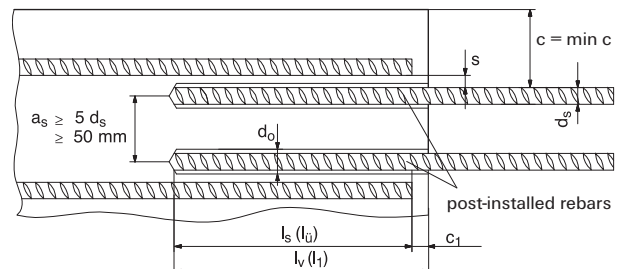
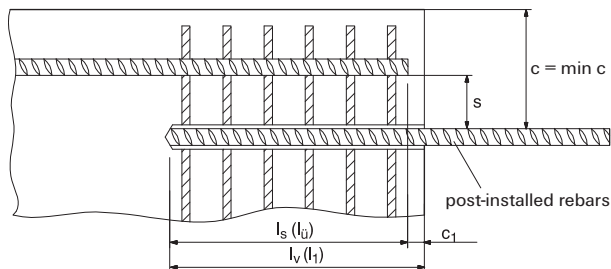


Injection systems FIS EM, FIS SB and FIS V with reinforcing steel B500B<sup>5)</sup> in accordance with rebar theory

Design resistances and permissible loads <sup>1)6)</sup> of single, post-installed rebars in cracked or non-cracked normal concrete of the strength class C20/25 <sup>2)</sup>						
Reinforcing steel B500B	Basic value for the anchorage length for FIS EM $l_{b,rqd}^{4)}$ [mm]	Basic value for the anchorage length for FIS SB $l_{b,rqd}^{4)}$ [mm]	Basic value for the anchorage length for FIS V $l_{b,rqd}^{4)}$ [Nm]	Maximum anchorage depth $l_{v,max}$	Maximum design resistance for axial tensile load $N_{Rd,s}^{3)}$	Maximum permissible tensile load $N_{perm,s}^{3)}$ [kN]
Ø 8 mm	378	378	378	1800 (3000) <sup>8)</sup>	21,9	15,6
Ø 10 mm	473	473	473	1800 (3000) <sup>8)</sup>	34,1	24,4
Ø 12 mm	567	567	567	1800 (3000) <sup>8)</sup>	49,2	35,1
Ø 14 mm	662	662	662	1800 (3000) <sup>8)</sup>	66,9	47,8
Ø 16 mm	756	756	756	1800 (3000) <sup>8)</sup>	87,4	62,4
Ø 20 mm	945	945	945	1800 (3000) <sup>8)</sup>	136,6	97,6
Ø 22 mm <sup>7)</sup>	1040	-	-	2000	165,3	118,1
Ø 24 mm <sup>7)</sup>	1134	-	-	2000	196,7	140,5
Ø 25 mm	1181	1181	1181	2000 (3000) <sup>8)</sup>	213,4	152,4
Ø 26 mm <sup>7)</sup>	1229	-	-	2000	230,8	164,9
Ø 28 mm	1323	1323	1323	2000 (3000) <sup>8)</sup>	267,7	191,2
Ø 30 mm <sup>7)</sup>	1418	-	-	2000	307,3	219,5
Ø 32 mm <sup>9)</sup>	1512	1512	-	2000 (3000) <sup>8)</sup>	349,7	249,8
Ø 34 mm <sup>7)</sup>	1607	-	-	2000	394,7	282,0
Ø 36 mm <sup>7)</sup>	1701	-	-	2000	442,6	316,1
Ø 40 mm <sup>7)</sup>	1890	-	-	2000	546,4	390,3

For planning and design the complete European Technical Assessments ETA-09/0089 (FIS EM), ETA-13/0651 (FIS SB) or resp. ETA-08/0266 (FIS V) have to be considered. For determination of the installation parameters (minimum concrete cover distanes, etc.) as well as required transverse reinforcement see EN 1992-1-1 and general installation rules of the assessments.

- The partial safety factors for resistance taken from the European standard EN 1992-1-1 as well as a partial safety factor for action of  $\gamma_L = 1,4$  are considered.
- The ETAs for FIS EM, FIS SB and FIS V permit post-installed rebar connections in concrete C12/15 up to C50/60. The above mentioned basic value for anchorage length changes depending on the relevant concrete strength class.
- For utilisation of the full steel capacity.
- Basic value of the anchorage length in accordance with EN 1992-1-1, section 8.4.3 for concrete strength class C20/25 and good bond conditions.
- Reinforcing steel with characteristic yield strength  $f_{yk} = 400 - 600 \text{ N/mm}^2$  in accordance with EN 1992-1-1 Annex C, Table C.1 and C.2N is approved. The above mentioned basic value for the anchorage length as well as maximum steel resistance (see foot note 3) will change accordingly.
- With FIS EM, FIS SB or FIS V post-installed rebars are approved in dry or wet concrete with temperatures up to +50 °C (resp. short term up to +80 °C) and drill hole cleaning in accordance with ETA.
- Only FIS EM.
- Values in brackets apply for FIS SB.
- Only FIS EM or FIS SB.



## Rebar anchor FRA with injection systems FIS EM, FIS SB and FIS V in accordance with rebar theory

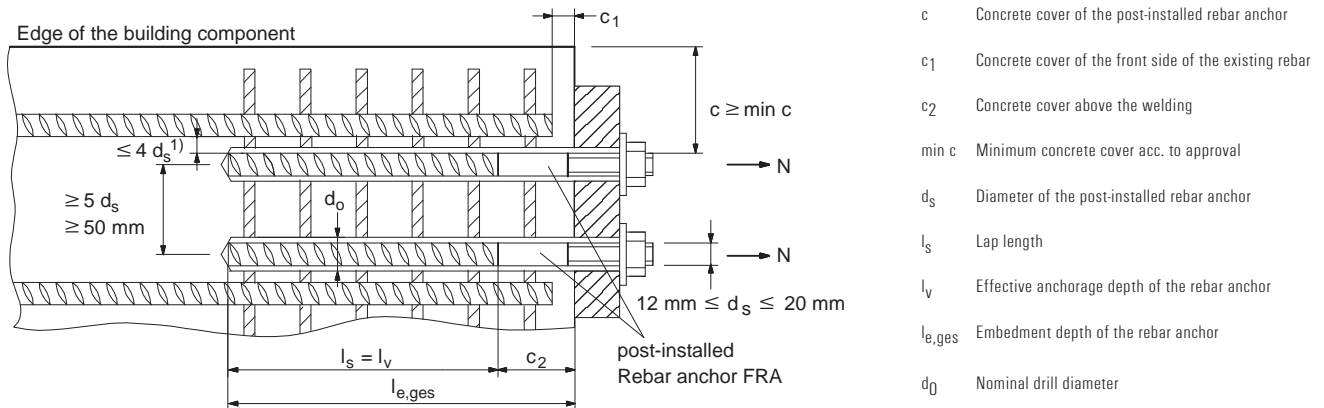
Design resistances and permissible loads <sup>1)5)</sup> of single, post-installed Rebar anchor in cracked or non-cracked normal concrete of the strength class C20/25 <sup>2)</sup>						
Type	Basic value for the anchorage length	Maximum anchorage depth	Maximum embedment depth	Maximum torque moment	Maximum design resistance for axial tensile load	Maximum permissible tensile load
	$l_{b,rqd}^{4)}$ [mm]	$l_{v,max}$ [mm]	$l_{e,ges,max}$ [mm]	$T_{inst}$ [Nm]	$N_{Rd,s}^{3)}$ [kN]	$N_{perm,s}^{3)}$ [kN]
<b>FRA 12/900 M12</b>	567	800	900	≤ 50	49,2	35,1
<b>FRA 16/1100 M16</b>	756	1000	1100	≤ 100	87,4	62,4
<b>FRA 20/1400 M20</b>	945	1300	1400	≤ 150	136,6	97,6

For planning and design the complete European Technical Assessments ETA-09/0089 (FIS EM), ETA-13/0651 (FIS SB) or resp. ETA-08/0266 (FIS V) have to be considered. For determination of the installation parameters (minimum concrete cover distances, etc.) as well as required transverse reinforcement see EN 1992-1-1 and general installation rules of the assessments.

- The partial safety factors for resistance taken from the European standard EN 1992-1-1 as well as a partial safety factor for action of  $\gamma_L = 1,4$  are considered.
- The ETAs for FIS EM, FIS SB and FIS V permit post-installed rebar connections in concrete C12/15 up to C50/60. The above mentioned basic value for anchorage length changes depending on the relevant concrete strength class.
- For utilisation of the full steel capacity.
- Basic value of the anchorage length in accordance with EN 1992-1-1, section 8.4.3 for concrete strength class C20/25 and good bond conditions.
- With FIS EM, FIS SB or FIS V post-installed Rebar anchors are approved in dry or wet concrete with temperatures up to +50 °C (resp. short term up to +80 °C) and drill hole cleaning in accordance with ETA.

### General rules of constructions

- The Rebar anchor FRA is permitted to transfer tension loads in direction of the axis of the rebar only.
- $l_v$  and  $l_s$  according to approval.
- According to approval it has to be proved that sufficient transverse reinforcement is available.



<sup>1)</sup> If the clear distance of the lapped bars is larger than  $4 \times d_s$ , EC2 has to be applied.