



25 May 2010

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To Whom it may concern,

Revalidation of report No IT360

This letter should be read in conjunction with Trada Technology Ltd report reference IT360. The test was carried out by Trada Technology Ltd on 14 May 1993, since renamed Chiltern International Fire Ltd. The test was accredited by NAMAS since renamed UKAS.

Testing was conducted to the principles of BS 476 Part 20. Since this test was carried out there have been no changes to the BS 476 Part 20 test standard, which remains valid and accepted at discretion by relevant authorities

The results only relate to the behaviour of the element of construction under the particular conditions of 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 specification and interpretation of fire test methods are the subject of ongoing development and refinement. Changes in associated legislation may also occur. For these reasons it is recommended that the relevance of test reports over 5 years old should be considered by the user. CIFL will be able to offer, on behalf of the legal owner, a review of the procedures adopted for a particular test to ensure that they are consistent with current practices, and if required may endorse the test report.

Results from fire test IT360

Specimen	Integrity	Insulation
A, B, D, E, F, G, H, I, J	122* (one hundred twenty two) minutes	**
C	86 (eighty six) minutes	**
Plywood panel	32 (thirty two) minutes	**

* No failure was recorded at the time of test termination.

** No insulation values were recorded during fire test IT360.

Mark Cummings
Head of Section – Fire Resistance

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25.05.2010



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CONFIDENTIAL

FIRE TEST SECTION

REPORT NO IT360

**REPORT OF A FIRE RESISTANCE TEST
PERFORMED ON VARIOUS PENETRATION SEALS
AND AN INTUMESCENT FINISH TREATED PLYWOOD PANEL**

FOR:

**COMPLETE FIRE PROTECTION LIMITED
1 QUEEN VICTORIA STREET
ST PHILIPS
BRISTOL
BS2 0QR**

DATE OF TEST:

14 MAY 1993

PROJECT NO :

TFETF30407

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Opinions and interpretations expressed herein are outside the scope of NAMAS accreditation.
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TRADA TECHNOLOGY LIMITED, STOCKING LANE, HUGHENDEN VALLEY, HIGH WYCOMBE, BUCKS HP14 4ND, UK

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1 INTRODUCTION

- 1.1 This test was performed at the request of the client, to determine the fire resistance performance of various penetration seals and a plywood panel when tested in accordance with the principles of BS 476 : Part 20 Series : 1987. The specimens were built into a blockwork wall forming one side of the test furnace.
- 1.2 The procedures adopted during the test followed the resolutions of the Fire Test Study Group, where appropriate. These resolutions provide the basis of common agreements between the consultant fire test laboratories in the UK, on areas of the test specification which may be ambiguous or open to interpretation.

2. TEST SPECIMENS

The specimens consisted of ten samples of various pipe and cable trunking penetration seals installed in a 100mm wide Thermalite blockwork wall forming one side of the furnace. They were all of different designs incorporating intumescent materials and were identified by the letters A - J. The specimens were installed along with their respective sections of upvc pipe, steel trunking or in preformed apertures in accordance with the client's instructions.

A plywood panel was installed, which had been treated with an intumescent finish, to the side of the pipework and electrical trunking.

General

The electrical trunking carried a bundle of pvc sheathed electrical cables of various diameters.

In general all upvc pipes and electrical trunking projected approximately 500mm each side of the Thermalite blockwork wall. The furnace end of the upvc pipes and the box section electrical trunking were packed with mineral wool to ensure that the hot gases and flames penetrated through the walls rather than via the open end. The non-fire side was left open to the atmosphere.

Specimen A

- 110mm diameter upvc pipe
- 50mm wide external bandage Firefly type 102 ref Fireplug FPB/100

Specimen B

- 150mm diameter upvc pipe
- 100mm wide external bandage Firefly type 102 ref Fireplug FPB/150

Specimen C

- 150mm diameter upvc pipe
- 150mm diameter intumescent pipe canister Firefly type 101 ref Fireplug FPC/150 fixed to the blockwork wall using 4 No 50mm long No 8 screws.

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Specimen D

- 110mm diameter upvc pipe
- 110mm diameter intumescent pipe canister Firefly type 101 ref Fireplug FPC/100 fixed to the blockwork wall using 4 No 50mm long No 8 screws.

Specimen E

- 50mm diameter upvc pipe
- 50mm wide external bandage Firefly type 102 ref Fireplug FPB/50

Specimen F

- 300mm² intumescent honeycomb grill ref Fireplug FPG/66

Specimen G

- 150mm x 30mm galvanised steel cable tray.
- 150mm x 50mm cable penetration intumescent plug ref Fireplug CTB/62

Specimen H

- 150mm x 50mm galvanised steel electrical trunking
- 150mm x 50mm internal cable penetration intumescent pad ref Fireplug ETC/63

Specimen I

- 80mm x 80mm galvanised steel electrical trunking
- 80mm x 80mm internal cable penetration intumescent pad ref Fireplug ETC/3

Specimen J

- 50mm x 50mm galvanised steel electrical trunking
- 50mm x 50mm internal cable penetration intumescent pad ref Fireplug ETC/2

Plywood Panel

The test specimen consisted of a 4mm thick plywood panel held in position using 10mm² softwood beading with a 30° chamfer in a 30mm² softwood frame. Two 0.5mm thick sheets of Firefly intumescent paper ref Fireplug CFPM were adhered to either side of the panel using Fireplug ICT intumescent finish. The entire panel then received two further coatings of Fireplug ICT intumescent finish and a top sealer coat ref Fireplug TSC.

The specimen was held in position within the blockwork wall using 63mm long No 8 steel screws.

3. TEST PROCEDURE

- 3.1 The furnace was operated to follow as closely as possible the temperature/time relationship specified in BS 476 : Part 20 : 1987.

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- 3.2 The furnace pressure was measured at a height level with the top of the test specimens and was continuously controlled as closely as possible after the first five minutes, to provide a pressure differential of 20 (\pm 2) Pascals for the duration of the test. This is the maximum pressure allowed under the provisions set out in BS 476 : Part 20 : 1987 : Section 3.2.2.
- 3.3 Observations were made during the test and these are recorded in Section 4. The comments refer to the unexposed side of the specimens unless otherwise stated.

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4. OBSERVATIONS

Time	Comments
00.00	Test started
06.00	Sample B, C and D, the exposed piece of pipework has melted, the intumescent starting to react. Sample F is now fully sealed up. Smoke is issuing out of samples I and H.
13.00	Sample A, B, C, D and E, intumescent has reacted further closing approx half of the aperture. Smoke is still issuing out of samples H, I and J.
15.00	All pipework (samples A - E) has partially sealed up with only a quarter of the aperture through to the furnace remaining. Copious smoke issuing from samples B, H and I.
17.00	Samples B and D, the apertures have almost completely sealed.
19.30	The intumescent inside samples H, I and J has not reacted yet.
23.40	Samples H, I and J, the intumescent starting to react now producing a slight bulge in the film. The intumescent within the canisters of samples C and D has now fully sealed up with only wisps of smoke coming through. Still very small holes visible and smoke issuing through samples A, B and C. The panel is starting to distort away from the furnace, slight discolouration in the top left corner and bottom right corner.
26.30	<p>A roving thermocouple reading was taken in the top left corner where temperature is just over 100°.</p> <p>Further discolouration occurring in the top corners approximately third of the way down, extensive distortion away from the furnace, smoke penetration coming through a pin hole in the face approximately third of the way up.</p>
29.00	Samples A and B, still very small holes visible through into the furnace.
32.00	The panel sample has discoloured approximately half of its face, the face is now vibrating.

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- 32.35 Panel gave way, burning through around the perimeter allowing it to fall down, constituting integrity failure.
- 34.00 Sample A, intumescent has fully reacted now with only a few wisps of smoke issuing. Sample B, still a small hole within the intumescent through to the furnace. Samples C and D have completely sealed although there is still some smoke issuing through. Sample E still has smoke issuing through having not fully sealed yet. Sample F has fully sealed. Sample G has not reacted yet but is not allowing any smoke through. Samples H, I and J the intumescent has reacted but there is still a hole of approximately a third of the area remaining.
- 41.50 Sample B, the intumescent has now fully reacted closing off the gap although it is still allowing the penetration of a few wisps of smoke. Sample C has sealed but still allowing smoke to penetrate. A few wisps also coming out of samples A, D and E, all of which appear to have sealed up. Samples H, I and J partially sealed but still have a hole approx quarter of the area still remaining.
- 56.00 Smoke still largely issuing out of sample C. The intumescent within samples H, I and J has still not fully closed the gap leaving a gap of approximately quarter of the area remaining. Sample F, the ventilation grill appears to have distorted producing a slight gap on the right hand side and the bottom of approx 1 - 2mm wide between the metal outer casing and the wall.
- 72.00 Samples H, I and J have holes through to the furnace, again just below a quarter of the cross sectional area remaining. Sample F, the ventilation grill, appears to have a 1-2mm gap almost all the way round the perimeter.
- 73.00 Sample B, the remainder of the pipework on the unexposed side has fallen away, although the intumescent plug has remained in position and there is no further smoke issuing through this aperture.
- 81.30 Samples H, I and J still have small holes through to the furnace approx one eighth of the cross sectional area. Sample C, there is still a small gap at the top of the intumescent seal, allowing smoke to penetrate through. Sample B, a small hole visible through the middle where only the intumescent is left remaining.

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85.00	Sample C, the remainder of the pipe has fallen off from the unexposed side, the intumescent has only partially blocked the aperture with approx an eighth of the area in gap showing through to the furnace.
86.00	A cotton pad integrity test was performed on the aperture of sample C, this resulted in ignition of the cotton pad constituting integrity failure. The aperture was blanked off with Rockwool to continue the test.
98.00	Samples H, I and J still have not fully sealed up yet.
120.00	Remaining specimens satisfactory.
122.00	Test terminated.

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5. **COMMENTARY**

None of the pipework or electrical trunking specimens showed any signs of imminent failure at the time of terminating the test at 122 minutes with the exception of specimen C. Specimen C failed the integrity criterion at 86 minutes when a cotton pad integrity test performed on it resulted in ignition of the cotton pad constituting integrity failure.

The plywood panel failed the integrity criterion at 32 minutes due to continuous flaming from the perimeter of the panel. The specimen was not evaluated for insulation.

6. **CONCLUSION**

When tested in accordance with the provisions of BS 476 : Part 20 Series : 1987, the specimens described in section 2 of this report achieved the following fire resistance performance ratings:

	Integrity
Specimens A, B, D, E, F, G, H, I, J	122* minutes
Specimen C	86 minutes
Plywood panel	32 minutes

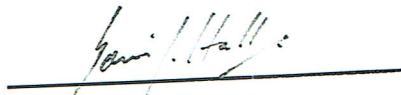
*No failure recorded at the time of test termination.

7. **INTERPRETATION**

The results of this test only relate to the behaviour of the specimen of the element of construction under the particular conditions of 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.



J P MULLETT
Officer Responsible for Test



Issued under the Authority of
Dr G S Hall

19 July 1993

Date of Issue

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