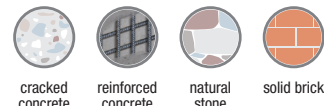


chemical anchors



# Vorpa VPE 585ml - Fixing in seismic C1+C2

High performance styrene free pure epoxy chemical anchor with European Technical Assessment for cracked concrete, post installed rebar and seismic zone

products group



### Approved for

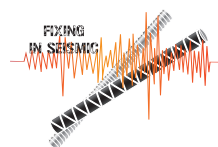
- cracked concrete M8-M30, rebar Ø8-Ø32mm
- non-cracked concrete M8-M30, rebar Ø8-Ø32mm
- seismic action for performance category C1: M8-M30 / rebar Ø8-Ø32mm
- seismic action for performance category C2: M12-M30
- diamond coring in concrete
- post-installed rebar Ø8-Ø40mm, seismic action Ø10-Ø40mm

### To fix

- structural fixings
- heavy duty metal structures
- heavy structural works
- construction joints
- scaffolding links
- wall ties, starter bars, studs, bolts & large screws
- electric installations plumbing

### Also suitable for

- natural stone
- solid brick



EAD 330499-01-0601 v01  
non cracked concrete:  
M8-M30, cracked concrete:  
M8-M30, rebar Ø8-Ø32mm  
Seismic action Cat.C1: M8-  
M30, Seismic action Cat. C2:  
M12-M30

EAD 330087-01-0601  
post-installed rebar Ø8-  
Ø40mm

Fire resistance in ETA for  
post-installed rebar



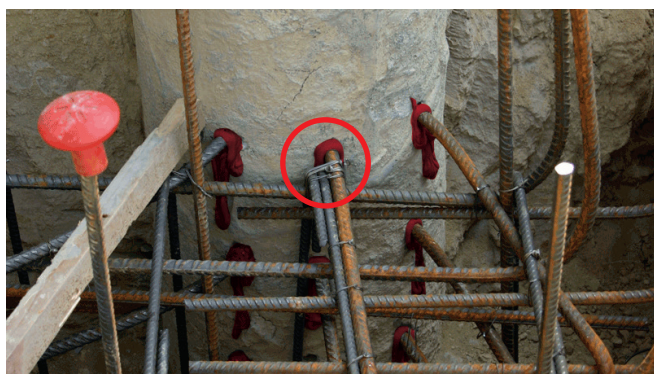
### product code

Code	Description	Content ml	Gun to be used	Shelf life
1329	VPE 585	585	side by side 3:1	24 months



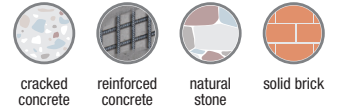
Store upright

### Examples of applications



# Vorpa VPE 585ml - Fixing in seismic C1+C2

High performance styrene free pure epoxy chemical anchor with European Technical Assessment for cracked concrete, post installed rebar and seismic zone



product information

**Characteristics**

- a two component chemical anchoring injection system in 3:1 ratio derived from pure epoxy with very high bond strength, developed to anchor threaded rods and rebar into concrete
- suitable for high loads featuring large diameter and deep embedment
- longer working times make it suitable for large holes, and high temperature
- use in wet or flooded environments and fixing holes, or underwater.
- overhead application
- performance based on clean holes

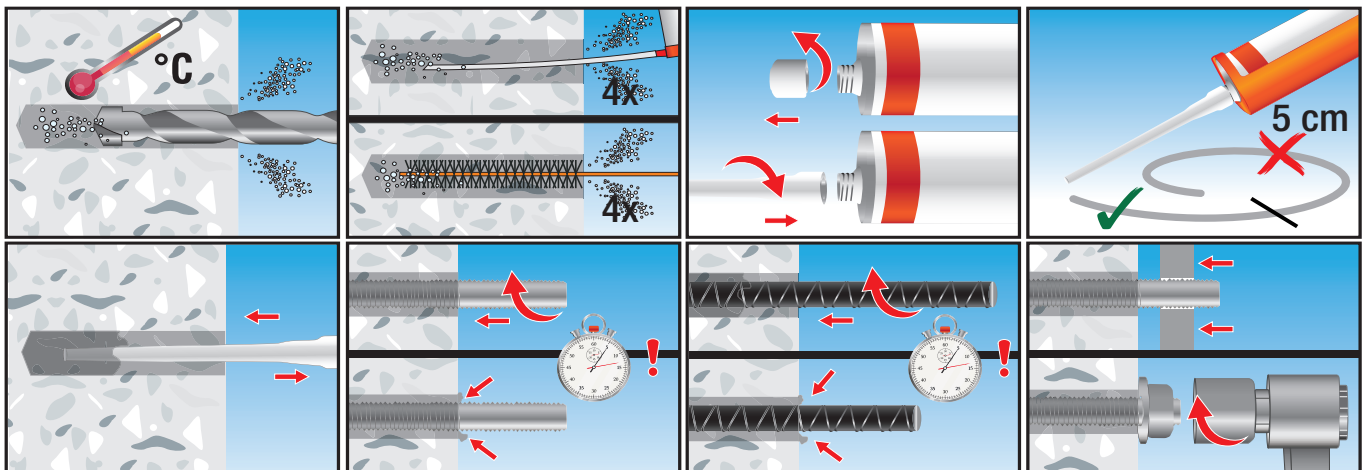
**Approval/certifications/testing**

- 19/0201 – ETA Option1 Cracked Concrete EAD 330499-01-0601 vo1 / Seismic action C1+C2
- 19/0200 – EAD 330087-01-0601 Post Installed Rebar Installations
- Fire Test Report in ETA for post-installed rebar
- NSF Standard 61 Approved for use with Potable drinking water
- LEED tested
- VOC A+ Rating (Volatile Organic Content)

**Suggestion for use**

- **Clean the hole before the installation**
- HAMMER DRILLED – blown and then brushed with a stiff metal brush and blown again

installation sequence



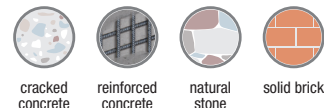
technical data

Physical Properties	Result	Test Method
UV resistance	Pass	-
Watertightness	0 mm	DIN EN 12390-8
Density	1,5 kg / dm <sup>3</sup>	-
Compressive strength	122 N / mm <sup>2</sup>	EN 196 Teil1
Flexural strength	66 N / mm <sup>2</sup>	EN 196 Teil1
Axial tensile strength	44 N / mm <sup>2</sup>	DIN EN ISO 527-2
E modulus	6300 N / mm <sup>2</sup>	DIN EN ISO 527-2
Shrinkage	< 1,4 ‰	DIN 52450
Hardness Shore A	99,4	DIN EN ISO 868
Hardness Shore D	86,1	DIN EN ISO 868
Electrical resistance	8,0 * 10 <sup>12</sup> Ω	IEC 93
Thermal conductivity	0,5 W / m·K	DIN EN 993-15
Spec. Heat capacity	1350 J / kg · K	DIN EN 993-15

**Reactivity**

Base material Temperature	Gel-working Time	Full curing time in dry base material
0 °to 4°C	90 min	144 h
5° to 9°C	80 min	48 h
10° to 14°C	60 min	28 h
15° to 19°C	40 min	18 h
20° to 24°C	30 min	12 h
25° to 34°C	12 min	9 h
35° to 39°C	8 min	6 h
40°C	8 min	4 h

Minimum curing time in wet concrete x2  
 All specifications based on supplied mixer  
 Store at temperatures between +5 and +25 degrees, away from direct heat, rain and moisture



## Vorpa VPE 585ml - Fixing in seismic C1+C2

High performance styrene free pure epoxy chemical anchor with European Technical Assessment for cracked concrete, post installed rebar and seismic zone

### technical data

#### Setting parameters threaded rods

Anchor size		M8	M10	M12	M16	M20	M24	M27	M30	M33	M36	M39	M42	M48	
Outer diameter of anchor	$d = d_{nom}$	mm	8	10	12	16	20	24	27	30	33	36	39	42	48
Nominal drill hole diameter	$d_o$	mm	10	12	14	18	22	28	30	35	38	42	45	52	60
Effectivite embedment depth	$h_{ef min}$	mm	60	60	70	80	90	96	108	120	132	144	156	168	192
	$h_{ef max}$	mm	160	200	240	320	400	480	540	600	660	720	780	840	960
Diameter of clearance hole in the fixture 1)	pre-positioned anchorage $d_f$	mm	9	12	14	18	22	26	30	33	36	39	42	45	52
	in-place anchorage $d_f$	mm	12	14	16	20	24	30	33	40	40	44	47	54	62
Maximum torque moment	$T_{inst} \leq$		10	20	35	60	100	170	250	300	330	360	390	460	550
Minimum thickness of member	$h_{min}$	mm	$h_{ef} + 30mm \geq 100mm$			$h_{ef} + 2d_o$									
Minimum spacing	$S_{min}$	mm	40	50	60	75	95	115	125	140	165	180	195	210	240
Minimum edge distance	$C_{min}$	mm	35	40	45	50	60	65	75	80	165	180	195	210	240

1) When used under seismic load, the diameter of the through hole in the fixture must not exceed  $d_1 + 1$  mm or alternatively, the annular gap between the fixture and the anchor rod must be force-filled with mortar

#### Recommended loads-Threaded rod. Working life of 50 years

##### Property class 8.8 - Concrete C20/25 wet / dry - Hammer (HD) and compressed air drilling (CD)

The recommended loads are only valid for single anchor for a roughly design, if the following conditions are valid

- $C \geq 1,5 \times h_{ef}$   $S \geq 3,0 \times h_{ef}$   $h \geq 2,0 \times h_{ef}$
- $\psi_{SUS} = 1,0$ ; per  $\alpha_{SUS} \leq \psi_{SUS}$  see table below
- The recommended loads have been calculated using the partial safety factors for resistances stated in the ETA and with a partial safety factor for actions of  $\gamma = 1,4$ . The partial safety factor for seismic actions is  $\gamma_1 = 1,0$ .
- If the conditions are not fulfilled the loads must be calculated acc.to EN 1992-4. For further details observe ETA-19/0201.

Anchor size		M8	M10	M12	M16	M20	M24	M27	M30	M33	M36	M39	M42	M48	
Tension 40°C/24°C 1) $\psi_{SUS} = 0,80$	uncracked $N_{rec,stat}$	kN	13,8	20,0	27,0	32,7	51,9	71,3	92,6	103,9	111,7	127,8	144,6	168,0	205,3
	cracked $N_{rec,stat}$	kN	6,7	9,4	16,8	22,9	36,3	49,9	64,8	72,7	78,2	89,5	101,2	117,6	143,7
	$N_{rec,eq,C1}$	kN	6,7	9,4	16,8	22,9	36,3	49,9	64,8	72,7					
	$N_{rec,eq,C2}$	kN	NPA	NPA	16,0	20,1	35,6	49,9	NPA	NPA					
Tension 72°C/50°C 1) $\psi_{SUS} = 0,68$	uncracked $N_{rec,stat}$	kN	13,8	20,0	27,0	32,7	51,9	71,3	92,6	103,9					NPA
	cracked $N_{rec,stat}$	kN	5,7	8,1	13,8	20,9	35,6	49,9	64,8	72,7					
	$N_{rec,eq,C1}$	kN	5,7	8,1	13,8	20,9	35,6	49,9	64,8	72,7					
	$N_{rec,eq,C2}$	kN	NPA	NPA	13,8	17,2	30,6	46,4	NPA	NPA					
Recommended shear load without lever arm 2) 3)	uncracked $V_{rec,stat}$	kN	8,6	11,9	16,5	20,8	34,1	48,1	63,5	72,3	93,3	106,1	120,3	140,4	174,6
	cracked $V_{rec,stat}$	kN	6,9	8,4	11,7	14,8	24,2	34,0	45,0	51,2	66,1	75,2	85,2	99,5	123,7
	$V_{rec,eq,C1}$	kN	6,9	8,4	11,7	14,8	24,2	34,0	45,0	51,2					
	$V_{rec,eq,C2}$	kN	NPA	NPA	11,7	14,8	24,2	34,0	NPA	NPA					
Effective embedment depth	$h_{ef}$	mm	80	90	110	125	170	210	250	270	320	350	380	420	480
Edge distance	$C \geq$	mm	120	135	165	187,5	255	315	375	405	480	525	570	630	720
Axial distance	$S \geq$	mm	240	270	330	375	510	630	750	810	960	1050	1140	1260	1440

#### Recommended loads-Threaded rod. Working life of 50 years

##### Property class 8.8 - Concrete C20/25 wet / dry - Diamond drilling (DD)

Anchor size		M8	M10	M12	M16	M20	M24	M27	M30	M33	M36	M39	M42	M48	
Tension 40°C/24°C 1) $\psi_{SUS} = 0,77$	non fessurato $N_{rec,stat}$	kN	13,8	18,8	27,0	32,7	51,9	71,3	92,6	103,9	111,7	127,8	144,6	168,0	205,3
	$N_{rec,stat}$	kN	11,5	16,2	21,7	29,9	48,3	71,3	90,9	103,9					
Tension 72°C/50°C 1) $\psi_{SUS} = 0,72$	non fessurato $N_{rec,stat}$	kN	11,5	16,2	21,7	29,9	48,3	71,3	90,9	103,9					NPA
	$N_{rec,stat}$	kN	8,6	11,9	16,5	20,8	34,1	48,1	63,5	72,3	93,3	106,1	120,3	140,4	174,6
Recommended shear load without lever arm 2) 3)	non fessurato $V_{rec,stat}$	kN	8,6	11,9	16,5	20,8	34,1	48,1	63,5	72,3	93,3	106,1	120,3	140,4	174,6
Effective embedment depth	$h_{ef}$	mm	80	90	110	125	170	210	250	270	320	350	380	420	480
Edge distance	$C \geq$	mm	120	135	165	188	255	315	375	405	480	525	570	630	720
Axial distance	$S \geq$	mm	240	270	330	375	510	630	750	810	960	1050	1140	1260	1440

1) Short term temperature / Long term temperature

2) Shear loads are valid for all specified temperature ranges

3) In case of seismic action, the annular gap between the fixture and the anchor rod must be force-filled with mortar, otherwise  $\alpha_{gap} = 0,5$  acc.to ETA 19/0201 must be taken into account

4) Application is not covered by the ETA-19/0201

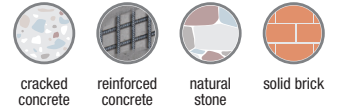
$N_{rec,stat}$   $V_{rec,stat}$  = Recommended load under static and quasi-static action

$N_{rec,eq}$   $V_{rec,eq}$  = Recommended load under seismic action

NPA = No performance assessed

# Vorpa VPE 585ml - Fixing in seismic C1+C2

High performance styrene free pure epoxy chemical anchor with European Technical Assessment for cracked concrete, post installed rebar and seismic zone



technical data

### Setting parameters rebar

Anchor size			ø8*	ø10*	ø12*	ø14	ø16	ø20	ø24*	ø25*	ø28	ø32	ø36	ø40	
Outer diameter of anchor	$d=d_{nom}$	mm	8	10	12	14	16	20	24	25	28	32	36	40	
Nominal drill hole diameter	$d_o$	mm	10-12	12-14	14-16	18	20	25	30-32	30-32	35	40	45	50	
Effectivite embedment depth	$h_{ef min}$	mm	60	60	70	75	80	90	96	100	112	128	144	240	
	$h_{ef max}$	mm	160	200	240	280	320	400	480	500	560	640	720	800	
Minimum thickness of member	$h_{min}$	mm	$h_{ef} + 30mm \geq 100mm$								$h_{ef} + 2d_o$				
Minimum spacing	$S_{min}$	mm	40	50	60	70	75	95	120	120	130	150	180	200	
Minimum edge distance	$C_{min}$	mm	35	40	45	50	50	60	70	70	75	85	180	200	

### Recommended loads-BSt500 rebar. Working life of 50 years

#### BSt500 rebar - Concrete C20/25 wet / dry - Hammer (HD) and compressed air drilling (CD)

The recommended loads are only valid for single anchor for a roughly design, if the following conditions are valid

- $C \geq 1,5 \times h_{ef}$   $S \geq 3,0 \times h_{ef}$   $h \geq 2,0 \times h_{ef}$
- $\psi_{SUS} = 1,0$ ; per  $\alpha_{SUS} \leq \psi_{SUS}$  see table below
- The recommended loads have been calculated using the partial safety factors for resistances stated in the ETA and with a partial safety factor for actions of  $\gamma = 1,4$ . The partial safety factor for seismic actions is  $\gamma_1 = 1,0$ .
- If the conditions are not fulfilled the loads must be calculated acc.to EN 1992-4. For further details observe ETA-19/0200.

Anchor size				ø8	ø10	ø12	ø14	ø16	ø20	ø24	ø25	ø28	ø32	ø36 <sup>4)</sup>	ø40 <sup>4)</sup>
Tension 40°C/24°C <sup>1)</sup> $\psi_{SUS} = 0,80$	uncracked	$N_{rec,stat}$	kN	14,3	20,0	27,0	28,9	32,7	51,9	68,8	71,3	92,6	103,9	127,8	144,6
		$N_{rec,stat}$	kN	6,7	9,4	16,8	20,2	22,9	36,3	48,1	49,9	64,8	72,7	89,5	101,2
	cracked	$N_{rec,eq,C1}$	kN	6,7	9,4	16,8	20,2	22,9	36,3	48,1	49,9	64,8	72,7		
Tension 72°C/50°C <sup>1)</sup> $\psi_{SUS} = 0,68$	uncracked	$N_{rec,stat}$	kN	11,5	16,2	23,7	28,9	32,7	51,9	68,8	71,3	92,6	103,9		NPA
		$N_{rec,stat}$	kN	5,7	8,1	13,8	16,9	20,9	35,6	48,1	49,9	64,8	72,7		
	cracked	$N_{rec,eq,C1}$	kN	5,7	8,1	13,8	16,9	20,9	35,6	48,1	49,9	64,8	72,7		
Recommended shear load without lever arm <sup>2) 3)</sup>	uncracked	$V_{rec,stat}$	kN	6,7	10,5	14,8	18,0	20,8	34,1	46,4	48,4	63,8	73,0	106,1	121,3
		$V_{rec,stat}$	kN	6,7	8,4	11,7	12,8	14,8	24,2	32,8	34,3	45,2	51,7	75,2	86,0
	cracked	$V_{rec,eq,C1}$	kN	6,5	8,4	11,7	12,8	14,8	24,2	32,8	34,3	45,2	36,2		NPA
Effective embedment depth	$h_{ef}$	mm	80	90	110	115	125	170	205	210	250	270	350	380	
Edge distance	$C \geq$	mm	120	135	165	173	188	255	308	315	375	405	525	570	
Axial distance	$S \geq$	mm	240	270	330	345	375	510	615	630	750	810	1050	1140	

### Recommended loads-Threaded rod. Working life of 50 years

#### BSt500 rebar - Concrete C20/25 wet / dry - Diamond drilling (DD)

Anchor size				ø8	ø10	ø12	ø14	ø16	ø20	ø24	ø25	ø28	ø32	ø36 <sup>4)</sup>	ø40 <sup>4)</sup>
Tension 40°C/24°C <sup>1)</sup> $\psi_{SUS} = 0,77$	uncracked	$N_{rec,stat}$	kN	13,4	17,5	25,7	28,9	32,7	51,9	68,8	71,3	92,6	103,9	127,8	144,6
	cracked	$N_{rec,eq,C1}$	kN	13,4	17,5	25,7	28,9	32,7	51,9	68,8	71,3	92,6	103,9		
Tension 72°C/50°C <sup>1)</sup> $\psi_{SUS} = 0,72$	uncracked	$N_{rec,stat}$	kN	10,5	14,8	19,7	24,1	29,9	48,3	68,8	71,3	92,6	103,9		NPA
	cracked	$N_{rec,eq,C1}$	kN	10,5	14,8	19,7	24,1	29,9	48,3	68,8	71,3	92,6	103,9		
Recommended shear load without lever arm <sup>2) 3)</sup>	uncracked	$V_{rec,stat}$	kN	6,7	10,5	14,8	18,0	20,8	34,1	46,4	48,4	63,8	73,0	106,1	121,3
Effective embedment depth	$h_{ef}$	mm	80	90	110	115	125	170	205	210	250	270	350	380	
Edge distance	$C \geq$	mm	120	135	165	173	188	255	308	315	375	405	525	570	
Axial distance	$S \geq$	mm	240	270	330	345	375	510	615	630	750	810	1050	1140	

1) Short term temperature / Long term temperature

2) Shear loads are valid for all specified temperature ranges

3) In case of seismic action, the annular gap between the fixture and the anchor rod must be force-filled with mortar, otherwise  $\alpha_{gap}=0,5$  acc.to ETA 19/0201 must be taken into account

4) Application is not covered by the ETA-19/0200

$N_{rec,stat}$   $V_{rec,stat}$  = Recommended load under static and quasi-static action

$N_{rec,eq}$   $V_{rec,eq}$  = Recommended load under seismic action

NPA = No performance assessed