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Declaration of Performance n° 19/0705

CE

Vorpa trade name:

Bonded anchor VPE 385

Intended use of the construction product according to EAD 330499-01-0601		
Generic type		Bonded anchor for threaded rods and rebar
Base material		Cracked concrete and non cracked concrete from C20/25 to C50/60 - EN 206-1:2003
A	Material	Zincplated threaded rods steel class 4.6 -12.9 EN ISO 898-1
B	Material	Stainless steel A2-50 (>M24) A4-70 (≤M24) acc. to EN ISO 3506
C	Material	Stainless steel A4-50 (>M24) A4-70 (≤M24) A4-80 acc. to EN ISO
D	Material	Stainless seel HCR Class 50 (>M24) Class 70 (≤M24) Class 80
Loads		Static, quasi static Seismic action category C1 (M8 - M16) Seismic action category C2 (M12 and M16)
Service temperature		**Range I)** from -40°C to +40°C (max short term temp. +40°C and max long term temp. +24°C) **Range II)** from -40°C to +60°C (max short term temp. +60°C and max long term temp. +43°C)
Use categories		Category 1: Dry and wet concrete (M8-M30 / Ø8-Ø32) Category 2: Flooded holes, not seawater (M8-M30 / Ø8-Ø32) Overhead installation allowed.
Manufacturer information		
Chemfix Products ltd - Mill Street East - Dewsbury, West Yorkshire		
Certificate information		
ETA 19/0705 issued by		ETA Danmark A/S Goteborg Plads 1 DK-2150 Nordhavn
On the basis of		EAD 330499-01-0601
Certificate of conformity **1404-CPR-3267** Issued by		Zavod za Gradbenistvo Slovenije (ZAG) Dimičeva ulica 12, 1000 Ljubljana
Under system		1

Declared performance according to EAD 330499-01-0601									
Essential characteristics			**Performance**						
			M8	**M10**	**M12**	**M16**	**M20**	**M24**	**M27**	**M30**
Installation parameters (Threaded rods)									
D	Diameter of anchor bolt or thread	[mm]	8	10	12	16	20	24	27	30
d_0	Nominal diameter of drill bit	[mm]	10	12	14	18	22	28	30	35
h_{ef}	Minimum effective anchorage depth	[mm]	60	60	70	80	90	96	108	120
	Maximum effective anchorage depth		160	200	240	320	400	480	540	600
d_{fix}	Diameter of clearance hole in the fixture	[mm]	9	12	14	18	22	26	30	33
h_{min}	Minimum thickness of the concrete member	[mm]	h_{ef} + 30 mm (≥100 mm)				h_{ef} + 2d_0			
T_{inst}	Setting torque	[Nm]	10	20	40	60	120	160	250	300
s_{min}	Minimum spacing	[mm]	40	40	60	75	95	115	125	140
c_{min}	Minimum edge distance	[mm]	35	40	45	50	60	65	75	80

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			M8	M10	M12	M16	M20	M24	M27	M30
Tension – Steel failure mode										
$N_{Rk,s}$	Tension steel characteristic failure (4.6 / 4.8)	[kN]	15	23	34	63	98	141	184	224
$N_{Rk,s}$	Tension steel characteristic failure (5.6 / 5.8)	[kN]	18	29	42	78	122	176	230	281
$N_{Rk,s}$	Tension steel characteristic failure (8.8)	[kN]	29	46	67	125	196	282	367	449
$N_{Rk,s}$	Tension steel characteristic failure (10.9)	[kN]	37	58	84	157	245	353	459	561
$N_{Rk,s}$	Tension steel characteristic failure (12.9)	[kN]	44	70	101	188	294	424	551	673
$N_{Rk,s}$	Tension steel characteristic failure (A2, A4, HCR -50)	[kN]	18	29	42	79	123	177	230	281
$N_{Rk,s}$	Tension steel characteristic failure (A2, A4, HCR -70)	[kN]	26	41	59	110	171	247	321	393
$N_{Rk,s}$	Tension steel characteristic failure (A4, HCR -80)	[kN]	29	46	67	126	196	282	367	449
Pull out – Characteristic bond resistance – Hammer drilling (HD) and compressed air drilling (CD)										
$\tau_{Rk,ucr}$	In **dry and wet** non cracked concrete C20/25 **(Temperature range I)**	[MPa]	18	18	17	16	16	15	15	15
	In **flooded** non cracked concrete C20/25 **(Temperature range I)**		18	18	17	16	14	12	10	8
	In **dry and wet** non cracked concrete C20/25 **(Temperature range II)**		17	16	16	15	14	14	14	13
	In **flooded** non cracked concrete C20/25 **(Temperature range II)**		17	16	16	15	13	11	9	8
$\tau_{Rk,cr}$	In **dry and wet** cracked concrete C20/25 **(Temperature range I)**	[MPa]	9	8.5	8.5	6	5.5	6	7.5	7.5
	In **dry and wet** cracked concrete C20/25 – C1 **(Temperature range I)**		9	8.1	8.5	5.9	NPD			
	In **dry and wet** cracked concrete C20/25 – C2 **(Temperature range I)**		-	-	4.1	2.4	NPD			
	In **flooded** cracked concrete C20/25 **(Temperature range I)**		9	8.5	8.5	6	5.5	6	5	4
	In **flooded** cracked concrete C20/25 – C1 **(Temperature range I)**		9	8.1	8.5	5.9	NPD			
	In **flooded** cracked concrete C20/25 – C2 **(Temperature range I)**		-	-	4.1	2.4	NPD			
	In **dry and wet** cracked concrete C20/25 **(Temperature range II)**		8	8	7.5	5.5	4.5	5.5	7	7
	In **dry and wet** cracked concrete C20/25 – C1 **(Temperature range II)**		8	7.6	7.5	5.4	NPD			
	In **dry and wet** cracked concrete C20/25 – C2 **(Temperature range II)**		-	-	3.7	2.2	NPD			
	In **flooded** cracked concrete C20/25 **(Temperature range II)**		8	8	7.5	5.5	4.5	5.5	4.5	4
	In **flooded** cracked concrete C20/25 – C1 **(Temperature range II)**		8	7.6	7.5	5.4	NPD			
	In **flooded** cracked concrete C20/25 – C2 **(Temperature range II)**		-	-	3.7	2.2	NPD			
γ_{inst}	Partial safety factor **Dry and wet** concrete	[-]	1.2							
γ_{inst}	Partial safety factor **Flooded** concrete	[-]	1.2			1.4				
$\Psi_{c,ucr}$ C25/30	Increasing factor for non cracked concrete C25/30	[-]	1.05							1.11
$\Psi_{c,ucr}$ C30/37	Increasing factor for non cracked concrete C30/37	[-]	1.10							1.21
$\Psi_{c,ucr}$ C35/45	Increasing factor for non cracked concrete C35/45	[-]	1.15							1.30
$\Psi_{c,ucr}$ C40/50	Increasing factor for non cracked concrete C40/50	[-]	1.18							1.38
$\Psi_{c,ucr}$ C45/55	Increasing factor for non cracked concrete C45/55	[-]	1.22							1.45

$\Psi_{c,ucr}$ C50/60	Increasing factor for non cracked concrete C50/60	[-]	1.25							1.52
$\Psi_{c,ucr}$ C25/30	Increasing factor for cracked concrete C25/30	[-]	1.05							1.11
$\Psi_{c,ucr}$ C30/37	Increasing factor for cracked concrete C30/37	[-]	1.12							1.21
$\Psi_{c,ucr}$ C35/45	Increasing factor for cracked concrete C35/45	[-]	1.17							1.31
$\Psi_{c,ucr}$ C40/50	Increasing factor for cracked concrete C40/50	[-]	1.22							1.41
$\Psi_{c,ucr}$ C45/55	Increasing factor for cracked concrete C45/55	[-]	1.26							1.49
$\Psi_{c,ucr}$ C50/60	Increasing factor for cracked concrete C50/60	[-]	1.30							1.58
Splitting failure										
$s_{cr,sp}$	Critical sacing (splitting)	[mm]	$2\ C_{cr,sp}$							
$c_{cr,sp}$	Critical edge distance (splitting)	[mm]	$h / h_{ef} \geq 2.0 = 1.0\ h_{ef}$ $2.0 > h / h_{ef} > 1.3 = 3.86\ h_{ef} - 1.43\ h$ $h / h_{ef} \leq 1.3 = 2\ h_{ef}$							
Shear – Steel failure										
$V_{Rk,s}$	Shear characteristic failure (4.6 – 4.8)	[kN]	7	12	17	31	49	71	92	112
$V_{Rk,sC1}$	Shear characteristic failure (4.6 – 4.8) – C1	[kN]	$0.7 \times V_{Rk,s}$				-			
$V_{Rk,sC2}$	Shear characteristic failure (4.6 – 4.8) – C2	[kN]	-		$0.7 \times V_{Rk,s}$					
$V_{Rk,s}$	Shear characteristic failure (5.6 - 5.8)	[kN]	9	15	21	39	61	88	115	140
$V_{Rk,sC1}$	Shear characteristic failure (5.6 - 5.8) – C1	[kN]	$0.7 \times V_{Rk,s}$				-			
$V_{Rk,sC2}$	Shear characteristic failure (5.6 - 5.8) – C2	[kN]	-		$0.7 \times V_{Rk,s}$					
$V_{Rk,s}$	Shear characteristic failure (8.8)	[kN]	15	23	34	63	98	141	184	224
$V_{Rk,sC1}$	Shear characteristic failure (8.8) – C1	[kN]	$0.7 \times V_{Rk,s}$				-			
$V_{Rk,sC2}$	Shear characteristic failure (8.8) – C2	[kN]	-		$0.7 \times V_{Rk,s}$					
$V_{Rk,s}$	Shear characteristic failure (10.9)	[kN]	37	75	131	333	649	1123	1664	2249
$V_{Rk,sC1}$	Shear characteristic failure (10.9) – C1	[kN]	$0.7 \times V_{Rk,s}$				-			
$V_{Rk,sC2}$	Shear characteristic failure (10.9) – C2	[kN]	-		$0.7 \times V_{Rk,s}$					
$V_{Rk,s}$	Shear characteristic failure (12.9)	[kN]	45	90	157	400	776	1347	1997	2699
$V_{Rk,sC1}$	Shear characteristic failure (12.9) – C1	[kN]	$0.7 \times V_{Rk,s}$				-			
$V_{Rk,sC2}$	Shear characteristic failure (12.9) – C2	[kN]	-		$0.7 \times V_{Rk,s}$					
$V_{Rk,s}$	Shear characteristic failure (A2, A4, HCR -50)	[kN]	19	37	66	167	325	561	832	1125
$V_{Rk,sC1}$	Shear characteristic failure (A2, A4, HCR -50) – C1	[kN]	$0.7 \times V_{Rk,s}$				-			
$V_{Rk,sC2}$	Shear characteristic failure (A2, A4, HCR -50) – C2	[kN]	-		$0.7 \times V_{Rk,s}$					
$V_{Rk,s}$	Shear characteristic failure (A2, A4, HCR -70)	[kN]	26	52	92	232	454	784	1165	1574
$V_{Rk,sC1}$	Shear characteristic failure (A2, A4, HCR -70) – C1	[kN]	$0.7 \times V_{Rk,s}$				-			
$V_{Rk,sC2}$	Shear characteristic failure (A2, A4, HCR -70) – C2	[kN]	-		$0.7 \times V_{Rk,s}$					
$V_{Rk,s}$	Shear characteristic failure (A4, HCR -80)	[kN]	30	59	105	266	519	896	1332	
$V_{Rk,sC1}$	Shear characteristic failure (A4, HCR -80) – C1	[kN]	$0.7 \times V_{Rk,s}$				-			
$V_{Rk,sC2}$	Shear characteristic failure (A4, HCR -80) – C2	[kN]	-		$0.7 \times V_{Rk,s}$					
$M^0_{Rk,s}$	Bending moment characteristic failure (4.6 – 4.8)	[KN]	15	30	52	133	260	449	666	900
$M^0_{Rk,s}$	Bending moment characteristic failure (5.6 – 5.8)	[KN]	19	37	65	166	324	560	833	1123

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$M^0_{Rk,s}$	Bending moment characteristic failure (8.8)	[KN]	30	60	105	266	519	896	1333	1797
$M^0_{Rk,s}$	Bending moment characteristic failure (10.9)	[KN]	37	75	131	333	649	1123	1664	2249
$M^0_{Rk,s}$	Bending moment characteristic failure (12.9)	[KN]	45	90	157	400	778	1347	1997	2699
$M^0_{Rk,s}$	Bending moment characteristic failure (A2, A4, HCR – 50)	[KN]	19	37	66	167	325	561	832	1125
$M^0_{Rk,s}$	Bending moment characteristic failure (A2, A4, HCR – 70)	[KN]	26	52	92	232	454	784	1165	1574
$M^0_{Rk,s}$	Bending moment characteristic failure (A4, HCR – 80)	[KN]	30	59	105	266	519	896	1332	1766
Shear – Concrete edge failure										
γ_{inst}	Partial safety factor	[-]	1.0							

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Essential characteristics			Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø24	Ø25	Ø28	Ø30	Ø32
Installation parameters (Rebar)													
D	Diameter of anchor bolt or thread	[mm]	8	10	12	14	16	20	24	25	28	30	32
d_0	Nominal diameter of drill bit	[mm]	10 12	12 14	14 16	18	20	24	30 32	32	32 35	35	40
h_{ef}	Minimum effective anchorage depth	[mm]	60	60	70	75	80	90	96	100	112	120	128
	Maximum effective anchorage depth		160	200	240	280	320	400	480	500	560	600	640
h_{min}	Minimum thickness of the concrete member	[mm]	h_{ef} + 30 mm (≥100 mm)					h_{ef} + $2d_0$					
s_{min}	Minimum spacing	[mm]	40	40	60	60	75	95	120	120	130	140	150
c_{min}	Minimum edge distance	[mm]	35	40	45	50	50	60	70	70	75	115	150
Tension – Steel failure													
$N_{Rk,s}$	Characteristic steel failure	[kN]	As x f_{uk}										
Pull out – Characteristic bond resistance - Hammer drilling (HD) and compressed air drilling (CD)													
$\tau_{Rk,ucr}$	In **dry and wet** non cracked concrete C20/25 **(Temperature range I)**	[MPa]	11	11	11	11	11	11	11	11	11	11	10
	In **flooded** non cracked concrete C20/25 **(Temperature range I)**		11	11	11	11	11	9.5	8	8	7	6	6
	In **dry and wet** non cracked concrete C20/25 **(Temperature range II)**		10	10	10	10	10	10	9.5	9.5	9.5	9.5	9.5
	In **flooded** non cracked concrete C20/25 **(Temperature range II)**		10	10	10	10	10	8.5	7.5	7.5	6.5	5.5	5.5
$\tau_{Rk,cr}$	In **dry and wet** cracked concrete C20/25 **(Temperature range I)**		-	-	6.5	7	7	7	7	7	7.5	7.5	7.5
	In **flooded** cracked concrete C20/25 **(Temperature range I)**		-	-	6.5	7	7	6.5	6	6	7	7	7
	In **dry and wet** cracked concrete C20/25 **(Temperature range II)**		-	-	6	6	6	6.5	6	6	7	7	7
	In **flooded** cracked concrete C20/25 **(Temperature range II)**		-	-	6	6	6	6	5.5	5.5	5	4	4
$\Psi_{c,ucr}$ C25/30	Increasing factor for non cracked concrete C25/30	[-]	1.04								1.06	1.08	1.04
$\Psi_{c,ucr}$ C30/37	Increasing factor for non cracked concrete C30/37	[-]	1.08								1.13	1.17	1.08
$\Psi_{c,ucr}$ C35/45	Increasing factor for non cracked concrete C35/45	[-]	1.11								1.17	1.24	1.11
$\Psi_{c,ucr}$ C40/50	Increasing factor for non cracked concrete C40/50	[-]	1.15								1.23	1.30	1.15
$\Psi_{c,ucr}$ C45/55	Increasing factor for non cracked concrete C45/55	[-]	1.18								1.17	1.36	1.18
$\Psi_{c,ucr}$ C50/60	Increasing factor for non cracked concrete C50/60	[-]	1.20								1.32	1.42	1.20
$\Psi_{c,ucr}$ C25/30	Increasing factor for cracked concrete C25/30	[-]	1.0	1.0	1.08	1.08	1.08	1.08	1.11	1.11	1.04	1.04	1.04
$\Psi_{c,ucr}$ C30/37	Increasing factor for cracked concrete C30/37	[-]	1.0	1.0	1.18	1.18	1.18	1.18	1.22	1.22	1.08	1.08	1.08
$\Psi_{c,ucr}$ C35/45	Increasing factor for cracked concrete C35/45	[-]	1.0	1.0	1.25	1.25	1.25	1.25	1.31	1.31	1.12	1.12	1.12
$\Psi_{c,ucr}$ C40/50	Increasing factor for cracked concrete C40/50	[-]	1.0	1.0	1.32	1.32	1.32	1.32	1.41	1.41	1.15	1.15	1.15
$\Psi_{c,ucr}$ C45/55	Increasing factor for cracked concrete C45/55	[-]	1.0	1.0	1.38	1.38	1.38	1.38	1.49	1.49	1.17	1.17	1.17
$\Psi_{c,ucr}$ C50/60	Increasing factor for cracked concrete C50/60	[-]	1.0	1.0	1.44	1.44	1.44	1.44	1.58	1.58	1.20	1.20	1.20
Splitting failure													

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$s_{cr,sp}$	Critical sacing (splitting)	[mm]	$2\ C_{cr,sp}$
$c_{cr,sp}$	Critical edge distance (splitting)	[mm]	$h / h_{ef} \geq 2.0 = 1.0\ h_{ef}$ $2.0 > h / h_{ef} > 1.3 = 3.86\ h_{ef} - 1.43\ h$ $h / h_{ef} \leq 1.3 = 2\ h_{ef}$
Shear – Steel failure			
$V_{Rk,s}$	Shear characteristic failure	[kN]	$0.5 \times A_s \times f_{uk}$
κ_7	Ductility factor	[-]	1.0
$M^0_{Rk,s}$	Bending moment characteristic failure	[KN]	$1.2 \times W_{el} \times f_{uk}$
Shear – Concrete edge failure			
γ_{inst}	Partial safety factor	[-]	1.0

The above performance apply for the following article numbers:

Code	Type	Capacity
1300	VPE 385	385 ml

The performances of the product identified by the above identification code are in conformity with the declared performance. This declaration of performance is issued on the basis of the European regulation (EU) N. 305/2011, under the sole responsibility of indicated Manufacturer.
For further specifications see product ETA.

Signed for and in behalf of the manufacturer by:

Urs Joos	Dewsbury 13/07/2022	