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Title:

Indicative fire test

WF Report No:

332065



Prepared for:

Intumescent Systems Ltd

Envirograf House
Barfrestone
Dover
Kent
CT15 7JG

Date: 12th November 2013

Indicative Fire Test

We have pleasure in enclosing the information obtained from the indicative fire test conducted, on your behalf, on the 9th August 2013.

The test results relate to an investigation, which utilised the heating and pressure conditions specified in BS EN 1363-1: 2012. The information is provided for the test sponsor's information only and should not be used to demonstrate performance against any published fire test standard, nor compliance with a regulatory requirement.

The test was not conducted under the requirement of UKAS accreditation.

The purpose of the investigation was to provide an indication of the behaviour of a section of a timber floor protected on its underside by a plasterboard ceiling incorporating three speakers and associated covers, when subjected on its underside to the heating and pressure conditions specified by BS EN 1363-1: 2012.

The test assembly had overall nominal dimensions of 1700 mm wide by 2200 mm long and briefly comprised three sections of softwood timber joist at nominally 600 mm centres. The ends of the joists were closed with a section of the same softwood joist fixed across the ends on both edges. The floor construction was faced on its upper surface with a single layer of nominally 22 mm thick chipboard flooring. The underside of the floor was provided with a direct fixed ceiling formed from two layers of 12.5mm thick Lafarge 'Firecheck' plasterboard. Three speakers with associated covers were fitted into the ceiling. The speakers were referenced A to C for the purpose of the test and were described by the sponsor as follows:

Specimen A was referenced "Monitor Audio CT165 Ceiling Speaker (Hoody 1)". The specimen had a nominal diameter of 265 mm by 160 mm high and was installed within a cut out aperture within the ceiling 211 mm diameter by 114 mm high.

Specimen B was referenced "Monitor Audio CT180 Ceiling Speaker (Hoody 2)". The specimen had a nominal diameter of 335 mm by 180 mm high and was installed within a cut out aperture within the ceiling 247 mm diameter by 121 mm high.

Specimen C was referenced "Monitor Audio CWT140R Ceiling Speaker (Hoody 5)". The specimen had a nominal diameter of 185 mm by 145 mm high and was installed within a cut out aperture within the ceiling 149 mm diameter by 98.6 mm high.

All three speakers were fitted with an Acoustic Fireproof Cover, provided by Intumescent Systems Ltd.

The floor assembly was mounted such that it formed the top horizontal face of a 1.5 m by 2.0 m gas fired furnace chamber, the temperature rise of which was controlled to conform with the heating and pressure conditions specified in BS EN 1363-1: 2012.

The following information relating to the test is enclosed:

- ◆ Table 1 - Specified and actual furnace temperatures and percentage tolerances
- ◆ Table 2 - Individual and mean temperatures recorded on the unexposed surface of the floor (Thermocouples 20 to 24)
- ◆ Table 3 - Individual temperatures recorded on the unexposed surface of the floor adjacent to joints. (Thermocouples 25 and 26)
- ◆ Table 4 - At three positions mid-height of the air cavity, adjacent to the speaker assemblies (Thermocouples 27 to 29)
- ◆ Graph 1 - Graph showing the specified and actual furnace temperatures

- ◆ Graph 2 - Graph showing the individual and mean temperatures recorded on the unexposed surface of the floor.
- ◆ Observations on the general behaviour of the specimens during the test.
- ◆ Photographs taken before and after the test.

The test was discontinued after a period of 90 minutes.

We trust that the information obtained from the test will be useful to you.

Yours faithfully,



Responsible Officer
D. Yates
Testing Officer
Fire Resistance Department
Exova Warringtonfire

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Table 1

Time Minutes	Specified Furnace Temperature Deg. C	Actual Furnace Temperature Deg. C
0	20	26
3	502	481
6	603	595
9	663	653
12	705	698
15	739	741
18	766	766
21	789	785
24	809	806
27	826	827
30	842	843
33	856	857
36	869	870
39	881	880
42	892	892
45	902	902
48	912	912
51	921	922
54	930	931
57	938	941
60	945	945
63	953	956
66	960	964
69	966	967
72	973	970
75	979	981
78	985	986
81	990	991
84	996	994
87	1001	999
90	1006	1004

Table 2

Time Minutes	T/C Number 20 Deg. C	T/C Number 21 Deg. C	T/C Number 22 Deg. C	T/C Number 23 Deg. C	T/C Number 24 Deg. C	Mean Temp Deg. C
0	21	21	22	23	22	22
3	21	21	22	23	22	22
6	21	21	22	22	22	22
9	21	21	22	23	22	22
12	21	22	23	23	23	22
15	22	22	25	24	23	23
18	23	24	28	25	25	25
21	24	25	34	26	26	27
24	26	27	45	28	28	31
27	28	28	59	29	30	35
30	29	30	71	31	31	38
33	31	32	78	32	33	41
36	32	33	84	34	34	43
39	34	35	85	35	36	45
42	36	37	87	37	38	47
45	38	39	90	38	39	49
48	39	40	92	40	41	50
51	41	42	95	41	42	52
54	42	43	98	42	43	54
57	44	45	102	43	45	56
60	46	47	108	45	47	59
63	48	52	119	48	51	64
66	52	57	130	53	56	70
69	57	62	141	58	61	76
72	62	66	151	62	65	81
75	66	70	159	66	69	86
78	69	72	166	69	71	89
81	72	74	170	72	73	92
84	74	76	176	74	75	95
87	75	77	181	76	76	97
90	78	79	191	78	79	101

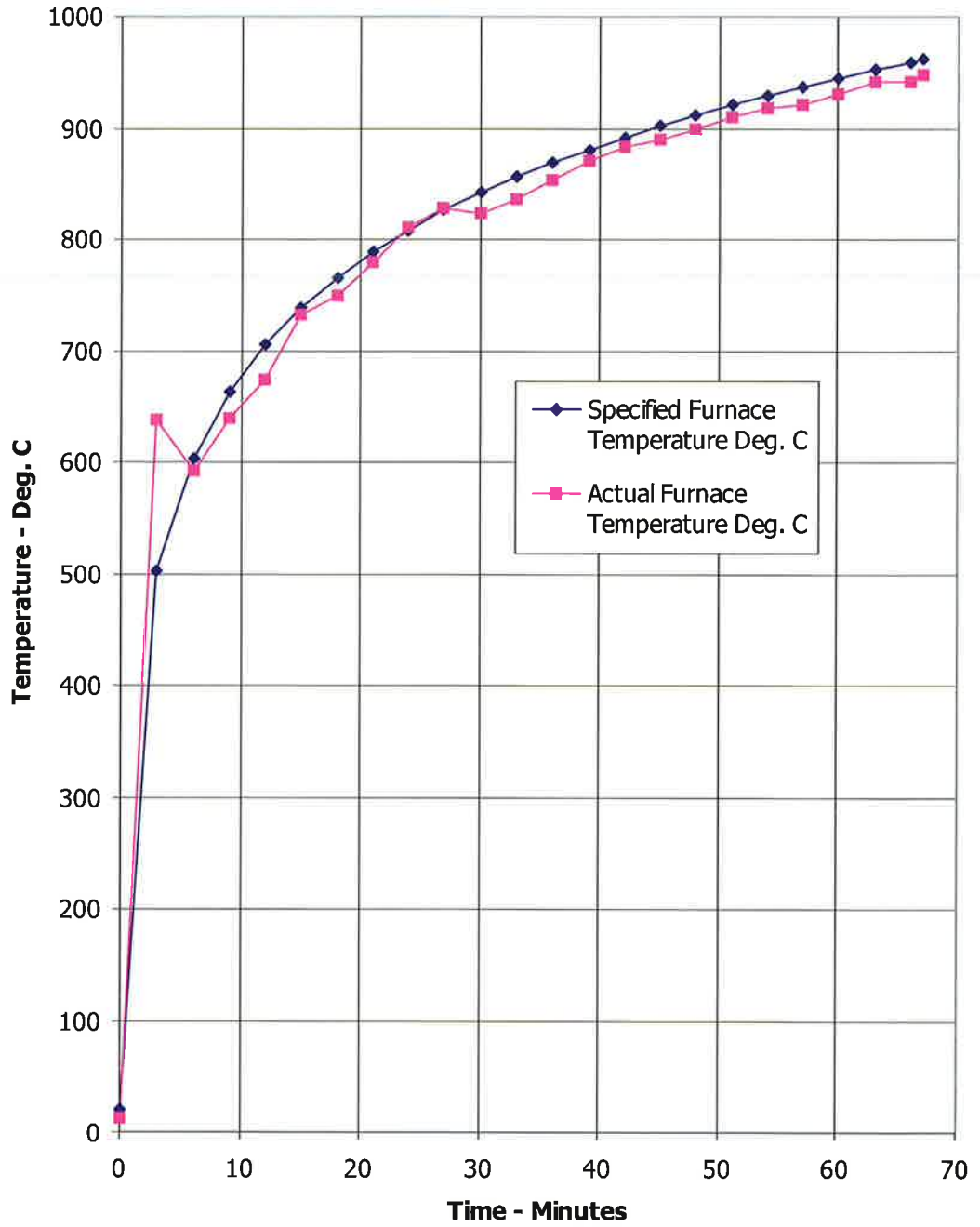
Table 3

Time Minutes	T/C Number 25 Deg. C	T/C Number 26 Deg. C
0	21	22
3	21	22
6	21	22
9	21	22
12	21	22
15	22	23
18	22	23
21	23	24
24	24	26
27	26	27
30	27	28
33	29	30
36	30	31
39	32	33
42	34	35
45	36	39
48	38	43
51	41	46
54	48	49
57	54	52
60	60	57
63	64	61
66	67	63
69	70	66
72	72	67
75	74	69
78	74	71
81	74	73
84	76	74
87	76	76
90	79	78

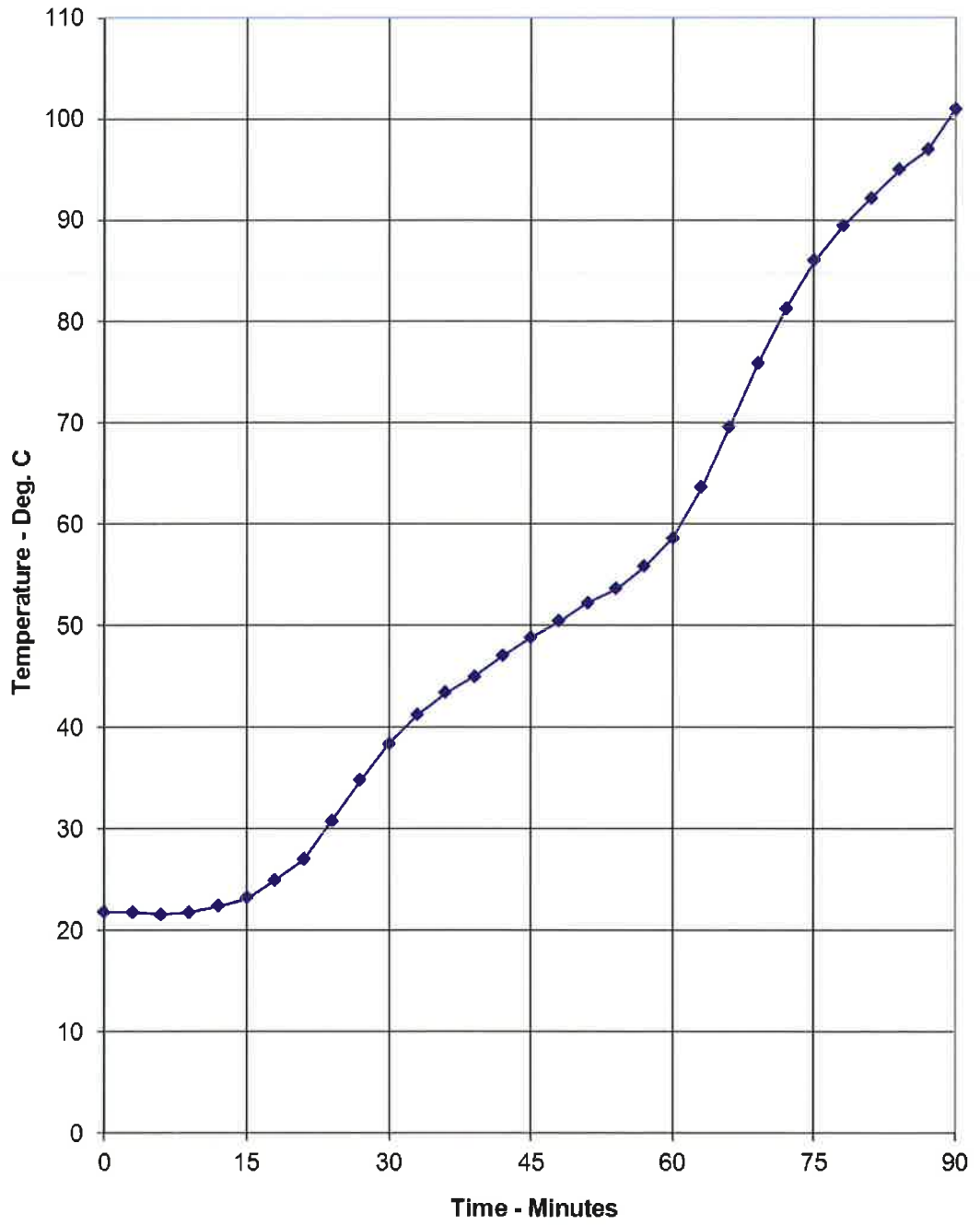
Table 4

Time Minutes	T/C Number 27 Deg. C	T/C Number 28 Deg. C	T/C Number 29 Deg. C
0	23	23	24
3	24	24	26
6	32	33	48
9	47	56	74
12	70	91	92
15	88	129	109
18	127	178	116
21	164	217	132
24	200	250	151
27	230	257	165
30	255	286	177
33	264	352	189
36	273	412	197
39	290	463	207
42	334	494	217
45	375	516	230
48	405	530	245
51	421	538	256
54	430	542	262
57	437	541	272
60	448	535	302
63	471	542	338
66	491	549	382
69	504	551	423
72	517	558	450
75	532	567	475
78	548	576	493
81	561	586	514
84	581	607	540
87	617	661	563
90	652	675	587

Graph 1



Graph 2



Test Observations

Time		All observations are from the unexposed face unless noted otherwise.
mins	secs	The ambient air temperature in the vicinity of the test construction was 21°C at the start of the test with a maximum variation of +4, -1°C during the test.
00	00	The test commences.
04	30	Slight smoke release begins from the joints within the timber deck.
05	30	Viewed from the exposed face, the paper face of the plaster board ceiling has begun to burn away. The plastic speaker facing of Specimens A and B appears to have melted and fallen away.
06	00	Viewed from the exposed face, the plastic speaker facing of Specimen C appears to have melted and fallen into the furnace.
11	20	Slight smoke release continues from along the joints within the timber deck. Slight discolouration is evident at the same locations.
30	00	The ceiling board joints appear black in colour and slightly charred. The circular apertures within the ceiling appear blackened and slightly charred also.
50	00	The board joints within the first layer of ceiling board have opened up by approximately 20 – 25 mm.
58	40	Viewed from the exposed face, a large section of the first layer of ceiling board has dropped downwards by approximately 30 – 35 mm as it begins to detach from the ceiling along the joint.
62	10	Smoke release from the joints within the timber floor has increased slightly. Discolouration has become more evident at the same location.
64	30	Viewed from the exposed face, flames issue from the circular openings within the ceiling. The first layer of the ceiling board has dropped down further along the joint now by approximately 50 mm.
71	30	Smoke release from the joints within the timber deck has increased further.
72	10	Viewed from the exposed face, a large section of the first layer of ceiling board continued to pull away from the ceiling now by approximately 150 – 200 mm.
73	10	A large section of the first layer of ceiling board has detached and fallen into the furnace chamber.
75	00	Smoke release has increased further along the timber deck joints.
78	55	A cotton pad is applied at the mid span of a timber deck joint but fails to ignite.
83	20	Viewed from the exposed face, large amounts of flaming issue from the circular apertures within the ceiling.

Time

mins secs

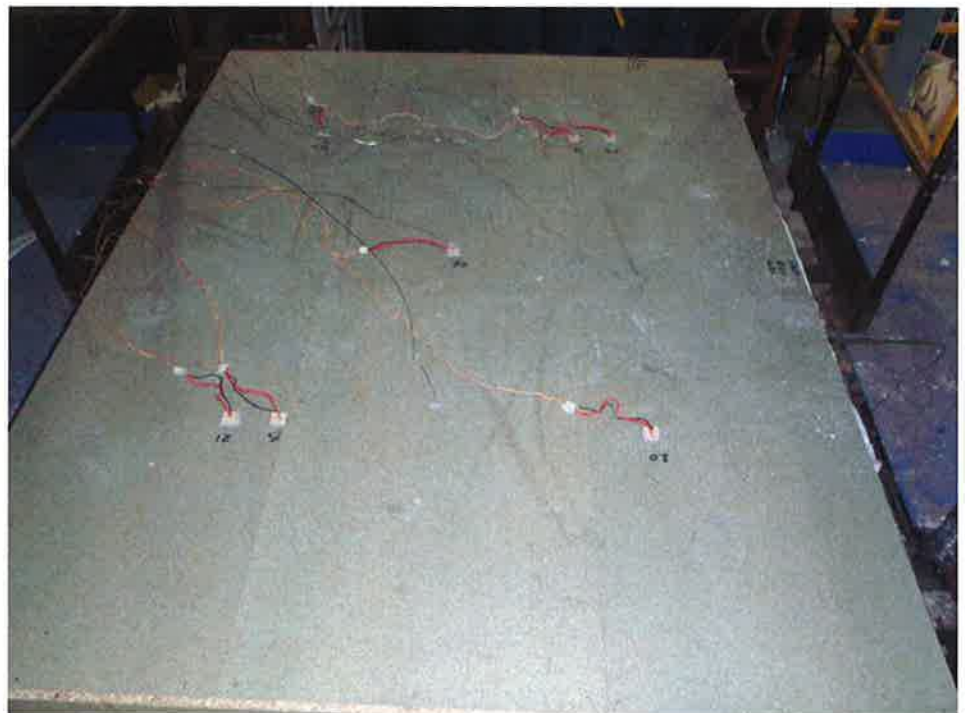
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|-----------|-----------|---|
| 84 | 40 | Smoke release from the joints within the timber deck has increased significantly. |
| 89 | 50 | A large section of the second layer of board begins to drop downwards at the approximate centre of the ceiling. |
| 90 | 00 | Smoke release from the ceiling increases significantly and the test is discontinued at the sponsor's request. |
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Test Photographs

The exposed face of the ceiling prior to the test.



The unexposed face of the ceiling prior to the test.



**The unexposed
face of the ceiling
after a test
duration of 30
minutes**



**The exposed face
of the ceiling after
a test duration of
30 minutes**



The unexposed face of the ceiling after a test duration of 60 minutes



The exposed face of the ceiling after a test duration of 60 minutes



The unexposed face of the ceiling after a test duration of 90 minutes



The exposed face of the ceiling after a test duration of 90 minutes



**The exposed face
of the ceiling
immediately after
the test**

