Hybrid GEN 2

B+BTec DesignFiX®

TR023

ETA - 19/0130

Hybrid Injection Adhesive ETA Assessed for Post-Installed Rebar Connections

Post-Installed Rebar Dowels Ø8 - Ø32 mm

- Rebar EN 1992-1-1:2004 + AC:2010 Annex C
  Bars and de-coiled rods class B or C with f_{yk} and k acc. to NDP or NCL of EN 1992-1-1/NA
  $f_{uk} = f_{tk} = k \cdot f_{yk}$

Features

- NEW! ETA Assessed for the Installation in Flooded Holes
- NEW! No Cleaning required for Hollow Drilling
- NEW! Extended Seismic C2 Range: M12 - M24
- For Extreme Loads
- Fast Curing
- Styrene Free
- Low VOC: A+ Rating
- Fire Rated
- Leed Tested
- Potable Water Approved
- B+BTec DesignFix® support

Use Conditions

- Installation in Cracked & Non-Cracked Concrete C20/25 to C50/60
- For Anchor Rods M8-M30, Rebar Ø8-32 mm and Threaded Sleeves M6-M20
- Seismic Action C1: M8-M30, Ø8-32 mm
- Seismic Action C2: M12 - M24
- For Hammer/Air drilled Holes
- Installation in Dry and Wet Holes
- Installation in Flooded Holes
- Overhead Installation allowed.

Approvals & Test Reports

ETA - 19/0130
ETA - 19/0131
SEISMIC C1
SEISMIC C2
FIRE F120
A+ VOC
LEED
POTABLE WATER

Temperature Range

B+BTec BIS-HY GEN2 injection mortar may be applied in the temperature ranges given below. An elevated base material temperature leads to a reduction of the bond resistance.

Max. long term base material temperature: Long term elevated base material temperatures are roughly constant over significant periods of time.

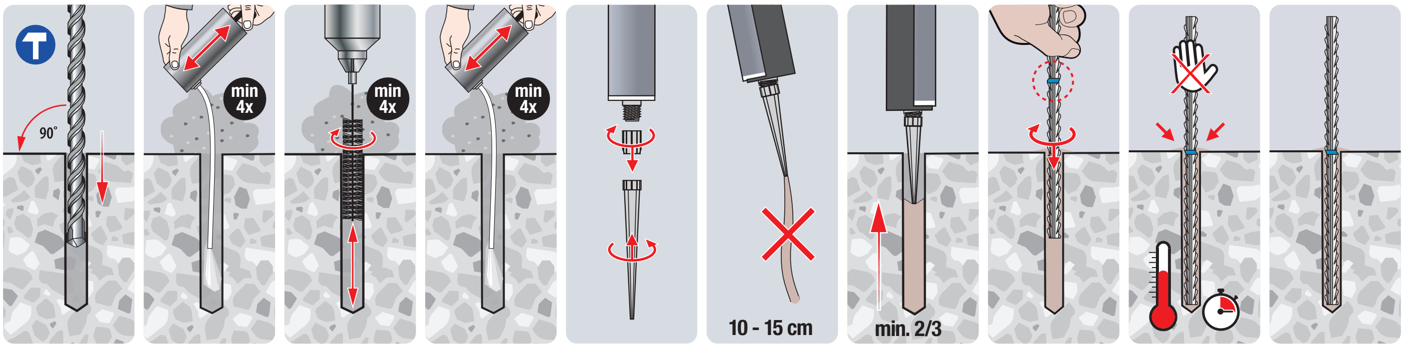
Max. short term base material temperature: Short term elevated base material temperatures are those that occur over brief intervals, e.g. as a result of diurnal cycling.

Temperature Range	Temperature Base Material	Max. Long Term Base Material Temperature	Max. Short Term Base Material Temperature
Temp. Range I	-40°C to +80°C	+ 50°C	+80°C

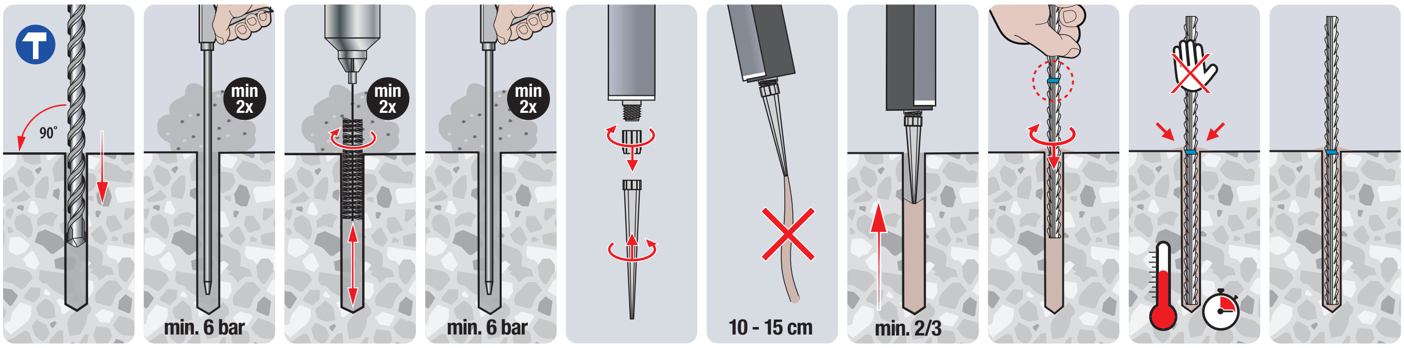
Hybrid GEN 2

Installation Procedures (Hand Pump Cleaning)

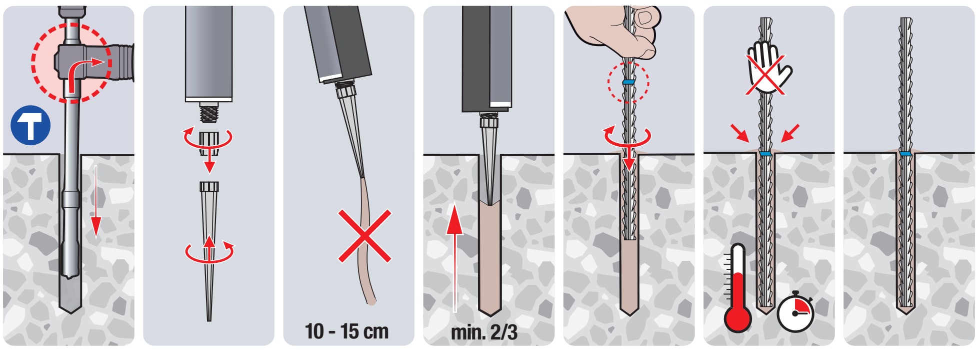
Hand Pump Cleaning for bore hole diameter $d_0 \leq 20mm$, bore hole depth $h_0 \leq 10d_{nom}$ and Non-Cracked Concrete only.



Installation Procedures (Compressed Air Cleaning)



Installation Procedures (Hollow Drilling)



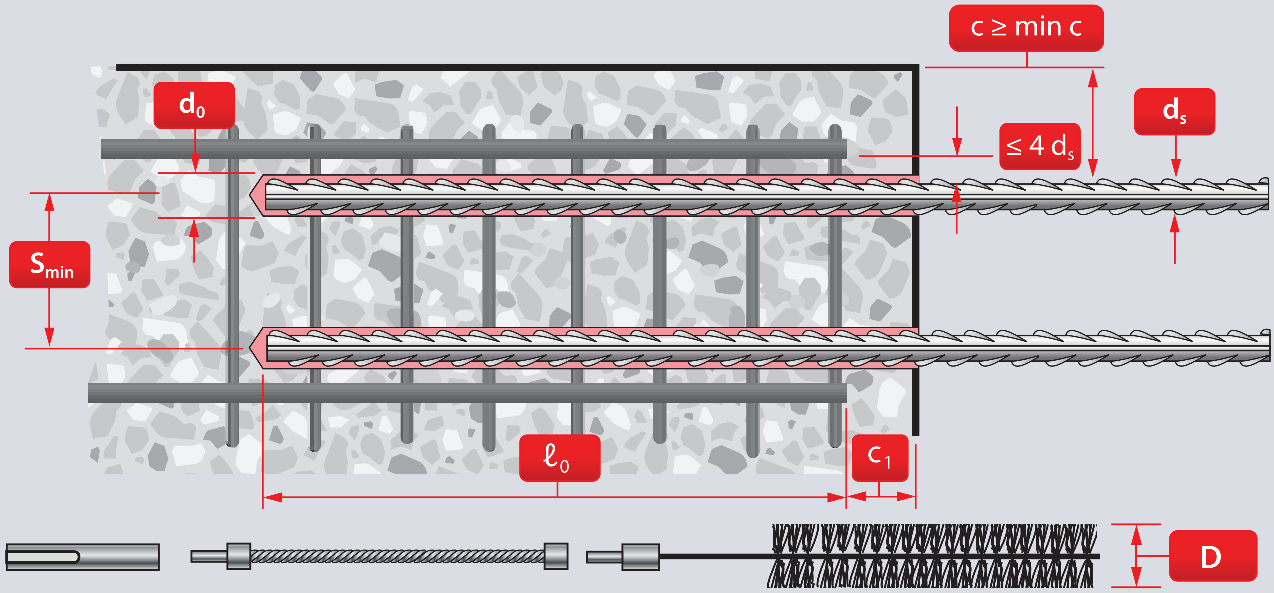
Curing Times[1)]

Temperature[2)]	°C	-5 to -1	0 to +4	+5 to +9	+10 to + 14	+15 to +19	+20 to +29	+30 to +40
Processing Time		50 min	25 min	15 min	10 min	6 min	3 min	2 min
Curing Time Dry Holes		5 h	3,5 h	2 h	1h	40 min	30 min	30 min
Curing Time Wet Holes		10 h	7 h	4 h	2h	80 min	60 min	60 min

1) Cartridge Temperature must be between +5°C and +40°C. 2) Concrete Temperature

ETA - 19/0130

Specification Data for the use in reinforced & unreinforced Concrete and Hammer/Air Drilled Holes according to EN 1992-1-1 :2004+AC:201 0, EN 1992-1-2:2004+AC:2008 and Annex B 2 and B 3



Installation Dimensions

Rebar Size	d_s		Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø22	Ø24	Ø25	Ø28	Ø32
Hole Diameter	d_0	[mm]	12	14	16	18	20	25	28	32	32	35	40
Min. Anchoring Length C20/25	$l_{b,min}$ 1)2)	[mm]	113	142	170	198	227	284	312	340	354	397	454
Min. Anchoring Length C50/60	$l_{b,min}$ 1)2)	[mm]	100	100	120	140	160	200	220	240	250	280	320
Min. Lap Length C20/25	$l_{0,min}$ 1)2)	[mm]	200	200	200	210	240	300	330	360	375	420	480
Min. Lap Length C50/60	$l_{0,min}$ 1)2)	[mm]	200	200	200	210	240	300	330	360	375	420	480
Design Anchoring Length													
- for Yield of Rebar C20/25	$l_{bd,y\,(\alpha 2=1)}$	[mm]	378	473	567	662	756	945	1040	1134	1181	1323	1512
- for Yield of Rebar C50/60	$l_{bd,y\,(\alpha 2=1)}$	[mm]	202	253	303	354	404	506	556	607	632	708	809
- for Yield of Rebar C20/25	$l_{bd,y\,(\alpha 2=0,7)}$	[mm]	265	331	397	463	529	662	728	794	827	926	1059
- for Yield of Rebar C50/60	$l_{bd,y\,(\alpha 2=0,7)}$	[mm]	142	177	212	248	283	354	389	425	442	495	566
Max. Embedment Depth	l_{max} 3)	[mm]	1000	1000	1200	1400	1600	2000	2000	2000	2000	2000	2000
Min. Spacing	s_{min}	[mm]	50	50	60	70	80	100	110	120	125	140	160
Required Volume per cm Embedment Depth	V_s	[ml/cm]	0,75	0,90	1,06	1,21	1,36	2,12	2,83	4,22	3,76	4,16	5,43

1) According to EC2: EN 1992-1-1:2004 $l_{b,min}$ (8.6) and $l_{0,min}$ (8.11) are calculated for good bond conditions with characteristic yield strength f_{yk} = 500 N/mm², γ_M = 1,15 and α_6 = 1,0
2) Minimum anchorage length $l_{b,min}$ and the minimum lap length $l_{0,min}$ according to EN 1992-1-1 shall be multiplied by relevant amplification factor α_{lb} (see amplification factor table)
3) When using the hollow drill bit system (HDB) the maximum embedment depth is 1000 mm for all diameters

Steel Brush & Piston Plug Dimensions4)

Rebar Size	d_s		Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø22	Ø24	Ø25	Ø28	Ø32
Brush Diameter	D	[mm]	14	16	18	20	22	27	30	34	34	37	42
Min. Brush Diameter	D_{min}	[mm]	12,5	14,5	16,5	18,5	20,5	25,5	28,5	32,5	32,5	35,5	40,5
Piston Plug	#	--	-	14	16	18	20	25	28	32	32	35	40

4) No cleaning required for holes that are drilled with the hollow drill bit system (HDB)

Minimum Concrete Cover

Drilling Method		d_s [mm]	Without Drilling Guide [mm]	With Drilling Guide [mm]
Hammer Drilling/Hollow Drill Bit	HD/HDB	<25	$30 + 0{,}06 \cdot \ell_v \geq 2d_s$	$30 + 0{,}02 \cdot \ell_v \geq 2d_s$
		≥25	$40 + 0{,}06 \cdot \ell_v \geq 2d_s$	$40 + 0{,}02 \cdot \ell_v \geq 2d_s$
Compressed Air Drilling	CD	<25	$50 + 0{,}08 \cdot \ell_v$	$50 + 0{,}02 \cdot \ell_v$
		≥25	$60 + 0{,}08 \cdot \ell_v$	$60 + 0{,}02 \cdot \ell_v$

Design Values of the ultimate bond stress $f_{bd,PIR}$ in N/mm² for all drilling methods and for good conditions[5)]

Rebar	Concrete Class								
	C12/15	C16/20	C20/25	C25/30	C30/37	C35/45	C40/50	C45/55	C50/60
Ø8 - 32 mm	1,6	2,0	2,3	2,7	3,0	3,4	3,7	4,0	4,3

5) All other bond conditions multiply the values by 0,7.

Amplification factor α_{lb} related to concrete class and drilling method

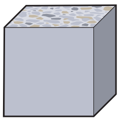
Concrete Class	Drilling Method	Rebar Size	Amplification Factor
C12/15 to C50/60	All Drilling Methods	Ø8 - 32 mm	1,0

Static and quasi-static resistance

All data in this section subject to:
- Correct setting (see setting instructions).
- Embedment depth l_{bd} used in the tables below is equal to $l_{b,min}$, unless $l_{bd,y} \geq l_{b,min}$
- Temperature range I: (max. long/short term temperature +50°C/+80°C).
- Amplification factor α_{lb} = 1,0 for all concrete classes, drilling methods and bar sizes.

Design Resistance Dry/Wet Holes Concrete Class C20/25

Reinforcing bars, f_{yk} = 500 N/mm²
Design loads in [kN]



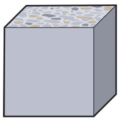
Rebar Size ► d_s / ▼ Embedment Depth ℓ_b	Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø22	Ø24	Ø25	Ø28	Ø32
113	6,6										
142	8,2	10,2									
170	9,8	12,3	14,8								
198	11,5	14,3	17,2	20,1							
227	13,1	16,4	19,7	22,9	26,2						
284	16,4	20,5	24,6	28,7	32,8	41,0					
312	18,0	22,5	27,0	31,6	36,1	45,1	49,6				
340	19,7	24,6	29,5	34,4	39,3	49,2	54,1	59,0			
354	20,5	25,6	30,7	35,9	41,0	51,2	56,3	61,5	64,0		
378	**21,9**	27,3	32,8	38,2	43,7	54,6	60,1	65,6	68,3		
397		28,7	34,4	40,2	45,9	57,4	63,1	68,8	71,7	80,3	
454		32,8	39,3	45,9	52,5	65,6	72,1	78,7	82,0	91,8	104,9
473		**34,1**	41,0	47,8	54,6	68,3	75,1	82,0	85,4	95,6	109,3
567			**49,2**	57,4	65,6	82,0	90,2	98,3	102,4	114,7	131,1
662				**66,9**	76,5	95,6	105,2	114,7	119,5	133,9	153,0
756					**87,4**	109,3	120,2	131,1	136,6	153,0	174,8
945						**136,6**	150,3	163,9	170,7	191,2	218,5
1040							**165,3**	180,3	187,8	210,4	240,4
1134								**196,7**	204,9	229,5	262,3
1181									**213,4**	239,0	273,2
1323										**267,7**	306,0
1512											**349,7**
Design yield force of bar $N_{Rd,s}$	**21,9**	**34,1**	**49,2**	**66,9**	**87,4**	**136,6**	**165,3**	**196,7**	**213,4**	**267,7**	**349,7**

Static and quasi-static resistance

All data in this section subject to:
- Correct setting (see setting instructions).
- Embedment depth l_{bd} used in the tables below is equal to $l_{b,min}$, unless $l_{bd,y} \geq l_{b,min}$
- Temperature range I: (max. long/short term temperature +50°C/+80°C).
- Amplification factor α_{lb} = 1,0 for all concrete classes, drilling methods and bar sizes.

Design Resistance Dry/Wet Holes Concrete Class C50/60

Reinforcing bars, f_{yk} = 500 N/mm²
Design loads in [kN]



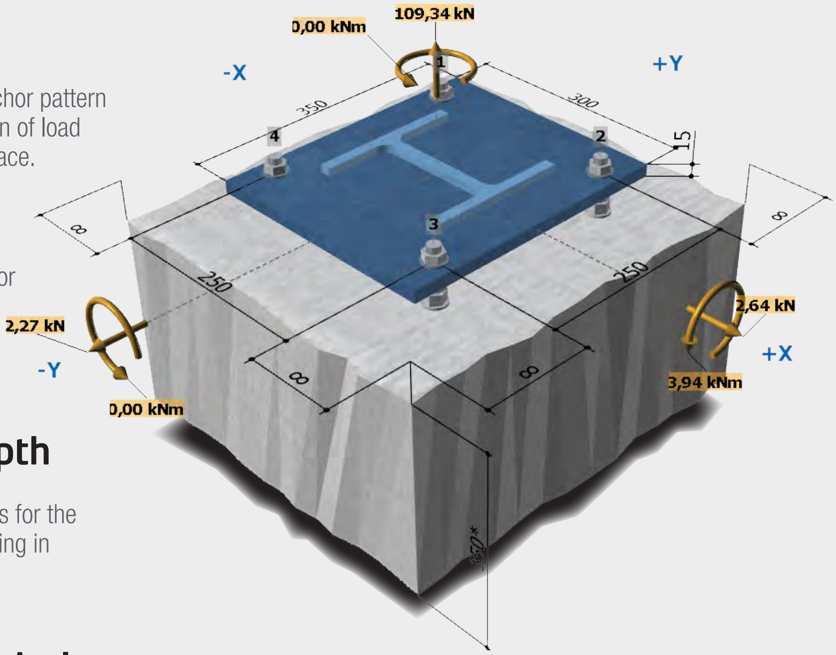
Rebar Size ▶ d_s / ▼ Embedment Depth ℓ,b	Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø22	Ø24	Ø25	Ø28	Ø32
100	10,8	13,5									
120	13,0	16,2	19,5								
140	15,1	18,9	22,7	26,5							
160	17,3	21,6	25,9	30,3	34,6						
200	21,6	27,0	32,4	37,8	43,2	54,0					
202	**21,9**	27,3	32,8	38,2	43,7	54,6					
220		29,7	35,7	41,6	47,6	59,4	65,4				
240		32,4	38,9	45,4	51,9	64,8	71,3	77,8			
250		33,8	40,5	47,3	54,0	67,5	74,3	81,1	84,4		
253		**34,1**	41,0	47,8	54,6	68,3	75,1	82,0	85,4		
280			45,4	53,0	60,5	75,6	83,2	90,8	94,6	105,9	
303			**49,2**	57,4	65,6	82,0	90,2	98,3	102,4	114,7	
320				60,5	69,2	86,5	95,1	103,7	108,1	121,0	138,3
354				**66,9**	76,5	95,6	105,2	114,7	119,5	133,9	153,0
404					**87,4**	109,3	120,2	131,1	136,6	153,0	174,8
506						**136,6**	150,3	163,9	170,7	191,2	218,5
556							**165,3**	180,3	187,8	210,4	240,4
607								**196,7**	204,9	229,5	262,3
632									**213,4**	239,0	273,2
708										**267,7**	306,0
809											**349,7**
Design yield force of bar $N_{Rd,s}$	**21,9**	**34,1**	**49,2**	**66,9**	**87,4**	**136,6**	**165,3**	**196,7**	**213,4**	**267,7**	**349,7**

Free Anchor Design Software for Structural Safety!

B+BTec DesignFiX® Anchor Design made Easy!

Input Freedom & 3D User Interface

B+BTEC DesignFiX® offers complete freedom to select an anchor pattern and base plate configuration, as well as the position and direction of load combinations. Changes are made directly into the 3D user interface.

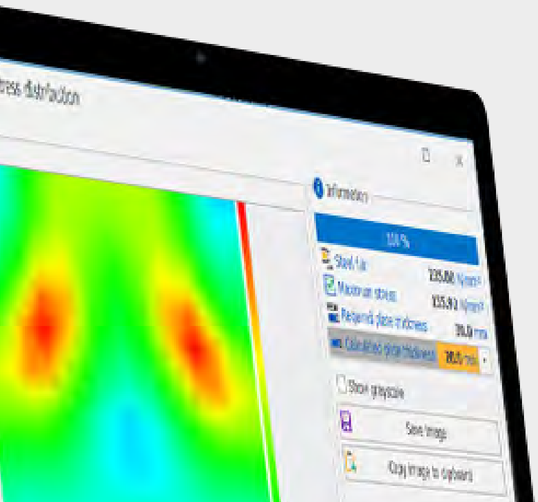


Anchor Type Comparison

B+BTEC DesignFiX® displays the usability of the various anchor types (according to ETAG-001, Annex A, TR029), including the values for each load type. This allows you to compare the calculation results of the different anchor types in a single easy to read panel.

Calculation Effective Anchorage Depth

When selecting an Injection Mortar **B+BTEC DesignFiX®** allows for the automatic calculation of the most effective anchorage depth, taking in consideration the minimal and maximum values of the ETA.



Calculation Base Plate Thickness

The integrated FEM-Calculation Method (Finite Element Method) in **B+BTEC DesignFiX®** allows you to calculate the base plate thickness based upon the stresses in the base plate in combination with the base plate configuration.

B+BTec DesignFiX®

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