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Re: Indicative Fire Resistance Test Chilt/IF10090

This letter is to confirm the results of an indicative fire resistance test undertaken on 25th November 2010.

The specimen consisted of a section of floor fitted with two metal exhaust valves with associated ductwork.

Details of the test specimen

The overall size of the floor section was 1200mm wide x 1380mm long x 288mm deep.

The floor section comprised 245mm high x 45mm thick C24 softwood joists located at 525mm centres, fitted within the perimeter rimboard, with two layers of 12.5mm British Gypsum Fireline plasterboard (soffit). The first board layer was fixed with 41mm long timber drywall screws and the second board layer was fixed with 50mm long timber drywall screws, fixed at 210mm – 230mm centres. 18mm thick tongue and grooved chipboard decking was fixed to the top of the joists with 40mm long wood screws at 260mm centres.

Full height noggins were used to make four discrete voids, the voids were labelled from A through to C; void A being front left and void C being rear right. EV Metal Air Exhaust Valves were fitted voids B and C. Void A was used as a control reference.

Air exhaust valve void B was fitted in the rear left void, positioned centrally in the void between the joists and noggins, and was referenced 'Tenmat Fire Rated ceiling valve 125mm' incorporating a 4mm thick x 92mm diameter intumescent gasket. The valve assembly had a flange outside diameter of 165mm and an inside diameter of 97mm and the approximate height of the valve assembly was 58mm. The valve disc measured 98mm diameter, with a 6mm diameter threaded stud welded to it.

The valve assembly was screw fitted into a galvanised steel flanged tube, fitted through a 168mm diameter cut out in the plasterboard; a 15mm wide x 10mm thick (uncompressed) foam sealing ring was fitted between the valve and tube flanges. The flanged steel tube was held in place in the ceiling aperture with 4No. 25mm long wood screws. A 4mm thick x 92mm diameter disc of Tenmat intumescent material (details held on file in confidence by CIFL) was fitted to the exposed side of the valve disc.

A round to rectangular plastic elbow fitting and plastic duct were fitted to the valve on the unexposed face in the ceiling void. (See photographs of page 3)

Air exhaust valve void C was fitted in the rear right void, positioned centrally in the void between the joists and noggins, and was referenced 'Tenmat Fire Rated ceiling valve 100mm' incorporating a 4mm thick x 68mm diameter intumescent gasket. The valve assembly had a flange outside diameter of 140mm and an inside diameter of 72mm and the approximate height of the valve assembly was 55mm. The valve disc measured 74mm diameter, with a 6mm diameter threaded stud welded to it.

The valve assembly was screw fitted into a galvanised steel flanged tube, fitted through a 100mm diameter cut out in the plasterboard; a 15mm wide x 10mm thick (uncompressed) foam sealing ring was fitted between the valve and tube flanges. The flanged steel tube was held in place in the ceiling aperture with 4No. 25mm long wood screws. A 4mm thick x 68mm diameter disc of Tenmat intumescent gasket (details held on file in confidence by CIFL) was fitted to the exposed side of the valve disc.

A round to rectangular plastic elbow fitting and plastic duct were fitted to the valve on the unexposed face in the ceiling void. (See photographs of page 3)

The air valves were tested in the open position, with the exposed face of the valve disc flush with the face of the flange.

Photographs

Galvanised steel flanged tube fitted through plasterboard aperture

Fixing screws

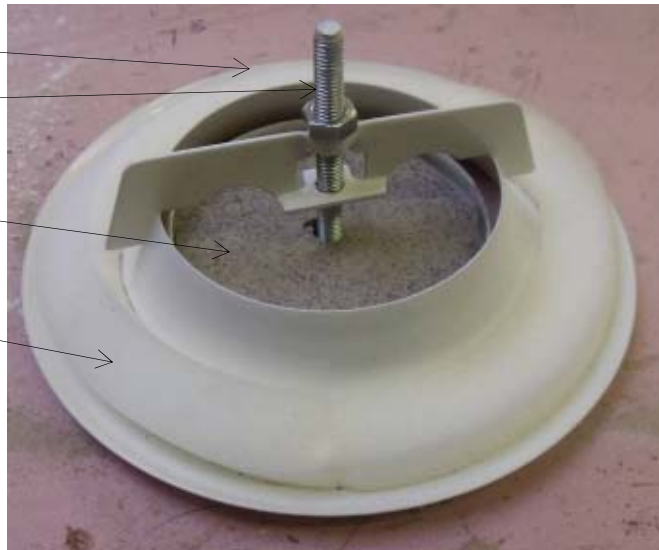


Air valve assembly

Valve threaded stud

Intumescent gasket fitted inside valve disc

Foam seal



Plastic ducts fitted to exhaust valves



Exposed face – before the beginning of the test

Air exhaust
valve - Void B



Air exhaust
valve - Void C

Exposed face – at the end of the test



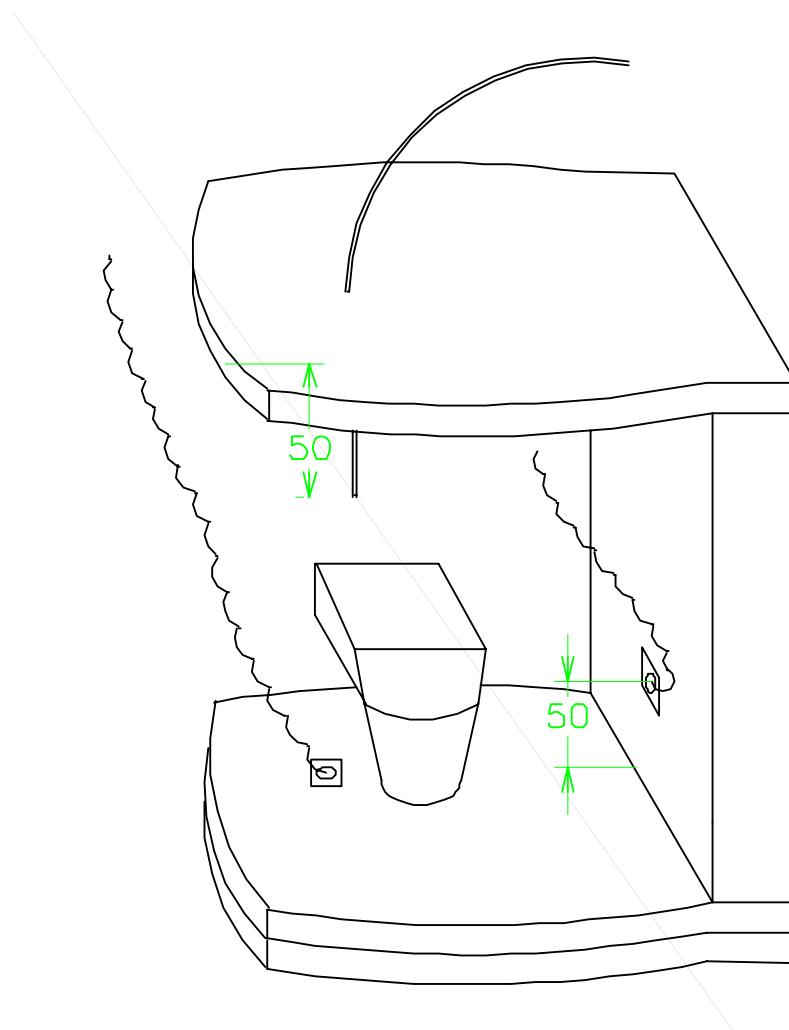
Test conditions

The furnace was controlled using the average of 4No furnace thermocouples to the temperature and pressure conditions outlined in BS 476: Part 20: 1987.

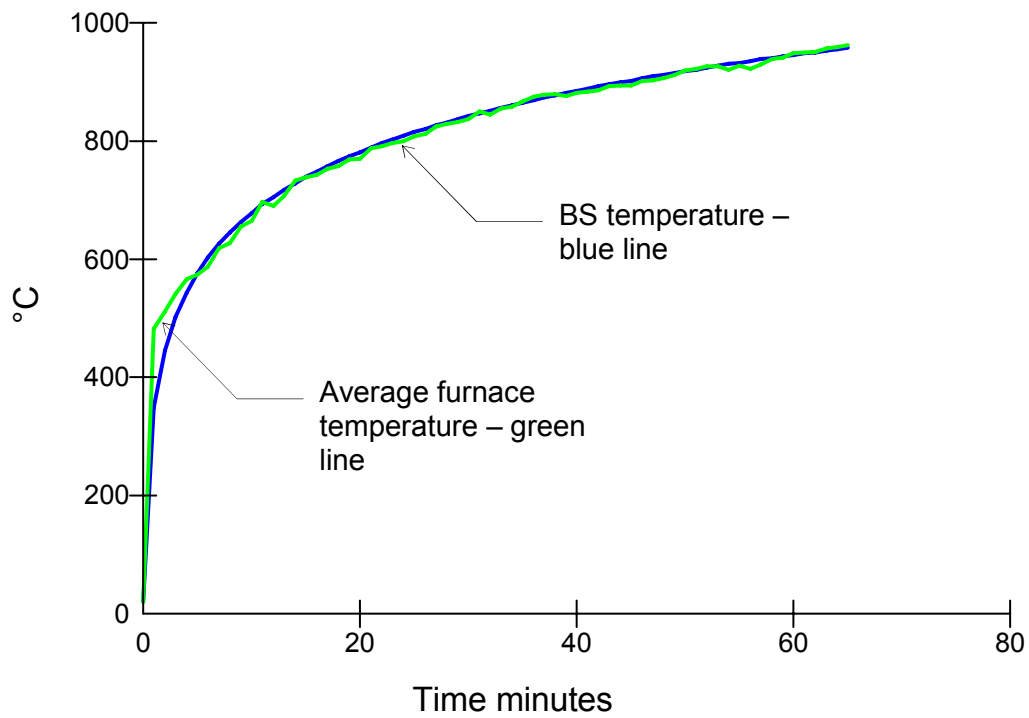
The ambient temperature of the laboratory at the start of the test was 14°C.

The pressure at the underside of the floor sample was maintained at 20 Pa.

There were 3 internal thermocouples installed into three of the discrete areas of the specimen; one was fixed 50mm up from the plasterboard and mid width to the central joist, one was fixed to the unexposed face of the plasterboard and one was a 1.5mm Ø probe thermocouple fixed through the chipboard decking, reading 50mm from the underside of the decking. (see below)

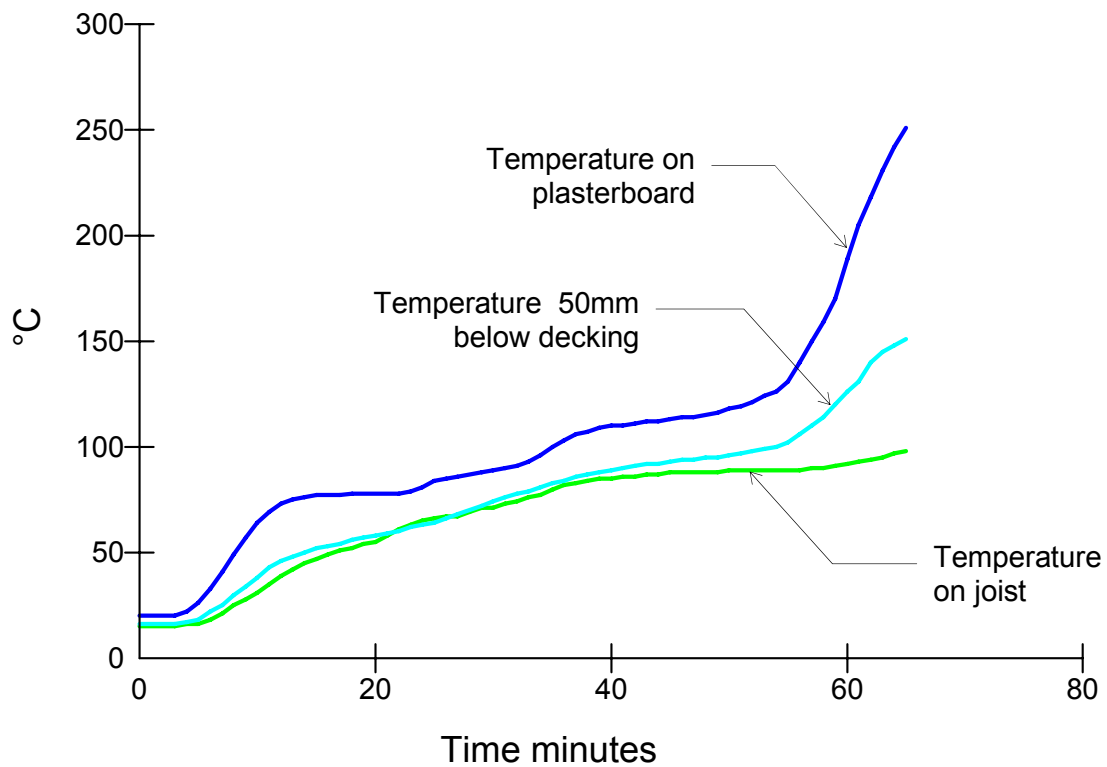


Furnace temperature curve

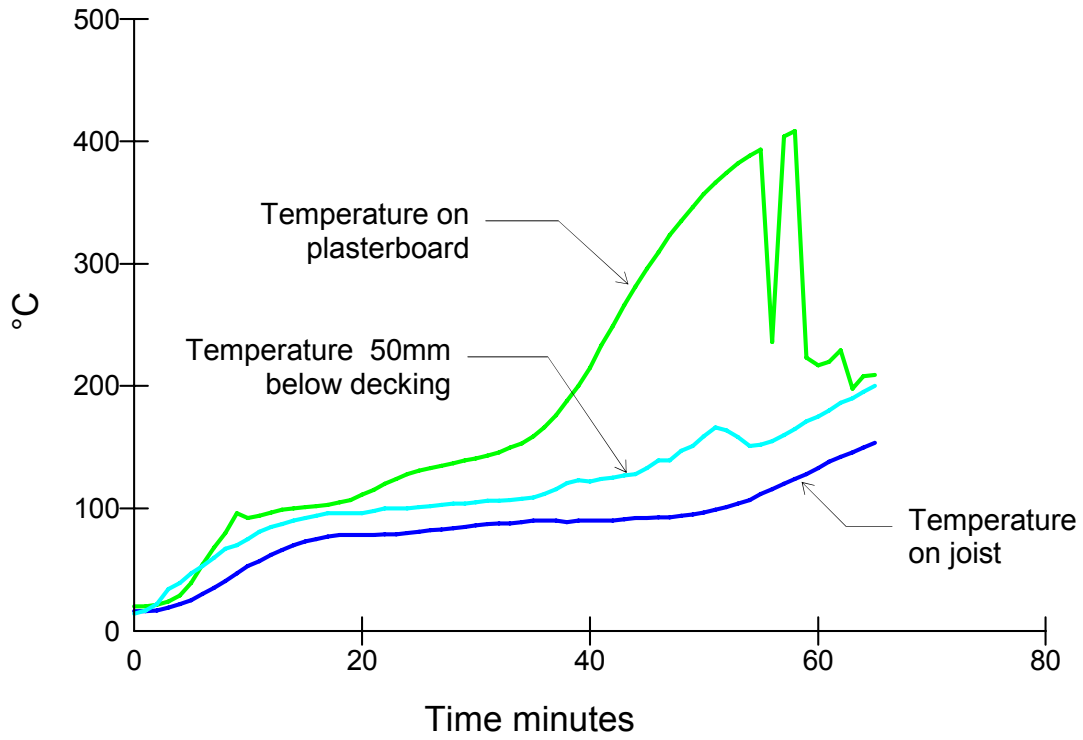


Void temperature curves

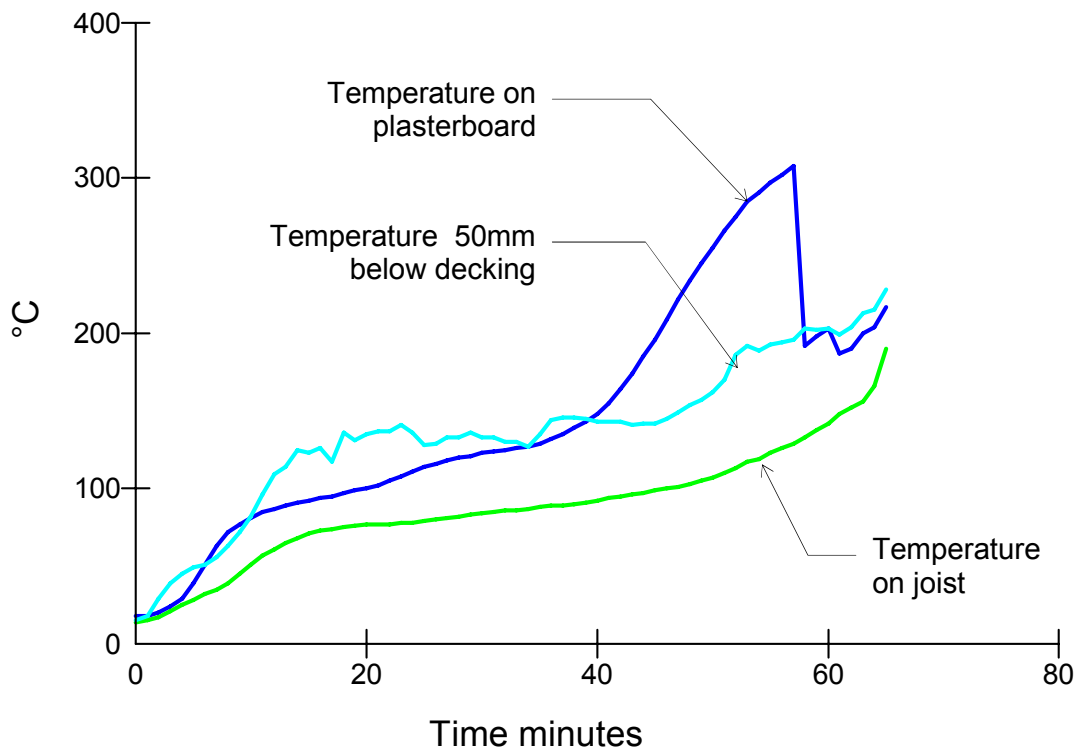
Void A (control reference)



Void B



Void C



Observations

All comments refer to the exposed face unless stated otherwise

Time (minutes)	Comments
00.00	Test started
06.00	The paper on the plaster board is starting to burn.
06.10	There is discolouration on the ceiling vent.
15.27	The jointing tape is falling away.
30.00	Temperatures recorded 50mm below underside of decking:- Void A: 74°C, Void B: 105°C, Void C: 133°C Temperatures recorded 50mm above the plasterboard on central joist:- Void A: 71°C, Void B: 86°C, Void C: 84°C Temperatures recorded on plasterboard:- Void A: 89°C, Void B: 141°C Void C: 123°C
45.00	The gap between the two first layers of the plaster board has opened to approximately 8mm.
47.20	There is slight sagging on the left hand side and right hand side of the boards
60.00	All fittings and plasterboard layers remain in position. There is a hairline crack in the first layer of the plaster board. There is a gap between the central join opened to approximately 15mm. Temperatures recorded 50mm below underside of decking:- Void A: 126°C, Void B: 175°C, Void C: 203°C Temperatures recorded 50mm above the plasterboard on central joist:- Void A: 92°C, Void B: 133°C, Void C: 142°C Temperatures recorded on plasterboard:- Void A: 189°C, Void B: 217°C, Void C: 203°C
66.00	Test terminated. All plasterboard is still in place.

Post test observations:

There was a crack to both layers of the plaster board. There is no char to the side of the joists in any of the cavities. There is approximately 1-2mm charring on the bottom ends of the joists where they meet the plasterboard.

Primary Observations

Time (minutes)	Observation
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- | | |
|-------|---|
| 30.00 | Temperatures recorded 50mm below underside of decking:-
Void A: 74°C, Void B: 105°C, Void C: 133°C
Temperatures recorded 50mm above the plasterboard on central joist:-
Void A: 71°C, Void B: 87°C, Void C: 84°C
Temperatures recorded on plasterboard:-
Void A: 89°C, Void B: 141°C Void C: 123°C |
| 60.00 | All fittings and plasterboard layers remain in position. There is a hairline crack in the first layer of the plaster board. There is a gap between the central join opened to approximately 15mm.
Temperatures recorded 50mm below underside of decking:-
Void A: 126°C, Void B: 175°C, Void C: 203°C
Temperatures recorded 50mm above the plasterboard on central joist:-
Void A: 92°C, Void B: 133°C, Void C: 142°C
Temperatures recorded on plasterboard:-
Void A: 189°C, Void B: 217°C, Void C: 203°C |
| 66.00 | Test terminated. All plasterboard is still in place. |

Post test observations:

There was a crack to both layers of the plaster board. There is no char to the side of the joists in any of the cavities. There is approximately 1-2mm charring on the bottom ends of the joists where they meet the plasterboard.

Whilst this report relates to an investigation, which utilised the exposure conditions given in BS476: Part 20: 1987, the full requirements of the test standard were not complied with. The information is provided for the test sponsor's information and should not be used to demonstrate performance against the standard nor compliance with regulatory requirements.

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

Yours sincerely



Robert Axe
Deputy Section Leader



Ross Newman
Principal Test Engineer