

# fischer Test Report

## Fixing Tests for Wienerberger 'Porotherm' Blocks

### Test Parameters

The fixings were tested into both Wienerberger Porotherm 190 & Porotherm 365 fired clay construction blocks. The tests were carried out by Laurence Parker – fischer Technical Field Engineer on 11th March 2009. Tests were carried out on walls constructed from Porotherm 190 and Porotherm 365 at the Wienerberger Factory complex in the UK. Fixings were fitted into block ends and randomly into wall sides to simulate the unpredictability of locating fixings into a plastered surface where the structure of the block cannot be determined. All drilling operations into these blocks should be done without the hammer action using rotary only. All tests were carried out using a calibrated Hydrajaws 2000 tensile meter 0-20 kN Gauge serial No CF S1, conforming to CFA (Construction Fixings Association) guidelines. Each type of fixing was tested six times.

### Porotherm Core Range

	DIMENSIONS W x L x H (mm)	QUANTITY m <sup>2</sup>	QUANTITY PACK No. (m <sup>2</sup> )	WEIGHT EACH Kg	WEIGHT PACK (inc. pallet) Kg
POROTHERM 100	100 x 300 x 224	15	160 (10.6)	6.4	1032
POROTHERM 140	140 x 300 x 224	15	120 (8)	7.9	955
POROTHERM 190	190 x 300 x 224	15	80 (5.3)	10.7	870
POROTHERM 365 (T12)	365 x 248 x 249	16	60 (3.7)	14.1	854

Porotherm blocks comply with EN771-1, LD Classification and carry a CE mark 

### Fixing Products Tested

#### fischer Nylon UX Plug

**Typical Installation** Light duty fixing for general fixings, i.e. battens, curtain rails, light weight shelving, bathroom cabinets etc.

#### fischer Nylon FUR Frame Fixing

**Typical Applications** Façade fixing (wooden & metal substructures): Anchorage of laths, wall plates, beams and frames, metal consoles. Supports and rails on inner & outer walls.

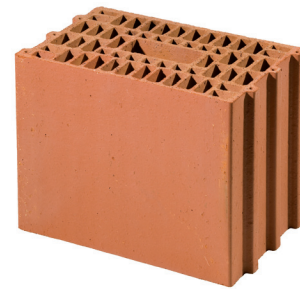
#### fischer Frame Fixing SXR

**Typical Applications** The SXR is a light - medium duty fixing and can be used to fix door frames, battens for cladding, shelving and with the A4 grade screws, external fixtures and fittings. **ETA Approvals** ETA approval is available for the SXR Frame fixing into various Porotherm Blocks. (Please refer to fischer Fixings Technical Department 01491 827 920 for further details).

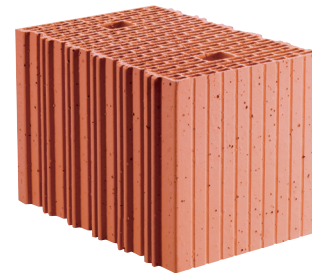
#### fischer FIS V 360 S Hybrid Vinyl Ester Resin with FIS H 16 x 85 K sleeve and M10 Rod

**Typical Applications** This is a heavy duty fixing for door frames, Wall plates and any application where a recommended load of up to 1.4 kN per fixing is required.

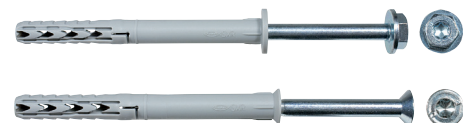
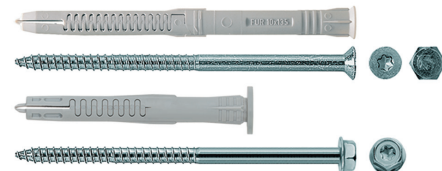
### Substrates Tested



Porotherm 190



Porotherm 365



## Test Results

fischer Nylon UX into PTH 190 & PTH 365 using Ø8mm drill hole, embedment depth of 50mm fixed for this plug, screw length will depend on fixture thickness.

fischer Nylon UX 8 x 50 R with 5mm wood screw into PTH 190		
TEST No	LOAD IN kN	MODE OF FAILURE
1	1.0	Block End 1st Tensile Slip
2	0.9	Block End 1st Tensile Slip
3	0.5	Mid Block 1st Tensile Slip
4	0.7	Mid Block 1st Tensile Slip
5	0.5	Mid Block 1st Tensile Slip
6	0.5	Mid Block 1st Tensile Slip

Average Ultimate Tensile Load = 0.68kN. Using a global safety factor of 7, safe working load in tension = 0.10kN

fischer Nylon UX 8 x 50 R with 5mm woodscrew into PTH 365		
TEST No	LOAD IN kN	MODE OF FAILURE
1	1.0	Block End 1st Tensile Slip
2	0.7	Block End 1st Tensile Slip
3	1.5	Mid Block 1st Tensile Slip
4	0.7	Mid Block 1st Tensile Slip
5	1.0	Mid Block 1st Tensile Slip
6	0.6	Mid Block 1st Tensile Slip

Average Ultimate Tensile Load = 0.91kN. Using a global safety factor of 7, safe working load in tension = 0.13kN

fischer Nylon FUR frame fixing in PTH 190 & PTH 365 using Ø10mm drill hole.

fischer FUR 10 x 80 FUS into PTH 190		
TEST No	LOAD IN kN	MODE OF FAILURE
1	1.1	Block End 1st Tensile Slip
2	0.5	Block Mid Wall 1st Tensile Slip
3	1.8	Block Mid Wall 1st Tensile Slip
4	1.5	Block Mid Wall 1st Tensile Slip
5	1.5	Block Mid Wall 1st Tensile Slip
6	1.0	Block Mid Wall 1st Tensile Slip

Average Ultimate Tensile Load = 1.23kN. Using a global safety factor of 7, safe working load in tension = 0.17kN

fischer FUR 10 x 80 FUS into PTH 365		
TEST No	LOAD IN kN	MODE OF FAILURE
1	1.2	Block End 1st Tensile Slip
2	1.3	Block Mid Wall 1st Tensile Slip
3	0.8	Block Mid Wall 1st Tensile Slip
4	1.3	Block Mid Wall 1st Tensile Slip
5	1.1	Block Mid Wall 1st Tensile Slip
6	1.2	Block Mid Wall 1st Tensile Slip

Average Ultimate Tensile Load = 1.15kN. Using a global safety factor of 7, safe working load in tension = 0.16kN

N.B. Choice of FUR frame fixing length will depend on the fixture thickness, but all FURs both 8mm & 10mm require a full 70mm embedment to perform correctly.

fischer SXR frame fixing into PTH 190 & PTH 365 with Ø10mm drill hole.

fischer SXR 10 x 100 T into PTH 190		
TEST No	LOAD IN kN	MODE OF FAILURE
1	1.0	Block End Substrate Failure
2	1.4	Mid Block Substrate Failure
3	0.8	Mid Block Substrate Failure
4	1.0	Mid Block Substrate Failure
5	0.9	Mid Block Substrate Failure
6	1.2	Mid Block Substrate Failure

Average Ultimate Tensile Load = 1.05kN. Using a global safety factor of 7, safe working load in tension = 0.15kN

fischer SXR 10 x 100 T into PTH 365		
TEST No	LOAD IN kN	MODE OF FAILURE
1	0.9	Block End Substrate Failure
2	1.0	Block End Substrate Failure
3	1.2	Block Side Substrate Failure
4	1.2	Block Side Substrate Failure
5	1.6	Block Side Substrate Failure
6	1.6	Block Side Substrate Failure

Average Ultimate Tensile Load = 1.25kN. Using a global safety factor of 7, safe working load in tension = 0.17kN

N.B. Choice of SXR frame fixing length will depend on the fixture thickness, but all SXRs both 8mm & 10mm require a full 50mm embedment to perform correctly.

fischer FIS V 360 S Resin + Sleeve and M8 Stud in to PTH 190 & PTH 365

fischer FIS V 360 S with FIS H 16 x 85 Sleeve + M8 Stud into PTH 190		
TEST No	LOAD IN kN	MODE OF FAILURE
1	6.0	Block Failure
2	6.1	Block Failure
3	6.2	Block Failure
4	7.0	Block Failure
5	9.9	Block Failure
6	5.0	Block Failure

Average Ultimate Tensile Load = 6.7kN. Using a global safety factor of 4, safe working load in tension = 1.67kN

fischer FIS V 360 S Resin + Sleeve & M8 Stud into PTH 365		
TEST No	LOAD IN kN	MODE OF FAILURE
1	4.5	Block Failure
2	6.0	Block Failure
3	7.0	Block Failure
4	5.0	Block Failure
5	6.0	Block Failure
6	6.1	Block Failure

Average Ultimate Tensile Load = 5.7kN. Using a global safety factor of 4, safe working load in tension = 1.44kN

## Conclusion

fischer has a range of fixings suitable for both the Wienerberger Porotherm 190 and 365 perforated fired clay building blocks. From heavy duty fixing requirements to light duty applications, the correct solution can be found. For the most demanding Heavy Duty applications, in both blocks, the Resin anchor FIS V 360 S with FIS H Nylon Sleeve and threaded rod gives the best results with recommended loads of up to 1.67kN in Porotherm 190 and 1.44kN in Porotherm 365. For Medium Duty applications up to 0.17kN the FUR and SXR frame fixings are the most suitable. The FUR with an embedment depth of 70mm is generally a more efficient fixing and easier to install where web spacing is 50mm apart, being particularly

useful in block ends. The SXR however is a powerful fixing in blocks with web spacings of between 15mm and 20mm as in the Porotherm 365. The UX plug offers a first class light duty fixing for general applications in both blocks. It friction locks in blocks with close spaced webs and knot locks behind 1st web or outer skin in blocks with larger web spacings and block ends. Recommended loads in the region of 0.10kN were achieved in both blocks.

N.B. All drilling operations in these Blocks should be done without Hammer action.

For further information refer to Ceram Technical Report/Design Guidelines