Design development and testing of Plasterboard systems

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Fire test summary report of the test at Exova Warrington on a non –loadbearing external wall system when tested in accordance with BS EN 1364 -1:2015 on 10 November 2015. Report No BMT F 15246

This test had the external wall panels exposed to the fire. 50 % Sponsorship came from Siniat Ltd

1 Construction Details – Specimen size 3000 mm H x 3000 mm W x 179mm thick

Timber frame structure - 120 x 38 mm CLS studs at 400 mm centres with top and bottom rails the same .
Steel SHS post --In the centre of the frame there was a hot rolled steel post 80x80 x 6mm .
Insulation – 100 mm Knauf Earthwool loft roll at 10 kg/ m3 friction fitted.
External wall panels – 31 mm thick Excel CladEx comprising of Ravatherm XPS bonded to plastisol steel sheet, nominal width 1200 mm, screwed to the timber frame.
Sheathing board – 12.5 mm Weather Defence Board screwed to the timber frame
Internal Lining – single layer15 mm vinyl Mega Excel board fixed to the timber frame with drywall screws and Unibond Megagrip . Screws were hidden behind plastic male and female Tee trims.

2 Testing Details

The furnace was operated in accordance with BS EN 1363-1:2012 using plate thermocouples.
The specimen was fixed to the concrete test frame using 100x 6 mm long concrete screw anchors at 600 mm centres , top , bottom and down one side .The RHS vertical edge was free.
Thermocouples were fixed onto the studs, onto the steel post, onto the sheathing boards and onto the unexposed 15 mm vinyl faced vinyl Mega Excel board in accordance with recommended practice .

3 Observations during the test

Progress of the fire on the unexposed Mega Excel side viewed from within the control room.
At 16 mins the PVC trims fell down from the CladEx
At 30 mins the joints in the CladEx opened up
At 42 mins the plastisol steel facing fell away exposing the Weather Defence board
Between 52 and 54 mins the vinyl surface on the Mega board was bubbling with steam pockets
At 60 mins there was a glowing gap at the top of the wall but no failure of insulation or integrity.
Between 60 mins and 77 mins all the plastic trims had fallen away.
The test was stopped at 77 mins when flames came out at the top of the test specimen.

4 Summary of the test results – 60 minutes Fire Resistance was achieved.

Integrity E – flaming at 77 mins
Insulation I –no failure shown on the unexposed side thermocouples at 60 mins
Steel Post – no failure, the mean temperature on the post was 400 deg C at 60 mins

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