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Title:

Indicative Fire Test

WF Report No:

334623/B

Prepared for:

Intumescent Systems Ltd

Envirograf House
Barfrestone
Dover
Kent
CT15 7JG

Date: 19th December 2013

Indicative Fire Test

We have pleasure in enclosing the information obtained from the indicative fire test conducted, on your behalf, on the 1st November 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 ability of a penetration sealing system to maintain the fire resistance of a plasterboard partition where it has been penetrated by PVC air conditioning trunking, when subjected to the heating and pressure conditions specified by BS EN 1363-1: 2012.

The test assembly consisted of a plasterboard partition of overall nominal dimensions of 1500 mm high by 1500 mm wide by 100mm thick penetrated by two sections of galvanised steel trunking. The partition comprised a galvanised mild steel framework lined on each face by 2 layers of 12.5 mm thick 'Type F' gypsum board. Three PVC air conditioning trunkings where tested two at 204mm by 60mm cross-sectional area and the other at 220mm by 90mm cross-sectional area. The smaller of the two sizes was tested in a vertical and horizontal orientation. For the purpose of the test the specimen PVC air conditioning trunkings were referenced A, D and E. Other test specimens where incorporated in the test and these are reported separately.

Specimen A consisted of a PVC air conditioning trunking 204mm wide by 60mm high. The trunking was provided with consisted of two layers of 3mm thick Envirograf Multigraf intumescent sheet; one layer of No.3 grade and one layer No.2 grade wrapped in aluminium foil with an outer layer of Envirograf foiled FB70 cloth.

Specimen E consisted of a PVC air conditioning trunking 204mm high by 60mm wide. The trunking was provided with consisted of two layers of 3mm thick Envirograf Multigraf intumescent sheet; one layer of No.3 grade and one layer No.2 grade wrapped in aluminium foil with an outer layer of Envirograf foiled FB70 cloth.

Specimen D consisted of a PVC air conditioning trunking 220mm high by 90mm wide. The trunking was provided with an 'Envirograf Firoblok Ref:110V29'. The Firoblok consisted of 3 layers of 3mm thick Envirograf Multigraf No. 3 intumescent sheet material wrapped in aluminium foil with an outer layer of Envirograf foiled FB70 cloth.

The test construction was mounted such that it formed the front vertical 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 Specimen A. (Thermocouples 20 and 21)
- Table 3 - Individual temperatures recorded on the unexposed surface of Specimen D. (Thermocouples 26 and 27)
- Table 4 - Individual temperatures recorded on the unexposed surface of Specimen E. (Thermocouples 28 and 29)
- Graph 1 - Graph showing the specified and actual furnace temperatures

- Observations on the general behaviour of the specimens during the test.
- Photographs taken before, during and after the test.

The test was discontinued after a period of 130 minutes.

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

G. A. Edmonds

Responsible Officer
G. Edmonds
Senior Testing and Auditing Officer
Fire Resistance Department
Exova Warringtonfire

Table 1

Time Minutes	Specified Furnace Temperature Deg. C	Actual Furnace Temperature Deg. C
0	20	15
5	576	595
10	678	667
15	739	737
20	781	782
25	815	818
30	842	840
35	865	864
40	885	887
45	902	910
50	918	925
55	932	931
60	945	945
65	957	958
70	968	969
75	979	979
80	988	989
85	997	999
90	1006	1007
95	1014	1011
100	1022	1022
105	1029	1030
110	1036	1036
115	1043	1044
120	1049	1049
125	1055	1053
130	1061	1080

Table 2

Time Minutes	T/C Number 20 Deg. C	T/C Number 21 Deg. C
0	15	15
5	16	63
10	27	61
15	43	45
20	53	36
25	57	33
30	60	32
35	63	32
40	64	32
45	65	33
50	64	34
55	63	34
60	61	35
65	60	35
70	59	34
75	61	33
80	62	33
85	65	33
90	66	33
95	67	34
100	69	34
105	70	35
110	71	36
115	72	36
120	73	37
125	73	37
130	73	38

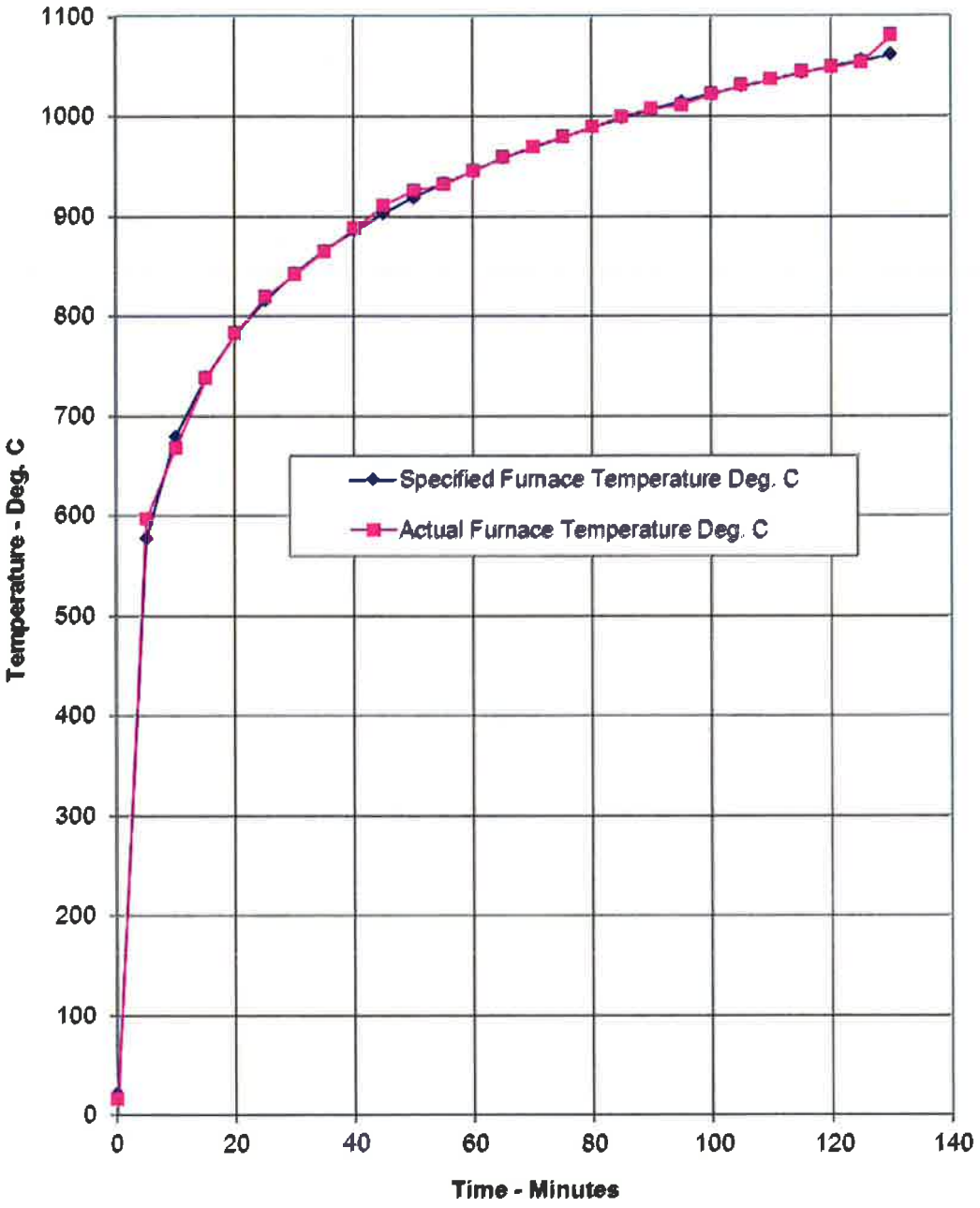
Table 3

Time Minutes	T/C Number 26 Deg. C	T/C Number 27 Deg. C
0	13	13
5	15	44
10	16	54
15	24	46
20	36	44
25	44	43
30	55	43
35	57	43
40	63	44
45	62	45
50	58	45
55	58	45
60	60	46
65	62	47
70	65	48
75	69	49
80	74	50
85	76	51
90	76	51
95	76	53
100	78	54
105	79	55
110	80	58
115	82	60
120	85	63
125	86	67
130	86	70

Table 4

Time Minutes	T/C Number 28 Deg. C	T/C Number 29 Deg. C
0	14	14
5	16	71
10	23	67
15	31	49
20	45	43
25	53	41
30	58	40
35	63	41
40	63	42
45	65	43
50	67	44
55	67	46
60	69	49
65	71	52
70	73	55
75	74	59
80	75	60
85	77	63
90	77	62
95	78	63
100	79	64
105	80	67
110	80	68
115	80	69
120	82	70
125	84	71
130	86	72

Graph 1

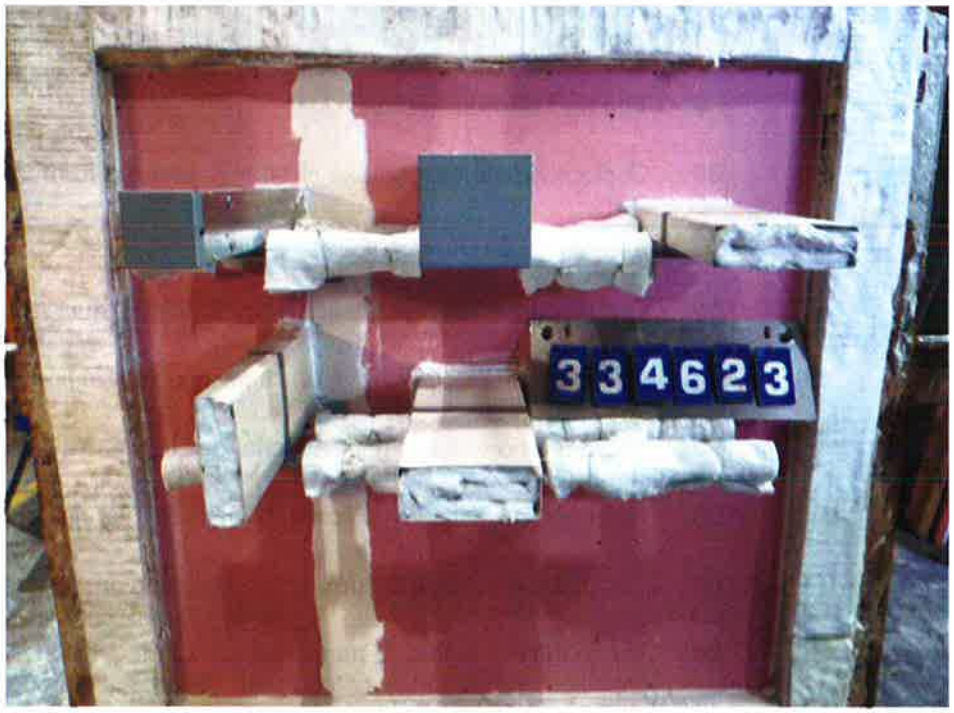

1100
1000
900
800
700
600
500
400
300
200
100
0
Temperature - Deg. C
0
20
40
60
80
100
120
140
Time - Minutes
Specified Furnace Temperature Deg. C
Actual Furnace Temperature Deg. C

Test Observations

Time		
mins	**secs**	
00	**00**	**The test commences.**
03	**00**	Copious amounts of smoke are being released form Specimen Duct E.
04	**00**	Smoke release from Specimen duct E decreases.
06	**00**	Fair amount of smoke release from Specimen duct A.
10	**00**	All of the plastic ducts have burnt away on the exposed face.
15	**00**	There are no visible significant changes to the test specimens on the unexposed face.
40	**00**	There are no visible significant changes to the unexposed face of the specimen.
50	**00**	The partition and steel trunking are radiating on the exposed face.
60	**00**	The partition, where it has been penetrated by the steel trunking, is satisfying the specified performance criteria with regards to through gaps, sustained flaming and cotton pad ignition on the unexposed face.
76	**00**	A small section of the intumescent material is being forced out from the underside of Specimen D.
90	**00**	The partition, where it has been penetrated by the steel trunking, is satisfying the specified performance criteria with regards to through gaps, sustained flaming and cotton pad ignition on the unexposed face.
110	**00**	Therefore no visible significant changes to the unexposed and exposed faces of the test construction.
120	**00**	The partition, where it has been penetrated by the steel trunking, is satisfying the specified performance criteria with regards to through gaps, sustained flaming and cotton pad ignition on the unexposed face.
128	**00**	Some small sections of intumescent material are falling away from Specimens D and E.
130	**00**	The partition, where it has been penetrated by the steel trunking, is satisfying the specified performance criteria with regards to through gaps, sustained flaming and cotton pad ignition on the unexposed face.

Test Photographs

The exposed face of the test construction prior to the test.



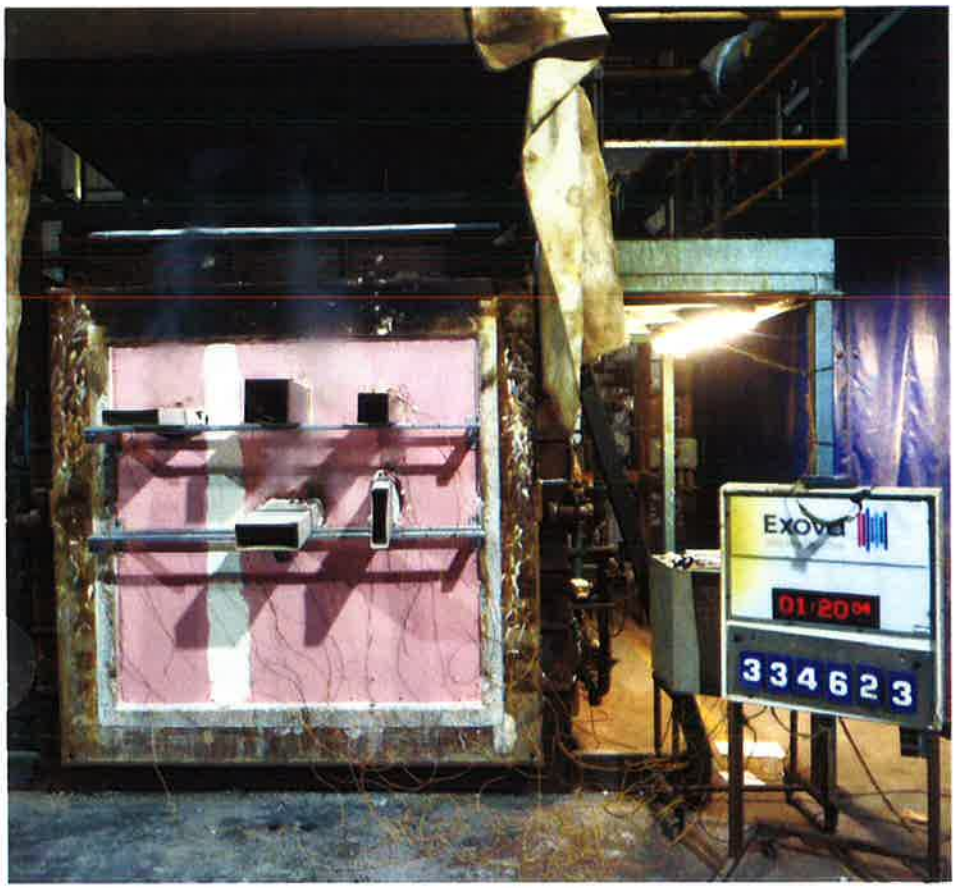
The unexposed face of the test construction after 20 minutes of testing.

The unexposed face of the test construction after 30 minutes of testing

The unexposed face of the test construction after 71 minutes of testing

The unexposed face of the test construction after 76 minutes of testing

The unexposed face of the test construction after 80 minutes of testing



The unexposed face of the test construction after 95 minutes of testing

The unexposed face of the test construction after 103 minutes of testing

The unexposed face of the test construction after 120 minutes of testing

The unexposed face of the test construction after 130 minutes of testing

The exposed face of the test construction shortly after the test