

Last Updated:
 06.02.2020

Xtreme Bond VR-PLUS styrene free vinyl ester chemical anchor

Product Code: HH0106000010

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Certificates

ETA- 09/0140 Option 1: Anchoring of threaded bars/anchor studs [M10-M20] in cracked concrete with variable anchorage depths.
 ETA- 09/0140 Option 7: Anchoring of threaded bars/anchor studs [M8-M30] and reinforcing bars [Ø8-Ø32] in non-cracked concrete with variable anchorage depths.
 ETA- 09/0140 Seismic C1 [M12-M20] and C2 [M12-M16] for threaded bars/anchor studs.
 ETA- 09/0246: Post installed reinforcing bars [Ø8-Ø32], fire and seismic actions, designed according to Eurocode 2 (EN 1992-1-1).

Complies with LEED® requirements.
 Class A+ for emission of volatile organic compounds (VOCs) in living spaces.



Base material

Certified use	Specific use	Suitable use
Cracked concrete Non cracked concrete	Natural stone Solid, perforated and hollow masonry Hollow concrete block Wood	Cellular Aerated concrete

Product

Art.	Content	Mixer	Applicator
HH0106000010	400 ml	HH0106100040	HH0106100010

Intended use

Dry or wet concrete
 Flooded holes in concrete (bars M8 to M30 and Ø8 to Ø32)
 Dry masonry, installation in dry or wet substrate
 Cartridge temperature: between +5 and +25 °C
 Installation temperature: between -10 and +35 °C
 Work temperature: I between -40 and +40 °C (maximum short term temperature +40 °C; long term +24 °C)
 II between -40 and +80 °C (maximum short term temperature +80 °C; long term +50 °C)
 Shelf life: 16 months for 400 ml cartridges (storage temperature between +5 and +25°C)

Time and temperatures

Temperature of base material	Working time	Full curing dry base material	Full curing wet base material
30°C	3 min	30 min	60 min
25°C	5 min	35 min	70 min
20°C	7 min	40 min	80 min
15°C	11 min	45 min	90 min
10°C	16 min	60 min	120 min
5°C	25 min	90 min	180 min
0°C	45 min	7 hrs	14 hrs
-5 °C	65 min	14 hrs	28 hrs
-10 °C	110 min	24 hrs	48 hrs

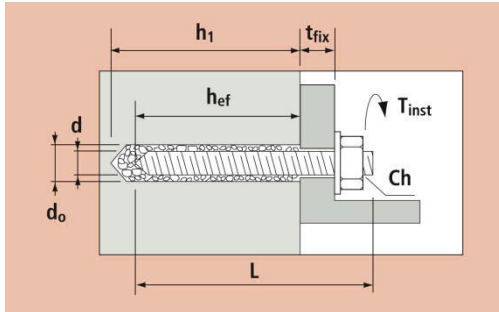
Cartridge temperature must be between +5 and +20 °C

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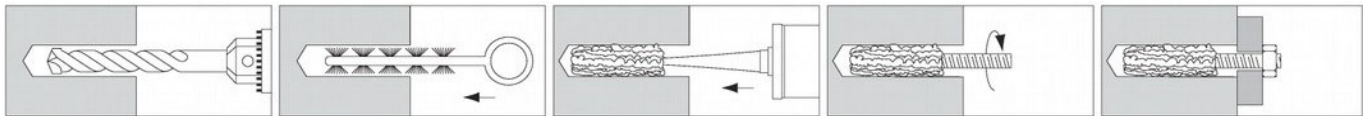
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d = bar diameter
 L = bar length
 t_{fix} = fixable thickness
 d_0 = hole diameter
 h_1 = minimum hole depth
 h_{nom} = setting depth
 h_{ef} = effective anchorage depth
 T_{inst} = tightening torque

Use in non-cracked and cracked concrete with threaded bars/anchor studs

Installation (for detailed instructions and recommendations ask for FFX data sheet)



Setting parameters

Thread size		M8	M10	M12	M16	M20	M24	M27	M30
Hole diameter	d_0 [mm]	10	12	14	18	24	28	30	35
Hole depth	$h_{ef.min}$ [mm]	60	70	80	100	120	145	145	145
	$h_{ef.max}$ [mm]	160	200	240	320	400	480	540	600
Characteristic spacing [min depth] $h_{ef.min}$	$S_{cr, N}$ [mm]	180	210	240	300	360	435	435	435
Characteristic spacing [max depth] $h_{ef.max}$	$S_{cr, N}$ [mm]	230	250	300	400	450	540	625	700
Minimum spacing *	S_{min} [mm]	40	50	60	75	100	115	120	140
Characteristic edge [min depth] $h_{ef.min}$	$C_{cr, N}$ [mm]	90	105	120	150	180	220	220	220
Characteristic edge [max depth] $h_{ef.max}$	$C_{cr, N}$ [mm]	115	125	150	200	225	270	315	350
Minimum edge distance *	C_{min} [mm]	40	50	60	75	100	115	120	140
Min. base material thickness	h_{min} [mm]	$h_{ef} + 30 \geq 100$				$h_{ef} + 2d_0$			
Tightening torque	T_{inst} Nm	10	20	40	80	150	200	250	280

* seek advice from FFX Technical Dept for performance at these distances and spacings

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Performance data

For installation in dry or wet concrete and work temperature I (minimum temperature -40 °C, maximum short term temperature +40 °C; long term +24 °C)

Valid for a single anchor with no influence of spacing or edge distance, on a thick concrete member [min 2x h_{ef}] of class C20/25 with normal reinforcement.

- Threaded bars/anchor studs in non-cracked concrete**

Characteristic resistance (kN) C20/25 non cracked concrete, 5.8 grade anchor studs

Thread size		M8	M10	M12	M16	M20	M24	M27	M30
Embedment depth	h _{ef} [mm]	80	90	110	125	170	210	240	270
Tension	N _{Rk} [kN]	19.0	30.2	43.8	70.5	104.7	153.2	168.6	208.4
Shear	V _{Rk} [kN]	9.5	15.1	21.9	40.8	63.5	92.0	119.5	146.0

Design resistance (kN) C20/25 non cracked concrete, 5.8 grade anchor studs

Thread size		M8	M10	M12	M16	M20	M24	M27	M30
Embedment depth	h _{ef} [mm]	80	90	110	125	170	210	240	270
Tension	N _{Rd} [kN]	12.6	20.0	29.1	47.0	69.7	102.0	112.4	138.8
Shear	V _{Rd} [kN]	7.6	12.0	17.5	32.6	50.8	73.6	95.6	116.8

Recommended load (kN) C20/25 non cracked concrete, 5.8 grade anchor studs

Thread size		M8	M10	M12	M16	M20	M24	M27	M30
Embedment depth	h _{ef} [mm]	80	90	110	125	170	210	240	270
Tension	N _{rec} [kN]	9.0	14.3	20.8	33.6	49.8	72.9	80.3	99.2
Shear	V _{rec} [kN]	5.4	8.6	12.5	23.3	36.3	52.5	68.2	83.4

1 kN ~ 100 kg

- Threaded bars/anchor studs in cracked concrete**

Characteristic resistance (kN) C20/25 cracked concrete, 5.8 grade anchor studs

Thread size		M8	M10*	M12*	M16*	M20*	M24	M27	M30
Embedment depth	h _{ef} [mm]	80	90	110	125	170	210	240	270
Tension	N _{Rk} [kN]	13.6	24.6	37.5	50.3	71.0	95.0	101.8	114.5
Shear	V _{Rk} [kN]	9.0	15.1	21.9	40.8	63.5	88.0	115.0	129.0

Design resistance (kN) C20/25 cracked concrete, 5.8 grade anchor studs

Thread size		M8	M10*	M12*	M16*	M20*	M24	M27	M30
Embedment depth	h _{ef} [mm]	80	90	110	125	170	210	240	270
Tension	N _{Rd} [kN]	9.0	16.4	25.0	33.5	47.3	63.3	67.9	76.3
Shear	V _{Rd} [kN]	7.2	12.0	17.5	32.6	50.8	70.4	92.0	103.2

Recommended load (kN) C20/25 cracked concrete, 5.8 grade anchor studs

Thread size		M8	M10*	M12*	M16*	M20*	M24	M27	M30
Embedment depth	h _{ef} [mm]	80	90	110	125	170	210	240	270
Tension	N _{rec} [kN]	6.4	11.7	17.8	23.9	33.8	45.2	48.5	54.5
Shear	V _{rec} [kN]	5.1	8.6	12.5	23.3	36.2	50.2	65.7	73.7

1kN ~ 100 kg

* M10-M20 are included in the ETA for cracked concrete (manufacturers figures for other sizes)

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Use in non-cracked concrete with reinforcing bars (rebar used as anchors)
Installation (for detailed instructions and recommendations ask for FFX data sheet)

Setting parameters

Bar size		Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø28	Ø32
Hole diameter	d_0 [mm]	12	14	16	18	20	25	32	35	40
Minimum spacing *	S_{min} [mm]	50	60	65	75	80	100	120	140	160
Minimum edge distance *	C_{min} [mm]	50	60	65	75	80	100	120	140	160
Hole depth	$h_{ef, min}$ [mm]	60	70	80	80	100	120	150	180	200
	$h_{ef, max}$ [mm]	160	200	240	280	320	400	500	560	640
Min. base material thickness	h_{min} [mm]	$h_{ef} + 30 \geq 100$			$h_{ef} + 2d_0$					

* seek advice from FFX Technical Dept for performance at these distances and spacings

Performance data

 For installation in dry or wet concrete and work temperature I (minimum temperature $-40\text{ }^\circ\text{C}$, maximum short term temperature $+40\text{ }^\circ\text{C}$; long term $+24\text{ }^\circ\text{C}$)

 Valid for a single anchor with no influence of spacing or edge distance, on a thick concrete member [min $2 \times h_{ef}$] of class C20/25 with normal reinforcement

- Reinforcing bars on non-cracked concrete**

Characteristic resistance (kN) for reinforcing bars with $f_{uk} = 550\text{ N/mm}^2$

Bar size		Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø28	Ø32
Embedment depth	h_{ef} [mm]	80	90	110	125	140	170	210	270	300
Tension	N_{Rk} [kN]	27.1	36.3	52.1	66.6	73.8	104.1	153.7	205.7	228.5
Shear	V_{Rk} [kN]	13.6	21.2	30.5	41.6	54.3	84.8	132.5	166.3	217.1

Design resistance (kN) for reinforcing bars with $f_{uk} = 550\text{ N/mm}^2$

Bar size		Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø28	Ø32
Embedment depth	h_{ef} [mm]	80	90	110	125	140	170	210	270	300
Tension	N_{Rd} [kN]	18.1	24.2	34.7	44.4	49.2	69.4	102.5	137.1	152.3
Shear	V_{Rd} [kN]	10.9	16.9	24.4	33.3	43.5	67.9	106.0	133.1	173.7

Recommended load (kN) for reinforcing bars with $f_{uk} = 550\text{ N/mm}^2$

Bar size		Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø28	Ø32
Embedment depth	h_{ef} [mm]	80	90	110	125	140	170	210	270	300
Tension	N_{rec} [kN]	12.9	17.3	24.8	31.7	35.1	49.6	73.2	97.9	108.8
Shear	V_{rec} [kN]	7.8	12.1	17.4	23.8	31.0	48.5	75.7	95.0	124.1

1 kN ~ 100 kg

 Load values derive from parameters certified in European Technical Assessment ETA 09/0140. Characteristic resistance N_{Rk} refers to the resistance to failure due to pull-out, concrete cone and steel failure. Design resistances N_{Rd} and V_{Rd} refer to all failure modes and include partial safety factors on strengths. Recommended loads N_{rec} and V_{rec} include the further 1.4 safety factor.

 For the design of fixing with reduced spacing, near the edge or on concrete with increased resistance, reduced thickness or dense reinforcement refer to ETA 09/0140 or to Declaration of Performance and use the design method outlined in EOTA's *Technical Report 029* or in EN 1992-4. In the same way, for anchors installed in flooded holes and for different working temperatures (II, between -40 and $+80\text{ }^\circ\text{C}$) refer to ETA.

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Post Installed rebar connections (ETA -09/0246)
Bond resistance f_{bd} [N/mm²]. Design value for all embedments with hammer drilled holes.

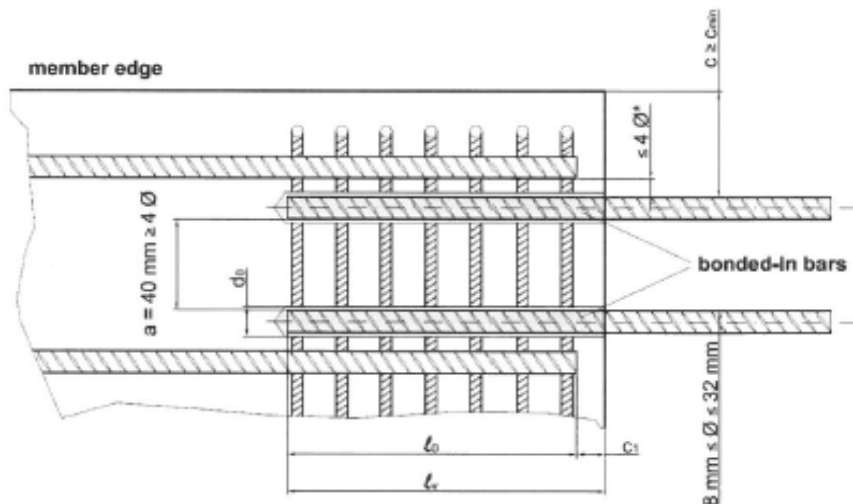
Bar size		Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø28	Ø32
Bond resistance N/mm²										
Concrete Strength	C 12/15	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	C 16/20	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
	C 20/25	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	C 25/35	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
	C 30/37	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.7
	C 35/45	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	2.7
	C 40/50	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.4	2.7
	C 45/55	4.0	4.0	4.0	4.0	4.0	3.7	3.7	3.4	2.7
C 50/60	4.3	4.3	4.3	4.3	4.3	4.0	4.0	3.4	2.7	

General Design Rules for Post Installed Rebar (ETA -09/0246)

Post installed rebar may be designed for tension forces only.

The transfer of shear forces between new concrete and existing structure shall be designed additionally according to EN 1992-1-1:2004+AC:2010.

The joints for concreting must be roughened to at least such an extent that aggregate protrude.



* If the clear distance between overlapping rebar is greater than $4 \varnothing$ the overlap length shall be enlarged by the difference between the clear distance and $4 \varnothing$.

- l_0 lap length according to EN 1992-1-1:2004+AC:2010 for static and quasi-static loading or EN 1998-1:2004+AC:2009 for seismic loading.
- l_v effective embedment depth; $l_v \geq l_0 + c_1$
- c concrete cover of post-installed rebar
- c_{\min} minimum concrete cover acc. to Annex B3 and EN 1992-1-1:2004+AC:2010
- c_1 concrete cover at end-face of existing rebar
- \varnothing nominal drill bit diameter acc. to Annex B3
- \varnothing rebar diameter (d_s)



TECHNICAL DATA SHEET



OPTION 1

Folkestone Fixings Ltd
Dyna House, Lympe Industrial Estate
Otterpool Lane, Lympe, Kent.
CT21 4LR Tel: 01303 847 787

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Notes: