Declaration of Performance CE-110008-A1

MQL Universal Nylon Frame Plug

(Plastic anchor for multiple use in concrete and masonry for non-structural applications)

Intended use or uses of the construction product according to ETAG 001 parts 1 and 2				
Generic type	Plastic anchor for multiple use			
Base material concrete	cracked and un-cracked concrete min. C12/15 to C50/60 acc. to EN 206-1:2003			
Base material all masonry	Mortar strength min. M2,5 acc. To EN 998-2			
	Name	Standard	Minimum size	Bulk density class [kg/dm³]
Base material 1 use category “b”	Solid brick, Mz 20/2,0	Mz DIN V 105-100/ EN 771-1	240x115x113	≥ 2,0
Base material 2 use category “b”	Solid sand lime brick KSV 12/2,0	KSV DIN V 106-100/ EN 771-2	240x115x113	≥ 2,0
Base material 3 use category “c”	Perforated brick HLz HLZ 12/1,2	DIN V 105-100/ EN 771-1	300x240x240	1,2
Base material 4 use category “c”	Hollow lime sand brick KSL / KSL 12/1,4	DIN V 106-100/ EN 771-2	300x195x240	1,4
Base material 5 use category “c”	Ital. hollow brick Mattone	EN 771-1	300x195x240	0,84
Material Anchor sleeve	Nylon PA6			
Material screw 1	Steel, gvz ≥ 5 µm acc. EN ISO 4042, blue passivated			
Material screw 2 (stainless)	Stainless steel, Material number: 1.4401, 1.4301, 1.4571			
Durability screw 1	internal dry conditions and external atmospheric exposure if intrusion of moisture into the anchor shaft is prevented. E.g. external cladding + soft plastic, permanently elastic bitumen-oil-combination coating = body cavity protection for cars			
Durability screw 2(stainless)	Internal and external atmospheric exposure (including industrial and marine environment), or exposure in permanently damp internal conditions, if no particular aggressive conditions exist.			
Loading	static, quasi-static			
Temperature range	b) -20 °C to +80 °C (max long term temperature +50 °C and max short term temperature +80 °C)			
Fire Resistance	R90 if the admissible load [FRk / (γM·γF)] is ≤ 0,8 kN acc TR020			
ETA - 11/0008 issued by	DIBt Deutsches Institut für Bautechnik			
On the basis of	ETAG 020, Parts 1-4			
Certificate of Conformity 1109-CPD-0072 issued by	IFBT GmbH, Leipzig			
Under AVCP System	2+			

Declared performances according to ETAG 0020 parts 1 to 4				
Essential characteristics				
Installation parameters masonry and concrete				
d_0	Nominal diameter of drill bit	[mm]	10	
d_{cut}	Maximum cutting diameter of drill bit	[mm]	10,45	
d_f	Maximum diameter of clearance hole in fixture	[mm]	10,5	
h_1	Minimum drill depth	[mm]	80	
h_{nom}	Minimum installation depth	[mm]	70	

Installation parameters concrete				
Base Material	h_{min} [mm]	$c_{cr,Nn}$ [mm]	c_{min} [mm]	s_{min} [mm]
Concrete ≥C12/15	100	140	70	140
Concrete ≥C16/20	100	100	50	100

Installation parameters brick

Base Material	Single anchor h_{min} [mm]	Single anchor c_{min} [mm]	Single anchor a_{min} [mm]	Group of Anchor s_{min1} [mm] ⊥ to free edge	Group of Anchor s_{min1} [mm] ∥ to free edge
Solid brick Mz 20/2,0 Mz DIN V 105-100/ EN 771-1	115	100	250	200	400
Solid sand lime brick KSV 12/2,0 KSV DIN V 106-100/ EN 771-2	115				
Perforated brick HLz HLZ 12/1,2 DIN V 105-100/ EN 771-1	240				
Hollow lime sand brick KSL KSL 12/1,4 DIN V 106-100/ EN 771-2	240				
Ital. hollow brick Mattone EN 771-1	240				

			Steel	Stainless Steel
Steel failure mode: Tension	Screw material			
$N_{Rk,s}$	Tension Steel characteristic failure	[kN]	15,9	18,5
$\gamma_{m,sN}$	Partial safety factor for tension steel failure	[-]	1,5	1,87
Steel failure mode: Shear				
$V_{Rk,s}$	Shear Steel characteristic failure	[kN]	7,9	9,2
$\gamma_{m,sV}$	Partial safety factor for shear steel failure	[-]	1,25	1,56
Steel failure mode: Bending				
$M_{Rk,s}$	Bending Moment characteristic failure	[Nm]	16,2	15,2
$\gamma_{m,s}$	Partial safety factor for steel failure bending	[-]	1,25	1,25
Pull-out failure mode concrete (plastic sleeve)				
$N_{Rk,p,cr}$	Tension characteristic load in cracked concrete ≥C12/15	[kN]	1,5	
γ_2	Partial safety factor	[-]	1,8	
$N_{Rk,p,cr}$	Tension characteristic load in cracked concrete ≥C16/20	[kN]	2,5	
γ_2	Partial safety factor	[-]	1,8	

Concrete cone failure and concrete edge failure for single anchor and anchor group acc. ETAG 020 Annex C

Tension load [2)]

$$N_{Rk,c} = 7{,}2 \cdot \sqrt{f_{ck,cube}} \cdot h_{ef}^{1,5} \cdot \frac{c}{c_{cr,N}} = N_{Rk,p} \cdot \frac{c}{c_{cr,N}} \qquad \text{mit:} \quad h_{ef}^{1,5} = \frac{N_{Rk,p}}{7{,}2 \cdot \sqrt{f_{ck,cube}}}$$

$$\frac{c}{c_{cr,N}} \leq 1$$

Shear load [2)]

$$V_{Rk,c} = 0{,}45 \cdot \sqrt{d_{nom}} \cdot (h_{nom}/d_{nom})^{0,2} \cdot \sqrt{f_{ck,cube}} \cdot c_1^{1,5} \cdot \left(\frac{c_2}{1{,}5\,c_1}\right)^{0,5} \cdot \left(\frac{h}{1{,}5\,c_1}\right)^{0,5} \qquad \text{mit:} \quad \left(\frac{c_2}{1{,}5\,c_1}\right)^{0,5} \leq 1$$

$$\left(\frac{h}{1.5\,c_1}\right)^{0,5} \leq 1$$

c_1 Edge distance closest to the edge in load direction
c_2 Edge distance perpendicular to direction 1
$f_{ck,cube}$ Nominal characteristic compressive strength (cube), value for C 50/60 at maximum

Partial safety factor γ_{Mc}	1,8

Pull-out failure mode masonry (plastic sleeve)				
	Name	Min compressive strength F_b [N/mm²]		Charact. Resistance F_{RK} [kN] tension, shear or combined tension and shear load
Base material 1 use category “b”	Solid brick, Mz 20/2,0	10		2,0
Base material 1 use category “b”	Solid brick, Mz 20/2,0	20		3,0
Base material 2 use category “b”	Solid sand lime brick KSV 12/2,0	10		1,5
Base material 2 use category “b”	Solid sand lime brick KSV 12/2,0	20		2,5
Base material 3 use category “c”	Perforated brick HLz HLZ 12/1,2	12		1,2
Base material 3 use category “c”	Perforated brick HLz HLZ 12/1,2	20		2,0
Base material 4 use category “c”	Hollow lime sand brick KSL KSL 12/1,4	8		1,2
Base material 4 use category “c”	Hollow lime sand brick KSL KSL 12/1,4	12		2,0
Base material 5 use category “c”	Ital. hollow brick Mattone	10		0,9
Partial safety factor	γ_M			2,5
Displacement on tension load in concrete and masonry				
N_{cr}	Service tension load in cracked concrete	[kN]	1,2	
$\delta_{N0,cr}$	Short term displacement under tension load	[mm]	0,06	
$\delta_{N\infty,cr}$	Long term displacement under tension load	[mm]	0,12	
Displacement on Shear Load in concrete and masonry				
V	Service shear load in concrete	[kN]	4,5	
δ_{V0}	Short term displacement under shear load	[mm]	3,0	
$\delta_{V\infty}$	Long term displacement under shear load	[mm]	4,5	
Fire Resistance				
$N_{Rk,s,fi,90}$	For fire resistance duration = 90 minutes (façade systems only)	[kN]	≤0,8	

The below performances apply for the following article numbers:

d	L [mm]	t_{fix} [mm]	Art. No
MQL-ST Countersunk T40	100	30	70312
	120	50	70313
	140	70	70314
	160	90	70315
	180	110	68393
	200	130	68394
MQL-STr Stainless countersunk T40	100	30	70299
	120	50	70300
	140	70	70321
	160	90	70322

The performances of the product identified by the above identification code are in conformity with the declared performance.

This declaration of performance is issued under the sole responsibility of Gbo Fastening Systems AB.

Signed for and on behalf of the manufacturer by:

Gunnebo September 04, 2013

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Claes Arnesson, Head of Operation

Revised September 11, 2014

Further information:

Liability for printing errors is excluded. The full content of the corresponding ETA has to be observed.