Declaration of Performance nr.kemvinyl

KEM-UP + Vinylester

Bonded anchor vinylester resin in cartridge

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Intended use or uses of the construction product according to ETAG 001 p.1-5 and TR029	
Generic type	bonded anchor for anchorage of threaded rod and reinforcing rebar.
Base material	un-cracked concrete C20/25 to C50/60 acc. to EN 206-1:2003
Use category	> Installation in dry and wet concrete (flooded holes only M8÷M16 and Ø8÷Ø16) > Overhead installation
Material of threaded rod and Durability	> galvanised steel cl. 5.8 and 8.8 acc. to EN ISO 898 for dry internal conditions > stainless steel AISI316 cl. A4-70 acc. to EN ISO 3506 for dry internal conditions, external atmospheric exposure (including industrial and marine environment) or exposure in permanently damp internal conditions if no particular aggressive conditions exist > high resistant corrosion stainless steel cl. 70 acc. to EN ISO 3506 for all conditions
Material of reinforcing rebar	class B and C as EN 1992-1-1 Annex C
Loading	static, quasi-static
Temperature Range	> -40°C to +40°C max long term temperature +24°C and max short term temperature +40°C > -40°C to +80°C max long term temperature +50°C and max short term temperature +80°C
Fire Resistance	F120
Fire Reaction	A1 according to EN 13501-1
ETA-08/0383 issued by	**DIBT** approval body
On the basis of	**ETAG 001 p.1-5 and TR029**
Certificate of Conformity **0756-CPD-0248** issued by	**DIBT** notified body nr.0756
Under System	**1**

Intended use or uses of the construction product according to ETAG 001 p.1-5 and TR023	
Generic type	bonded anchor for anchorage of **post installed rebar connection**.
Base material	non-carbonated concrete C12/15 to C50/60 acc. to EN 206-1:2000 (Cl.0,40 max)
Use category	installation in dry and wet concrete (not flooded holes)
Material of reinforcing rebar	class B and C as EN 1992-1-1 Annex C
Loading	Eurocode 2 EN 1992-1-1: 2004
Temperature Range	-40°C to +80°C max long term temperature +50°C and max short term temperature +80°C
ETA-12/0533 issued by	**DIBT** approval body
On the basis of	**ETAG 001 p.1-5 and TR023**
Certificate of Conformity **0756-CPD-0562** issued by	**DIBT** notified body nr.0756
Under System	**1**

Intended use or uses of the construction product according to ETAG 029	
Generic type	bonded anchor for anchorage of threaded rod.
Base material	b and c, **solid or hollow masonry** acc. to EN 771
Use category	w/w installation and use in dry and wet masonry
Material of threaded rod and Durability	> galvanised steel cl. 5.8 and 8.8 acc. to EN ISO 898 for dry internal conditions > stainless steel AISI316 cl. A4-70 acc. to EN ISO 3506 for dry internal conditions, external atmospheric exposure (including industrial and marine environment) or exposure in permanently damp internal conditions if no particular aggressive conditions exist > high resistant corrosion stainless steel cl. 70 acc. to EN ISO 3506 for all conditions
Loading	static, quasi-static
Temperature Range	> -40°C to +40°C max long term temperature +24°C and max short term temperature +40°C > -40°C to +80°C max long term temperature +50°C and max short term temperature +80°C
Fire Reaction	A1 according to EN 13501-1
ETA-12/0543 issued by	**DIBT** approval body
On the basis of	**ETAG 029**
Certificate of Conformity **0756-CPD-0513** issued by	**DIBT** notified body nr.0756
Under System	**1**

Declared performances according to ETAG 001 p.1-5 and TR029

Essential Characteristics				Performance							
Installation parameters		**Threaded rods**		**M8**	**M10**	**M12**	**M16**	**M20**	**M24**	**M27**	**M30**
d_0	Nominal diameter of drill bit		[mm]	10	12	15	18	24	28	32	35
h_{ef}	Effective embedment depth	$h_{ef,min}$	[mm]	60	60	70	80	90	96	108	120
		$h_{ef,std}$	[mm]	80	90	110	125	170	210	240	270
		$h_{ef,max}$	[mm]	160	200	240	320	400	480	540	600
h_{min}	Minimum thickness of the concrete member		[mm]	h_{ef} + 30 ≥ 100			$h_{ef} + 2d_0$				
T_{inst}	Torque moment (max)		[Nm]	10	20	40	80	120	160	180	200
s_{min}	Minimum spacing		[mm]	40	50	60	80	100	120	135	150
c_{min}	Minimum edge distance		[mm]	40	50	60	80	100	120	135	150
Tension Steel failure mode											
$N_{Rk,s}$	Tension Steel characteristic failure	cl. 5.8	[kN]	18	29	42	78	122	179	230	280
		cl. 8.8	[kN]	29	46	67	125	196	282	368	449
		A4-70 (50)	[kN]	26	41	59	110	171	247	(230)	(281)
$\gamma_{m,sN}$ 1)	Partial safety factor	cl. 5.8-8.8	[-]	1,5							
		A4-70 (50)	[-]	1,87						(2,86)	
Combined pull-out and concrete cone failure mode: "dry and wet"											
$\tau_{Rk,ucr}$	Characteristic bond resistance in un-cracked concrete C20/25	40°/24°C	[MPa]	**10**	**12**	**12**	**12**	**12**	**11**	**10**	**9**
		80°/50°C	[Mpa]	**7,5**	**9**	**9**	**9**	**9**	**8,5**	**7,5**	**6,5**
γ_2	Partial safety factor		[-]	1,0	1,2						
$\gamma_{m,c}$ 1)	Partial safety factor		[-]	1,5	1,8						
Combined pull-out and concrete cone failure mode: "flooded hole"											
$\tau_{Rk,ucr}$	Characteristic bond resistance in un-cracked concrete C20/25	40°/24°C	[MPa]	7,5	8,5	8,5	8,5	not admissible			
		80°/50°C	[MPa]	5,5	6,5	6,5	6,5				
γ_2	Partial safety factor		[-]	1,4							
$\gamma_{m,c}$ 1)	Partial safety factor		[-]	2,1							
Splitting failure mode											
$c_{cr,sp}$	Critical edge distance(splitting)		[mm]	$1{,}0\ h_{ef} \leq 2\ h_{ef}\ (2{,}5 - h/\ h_{ef}) \leq 2{,}4\ h_{ef}$							
$s_{cr,sp}$	Critical spacing(splitting)		[mm]	2 $C_{cr,sp}$							
$\gamma_{m,sp}$	Partial safety factor		[-]	See $\gamma_{m,c}$							
Displacement under Tension Load in Concrete				M8	M10	M12	M16	M20	M24	M27	M30
δ_{N0}	Short term displacement	40°/24°C	[mm/MPa]	**0,021**	**0,023**	**0,026**	**0,031**	**0,036**	**0,041**	**0,045**	**0,049**
		80°/50°C	[mm/MPa]	**0,050**	**0,056**	**0,063**	**0,075**	**0,088**	**0,100**	**0,110**	**0,119**
$\delta_{N\infty}$	Long term displacement	40°/24°C	[mm/MPa]	**0,030**	**0,033**	**0,037**	**0,045**	**0,052**	**0,060**	**0,065**	**0,071**
		80°/50°C	[mm/MPa]	**0,072**	**0,081**	**0,090**	**0,108**	**0,127**	**0,145**	**0,159**	**0,172**
Shear Steel failure mode				**M8**	**M10**	**M12**	**M16**	**M20**	**M24**	**M27**	**M30**
$V_{Rk,s}$	Shear Steel characteristic failure	cl. 5.8	[kN]	9	15	21	39	61	88	115	140
		cl. 8.8	[kN]	15	23	34	63	98	141	184	224
		A4-70 (50)	[kN]	13	20	30	55	86	124	(115)	(140)
$M^0_{Rk,s}$	Bending Moment characteristic failure	cl. 5.8	[Nm]	19	37	65	166	324	560	833	1123
		cl. 8.8	[Nm]	30	60	105	266	519	896	133	1797
		A4-70 (50)	[Nm]	26	52	92	232	454	784	832	1125
$\gamma_{m,sV}$ 1)	Partial safety factor	cl. 5.8-8.8	[-]	1,25							
		A4-70 (50)	[-]	1,56						(2,38)	
Concrete Pryout failure mode											
k	Factor in equation 5.7 of TR029		[-]	2							
$\gamma_{m,cp}$ 1)	Partial safety factor		[-]	1,5							
Concrete Edge failure mode				See section 5.2.3.4 of TR029 for the design of Bonded Anchors							
$\gamma_{m,c}$ 1)	Partial safety factor		[-]	1,5							
Displacement under Shear Load				M8	M10	M12	M16	M20	M24	M27	M30
δ_{V0}	Short term displacement		[mm/kN]	**0,06**	**0,06**	**0,05**	**0,04**	**0,04**	**0,03**	**0,03**	**0,03**
$\delta_{V\infty}$	Long term displacement		[mm/kN]	**0,09**	**0,08**	**0,08**	**0,06**	**0,06**	**0,05**	**0,05**	**0,05**

1) In absence of other national regulations.

Fire Resistance according to TR020			**M8**	**M10**	**M12**	**M16**	**M20**	**M24**	**M30**
d_0	Nominal diameter of drill bit	[mm]	10	12	14	18	24	28	35
h_{ef}	Effective embedment depth	[mm]	80	90	110	125	170	210	280
$N_{Rum,fi,30}$	For Fire resistance duration = 30 minutes	[kN]	≤ 1,6	≤ 2,6	≤ 3,3	≤ 6,3	≤ 9,8	≤ 14,0	≤ 18,3
$N_{Rum,fi,60}$	For Fire resistance duration = 60 minutes	[kN]	≤ 1,1	≤ 1,8	≤ 2,6	≤ 4,8	≤ 7,5	≤ 10,8	≤ 14,1
$N_{Rum,fi,90}$	For Fire resistance duration = 90 minutes	[kN]	≤ 0,6	≤ 0,9	≤ 1,8	≤ 3,4	≤ 5,3	≤ 7,6	≤ 9,9
$N_{Rum,fi,120}$	For Fire resistance duration = 120 minutes	[kN]	≤ 0,3	≤ 0,5	≤ 1,4	≤ 2,7	≤ 4,2	≤ 6,0	≤ 7,9

Declared performances according to ETAG 001 p.1-5 and TR029

Essential Characteristics				Performance								
Installation parameters		**Reinforcing rebar**		**Ø8**	**Ø 10**	**Ø 12**	**Ø 14**	**Ø 16**	**Ø 20**	**Ø 25**	**Ø 28**	**Ø 32**
d_0	Nominal diameter of drill bit		[mm]	12	14	16	18	20	24	32	35	40
h_{ef}	Effective embedment depth	$h_{ef,min}$	[mm]	60	60	70	75	80	90	100	112	128
		$h_{ef,std}$	[mm]	80	90	110	115	125	170	210	250	280
		$h_{ef,max}$	[mm]	160	200	240	280	320	400	480	540	640
h_{min}	Minimum thickness of the concrete member		[mm]	h_{ef} + 30 ≥ 100	$h_{ef} + 2d_0$							
s_{min}	Minimum spacing		[mm]	40	50	60	70	80	100	125	140	160
c_{min}	Minimum edge distance		[mm]	40	50	60	70	80	100	125	140	160
Tension Steel failure mode				Ø8	Ø 10	Ø 12	Ø 14	Ø 16	Ø 20	Ø 25	Ø 28	Ø 32
$N_{Rk,s}$	Tension Steel characteristic failure	B500	[kN]	28	43	62	85	111	173	270	339	442
$\gamma_{m,sN}$ [1]	Partial safety factor		[-]	1,4								
Combined pull-out and concrete cone failure mode: dry and wet												
$\tau_{Rk,ucr}$	Characteristic bond resistance in un-cracked concrete C20/25	40°/24°C	[MPa]	**8,5**	**10**	**10**	**10**	**10**	**10**	**9**	**8**	**7**
		80°/50°C	[MPa]	**6**	**7,5**	**7,5**	**7,5**	**7,5**	**7,5**	**7**	**6**	**5**
γ_2	Partial safety factor		[-]	1,0	1,2							
$\gamma_{m,c}$ [1]	Partial safety factor		[-]	1,5	1,8							
Combined pull-out and concrete cone failure mode: flooded hole												
$\tau_{Rk,ucr}$	Characteristic bond resistance in un-cracked concrete C20/25	40°/24°C	[MPa]	6	7,5	7,5	7,5	7,5	not admissible			
		80°/50°C	[MPa]	4,5	5,5	5,5	5,5	5,5				
γ_2	Partial safety factor		[-]	1,4								
$\gamma_{m,c}$ [1]	Partial safety factor		[-]	2,1								
Splitting failure mode												
$c_{cr,sp}$	Critical edge distance(splitting)		[mm]	$1,0\ h_{ef} \leq 2\ h_{ef}\ (2,5 - h / h_{ef}) \leq 2,4\ h_{ef}$								
$s_{cr,sp}$	Critical spacing (splitting)		[mm]	$2\ C_{cr,sp}$								
$\gamma_{m,sp}$ [1]	Partial safety factor		[-]	see $\gamma_{m,c}$								
Displacement under Tension Load				Ø8	Ø 10	Ø 12	Ø 14	Ø 16	Ø 20	Ø 25	Ø 28	Ø 32
δ_{N0}	Short term displacement	40°/24°C	[mm/MPa]	**0,021**	**0,023**	**0,026**	**0,028**	**0,031**	**0,036**	**0,043**	**0,044**	**0,052**
		80°/50°C	[mm/MPa]	**0,050**	**0,056**	**0,063**	**0,069**	**0,075**	**0,088**	**0,104**	**0,113**	**0,126**
$\delta_{N\infty}$	Long term displacement	40°/24°C	[mm/MPa]	**0,030**	**0,033**	**0,037**	**0,041**	**0,045**	**0,052**	**0,061**	**0,071**	**0,075**
		80°/50°C	[mm/MPa]	**0,072**	**0,081**	**0,090**	**0,099**	**0,108**	**0,127**	**0,149**	**0,163**	**0,181**
Shear Steel failure mode				**Ø8**	**Ø 10**	**Ø 12**	**Ø 14**	**Ø 16**	**Ø 20**	**Ø 25**	**Ø 16**	**Ø 32**
$V_{Rk,s}$	Shear Steel characteristic failure	B500	[kN]	14	22	31	42	55	86	135	169	221
$M^0_{Rk,s}$	Bending Moment characteristic failure	B500	[Nm]	33	65	112	178	265	518	1012	1422	2123
$\gamma_{m,sV}$ [1]	Partial safety factor		[-]	1,5								
Concrete Pryout failure mode												
k	Factor in equation 5.7 of TR029		[-]	2								
$\gamma_{m,cp}$ [1]	Partial safety factor		[-]	1,5								
Concrete Edge failure mode				See section 5.2.3.4 of TR029 for the design of Bonded Anchors								
$\gamma_{m,c}$ [1]	Partial safety factor		[-]	1,5								
Displacement under Shear Load				Ø8	Ø 10	Ø 12	Ø 14	Ø 16	Ø 20	Ø 25	Ø 28	Ø 32
δ_{V0}	Short term displacement		[mm/kN]	**0,06**	**0,05**	**0,05**	**0,04**	**0,04**	**0,04**	**0,03**	**0,03**	**0,03**
$\delta_{V\infty}$	Long term displacement		[mm/kN]	**0,09**	**0,08**	**0,08**	**0,06**	**0,06**	**0,05**	**0,05**	**0,04**	**0,04**

[1] In absence of other national regulations.

Declared performances according to ETAG 001 p.1-5 and TR023

Essential Characteristics				Performance								
Installation parameters		**Post-installed rebar connection**		**Ø8**	**Ø10**	**Ø12**	**Ø14**	**Ø16**	**Ø20**	**Ø22**	**Ø24**	**Ø25**
d_0	Nominal diameter of drill bit		[mm]	12	14	16	18	20	25	28	32	32
l_b	Anchorage lenght	$l_{b\ MIN}$	[mm]	170	213	255	298	340	425	468	510	532
		$l_{b\ MAX}$	[mm]	1000	1000	1200	1400	1600	2000	2000	2000	2000
$l_{0\ MIN}$	Overlap joint length		[mm]	300	300	300	315	360	450	495	540	563
s_{min}	Minimum spacing		[mm]	≥ 5Ø ≥ 50 mm								
c	Minimum concrete cover min c	hammer drilling	[mm]	30 mm + 0,06 l_v ≥ 2Ø								[2]
		compr. air drilling	[mm]	50 mm + 0,08 l_v								[3]
Design values of ultimate bond resistance				for all drilling methods for good conditions [4]								
f_{bd}	**Bond design value resistance acc.to EN 1992-1-1: 2004**	C16/20	[MPa]	**2,0**								
		C20/25	[MPa]	**2,3**								
		C25/30	[MPa]	**2,7**								
		C30/37	[MPa]	**3,0**								
		C40/50	[MPa]	**3,7**								
		C45/55	[MPa]	**4,0**								
		C50/60	[MPa]	**4,3**								

[2] 40 mm + 0,06 l_v ≥ 2Ø; [3] 60 mm + 0,08 l_v; [4] for all other bond conditions multiply the values for $\mathbf{f_{bd}}$ by 0.7.

Declared performances according to ETAG 029

Essential Characteristics			Performance		
Installation parameters in solid Masonry			**M8**	**M10**	**M12**
d_0	Nominal diameter of drill bit	[mm]	10	12	14
h_{ef}	Effective embedment depth	[mm]	80	90	90
T_{inst}	Nominal torque moment	[Nm]	2		

Characteristic values for tension and shear loads						M8		M10		M12	
Brick no. [5)]	density [Kg/dm³]	compress. [N/mm²]	character. load	Temperature Range	Use	dry	wet	dry	wet	dry	wet
1	$\rho \geq 1,8$	$f_b \geq 8$	N_{Rk}	40°/24°C	[kN]	4	3	5	4	5	4
				80°/50°C	[kN]	3	2,5	4,5	3,5	4,5	3,5
			V_{Rk}	40°/24°C	[kN]	4	3	5	4	5	4
				80°/50°C	[kN]	3	2,5	4,5	3,5	4,5	3,5
2	$\rho \geq 1,8$	$f_b \geq 12$	N_{Rk}	40°/24°C	[kN]	4	3,5	5	5	5	5
				80°/50°C	[kN]	3	3	4,5	4	4,5	4
			V_{Rk}	40°/24°C	[kN]	4	3,5	5	5	5	5
				80°/50°C	[kN]	3	3	4,5	4	4,5	4
γ_M [1)]	Partial safety factor				[-]	2,5					

Installation parameters in hollow Masonry "with sleeve"			M8	M10	M12
d_0	Nominal diameter of drill bit	[mm]	16	16	16
h_{ef}	Effective embedment depth	[mm]	90	90	90
T_{inst}	Nominal torque moment	[Nm]	2		

Characteristic values for tension and shear loads						M8		M10		M12	
Brick no. [5)]	density [Kg/dm³]	compress. [N/mm²]	character. load	Temperature Range	Use	dry	wet	dry	wet	dry	wet
4	$\rho \geq 1,2$	$f_b \geq 12$	N_{Rk}	40°/24°C	[kN]	3	2	3	2	3	2
				80°/50°C	[kN]	3	2	3	2	3	2
			V_{Rk}	40°/24°C	[kN]	2,5	2	2,5	2	2,5	2
				80°/50°C	[kN]	2,5	2	2,5	2	2,5	2
5	$\rho \geq 0,8$	$f_b \geq 12$	N_{Rk}	40°/24°C	[kN]	2	2	2	2	2	2
				80°/50°C	[kN]	2	2	2	2	2	2
			V_{Rk}	40°/24°C	[kN]	2,5	2,5	2,5	2,5	2,5	2,5
				80°/50°C	[kN]	2,5	2,5	2,5	2,5	2,5	2,5
γ_M [1)]	Partial safety factor				[-]	2,5					

1) In absence of other national regulations; 5) see ETA-12/0543 for description of Bricks.

We inform you that Friulsider is classified in the EC 1907/2006 Reach Directive as a Downstream-user of substances.
The product supplied does not contain substances classified as SVHC according to the Candidate List in a concentration equal or greater than 0.1% (weight / weight).
You can require the safety data sheet of the product at environmental@friulsider.com or download it at www.friulsider.com/sds.

The below performances apply for the following article numbers:

Type of Cartridge	Format	Cod.
Coaxial	150-280-300-330-380-410-420 ml	**94103000**00 /01-02-03-04-05-06-07-08 (420ml)
Side-by-side	235-345-825 ml	**94201000**00/01-02-03-04-05-06-07-08 (345ml)
Silicon gun	165-300 ml	**94301000**00/01-02-03-04-05-06-07-08 (300ml)

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 ECAP.
Signed for and behalf of the manufacturer by:

Name and functions	Place and date of issue	Signature
Eng.Vittorio Pilla General Director	San Giovanni al Natisone, 12-06-2013	