



SAFETY  
DESIGN  
IN  
BUILDINGS

# Overcoming Challenges Of Fire Compartmentation Of Façades

Presented By:

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**SIDERISE INSULATION LTD**

Doha Conference – Crowne Plaza – The Business Park – Oct 16<sup>th</sup> 2019

# Course Description



This presentation will review types of compartmentation, the functional and testing requirements of perimeter barrier firestop systems and cavity barriers in global market and Routes to compliance through large scale system tests like NFPA 285 and BS 8414

# Learning Objectives



- 1.FUNDAMENTALS REQUIREMENTS FROM FIRST PRINCIPLES
- 2.TYPES OF COMPARTMENTATION
- 3.CRITICAL INTERFACE BETWEEN SLAB EDGE AND CURTAINWALL
- 4.COMPARTMENTATION WITHIN EXTERNAL FAÇADE ASSEMBLIES

# FUNDAMENTALS



## WHAT IS REACTION TO FIRE

CLASSIFICATION

A1, A2, B1 ETC

## WHAT IS RESISTANCE TO FIRE

MEASUREMENT

INTEGRITY (E) OR FIRE RATING

INSULATION (I) OR TEMPERATURE (T)

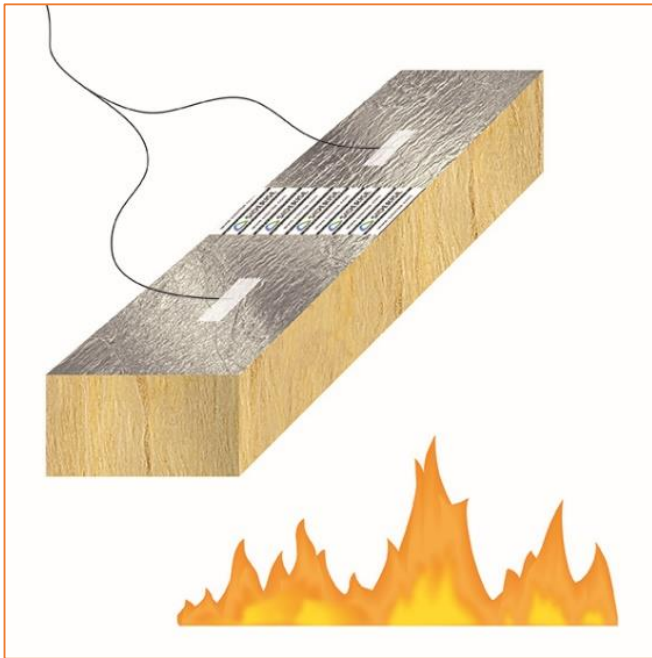
30 MINUTES, 60 MINUTES, 90 MINUTES

120 MINUTES



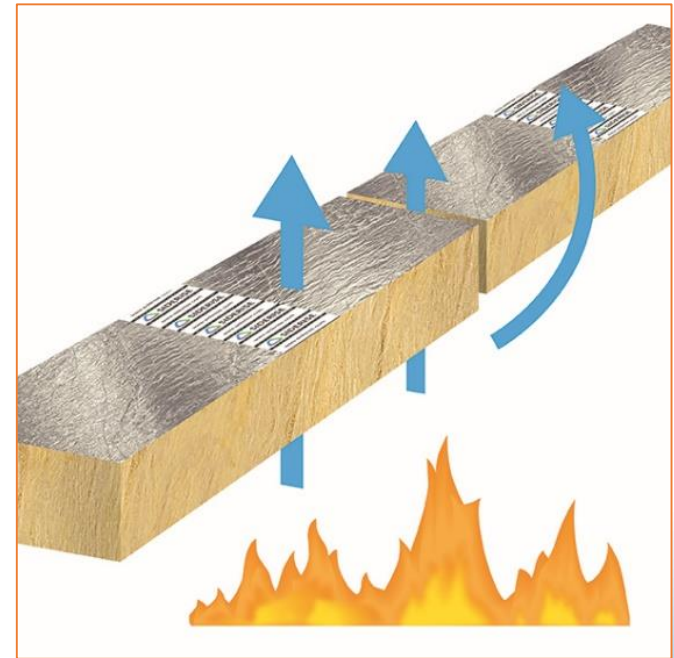
# HOW IS RESISTANCE MEASURED

## INSULATION



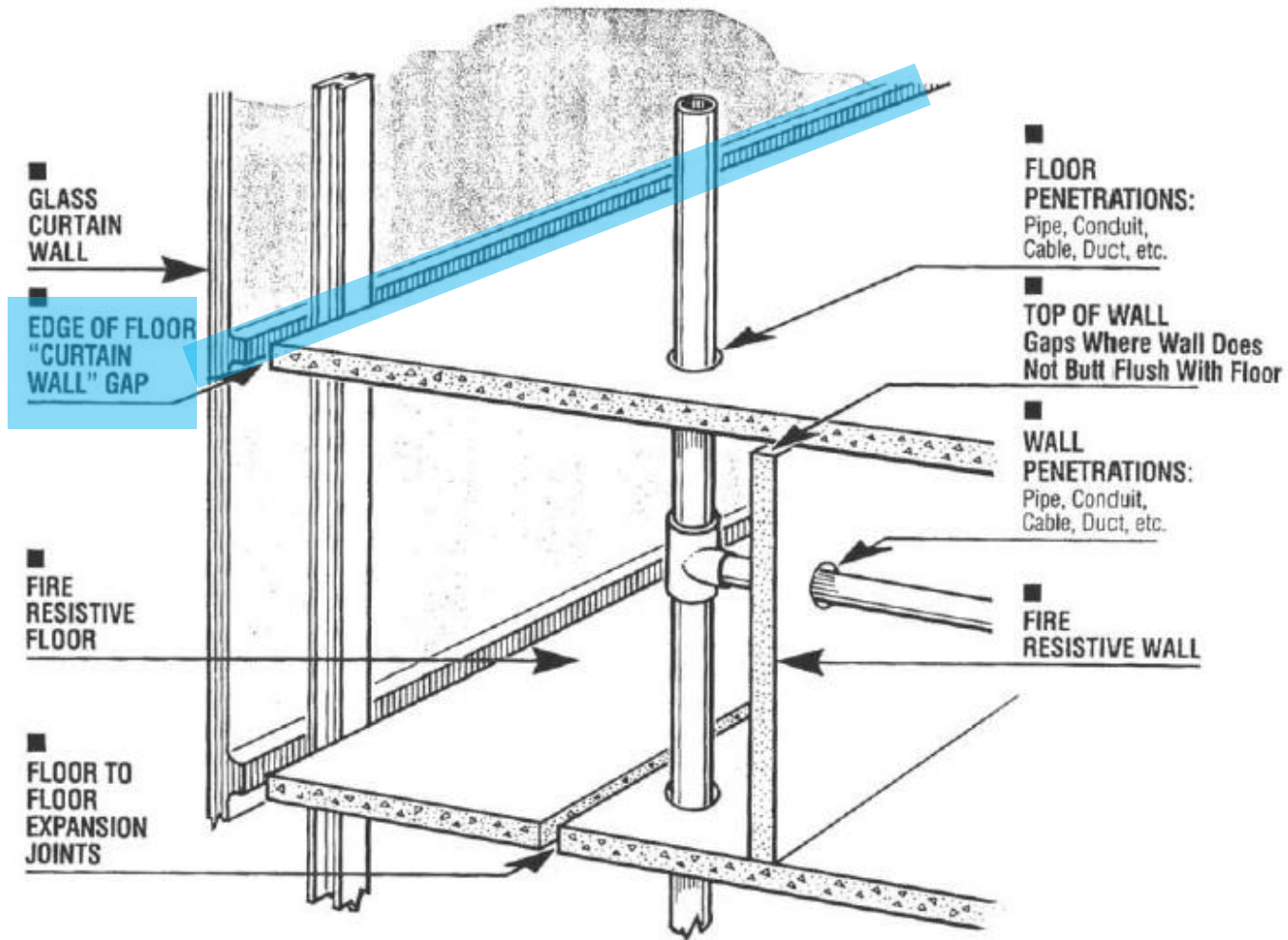
Conducted heat  
Ambient plus 180 °C

## INTEGRITY



Flame, smoke and gases

# WHERE ARE THESE LOCATED



# PRIMARY FUNCTION



Continuity of fire resistance

# HOW ARE THE PERFORMANCE MEASURED – TEST STANDARD

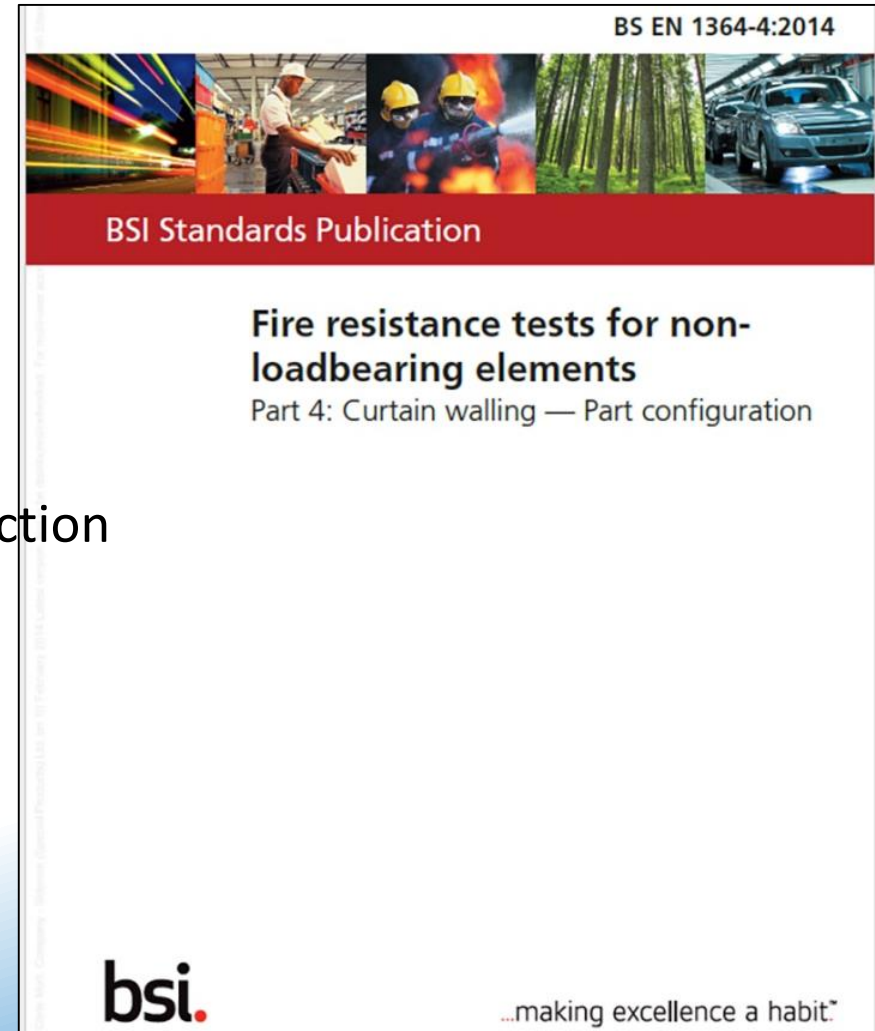
## EN 1364 PART 4

### Fire resistance test for non-loadbearing elements

Part 4: Curtain walling

Part configuration

- Test of compartment floor: spandrel junction
- Models movements of curtain wall and the floor during a fully developed/ flashed over fire.
- Perimeter seal under the most duress





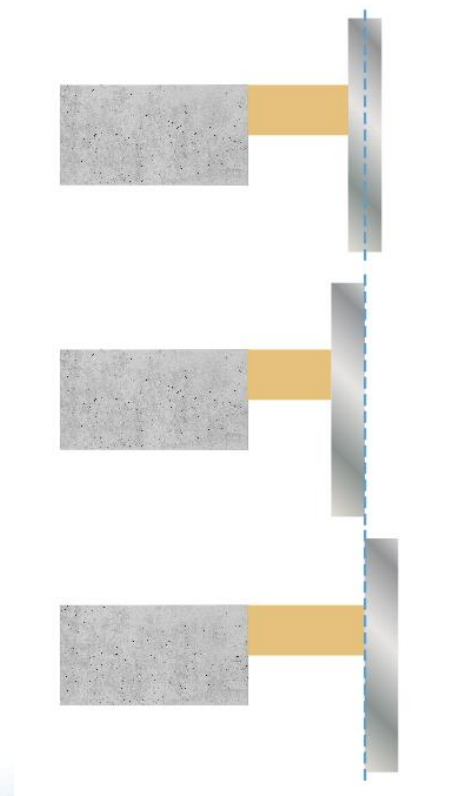
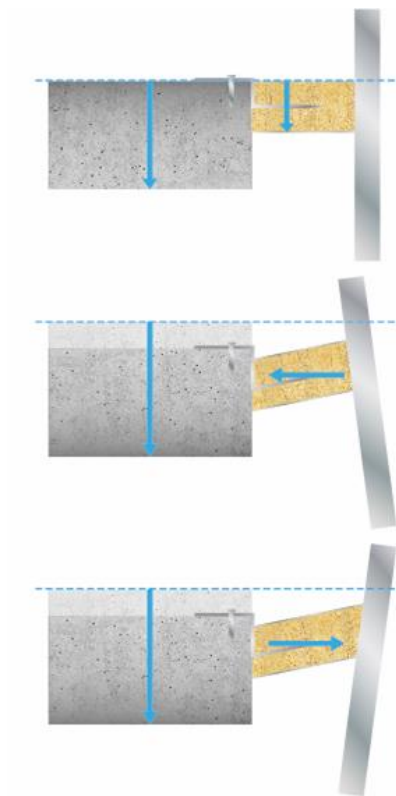
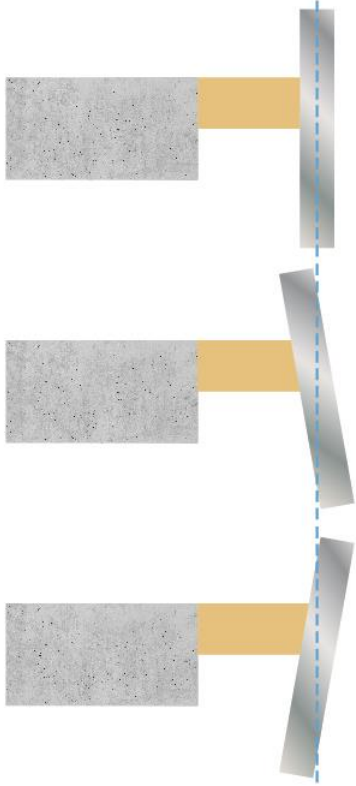


# HOW ARE THE PERFORMANCE MEASURED – TEST STANDARD

ASTM E 2307



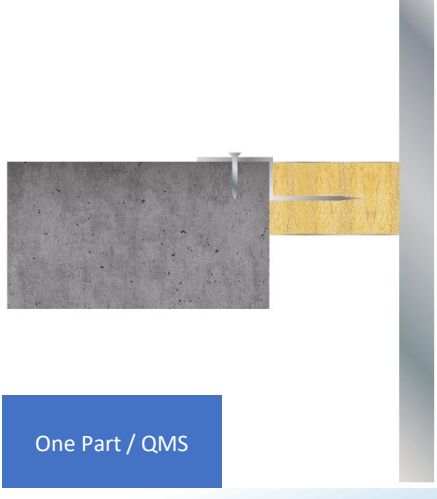
# FUNCTIONAL REQUIREMENTS



# CONVENTIONAL SYSTE,



# COMPLIANT SYSTEM



# HOW TO COMPLY



Legal requirements

Testing to specified standards  
at approved labs

Certification by approved labs

C.O.C as per system specification

Compliant

Test standard

System assembly

Audited products



intertek

# BUILDING FIRES



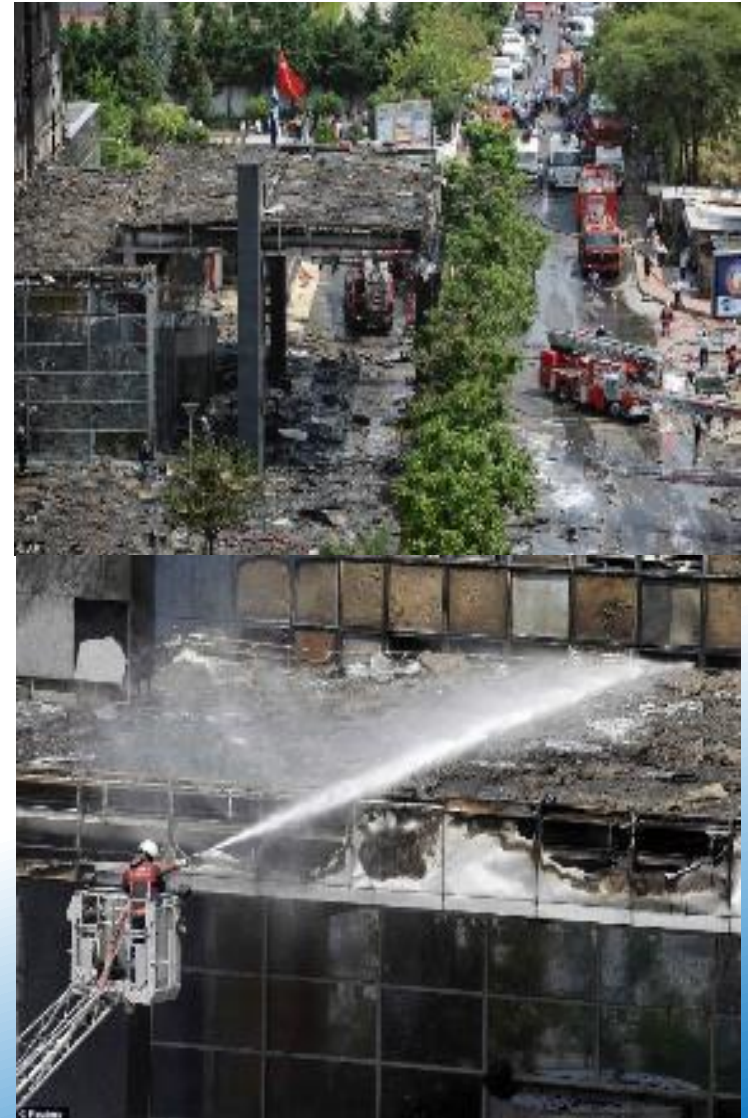
# CAVITY BARRIERS

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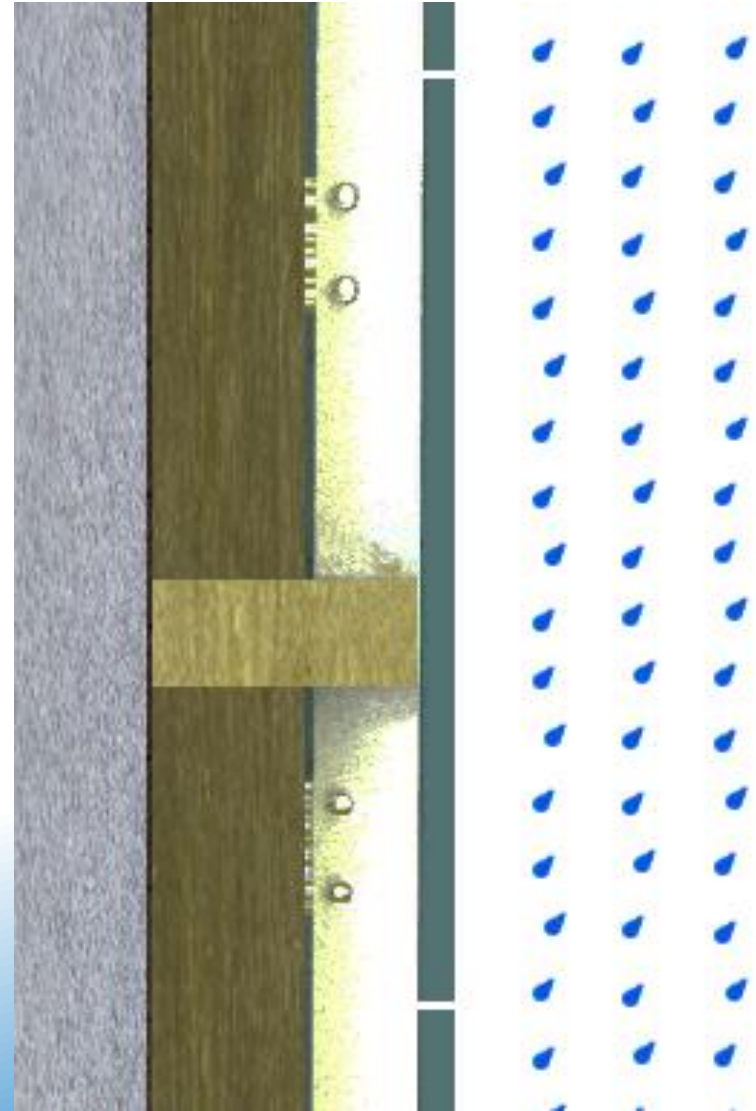


# POLAT TOWER, INSTANBUL



# CAVITY BARRIER IN EXTERNAL FAÇADE ASSEMBLIES

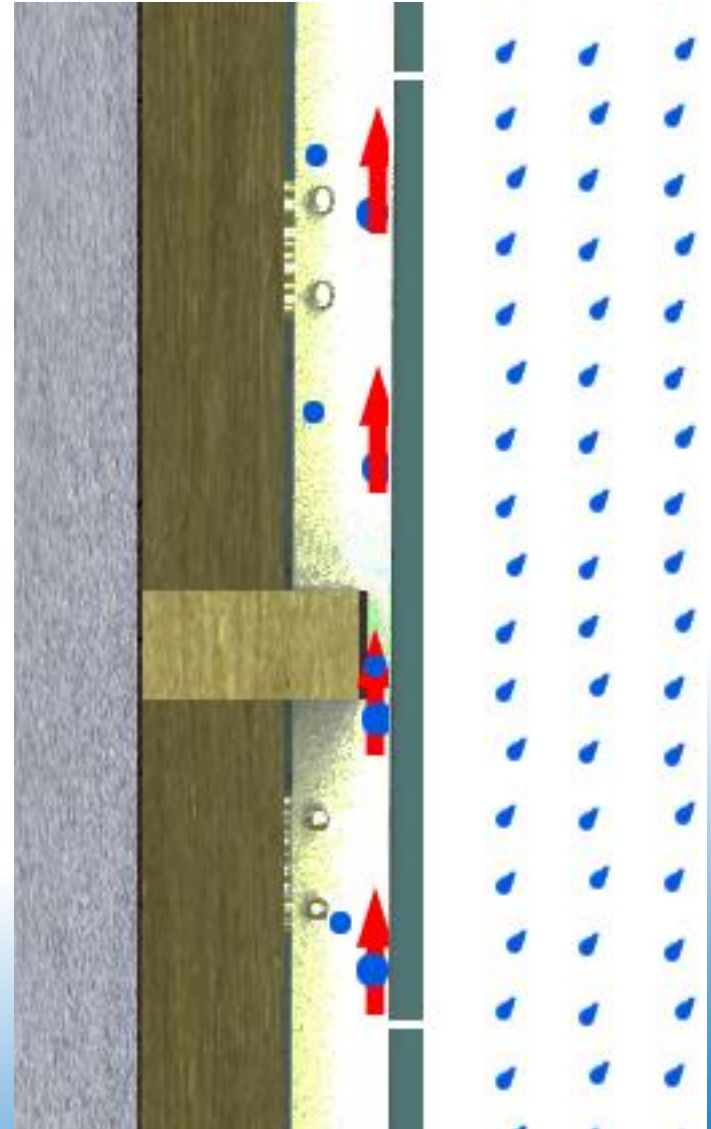
- Traditional full-width cavity barriers prevent ventilation and drainage
- Cavity barriers in rainscreen presents a conflict.
- How do we overcome this conflict?



# CORRECT BARRIER DESIGN

The use of intumescent materials:

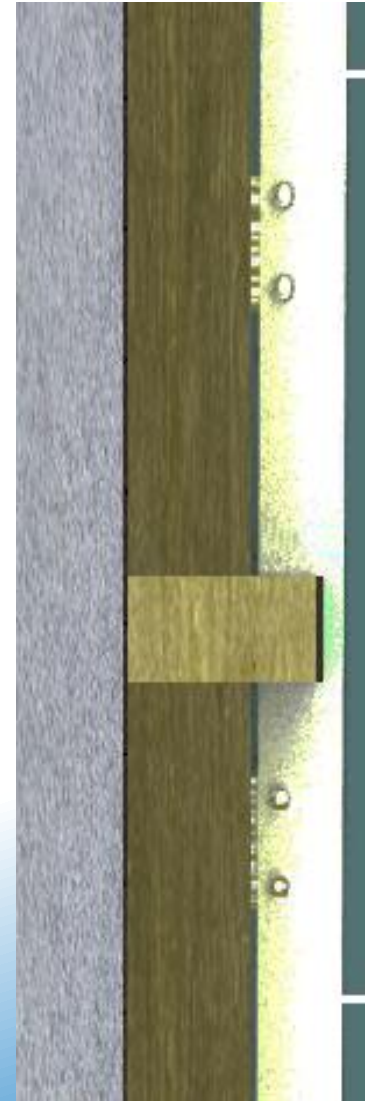
- Allow a cavity to be maintained under normal circumstances



# CORRECT CAVITY BARRIERS

The use of intumescent materials:

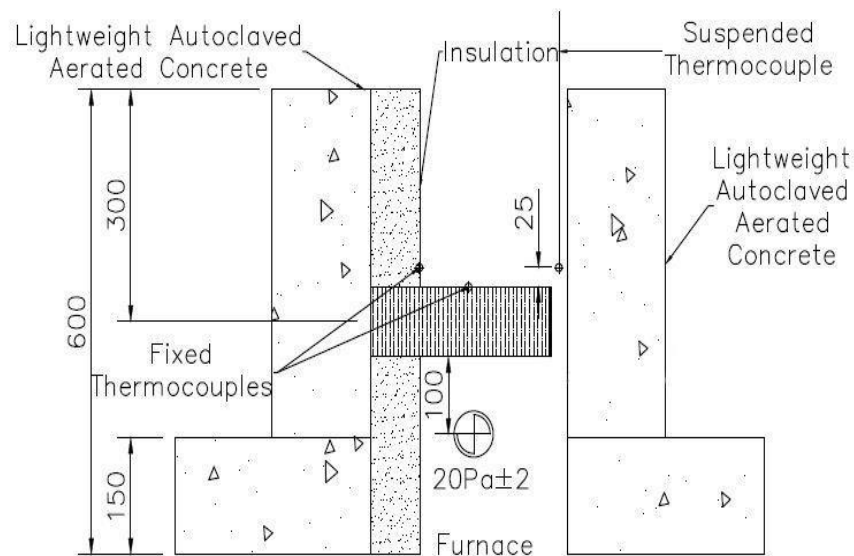
- Allow a cavity to be maintained under normal circumstances
- Seals cavity in the event of a fire
  - Activated at critical temperature
  - 'Integrity' re-established
  - Continues to expand to close air gap.



# STANDARD TO EVALUATE CAVITY BARRIERS

## 11.1 Effective Closure of the 'open-state' cavity barrier

10.4 Cavity closure time should be < 5 Minutes



ASFP Technical Guidance Document - TGD 19

**Fire Resistance Test for 'Open-State' Cavity Barriers used in the external envelope or fabric of buildings**

July 2014

# LARGE SCALE TEST – BS 8414



# LARGE SCALE TEST



# REPORTS AND CERTIFICATION



Approved applications

Type Details

Limits of field use



This is a page from an Intertek report. At the top left is the Intertek logo with the tagline 'Total Quality. Assured.'. At the top right, it specifies 'Division 07 - Thermal and Moisture Protection', '07 42 00 Wall Panels', and '07 42 13.23 Metal Composite Material Wall Panels'. The main title area identifies the manufacturer as 'Emirates Panel Manufacture LLC', the design as 'Design No. EPM/MCMWP 30-03', the product as 'Exterior Non-Loadbearing Wall Assembly', the material as 'Corebond-A2 ACP', and the standard as 'NFPA 285 (Ed. 2012)'. The rating is 'Meets the requirements'. The central part of the page contains two technical drawings: a 'FRONT ELEVATION' showing a grid of wall panels with dimensions and a 'VERTICAL JOINT DETAIL' showing a cross-section of the wall assembly with various components labeled and dimensions. At the bottom, it includes the date 'Date Issued: June 10, 2019', 'Page 1 of 4', 'Project No. G790638', and version information 'Version: 02 August 2017' and 'SFT-BC-CP-159'.



# ... AND CERTIFICATION

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**CERTIFICATE OF APPROVAL**  
**No ME 5101**

**SIDERISE INSULATION LTD**  
Forge Industrial Estate, Maesteg, Bridgend, CF34 0AY  
Tel: +44 01656 730833  
Website: www.siderise.com


Have been assessed against the requirements of the test standard(s) denoted below and are approved for use subject to the conditions appended hereto:

CERTIFIED PRODUCTS	TEST STANDARDS
Siderise RH Open State Barriers	ASFP Technical Guidance Document – TGD 19 Fire Resistance Test for 'Open State' cavity Barriers Used In the External Envelope or Fabric Of Building Nov 2017
Siderise RV Barriers	prEN 1364-6 Fire Resistance Tests For Non Loadbearing Elements – part6: Cavity Barriers April 2016  BS EN 1366-4: 2006 Fire Resistance Tests For Service Installations Part 4 : Linear Joint Seals

Signed and sealed for and on behalf of Exova (UK) Limited trading as Warrington Certification

  
Paul Duggan  
Certification Manager





Issued: 24<sup>th</sup> October 2018  
Valid to: 23<sup>rd</sup> October 2023

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# FUTURE....



## Theme #1 – Thinking ahead

A failure to incorporate adequate early thought into how to detail for good fire and acoustic performance in façades in general

## Theme #2 – Change of use

We need to think about change of use – can we future proof buildings so they can evolve often from commercial to residential over time or vice versa?

## Theme #3 – Service life & building movement

We need to consider how passive perimeter compartmentation and cavity barriers in ventilated façades behave over time and how to design them for maximum life, taking into account building geography and climatic conditions.



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**Thank you**