






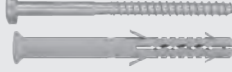
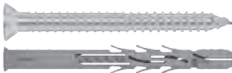
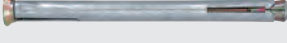
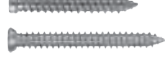


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4ALL – Universal plug

PRODUCT INFORMATION



4ALL

BASE MATERIAL:

- Concrete (A) class min C12/15
- Solid brick (B) class 50 acc. EN 771-1
- Sand-lime block (eg. silica) (B) class 30 acc. EN 771-2
- KSL 6DF blocks (C) class 20 acc. DIN 106/EN 771-2
- Perforated brick (Doppio) uni (C) class 15 acc. EN 771-1
- Hollowed brick (Optibrick) PV (C) class 7,5 acc. EN-771-1
- Brick HLZ (C) class 12 acc. DIN 105/ EN 771-1
- Hollowed brick Hbl (D) class 2 acc. EN 771-3
- Perforated brick Porotherm PW 25 (C) class 15 acc. EN 771-1
- Perforated brick MAX (C) class 15 acc. EN 771-1
- Autoclaved aerated concrete (E) class AAC 2 and AAC 6 acc. EN 771-4

FEATURES:**PLUG:**

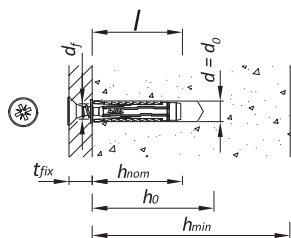
- Colored polyamide

SCREW:

- Zinc electroplated carbon steel

Size	Product code	Plug		Screw		Fixture	
		Diameter	Length	Diameter	Length	Max thickness	Hole diameter
		d [mm]	l [mm]	D [mm]	L [mm]	t _{fix} [mm]	d _f [mm]
Ø5	4ALL-05	5	25	3	25 - 40	1 - 15	4
				3.5	25 - 50	1 - 25	4
				4	25 - 80	1 - 55	5
Ø6	4ALL-06	6	30	4	30 - 80	1 - 50	5
				4.5	30 - 80	1 - 50	5
				5	30 - 260	1 - 230	6
Ø8	4ALL-08	8	40	4.5	40 - 80	1 - 40	5
				5	40 - 260	1 - 220	6
				6	40 - 200	1 - 160	7
Ø10	4ALL-10	10	50	6	50 - 200	1 - 150	7
				8	50 - 260	1 - 210	9

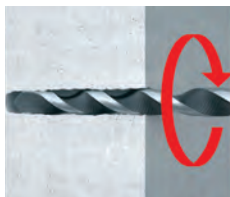
INSTALLATION DATA



Size		Ø5	Ø6	Ø8	Ø10
Fixing diameter	d [mm]	5	6	8	10
Hole diameter in substrate	d ₀ [mm]	5	6	8	10
Min. hole depth in substrate	h ₀ [mm]	35	40	50	60
Installation depth	h _{nom} [mm]	25	30	40	50
Min. substrate thickness	h _{min} [mm]	65	70	80	90
Min. spacing	s _{min} [mm]	25	30	40	50
Min. edge distance	c _{min} [mm]	25	30	40	50

INSTALLATION GUIDE

1. Drill a hole of required diameter.
2. Insert 4ALL plug into hole and tap home.
3. Insert screw of required diameter into plug through fixture and tighten.



BASIC PERFORMANCE DATA

Performance data for single fixing without influence of edge distance and spacing.

Substrate		Concrete	Ceramic hollow brick	Aerated concrete	Plasterboard
MEAN ULTIMATE LOAD $F_{Ru,m}$					
Plug Ø5 + screw Ø3.5	[kN]	0.36	0.34	0.57	0.18*
Plug Ø6 + screw Ø4.5	[kN]	0.60	0.78	0.46	0.22*
Plug Ø8 + screw Ø5.0	[kN]	0.98	0.59	0.70	0.32**
Plug Ø10 + screw Ø6.0	[kN]	1.36	1.22	1.10	0.34**
CHARACTERISTIC LOAD F_{Rk}					
Plug Ø5 + screw Ø3.5	[kN]	0.29	0.25	0.38	0.13*
Plug Ø6 + screw Ø4.5	[kN]	0.51	0.62	0.39	0.10*
Plug Ø8 + screw Ø5.0	[kN]	0.74	0.42	0.41	0.27**
Plug Ø10 + screw Ø6.0	[kN]	1.12	0.89	0.98	0.27**
DESIGN LOAD F_{Rd}					
Plug Ø5 + screw Ø3.5	[kN]	0.16	0.10	0.19	0.06*
Plug Ø6 + screw Ø4.5	[kN]	0.28	0.25	0.20	0.05*
Plug Ø8 + screw Ø5.0	[kN]	0.41	0.17	0.21	0.13**
Plug Ø10 + screw Ø6.0	[kN]	0.62	0.36	0.49	0.13**
RECOMMENDED LOAD F_{rec}^{***}					
Plug Ø5 + screw Ø3.5	[kN]	0.11	0.07	0.14	0.05*
Plug Ø6 + screw Ø4.5	[kN]	0.20	0.18	0.14	0.03*
Plug Ø8 + screw Ø5.0	[kN]	0.29	0.12	0.15	0.09**
Plug Ø10 + screw Ø6.0	[kN]	0.44	0.26	0.35	0.09**

* plasterboard thickness min 9.5 mm

** plasterboard thickness min 12.5 mm

*** partial safety factor 1.4

F – Force independent of direction

PRODUCT INFORMATION



UNO

BASE MATERIAL:

- Concrete min C20/25
- Solid brick min 15MPa
- Hollow/cavity brick min 15MPa
- Hollow clay block min 15MPa
- Aerated concrete density min 600 Mark V
- Plasterboard min 12.5mm

FEATURES:

PLUG:

- Coloured polypropylene PP or polyamide (Nylon) PA 6.6

SCREW:

- Zinc electroplated steel
- Zinc coating thickness min 5µm

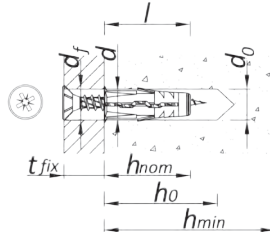
APPROVALS AND REPORTS:

- AT-15-8093/2009



Size	Product code	Plug		Screw		Fixture	
		Diameter	Length	Diameter	Length	Max thickness	Hole diameter
		d	l	D	L	t _{fix}	d _f
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
Ø5	UNO-05	5	24	3	25 - 40	1 - 16	4
	UNO-05	5	24	3.5	25 - 50	1 - 26	4
	UNO-05	5	24	4	25 - 80	1 - 56	5
	UNO-05	5	24	4.5	25 - 80	1 - 56	5
Ø6	UNO-06	6	28	3.5	25 - 50	1 - 22	4
	UNO-06	6	28	4	25 - 80	1 - 52	5
	UNO-06	6	28	4.5	25 - 80	1 - 52	5
	UNO-06	6	28	5	30 - 260	1 - 232	6
Ø7	UNO-07	7	30	4	25 - 80	1 - 50	5
	UNO-07	7	30	4.5	25 - 80	1 - 50	5
	UNO-07	7	30	5	30 - 260	1 - 230	6
	UNO-07	7	30	6	30 - 200	1 - 170	7
Ø8	UNO-08	8	32	4.5	25 - 80	1 - 48	5
	UNO-08	8	32	5	30 - 260	1 - 228	6
	UNO-08	8	32	6	30 - 200	1 - 168	7
Ø10	UNO-10	10	36	5	30 - 260	1 - 224	6
	UNO-10	10	36	6	30 - 260	1 - 224	7
	UNO-10	10	36	8	30 - 260	1 - 224	9

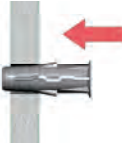
INSTALLATION DATA



Size			Ø5	Ø6	Ø7	Ø8	Ø10
Fixing diameter	d	[mm]	5	6	7	8	10
Hole diameter in substrate	d ₀	[mm]	5	6	7	8	10
Min. hole depth in substrate	h ₀	[mm]	34	38	40	42	46
Installation depth	h _{nom}	[mm]	24	28	30	32	36
Min. substrate thickness	h _{min}	[mm]	50	55	60	65	70
Min. spacing	s _{min}	[mm]	24	28	30	32	36
Min. edge distance	c _{min}	[mm]	24	28	30	32	36

INSTALLATION GUIDE

1. Drill a hole of required diameter.
2. Insert UNO plug into hole and tap home.
3. Insert screw of required diameter into plug through fixture and tighten.



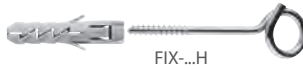
BASIC PERFORMANCE DATA

Performance data for single fixing in tension without influence of edge distance and spacing.

Substrate		Concrete C20/25	Solid clay brick 15MPa	Aerated concrete 600 Mark V	Hollow brick 15MPa	Perforated brick 15MPa	Plasterboard min. 12.5mm
MEAN ULTIMATE LOAD $N_{Ru,m}$							
Plug Ø5 + screw Ø3.5	[kN]	1.77	0.79	0.28	0.94	0.62	0.24
Plug Ø6 + screw Ø3.5	[kN]	1.63	1.18	0.73	0.87	0.72	0.30
Plug Ø7 + screw Ø4.0	[kN]	1.67	0.88	0.86	1.32	0.87	0.37
Plug Ø8 + screw Ø4.5	[kN]	2.49	1.39	0.84	1.15	0.94	0.40
Plug Ø10 + screw Ø5.0	[kN]	6.81	1.50	0.73	1.42	1.66	0.45
CHARACTERISTIC LOAD N_{Rk}							
Plug Ø5 + screw Ø3.5	[kN]	1.39	0.47	0.27	0.72	0.39	0.17
Plug Ø6 + screw Ø3.5	[kN]	1.48	0.85	0.63	0.51	0.21	0.21
Plug Ø7 + screw Ø4.0	[kN]	0.89	0.32	0.51	0.71	0.60	0.25
Plug Ø8 + screw Ø4.5	[kN]	1.25	0.68	0.48	0.95	0.81	0.26
Plug Ø10 + screw Ø5.0	[kN]	3.59	0.69	0.42	1.18	0.92	0.34
DESIGN LOAD N_{Rd}							
Plug Ø5 + screw Ø3.5	[kN]	0.77	0.19	0.13	0.29	0.15	0.07
Plug Ø6 + screw Ø3.5	[kN]	0.82	0.34	0.31	0.20	0.20	0.08
Plug Ø7 + screw Ø4.0	[kN]	0.49	0.13	0.25	0.28	0.24	0.10
Plug Ø8 + screw Ø4.5	[kN]	0.69	0.38	0.24	0.38	0.32	0.10
Plug Ø10 + screw Ø5.0	[kN]	1.99	0.38	0.21	0.47	0.37	0.13
RECOMMENDED LOAD N_{rec}^*							
Plug Ø5 + screw Ø3.5	[kN]	0.55	0.14	0.09	0.21	0.11	0.05
Plug Ø6 + screw Ø3.5	[kN]	0.59	0.24	0.22	0.14	0.14	0.06
Plug Ø7 + screw Ø4.0	[kN]	0.35	0.09	0.18	0.20	0.17	0.07
Plug Ø8 + screw Ø4.5	[kN]	0.49	0.27	0.17	0.27	0.23	0.07
Plug Ø10 + screw Ø5.0	[kN]	1.42	0.27	0.15	0.34	0.26	0.09

* partial safety factor 1.4

PRODUCT INFORMATION



FIX-...H



FIX



FIX-...K



FIX



FIX-...S

BASE MATERIAL:

- Concrete min C20/25
- Solid brick min 15MPa
- Aerated concrete 600 Mark V

APPROVALS AND REPORTS:

- AT-15-8093/2009



FEATURES:

PLUG:

- Coloured polypropylene or polyamide

SCREW:

- Zinc electroplated carbon steel
- Zinc coating thickness min 5µm

Size	Product code			Plug		Screw		Fixture			
	Without collar		With collar	Diameter	Length	Diameter	Length	Max thickness	Hole diameter		
	Screw head type			d	l	D	L	t _{fix}	d _f		
	Countersunk	Hex	Countersunk	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]		
Ø5	FIX-05+	-	-	5	25	3,5	30	5	4		
	FIX-06+	-	FIX-K-06+	6	30	3,5	30	1	4		
FIX-06+340	-	FIX-K-06+340	40				10				
FIX-06+350	-	FIX-K-06+350	50				20				
Ø6	FIX-06+435	-	FIX-K-06+435			4	30	4	35	5	5
	FIX-06+440	-	FIX-K-06+440						40	10	
	FIX-06+450	-	FIX-K-06+450					50	20	6	
	FIX-08+	-	FIX-K-08+	8	40			5	45		5
FIX-08+450	-	FIX-K-08+450	4,5			50	10				
FIX-08+460	-	FIX-K-08+460				60	20	5			
FIX-08+550	-	FIX-K-08+550	5			50	10		6		
FIX-08+560	-	-				60	20				
FIX-08+580	-	-				80	40				
FIX-08+100	-	-				100	60				
Ø10	FIX-10+560	-	FIX-K-10+560	10	50	5	60	10	6		
	FIX-10+660	FIX-10/660	FIX-K-10+660				6	60		10	
	FIX-10+680	FIX-10/680	-			80		30			
	FIX-10+100	FIX-10/100	-			100		50	7		
	FIX-10+120	FIX-10/120	-			120		70			
	FIX-10+160	-	-			160	110				

Size	Product code			Plug		Screw		Fixture	
	Without collar		With collar	Diameter	Length	Diameter	Length	Max thickness	Hole diameter
	Screw head type			d	l	D	L	t _{fix}	d _f
	Countersunk	Hex	Countersunk	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
Ø12	FIX-12+680	-	-	12	60	6	80	20	7
	FIX-12+100	-	-				100	40	
	FIX-12+120	-	-				120	60	
	-	FIX-12/60	-			8	60	1	9
	-	FIX-12/70	-				70	10	
	-	FIX-12/80	-				80	20	
	-	FIX-12/100	-				100	40	
	-	FIX-12/120	-				120	60	
	-	FIX-12/140	-				140	80	
	-	FIX-12/160	-				160	100	
	-	FIX-12/180	-				180	120	
Ø14	-	FIX-14/80	-	14	70	10	80	10	11
	-	FIX-14/100	-				100	30	
	-	FIX-14/120	-				120	50	
	-	FIX-14/160	-				160	90	
	-	FIX-14/180	-				180	110	
	-	FIX-14/200	-				200	130	
	-	FIX-14/220	-				220	150	
	-	FIX-14/260	-				260	190	

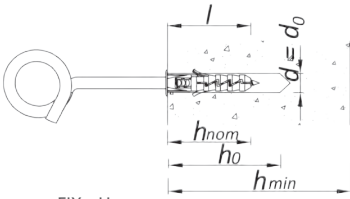
Size	Product code		Plug		Screw	
	Without collar	With collar	Diameter	Length	Diameter	Length
			d	l	D	L
Ø6	FIX-06K	FIX-K-06K	6	30	4.5	35
	FIX-06S	FIX-K-06S				50
Ø8	FIX-08K	FIX-K-08K	8	40	5	50
	FIX-08S	FIX-K-08S				65
Ø10	FIX-10K	FIX-K-10K	10	50	6	55
	FIX-10S	FIX-K-10S				85
Ø12	FIX-12K	FIX-K-12K	12	60	8	65
	FIX-12H	-				130

K - angle hook

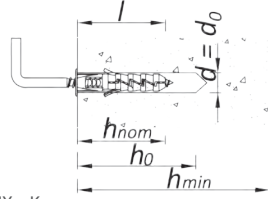
S - round hook

H - pig tail hook

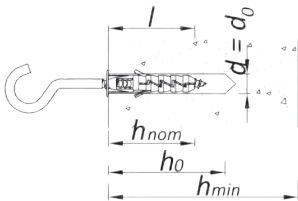
INSTALLATION DATA



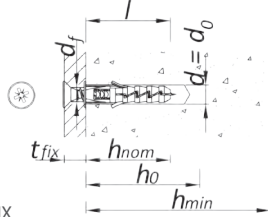
FIX-...H



FIX-...K



FIX-...S

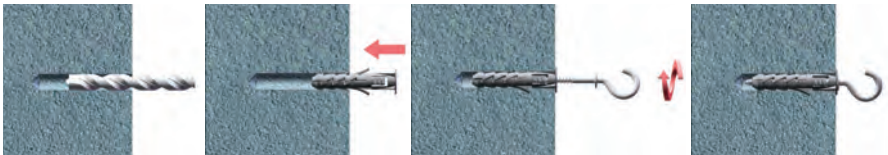


FIX

Size		Ø5	Ø6	Ø8	Ø10		Ø12		Ø14
					Non-hex head	Hex head	Non-hex head	Hex head	
Fixing diameter	d [mm]	5	6	8	10		12		14
Hole diameter in substrate	d ₀ [mm]	5	6	8	10		12		14
Min. hole depth in substrate	h ₀ [mm]	35	40	50	60		70		80
Installation depth	h _{nom} [mm]	25	30	40	50		60		70
Min. substrate thickness	h _{min} [mm]	55	60	70	80		90		100
Min. spacing	s _{min} [mm]	25	30	40	30	50	30	60	70
Min. edge distance	c _{min} [mm]	25	30	40	40	50	40	60	70

INSTALLATION GUIDE

1. Drill a hole of required diameter.
2. Insert FIX plug into hole and tap home.
3. Insert screw of required diameter into plug through fixture and tighten.



BASIC PERFORMANCE DATA

Performance data for single fixing without influence of edge distance and spacing.

Substrate		Concrete C20/25	Solid brick 15MPa	Aerated concrete 600 Mark V
MEAN ULTIMATE LOAD $F_{R,u,m}$				
Plug Ø5 + screw Ø3.5	[kN]	0.49	–	–
Plug Ø6 + screw Ø4.0	[kN]	0.29	–	–
Plug Ø8 + screw Ø5.0	[kN]	0.83	1.21	1.47
Plug Ø10 + screw Ø6.0	[kN]	1.11	1.20	0.95
Plug Ø12 + screw Ø8.0	[kN]	3.43	3.15	1.91
Plug Ø14 + screw Ø10.0	[kN]	3.89	1.94	1.73
CHARACTERISTIC LOAD $F_{R,k}$				
Plug Ø5 + screw Ø3.5	[kN]	0.38	–	–
Plug Ø6 + screw Ø4.0	[kN]	0.22	–	–
Plug Ø8 + screw Ø5.0	[kN]	0.64	0.93	1.13
Plug Ø10 + screw Ø6.0	[kN]	0.85	0.92	0.73
Plug Ø12 + screw Ø8.0	[kN]	2.64	2.42	1.47
Plug Ø14 + screw Ø10.0	[kN]	2.99	1.49	1.33
DESIGN LOAD $F_{R,d}$				
Plug Ø5 + screw Ø3.5	[kN]	0.20	–	–
Plug Ø6 + screw Ø4.0	[kN]	0.10	–	–
Plug Ø8 + screw Ø5.0	[kN]	0.30	0.45	0.55
Plug Ø10 + screw Ø6.0	[kN]	0.40	0.45	0.35
Plug Ø12 + screw Ø8.0	[kN]	1.30	1.20	0.75
Plug Ø14 + screw Ø10.0	[kN]	1.50	0.75	0.65
RECOMMENDED LOAD $F_{R,ec}^*$				
Plug Ø5 + screw Ø3.5	[kN]	0.14	–	–
Plug Ø6 + screw Ø4.0	[kN]	0.07	–	–
Plug Ø8 + screw Ø5.0	[kN]	0.21	0.32	0.39
Plug Ø10 + screw Ø6.0	[kN]	0.29	0.32	0.25
Plug Ø12 + screw Ø8.0	[kN]	0.93	0.86	0.54
Plug Ø14 + screw Ø10.0	[kN]	1.07	0.54	0.46

* partial safety factor 1.4

F – Force independent of direction



FX-L



FX-C



FX-K

BASE MATERIAL:

- Concrete (A) C12/15 - C50/60 acc. EN 206-1
- Solid brick (B) min 30MPa acc. EN 771-1
- Sand-lime solid brick (B) min 20MPa acc. DIN 106 (EN 771-2)
- Sand-lime hollow brick (C) min 12 MPa acc. DIN 106 (EN 771-2)
- Lightweight concrete hollow block (C) min 2MPa acc. DIN 18151 (EN 771-3)
- Lightweight concrete block (D) min 20MPa
- Autoclaved aerated concrete (E) min 2MPa acc. EN 771-4

FEATURES:

- FX-L – Countersunk version
- FX-C – Cylindrical version
- FX-K – Mushroom version
- PLUG:**
 - Polyamide (Nylon) PA
 - Polypropylene PP
- NAIL:**
 - Zinc electroplated carbon steel
 - Zinc coating thickness min 5µm

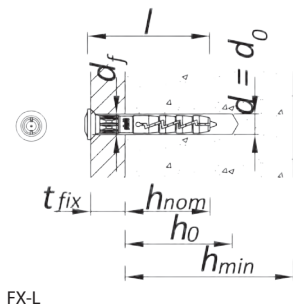
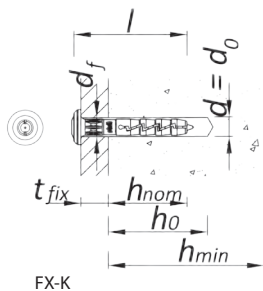
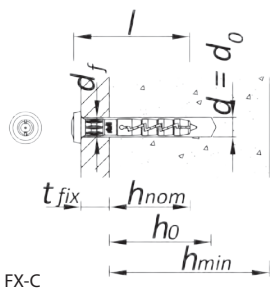
APPROVALS AND REPORTS:

- AT-15-4237/2006
- ETA-12/0457



Size	Product code			Plug		Fixture	
				Diameter	Length	Max thickness	Hole diameter
	Plug collar type			d	l	t _{fix}	d _i
Countersunk	Flange	Cylinder	[mm]	[mm]	[mm]	[mm]	
Ø5	FX-05L025	–	–	5	25	1	6
	FX-05L030	FX-05K030	FX-05C030		30	5	
	FX-05L035	FX-05K035	FX-05C035		35	10	
	FX-05L040	FX-05K040	FX-05C040		40	15	
	FX-05L050	FX-05K050	FX-05C050		50	25	
Ø6	FX-06L030	FX-06K030	FX-06C030	6	30	1	7
	FX-06L035	FX-06K035	FX-06C035		35	6	
	FX-06L040	FX-06K040	FX-06C040		40	11	
	FX-06L045	FX-06K045	FX-06C045		45	16	
	FX-06L050	FX-06K050	FX-06C050		50	21	
	FX-06L055	FX-06K055	FX-06C055		55	26	
	FX-06L060	FX-06K060	FX-06C060		60	31	
	FX-06L070	FX-06K070	FX-06C070		70	41	
Ø8	FX-08L045	FX-08K045	FX-08C045	8	45	5	9
	FX-08L060	FX-08K060	FX-08C060		60	20	
	FX-08L080	FX-08K080	FX-08C080		80	40	
	FX-08L100	FX-08K100	FX-08C100		100	60	
	FX-08L120	FX-08K120	FX-08C120		120	80	
	FX-08L140	FX-08K140	FX-08C140		140	100	
	FX-08L160	FX-08K160	FX-08C160		160	120	

INSTALLATION DATA



Size		Ø5	Ø6	Ø8
Fixing diameter	d [mm]	5	6	8
Hole diameter in substrate	d ₀ [mm]	5	6	8
Min. hole depth in substrate	h ₀ [mm]	30	35	45
Installation depth	h _{nom} [mm]	25	29	40
Min. substrate thickness	h _{min} [mm]	100	100	100
Min. spacing	s _{min} [mm]	100	100	100
Min. edge distance	c _{min} [mm]	100	100	100

INSTALLATION GUIDE

1. Drill a hole of required diameter.
2. Insert FX plug into hole through fixture.
3. Hammer home the nail.



BASIC PERFORMANCE DATA

Performance data for single fixing in tension without influence of edge distance and spacing.

Substrate		Concrete C12/15	Concrete C20/25 - C50/60	Solid brick	Sand-lime solid brick	Sand-lime hollow brick	Lightweight concrete hollow block	Lightweight concrete block	Autoclaved aerated concrete
POLYPROPYLENE PLUG									
MEAN ULTIMATE LOAD $N_{Ri,m}$									
Ø5, Embedment depth 25mm	[kN]	0.27	0.38	0.42	0.35	0.45	0.37	0.51	0.09
Ø6, Embedment depth 29mm	[kN]	0.46	0.66	0.43	0.48	0.63	0.39	0.68	0.14
Ø8, Embedment depth 40mm	[kN]	0.45	0.64	0.80	1.07	-	0.49	0.63	0.19
CHARACTERISTIC LOAD N_{Rk}									
Ø5, Embedment depth 25mm	[kN]	0.10	0.20	0.20	0.20	0.30	0.20	0.30	0.10
Ø6, Embedment depth 29mm	[kN]	0.20	0.40	0.20	0.30	0.30	0.20	0.30	0.10
Ø8, Embedment depth 40mm	[kN]	0.30	0.50	0.60	0.75	-	0.40	0.50	0.10
DESIGN LOAD N_{Rd}									
Ø5, Embedment depth 25mm	[kN]	0.05	0.10	0.10	0.10	0.15	0.10	0.15	0.05
Ø6, Embedment depth 29mm	[kN]	0.10	0.20	0.10	0.15	0.15	0.10	0.15	0.05
Ø8, Embedment depth 40mm	[kN]	0.15	0.25	0.30	0.38	-	0.20	0.25	0.05
RECOMMENDED LOAD N_{rec}^*									
Ø5, Embedment depth 25mm	[kN]	0.04	0.07	0.07	0.07	0.11	0.07	0.11	0.04
Ø6, Embedment depth 29mm	[kN]	0.07	0.14	0.07	0.11	0.11	0.07	0.11	0.04
Ø8, Embedment depth 40mm	[kN]	0.11	0.18	0.21	0.27	-	0.14	0.18	0.04
POLYAMIDE PLUG									
MEAN ULTIMATE LOAD $N_{Ri,m}$									
Ø5, Embedment depth 25mm	[kN]	0.36	0.51	0.41	0.44	0.49	0.35	0.42	-
Ø6, Embedment depth 29mm	[kN]	0.37	0.53	0.39	0.55	0.53	0.40	0.49	0.14
Ø8, Embedment depth 40mm	[kN]	0.55	0.78	0.82	0.55	-	0.50	0.74	0.17
CHARACTERISTIC LOAD N_{Rk}									
Ø5, Embedment depth 25mm	[kN]	0.20	0.30	0.20	0.20	0.30	0.20	0.20	-
Ø6, Embedment depth 29mm	[kN]	0.20	0.30	0.20	0.40	0.30	0.30	0.30	0.10
Ø8, Embedment depth 40mm	[kN]	0.30	0.50	0.50	0.40	-	0.30	0.50	0.10
DESIGN LOAD N_{Rd}									
Ø5, Embedment depth 25mm	[kN]	0.15	0.15	0.10	0.10	0.15	0.10	0.10	-
Ø6, Embedment depth 29mm	[kN]	0.15	0.15	0.10	0.20	0.15	0.15	0.15	0.05
Ø8, Embedment depth 40mm	[kN]	0.25	0.25	0.25	0.20	-	0.15	0.25	0.05
RECOMMENDED LOAD N_{rec}^*									
Ø5, Embedment depth 25mm	[kN]	0.11	0.11	0.07	0.07	0.11	0.07	0.07	-
Ø6, Embedment depth 29mm	[kN]	0.11	0.11	0.07	0.14	0.11	0.11	0.11	0.04
Ø8, Embedment depth 40mm	[kN]	0.18	0.18	0.18	0.14	-	0.11	0.18	0.04

* partial safety factor 1.4

GS – Ceiling wedge anchor

PRODUCT INFORMATION



GS

BASE MATERIAL:

- Non-cracked concrete C20/25 - C50/60
- Cracked concrete C20/25 - C50/60

APPROVALS AND REPORTS:

- ETA-11/0268
- AT-15-7637/2008



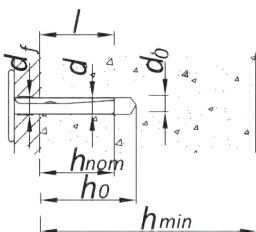
FEATURES:

ANCHOR:

- Zinc electroplated carbon steel class min 3.6 acc. EN 1063-2
- Zinc coating thickness min 8µm

Size	Product code	Anchor		Fixture	
		Diameter	Length	Max thickness	Hole diameter
		d [mm]	l [mm]	t _{fix} [mm]	d _f [mm]
Ø6	GS-06040	5.8	36	4.5	7
	GS-06065	5.8	65	35	7

INSTALLATION DATA



Size		Ø6
Anchor diameter	d [mm]	5.8
Hole diameter in substrate	d ₀ [mm]	6
Min. hole depth in substrate	h ₀ [mm]	40
Installation depth	h _{nom} [mm]	32
Min. substrate thickness	h _{min} [mm]	100
Min. spacing	s _{min} [mm]	200
Min. edge distance	c _{min} [mm]	150

INSTALLATION GUIDE

1. Drill a hole of required diameter
2. Insert anchor through fixture into hole and tap home nail.



BASIC PERFORMANCE DATA

Performance data for single fixing without influence of edge distance and spacing.

Substrate		Cracked concrete	Non-cracked concrete
MEAN ULTIMATE LOAD F_{Ru,m}			
Embedment depth 32 mm	[kN]	4.27	4.27
CHARACTERISTIC LOAD F_{Rk}			
Embedment depth 32 mm	[kN]	3.00	3.00
DESIGN LOAD F_{Rd}			
Embedment depth 32 mm	[kN]	2.00	2.00
RECOMMENDED LOAD F_{rec}*			
Embedment depth 32 mm	[kN]	1.43	1.43

* partial safety factor 1.4

■ steel failure

F – Force independent of direction

PRODUCT INFORMATION



KMW

BASE MATERIAL:

- Concrete min C20/25
- Solid brick min 15MPa

APPROVALS AND REPORTS:

- AT-15-7637/2008



FEATURES:

ANCHOR:

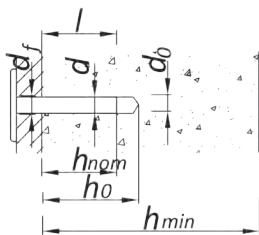
- Zinc electroplated steel class min 3.6
- Zinc coating thickness min 8µm

EXPANSION SLEEVE:

- ZnAl Alloy (ZnAl4)

Size	Product code	Anchor		Fixture	
		Diameter	Length	Max thickness	Hole diameter
		d [mm]	l [mm]	t _{fix} [mm]	d _f [mm]
Ø5	KMW-05020	5	20	1	6
Ø6	KMW-06030	6	30	1	7
	KMW-06040		40	10	
	KMW-06050		50	20	
	KMW-06065		65	35	

INSTALLATION DATA



Size		Ø5	Ø6
Anchor diameter	d [mm]	5	6
Hole diameter in substrate	d ₀ [mm]	5	6
Min. hole depth in substrate	h ₀ [mm]	25	35
Installation depth	h _{nom} [mm]	20	30
Min. substrate thickness	h _{min} [mm]	40	50
Min. spacing	s _{min} [mm]	20	30
Min. edge distance	c _{min} [mm]	20	30

BASIC PERFORMANCE DATA

Performance data for single fixing without influence of edge distance and spacing.

Substrate	Concrete C20/25	Solid brick 15MPa
MEAN ULTIMATE LOAD F_{Ru,m}		
Ø5 & Ø6 [kN]	3.85	2.85
CHARACTERISTIC LOAD F_{Rk}		
Ø5 & Ø6 [kN]	3.55	2.00
DESIGN LOAD F_{Rd}		
Ø5 & Ø6 [kN]	1.40	0.80
RECOMMENDED LOAD F_{rec} *		
Ø5 & Ø6 [kN]	1.00	0.57

* partial safety factor 1.4

F – Force independent of direction

FF1 – Frame fixing

PRODUCT INFORMATION



FF1(-N)-10L



FF1(-N)-10K

BASE MATERIAL:

- Concrete (A) class min C12/15
- Solid brick (B) class 50 acc. EN 771-1
- Sand-lime block (eg. Silka) (B) class 30 acc. EN 771-2
- KSL 6DF blocks (C) class 20 acc. DIN 106/EN 771-2
- Perforated brick (Doppio) uni (C) class 15 acc. EN 771-1
- Hollowed brick (Optibrick) PV (C) class 7,5 acc. EN-771-1
- Brick HLZ (C) class 12 acc. DIN 105/ EN 771-1
- Hollowed brick Hbl (D) class 2 acc. EN 771-3
- Perforated brick Porotherm PW 25 (C) class 15 acc. EN 771-1
- Perforated brick MAX (C) class 15 acc. EN 771-1
- Autoclaved aerated concrete (E) class AAC 2 and AAC 6 acc. EN 771-4

APPROVALS AND REPORTS:

- ETA-12/0398
- ETAG020 - 1 to 5



FEATURES:

PLUG:

- Polypropylene PP
- Polyamide (Nylon) PA
- Plug with or without collar (available in choice of materials for both versions)

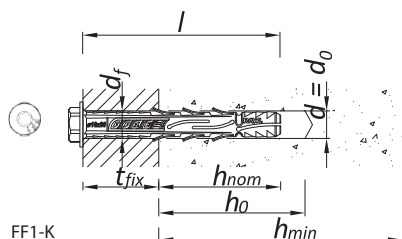
SCREW:

- HEX head - TORX40 - FF1(-N)-10K
- Countersunk head - TORX40 - FF1(-N)-10L
- Carbon steel
- Zinc electroplated, zinc coating thickness min 5um acc. ISO 4042
- Delta protect coating
- Stainless steel

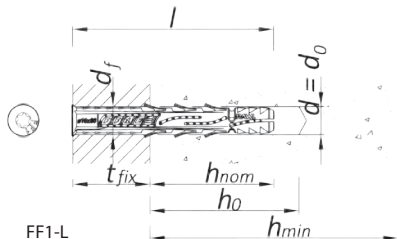
Size	Product code		Plug		Screw		Fixture		
			Diameter	Length	Diameter	Length	Max thickness		Hole diameter
	Type of plug		d	l	D	L	t _{fix}	t _{fix}	
	Collar	Countersunk	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
Ø10	R-FF1(-N)-10K080	R-FF1(-N)-10L080	9.8	80	7	89	30	10	10
	R-FF1(-N)-10K100	R-FF1(-N)-10L100	9.8	100	7	109	50	30	10
	R-FF1(-N)-10K120	R-FF1(-N)-10L120	9.8	120	7	129	70	50	10
	R-FF1(-N)-10K140	R-FF1(-N)-10L140	9.8	140	7	149	90	70	10
	R-FF1(-N)-10K160	R-FF1(-N)-10L160	9.8	160	7	169	110	90	10
	R-FF1(-N)-10K200	R-FF1(-N)-10L200	9.8	200	7	209	150	130	10
	R-FF1(-N)-10K240	R-FF1(-N)-10L240	9.8	240	7	249	190	170	10
	R-FF1(-N)-10K300	R-FF1(-N)-10L300	9.8	300	7	309	250	230	10

* (-N) – Polyamide PA (Nylon) version

INSTALLATION DATA



FF1-K



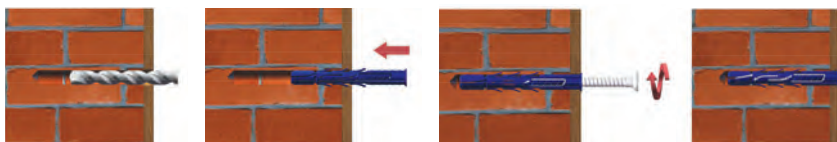
FF1-L

Embedment (dependent on substrate)			Embedment depth 50 mm	Embedment depth 70 mm
Fixing diameter	d	[mm]	9.8	9.8
Hole diameter in substrate	d ₀	[mm]	10	10
Min. hole depth in substrate	h ₀	[mm]	60	80
Installation depth	h _{nom}	[mm]	50	70
Min. substrate thickness	h _{min}	[mm]	100	115
Min. spacing	s _{min}	[mm]	90	200*
Min. edge distance	c _{min}	[mm]	80	100

* Spacing distance perpendicular to the edge. When spacing distance is parallel to the edge, this value must be doubled

INSTALLATION GUIDE

1. Drill a hole of required diameter and depth.
2. Lightly tap the plug through the fixture into hole with a hammer, until fixing depth is reached.
3. Tighten the FF1 screw.



BASIC PERFORMANCE DATA

Performance data for single fixing without influence of edge distance and spacing.

Substrate	Concrete C12/15 (cracked and non-cracked)		Concrete C20/25 (cracked and non-cracked)		Solid brick min 50MPa	Sand-lime brick min 30MPa	Hollow clay block min 7.5MPa	Hollow brick min 15MPa	Hollow brick min 12MPa	Sand-lime hollow block min 20MPa	Hollow lightweight concrete min 2MPa	Perforated brick MAX	Perforated brick PW25	Autoclaved aerated concrete AAC 2	Autoclaved aerated concrete AAC 6	
	Embedment depth h _{ef}	mm	50	70	50	70	50	70	70	70	70	70	70	70	70	
MEAN ULTIMATE LOAD F_{Ru,m}																
For plug PP	[kN]	-	-	2.13	3.97	7.73	2.73	0.73	1.55	1.44	2.38	0.79	1.48	2.00	0.64	1.45
For plug PA	[kN]	-	-	3.35	-	9.95	3.07	1.02	1.04	1.24	4.50	1.22	2.13	2.07	0.56	1.73
CHARACTERISTIC LOAD F_{Rk}																
For plug PP	[kN]	0.50	0.90	0.90	1.20	2.50	0.90	0.30	0.60	0.50	0.75	0.30	0.50	0.60	0.40	0.90
For plug PA	[kN]	0.90	-	1.50	-	4.50	1.20	0.60	0.60	0.60	2.00	0.60	0.90	0.90	0.30	0.90
DESIGN LOAD F_{Rfd}																
For plug PP	[kN]	0.28	0.50	0.50	0.67	1.00	0.36	0.12	0.24	0.20	0.30	0.12	0.20	0.24	0.20	0.45
For plug PA	[kN]	0.50	-	0.83	-	1.80	0.48	0.24	0.24	0.24	0.80	0.24	0.36	0.36	0.15	0.45
RECOMMENDED LOAD F_{rec}*																
For plug PP	[kN]	0.20	0.36	0.36	0.48	0.71	0.26	0.09	0.17	0.14	0.21	0.09	0.14	0.17	0.14	0.32
For plug PA	[kN]	0.36	-	0.60	-	1.29	0.34	0.17	0.17	0.17	0.57	0.17	0.26	0.26	0.11	0.32

* partial safety factor 1.4

F – Force independent of direction

PRODUCT INFORMATION



BASE MATERIAL:

- Concrete min C20/25
- Solid brick min 7.5MPa

APPROVALS AND REPORTS:

- AT-15-8987/2012



FEATURES:

PLUG:

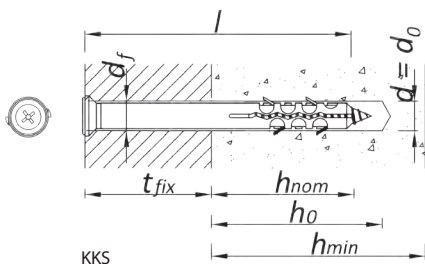
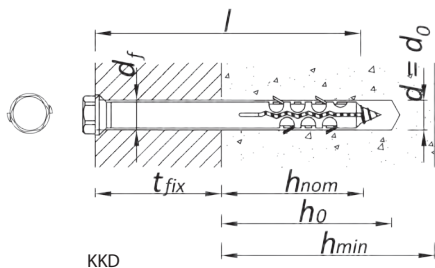
- Polypropylene PP
- Polyamide (Nylon) PA

SCREW:

- Countersunk KKS
- HEX head KKD
- Zinc electroplated carbon steel

Size	Product code		Plug		Screw		Fixture		
			Diameter	Length	Diameter	Length	Max thickness		Hole diameter
	Head type		d	l	D	L	Concrete	Clay brick	
	Countersunk	Hex head	[mm]	[mm]	[mm]	[mm]	t _{fix} [mm]	t _{fix} [mm]	
Ø8	KKS-08060	-	8	60	4.9	65	20	-	9
	KKS-08080			80		85	40	20	
	KKS-08100			100		105	60	40	
	KKS-08120			120		125	80	60	
Ø10	-	KKD-10100	10	100	6.8	105	60	40	11
		KKD-10120		120		125	80	60	
		KKD-10140		140		145	100	80	
		KKD-10160		160		165	120	100	

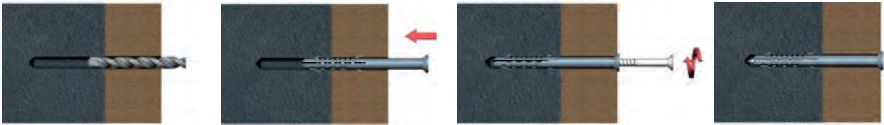
INSTALLATION DATA



Substrate			Concrete		Solid brick	
Size			Ø8	Ø10	Ø8	Ø10
Fixing diameter	d	[mm]	8	10	8	10
Hole diameter in substrate	d ₀	[mm]	8	10	8	10
Min. hole depth in substrate	h ₀	[mm]	50		70	
Installation depth	h _{nom}	[mm]	40		60	
Min. substrate thickness	h _{min}	[mm]	80		80	
Min. spacing	s _{min}	[mm]	25		35	
Min. edge distance	c _{min}	[mm]	25		35	

INSTALLATION GUIDE

1. Drill a hole of required diameter and depth.
3. Lightly tap the plug through the fixture into hole with a hammer, until fixing depth is reached.
3. Tighten the KKD/KKS screw.



BASIC PERFORMANCE DATA

Performance data for single fixing without influence of edge distance and spacing.

Substrate		Concrete C20/25	Solid brick 7.5MPa
Embedment depth h _{ef}	mm	40	60
MEAN ULTIMATE LOAD F_{Ru,m}			
Ø8	[kN]	1.68	1.11
Ø10	[kN]	2.91	2.39
CHARACTERISTIC LOAD F_{Rk}			
Ø8	[kN]	1.35	0.80
Ø10	[kN]	2.42	1.77
DESIGN LOAD F_{Rd}			
Ø8	[kN]	0.75	0.32
Ø10	[kN]	1.34	0.71
RECOMMENDED LOAD F_{rec}*			
Ø8	[kN]	0.54	0.23
Ø10	[kN]	0.96	0.51

* partial safety factor 1.4

F – Force independent of direction

PRODUCT INFORMATION



BASE MATERIAL:

- Aerated concrete, class 500
- Hollow brick, class min 3.5 MPa
- Perforated brick (eg. Porotherm), class 400

APPROVALS AND REPORTS:

- AT-15-8987/2012



FEATURES:

PLUG:

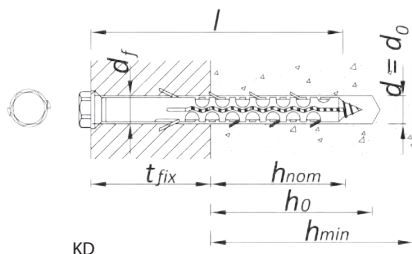
- Polypropylene PP
- Polyamide (Nylon) PA

SCREW:

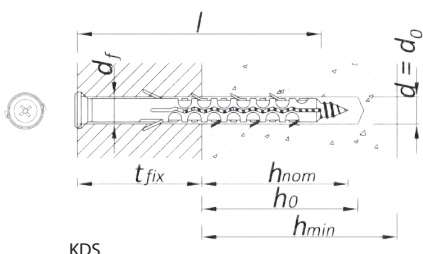
- Countersunk head KDS
- HEX head KD
- Zinc electroplated carbon steel

Size	Product code		Plug		Screw		Fixture	
			Diameter	Length	Diameter	Length	Max thickness	Hole diameter
	Head type		d	l	D	L	t _{fix}	d _f
	Countersunk	Hex head	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
Ø8	KDS-08100	-	8	100	4.9	110	40	9
	KDS-08120	-		120		130	60	9
	KDS-08140	-		140		150	80	9
Ø10	KDS-10080	KD-10080	10	80	6.8	90	20	11
	KDS-10100	KD-10100		100		110	40	11
	KDS-10120	KD-10120		120		130	60	11
	KDS-10140	KD10140		140		150	80	11
	KDS-10160	KD-10160		160		170	100	11
	KDS-10200	KD-10200		200		210	140	11
	KDS-10240	KD-10240		240		250	180	11
	-	KD16140		140		150	40	17
Ø16	-	KD-16160	16	160	11.7	170	60	17
	-	KD-16200		200		210	100	17
	-	KD-16240		240		250	140	17
	-	-		-		-	-	-

INSTALLATION DATA



KD

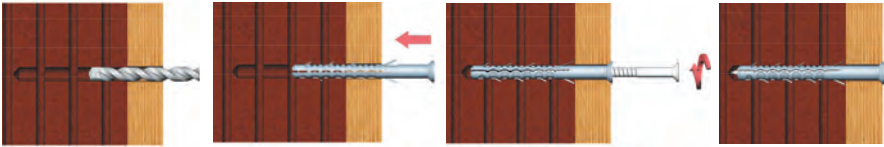


KDS

Size			Ø8	Ø10	Ø16
Fixing diameter	d	[mm]	8	10	16
Hole diameter in substrate	d ₀	[mm]	8	10	16
Min. hole depth in substrate	h ₀	[mm]	70	70	110
Installation depth	h _{nom}	[mm]	60	60	100
Min. substrate thickness	h _{min}	[mm]	80	80	120
Min. spacing	s _{min}	[mm]	30	30	55
Min. edge distance	c _{min}	[mm]	30	30	55

INSTALLATION GUIDE

1. Drill a hole of required diameter and depth.
2. Lightly tap the plug through the fixture into hole with a hammer, until fixing depth is reached.
3. Tighten the KD/KDS screw.



BASIC PERFORMANCE DATA

Performance data for single fixing without influence of edge distance and spacing.

Substrate		Aerated concrete 500	Hollow brick 3.5MPa	Perforated brick (eg. Porotherm) 400
MEAN ULTIMATE LOAD F_{Ru,m}				
Ø8	[kN]	1.76	0.86	0.51
Ø10	[kN]	2.63	1.82	1.56
Ø16	[kN]	3.54	2.50	1.71
CHARACTERISTIC LOAD F_{Rk}				
Ø8	[kN]	1.51	0.66	0.33
Ø10	[kN]	1.41	1.44	1.04
Ø16	[kN]	2.78	2.10	1.31
DESIGN LOAD F_{Rd}				
Ø8	[kN]	0.76	0.26	0.13
Ø10	[kN]	0.71	0.58	0.42
Ø16	[kN]	1.39	0.84	0.52
RECOMMENDED LOAD F_{rec}*				
Ø8	[kN]	0.50	0.20	0.10
Ø10	[kN]	0.50	0.40	0.30
Ø16	[kN]	1.00	0.60	0.40

* partial safety factor 1.4

F – Force independent of direction

PRODUCT INFORMATION



0

BASE MATERIAL:

- Non-cracked concrete min C20/25
- Reinforced and unreinforced concrete
- Solid brick min 15MPa

FEATURES:

- Zinc electroplated carbon steel
- Steel class 4.6
- Zinc coating thickness min 5µm

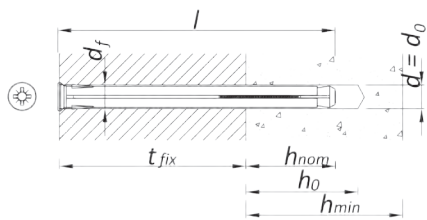
APPROVALS AND REPORTS:

- AT-15-7553/2008



Size	Product code	Anchor		Fixture		
		Diameter	Length	Max thickness		Hole diameter
				Concrete	Solid brick	
d	l	t _{fix}	t _{fix}	d _f		
[mm]	[mm]	[mm]	[mm]	[mm]		
M10	O-10072	10	72	32	12	11
	O-10092	10	92	52	32	11
	O-10112	10	112	72	52	11
	O-10132	10	132	92	72	11
	O-10152	10	152	112	92	11
	O-10182	10	182	142	122	11
	O-10202	10	202	162	142	11

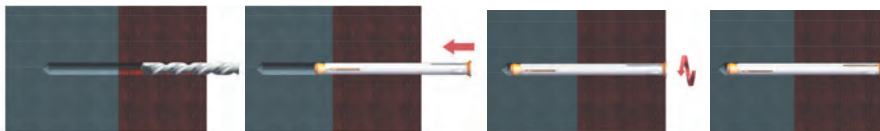
INSTALLATION DATA



Substrate			Concrete	Solid clay brick
Anchor diameter	d	[mm]	10	10
Hole diameter in substrate	d ₀	[mm]	10	10
Min. hole depth in substrate	h ₀	[mm]	50	70
Installation depth	h _{norm}	[mm]	40	60
Min. substrate thickness	h _{min}	[mm]	70	90
Min. spacing	s _{min}	[mm]	40	40
Min. edge distance	c _{min}	[mm]	60	60

INSTALLATION GUIDE

1. Drill a hole of required diameter and depth.
2. Lightly tap the anchor through the fixture into hole with a hammer, until fixing depth is reached.
3. Tighten screw until secure.



BASIC PERFORMANCE DATA

Performance data for single fixing without influence of edge distance and spacing.

Substrate		Concrete C20/25	Solid brick 15MPa
MEAN ULTIMATE LOAD $F_{Rd,m}$			
Embedment depth 40 mm	[kN]	5.40	-
Embedment depth 60 mm	[kN]	-	2.10
CHARACTERISTIC LOAD F_{Rk}			
Embedment depth 40 mm	[kN]	4.80	-
Embedment depth 60 mm	[kN]	-	2.00
DESIGN LOAD F_{Rd}			
Embedment depth 40 mm	[kN]	1.60	-
Embedment depth 60 mm	[kN]	-	0.70
RECOMMENDED LOAD F_{rec}^*			
Embedment depth 40 mm	[kN]	1.14	-
Embedment depth 60 mm	[kN]	-	0.50

* partial safety factor 1.4

F –Force independent of direction

PRODUCT INFORMATION



WHO



WHS

BASE MATERIAL:

- Concrete C20/25
- Perforated brick K3
- Solid brick 7.5MPa
- Aerated concrete 400

APPROVALS AND REPORTS:

- AT-15-6977/2012

FEATURES:

SCREW:

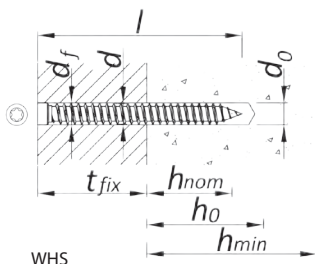
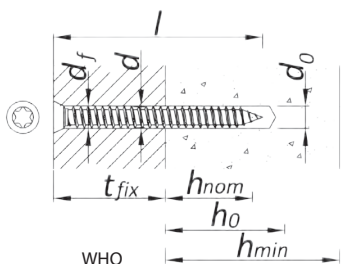
- Zinc electroplated steel
- Zinc coating thickness min 7µm
- **WHO** – TORX30
- **WHS** – TORX25



Size	Product code		Screw		Fixture		Hole diameter
			Diameter	Length	Max thickness		
	WHS	WHO	d [mm]	l [mm]	Concrete t_{fix} [mm]	Other t_{fix} [mm]	d_f [mm]
Ø7.5	WHS-75052	WHO-75052	7.5	52	22	-	8
	WHS-75072	WHO-75072	7.5	72	42	12	8
	WHS-75092	WHO-75092	7.5	92	62	32	8
	WHS-75112	WHO-75112	7.5	112	82	52	8
	WHS-75132	WHO-75132	7.5	132	102	72	8
	WHS-75152	WHO-75152	7.5	152	122	92	8
	WHS-75182	WHO-75182	7.5	182	152	122	8
	WHS-75212*	WHO-75212*	7.5	212	182	152	8

* Not covered by approval

INSTALLATION DATA



Substrate			Concrete	Aerated concrete	Other
Fixing diameter	d	[mm]	7.5	7.5	7.5
Hole diameter in substrate	d ₀	[mm]	6	-	6
Min. hole depth in substrate	h ₀	[mm]	40	-	70
Installation depth	h _{nom}	[mm]	30	60	60
Min. substrate thickness	h _{min}	[mm]	60	90	90
Min. spacing	s _{min}	[mm]	15	30	30
Min. edge distance	c _{min}	[mm]	15	50	50

INSTALLATION GUIDE

1. Drill a hole of required diameter and depth.
2. Lightly screw in the screw through the fixture into hole, until fixing depth is reached and fixture is secure.



BASIC PERFORMANCE DATA

Performance data for single fixing without influence of edge distance and spacing.

Substrate		Concrete C20/25	Solid brick 7.5MPa	Aerated concrete 400	Perforated brick K3
Embedment	[mm]	30	60	60	60
MEAN ULTIMATE LOAD $F_{Ru,m}$					
WHS, WHO		6.15	2.58	1.27	1.02
CHARACTERISTIC LOAD F_{Rk}					
WHS, WHO		5.21	2.11	1.14	0.90
DESIGN LOAD F_{Rd}					
WHS, WHO		2.08	0.84	0.46	0.36
RECOMMENDED LOAD F_{rec}^*					
WHS, WHO		1.49	0.60	0.33	0.26

* partial safety factor 1.4

F – Force independent of direction

A large grid of graph paper for taking notes, consisting of 20 columns and 30 rows of small squares.