

## The versatile fixing system with injection anchor sleeves for perforated brick masonry

Chemical fixings 3



Wall consoles



Pipeline routes

### VERSIONS

- Zinc-plated steel
- Stainless steel

### BUILDING MATERIALS

#### Approved for:

- Vertically perforated brick
- Hollow blocks made from lightweight concrete
- Hollow blocks made from concrete
- Perforated sand-lime brick
- Solid sand-lime brick
- Solid brick

#### Also suitable for:

- Hollow pumice slabs
- Slabs made of hollow brick and other perforated brick
- Solid pumice and other solid building materials

### ASSESSMENT/APPROVAL



### ADVANTAGES

- The grating structure of the FIS H K anchor sleeve is adapted for the injection mortars FIS V, FIS VL, FIS GREEN and FIS P Plus, and ensures sparing mortar use with the best interlock.
- The centring blades perfectly align the anchor in the anchor sleeve, and allow for use with various threaded rod diameters.
- The barbed hooks secure the anchor sleeve in the drill hole and allow for a trouble-free overhead installation.
- The geometry of the anchor sleeves allows for the bridging of non-bearing layers for a simple and convenient installation.

### APPLICATIONS

- Awnings
- Canopies
- Gates
- Handrails
- Consoles
- Pipelines
- Sanitary equipment
- Gratings
- Satellite antennas
- Sun protection

### FUNCTIONING

- The system can be used with any of the following injection mortars: FIS V, FIS VW HIGH SPEED, FIS VS LOW SPEED, FIS VL, FIS GREEN or FIS P Plus. FIS P can be used but does not have approvals.
- The system is suitable for pre-positioned installation when combined with injection anchor sleeves and threaded rods FIS A or internal threaded anchors FIS E.
- The anchor sleeve is placed in the drill hole, and filled with injection mortar from the anchor sleeve base.
- Turning in the anchor causes the mortar to be pushed through the anchor sleeve's grating structure, so that it fits the base material perfectly. The load is borne by the interlock.

### FOR USE WITH



**FIS V mortar**  
see page 130



**FIS GREEN mortar**  
see page 151



**FIS P Plus mortar**  
see page 154

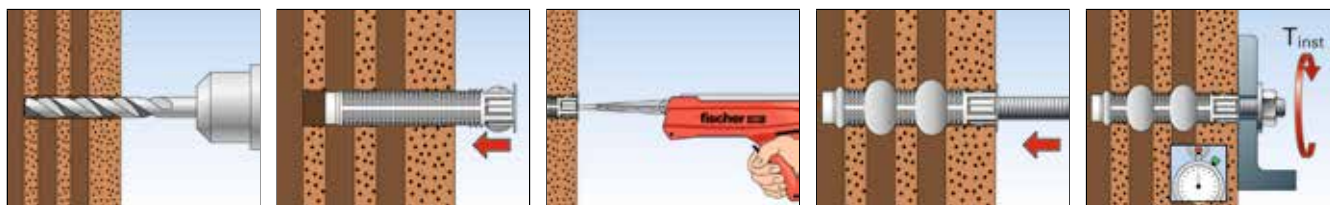


**FIS P mortar**  
see page 156



**FIS VL mortar**  
see page 136

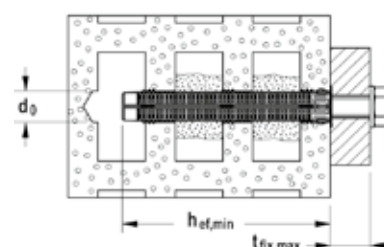
## INSTALLATION



## TECHNICAL DATA



Threaded rod FIS A



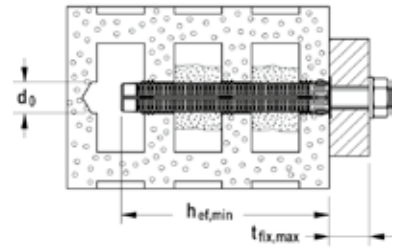
Item	zinc plated, steel grade 5.8	zinc plated, steel grade 8.8	stainless steel	Approval ETA	Drill hole diameter in perforated brick masonry	Min. anchorage depth in perfora- ted brick masonry	Max. useful length in perforated brick masonry	Suitable injection anchor sleeve	Sales unit [pcs]
	Art.-No.	Art.-No.	Art.-No.		$d_0$ [mm]	$h_{ef, min}$ [mm]	$t_{fix, max}$ [mm]		
	gvz	gvz	A4						
<b>FIS A M 6 x 70</b>	<b>046204</b> <sup>1)</sup>	—	—	■	12	50	11	FIS H 12 x 50 K	10
<b>FIS A M 6 x 75</b>	<b>090243</b> <sup>1)</sup>	—	<b>090437</b> <sup>1)</sup>	■	12	50	16	FIS H 12 x 50 K	20
<b>FIS A M 6 x 85</b>	<b>090272</b> <sup>1)</sup>	—	—	■	12	50	26	FIS H 12 x 50 K	20
<b>FIS A M 6 x 110</b>	<b>090273</b> <sup>1)</sup>	—	<b>090439</b> <sup>1)</sup>	■	12	50 85	52 17	FIS H 12 x 50 K FIS H 12 x 85 K	20
<b>FIS A M 8 x 90</b>	<b>090274</b> <sup>1)</sup>	<b>519390</b> <sup>1)</sup>	<b>090440</b> <sup>1)</sup>	■	12	50	29	FIS H 12 x 50 K	10
<b>FIS A M 8 x 110</b>	<b>090275</b> <sup>1)</sup>	<b>519391</b> <sup>1)</sup>	<b>090441</b> <sup>1)</sup>	■	12	50	49	FIS H 12 x 50 K	10
					12	85	14	FIS H 12 x 85 K	
					16	85	14	FIS H 16 x 85 K	
<b>FIS A M 8 x 130</b>	<b>090276</b> <sup>1)</sup>	<b>519392</b> <sup>1)</sup>	<b>090442</b> <sup>1)</sup>	■	12/16	50	69	FIS H 12 x 50 K	10
						85	34	FIS H 12 x 85 K	
						85	34	FIS H 16 x 85 K	
<b>FIS A M 8 x 175</b>	<b>090277</b> <sup>1)</sup>	<b>519393</b> <sup>1)</sup>	<b>090443</b> <sup>1)</sup>	■	12	50	114	FIS H 12 x 50 K	10
					12	85	79	FIS H 12 x 85 K	
					16	85	79	FIS H 16 x 85 K	
						130	34	FIS H 16 x 130 K	
<b>FIS A M 10 x 110</b>	<b>090278</b>	—	<b>090444</b>	■	16	85	12	FIS H 16 x 85 K	10
<b>FIS A M 10 x 130</b>	<b>090279</b>	<b>524170</b>	<b>090447</b>	■	16	85	32	FIS H 16 x 85 K	10
<b>FIS A M 10 x 150</b>	<b>090281</b>	<b>517935</b>	<b>090448</b>	■	16	85	52	FIS H 16 x 85 K	10
						130	7	FIS H 16 x 130 K	
<b>FIS A M 10 x 170</b>	<b>044969</b>	<b>519395</b>	<b>044973</b>	■	16	85	72	FIS H 16 x 85 K	10
						130	27	FIS H 16 x 130 K	
<b>FIS A M 10 x 190</b>	—	<b>517936</b>	—	■	16	85	92	FIS H 16 x 85 K	10
						130	47	FIS H 16 x 130 K	
<b>FIS A M 10 x 200</b>	<b>090282</b>	<b>519396</b>	<b>090449</b>	■	16	85	102	FIS H 16 x 85 K	10
						130	57	FIS H 16 x 130 K	
<b>FIS A M 12 x 120</b>	<b>044971</b>	<b>519397</b>	<b>044974</b>	■	20	85	19	FIS H 20 x 85 K	10
<b>FIS A M 12 x 140</b>	<b>090283</b>	<b>519398</b>	<b>090450</b>	■	20	85	39	FIS H 20 x 85 K	10
<b>FIS A M 12 x 160</b>	<b>090284</b>	<b>517937</b>	<b>090451</b>	■	20	85	59	FIS H 20 x 85 K	10
						130	14	FIS H 20 x 130 K	
<b>FIS A M 12 x 180</b>	<b>090285</b>	<b>519399</b>	<b>090452</b>	■	20	85	79	FIS H 20 x 85 K	10
						130	34	FIS H 20 x 130 K	
<b>FIS A M 12 x 200</b>	—	<b>517938</b>	—	■	20	85	99	FIS H 20 x 85 K	10
						130	54	FIS H 20 x 130 K	
<b>FIS A M 12 x 210</b>	<b>090286</b>	—	<b>090453</b>	■	20	85	109	FIS H 20 x 85 K	10
						130	64	FIS H 20 x 130 K	

1) Not approved for cracked concrete.

## TECHNICAL DATA



Threaded rod **FIS A**



3  
Chemical fixings

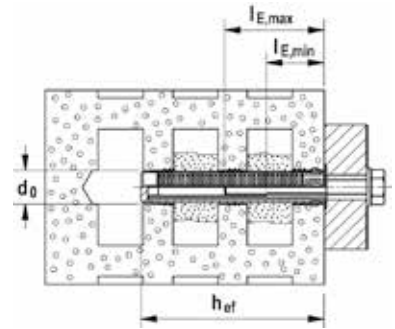
	zinc plated, steel grade 5.8	zinc plated, steel grade 8.8	stainless steel	Approval	Drill hole diameter in perforated brick masonry $d_0$ [mm]	Min. anchorage depth in perforated brick masonry $h_{ef, min}$ [mm]	Max. useful length in perforated brick masonry $t_{fix, max}$ [mm]	Suitable injection anchor sleeve	Sales unit
Item	Art.-No.	Art.-No.	Art.-No.	ETA					[pcs]
	gvz	gvz	A4						
<b>FIS A M 12 x 260</b>	<b>090287</b>	—	<b>090454</b>	■	20	85 130 200	169 114 44	FIS H 20 x 85 K FIS H 20 x 130 K FIS H 20 x 200 K	10
<b>FIS A M 16 x 130</b>	<b>044972</b>	<b>519400</b>	<b>044975</b>	■	20	85	25	FIS H 20 x 85 K	10
<b>FIS A M 16 x 175</b>	<b>090288</b>	<b>519401</b>	<b>090455</b>	■	20	85 130	70 25	FIS H 20 x 85 K FIS H 20 x 130 K	10
<b>FIS A M 16 x 200</b>	<b>090289</b>	<b>517939</b>	<b>090456</b>	■	20	85 130	95 50	FIS H 20 x 85 K FIS H 20 x 130 K	10
<b>FIS A M 16 x 250</b>	<b>090290</b>	<b>517940</b>	<b>090457</b>	■	20	85 130 200	145 100 30	FIS H 20 x 85 K FIS H 20 x 130 K FIS H 20 x 200 K	10
<b>FIS A M 16 x 300</b>	<b>090291</b>	<b>519402</b>	<b>090458</b>	■	20	85 130 200	195 150 80	FIS H 20 x 85 K FIS H 20 x 130 K FIS H 20 x 200 K	10

1) Not approved for cracked concrete.

## TECHNICAL DATA



Internal threaded sockets **FIS E**



	zinc-plated steel	Approval	Drill hole diameter in perforated brick masonry $d_0$ [mm]	Effect. anchorage depth $h_{ef}$ [mm]	Min. bolt penetration $l_{E, min}$ [mm]	Max. bolt penetration $l_{E, max}$ [mm]	Suitable injection anchor sleeve	Sales unit
Item	Art.-No.	ETA						[pcs]
	gvz							
<b>FIS E 11 x 85 M6</b>	<b>043631</b>	■	16 20	85	6	60	FIS H 16 x 85 K FIS H 20 x 85 K	10
<b>FIS E 11 x 85 M8</b>	<b>043632</b>	■	16 20	85	8	60	FIS H 16 x 85 K FIS H 20 x 85 K	10
<b>FIS E 15 x 85 M10</b>	<b>043633</b>	■	20	85	10	60	FIS H 20 x 85 K	10
<b>FIS E 15 x 85 M12</b>	<b>043634</b>	■	20	85	12	60	FIS H 20 x 85 K	10

## TECHNICAL DATA



Injection anchor sleeve **FIS H K**

Item	Art.-No.	Approval ETA	Drill hole diameter $d_0$ [mm]	Drill hole depth acc. ETA [mm]	Effect. anchorage depth $h_{ef}$ [mm]	Match	Fill quantity per sleeve [scale units]	Sales unit [pcs]
<b>FIS H 12 x 50 K</b>	<b>041900</b>	■	12	55	50	FIS A M6-M8	5	50
<b>FIS H 12 x 85 K</b>	<b>041901</b>	■	12	90	85	FIS A M6-M8	10	50
<b>FIS H 16 x 85 K</b>	<b>041902</b>	■	16	90	85	FIS A M8-M10, FIS E M6-M8	12	50
<b>FIS H 16 x 130 K</b>	<b>041903</b>	■	16	135	110	FIS A M8-M10	15	20
<b>FIS H 20 x 85 K</b>	<b>041904</b>	■	20	90	85	FIS A M12-M16, FIS E M10-M12	15	20
<b>FIS H 20 x 130 K</b>	<b>046703</b>	■	20	135	110	FIS A M12-M16	25	20
<b>FIS H 20 x 200 K</b>	<b>046704</b>	■	20	205	180	FIS A M12-M16	40	20

## TECHNICAL DATA



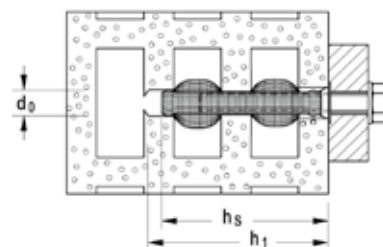
Injection anchor sleeve, 1 m length **FIS H L**

Item	Art.-No.	Drill hole diameter $d_0$ [mm]	Total length $l$ [mm]	Match	Fill quantity per 10cm	Sales unit [pcs]
<b>FIS H 12 x 1000 L</b>	<b>050598</b>	12	1000	Ø6 / M 6 - Ø8 / M 8	12	10
<b>FIS H 16 x 1000 L</b>	<b>050599</b>	16	1000	Ø10/M10 / Ø12/M12	14	10
<b>FIS H 22 x 1000 L</b>	<b>045301</b>	22	1000	Ø12/M12 - Ø16/M16	20	6
<b>FIS H 30 x 1000 L</b>	<b>000645</b>	30	1000	Ø16/M16 - Ø22/M22	26	4

## TECHNICAL DATA



Injection anchor sleeve with net **FIS H N**



Item	Art.-No.	Drill hole diameter $d_0$ [mm]	Min. drill hole depth $h_1$ [mm]	Min. anchorage depth anchor $h_v$ [mm]	Fill quantity per sleeve [scale units]	Match	Sales unit [pcs]
<b>FIS H 16 x 85 N</b>	<b>050470</b>	16	95	90	15	Ø8/M8	20
<b>FIS H 18 x 85 N</b>	<b>050472</b>	18	95	90	17	Ø10/M10	20
<b>FIS H 20 x 85 N</b>	<b>050474</b>	20	95	90	18	Ø12/M12	20

## LOADS

**Injection system FIS V, FIS VW HIGH SPEED and FIS VS LOW SPEED with threaded rod FIS A<sup>5)</sup> and anchor sleeve FIS H..K**  
Highest permissible loads<sup>1) 6)</sup> for a single anchor in perforated brick masonry for pre-positioned installation.  
For the design the complete assessment ETA-10/0383 has to be considered.

Type	Compressive brick strength $f_b$ [N/mm <sup>2</sup> ]	Brick raw density $\rho$ [kg/dm <sup>3</sup> ]	Minimum brick dimensions <sup>7)</sup> (L x W x H) [mm]	Min. effective anchorage depth <sup>4)</sup> $h_{ef}$ [mm]	Min. member thickness $h_{min}$ [mm]	Maximum torque $T_{inst,max}$ [Nm]	Perforated brick masonry			
							Permissible tensile load <sup>3)</sup> $N_{perm}$ [kN]	Permissible shear load <sup>3)</sup> $V_{perm}$ [kN]	Min. spacing <sup>2)</sup> $s_{min}$ [mm]	Min. edge distance <sup>2)</sup> $c_{min}$ [mm]
<b>Vertically perforated brick Hlz, shape B acc. EN 771-1</b>										
M6 / M8	≥ 6	≥ 1,0	370x240x237	50	240	2,0	0,17	0,21	100	100
M8 - M16	≥ 6			85						
M6 / M8	≥ 8			50						
M8 - M16	≥ 8			85						
M6 / M8	≥ 16			50						
M8 - M16	≥ 16			85						
<b>Perforated sand-lime brick KSL acc. EN 771-2</b>										
M6 / M8	≥ 12	≥ 1,4	240x175x113	50	175	2,0	0,71	0,71	100	60
M12 / M16	≥ 12			85						
M8 / M10	≥ 20			85						
M12 / M16	≥ 20			85						
<b>Hollow block of lightweight aggregate concrete Hbl acc. EN 771-3</b>										
M6 / M8	≥ 4	≥ 1,0	362x240x240	50	240	2,0	0,71	0,57	100	60
M12 / M16	≥ 4			85						

<sup>1)</sup> 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.

<sup>2)</sup> Minimum possible axial spacings resp. edge distance. Details concerning the distances to joints see assessment.

<sup>3)</sup> For combinations of tensile loads, shear loads, bending moments as well as reduced edge distances or spacings (anchor groups) see assessment.

<sup>4)</sup> The max. anchorage depth is corresponding with the relevant anchor sleeves FIS H..K (see technical data).

<sup>5)</sup> gvz, A4 and C.

<sup>6)</sup> The given loads are valid for installation and use of fixations in dry masonry for temperatures in the substrate up to +50°C (resp. short term up to 80°C) and drillhole cleaning according assessment. The given brick types in combination with the permissible loads are only a small extract of the assessment.

<sup>7)</sup> Hole patterns see assessment.

## LOADS

### Injection system FIS VL with threaded rod FIS A<sup>5)</sup> and anchor sleeve FIS H..K

Highest permissible loads<sup>1) 6)</sup> for a single anchor in perforated brick masonry for pre-positioned installation.  
For the design the complete European Technical Assessment ETA-15/0263 has to be considered.

Type	Compressive brick strength $f_b$ [N/mm <sup>2</sup> ]	Brick raw density $\rho$ [kg/dm <sup>3</sup> ]	Minimum brick dimensions <sup>7)</sup> (L x W x H) [mm]	Min. effective anchorage depth <sup>4)</sup> $h_{ef}$ [mm]	Min. member thickness $h_{min}$ [mm]	Maximum torque $T_{inst,max}$ [Nm]	Perforated brick masonry			
							Permissible tensile load <sup>3)</sup> $N_{perm}$ [kN]	Permissible shear load <sup>3)</sup> $V_{perm}$ [kN]	Min. spacing <sup>2)</sup> $s_{min}$ [mm]	Min. edge distance <sup>2)</sup> $c_{min}$ [mm]
<b>Perforated sand-lime brick acc. EN 771-2</b>										
M8	≥12	≥1,4	240x175x113	85	115	2	0,71	0,71	115	100
M8 / M10	≥12						0,86	1,29	115	100
M12	≥12						1,00	1,29	115	100
M8	≥20						1,28	1,29	115	100
M8 / M10	≥20						1,43	2,14	115	100
M12	≥20						1,71	2,14	115	100
<b>Vertically perforated brick Hz acc. EN 771-1</b>										
M6 / M8	≥8	≥0,6	370x250x245	85	250	2	0,57	0,57	245	120
M8 / M10	≥8						0,57	0,86	245	120
M12 / M16	≥8						0,57	0,43	245	120
<b>Vertically perforated brick Hz acc. EN 771-1</b>										
M6 / M8	≥10	≥0,9	240x175x113	85	175	2	1,14	1,14	115	100
M8 / M10	≥10						1,00	1,57	115	100
M12 / M16	≥10						1,00	1,71	115	100

<sup>1)</sup> 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.

<sup>2)</sup> Minimum possible axial spacings resp. edge distance. Details concerning the distances to joints see assessment.

<sup>3)</sup> For combinations of tensile loads, shear loads, bending moments as well as reduced edge distances or spacings (anchor groups) see ETAG 029.

<sup>4)</sup> The max. anchorage depth is corresponding with the relevant anchor sleeves FIS H..K (see technical data).

<sup>5)</sup> gvz, A4 and C

<sup>6)</sup> The given loads are valid for installation and use of fixations in dry masonry for temperatures in the substrate up to +50 °C (resp. short term up to 80 °C) and drillhole cleaning according assessment. The given brick types in combination with the permissible loads are only a small extract of the assessment.

<sup>7)</sup> Hole patterns see assessment.

## LOADS

### Injection system FIS green with threaded rod FIS A<sup>5)</sup> and anchor sleeve FIS H..K

Highest permissible loads<sup>1) 6)</sup> for a single anchor in perforated brick masonry for pre-positioned installation.  
For the design the complete approval has to be considered.

Type	Compressive brick strength $f_b$ [N/mm <sup>2</sup> ]	Brick raw density $\rho$ [kg/dm <sup>3</sup> ]	Minimum brick dimensions <sup>7)</sup> (L x W x H) [mm]	Min. effective anchorage depth <sup>4)</sup> $h_{ef}$ [mm]	Min. member thickness $h_{min}$ [mm]	Maximum torque $T_{inst,max}$ [Nm]	Perforated brick masonry			
							Permissible tensile load <sup>3)</sup> $N_{perm}$ [kN]	Permissible shear load <sup>3)</sup> $V_{perm}$ [kN]	Min. spacing <sup>2)</sup> $s_{min}$ [mm]	Min. edge distance <sup>2)</sup> $c_{min}$ [mm]
<b>Vertically perforated brick Hz acc. EN 771-1</b>										
M8 / M10 / M12	≥ 8	≥ 1,4	230x106x55	85	106	4,0	0,57	0,71	55	100
M8	≥ 12	≥ 0,9	240x175x113	50	175	4,0	0,57	1,14	115	120
M8 / M10				85			0,57	1,57	115	120
M12 / M16				0,71			1,71	115	120	

<sup>1)</sup> 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.

<sup>2)</sup> Minimum possible edge distance resp. axial spacing for anchor groups. For further measures e.g. the corresponding axial spacing for anchor groups or the minimum distance between anchor groups please see approval.

<sup>3)</sup> For combinations of tensile loads, shear loads, bending moments as well as reduced axial spacings (anchor groups) see approval.

<sup>4)</sup> The maximum anchorage depth is corresponding with the relevant anchor sleeves FIS H..K (see technical data).

<sup>5)</sup> gvz, A4 and C.

<sup>6)</sup> The given loads are valid for installation and use of fixations in dry masonry for temperatures in the substrate up to +50 °C (resp. short term up to 80 °C) and drillhole cleaning according approval. The given brick types in combination with the permissible loads are only an extract of the approval.

<sup>7)</sup> Hole patterns see approval.

## LOADS

### Injection system FIS P Plus with threaded rod FIS A<sup>5)</sup> and anchor sleeve FIS H..K

Highest permissible loads<sup>1) 6)</sup> for a single anchor in perforated brick masonry for pre-positioned installation.  
For the design the complete approval ETA-11/04 19 has to be considered.

Type	Compressive brick strength $f_b$ [N/mm <sup>2</sup> ]	Min. effective anchorage depth <sup>4)</sup> $h_{ef,min}$ [mm]	Brick type, naming acc. DIN [-] [-]	Max. torque moment $T_{inst,max}$ [Nm]	Perforated brick masonry			
					Permissible tensile load <sup>3)</sup> $N_{perm}$ [kN]	Permissible shear load <sup>3)</sup> $V_{perm}$ [kN]	Min. spacing <sup>2)</sup> $s_{min}$ [mm]	Min. edge distance <sup>2)</sup> $c_{min}$ [mm]
<b>Vertically perforated brick Hlz</b>								
M8 / M10	8	110	Hlz	2,0	0,57	0,57	80	100
M12 / M16	8	110	Hlz	2,0	0,43	0,57	80	120
M8 / M10	10	110	Hlz	2,0	0,71	0,43	80	100
M12 / M16	10	110	Hlz	2,0	1,00	0,43	80	120
M8 / M10	12	110 <sup>7)</sup>	Hlz	2,0	0,57	0,57	80	100
M12 / M16	12	110	Hlz	2,0	1,00	0,57	80	120
M8 / M10	28	85	Hlz	2,0	1,00	1,71	100	240
M12 / M16	28	110	Hlz	2,0	-	-	-	-
<b>Perforated sand-lime brick KSL</b>								
M8 / M10	12	85	KSL	2,0	0,71	1,29	80	100
M12 / M16	12	110	KSL	2,0	0,86	1,29	80	120
M8 / M10	20	85	KSL	2,0	1,00	1,71	80	100
M12 / M16	20	110	KSL	2,0	1,29	1,71	80	120
<b>Hollow block of lightweight aggregate concrete Hbl</b>								
M8 / M10	6	110	Hbl	2,0	0,34	0,71	80	100
M12 / M16	6	110	Hbl	2,0	0,34	0,71	80	120

<sup>1)</sup> 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.

<sup>2)</sup> Minimum possible axial spacings resp. edge distance while reducing the permissible load.

<sup>3)</sup> For combinations of tensile loads, shear loads, bending moments as well as reduced edge distances or spacings (anchor groups) see approval.

<sup>4)</sup> The max. anchorage depth is corresponding with the relevant anchor sleeves FIS H..K (see technical data).

<sup>5)</sup> gvz, A4 and C.

<sup>6)</sup> The given loads are valid for fixations in dry and wet masonry for temperatures in the substrate up to +50°C (resp. short term up to 80°C) and best possible drillhole cleaning according approval.

<sup>7)</sup> For bricks with certain hole patterns 85 mm are possible. Please see approval.