

fischer 

Bison

Substrate Report



Products

ETA approved fischer products

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fischer tested products

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Summary

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1. FBS II 6



- The first concrete screw with drill diameter 6mm with variable embedment depth offers flexible use of the embedment depth compared to the loads.
- ETA assessment Option 1 includes the use in cracked and non-cracked concrete for highest safety requirements.
- The first 6mm drill diameter concrete screw with an ETA assessment for C1 seismic performance
- Different head designs offer maximum flexibility
- The ULTRACUT FBS II 6 is approved for multiple use of non-load bearing systems and thereby ideal for the installation of pipe, cable trays into pre-stressed hollow concrete ceilings.



LOADS

Concrete screw ULTRACUT FBS II 6 zinc plated

Highest permissible loads¹⁾ for a single anchor for multiple use for non-structural applications in pre-stressed hollow core slabs⁴⁾

| Type | | FBS II 6 | | | | | | | |
|---|--------------------------|-----------|------|------|------|------|------|------|------|
| | | h_{nom} | 25 | 30 | 35 | 40 | 45 | 50 | 55 |
| Nominal embedment depth | | h_{nom} | 25 | 30 | 35 | 40 | 45 | 50 | 55 |
| Permissible load in the respective bottom flange thickness F_{rec}³⁾ | | | | | | | | | |
| ≥ 25 mm | [kN] | 0,23 | 0,47 | 0,47 | 0,47 | 0,47 | 0,47 | 0,47 | 0,47 |
| ≥ 30 mm | [kN] | 1,64 | 1,64 | 1,64 | 1,64 | 1,64 | 1,64 | 1,64 | 1,64 |
| ≥ 35 mm | [kN] | 1,64 | 1,88 | 2,11 | 2,35 | 2,58 | 2,82 | 3,05 | 3,05 |
| ≥ 40 mm | [kN] | 1,64 | 2,35 | 2,58 | 2,82 | 3,29 | 3,52 | 3,76 | 3,76 |
| ≥ 50 mm | [kN] | 1,64 | 2,58 | 3,29 | 3,76 | 4,46 | 5,16 | 5,63 | 5,63 |
| Installation torque | $T_{inst, max}$ | [Nm] | 5 | 5 | 10 | 10 | 10 | 10 | 10 |
| Min. spacing | s_1, s_2 ²⁾ | [mm] | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Min. edge distance | c_1, c_2 ²⁾ | [mm] | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

For the design the complete assessment ETA-18/0242, issued 30.10.2018 has to be considered.

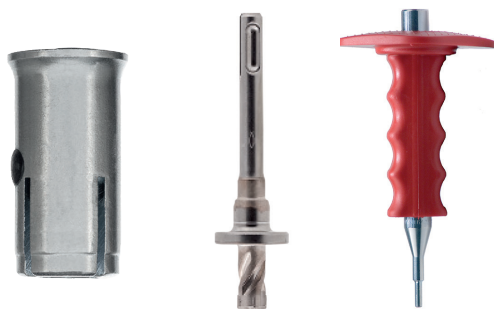
¹⁾ The required partial safety factors for material resistance as well as a partial safety factor for load actions of $\gamma_L = 1,4$ are considered.

²⁾ Minimum possible axial spacings resp. edge distance. For further measures see assessment.

³⁾ Valid for tensile load, shear load and oblique load under any angle.

⁴⁾ Concrete strength class C30/37 up to C50/60.

2. EA II 25



- The oversized rim prevents the anchor sleeve from slipping into the drill hole, ensuring trouble-free installation.
- The metric internal thread means that it is possible to use standard metric bolts or threaded rods
- The special stop drill EBB should be used where drilling depth is at a minimum
- The face of the fixing is marked during installation when the EHS Plus setting tool is used
- There is also the EMS machine setting tool, not shown, to ensure effortless installation, ideal for multiple overhead applications.
- The black fixing point prevent the anchor from falling out of the drill hole during overhead installation.



LOADS

Hammerset anchor EA II (screw property class 4.6 and A4-50)

Highest permissible loads¹⁾ for a single anchor for multiple use for non-structural applications in pre-stressed hollow core slabs⁴⁾

| Type | Bottom flange thickness [mm] | Effective anchorage depth h_{ef} [mm] | Maximum torque moment $T_{inst,max}$ [Nm] | Permissible load F_{perm} ³⁾ [kN] | Min. spacing s_{min} ²⁾ [mm] | Min. edge distance c_{min} ²⁾ [mm] |
|----------------|---------------------------------|---|---|--|---|---|
| EA II M6 x 25 | ≥ 35 ⁵⁾ | 25 | 4,0 | 1,0 | 200 | 150 |
| EA II M8 x 25 | | | 8,0 | 1,4 | | |
| EA II M10 x 25 | | | 15,0 | 1,9 | | |
| EA II M12 x 25 | | | 35,0 | 1,9 | | |

For the design the complete approval ETA-07/0142 has to be considered.

¹⁾ The required partial safety factors for material resistance as well as a partial safety factor for load actions of $\gamma_L = 1,4$ are considered.

²⁾ Minimum possible axial spacings resp. edge distance. For further measures see approval.

³⁾ Valid for tensile load, shear load and oblique load under any angle. For combinations of tensile loads, shear loads as well as bending moments see approval.

⁴⁾ Concrete strength class C30/37 up to C50/60.

⁵⁾ The anchor may be used in a flange thickness $d_f = 30$ mm with the same characteristic resistance, but the drill hole must not cut a cavity.

3. SXR L 10



- The long expansion section makes the SXRL a versatile product.
- Through the special design of the plug, the expansion forms a positive lock inside the substrate
- The longer ribs prevent the plug rotating during installation.
- The approval for hollow core slabs makes the SXRL the specialist in concrete



LOADS

Frame fixing SXRL (inc. A4 stainless)

Highest permissible loads¹⁾²⁾ of a single anchor as part of a multiple fixing of non-structural systems.

For the design the complete assessment ETA-07/0121 has to be considered.

| Product | | | |
|---|-----------|------|-------------|
| SXRL | | [mm] | Ø 10 |
| Anchorage depth | h_{nom} | [mm] | 50 |
| Anchorage in pre-stressed hollow-core concrete slabs (web thickness $d_b \geq 30$ mm) made of concrete $\geq C45/55$ | | | |
| Permissible tensile load | | [kN] | 1,39 |
| Permissible shear load | | [kN] | 5,98 |

¹⁾ The required partial safety factors for material resistance as well as a partial safety factor for load actions $\gamma_t = 1,4$ are considered. As a single anchor counts e.g. an anchor with a minimum spacing according to table B4.1 resp. table B4.2 of the assessment.

²⁾ Valid for temperatures in the substrate up to +50 °C (resp. short term up to +80 °C). For long term temperatures up to +30 °C higher permissible loads may be possible.

Zulassung approved fischer products

4. FHY (M6 - M12)



- The principle of the anchor means that the FHY can be used in cavities or in solid materials up to 50mm from the tensioning wire.
- The flange prevents the anchor sleeve from slipping into the cavity during installation.
- The optimised geometry minimises setting force and allows for use in extremely narrow spaces for ease of installation.
- The metric internal thread means that it is possible to use standard screws or threaded rods



LOADS

Hollow-ceiling anchor FHY (inc. R stainless)

Highest permissible loads¹⁾ of a single anchor as part of a multiple fixing of non-structural systems in pre-stressed hollow-core concrete slabs of strength class \geq C45/55.

| Type | Bottom flange thickness d_u [mm] | Installation torque T_{inst} [Nm] | Permissible load F_{perm} ²⁾ [kN] | Min. spacing s_{min} ³⁾ [mm] | Min. edge distance c_{min} ³⁾ [mm] |
|-------------|--|---|--|---|---|
| FHY M6 / R | 25 - 29 | 8 / 10 | 2.38 | 70 | |
| | 30 - 39 | | 2.38 | | |
| | ≥ 40 | | 2.38 | | |
| FHY M8 / R | 25 - 29 | 10 / 20 | 3.33 | 70 | 100 |
| | 30 - 39 | | 3.33 | | |
| | ≥ 40 | | 3.33 | | |
| FHY M10 / R | 25 - 29 | 20 / 40 | 3.80 | 80 | |
| | 30 - 39 | | 4.76 | | |
| | ≥ 40 | | 4.76 | | |
| FHY M12 / R | 25 - 29 | 30 / 50 | 4.28 | 80 | 150 |
| | 30 - 39 | | 4.28 | | |
| | ≥ 40 | | 4.76 | | |

For the design the complete approval ETA 21/0587 has to be considered.

¹⁾ The required partial safety factors for material resistance as well as a partial safety factor for load actions $\gamma_L = 1,4$ are considered. As a single anchor counts e.g. an anchor with a minimum spacing according to table B4.1 of the assessment.

²⁾ Valid for tensile load, shear load and oblique load under any angle. For combinations of tensile loads, shear loads, bending moments as well as reduced edge distances or spacings (anchor groups) see approval.

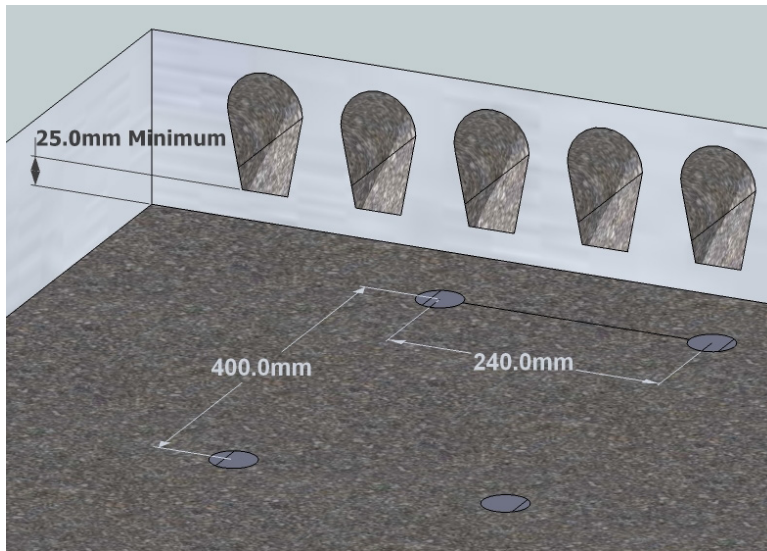
³⁾ Minimum possible axial spacings resp. edge distance while reducing the permissible load.

fischer tested products

5. FIS V 360 S



- The FIS V injection mortar has numerous system approvals, such as masonry and for special applications.
- The extensive range of accessories is ideally suited to the FIS V injection mortar family, increasing its flexibility allowing for a broad range of applications.



LOADS

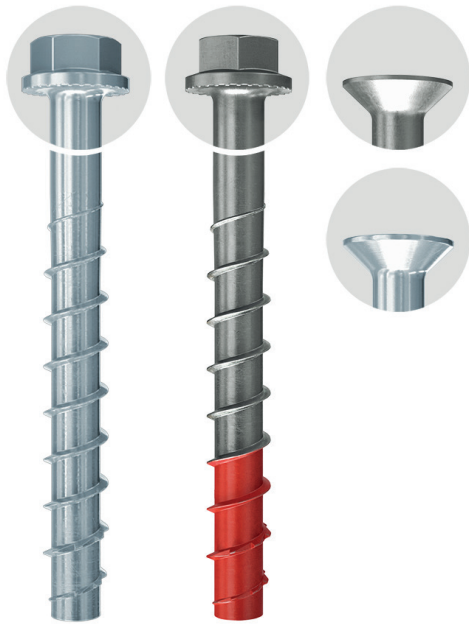
FIS V 360 S Injection resin, FIS H 18x85 N resin sleeve and M10 threaded rod (zinc or A4 stainless)

Highest permissible loads for a single anchor in pre-stressed hollow-core concrete slabs of strength class \geq C45/55.

| Type | Average Ultimate max. load [kN] | Allowable Load Using global safety factor of 4 [kN] |
|---|------------------------------------|---|
| FIS V 360 S (Underside fixing - 25mm web) | 25.80 | 6.45 |
| FIS V 360 S (Top fixing - 25mm web) | 25.60 | 6.40 |
| FIS V 360 S (Top fixing - 30mm web) | 21.10 | 5.28 |

Refer to drawing above for characteristic axial spacing's

6. FBS II 8-10



- ULTRACUT FBS II 8-10 (zinc and A4 stainless) have unique saw-tooth geometry that cuts quickly into the concrete
- The specially hardened red tip of the stainless steel A4 version provides faster and more secure installation.

LOADS

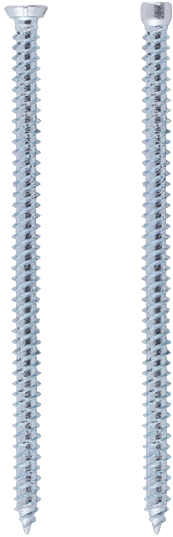
FBS II 8 -10 (inc A4 stainless)

Permissible loads for a single anchor in pre-stressed hollow core concrete slabs, strength C30/37

| Type | Minimum spacing | Minimum edge | Web Thickness (minimum) | Installation Torque (hand) | Characteristic Resistance F_{Rk} | Recommended Load F_{rec} |
|------------------|-----------------|--------------|-------------------------|----------------------------|------------------------------------|----------------------------|
| | [mm] | [mm] | [mm] | [Nm] | [kN] | [kN] |
| FBS II 8 | 100 | 100 | 30 | 20 | 3.5 | 1.60 |
| FBS II 10 | 100 | 100 | 30 | 25 | 3.5 | 1.60 |

Refer to original document for further details

7. FSS



- Screw installation without plug for economical installation.
- The small drill diameter of 6 mm allows for efficient installation.
- The continuous thread ensures stress-free fixing to the substrate.
- The high-low-thread design at the screw tip, as well as several cutting notches, reduces the force required for screwing into the substrate
- With two head types available for most common materials.

LOADS

FFS zinc plate

Highest permissible loads for a single anchor in pre-stressed hollow-core concrete slabs of strength class \geq C45/55.

| Type | Characteristic axial spacing [mm] | Average Ultimate max. load [kN] | Allowable Load Using global safety factor of 4 [kN] |
|------------------------|--------------------------------------|------------------------------------|---|
| FFS frame screw | >75 | 5.97 | 1.59 |

Refer to drawing above for characteristic axial spacing's

8. DUOTEC 12



- Flexible screw mount allows for the use of screws and hooks with different thread shapes.
- Glass fibre-reinforced plastics and a metal skeleton insert, allow the toggle to handle heavy tensile and transverse loads
- Standard drill hole diameter and short tilting element for easy installation in narrow cavities.
- White flush sleeve with snap function allows the plug to be pre-installed quickly and securely in the drill hole.
- The scale on the grip strap allows you to determine the required screw length (scale value + 20 mm).

LOADS

Nylon toggle fischer DUOTEC 12

Highest recommended loads¹⁾⁴⁾ for a single anchor.

| Type | | fischer DUOTEC 12 | | | |
|---|------|-------------------|----------------|--------------|--------------------|
| | | Chipboard screw | Metrical screw | fischer Hook | |
| Screw diameter | [mm] | 5 | 6 | 6 | 5,5 |
| Recommended loads in the respective base material F_{rec}²⁾ | | | | | |
| Pre-stressed hollow-core concrete slabs | [kN] | 1,00 | 1,40 | 1,30 | 0,50 ³⁾ |

¹⁾ Required safety factors are considered.

²⁾ Valid for tensile load, shear load and oblique load under any angle.

³⁾ Bending of the hook is decisive. Only for tension load.

⁴⁾ The recommended loads are reference values and depending to the building material and the workmanship. The values are only valid for the given screw diameter.



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6 January 2012

For the attention of Mirka Valovicova

Testing of Fischer Fixings in Bison Hollow Core Slabs

We confirm that the tests as detailed in your document title “Fixings Testing on Bison Hollow Core Slabs”, were carried out in our laboratory. The tests were carried out on the soffit of a standard 150 mm deep slab, and the results are a true record of the tests. Therefore, we can recommend that the fixings described are suitable for use with hollow core slabs, up to the safe working loads stated.

Yours Faithfully

For Bison Manufacturing Ltd

Dr Kamel BENSLEM
Chief Structural Engineer

Summary

| Product | Recommended Load (kN) | | |
|---|-----------------------|------|------|
| | 25 | ≥30 | ≥35 |
| Web thickness (mm) | | | |
| ETA approved fischer products | | | |
| 1. FBS II 6 - Concrete screw (30mm embedment) | 0.47 | 1.64 | 1.64 |
| 2. EA II 25 - Hammerset anchor (M6x25) * | - | - | 1.0 |
| (M8x25) * | - | - | 1.4 |
| (M10x25) * | - | - | 1.9 |
| (M12x25) * | - | - | 1.9 |
| 3. SXR L 10 - Frame fixing | - | 1.39 | 1.39 |
| 4. FHY - M6 - Hollow-ceiling anchor | 2.38 | 2.38 | 2.38 |
| M8 | 3.33 | 3.33 | 3.33 |
| M10 | 3.81 | 4.76 | 4.76 |
| M12 | 4.28 | 4.28 | 4.76 |
| fischer tested products | | | |
| 5. FIS V 360 S - Injection mortar (Underside) | 6.45 | 6.45 | 6.45 |
| (Top) | 5.28 | 6.4 | 6.4 |
| 6. FBS II 8 - Concrete screw | - | 1.66 | 1.66 |
| FBS II 10 - Concrete screw | - | 1.66 | 1.66 |
| 7. FFS - Window frame screws | 2.5 | 2.5 | 2.5 |
| 8. DUOTEC 12 - Nylon toggle (M6 thread) | 1.3 | 1.3 | 1.3 |

** Highest load shown, see spacings

Please note that this document is for guidance only
 For further technical information, please refer to the ETA or original report.
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