Design development and testing of Plasterboard systems

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Date 01 Dec 2015

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 13 November 2015. Report No BMT F 15247

This test had the internal 15 mm vinyl Mega Excel lining exposed to the fire.

1 Construction Details – Specimen size 3000 mm H x 3000 mm W x 177mm 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 and OSB
Sheathing board – 11 mm OSB 3 board screwed to the timber frame with 50mm drywall screws.
Internal Lining – single layer15 mm vinyl Mega Excel board fixed to the timber frame with 50 mm 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
Thermocouples were fixed onto the studs, onto the steel post onto the sheathing boards and onto the unexposed face of the Excel CladEx in accordance with recommended practice .

3 Observations during the test

It was possible to look into the back of the furnace through fire proof windows and to view the progress of the fire on the unexposed external side from within the control room.
At 10 mins the PVC trims fell down from the vinyl Mega Excel boards
At 30 mins the joints in the vinyl Mega Excel boards started to open up by about 10 mm
At 40 mins the joints on the Mega Excel boards were opened with a 40 mm gap exposing the timber studs
At 50 mins the timber studs and OSB were burning, as seen through the fire proof windows
At 57 mins a 10 mm wide gap opened up down the RHS of the CladEx
At 60 mins there was no failure of insulation or integrity and the 15mm Mega Excel boards did not fail
The test was stopped at 63 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 63 mins
Insulation I –no failure shown on the unexposed side thermocouples at 60 minutes
Steel Post – the mean temperature on the SHS post was > 500 deg C at 60 mins but no failure

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