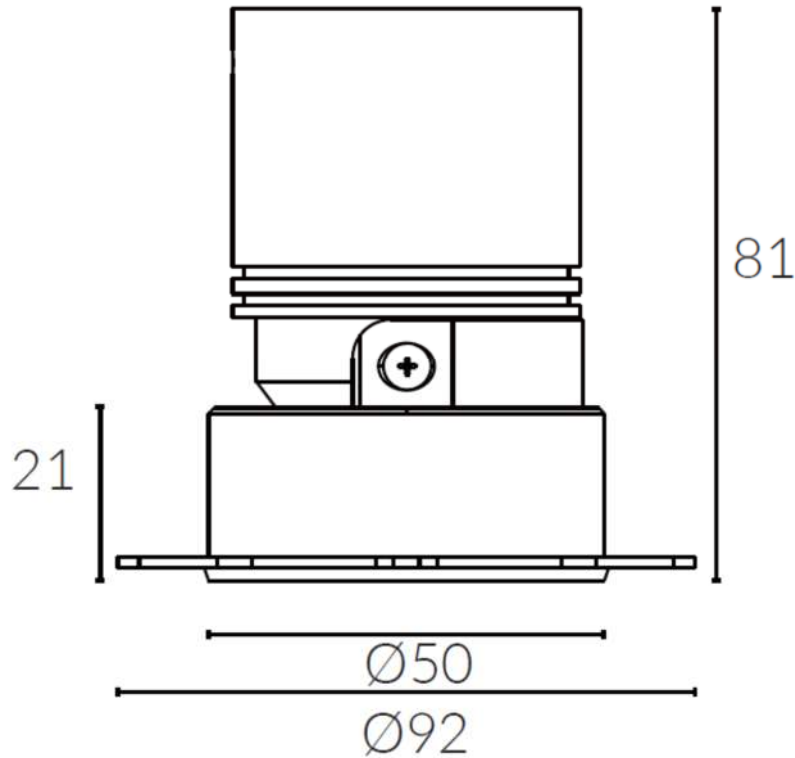


Figure 5 - Details of Downlights Specimen 'D'



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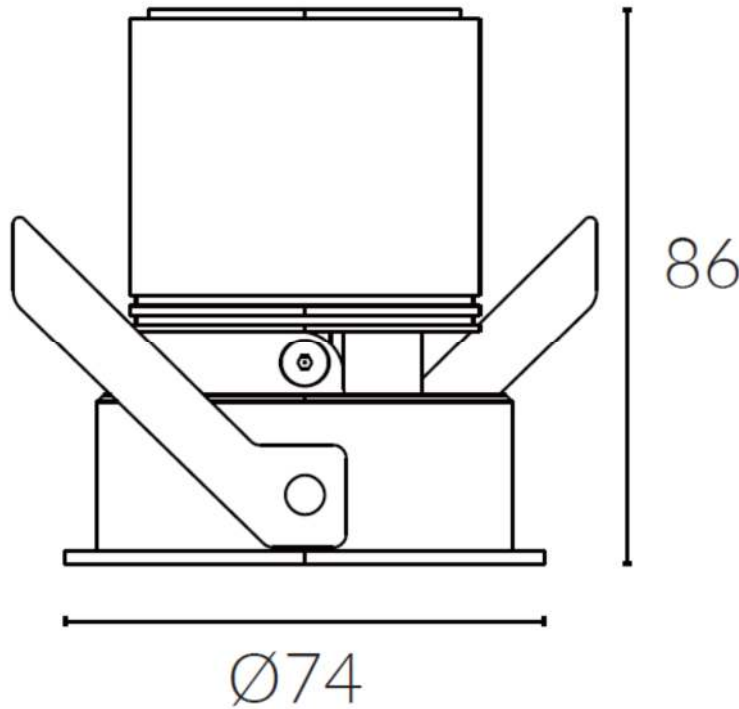
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Figure 6 - Details of Downlights Specimen 'E'



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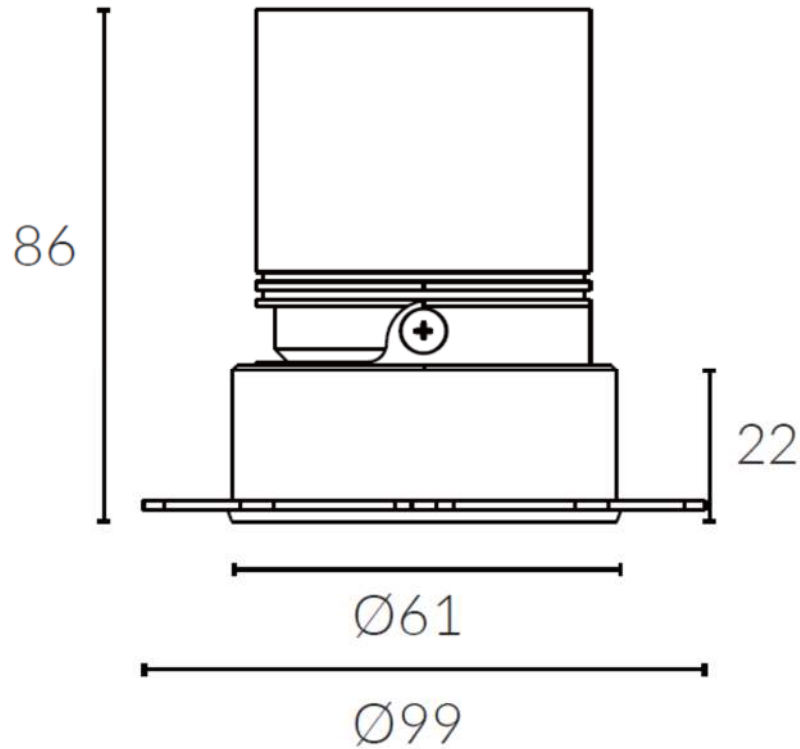
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Figure 7 - Details of Downlights Specimen 'F'



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Figure 8 - Details of Downlights Specimen 'G'

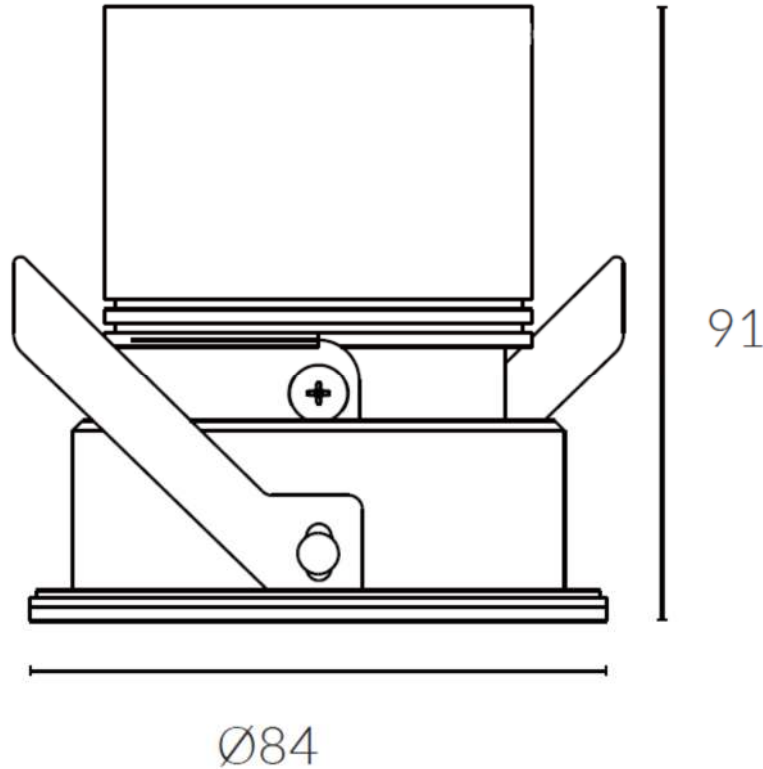
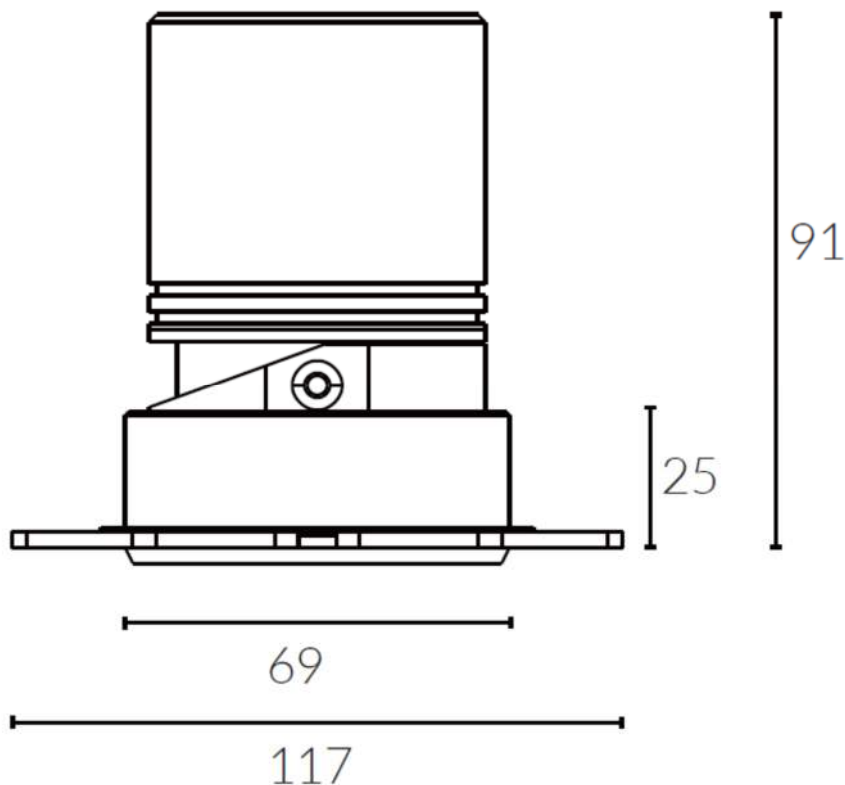


Figure 9 - Details of Downlights Specimen 'H'



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Figure 10 - Details of Downlights Specimen 'I'

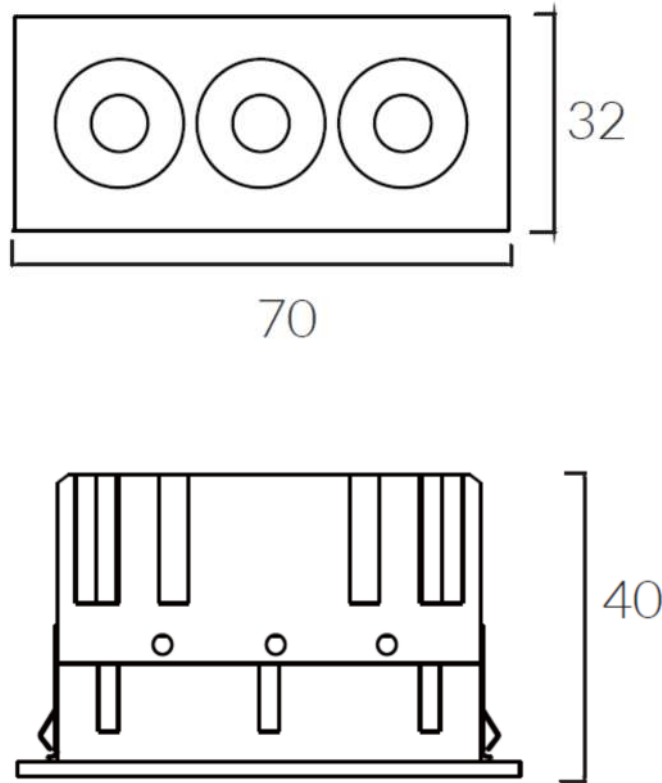
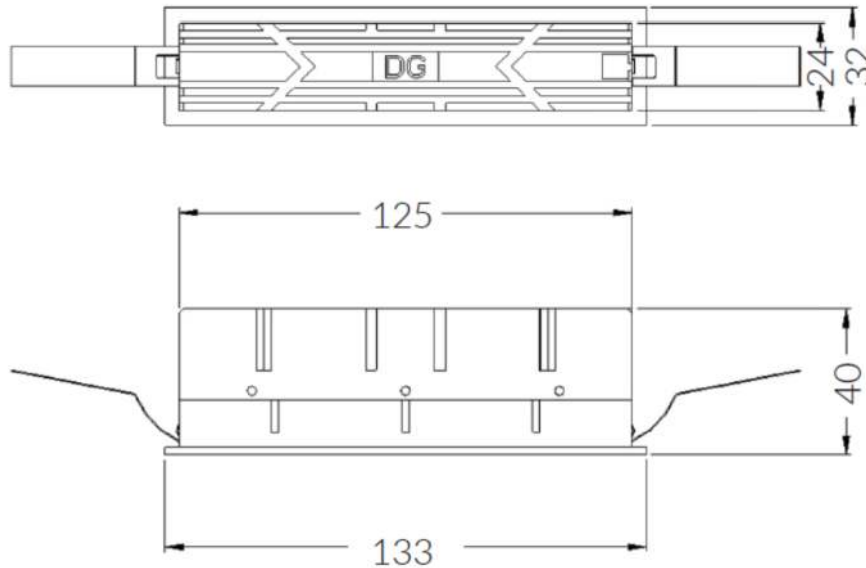


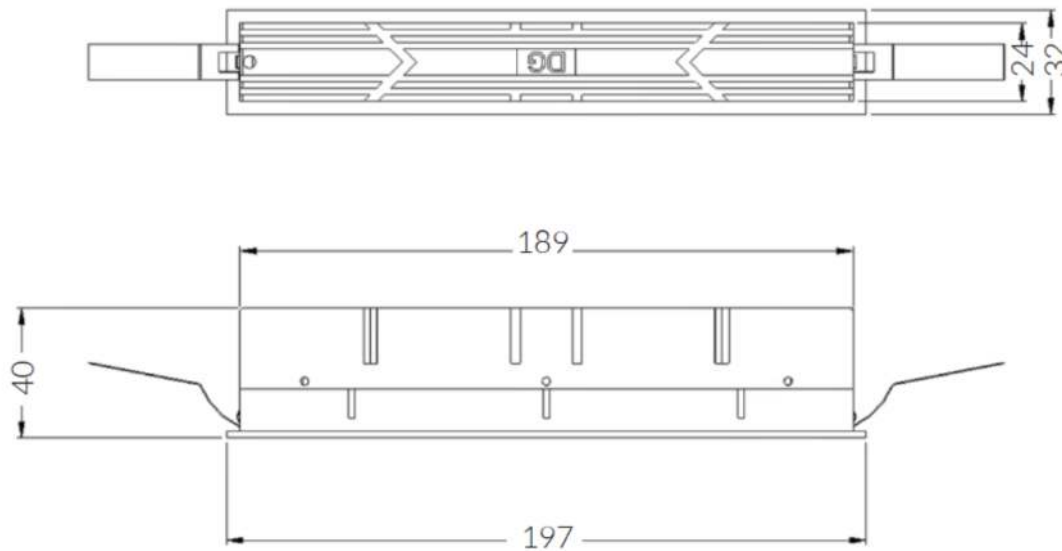
Figure 11 - Details of Downlights Specimen 'J'



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Figure 12 - Details of Downlights Specimen 'K'



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4. TEST PROCEDURE

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 EN1363-1:2020.

The locations and reference numbers of the various unexposed surface and internal thermocouples are shown in Figure 1.

The furnace pressure: shall be monitored and controlled. 5 min after the commencement of the test the furnace pressure shall be (0 ± 5) Pa 100 mm below the underside of the assembly; from 10 min onwards it shall be (0 ± 3) Pa 100 mm below the underside of the assembly. Irrespective of this, the nominal pressure on the underside of the test specimen shall not exceed 20 Pa.

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

Based on the requested of sponsor, the floor supported an evenly distributed load of 23 kg/m².

Gap gauges and cotton pad were used, if considered appropriate, to determine compliance with the integrity criterion. The occurrence of sustained flaming on the unexposed surface was also checked to determine compliance with the integrity criterion.

The deflection was measured from the commencement of heating by distance meter recorded at least one reading per minute.



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5. TEST DATA AND OBSERVATION

5.1 Condition

The ambient air temperature in the vicinity of the test construction was 33.8°C at the start of the test with variation of +0.8°C during the test.

5.2 Observations

Time		All observations are from the unexposed face unless noted otherwise
Mins	Secs	
00	00	Furnace fired and test was started.
11	00	A slight amount of smoke was released around the floor assembly.
19	11	There were a few cracks appearing on the plasterboard of the exposed face.
31	00	Smoke release increased gradually around the floor assembly.
31	43	Observed that some downlights had fall off.
40	00	No obvious change on the unexposed face of the floor assembly.
60	00	The floor assembly was maintaining its loadbearing capacity, integrity and insulation.
61	00	Test was terminated as per sponsor requirement.



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5.3 Deflection

Deflection Recorded on the Unexposed Surface of the Sample

Time (mins)	Deflection (mm)	Rate of Deflection (mm/min)
0	0.0	--
1	0.0	0.0
2	0.0	0.0
3	0.0	0.0
4	0.1	0.1
5	0.2	0.1
6	0.2	0.0
7	0.2	0.0
8	0.2	0.0
9	0.4	0.2
10	0.5	0.1
11	0.5	0.0
12	0.5	0.0
13	0.5	0.1
14	0.5	0.0
15	0.6	0.1
16	0.6	0.0
17	0.6	0.0
18	0.6	0.0
19	0.6	0.0
20	0.7	0.1
21	0.7	0.0
22	0.8	0.1
23	0.9	0.1
24	0.9	0.0
25	1.0	0.1
26	1.0	0.0
27	1.1	0.1
28	1.2	0.1
29	1.3	0.1
30	1.3	0.0
31	1.3	0.0

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Test Report

No. SDFS2408005695FR

Date: Aug.23, 2024

Page 23 of 49

Time (mins)	Deflection (mm)	Rate of Deflection (mm/min)
32	1.4	0.1
33	1.4	0.0
34	1.4	0.0
35	1.5	0.1
36	1.5	0.0
37	1.5	0.0
38	1.5	0.0
39	1.5	0.0
40	1.5	0.1
41	1.5	0.0
42	1.6	0.1
43	1.6	0.0
44	1.6	0.0
45	1.6	0.0
46	1.6	0.0
47	1.6	0.0
48	1.6	0.0
49	1.6	0.0
50	1.6	0.0
51	1.7	0.1
52	1.8	0.1
53	1.8	0.0
54	1.9	0.1
55	1.9	0.0
56	1.9	0.0
57	2.1	0.2
58	2.2	0.1
59	2.2	0.0
60	2.5	0.4



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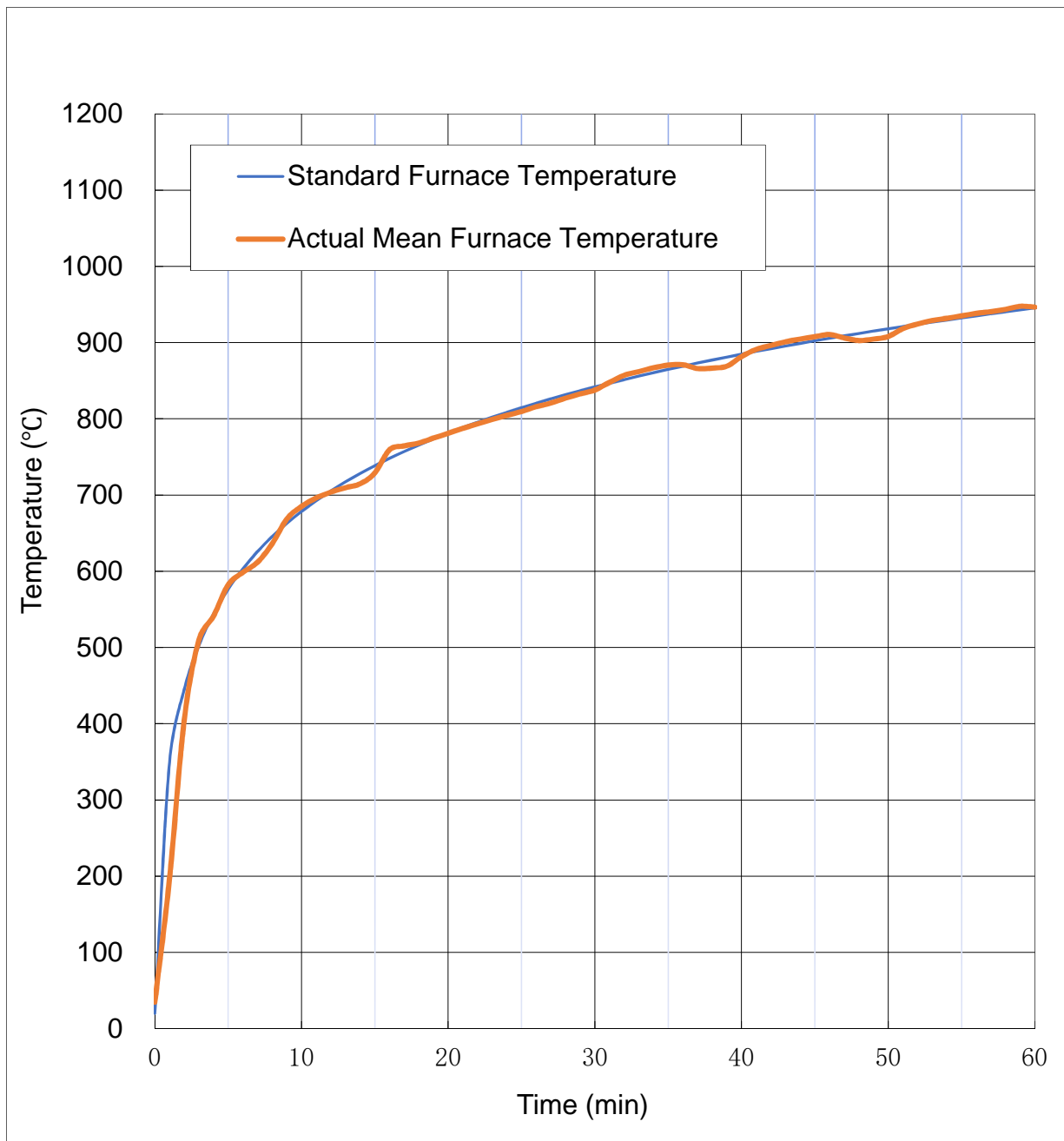
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5.4 Furnace temperature record

The actual furnace temperature and standard furnace temperature/time curve showed in below figure.



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Test Report

No. SDFS2408005695FR

Date: Aug.23, 2024

Page 25 of 49

The actual average temperatures within the furnace recorded in below table:

Time (min)	EN 1363-1 Std Average (°C)	Furnace Average (°C)	Error (%)
0	20	34.5	-
1	349	196.5	-37.4%
2	445	404.1	-28.5%
3	502	509.5	-17.3%
4	544	541.1	-11.4%
5	576	582.2	-8.4%
6	603	598.5	-6.5%
7	626	611.8	-5.6%
8	645	636.0	-5.0%
9	663	668.5	-4.3%
10	678	685.0	-3.7%
11	693	696.1	-3.2%
12	705	703.8	-2.8%
13	717	709.6	-2.6%
14	728	714.8	-2.5%
15	739	729.0	-2.4%
16	748	759.3	-2.2%
17	757	764.4	-2.0%
18	766	768.3	-1.8%
19	774	774.7	-1.7%
20	781	780.9	-1.6%
21	789	787.5	-1.5%
22	796	793.4	-1.4%
23	802	799.2	-1.4%
24	809	804.5	-1.3%
25	815	809.6	-1.3%
26	820	815.9	-1.2%
27	826	820.7	-1.2%
28	832	827.1	-1.2%
29	837	832.8	-1.2%
30	842	837.8	-1.1%
31	847	847.9	-1.1%
32	851	857.0	-1.0%

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Test Report

No. SDFS2408005695FR

Date: Aug.23, 2024

Page 26 of 49

Time (min)	EN 1363-1 Std Average (°C)	Furnace Average (°C)	Error (%)
33	856	861.9	-1.0%
34	860	866.9	-0.9%
35	865	870.4	-0.9%
36	869	870.8	-0.8%
37	873	866.0	-0.8%
38	877	866.5	-0.8%
39	881	869.0	-0.8%
40	885	881.7	-0.8%
41	888	890.9	-0.8%
42	892	896.2	-0.8%
43	896	901.0	-0.7%
44	899	904.6	-0.7%
45	902	907.7	-0.7%
46	906	910.5	-0.6%
47	909	906.2	-0.6%
48	912	902.7	-0.6%
49	915	904.5	-0.6%
50	918	908.0	-0.6%
51	921	918.3	-0.6%
52	924	924.3	-0.6%
53	927	929.0	-0.6%
54	930	931.7	-0.6%
55	932	935.1	-0.6%
56	935	938.4	-0.5%
57	938	940.6	-0.5%
58	940	943.6	-0.5%
59	943	947.6	-0.5%
60	945	946.5	-0.5%



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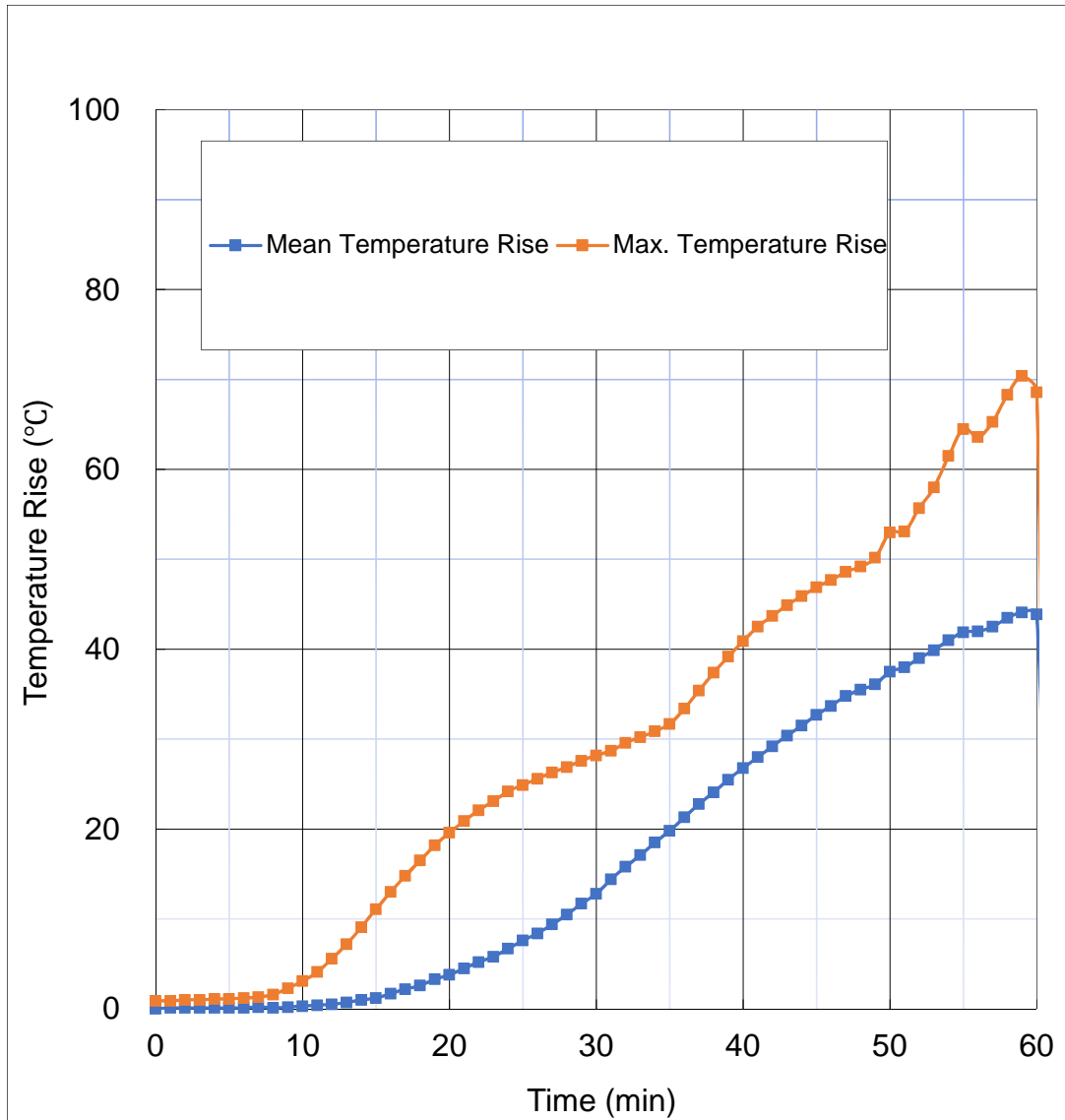
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5.5 Unexposed surface and Cavity temperatures record

Unexposed Surface Mean and Maximum Temperature Rise / Time Curve



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Individual Temperatures on the Unexposed Surface of the floor

Time(min)	Thermocouples temperatures (°C)					
	1#	2#	3#	4#	5#	1#~5# Mean Rise (°C)
0	36.2	35.8	35.0	34.6	34.9	0.0
1	36.2	36.0	35.0	34.6	35.0	0.1
2	36.3	36.1	35.0	34.7	35.0	0.1
3	36.3	36.0	35.0	34.7	35.0	0.1
4	36.4	36.1	35.0	34.7	35.0	0.1
5	36.4	36.0	35.1	34.7	34.9	0.1
6	36.5	36.0	35.1	34.7	34.9	0.1
7	36.5	36.1	35.1	34.8	35.0	0.2
8	36.5	36.1	35.0	34.7	34.9	0.1
9	36.5	36.2	35.1	34.7	35.0	0.2
10	36.6	36.2	35.1	34.8	35.1	0.3
11	36.7	36.3	35.2	34.9	35.2	0.4
12	36.9	36.4	35.2	35.0	35.5	0.5
13	37.1	36.6	35.3	35.2	35.8	0.7
14	37.4	36.9	35.4	35.5	36.2	1.0
15	37.7	37.2	35.4	35.7	36.7	1.2
16	38.1	37.7	35.6	36.0	37.4	1.7
17	38.6	38.4	35.8	36.5	38.0	2.2
18	39.1	39.0	35.9	36.8	38.7	2.6
19	39.8	39.9	36.2	37.4	39.5	3.3
20	40.4	40.6	36.4	37.8	40.1	3.8
21	41.2	41.5	36.7	38.5	40.9	4.5
22	42.3	42.5	37.0	39.0	41.6	5.2
23	43.2	43.3	37.3	39.6	42.3	5.8
24	44.5	44.2	37.5	40.6	43.1	6.7
25	46.2	45.1	37.8	41.7	43.8	7.6
26	47.5	46.0	38.0	42.4	44.4	8.4
27	49.1	46.9	38.3	43.8	45.2	9.4
28	51.1	47.8	38.5	45.5	46.1	10.5
29	53.0	48.7	38.8	47.4	47.0	11.7
30	55.7	48.9	39.0	49.2	47.8	12.8



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Time(min)	Thermocouples temperatures (°C)					
	1#	2#	3#	4#	5#	1#~5# Mean Rise (°C)
31	57.3	50.4	41.3	50.6	48.8	14.4
32	59.5	51.7	42.5	52.2	49.8	15.8
33	60.8	53.0	43.8	53.6	50.8	17.1
34	62.6	54.3	45.4	55.1	51.4	18.5
35	64.1	55.6	47.0	56.5	52.5	19.8
36	65.7	56.9	48.7	57.9	53.7	21.3
37	67.7	58.1	50.5	59.3	54.8	22.8
38	69.0	59.3	52.4	60.5	55.6	24.1
39	71.7	60.2	54.1	61.6	56.6	25.5
40	73.0	61.3	55.9	62.9	57.6	26.8
41	74.1	62.4	57.7	63.9	58.5	28.0
42	75.8	63.3	59.5	64.8	59.2	29.2
43	77.2	64.1	61.2	65.9	60.2	30.4
44	78.3	64.9	62.8	66.8	61.2	31.5
45	80.4	65.7	64.2	67.5	62.2	32.7
46	81.8	66.3	65.7	68.3	62.7	33.7
47	83.7	67.0	67.3	69.1	63.4	34.8
48	84.2	67.5	68.4	69.7	64.3	35.5
49	83.8	68.1	69.6	70.5	65.1	36.1
50	88.3	68.5	70.6	71.0	65.5	37.5
51	88.4	68.9	71.7	71.4	66.3	38.0
52	91.0	69.2	72.4	72.0	66.8	39.0
53	93.3	69.7	73.4	72.3	67.3	39.9
54	96.8	69.9	74.2	72.8	67.7	41.0
55	99.8	70.1	74.8	73.4	68.1	41.9
56	98.9	70.2	75.4	73.6	68.5	42.0
57	100.6	70.0	75.9	73.7	68.7	42.5
58	103.6	70.4	76.5	74.3	69.1	43.5
59	105.7	70.5	77.1	74.4	69.4	44.1
60	103.9	70.4	77.5	74.8	69.5	43.9



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Date: Aug.23, 2024

Page 30 of 49

Individual Temperatures on the Unexposed Surface of the floor

Time (min)	Thermocouples temperatures (°C)											
	6#	7#	8#	9#	10#	11#	12#	13#	14#	15#	16#	1#~16# Max. Rise
0	35.0	34.9	35.0	36.0	35.8	35.9	35.6	35.1	35.0	34.7	34.2	0.9
1	35.0	34.9	35.0	36.1	35.8	35.9	35.7	35.2	35.0	34.7	34.2	0.9
2	35.1	35.0	35.1	36.1	35.8	35.8	35.7	35.1	35.0	34.7	34.2	1.0
3	35.1	34.9	35.1	36.1	35.8	35.9	35.7	35.1	35.0	34.7	34.2	1.0
4	35.0	34.9	35.1	36.2	35.8	36.0	35.7	35.2	35.0	34.7	34.2	1.1
5	35.1	35.0	35.1	36.2	35.9	36.1	35.7	35.2	35.1	34.7	34.3	1.1
6	35.1	34.9	35.1	36.2	35.9	36.2	35.8	35.2	35.1	34.8	34.3	1.2
7	35.1	34.9	35.1	36.4	36.1	36.6	36.0	35.3	35.3	34.8	34.3	1.3
8	35.0	35.0	35.2	36.6	36.4	36.9	36.2	35.3	35.4	34.8	34.4	1.6
9	35.1	35.0	35.3	37.1	37.0	37.6	36.6	35.5	35.6	34.8	34.5	2.3
10	35.2	35.0	35.4	37.9	37.9	38.4	37.2	35.8	36.0	34.9	34.6	3.1
11	35.5	35.1	35.7	39.3	39.3	39.4	38.0	36.4	36.4	35.0	34.8	4.1
12	36.1	35.3	36.0	40.8	40.9	40.7	39.0	37.4	37.1	35.2	35.2	5.6
13	36.9	35.6	36.4	42.5	42.5	41.9	40.0	38.6	37.8	35.5	35.8	7.2
14	38.0	35.9	36.9	44.4	44.2	43.2	41.1	40.1	38.7	35.9	36.4	9.1
15	39.2	36.3	37.5	46.4	45.9	44.4	42.3	41.6	39.5	36.4	37.1	11.1
16	40.6	37.0	38.2	48.3	47.5	45.7	43.6	43.2	40.4	37.0	37.8	13.0
17	42.0	37.8	38.9	50.1	48.9	46.8	44.9	44.8	41.4	37.7	38.6	14.8
18	43.4	38.6	39.5	51.8	50.2	47.8	46.1	46.3	42.2	38.5	39.5	16.5
19	44.9	39.6	40.4	53.5	51.6	48.8	47.4	47.8	43.1	39.5	40.5	18.2
20	46.3	40.4	41.1	54.9	52.5	49.6	48.4	48.9	43.9	40.3	41.3	19.6
21	47.6	41.5	41.9	56.2	53.5	50.5	49.6	50.0	44.8	41.2	42.1	20.9
22	48.7	42.6	42.6	57.4	54.4	51.3	50.6	50.9	45.6	42.2	43.0	22.1
23	49.8	43.6	43.4	58.4	55.2	52.1	51.8	51.9	46.4	43.3	43.8	23.1
24	51.0	44.6	44.2	59.5	56.0	52.9	52.9	52.7	47.2	44.3	44.7	24.2
25	51.8	45.5	45.1	60.2	56.8	53.8	53.9	53.5	48.1	45.3	45.7	24.9
26	52.6	46.4	45.9	60.9	57.5	54.6	55.0	54.4	48.8	46.3	46.8	25.6
27	53.3	47.3	46.9	61.6	58.1	55.5	56.0	55.1	49.7	47.2	47.7	26.3
28	54.2	48.2	48.0	62.2	58.8	56.5	57.1	55.9	50.7	48.3	49.0	26.9
29	55.1	49.0	49.1	62.9	59.4	57.6	58.0	56.8	51.6	49.2	50.2	27.6
30	55.8	50.0	50.1	63.5	60.0	58.7	59.0	57.3	52.6	50.2	51.4	28.2
31	56.7	50.8	51.1	64.0	60.6	60.0	60.0	58.1	53.6	51.2	52.6	28.7



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Test Report

No. SDFS2408005695FR

Date: Aug.23, 2024

Page 31 of 49

Time (min)	Thermocouples temperatures (°C)											
	6#	7#	8#	9#	10#	11#	12#	13#	14#	15#	16#	1#~16# Max. Rise
32	57.6	51.8	52.1	64.9	61.4	61.7	61.1	59.1	54.7	52.4	53.8	29.6
33	58.4	52.7	53.1	65.5	61.7	63.4	62.1	59.6	55.7	53.1	54.9	30.2
34	59.2	53.8	54.2	66.2	62.1	65.0	63.0	60.3	56.6	53.9	55.9	30.9
35	60.0	54.6	55.1	67.0	62.5	66.9	64.0	61.0	57.8	54.8	56.9	31.7
36	60.8	55.7	55.8	67.9	62.8	68.7	65.0	61.7	58.8	55.7	57.9	33.4
37	61.7	56.6	56.9	68.9	63.1	70.7	65.7	62.5	59.8	56.7	58.9	35.4
38	62.5	57.4	57.7	70.0	63.3	72.7	66.6	63.3	60.8	57.5	59.9	37.4
39	63.2	58.2	58.5	71.0	63.5	74.5	67.5	64.1	61.6	58.1	60.7	39.2
40	64.3	59.0	59.4	72.3	63.8	76.2	68.6	64.8	62.4	58.7	61.5	40.9
41	65.0	59.7	60.0	73.3	64.2	77.8	69.7	65.6	63.2	59.6	62.2	42.5
42	65.6	60.2	60.5	74.2	64.5	79.0	70.7	66.1	63.9	60.0	62.9	43.7
43	66.2	60.7	61.3	75.0	64.7	80.2	71.5	66.6	64.5	60.5	63.4	44.9
44	66.8	61.3	61.7	75.9	64.9	81.2	72.3	67.4	65.3	60.9	64.2	45.9
45	67.4	61.9	62.3	76.9	65.2	82.2	73.1	67.8	65.9	61.3	64.6	46.9
46	67.8	62.2	62.8	77.5	65.5	83.0	73.6	68.3	66.6	61.6	65.2	47.7
47	68.4	62.7	63.2	78.2	65.7	83.9	74.4	68.7	67.2	61.9	65.7	48.6
48	68.8	62.8	63.5	78.8	65.9	84.5	74.8	69.0	67.7	62.0	66.0	49.2
49	69.2	63.3	63.6	79.3	66.2	85.5	75.2	69.6	68.2	62.5	66.2	50.2
50	69.6	63.3	64.0	79.7	66.4	86.4	75.6	70.1	68.4	62.7	66.5	53.0
51	70.1	63.4	64.2	80.2	66.7	87.4	76.0	70.3	68.9	62.7	66.8	53.1
52	70.0	63.2	64.4	80.3	67.0	88.2	76.2	70.6	69.2	62.8	67.1	55.7
53	70.5	63.3	64.6	80.8	67.3	89.0	76.7	70.6	69.5	63.0	67.3	58.0
54	70.6	63.1	64.7	80.8	67.4	89.7	76.8	70.7	69.8	63.1	67.7	61.5
55	70.7	63.2	64.8	80.8	67.6	90.5	76.8	70.8	69.9	63.3	67.8	64.5
56	70.7	63.2	65.1	80.8	67.9	91.0	77.1	71.0	69.9	63.5	68.1	63.6
57	70.8	63.1	65.0	81.1	68.3	91.7	77.4	70.8	69.9	63.6	68.1	65.3
58	70.8	63.3	65.3	81.1	68.6	92.4	77.8	71.1	70.3	63.6	68.5	68.3
59	70.9	63.4	65.7	81.1	69.2	92.9	78.0	71.2	70.4	64.2	68.6	70.4
60	70.9	63.4	66.0	81.2	69.7	93.3	78.4	71.2	70.6	64.2	68.7	68.6



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Test Report

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Date: Aug.23, 2024

Page 32 of 49

Individual Temperatures Recorded Adjacent to the Downlight Fittings at Mid-height of the Cavity

Time (min)	Thermocouples temperatures (°C)										
	A1	B2	C3	D4	E5	F6	G7	H8	I9	J10	K11
0	34.9	34.6	35.5	35.6	35.2	36.6	36.0	35.8	35.1	35.2	35.6
1	36.1	35.9	36.6	36.7	36.4	37.9	41.1	37.7	36.2	36.2	36.6
2	37.2	39.7	37.7	37.8	38.4	39.5	47.1	40.1	37.3	37.3	37.7
3	38.2	46.1	38.7	38.9	41.3	41.2	55.8	43.2	38.4	39.0	38.7
4	40.1	54.1	41.4	40.7	45.4	43.7	70.0	48.2	39.6	42.4	40.0
5	44.4	62.7	56.9	47.7	55.7	50.7	91.4	60.5	44.1	46.4	47.0
6	50.0	70.3	70.7	62.8	68.0	63.3	97.4	72.4	69.1	51.6	74.5
7	55.5	77.2	82.2	73.8	77.7	73.2	99.6	81.3	80.7	59.3	90.7
8	60.6	83.2	90.3	80.7	84.7	79.7	101.5	87.4	88.3	69.4	97.4
9	65.1	88.7	96.2	89.5	91.4	84.8	103.3	93.0	94.5	78.2	102.3
10	71.3	95.2	104.4	96.6	98.7	92.0	107.2	99.8	101.7	93.0	107.7
11	76.1	98.7	107.8	102.4	103.0	98.2	110.4	104.4	106.3	99.0	110.8
12	80.3	101.3	110.8	107.0	106.3	103.8	113.2	108.2	109.7	102.8	113.1
13	84.4	103.8	113.0	110.7	109.2	108.2	117.6	111.7	112.7	107.6	115.2
14	88.2	106.6	115.4	113.6	111.9	111.9	124.1	115.4	115.7	111.5	117.5
15	91.5	108.9	117.3	116.6	114.3	115.0	127.1	118.0	118.4	114.7	119.4
16	95.0	111.7	119.4	119.5	116.9	118.0	130.4	120.9	120.8	118.0	121.5
17	98.1	114.3	121.9	122.1	119.4	120.9	133.4	123.5	123.0	121.0	123.4
18	101.1	117.6	129.5	124.7	123.9	123.3	135.8	127.4	125.1	123.8	125.3
19	104.0	120.5	135.1	126.9	127.5	125.6	138.1	130.6	127.1	126.2	127.1
20	106.9	123.3	140.2	129.0	130.8	127.5	141.4	133.8	129.1	128.5	129.1
21	109.6	125.4	144.0	130.9	133.4	129.3	145.2	136.5	131.1	130.4	131.1
22	112.2	127.4	148.4	132.9	136.3	131.1	149.8	139.7	133.1	132.4	132.9
23	114.8	129.1	152.7	135.1	139.0	132.8	153.5	142.6	135.1	134.5	134.8
24	117.4	131.0	157.0	137.4	141.8	134.8	156.9	145.6	136.9	137.3	136.7
25	120.1	132.8	161.3	144.5	146.2	136.9	160.5	149.9	138.8	140.4	138.5
26	123.2	133.7	166.2	150.2	150.0	138.9	164.4	153.9	140.6	142.5	140.0
27	126.5	137.1	170.7	154.2	154.0	140.9	167.4	157.4	142.8	143.7	141.7
28	130.2	139.9	174.3	157.6	157.3	143.0	169.5	160.3	145.1	145.7	143.3
29	147.5	142.7	189.3	161.4	160.6	157.3	183.5	174.7	159.5	159.8	157.1
30	160.4	145.5	197.8	165.1	163.9	165.6	192.0	183.2	167.8	168.5	165.1
31	172.2	148.3	206.5	168.8	167.2	174.4	200.1	191.9	176.0	176.9	172.7
32	181.8	199.3	215.1	194.6	170.5	183.2	208.7	200.9	184.2	185.5	180.4
33	190.4	212.9	223.7	202.6	173.8	191.8	217.6	209.7	192.5	194.2	188.5
34	198.9	224.8	232.3	210.8	177.1	200.3	226.5	218.5	200.7	203.2	196.6
35	207.4	235.3	241.0	219.4	180.4	208.8	235.3	227.3	208.8	212.5	202.9
36	215.6	245.0	249.6	227.9	183.7	217.2	244.5	236.0	217.0	221.6	209.5



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Test Report

No. SDFS2408005695FR

Date: Aug.23, 2024

Page 33 of 49

Time (min)	Thermocouples temperatures (°C)										
	A1	B2	C3	D4	E5	F6	G7	H8	I9	J10	K11
37	223.9	254.7	258.0	236.4	187.0	225.5	255.9	245.1	225.1	230.5	217.7
38	232.1	264.1	266.2	245.0	190.3	233.9	271.0	254.9	233.1	239.4	224.2
39	240.2	273.1	274.3	253.4	266.9	242.4	285.3	264.4	241.2	248.1	232.1
40	248.3	281.7	282.2	261.9	275.3	250.8	294.7	273.0	249.3	256.6	240.2
41	256.2	290.1	290.0	270.3	283.5	259.2	302.1	281.0	257.2	265.2	249.0
42	264.4	298.3	297.8	278.8	291.6	267.5	309.3	289.0	265.2	273.6	257.1
43	272.4	306.2	305.6	287.2	299.6	275.7	320.1	297.6	273.1	282.2	265.2
44	280.5	313.9	313.3	295.6	307.6	283.9	334.7	307.0	281.1	290.8	273.0
45	288.5	321.6	321.2	304.0	315.6	292.1	345.5	315.7	289.1	299.3	280.2
46	296.6	329.6	329.3	312.4	323.8	300.2	354.7	324.1	297.0	307.8	287.9
47	304.6	337.5	337.4	320.9	331.9	308.3	364.7	332.6	304.9	316.5	295.5
48	312.5	345.5	345.5	329.3	340.1	316.4	374.9	341.3	313.1	325.3	303.7
49	320.5	353.8	353.7	338.0	348.5	324.7	387.1	350.4	321.0	334.0	311.7
50	328.7	362.1	362.1	346.8	357.0	333.0	400.3	359.8	328.6	343.0	320.6
51	336.7	370.5	370.6	356.0	365.7	341.1	412.3	369.1	334.0	352.0	330.4
52	344.8	379.0	379.5	365.5	374.7	349.1	425.6	378.9	338.9	361.0	343.7
53	352.9	387.8	388.5	375.3	383.9	357.4	438.9	388.8	346.7	370.3	362.2
54	361.0	396.8	397.8	385.5	393.3	365.6	452.1	398.9	355.1	380.9	377.1
55	369.0	405.9	407.2	396.1	403.1	374.0	466.2	409.3	363.2	391.8	389.5
56	377.0	415.3	417.1	407.7	413.4	382.6	481.3	420.4	377.9	403.4	400.9
57	385.1	425.6	427.6	420.3	424.5	391.4	495.9	432.0	395.8	415.6	411.7
58	393.0	436.8	438.4	433.3	436.1	400.1	512.7	444.1	411.2	428.0	422.3
59	401.1	448.9	449.1	446.6	448.2	409.0	530.8	456.7	426.8	441.0	433.1
60	409.1	461.2	460.0	460.9	460.7	417.9	551.0	470.1	443.0	454.7	444.1

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6. PERFORMANCE CRITERIA

The performance of the sample was assessed against the criteria for integrity and insulation in accordance with EN 1363-1:2020, Clause 11.

Loadbearing capacity: Failure is deemed to occur:

- a) measured deflection $\geq 1,5 \times D_{\text{limit}}$ or
- b) D_{limit} and $(dD/dt)_{\text{limit}}$ are exceeded

The limiting deflection and the limiting rate of deflection for the specimen, as calculated as:

Item	Value
L: is the clear span (mm)	3950
d: Depth of structural section (mm)	243
D_{limit} -- Limiting deflection ($L^2/400d$) (mm)	160.5
$(dD/dt)_{\text{limit}}$ -- Limiting rate of deflection ($L^2/9000d$) (mm/min)	7.1
Measured deflection $\geq 1.5x (L^2/400d)$ (mm)	240.8

Integrity: Failure is deemed to occur:

- a) When collapse occurs; or
- b) When sustained flaming for not less than 10s on the unexposed surface occurs; or
- c) For situations where the cotton pad is suitable, when flames and/or hot gases cause flaming or glowing of the cotton fibre pad; or
- d) For situations where the cotton pad is not suitable, when either:
 - i) the 6 mm diameter gap gauge can be passed through the test specimen, such that the gauge projects into the furnace, and can be moved a distance of 150 mm along the gap; or
 - ii) the 25 mm diameter gap gauge can be passed through the test specimen such that the gauge projects into the furnace.

Insulation: Failure is deemed to occur:

- a) When the mean unexposed surface temperature rise more than 140 K; or
- b) When the temperature rise recorded at any position on the unexposed surface, either by a fixed thermocouple or by the roving thermocouple is in excess of 180 K; or
- c) When integrity failure occurs.

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7. CONCLUSION

The ceiling incorporated eleven LED Recessed Luminaire satisfied the performance requirement for the following periods:

PERFORMANCE CRITERIA	RESULTS
Loadbearing capacity	60 minutes
Integrity	60 minutes
Insulation	60 minutes

The test was terminated after a period of 61 minutes as requested by the sponsor.

8. LIMITATION

The results only relate to the behaviour of the sample of the element of construction under the particular conditions of the test. They are not intended to be the sole criteria for assessing the potential fire performance of the element in use nor do they reflect the actual behaviour in fires.

The test results relate only to the sample tested. Any significant deviation with respect to size, constructional details, loads, stresses, edge or end conditions other than those allowed under the field of direct application in the relevant test method is not covered by this report. Annex A of BS EN 1363-1: 2020, provides guidance information on the application of fire resistance tests and the interpretation of test data.

The sample was asymmetrical and was tested such that the specified surface towards the heating conditions of the test. The test result may not be appropriate to situation other side towards the heating conditions.

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APPENDIX PHOTOS



Front view of Sample A



Side view of Sample A



Front view of Sample B



Side view of Sample B



Front view of Sample C



Side view of Sample C



Front view of Sample D



Side view of Sample D



Front view of Sample E



Side view of Sample E

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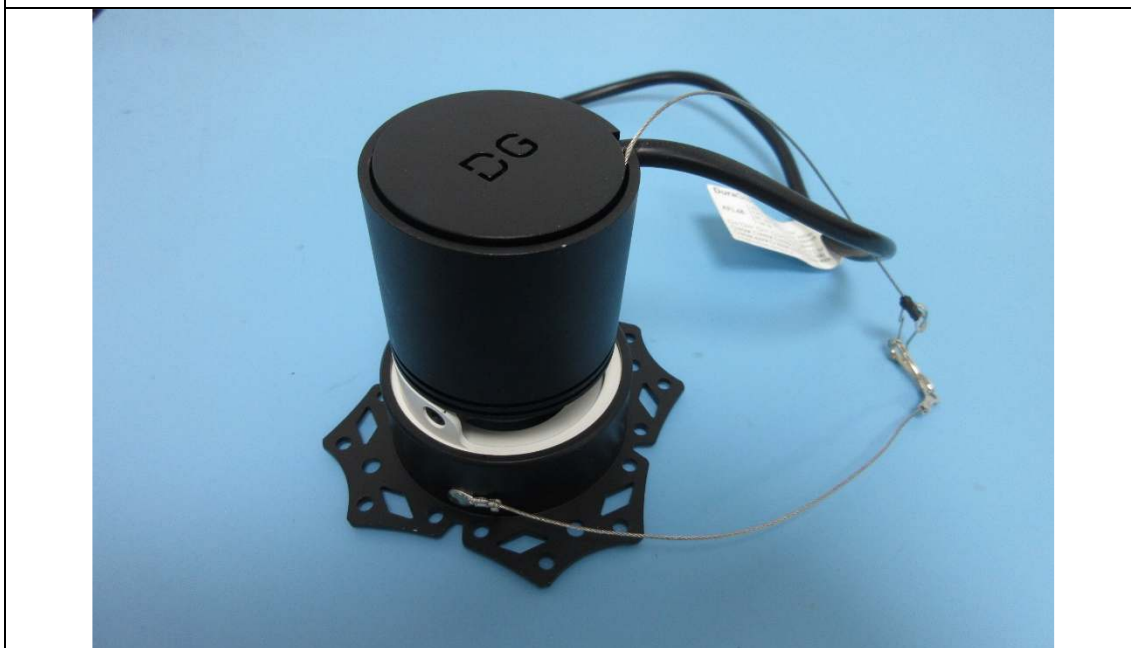
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Front view of Sample F



Side view of Sample F



Front view of Sample G



Side view of Sample G



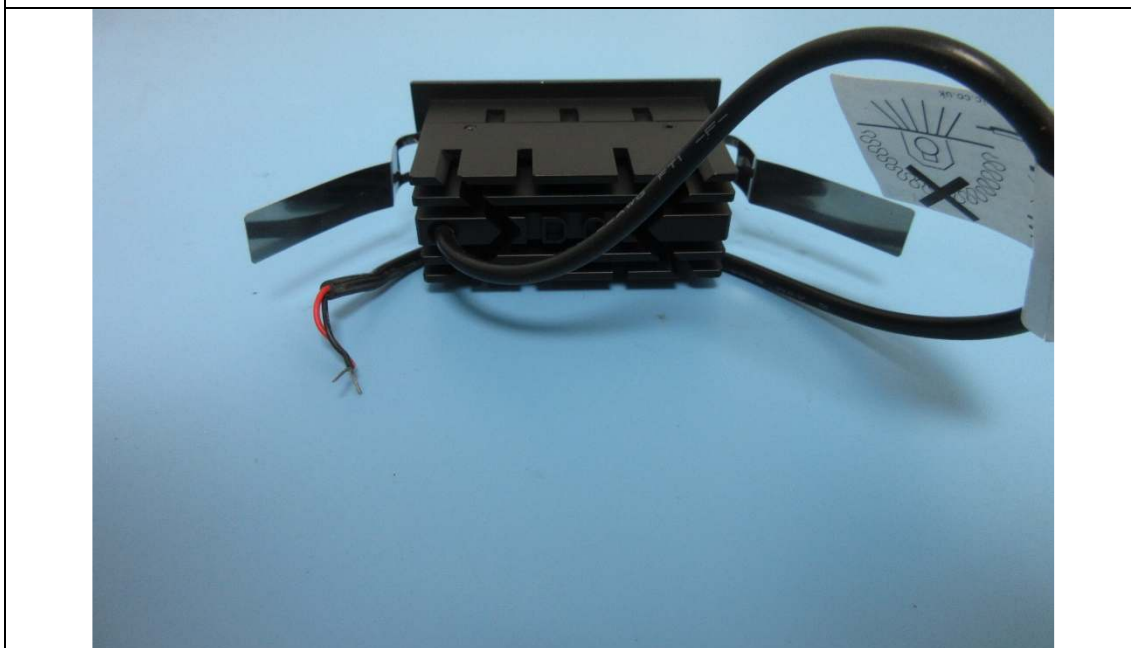
Front view of Sample H



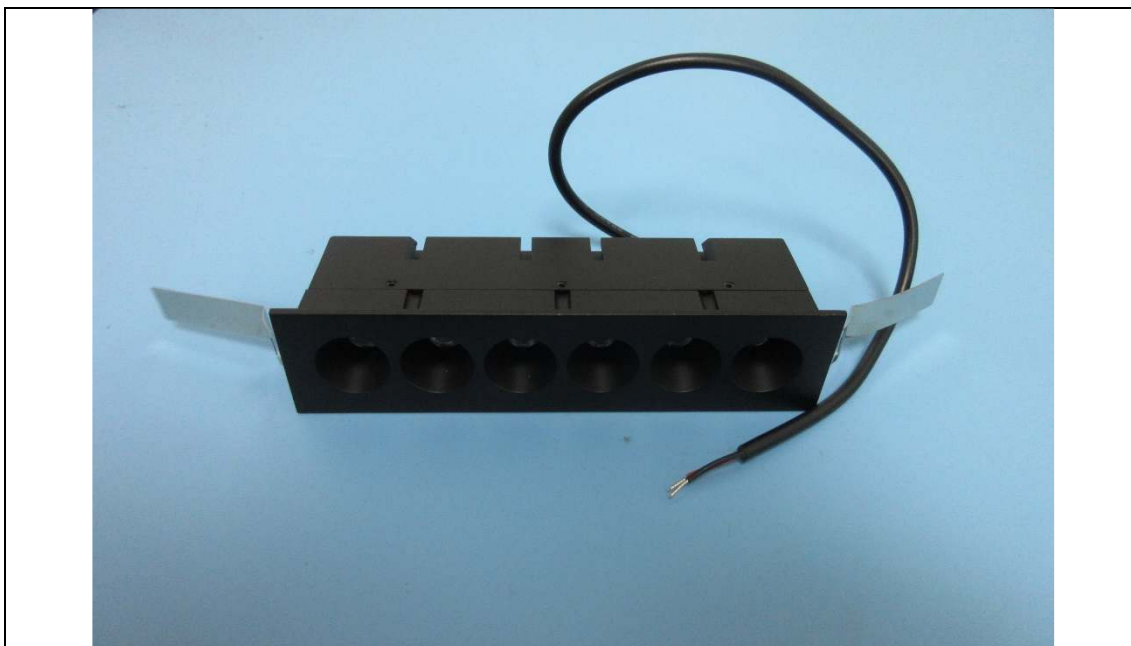
Side view of Sample H



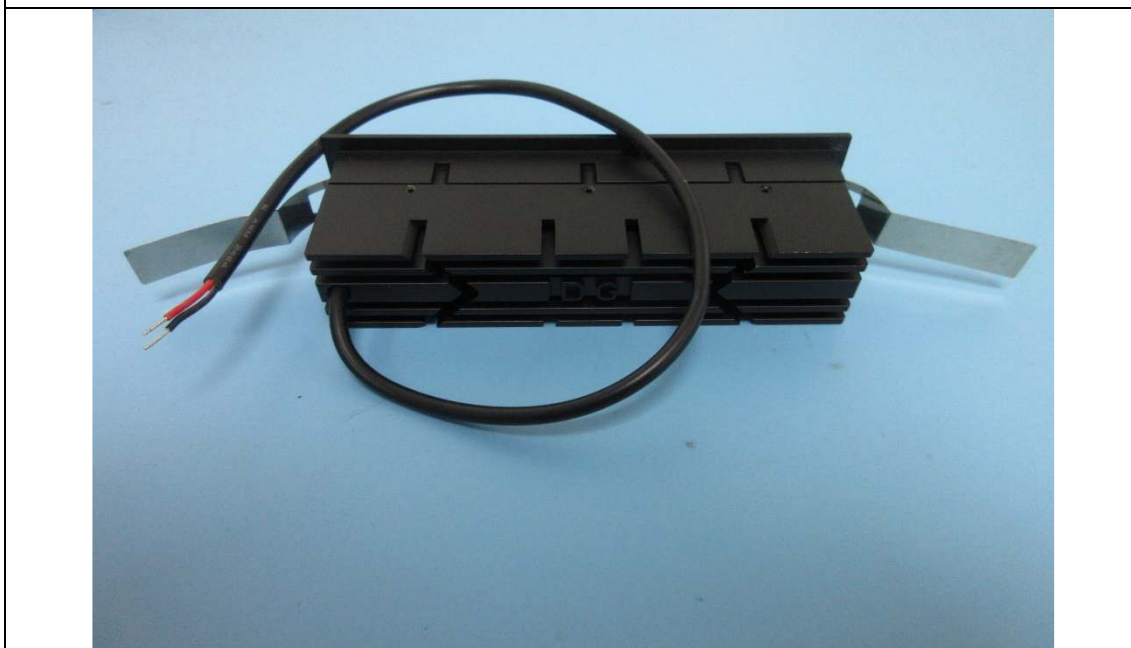
Front view of Sample I



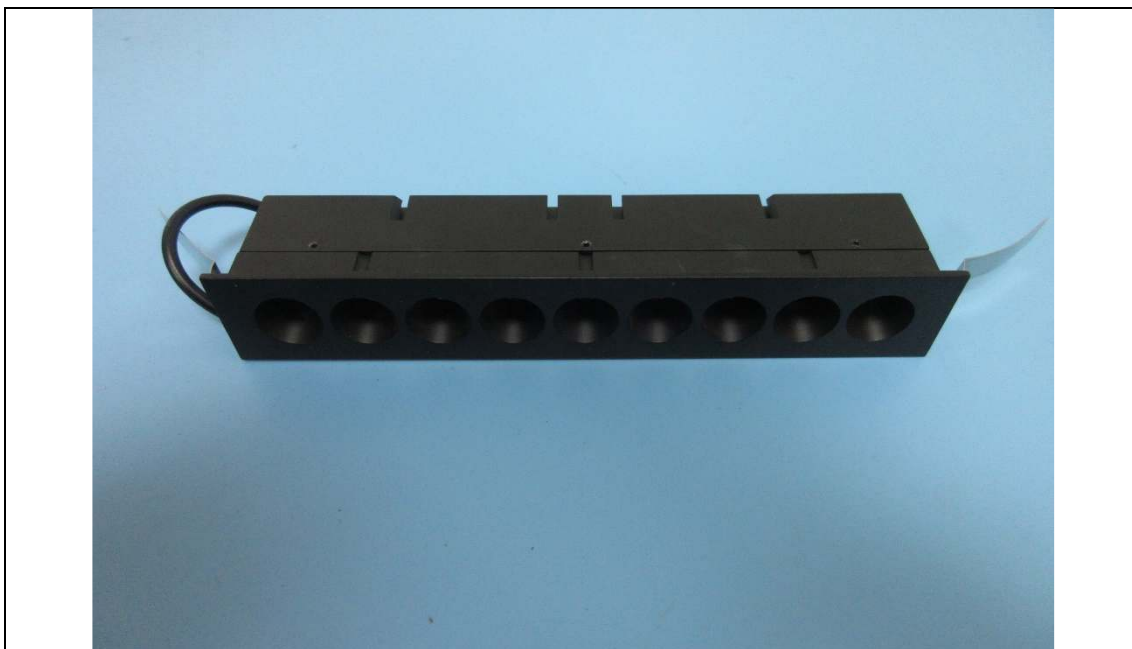
Side view of Sample I



Front view of Sample J



Side view of Sample J



Front view of Sample K



Side view of Sample K



The exposed face of the ceiling before the test



The unexposed face of the floor assembly before the test



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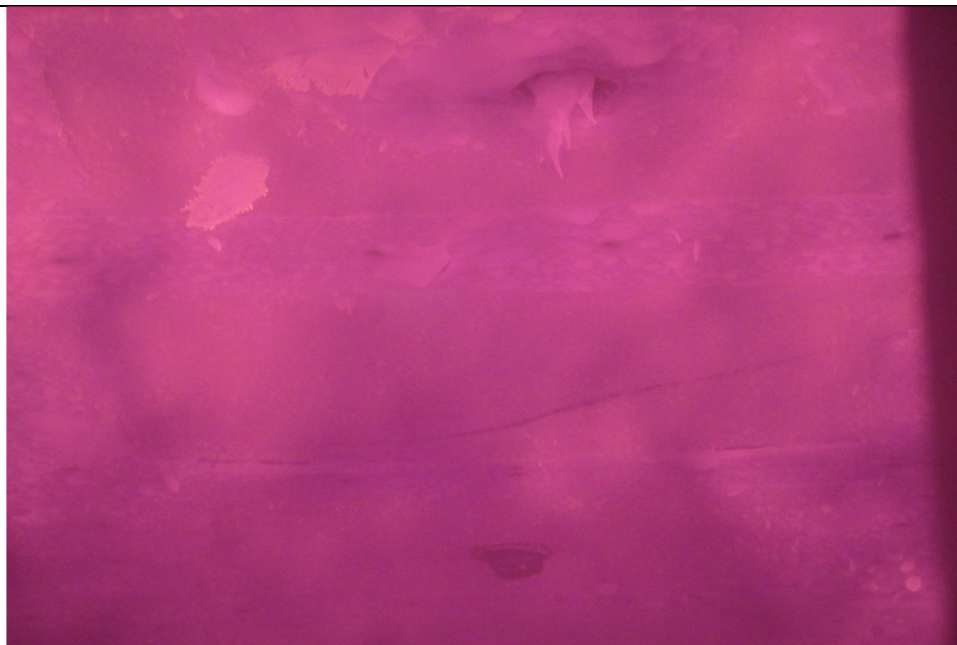
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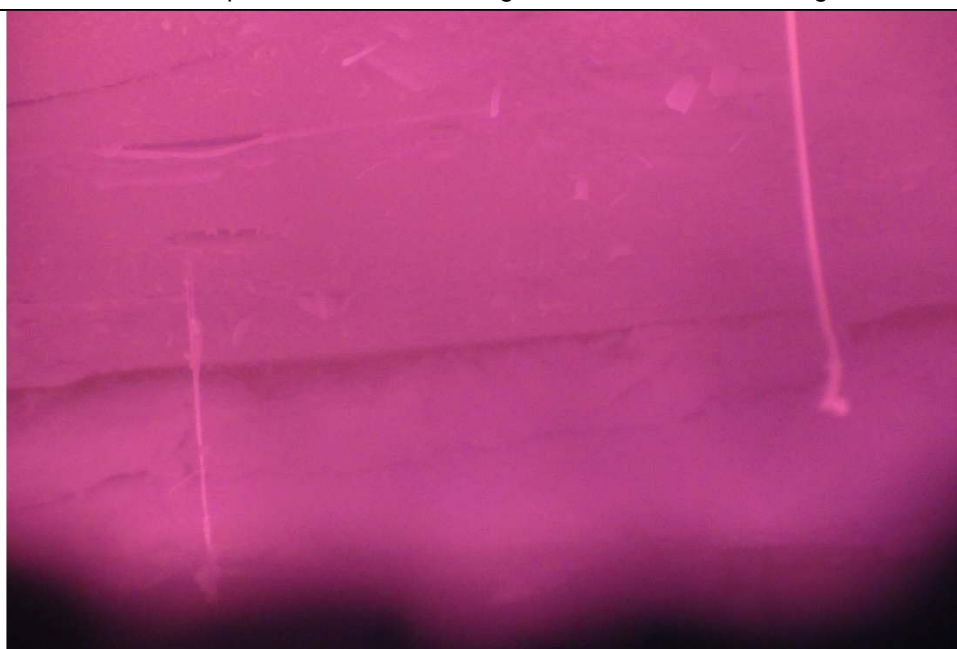
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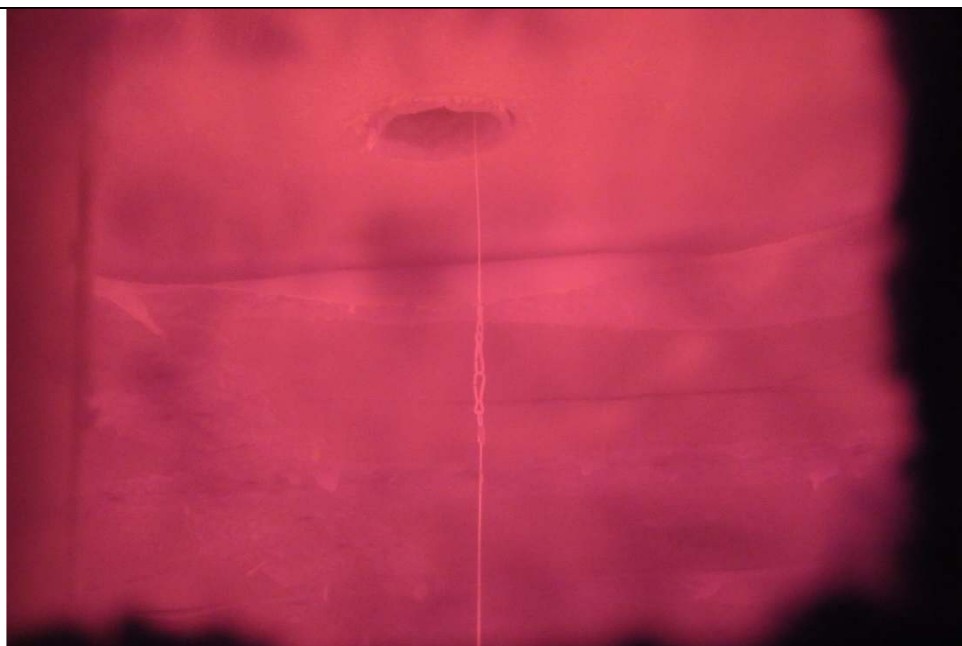
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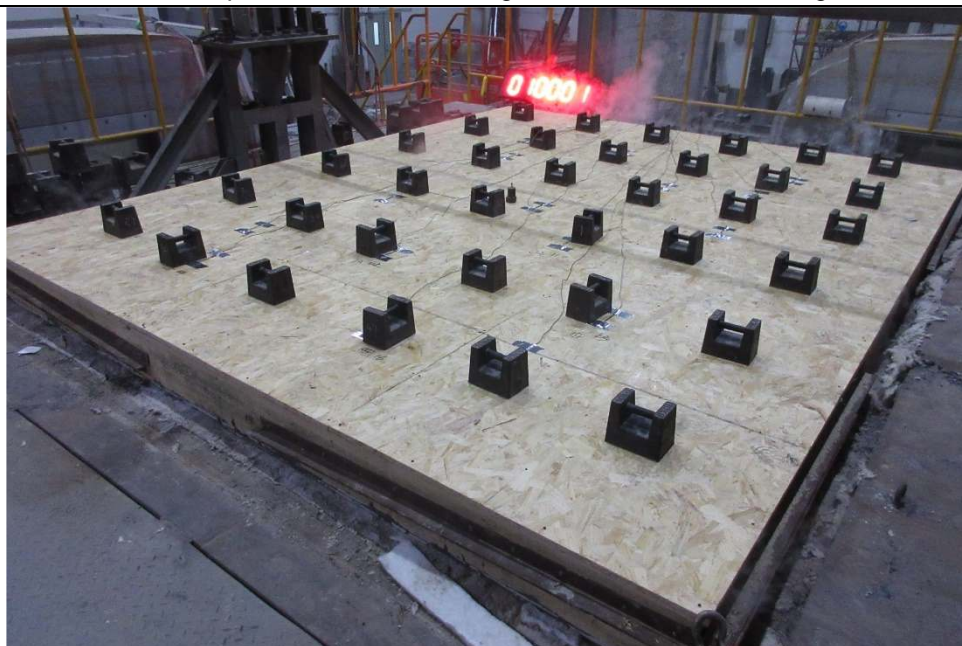
The exposed face of the ceiling after 30 minutes of testing



The exposed face of the ceiling after 31 minutes of testing



The exposed face of the ceiling after 50 minutes of testing



The unexposed face of the floor assembly after 60 minutes of testing

SGS authenticate the photo on original report only

End of Report



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