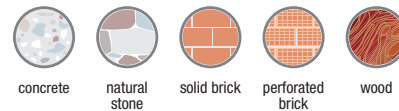


chemical anchors

Vorpa **PSF+**

Styrene free polyester chemical anchor with European Technical Assessment for non cracked concrete and masonry

products group

**Approved for**

- non cracked concrete M8-M24
- masonry use category b,c,d M8-M16

Also suitable for

- natural stone
- solid brick
- perforated brick
- wood

To fix

- non-structural fixings
- light metal structures
- light structural works
- solar panel fixing
- scaffolding links
- floor reinforcement
- construction joints
- railings

Seal in vertical
Thixotropic



EAD 330499-02-0601
non cracked concrete
M8-M24



EAD 330076-01-0604
masonry cat.b,c,d M8-M16



product code

Code	Description	Content ml	Gun to be used	Shelf life
51124P	PSF 300+	300	silicone type	12 months
51002P	PSF 400+	400	coaxial	18 months



+5°C/+25°C

Store upright

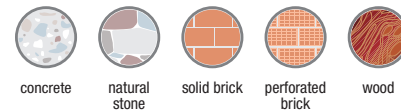
Examples of applications



Vorpa PSF+

Styrene free polyester chemical anchor with European Technical Assessment for non cracked concrete and masonry

product information



Characteristics

- polyester styrene free chemical anchors
- suitable for medium loads for non-critical applications
- fast working times for early loading in time sensitive applications
- no styrene allows for use indoors and enclosed spaces
- use in damp & wet environment and flooded fixing holes
- extremely versatile in masonry, hollow, aerated concrete
- crack and gap filling repairs in concrete vertical or horizontal 10:1 resin available in variety of cartridges types
- cartridge can be used up to the end of the validity date by replacing the static mixer or releasing cartridge with the sealing cap
- for applications on hollow materials use the appropriate perforated sleeves
- performance based on clean holes.

Approval/certifications/testing

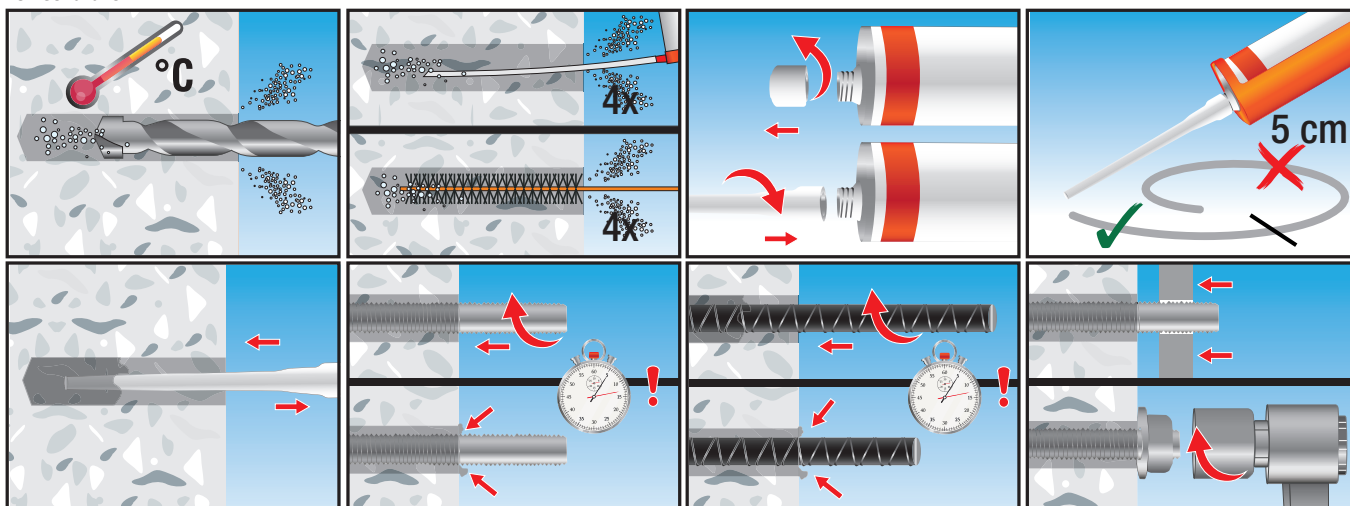
- 24/1153 - ETA EAD 330499-02-0601 M8-M24 non-Cracked Concrete
- 24/1155 - ETA EAD 330076-01-0604 hollow Wall / masonry Installations M8-M16
- LEED tested 2009 EQ. c4, 1 SCAQMD rule 1168 (2005)
- VOC A+ Rating (Volatile Organic Content)

Suggestion for use

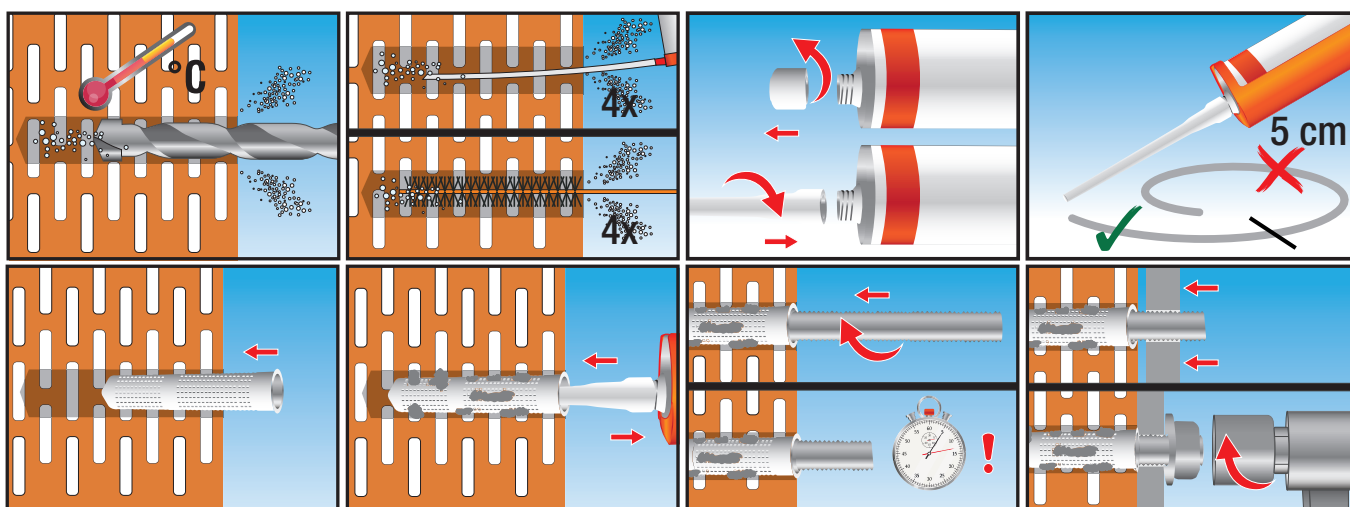
- **Clean the hole before the installation**
- HAMMER DRILLED – blown and then brushed with a stiff metal brush and blown again

installation sequence

On solid brick



On hollow brick

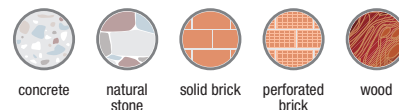


chemical anchors

Vorpa **PSF+**

Styrene free polyester chemical anchor with European Technical Assessment for non cracked concrete and masonry

technical data



Physical Properties	Test Method	
Resistenza raggi UV	Superato	-
Watertightness	0 mm	DIN EN 12390-8
Temperature stability	120° C	-
pH-value	>12	-
Density	1,79 kg / dm ³	-
Compressive strength	88 N / mm ²	EN 196 Teil1
Flexural strength	31 N / mm ²	EN 196 Teil1
E modulus	14.000 N / mm ²	EN 12504-4
Shrinkage	< 0,3%	-
Hardness Shore D	90	-
Electrical Resistance	1,5 10 ⁸ W m	IEC 93
Thermal Conductivity	0,49 W/m.K	DIN EN 993-15

Minimum Curing Time

Concrete Temperature	Max working time	Minimum curing time
da -5 °a -1°C	90 min	6 h
da 0° a 4°C	45 min	3 h
da 5° a 9°C	25 min	2 h
da 10° a 14°C	20 min	100 min
da 15° a 19°C	15 min	80 min
da 20° a 29°C	6 min	45 min
da 30° a 34°C	4 min	25 min
da 35°C a 39°C	2 min	20 min

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

Setting parameters threaded rods

Anchor size			M8	M10	M12	M16	M20	M24
Minimum edge distance	C_{min}	mm	40	50	60	80	100	120
Diameter of clearance hole in the fixture	$d_f \leq$	mm	9	12	14	18	22	26
Minimum axial distance	S_{min}	mm	40	50	60	80	100	120
Effectivite embedment depth	$h_{ef \text{ min - max}}$	mm	60-160	60-200	70-240	80-320	90-400	96-480
Minimum thickness of member	h_{min}	mm	$h_{ef} + 30mm \geq 100$		$h_{ef} + 30mm \geq 100$	$h_{ef} + 2d_o$	$h_{ef} + 2d_o$	
Nominal drill hole diameter	d_o	mm	10	12	14	18	24	28
Torque moment	$T_{inst} \leq$	Nm	10	20	40	80	120	160

Recommended loads-Threaded rod. Property class 5.8

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

- $C \geq 1,5 \times h_{ef}$ $S \geq 3,0 \times h_{ef}$ $h \geq 2,0 \times h_{ef}$
- If the conditions are not fulfilled the loads must be calculated acc.to EOTA Technical Report TR 029. For further details observe ETA .
- The safety factors are already included in the recommended loads

Anchor size			M8	M10	M12	M16	M20	M24
Recommended tension load								
40°C/24°C 1)	N _{rec,stat}	kN	6,8	9,0	13,2	19,9	33,9	50,3
80°C/50°C 1)	N _{rec,stat}	kN	5,2	6,7	9,9	15,0	25,4	37,7
Recommended shear load without lever arm 2)								
	V _{rec,stat}	kN	6,3	9,7	14,3	20,8	34,1	48,1
Effectivite embedment depth	h _{ef}	mm	80	90	110	125	170	210
Edge distance	c ≥	mm	120	135	165	187,5	255	315
Axial distance	s ≥	mm	240	270	330	375	510	630

1) Short term temperature/Long term temperature

2) Shear loads are valid for all specified temperature ranges

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

Installation parameters for autoclaved aerated concrete

Anchor size			M8	M10	M12	M16
Min.brush diameter	$d_{b,min} \geq$	mm	10,5	12,5	14,5	18,5
Diameter of clearance hole in the fixture	d_f	mm	9	12	14	18
Effectivite embedment depth	$h_{ef} = h_o$	mm	80	90	100	100
Minimum thickness of member	h_{min}	mm	$h_{ef} + 30mm$	$h_{ef} + 30mm$	$h_{ef} + 30mm$	$h_{ef} + 30mm$
Nominal drill hole diameter	d_o	mm	10	12	14	18
Torque moment	$T_{inst \text{ max}}$	Nm	see ETA	see ETA	see ETA	see ETA