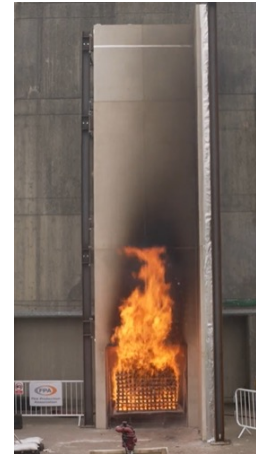


Peace of Mind from Cladding Fire Test

Tony Jones
Technical Director
The Concrete Centre



Why we did the test

- Concrete achieves a fire classification of A1 in accordance with BS EN 13501-1 without the need for test*.
- This is confirmed in the European Commission 96/603/EC**

* Subject to is containing less than 1% by volume or weight organic material.

** This was copied over into UK legislation on Brexit.

Why we did the test

- Industry now uses A1 classified insulation for nearly all applications.
- Systems tend to be independent of internal lining material so choice of lining not relevant to the system.
- Structural Resistance to fire can be demonstrated through design (BS EN 1992-1-2)

Why we did the test

- In Summary the vast majority of pre-cast concrete cladding satisfies Regulatory and the Approved Document B requirements - without the need for testing!
- But....

Why we did the test

- Uninformed clients request test evidence*
- Seemingly irrational increases in insurance premiums
- An opportunity to demonstrate the performance of concrete cladding for promotional purposes.
- To set a benchmark??

* Need to manage the risk that clients begin to expect it for each project!!
(BS9414 not really written with this type of cladding in mind)

Who was involved

- Project funded by MPA Precast.
- Cladding Panels fabricated by members.
- Erection carried out under supervision of member*.
- Fire Test to BS8414-2:2020** carried out by the Fire Protection Association (FPA).

* New rig also designed/constructed by members due to change in code and heavier specimen.

** Additional panels fabricated, to reflect higher sample size compared with previous revision of BS8414.

Details of the Test Specimen

- 150mm thick Min C32/40 wet cast concrete panels, designed to EC2 and manufactured to BS8297:2017
- 150mm mineral wool insulation
- Double mastic seal between panels.

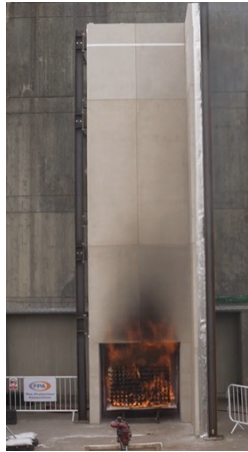
Details of the Test Specimen



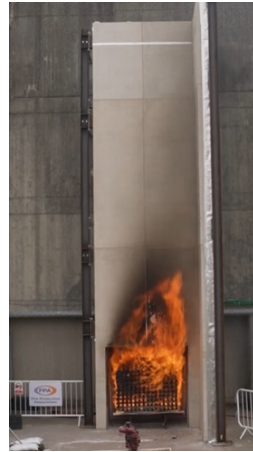
The Test



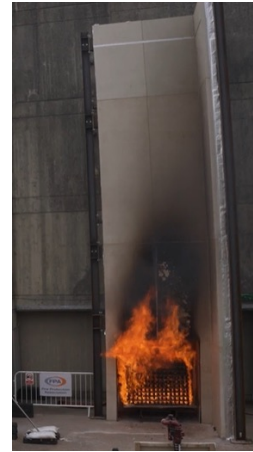
1 min



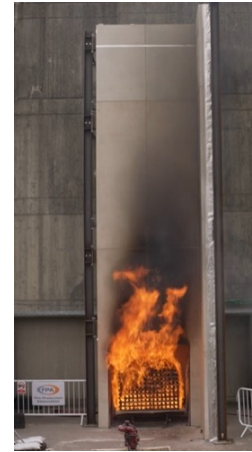
5 min



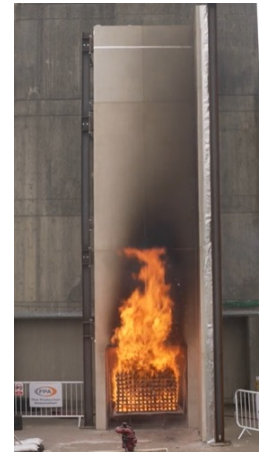
10 min



15 min

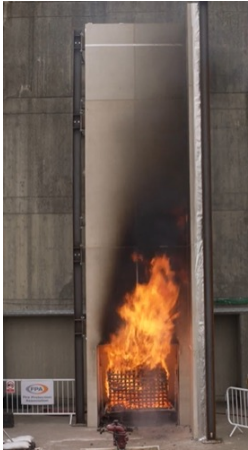


20 min

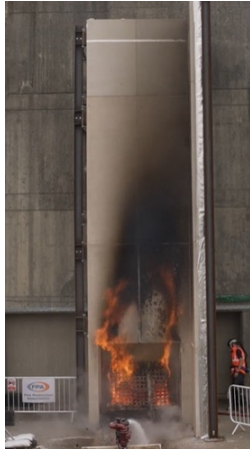


25 min

The Test



30 min



31 min



32 min



60 min

Test Results

- Full test report available:
<https://www.mpaprecast.org/Publications/FPA-Customer-Test-Report.aspx>



FPA
Fire Protection Association

CUSTOMER TEST REPORT

BS 8414-2:2020 Test Report with Classification in Accordance with BR135

Prepared by:
The Fire Protection Association
London Road
Moreton-in-Marsh
Gloucestershire
GL56 0RH

Prepared for:
MPA Precast
The Old Rectory,
Main Street,
Glenfield,
LE3 8DG

Report Date(s): 14/02/2022
Test Sponsor Reference: Precast Concrete Façade
Report Reference: 103138.002
Version number: 1.2

SYSTEM BRIEF DETAIL:
Report detailing the testing and classification of a precast concrete structural member used in a fire-resisting external cladding system tested in accordance with the requirements as described in British Standard 8414



10536

Test Results

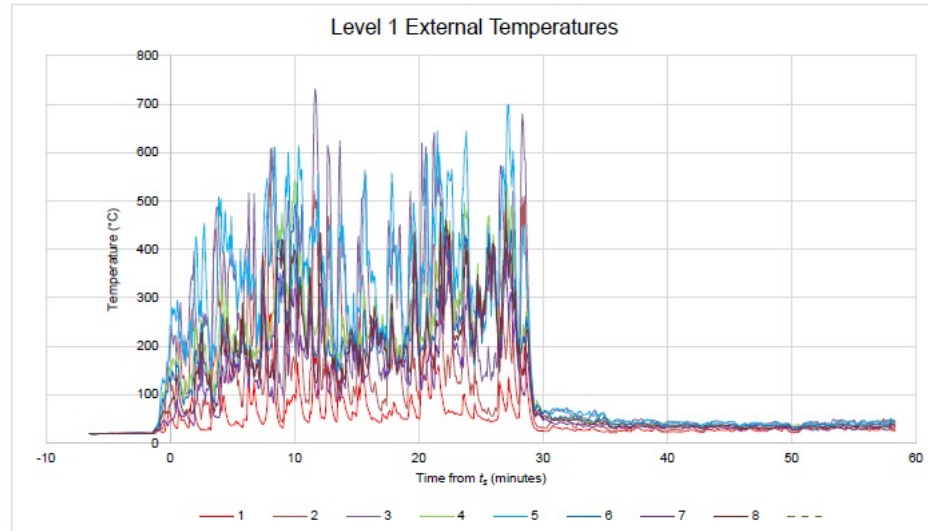
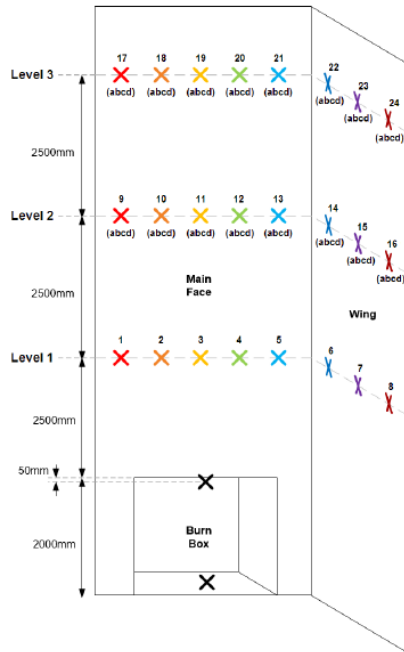


Figure 3 – External temperatures at level 1

Test Results

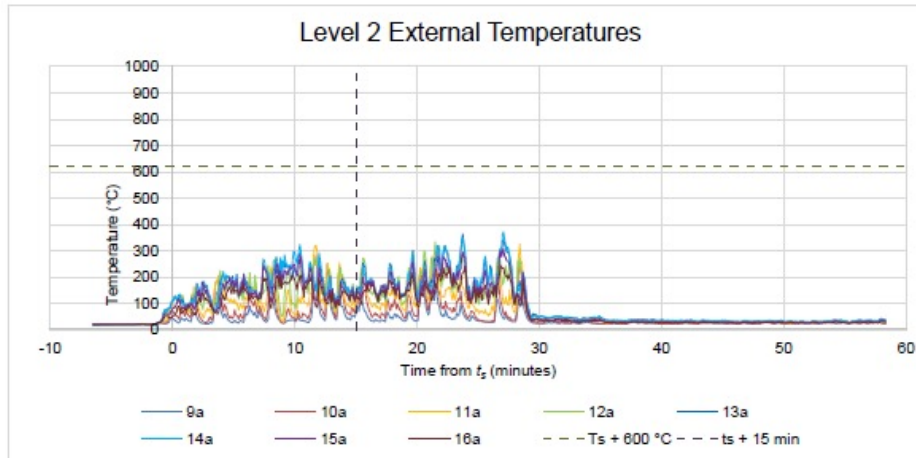


Figure 4 External temperatures at level 2

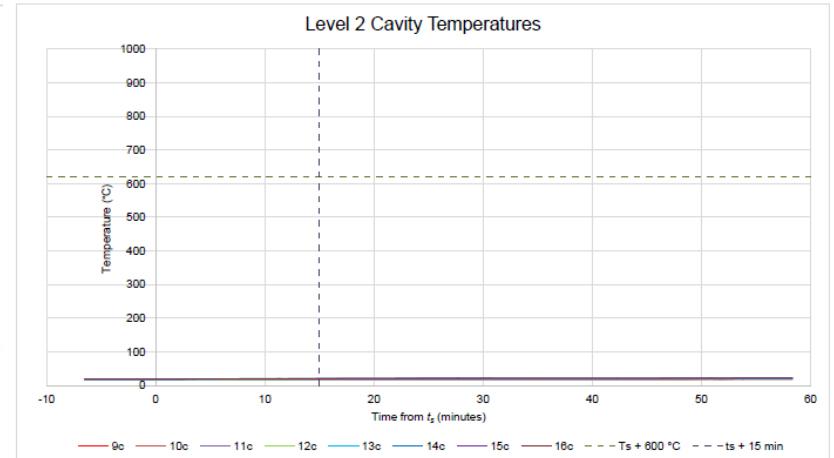


Figure 6 – Cavity internal temperatures at level 2

Test Results

- The specimen past the criteria in BR135 with ease

6.3 System Performance

Table 5 – System performance

Test criteria	Requirement met/not met
System tested to full duration	Requirement Met
External fire spread	Requirement Met
Internal fire spread	Requirement Met

Other Observations

- Minor surface spalling to one panel only. No conclusive reason why this panel spalled and the one next to it did not.
- Spalling seemed to originate from aggregate particles.
- Max depth less than 10mm, no deeper delamination found.
- Simple to repair with appropriate repair mortar.



Summary

- Nonetheless - to help inform other parts of the construction industry MPA precast commissioned FPA to carry out a fire test to BS8414-2:2020.
- Not a system test but general proof of performance.
- As expected the test passed the criteria in BR135 with ease.

Summary

- The test results can be seen as a “Benchmark” for peace of mind from external cladding.
 - i.e. rather than just satisfying the criteria in BR135 does the solution give equivalent performance to non-combustible systems?
- After cleaning minor spalling was observed to one panel that was straight forward to repair.

Further Information

- Non-combustibility of concrete facades :
<https://www.mpaprecast.org/Publications/The-Non-Combustibility-of-Concrete-Facades.aspx>
- Providing peace of mind in fire :
<https://www.mpaprecast.org/Technical/Fire-Performance.aspx>