

Frameclad Achieve Landmark Floor Penetration Fire Test Results



First BS EN 1366-3 floor penetration fire tests using light steel frame construction in the UK – six penetration types, one test, outstanding results.

Frameclad has recently conducted a floor service penetration fire test. Carried out at Element Materials Technology, Birchwood Park, Warrington, under Warringtonfire Testing and Certification Limited's flexible scope of UKAS accreditation (No. 0249), this is understood to be the first test of its kind conducted using light steel frame (LSF) floor construction in the United Kingdom.

Floor Penetration Fire Test Results

Applicable Test Standard

The test was conducted in accordance with **BS EN 1366-3:2021+A1:2024 incorporating corrigendum September 2025** – Fire resistance tests for service installations: Part 3 – Penetration seals. This European standard defines the test methods, specimen preparation, exposure conditions and classification criteria for penetration seals installed in floors and walls. Classification under this standard is expressed as **E** (integrity) and **I** (insulation), combined with the achieved duration in minutes – for example, **EI 90**.

Test Specimen: Floor Build-Up and Configuration

A single floor assembly was constructed and tested, incorporating six discrete circular penetration apertures – each sealed using a different Quelfire passive fire protection system. This approach allowed direct performance comparison across six product types within a single, controlled test environment.

The floor assembly was constructed as follows:

- Frameclad galvanised LGS floor cassette: 154 mm deep edge track (ref. T.154.50.15) and 150 mm deep joists (ref. S.150.50.15) at 400 mm centres, fixed with self-drilling screws
- British Gypsum Gypframe RBI cold-rolled steel resilient bars at 450 mm centres, fixed to the exposed (underside) face of the framework
- 3 mm self-adhesive expanded neoprene acoustic tape adhered to the top of the framework on the unexposed (upper) face only
- 100 mm Rockwool RWA45 mineral wool slab insulation (45 kg/m³) cut to size and friction-fitted between the joists
- 2 layers of 15 mm British Gypsum Gyproc® FireLine plasterboard (Type F gypsum core, 827 kg/m³) fixed to the exposed (underside) face; joints staggered between layers, taped and skimmed
- 18 mm Smartply OSB3 oriented strand board (660 kg/m³) fixed to the unexposed (upper) face



The overall floor assembly measured 2200 mm long × 1700 mm wide × 219 mm thick. The build-up was consistent across all six penetration locations. Pipe and cable services were supported at 430 mm and 500 mm from the unexposed face using frames fabricated from Frameclad C-channels (ref. S.50.50.1.2) with steel pipe clamps. Each of the six apertures was then sealed individually using a distinct Quelfire penetration sealing system, enabling a comprehensive, comparative assessment of product performance within a single test.

Six Penetration Sealing Systems Tested

The following table sets out each of the six specimens tested (referenced A to F in Warringtonfire Test Report 557425/R), including the service type, Quelfire sealing system and achieved classification:

Spec.	Service	Quelfire Sealing System	Result
A	110 mm Ø × 3.2 mm wall PVC pipe	QuelStop Fire Batt (50 mm, exposed face) + QuelCoil Continuous Intuwrap (3 × 2 mm graphite layers around pipe, exposed face) + QuelStop Ablative Coating (batt face and edges) + QuelStop Intumescent Acoustic Acrylic Sealant (annular gap, unexposed face)	EI 98≈
B	110 mm Ø × 3.2 mm wall PVC pipe	Quelfire QWR110/CE Fire Collar — stainless steel casing with 2 × 4 mm graphite intumescent layers, fixed to exposed face + QuelStop Intumescent Acoustic Acrylic Sealant (annular gap, unexposed face)	EI 98≈
C	Multi-cable bundle: 3×A1 (11.7 mm Ø), 3×A2 (11.4 mm Ø), 3×A3 (10.2 mm Ø) and 1×B (18.7 mm Ø) cables	QuelStop Fire Batt (50 mm, exposed face) + QuelStop HPE High Pressure Expansion Sealant (50 mm deep × 20 mm wide in annular gap, exposed face) + QuelStop Ablative Coating (batt face, edges and HPE sealant) + QuelStop Intumescent Acoustic Acrylic Sealant (annular gap, unexposed face)	EI 98≈
D	50 mm Ø × 2.4 mm wall PVC pipe	Quelfire QWR50/CE Fire Collar — stainless steel casing with 2 × 4 mm graphite intumescent layers, fixed to exposed face + QuelStop Intumescent Acoustic Acrylic Sealant (annular gap, unexposed face)	EI 98≈
E	110 mm Ø × 3.2 mm wall PVC pipe	QuelStop Fire Batt (50 mm, exposed face) + Quelfire QWR110/CE Fire Collar fixed to batt face (exposed) + QuelStop Ablative Coating (batt face and edges) + QuelStop Intumescent Acoustic Acrylic Sealant (annular gap, unexposed face)	EI 98≈
F	110 mm Ø × 3.2 mm wall PVC pipe	Quelfire QWR110/CE Fire Collar — stainless steel casing with 2 × 4 mm graphite intumescent layers, fixed to exposed face (125 mm Ø ceiling aperture variant) + QuelStop Intumescent Acoustic Acrylic Sealant (annular gap, unexposed face)	EI 98≈

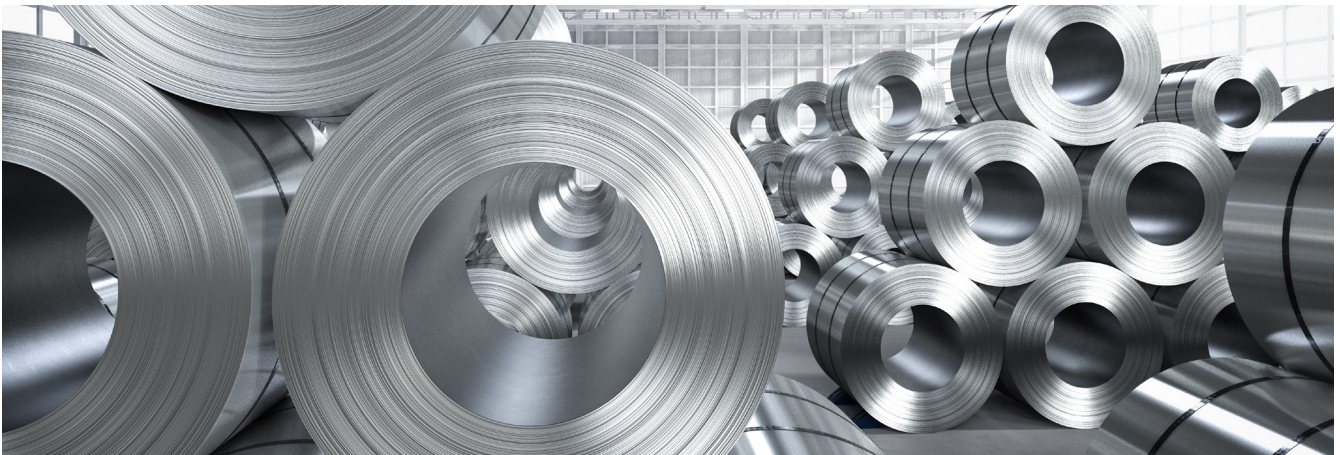
All six specimens tested to BS EN 1366-3:2021+A1:2024 incorporating corrigendum September 2025 (Warringtonfire Report 557425/R, 22 February 2026). ≈ Integrity failure of the supporting construction – not of the penetration seal.

Floor Penetration Fire Test Results

Outstanding Results Across All Six Specimens

Despite each of the six penetration sealing systems employing a distinct product and installation methodology, the fire test results were uniformly exceptional. **The structural integrity of each specimen was maintained for 98 minutes, with the test discontinued after a period of 99 minutes** – comfortably exceeding the 90-minute classification threshold.

At no point during the test duration were any visible signs of fire penetration or damage observed on the unexposed (upper) face of the floor assembly. The results demonstrate that all six Quelfire penetration sealing systems are capable of maintaining compartmentation within a light steel frame floor construction under full fire exposure conditions.



To discover more about Frameclad, our approach, products and services – or arrange a factory tour to see precision-engineering in action – contact our team.

Frameclad Ltd

Building 40 | Third Avenue | The Pensnett Trading Estate | Kingswinford | West Midlands | DY6 7UP

T: 01384 401114 E: enquiries@frameclad.com

Proud members of:



www.frameclad.com

FRAMECLAD