PARACHIM VINYLESTER

CHARACTERISTICS

- Two component anchoring mortar for anchoring into solid and hollow materials
- Superior performance for structural applications
- Perfect for all stress-free anchoring
- Styrene free, can be used in confined spaces
- Ready to use, pre-cut packaging
- Suitable for dry, wet and flooded holes without loss of performance
- Suitable for overhead installations (without additional accessories)
- Fast loading time
- With colour indicator for working time (blue turns grey)
- Anchoring may be placed close to the edges (see table installation parameters)
- Can be applied with a standard cartridge gun
- Chemical resistant to many acids, bases, solvents, hydrocarbons, sea water... (Contact the technical service)

APPLICATIONS

- Can be used for high load structural anchoring applications in hollow and solid materials.
- Can be used in hollow materials: hollow masonry and voided stone.
- Can be used in solid materials: concrete, solid masonry, rock, hard natural stone.
- For fixing roller shutters, staircase hand rails, sun protection, canopies, boilers, racking, bicycle racks, masonry supports, signs, safety barriers, balcony fences, satellite dishes...

TECHNICAL CHARACTERISTICS	
Type of product	Vinylester
Mixing ratio	10:1
Curing system	2-component chemical reaction
Packaging	Flexible pocket with 2 compartments for component A and component B contained in a single-piston cartridge
Working time	See table
Loading time	See table
Minimum resin cartridge temperature	+5°C
Temperature of base material	-5°C - +40°C
Minimum service temperature	-40°C
Maximum service temperature	Long term (>12h): +50°C Short term (<12h): +80°C
Threaded rod sizes in uncracked concrete	M8 - M10 - M12 - M16 - M20 - M24
Threaded rod sizes in masonry	M8 - M10 - M12
Shelf life, in the original packing in upside position, out of direct sunlight and in dry conditions between +5°C - +25°C	15 months

PACKING AND COLOUR
12 cartridges of 300 ml/box - 95 boxes/pallet (1140 cartridges)
With curing colour proof from blue to grey

Necessary accessories

- Standard applicator gun (manual, pneumatic or electric)
- Mixing nozzle (2 pieces included with cartridge)
- Cleansing blowing pump
- Cleansing brush
- Sieve sleeve (in case of hollow materials)

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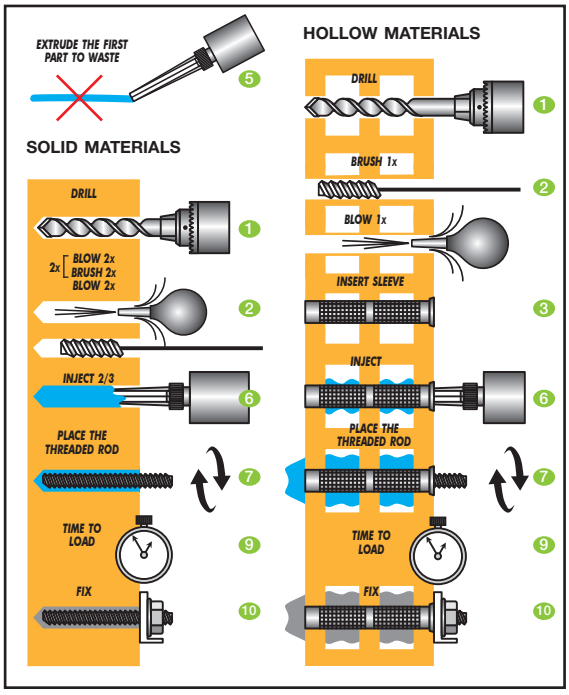
METHOD OF USE



Application in solid or hollow substrate

1. **Drill the hole** to the correct diameter and depth.

2. Thoroughly **clean the hole** in the following sequence:
   For solid materials: blow clean x2, then brush clean x2, then blow clean x2, then brush clean x2 and blow clean x2.
   For hollow materials: brush clean 1x, then blow clean x1.
   Note: use a brush with the required extensions and a source of clean compressed air. For holes of 400 mm or less deep, a blow pump may be used. The resin should be injected into a properly cleaned hole. Remove standing water before cleaning.

3. In case of hollow or perforated brick masonry: **insert the correct sieve sleeve**.

4. Once the hole is prepared, open the cartridge and screw **mixing nozzle** onto the mouth of the cartridge. Insert the cartridge into the sealant gun.

5. Extrude the first part of the cartridge to waste until an **even colour** is achieved, without streaking in the extruded product.

6. **Insert the mixing nozzle** to the bottom of the hole or the sleeve.
   Begin to extrude the product and slowly withdraw the mixer nozzle from the hole or the plug ensuring that there are no air voids as the mixer nozzle is withdrawn. For solid materials: fill the hole to approximately ½ to ¾ full and withdraw the nozzle completely. For hollow materials: completely fill the sleeve with resin.

7. Immediately **insert the clean threaded rod** (free from oil or other release agents) to the bottom of the hole using a back and forth twisting motion ensuring all the threads are thoroughly coated. Adjust to the correct position within the stated working time (see table).

8. Any **excess product** will be expelled from the hole evenly around the steel element showing that the hole is full. This excess product should be removed from around the mouth of the hole before it sets.

9. Leave the anchor to cure. **Do not disturb the anchor until the appropriate loading time has elapsed** (depending on the substrate conditions and ambient temperature).

10. Load with force after curing of the resin. Attach the fixture and tighten the nut to the recommended torque. Do not over-tighten.

11. Leave the static mixing nozzle on the cartridge and change with new one just before the next application.

Working and loading times

Temperature of resin cartridge and base material	Working time (Before blue turns to grey)	Loading time (Minimum time required until load can be applied)
-5°C » +0°C*	28 min.**	360 min.**
+0°C » +5°C*	18 min.	255 min.
+5°C » +10°C	10 min.	145 min.
+10°C » +20°C	6 min.	85 min.
+20°C » +25°C	5 min.	50 min.
+25°C » +30°C	4 min.	40 min.
+30°C » +35°C	2 min.**	35 min.**
+35°C » +40°C	1 min.**	25 min.**

T work is typical gel time at highest temperature. T load is set at the lowest temperature.
*Cartridge temperature may not be lower than +5°C.
**Not part of ETA.

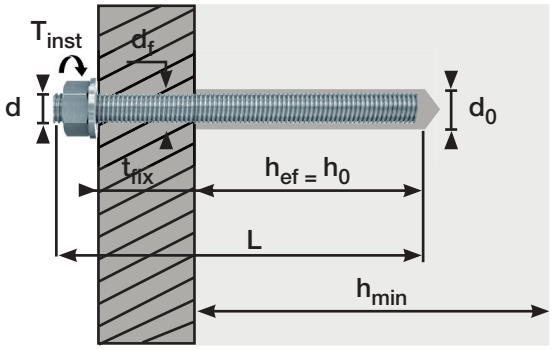
USE IN NON-CRACKED CONCRETE

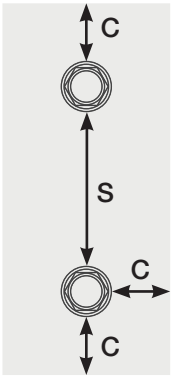
Installation parameters

Threaded rod		M8	M10	M12	M16	M20	M24
Size of threaded rod	d (mm)	8	10	12	16	20	24
Nominal drill hole diameter	d_o (mm)	10	12	14	18	22	26
Diameter of cleaning brush	d_b (mm)	14	14	20	20	29	29
Torque moment	T_{inst} (Nm)	10	20	40	80	150	200
Depth of drill hole for h_{ef} min/h_{ef} max	h_{ef} (mm)	64/96	80/120	96/144	128/192	160/240	192/288
Minimum edge distance	c_{min} (mm)	35/50	40/60	50/70	65/95	80/120	96/145
Minimum spacing	s_{min} (mm)	35/50	40/60	50/70	65/95	80/120	96/145
Minimum thickness of base material	h_{min} (mm)	h_{ef} + 30 mm ≥ 100 mm			h_{ef} + 2 d_o		

Theoretical consumption*

	Drill hole diameter d_o (mm)	Embedment depth h_{ef} min/standard/max (mm)	Number of applications per cartridge (# of drill holes)
M8	10	64	100
		80	**80**
		96	66
M10	12	80	55
		90	**49**
		120	37
M12	14	96	34
		110	**30**
		144	23
M16	18	128	15
		128	**15**
		192	10
M20	22	160	8
		170	**8**
		240	6
M24	26	192	5
		210	**4**
		288	3





*Consumption based on 60% filling rate of drill hole.

Characteristic bond resistance for combined pullout and concrete cone failure in dry/wet C20/25 uncracked concrete (temperature range: -40°C to +80°C)

		M8	M10	M12	M16	M20	M24
Characteristic bond resistance in dry/wet concrete	$T_{Rk\ uncr}$ (N/mm²)	10	8.0	9.0	9.5	8.5	8.5
Partial safety factor	γ_{Mp} (-)	1.8	1.8	1.8	1.8	1.8	1.8
Factor for concrete	Ψ_c C30/37	1.12					
Factor for concrete	Ψ_c C35/45	1.19					
Factor for concrete	Ψ_c C50/60	1.30					

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Tension load calculations for combined pullout and concrete cone failure at various embedment depths using threaded rods in dry/wet C20/25 uncracked concrete (temperature range: -40°C to +80°C)

Property	Symbol	Unit	M8	M10	M12	M16	M20	M24
Effective embedment depth = 8d	h_{ef}	mm	64	80	96	128	160	192
Characteristic load	$N_{Rk,p}$	kN	16.08	20.11	32.57	61.12	85.45	123.05
Partial safety factor	γ_{Mp}	-	1.80	1.80	1.80	1.80	1.80	1.80
Design load	N_{Rd}	**kN**	**8.93**	**11.17**	**18.09**	**33.95**	**47.47**	**68.36**
Effective embedment depth = STD	h_{ef}	mm	80	90	110	128	170	210
Characterstic load	$N_{Rk,p}$	kN	20.11	22.62	37.32	61.12	90.79	134.59
Partial safety factor	γ_{Mp}	-	1.80	1.80	1.80	1.80	1.80	1.80
Design load	N_{Rd}	**kN**	**11.17**	**12.56**	**20.73**	**33.95**	**50.43**	**74.77**
Effective embedment depth = 10d	h_{ef}	mm	80	100	120	160	200	240
Characterstic load	$N_{Rk,p}$	kN	20.11	25.13	40.72	76.40	106.81	153.81
Partial safety factor	γ_{Mp}	-	1.80	1.80	1.80	1.80	1.80	1.80
Design load	N_{Rd}	**kN**	**11.17**	**13.96**	**22.62**	**42.44**	**59.33**	**85.45**
Effective embedment depth = 12d	h_{ef}	mm	96	120	144	192	240	288
Characterstic load	$N_{Rk,p}$	kN	24.13	30.16	48.86	91.68	128.18	184.57
Partial safety factor	γ_{Mp}	-	1.80	1.80	1.80	1.80	1.80	1.80
Design load	N_{Rd}	**kN**	**13.40**	**16.75**	**27.14**	**50.93**	**71.21**	**102.53**

Remarks regarding tension load calculations table

1. Characteristic loads are valid for **combined concrete cone and pullout failure** as defined by TR029 only. All other failure modes, including steel failure, detailed in TR029 as welll as includling combined effects of tension and shear, must be considered in accordance with TR029.
2. Characteristic loads are valid for single anchors without close edge, anchor spacing or eccentric loading considerations.
3. Tabulated values are valid for temperature range -40°C to +80°C (Max LLT = +50°C; Max STT = +80°C).
4. Tabulated values are only valid for the installation conditions stated. Other conditions, such as different temperature ranges, may affect the performance of the product.
5. Long term temperatures are those that remain roughly constant over prolonged periods. Short term temperatures occur over brief intervals, eg: diurnal cycling.
6. The compressive strength of the concrete ($f_{ck,cube}$) is assumed to be 25 N/mm² for C20/25 concrete.
7. Tabulated values assume that the geometry of the anchor(s) and concrete member is sufficient to avoid splitting failure.

USE IN MASONRY

Installation parameters

		Hollow masonry		
Threaded rod		**M8**	**M10**	**M12**
Size of threaded rod	**d (mm)**	8	10	12
Sieve sleeve length	**l_s (mm)**	85	85	85
Sieve sleeve diameter	**d_s (mm)**	16	16	20
Nominal drill hole diameter	**d_o (mm)**	16	16	20
Diameter of cleaning brush	**d_b (mm)**	$20^{\pm 1}$	$20^{\pm 1}$	$22^{\pm 1}$
Depth of drill hole	**h_o (mm)**	90		
Effective anchorage depth	**h_{ef} (mm)**	85		
Diameter of clearance hole in the fixture	**$d_f \leq$ (mm)**	9	12	14
Torque moment	**T_{inst} (Nm)**	2		

For solid masonry: see installation parameters for use in non-cracked concrete.

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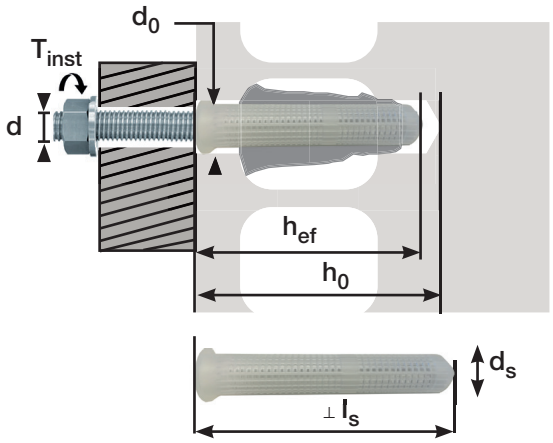
Theoretical consumption

		Drill hole diameter d_o (mm)	Embed-ment depth h_{ef} (mm)	Number of applications per cartridge (# of drill holes)
Hollow masonry	M8/M10	16	85	15
	M12	20	85	9



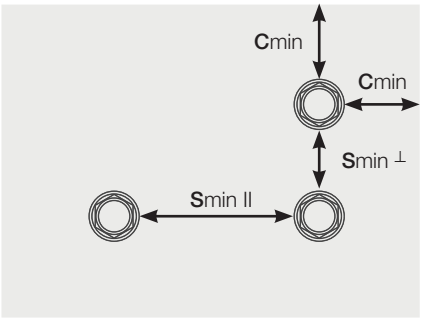
Edge distances and spacing

Cmin = Minimum allowable edge distance

Smin II = Minimum allowable spacing parallel to the horizontal joint

Smin ⊥ = Minimum allowable spacing perpendicular to the horizontal joint

Base material	M8			M10			M12		
	Cmin	Smin II	Smin ⊥	Cmin	Smin II	Smin ⊥	Cmin	Smin II	Smin ⊥
	mm	mm	mm	mm	mm	mm	mm	mm	mm
Brick no. 1	100	235	115	100	235	115	100	235	115
Brick no. 2	128	255	255	128	255	255	128	255	255
Brick no. 3	128	255	255	128	255	255	128	255	255
Brick no. 4	100	250	240	100	250	240	100	250	240
Brick no. 5	100	370	238	100	370	238	100	370	238
Brick no. 6	100	245	110	100	245	110	100	245	110
Brick no. 7	100	373	238	100	373	238	100	373	238



Characteristic resistance under tension (N_{Rk}) and shear loading (V_{Rk})

Base material	M8	M10	M12
	$N_{Rk} = V_{Rk}$ [kN]		
Brick no. 1	2.0	2.0	2.0
Brick no. 2	2.0	1.5	2.5
Brick no. 3	1.5	1.5	2.5
Brick no. 4	1.2	1.2	1.2
Brick no. 5	1.2	0.9	0.9
Brick no. 6	0.75	0.75	1.2
Brick no. 7	0.75	0.5	0.5

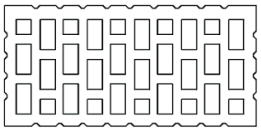
Design resistance under tension (N_{Rd}) and shear loading (V_{Rd})

Partial safety factor for masonry γ_{Mm} = 2.5 (according TR054)

Base material	M8	M10	M12
	$N_{Rd} = V_{Rd}$ [kN]		
Brick no. 1	0.8	0.8	0.8
Brick no. 2	0.8	1	1
Brick no. 3	1	1	1
Brick no. 4	0.48	0.48	0.48
Brick no. 5	0.48	0.36	0.36
Brick no. 6	0.3	0.3	0.48
Brick no. 7	0.3	0.2	0.2

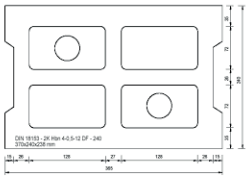
Types and dimensions of blocks and bricks

Brick no.1



Hollow clay brick Hlz 12-1,0-2DF
according to EN771-1
Length/width/height 235 mm/112 mm/115 mm
$f_b \geq 12$ N/mm² / $\rho \geq 1{,}0$ kg/dm³

Brick no. 2

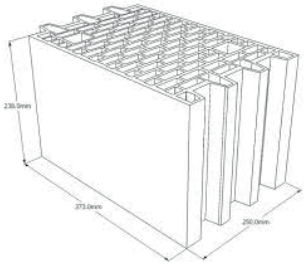


Concrete masonry unit Hbn 4-12DF
according to EN771-3
Length/width/height 370 mm/240 mm/238 mm
$f_b \geq 4$ N/mm² / $\rho \geq 1{,}2$ kg/dm³

Brick no. 3

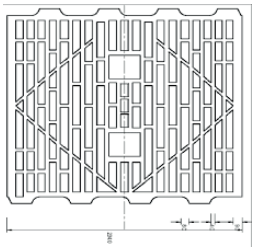
Solid clay brick Mz 12-2,0-NF
according to EN771-1
Length/width/height 240 mm/116 mm/71 mm
$f_b \geq 12$ N/mm² / $\rho \geq 2{,}0$ kg/dm³

Brick no. 4



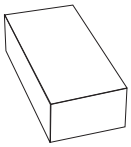
Hollow clay brick Porotherm 25P+W KL15
according to EN771-1
Length/width/height 373 mm/250 mm/238 mm
$f_b \geq 12$ N/mm² / $\rho \geq 0{,}9$ kg/dm³

Brick no. 5



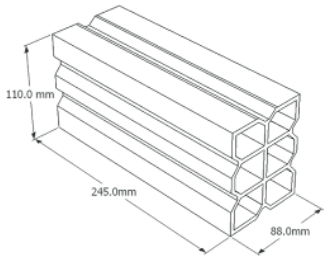
Hollow clay brick HlzW 6-0,7-8DF
according to EN771-1
Length/width/height 250 mm/240 mm/240 mm
$f_b \geq 6$ N/mm² / $\rho \geq 0{,}8$ kg/dm

Brick no. 6



Solid sand lime brick KS 12-2,0-NF
according to EN771-2
Length/width/height 240 mm/115 mm/70 mm
$f_b \geq 12$ N/mm² / $\rho \geq 2{,}0$ kg/dm³

Brick no. 7



Hollow clay brick Hueco Doble
according to EN771-1
Length/width/height 245 mm/110 mm/88 mm
$f_b \geq 2{,}5$ N/mm² / $\rho \geq 0{,}74$ kg/dm³

SAFETY

Safety data sheet available on request.

LIMITATIONS

- Due to the nature of the product, migration of the monomer in the resin may cause staining in certain materials (f. ex. natural stone). Preliminary tests are necessary.
- Not intended for anchoring into porous or reconstituted stone.
- The chemical anchor is not intended for use as a cosmetic or decorative product.
- Not intended for anchoring into holes flooded with seawater.

TECHNICAL APPROVALS

- ETA 19/ 0744 according to EAD 330499-01-0601 M8 - M24 for fixing and/or supporting to non-cracked concrete, structural elements (which contributes to the stability of the works) or heavy units.
- ETA 19/ 0743 according to EAD 330076-00-0604 M8 - M12 for fixing and/or supporting to masonry, structural elements (which contributes to the stability of the works) or heavy units.
- CE

ETA CE
European Technical Assessment Parachim Vinylester No. 1020 -CPR – 090-045971 DoP nr: MP 0190005
ETA 19/ 0744 **EAD 330499-01-0601** **M8 - M24**
For fixing and/or supporting to concrete, structural elements (which contributes to the stability of the works) or heavy units.

ETA CE
European Technical Assessment Parachim Vinylester No. 1020 -CPR – 090-045973 DoP nr: MP 0190005
ETA 19/ 0743 **EAD 330076-00-0604** **M8 - M12**
For fixing and/or supporting to masonry, structural elements (which contributes to the stability of the works) or heavy units.

* Information sur le niveau d'émission de substances volatiles dans l'air intérieur, présentant un risque de toxicité par inhalation, sur une échelle de classe allant de A+ (très faibles émissions) à C (fortes émissions).

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