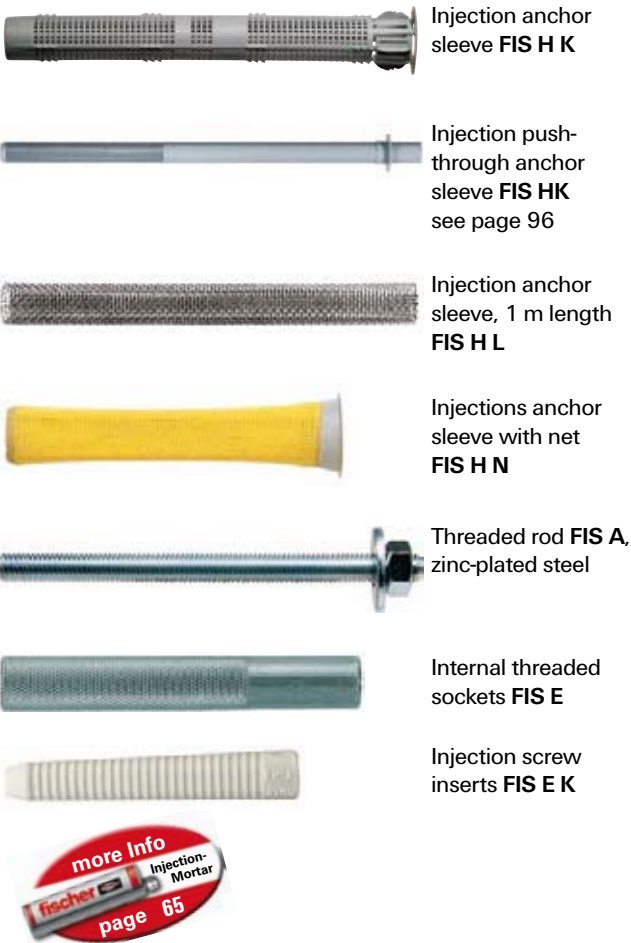


# Injection technique for masonry

The expansion-free anchoring for the professional user.

## OVERVIEW



### Approval:

- German approval (DIBt) in conjunction with Injection mortar FIS V, FIS VS, FIS VW FIS HK and FIS A resp. FIS E for solid and hollow material



### With anchor sleeve suitable for:

- Vertical perforated bricks
- Perforated sand-lime brick
- Hollow blocks
- Solid brick
- Solid sand-lime brick
- Hollow pumice plank
- Slabs made of perforated bricks and other perforated blocks

### Without anchor sleeve suitable for:

- Lightweight concrete
- Solid brick
- Solid sand-lime bricks
- Full pumice stone and other solid building materials
- Air crete

### For fixing of:

- Machines
- Gratings
- Gates
- Handrails
- Consoles
- Pipelines
- Sanitary equipment
- Cable trays
- Facades
- Awnings
- Canopies
- Wooden constructions

## DESCRIPTION

- Injection anchor sleeves, threaded rods and internal threaded sockets, specially for use with Injection mortars FIS V, FIS VS, FIS VT or FIS P in masonry materials.
- The anchor sleeve saves mortar in hollow materials and centres the anchor in the drill hole.
- In solid building materials the anchor sleeves are not required.
- In solid building materials, the injection mortar bonds the entire surface of the anchor rod / internal threaded sockets to the wall of the drilled hole.
- With hollow materials the mortar adapts to the anchoring substrate and bears the load primarily through a mechanical interlock.

## FIS H K - ADVANTAGES AT A GLANCE

**Optimised grating structure**  
The sleeve for reduced mortar consumption and optimum mechanical interlock.

**Barbed hook**  
Optimum hold in drill hole.

**Minimum edge thickness**  
Only protrudes slightly.

**Centring blade**  
Clicks into inside of drill hole and centres the anchor rod.

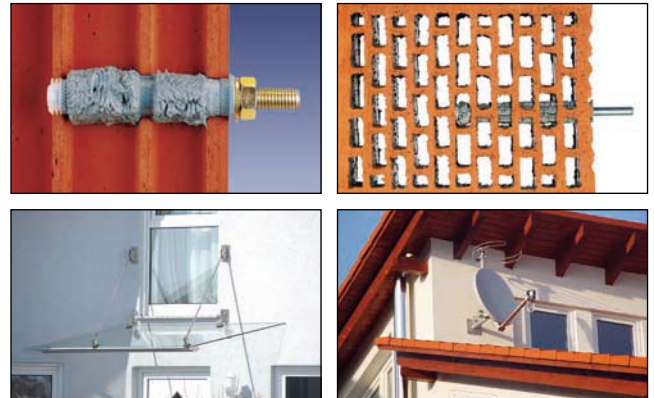
**Wide edge**  
Prevents anchor from slipping deeper and cleanly covers drill hole.

- Perfectly matched to the fischer injection mortar, the FIS H K anchor sleeve reduces the quantity of mortar you use and is more user-friendly.
- The optimised grating structure of the anchor sleeve leads to a reduced mortar consumption to 80% depending on dimensions.
- Handling is also simpler: the anchor sleeve centres itself and thus ensures the anchor rod is fixed securely in the drill hole.

## DESCRIPTION

### Advantages/Benefits

- High-performance mortars allow high loads in all building materials.
- Approval covers common masonry materials for maximum safety.
- Expansion-free fixing allows small spacings and edge distances.
- Extensive range for various cost-efficient applications.
- The mortar largely seals the drill hole.



## INSTALLATION

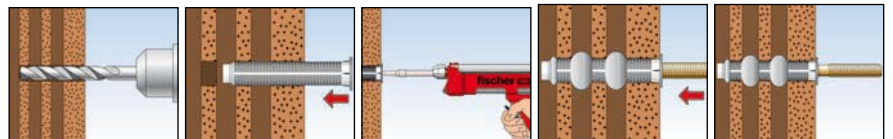
### Type of Installation

- Pre-positioned installation

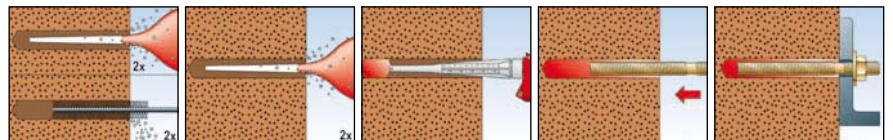
### Installation information

- In solid building materials the drill-hole must be cleaned thoroughly (blow out 2 x, brush out 2x, blow out 2 x).

#### in perforated brick with anchor sleeve



#### in solid materials without anchor sleeve



## TECHNICAL DATA



Injection anchor sleeve  
**FIS H 12 x 50 K**



Injection anchor sleeve  
**FIS H 16 x 130 K**

Type	Art.No.	drillØ		min. drill hole depth		effect. anchoring depth		Mortar filling quantity	fits	anchor per 360 ml-cartridge 1)	Qty. per box pcs.
		d <sub>0</sub> [mm]	t [mm]	t	h <sub>ef</sub> [mm]						
FIS H 12 x 50 K	<b>041900</b>	12	60	50	5	FIS A M6-M8, FIS EK 5-6	34	50			
FIS H 12 x 85 K	<b>041901</b>	12	95	85	10	FIS A M6-M8, FIS EK 5-6	17	50			
FIS H 16 x 85 K	<b>041902</b>	16	95	85	12	FIS A M8-M10, FIS EK 8-10, FIS E M6-M8, threaded rod with graduated diameter M12	14	50			
FIS H 16 x 130 K	<b>041903</b>	16	140	130	15	FIS A M8-M10, FIS EK 8-10, FIS E M6-M8, threaded rod with graduated diameter M12	11	20			
FIS H 20 x 85 K	<b>041904</b>	20	95	85	15	FIS A M12-M16, FIS E M10-M12	11	20			
FIS H 20 x 130 K	<b>046703</b>	20	140	130	25	FIS A M12-M16, FIS E M10-M12	7	20			
FIS H 20 x 200 K	<b>046704</b>	20	210	200	40	FIS A M12-M16, FIS E M10-M12	4	20			

1) max. number by using 1 static mixer

# Injection technique for masonry

## TECHNICAL DATA



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

Type	Art.-No.	drill-Ø	total length	fits	mortar filling quantity per 10 cm	Qty. per box
		$d_0$ [mm]	$l$ [mm]			pcs.
FIS H 12 x 1000 L	<b>050598</b>	12	1000	Ø6 / M 6 - Ø8 / M 8	12	10
FIS H 16 x 1000 L	<b>050599</b>	16	1000	Ø10/M10 / Ø12/M12	14	10
FIS H 22 x 1000 L	<b>045301</b>	22	1000	Ø12/M12 - Ø16/M16	20	6



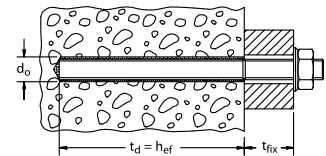
Injection anchor sleeve with net  
**FIS H N**

Type	Art.-No.	drill-Ø	min. drill hole depth	Min. anchorage depth anchor	Min. anchorage depth sleeve	Mortar filling quantity	anchor per 360 ml-cartridge	fits	Qty. per box
		$d_0$ [mm]	$t$ [mm]	$h_v$ [mm]	$h_v$ [mm]				pcs.
FIS H 16 x 85 N	<b>050470</b>	16	95	90	85	15	11	Ø8/M8 20	20
FIS H 18 x 85 N	<b>050472</b>	18	95	90	85	17	10	Ø10/M10	20
FIS H 20 x 85 N	<b>050474</b>	20	95	90	85	19	9	Ø12/M12	20



Threaded rod **FIS A**,  
zinc-plated steel

Type	Art.-No.	approval	drill-Ø	min. drill hole depth	min. anchorage depth in masonry	max. useful length in masonry	Mortar filling quantity without anchor sleeve	anchor per 360 ml-cartridge 1)	Qty. per box
		• DIBt	$d_0$ [mm]	$t$ [mm]	[mm]	[mm]	[scale units]		pcs.
FIS A M 6 x 70	2) <b>046204</b>	•	8	-	-	-	3	56	10
FIS A M 6 x 75	2) <b>090243</b>	•	8	-	-	-	3	56	20
FIS A M 6 x 85	<b>090272</b>	•	8	80	75	2	3	56	20
FIS A M 6 x 110	<b>090273</b>	•	8	80	75	25	3	56	20
FIS A M 8 x 70	<b>046206</b>	•	10	80	75	-	3	56	10
FIS A M 8 x 90	<b>090274</b>	•	10	80	75	5	3	56	10
FIS A M 8 x 110	<b>090275</b>	•	10	80	75	25	3	56	10
FIS A M 8 x 130	<b>090276</b>	•	10	80	75	45	3	56	10
FIS A M 8 x 175	<b>090277</b>	•	10	80	75	90	3	56	10
FIS A M 10 x 110	<b>090278</b>	•	12	80	75	25	4	42	10
FIS A M 10 x 130	<b>090279</b>	•	12	80	75	45	4	42	10
FIS A M 10 x 150	<b>090281</b>	•	12	80	75	65	4	42	10
FIS A M 10 x 170	<b>044969</b>	•	12	80	75	85	4	42	10
FIS A M 10 x 200	<b>090282</b>	•	12	80	75	115	4	42	10
FIS A M 12 x 120	<b>044971</b>	•	14	80	75	30	5	34	10
FIS A M 12 x 140	<b>090283</b>	•	14	80	75	50	5	34	10
FIS A M 12 x 160	<b>090284</b>	•	14	80	75	70	5	34	10
FIS A M 12 x 180	<b>090285</b>	•	14	80	75	90	5	34	10
FIS A M 12 x 210	<b>090286</b>	•	14	80	75	120	5	34	10
FIS A M 12 x 260	<b>090287</b>	•	14	80	75	170	5	34	10
FIS A M 16 x 130	<b>044972</b>	•	18	80	75	40	7	24	10
FIS A M 16 x 175	<b>090288</b>	•	18	80	75	85	7	24	10
FIS A M 16 x 200	<b>090289</b>	•	18	80	75	110	7	24	10
FIS A M 16 x 250	<b>090290</b>	•	18	80	75	160	7	24	10
FIS A M 16 x 300	<b>090291</b>	•	18	80	75	210	7	24	10



1) max. number by using 1 static mixer  
2) for use with FIS H 12 x 50 K

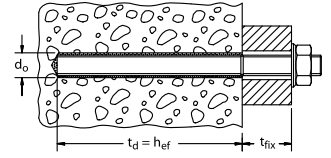
## TECHNICAL DATA



Threaded rod **FIS A**,  
stainless steel of the corrosion  
resistance class III e.g. A4

Type	Art.No.	approval	drill-Ø	min. drill hole depth	min. anchorage depth in masonry	max. useful length in masonry	Mortar filling quantity without anchor sleeve	anchor per 360 ml-cartridge 1)	Qty. per box
		● DIBt	$d_0$ [mm]	$t$ [mm]	[mm]	[mm]	[scale units]		pcs.
FIS A M 6 x 70 A4	2) <b>046205</b>	●	8	-	-	-	3	56	10
FIS A M 6 x 75 A4	2) <b>090437</b>	●	8	-	-	-	3	56	20
FIS A M 6 x 85 A4	<b>090438</b>	●	8	80	75	2	3	56	20
FIS A M 6 x 110 A4	<b>090439</b>	●	8	80	75	25	3	56	20
FIS A M 8 x 70 A4	<b>046245</b>	●	10	80	75	-	3	56	10
FIS A M 8 x 90 A4	<b>090440</b>	●	10	80	75	5	3	56	10
FIS A M 8 x 110 A4	<b>090441</b>	●	10	80	75	25	3	56	10
FIS A M 8 x 130 A4	<b>090442</b>	●	10	80	75	45	3	56	10
FIS A M 8 x 175 A4	<b>090443</b>	●	10	80	75	90	3	56	10
FIS A M 10 x 110 A4	<b>090444</b>	●	12	80	75	25	4	42	10
FIS A M 10 x 130 A4	<b>090447</b>	●	12	80	75	45	4	42	10
FIS A M 10 x 150 A4	<b>090448</b>	●	12	80	75	65	4	42	10
FIS A M 10 x 170 A4	<b>044973</b>	●	12	80	75	85	4	42	10
FIS A M 10 x 200 A4	<b>090449</b>	●	12	80	75	115	4	42	10
FIS A M 12 x 120 A4	<b>044974</b>	●	14	80	75	30	5	34	10
FIS A M 12 x 140 A4	<b>090450</b>	●	14	80	75	50	5	34	10
FIS A M 12 x 160 A4	<b>090451</b>	●	14	80	75	70	5	34	10
FIS A M 12 x 180 A4	<b>090452</b>	●	14	80	75	90	5	34	10
FIS A M 12 x 210 A4	<b>090453</b>	●	14	80	75	120	5	34	10
FIS A M 12 x 260 A4	<b>090454</b>	●	14	80	75	170	5	34	10
FIS A M 16 x 130 A4	<b>044975</b>	●	18	80	75	40	7	24	10
FIS A M 16 x 175 A4	<b>090455</b>	●	18	80	75	85	7	24	10
FIS A M 16 x 200 A4	<b>090456</b>	●	18	80	75	110	7	24	10
FIS A M 16 x 250 A4	<b>090457</b>	●	18	80	75	160	7	24	10
FIS A M 16 x 300 A4	<b>090458</b>	●	18	80	75	210	7	24	10

- 1) max. number by using 1 static mixer  
2) for use with FIS H 12 x 50 K



Internal threaded sockets  
**FIS E**

Type	Art.No.	approval	effect.	anchoring depth	min. bolt penetration	max. bolt penetration	internal thread	fits	Qty. per box
		● DIBt	$h_{ef}$ [mm]	$e_2$ [mm]	$e_1$ [mm]	$d_s$			pcs.
FIS E 11 x 85 M6	<b>043631</b>	●	85	6	60	M 6	FIS H 16 x 85 K FIS H 20 x 85 K		10
FIS E 11 x 85 M8	<b>043632</b>	●	85	8	60	M 8	FIS H 16 x 85 K FIS H 20 x 85 K		10
FIS E 15 x 85 M10	<b>043633</b>	●	85	10	60	M 10	FIS H 20 x 85 K		10
FIS E 15 x 85 M12	<b>043634</b>	●	85	12	60	M 12	FIS H 20 x 85 K		10



Injection screw inserts  
**FIS E K**

Type	Art.No.	effect. anchoring depth	screw	bolt penetration	drill-Ø without anchor sleeve	drill hole depth	fits	Qty. per box
		$h_{ef}$ [mm]	$d_s \times l_s$ [mm]	min. [mm]	max. [mm]	$h_0$ [mm]		pcs.
FIS E 5 x 45 K	<b>058053</b>	45	Ø 4-5/M5	20	35	10	FIS H 12 x 50 K FIS H 12 x 85 K	25
FIS E 6 x 75 K	<b>058049</b>	60	Ø 5-6/M6	35	65	10	FIS H 12 x 85 K	25
FIS E 8 x 80 K	<b>043667</b>	70	Ø 7-8/M8	20	65	14	FIS H 16 x 85 K FIS H 16 x 130 K	10
FIS E 10 x 95 K	<b>058051</b>	80	Ø 10/M10	45	85	14	FIS H 16 x 85 K FIS H 16 x 130 K	10

# Injection technique for masonry

## TECHNICAL DATA



Type	Art.-No.	fits	Qty. per box
FIS-brush Ø14/20 mm	<b>048980</b>	8 - 16	1
FIS-brush Ø20/30 mm	<b>048981</b>	16 - 30	1

## CORRECT USE WITHOUT ANCHOR SLEEVE

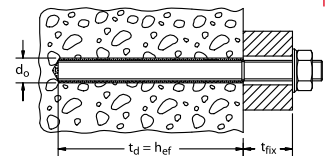
### Correct use without anchor sleeve

#### Suitable for:

Lightweight concrete, solid brick, sand-lime solid brick, solid pumice and other solid materials

#### Approved for:

Solid bricks  $\geq$  Mz 12, sand-lime solid bricks  $\geq$  KS 12.



Product	Injection threaded rod FIS A M...																					
	6x110	8x90	8x110	8x130	8x175	10x110	10x130	10x150	10x170	10x200	12x120	12x140	12x160	12x180	12x210	12x260	16x130	16x175	16x200	16x250	16x300	
Approval	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Usable length $t_{fix}$ [mm]	25	5	25	45	90	25	45	65	85	115	30	50	70	90	120	170	40	85	110	160	210	
Drill diameter $d_0$ [mm]	8	10	10	10	10	12	12	12	12	12	14	14	14	14	14	14	18	18	18	18	18	
Anchoring depth $h_{ef}$ [mm]	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	
No. of scale units	3	3	3	3	3	4	4	4	4	4	5	5	5	5	5	5	5	7	7	7	7	
Anchor per cartridge 1)	56	56	56	56	56	42	42	42	42	42	34	34	34	34	34	34	24	24	24	24	24	

### Correct use without anchor sleeve

Product	Internally threaded sockets FIS E...				Screw-inserts FIS E...K			
	11x85 M6	11x85 M8	15x85 M10	15x85 M12	5x45	6x75	8x80	10x95
Approval	●	●	●	●	-	-	-	-
Usable length $t_{fix}$ [mm]	-	-	-	-	-	-	-	-
Drill diameter $d_0$ [mm]	14	14	18	18	10	10	14	14
Anchoring depth $h_{ef}$ [mm]	85	85	85	85	45	75	80	95
No. of scale units	5	5	2	3	4	5	-	-
Anchor per cartridge 1)	34	34	85	56	42	34	-	-

1) Anchor with 1 static mixer per cartridge 360 ml

**CORRECT USE WITH ANCHOR SLEEVE**

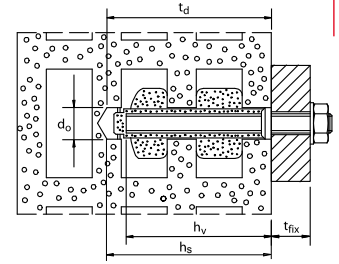
**Correct use with anchor sleeve: combination options**

**Suitable for:**

Vertically perforated bricks, sand-lime perforated bricks, hollow blocks, solid bricks, sand-lime solid bricks, pumice hollow blanks, hollow filler block floors, no-fines lightweight concrete and other perforated material.

**Approved for:**

Vertically perforated bricks  $\geq$  HLz 4, sand-lime perforated bricks  $\geq$  KSL 4, hollow blocks made from lightweight concrete  $\geq$  Hbl 2, hollow blocks made from concrete  $\geq$  Hbn 4, solid bricks  $\geq$  Mz 12, sand-lime solid bricks  $\geq$  KS 12 and no-fines lightweight concrete.



Product Installation details see Injection anchor sleeves	Injection anchor sleeve FIS H...K							Injection anchor sleeve, 1 m length FIS H...L			Injection anchor sleeve with net FIS H...N		
	12 x 50	12 x 85*	16 x 85*	16 x 130**	20 x 85*	20 x 130	20 x 200	12 x 1000	16 x 1000	22 x 1000	16 x 85	18 x 85	20 x 85
Type													
Art.-No.	<b>41900</b>	<b>41901</b>	<b>41902</b>	<b>41903</b>	<b>41904</b>	<b>46703</b>	<b>46704</b>	<b>50958</b>	<b>50599</b>	<b>45301</b>	<b>50470</b>	<b>50472</b>	<b>50474</b>
Drill- $\phi$ $d_g$ [mm]	12	12	16	16	20	20	20	12	16	22	16	18	20
Drill depth $t_d$ [mm]	$\geq 60$	$\geq 95$	$\geq 95$	$\geq 140$	$\geq 95$	$\geq 135$	$\geq 205$	$\geq 90$	$\geq 90$	$\geq 90$	$\geq 95$	$\geq 95$	$\geq 95$
No. of scale units	5	10	12	15	15	25	40	95/m	165/m	275/m	15	17	19
Anchor per 360 ml-cartridge	34	17	14	11	11	7	4				11	10	9
Anchoring depth $h_{ef}$	50	85	85	130	85	130	200	$\geq 75$	$\geq 75$	$\geq 75$	85	85	85

**suitable for:  
Injection threaded rod FIS A**



gvz	A4	usable length $t_{fix}$ [mm]									usable length $t_{fix}$ [mm]					
FIS A M 6 x 70	<b>046207</b>	<b>046205</b>	10													
FIS A M 6 x 75	<b>090243</b>	<b>090437</b>	15													
FIS A M 6 x 85	<b>090272</b>	<b>090438</b>	25													
FIS A M 6 x 110	<b>090273</b>	<b>090439</b>	50	15												
FIS A M 8 x 70	<b>046206</b>	<b>046245</b>	10													
FIS A M 8 x 90	<b>090274</b>	<b>090440</b>	30													
FIS A M 8 x 110	<b>090275</b>	<b>090441</b>	50	15	15									15		
FIS A M 8 x 130	<b>090276</b>	<b>090442</b>	70	35	35									35		
FIS A M 8 x 175	<b>090277</b>	<b>090443</b>	115	80	80	35								80		
FIS A M 10 x 110	<b>090278</b>	<b>090444</b>			15										15	
FIS A M 10 x 130	<b>090279</b>	<b>090447</b>			35										35	
FIS A M 10 x 150	<b>090281</b>	<b>090448</b>			55	10									55	
FIS A M 10 x 170	<b>044969</b>	<b>044973</b>			75	30									75	
FIS A M 10 x 200	<b>090282</b>	<b>090449</b>			105	60									105	
FIS A M 12 x 120	<b>044971</b>	<b>044974</b>					20									20
FIS A M 12 x 140	<b>090283</b>	<b>090450</b>					40									40
FIS A M 12 x 160	<b>090284</b>	<b>090451</b>					60	15								60
FIS A M 12 x 180	<b>090285</b>	<b>090452</b>					80	35								80
FIS A M 12 x 210	<b>090286</b>	<b>090453</b>					110	65								110
FIS A M 12 x 260	<b>090287</b>	<b>090454</b>					160	115	45							160
FIS A M 12 ( $\emptyset$ 10)	1)	1)			•	•										
FIS A M 16 x 130	<b>044972</b>	<b>044975</b>					30									
FIS A M 16 x 175	<b>090288</b>	<b>090455</b>					75	30								
FIS A M 16 x 200	<b>090289</b>	<b>090456</b>					100	55								
FIS A M 16 x 250	<b>090290</b>	<b>090457</b>					150	105	35							
FIS A M 16 x 300	<b>090291</b>	<b>090458</b>					200	155	85							

**Internal threaded sockets FIS E**

gvz										
FIS E 11 x 85 M6	<b>043631</b>			•	■	•				
FIS E 11 x 85 M8	<b>043632</b>			•	■	•				
FIS E 15 x 85 M10	<b>043633</b>					•				
FIS E 15 x 85 M12	<b>043634</b>					•				

**Injection screw inserts FIS E K**

FIS E 5 x 45 K	<b>058053</b>	■	■							
FIS E 6 x 75 K	<b>058049</b>		■							
FIS E 8 x 80 K	<b>043667</b>			■	■					
FIS E 10 x 95 K	<b>058051</b>			■	■					

Red font resp. • = Included in the German Approval. ■ Suitable but without approval.  
 1) Threaded rod with graduated diameter M12 (to  $\emptyset$  10 at anchoring base) on request.

\* Plaster bridging possible up to 20 mm except perforated sand-lime brick (KSL).  
 \*\* Plaster bridging possible up to 20mm.

# Injection technique for masonry

## LOADS

Permissible loads  $F_{perm}$  of a single anchor installed with FIS V, FIS VS or FIS VW in masonry and porous light-weight concrete (TGL) for tension, shear and combined tension and shear. For FIS VT and FIS P the below mentioned load values are valid as recommended loads only.

Anchor type			Threaded rod FIS A												
Application without anchor sleeve			M 6			M 8		M 10		M 12 (Ø10)		M 12			
Solid brick	≥ Mz 12	[kN]	1.0 <sup>1)</sup>			1.0 <sup>1)</sup>		1.7		1.7		1.7			
Sand-lime solid brick	≥ KS 12	[kN]	1.0 <sup>1)</sup>			1.0 <sup>1)</sup>		1.7		1.7		1.7			
Nominal drill diameter	Ø d <sub>Q</sub>	[mm]	8			10		12		12		14			
Drill hole depth	min h <sub>Q</sub>	[mm]	80			80		80		80		80			
Anchorage depth	min h <sub>ef</sub>	[mm]	75			75		75		75		75			
Minimum structural component thickness	d	[mm]	110			110		110		110		110			
Required mortar volume FIS V, FIS VS, FIS VW, FIS VR, FIS P	[scale units]		2			3		3		3		4			
Application with anchor sleeve			M 6			M 8		M 10		M 12 (Ø10)		M 12			
Anchor sleeve type FIS H ... K			12x50	12x85	12x50	12x85	16x85	16x130	16x85	16x130	16x85	16x130	20x85	20x130	20x200
Solid brick	≥ Mz 12	[kN]	1.0	1.0	1.7		1.7		1.7		1.7		1.7		
Sand-lime solid brick	≥ KS 12	[kN]	1.0	1.0	1.7		1.7		1.7		1.7		1.7		
Vertical perforated brick	≥ Hlz 4	[kN]	0.3/0.6 <sup>2)</sup>			0.3/0.6 <sup>2)</sup>		0.3/0.6 <sup>2)</sup>		0.3/0.6 <sup>2)</sup>		0.3/0.6 <sup>2)</sup>		0.3/0.6 <sup>2)</sup>	
	≥ Hlz 6	[kN]	0.4/0.8 <sup>2)</sup>			0.4/0.8 <sup>2)</sup>		0.4/0.8 <sup>2)</sup>		0.4/0.8 <sup>2)</sup>		0.4/0.8 <sup>2)</sup>		0.4/0.8 <sup>2)</sup>	
	≥ Hlz 12	[kN]	0.8/1.0 <sup>2)</sup>	0.8/1.0 <sup>2)</sup>	0.8/1.0 <sup>2)</sup> /1.4 <sup>3)</sup>	0.8/1.0 <sup>2)</sup>	0.8/1.0 <sup>2)</sup> /1.6 <sup>3)</sup>	0.8/1.0 <sup>2)</sup> /1.8 <sup>3)</sup>	0.8/1.0 <sup>2)</sup> /1.8 <sup>3)</sup>	0.8/1.0 <sup>2)</sup> /1.8 <sup>3)</sup>		0.8/1.0 <sup>2)</sup> /1.8 <sup>3)</sup>			
Perforated sand-lime brick	≥ KSL 4	[kN]	0.4/0.6 <sup>2)</sup>			0.4/0.6 <sup>2)</sup>		0.4/0.6 <sup>2)</sup>		0.4/0.6 <sup>2)</sup>		0.4/0.6 <sup>2)</sup>		0.4/0.6 <sup>2)</sup>	
	≥ KSL 6	[kN]	0.6/0.8 <sup>2)</sup>			0.6/0.8 <sup>2)</sup>		0.6/0.8 <sup>2)</sup>		0.6/0.8 <sup>2)</sup>		0.6/0.8 <sup>2)</sup>		0.6/0.8 <sup>2)</sup>	
	≥ KSL 12	[kN]	0.8/1.4 <sup>2)</sup>			0.8/1.4 <sup>2)</sup>		0.8/1.4 <sup>2)</sup>		0.8/1.4 <sup>2)</sup>		0.8/1.4 <sup>2)</sup>		0.8/1.4 <sup>2)</sup>	
Hollow block made of light-weight concrete	≥ Hbl 2	[kN]	0.3/0.5 <sup>2)</sup>			0.3/0.5 <sup>2)</sup>		0.3/0.5 <sup>2)</sup>		0.3/0.5 <sup>2)</sup>		0.3/0.5 <sup>2)</sup>		0.3/0.5 <sup>2)</sup>	
	≥ Hbl 4	[kN]	0.6/0.8 <sup>2)</sup>			0.6/0.8 <sup>2)</sup>		0.6/0.8 <sup>2)</sup>		0.6/0.8 <sup>2)</sup>		0.6/0.8 <sup>2)</sup>		0.6/0.8 <sup>2)</sup>	
Hollow block made of normal-weight concrete	≥ Hbn 4	[kN]	0.6/0.8 <sup>2)</sup>			0.6/0.8 <sup>2)</sup>		0.6/0.8 <sup>2)</sup>		0.6/0.8 <sup>2)</sup>		0.6/0.8 <sup>2)</sup>		0.6/0.8 <sup>2)</sup>	
Porous light-weight concrete	TGL	[kN]	-			1.3		1.3		1.3		2.0		-	
Aerated light-weight concret															
Nominal drill diameter	Ø d <sub>Q</sub>	[mm]	12	12	12	12	16	16	16	16	16	16	20	20	20
Drill hole depth	min h <sub>Q</sub>	[mm]	55	90	55	90	90	135	90	135	90	135	90	135	205
Embedment depth of the anchor sleeve	h <sub>s</sub>	[mm]	50	85	50	85	85	130	85	130	85	130	85	130	200
Anchorage depth	h <sub>ef</sub>	[mm]	50	85 <sup>4)</sup>	50	85 <sup>4)</sup>	85 <sup>4)</sup>	130 <sup>4)</sup>	85 <sup>4)</sup>	130 <sup>4)</sup>	85 <sup>4)</sup>	130 <sup>4)</sup>	85 <sup>4)</sup>	130 <sup>4)</sup>	200 <sup>4)</sup>
Minimum structural component thickness	d	[mm]	90	110	90	110	110 (175) <sup>5)</sup>	150 (175) <sup>5)</sup>	110 (175) <sup>5)</sup>	150 (175) <sup>5)</sup>	110 (175) <sup>5)</sup>	150 (175) <sup>5)</sup>	110 (175) <sup>5)</sup>	150 (175) <sup>5)</sup>	240
Required mortar volume FIS V, FIS VS, FIS VW, FIS VR, FIS P	[scale units]		5	10	5	10	12	15	12	15	12	15	15	25	40
Permissible bedding moment M <sub>perm</sub>															
M <sub>perm</sub> for zinc-plated steel 5.8	gvz	[Nm]	4.4			10.7		21.4		21.4		37.4		37.4	
M <sub>perm</sub> for stainless steel	A4	[Nm]	4.8			12.1		24.1		24.1		42.1		42.1	
Installation detail, spacings and edge distances															
Spacing (Group of anchors) <sup>6)</sup>	≥ a	[mm]	100 (for Hbl and Hbn: 200) (for porous light-weight concrete TGL: 150)												
	min a	[mm]	50 (for Hbl and Hbn: 200) (for porous light-weight concrete TGL: 100)												
Minimum interspacing	a <sub>2</sub>	[mm]	250 (for M8 and M10 in porous light-weight concrete TGL:200)												
Edge distance (only Mz, KS, Hlz, KSL, Hbl, Hbn)															
- for masonry with superimposed load or proof against tilting and without shear towards the free edge	≥ a <sub>r</sub>	[mm]	50 (for Mz and KS: 60)												
- for masonry without superimposed load or proof against tilting or with shear towards the free edge	≥ a <sub>r</sub>	[mm]	200 (for Mz and KS: 250)												
Edge distance (only porous light-weight concrete TGL)															
- without shear towards the free edge	≥ a <sub>r</sub>	[mm]	150												
- with shear towards the free edge	≥ a <sub>r</sub>	[mm]	200												
	min a <sub>r</sub>	[mm]	100												
Clearance in fixture to be attached	d <sub>f</sub>	[mm]	7			9		12		14		14			
Screw penetration depth of the screw/threaded rod	min s	[mm]	-			-		-		-		-		-	
	max s	[mm]	-			-		-		-		-		-	
Maximum installation torque	T <sub>inst</sub>	[Nm]	4 <sup>7)</sup>			4 <sup>7)</sup>		4 <sup>7)</sup>		4 <sup>7)</sup>		4 <sup>7)</sup>		4 <sup>7)</sup>	

<sup>1)</sup> For masonry with superimposed load the permissible load be increased to 1.4 kN.

<sup>2)</sup> Increased values are valid if the drill hole is drilled without hammer action but only rotary action. In KSL the outer brick walls have to have a thickness of at least 30 mm (old bricks).

<sup>3)</sup> Increased values are valid for old masonry (before 1977) made of vertical perforated bricks ≥ Hlz 12, if drilling was done without hammer action but only rotary action.

<sup>4)</sup> For anchor sleeves with an embedment depth of h<sub>s</sub> = 85 mm a non-bearing layer of up to 20 mm may be bridged; for h<sub>s</sub> = 130 mm the non-bearing layer may not be more than 30 mm; and for h<sub>s</sub> = 200 mm the non-bearing layer may not be more than 100 mm.  
The bridging of non-bearing layers is permitted with threaded rods only."

<sup>5)</sup> The value in bracket is valid for porous light-weight concrete TGL.

<sup>6)</sup> The spacing "a" may be reduced down to the value of "min a", if the permissible loads are reduced at the same time. Not valid for masonry made of Hbl and Hbn.

<sup>7)</sup> 2 Nm, if the fixture to be attached is not installed with a levelling mortar layer.

Continued next page.

## LOADS

Permissible loads  $F_{perm}$  of a single anchor installed with FIS V, FIS VS or FIS VW in masonry and porous light-weight concrete (TGL) for tension, shear and combined tension and shear. For FIS VT and FIS P the below mentioned load values are valid as recommended loads only.

Anchor type			Threaded rod FIS A			Internal threaded sockets FIS E				
Application without anchor sleeve			M 16			M 6	M 8	M 10	M 12	
Solid brick	$\geq$ Mz 12	[kN]	1.7			1.0 <sup>1)</sup>	1.0 <sup>1)</sup>	1.7	1.7	
Sand-lime solid brick	$\geq$ KS 12	[kN]	1.7			1.0 <sup>1)</sup>	1.0 <sup>1)</sup>	1.7	1.7	
Nominal drill diameter	$\emptyset$ d <sub>0</sub>	[mm]	18			14	14	18	18	
Drill hole depth	min h <sub>0</sub>	[mm]	80			90	90	90	90	
Anchorage depth	min h <sub>ef</sub>	[mm]	75			85	85	85	85	
Minimum structural component thickness	d	[mm]	110			110	110	110	110	
Required mortar volume FIS V, FIS VS, FIS VW, FIS VR, FIS P	[scale units]		5			4	4	5	5	
Application with anchor sleeve			M 16			M 6	M 8	M 10	M 12	
Anchor sleeve type FIS H... K			20x85	20x130	20x200	16x85	20x85	16x85	20x85	20x85
Solid brick	$\geq$ Mz 12	[kN]	1.7			1.0	1.7	1.7	1.7	
Sand-lime solid brick	$\geq$ KS 12	[kN]	1.7			1.0	1.7	1.7	1.7	
Vertical perforated brick	$\geq$ Hlz 4	[kN]	0.3/0.6 <sup>2)</sup>			0.3/0.6 <sup>2)</sup>	0.3/0.6 <sup>2)</sup>	0.3/0.6 <sup>2)</sup>	0.3/0.6 <sup>2)</sup>	
	$\geq$ Hlz 6	[kN]	0.4/0.8 <sup>2)</sup>			0.4/0.8 <sup>2)</sup>	0.4/0.8 <sup>2)</sup>	0.4/0.8 <sup>2)</sup>	0.4/0.8 <sup>2)</sup>	
	$\geq$ Hlz 12	[kN]	0.8/1.0 <sup>2)/1.8<sup>3)</sup></sup>			0.8/1.0 <sup>2)</sup>	0.8/1.0 <sup>2)/1.4<sup>3)</sup></sup>	0.8/1.0 <sup>2)</sup>	0.8/1.0 <sup>2)</sup>	
Perforated sand-lime brick	$\geq$ KSL 4	[kN]	0.4/0.6 <sup>2)</sup>			0.4/0.6 <sup>2)</sup>	0.4/0.6 <sup>2)</sup>	0.4/0.6 <sup>2)</sup>	0.4/0.6 <sup>2)</sup>	
	$\geq$ KSL 6	[kN]	0.6/0.8 <sup>2)</sup>			0.6/0.8 <sup>2)</sup>	0.6/0.8 <sup>2)</sup>	0.6/0.8 <sup>2)</sup>	0.6/0.8 <sup>2)</sup>	
	$\geq$ KSL 12	[kN]	0.8/1.4 <sup>2)</sup>			0.8/1.4 <sup>2)</sup>	0.8/1.4 <sup>2)</sup>	0.8/1.4 <sup>2)</sup>	0.8/1.4 <sup>2)</sup>	
Hollow block made of light-weight concrete	$\geq$ Hbl 2	[kN]	0.3/0.5 <sup>2)</sup>			0.3/0.5 <sup>2)</sup>	0.3/0.5 <sup>2)</sup>	0.3/0.5 <sup>2)</sup>	0.3/0.5 <sup>2)</sup>	
	$\geq$ Hbl 4	[kN]	0.6/0.8 <sup>2)</sup>			0.6/0.8 <sup>2)</sup>	0.6/0.8 <sup>2)</sup>	0.6/0.8 <sup>2)</sup>	0.6/0.8 <sup>2)</sup>	
Hollow block made of normal-weight concrete	$\geq$ Hbn 4	[kN]	0.6/0.8 <sup>2)</sup>			0.6/0.8 <sup>2)</sup>	0.6/0.8 <sup>2)</sup>	0.6/0.8 <sup>2)</sup>	0.6/0.8 <sup>2)</sup>	
Porous light-weight concrete	TGL	[kN]	2.0		-	-	1.3	1.3	2.0	
Aerated light-weight concret										
Nominal drill diameter	$\emptyset$ d <sub>0</sub>	[mm]	20	20	20	16	20	16	20	20
Drill hole depth	min h <sub>0</sub>	[mm]	90	135	205	90	90	90	90	90
Embedment depth of the anchor sleeve	h <sub>s</sub>	[mm]	85	130	200	85	85	85	85	85
Anchorage depth	h <sub>ef</sub>	[mm]	85 <sup>4)</sup>	130 <sup>4)</sup>	200 <sup>4)</sup>	85	85	85	85	85
Minimum structural component thickness	d	[mm]	110 (175) <sup>5)</sup>	150 (175) <sup>5)</sup>	240	110	110	110 (175) <sup>5)</sup>	110 (175) <sup>5)</sup>	110 (175) <sup>5)</sup>
Required mortar volume FIS V, FIS VS, FIS VW, FIS VR, FIS P	[scale units]		15	25	40	12	15	12	15	15
Permissible bedding moment M <sub>perm</sub>										
M <sub>perm</sub> for zinc-plated steel 5.8	gvz	[Nm]	94.9			4.4	10.7	21.4	37.4	
M <sub>perm</sub> for stainless steel	A4	[Nm]	104.2			4.8	12.1	24.1	42.1	
Installation detail, spacings and edge distances										
Spacing (Group of anchors) <sup>6)</sup>	$\geq$ a	[mm]	100 (for Hbl and Hbn: 200) (for porous light-weight concrete TGL: 150)							
	min a	[mm]	50 (for Hbl and Hbn: 200) (for porous light-weight concrete TGL: 100)							
Minimum interspacing	a <sub>z</sub>	[mm]	250 (for M8 and M10 in porous light-weight concrete TGL:200)							
Edge distance (only Mz, KS, Hlz, KSL, Hbl, Hbn)										
- for masonry with superimposed load or proof against tilting and without shear towards the free edge	$\geq$ a <sub>r</sub>	[mm]	50 (for Mz and KS: 60)							
- for masonry without superimposed load or proof against tilting or with shear towards the free edge	$\geq$ a <sub>r</sub>	[mm]	200 (for Mz and KS: 250)							
Edge distance (only porous light-weight concrete TGL)										
- without shear towards the free edge	$\geq$ a <sub>r</sub>	[mm]	150							
- with shear towards the free edge	$\geq$ a <sub>r</sub>	[mm]	200							
	min a <sub>r</sub>	[mm]	100							
Clearance in fixture to be attached	d <sub>f</sub>	[mm]	18			7	9	12	14	
Screw penetration depth of the screw/threaded rod	min s	[mm]	-			6	8	10	12	
	max s	[mm]	-			60	60	60	60	
Maximum installation torque	T <sub>inst</sub>	[Nm]	4 <sup>7)</sup>			4 <sup>7)</sup>	4 <sup>7)</sup>	4 <sup>7)</sup>	4 <sup>7)</sup>	

<sup>1)</sup> For masonry with superimposed load the permissible load be increased to 1.4 kN.

<sup>2)</sup> Increased values are valid if the drill hole is drilled without hammer action but only rotary action. In KSL the outer brick walls have to have a thickness of at least 30 mm (old bricks).

<sup>3)</sup> Increased values are valid for old masonry (before 1977) made of vertical perforated bricks  $\geq$  Hlz 12, if drilling was done without hammer action but only rotary action.

<sup>4)</sup> For anchor sleeves with an embedment depth of h<sub>s</sub> = 85 mm a non-bearing layer of up to 20 mm may be bridged; for h<sub>s</sub> = 130 mm the non-bearing layer may not be more than 30 mm; and for h<sub>s</sub> = 200 mm the non-bearing layer may not be more than 100 mm.

The bridging of non-bearing layers is permitted with threaded rods only."

<sup>5)</sup> The value in bracket is valid for porous light-weight concrete TGL.

<sup>6)</sup> The spacing "a" may be reduced down to the value of "min a", if the permissible loads are reduced at the same time. Not valid for masonry made of Hbl and Hbn.

<sup>7)</sup> 2 Nm, if the fixture to be attached is not installed with a levelling mortar layer.