



E410+/EC410+

Anchorage in masonry

E410+ / EC410+ can also be used for anchorages in masonry, both hollow and solid bricks. For application in hollow bricks perforated sleeves need to be used.

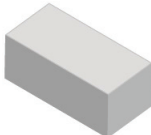
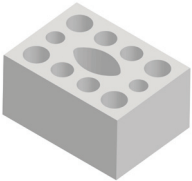
solid bricks			M8	M10	M12	M16	IG-M6	IG-M8	IG-M10
nominal drill hole diameter	d _o	[mm]	10	12	14	18	10	12	16
embedment depth	h _{ef}	[mm]	80	90	100	100	90	100	100
bore hole depth	h _o	[mm]	80	90	100	100	90	100	100
diameter of clearance hole in fixture	d _f	[mm]	9	12	14	18	7	9	12
diameter of steel brush	d _b ≥	[mm]	12	14	16	20	12	14	18

hollow and solid bricks			M8	M8	M10	M12	M16	IG-M6	IG-M8	IG-M10
perforated sleeve			12x80	16x85	16x85	20x85	20x85	16x85	20x85	20x85
				16x130	16x130	20x130	20x130	16x130	20x130	20x130
				16x200	16x200	20x200	20x200	16x200	20x200	20x200
nominal drill hole diameter	d _o	[mm]	12	16	16	20	20	16	20	20
embedment depth	h _{ef}	[mm]	80	85	85	85	85	85	85	85
				130	130	130	130	130	130	
				200	200	200	200	200	200	
bore hole depth	h _o	[mm]	85	90	90	90	90	90	90	90
				135	135	135	135	135	135	
				205	205	205	205	205	205	
diameter of clearance hole in fixture	d _f	[mm]	9	9	12	14	18	7	9	12
diameter of steel brush	d _b ≥	[mm]	14	18	18	22	22	18	22	22

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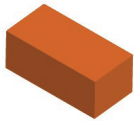
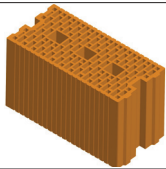
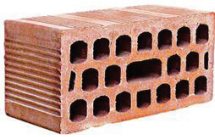
Tested stones

The later on described loads are only valid for anchorages in the following stones.
When using different stones, construction site tests are necessary. The results can be compared with a similar stone from this ETA-17/0378 and or UKTA 22/6266 / TDS.

	type	figure	dimensions l x b x h [mm]	compressive strength [N/mm ²]	density [kg/dm ³]	producer
calcium silica bricks	solid calcium silica brick KS-NF		≥ 240 x 115 x 71	≥ 10	≥ 2,0	e.g. Wemding (D)
	hollow calcium silica brick KSL-3DF		240 x 175 x 113	≥ 8	≥ 1,4	e.g. Wemding (D)
	hollow calcium silica brick KSL-12DF		498 x 175 x 238	≥ 10	≥ 1,4	e.g. Wemding (D)
concrete bricks	Bloc Creux B40		495 x 195 x 190	≥ 4	≥ 0,8	e.g. Sepa (FR)
	solid light weight concrete brick LAC		≥ 300 x 123 x 248	≥ 2	≥ 0,6	e.g. Bisotherm (D)
	Hollow concrete brick Leca Lex Harkko RUH-200		≥ 498 x 200 x 195	≥ 2,7	≥ 0,7	e.g. Saint Gobain Weber (FIN)
	Solid concrete brick Leca Lex Harkko RUH-200 Kulma		≥ 498 x 200 x 195	≥ 3	≥ 0,78	e.g. Saint Gobain Weber (FIN)

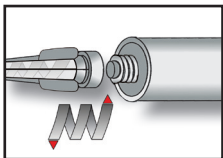
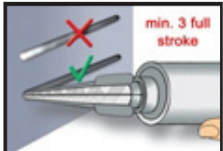
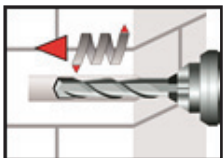
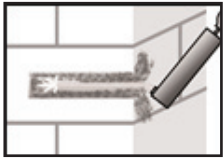
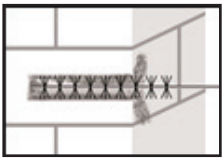
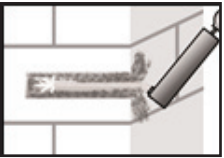
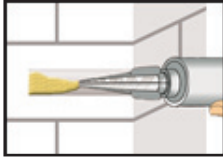
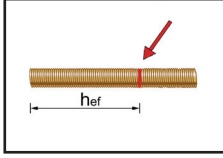
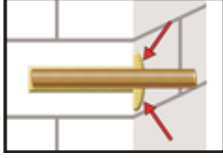
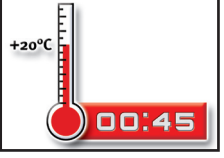
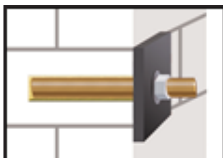
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Tested stones

	type	figure	dimensions l x b x h [mm]	compressive strength [N/mm ²]	density [kg/dm ³]	producer
Clay bricks	solid clay brick Mz-1DF		≥ 240 x 115 x 55	≥ 10	≥ 1,6	e.g. Unipor (D)
	hollow clay brick Hlz-16DF		497 x 240 x 238	≥ 6	≥ 0,8	e.g. Unipor (D)
	Porotherm Homebric		500 x 200 x 299	≥ 4	≥ 0,7	e.g. Wienerberger (FR)
	BGV Thermo		500 x 200 x 314	≥ 4	≥ 0,6	e.g. Leroux (FR)
	Calibric R+		500 x 200 x 314	≥ 6	≥ 0,6	e.g. Terreal (FR)
	Urbanbric		500 x 200 x 274	≥ 6	≥ 0,7	e.g. Imerys (FR)
	Blocchi Leggeri		250 x 120 x 250	≥ 4	≥ 0,6	e.g. Wienerberger (IT)
	Doppio Uni		250 x 120 x 120	≥ 10	≥ 0,9	e.g. Wienerberger (IT)
AAC	autoclaved ae- rated concrete AAC		≥ 499 x 240 x 249	≥ 2	≥ 0,6	e.g. Porrit (D)

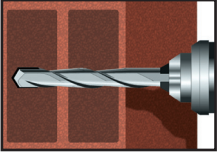
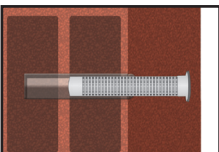
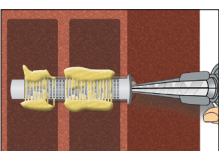
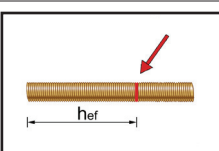
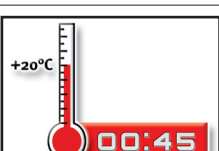
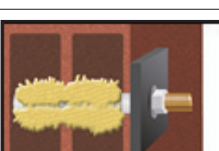
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Installation instructions

Preparation of cartridge	
	1. Remove the cap and attach the supplied static-mixing nozzle to the cartridge and load the cartridge into the correct dispensing tool. In case of a foil tube cartridge, cut off the clip before use. For every working interruption longer than the recommended working time (Table B4) as well as for new cartridges, a new static-mixer shall be used.
	2. Initial adhesive is not suitable for fixing the anchor. Prior to dispensing into the anchor hole, squeeze out separately a minimum of three full strokes, for foil tube cartridges six full strokes and discard non-uniformly mixed adhesive components until the mortar shows a consistent grey colour.
Installation in solid masonry (without sleeve)	
	3. Holes to be drilled perpendicular to the surface of the base material by using a hard-metal tipped hammer drill bit. Drill a hole, with drilling method according to Annex C4-C45, into the base material, with nominal drill hole diameter and bore hole depth according to the size and embedment depth required by the selected anchor. In case of aborted drill hole the drill hole shall be filled with mortar.
	4. Blow out from the bottom of the bore hole two times. Attach the brush to a drilling machine or a battery screwdriver, brush the hole clean two times, and finally blow out the hole again two times.
	
	
	5. Starting from the bottom or back of the cleaned anchor hole, fill the hole up to min two-thirds with adhesive. Slowly withdraw the static mixing nozzle will avoid creating air pockets. Observe the gel-/ working times given in Table B4.
	6. The position of the embedment depth shall be marked on the threaded rod. Push the threaded rod into the anchor hole while turning slightly to ensure positive distribution of the adhesive until the embedment depth is reached. The anchor shall be free of dirt, grease, oil or other foreign material.
	7. Be sure that the annular gap is fully filled with mortar. If no excess mortar is visible at the top of the hole, the application has to be renewed.
	
	8. Allow the adhesive to cure to the specified curing time prior to applying any load or torque. Do not move or load the anchor until it is fully cured (attend Table B4).
	9. After full curing, the fixture can be installed with up to the max. installation torque (see parameters of brick Annex C4 to Annex C45) by using a calibrated torque wrench.

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Installation instructions

Installation in solid and hollow masonry (with sleeve)	
	3. Holes to be drilled perpendicular to the surface of the base material by using a hard-metal tipped hammer drill bit. Drill a hole, with drill method according to Annex C4 - C45, into the base material, with nominal drill hole diameter and bore hole depth according to the size and embedment depth required by the selected anchor.
	4. Blow out from the bottom of the bore hole two times. Attach the brush to a drilling machine or a battery screwdriver, brush the hole clean two times, and finally blow out the hole again two times.
	
	5. Insert the perforated sleeve flush with the surface of the masonry or plaster. Only use sleeves that have the right length. Never cut the sleeve.
	6. Starting from the bottom or back fill the sleeve with adhesive. For embedment depth equal to or larger than 130 mm an extension nozzle shall be used. For quantity of mortar attend cartridges label installation instructions. Observe the gel- / working times given in Table B4.
	7. The position of the embedment depth shall be marked on the threaded rod. Push the threaded rod into the anchor hole while turning slightly to ensure positive distribution of the adhesive until the embedment depth is reached. The anchor shall be free of dirt, grease, oil or other foreign material.
	
	8. Allow the adhesive to cure to the specified curing time prior to applying any load or torque. Do not move or load the anchor until it is fully cured (attend Table B4).
	9. After full curing, the fixture can be installed with up to the max. installation torque (See parameters of brick Annex C4 to Annex C45) by using a calibrated torque wrench.

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Cleaning - masonry



- Brush:

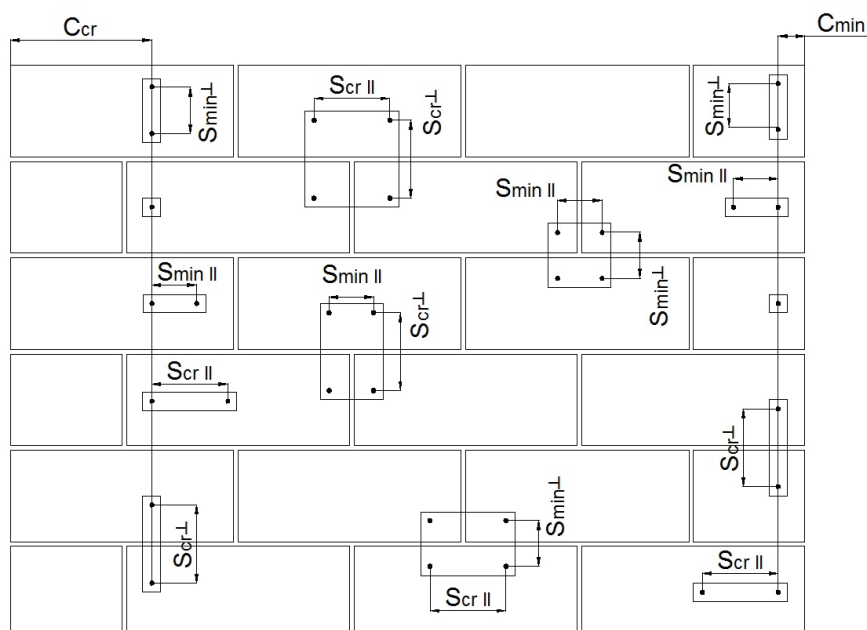


- Blower

Calculation of recommended loads

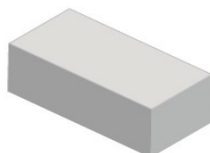
The recommended loads are only valid under the following conditions. For a more detailed design see ETA-17/0378 and or UKTA-22/6266:

- dry environment
- spacing $s \geq s_{cr}$
- edge distance $c \geq c_{cr}$
- masonry mortar of strength class M2,5 to M9
- no prestressing force on the wall
- visible joints
- vertical joints are filled with mortar
- steel strength of anchor rod 5.8 or higher
- the partial safety factors for material and load are already considered
- no interaction of tension and shear loads considered



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recommended loads in masonry

solid calcium silica brick KS-NF		dimensions ≥ 240 x 115 x 71		compressive strength ≥ 10 N/mm²		density ≥ 2,0 kg/dm³		producer e.g. Wemding (D)				
usage without perforated sleeve				M8	M10	M12	M16	IG M6 ³⁾	IG M8 ³⁾	IG M10 ³⁾		
perforated sleeve				-	-	-	-	-	-	-		
anchorage depth	h_{ef}	mm	80	90	100	100	90	100	100			
minimum wall thickness	h_{min}	mm	115	240	240	240	240	240	240			
installation torque	T_{inst}	Nm	2									
drilling method			hammer drilling									
critical edge distance	c_{cr}	mm	120	135	150	150	135	150	150			
critical axial distance parallel to horizontal joint	$s_{cr,II}$	mm	240	270	300	300	270	300	300			
critical axial distance perpendicular to horizontal joint	$s_{cr,T}$	mm	240	270	300	300	270	300	300			
minimal edge distance ²⁾	c_{min}	mm	c_{cr}									
minimal axial distance ²⁾	s_{min}	mm	s_{cr}									
recommended tension load ¹⁾	N_{zul}	kN	0,86									
recommended vertical shear load ¹⁾	$V_{vert.}$	kN	0,86									
recommended horizontal shear load ¹⁾	$V_{hori.}$	kN	0,86									
usage with perforated sleeve				M8	M8	M10	M12	M16	IG M6 ³⁾	IG M8 ³⁾	IG M10 ³⁾	
perforated sleeve				12	16	16	20	20	16	20	20	
anchorage depth	h_{ef}	mm	80	85; 130; 200								
minimum wall thickness	h_{min}	mm	115	$h_{ef} + 30mm$								
installation torque	T_{inst}	Nm	2									
drilling method			hammer drilling									
critical edge distance	c_{cr}	mm	120	127,5								
critical axial distance parallel to horizontal joint	$s_{cr,II}$	mm	240	255								
critical axial distance perpendicular to horizontal joint	$s_{cr,T}$	mm	240	255								
minimal edge distance ²⁾	c_{min}	mm	c_{cr}									
minimal axial distance ²⁾	s_{min}	mm	s_{cr}									
recommended tension load ¹⁾	N_{zul}	kN	0,71									
recommended vertical shear load ¹⁾	$V_{vert.}$	kN	0,71	0,86								
recommended horizontal shear load ¹⁾	$V_{hori.}$	kN	0,71	0,86								

¹⁾ Conditions and assumptions for the recommended loads see page 15

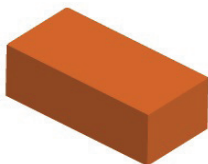
²⁾ Reduction factors see ETA 17/0378 and or UKTA-22/6266

³⁾ not covered by ETA/UKTA

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recommended loads in masonry

solid clay brick				dimensions			compressive strength			density			producer		
Mz-1DF				≥ 240 x 115 x 55			≥ 10 N/mm²			≥ 1,6 kg/dm³			e.g. Unipor (D)		
usage without perforated sleeve							M8	M10	M12	M16	IG M6 ³)	IG M8 ³)	IG M10 ³)		
perforated sleeve							-	-	-	-	-	-	-		
anchorage depth				h _{ef}	mm	80	90	100	100	90	100	100			
minimum wall thickness				h _{min}	mm	115	240	240	240	240	240	240			
installation torque				T _{inst}	Nm	2									
drilling method				hammer drilling											
critical edge distance				c _{cr}	mm	120	135	150	150	135	150	150			
critical axial distance parallel to horizontal joint				s _{cr,II}	mm	240	270	300	300	270	300	300			
critical axial distance perpendicular to horizontal joint				s _{cr,T}	mm	240	270	300	300	270	300	300			
minimal edge distance ²)				c _{min}	mm	c _{cr}									
minimal axial distance ²)				s _{min}	mm	s _{cr}									
recommended tension load ¹)				N _{zul}	kN	0,43									
recommended vertical shear load ¹)				V _{vert.}	kN	0,86	1,0	1,43	1,43	0,86	1,0	1,43			
recommended horizontal shear load ¹)				V _{hori.}	kN	0,86	1,0	1,43	1,43	0,86	1,0	1,43			
usage with perforated sleeve							M8	M8	M10	M12	M16	IG M6 ³)	IG M8 ³)	IG M10 ³)	
perforated sleeve							12	16	16	20	20	16	20	20	
anchorage depth				h _{ef}	mm	80	85; 130; 200								
minimum wall thickness				h _{min}	mm	115	h _{ef} + 30mm								
installation torque				T _{inst}	Nm	2									
drilling method				hammer drilling											
critical edge distance				c _{cr}	mm	120	127,5								
critical axial distance parallel to horizontal joint				s _{cr,II}	mm	240	255								
critical axial distance perpendicular to horizontal joint				s _{cr,T}	mm	240	255								
minimal edge distance ²)				c _{min}	mm	c _{cr}									
minimal axial distance ²)				s _{min}	mm	s _{cr}									
recommended tension load ¹)				N _{zul}	kN	0,57									
recommended vertical shear load ¹)				V _{vert.}	kN	0,86	0,86	1,0	1,0	1,0	0,86	1,0	1,0		
recommended horizontal shear load ¹)				V _{hori.}	kN	0,86	0,86	1,0	1,0	1,0	0,86	1,0	1,0		

¹⁾ Conditions and assumptions for the recommended loads see page 15

²⁾ Reduction factors see ETA 17/0378 and or UKTA-22/6266

³⁾ not covered by ETA/UKTA

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recommended loads in masonry

solid light weight con- crete brick LAC		dimensions ≥ 300 x 123 x 248	compressive strength ≥ 2 N/mm²			density ≥ 0,6 kg/dm³		producer e.g. Bisotherm (D)		
usage without perforated sleeve			M8	M10	M12	M16	IG M6 ³⁾	IG M8 ³⁾	IG M10 ³⁾	
perforated sleeve			-	-	-	-	-	-	-	
anchorage depth	h_{ef}	mm	80	90	100	100	90	100	100	
minimum wall thickness	h_{min}	mm	300							
installation torque	T_{inst}	Nm	2							
drilling method			hammer drilling							
critical edge distance	c_{cr}	mm	120	135	150	150	135	150	150	
critical axial distance parallel to horizontal joint	$s_{cr, }$	mm	240	270	300	300	270	300	300	
critical axial distance perpendicular to horizontal joint	$s_{cr,T}$	mm	240	270	300	300	270	300	300	
minimal edge distance ²⁾	c_{min}	mm	c_{cr}							
minimal axial distance ²⁾	s_{min}	mm	s_{cr}							
recommended tension load ¹⁾	N_{zul}	kN	0,57							
recommended vertical shear load ¹⁾	$V_{vert.}$	kN	0,86	1,00	1,14	1,14	1,00	1,14	1,14	
recommended horizontal shear load ¹⁾	$V_{hori.}$	kN	0,60	0,78	0,98	1,07	0,78	0,98	1,07	

solid light weight con- crete brick Leca Lex Harkko RUH-200 kulma		dimensions ≥ 498 x 200 x 195	compressive strength ≥ 3 N/mm²			density ≥ 0,78 kg/ dm³		producer e.g. Saint Gobain Weber (FIN)		
usage without perforated sleeve			M8	M10	M12	M16	IG M6 ³⁾	IG M8 ³⁾	IG M10 ³⁾	
perforated sleeve			-	-	-	-	-	-	-	
anchorage depth	h_{ef}	mm	80	90	100	100	90	100	100	
minimum wall thickness	h_{min}	mm	300							
installation torque	T_{inst}	Nm	2							
drilling method			hammer drilling							
critical edge distance	c_{cr}	mm	120	135	150	150	135	150	150	
critical axial distance parallel to horizontal joint	$s_{cr, }$	mm	240	270	300	300	270	300	300	
critical axial distance perpendicular to horizontal joint	$s_{cr,T}$	mm	240	270	300	300	270	300	300	
minimal edge distance ²⁾	c_{min}	mm	c_{cr}							
minimal axial distance ²⁾	s_{min}	mm	s_{cr}							
recommended tension load ¹⁾	N_{zul}	kN	0,57	0,86						
recommended vertical shear load ¹⁾	$V_{vert.}$	kN	0,86	1,14						
recommended horizontal shear load ¹⁾	$V_{hori.}$	kN	0,73	0,95	1,14	1,14	0,95	1,14	1,14	

¹⁾ Conditions and assumptions for the recommended loads see page 15

²⁾ Reduction factors see ETA 17/0378 and or UKTA-22/6266 ³⁾ not covered by ETA/UKTA

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recommended loads in masonry

hollow concrete brick Leca Lex Harkko RUH-200		dimensions ≥ 498 x 200 x 195 mm	compressive strength ≥ 2,7 N/mm²				density ≥ 0,7 kg/dm³			producer e.g. Saint Gobain Weber (FIN)	
			M8	M8	M10	M12	M16	IG M6 ³)	IG M8 ³)	IG M10 ³)	
perforated sleeve			12	16	16	20	20	16	20	20	
anchorage depth		h _{ef} mm	80	85; 130							
minimum wall thickness		h _{min} mm	200								
installation torque		T _{inst} Nm	2								
drilling method			rotation drilling								
critical edge distance		c _{cr} mm	100	100	100	120	120	100	120	120	
critical axial distance parallel to horizontal joint		s _{cr,ll} mm	498								
critical axial distance perpendicular to horizontal joint		s _{cr,T} mm	195								
minimal edge distance ²)		c _{min} mm	c _{cr}								
minimal axial distance ²)		s _{min} mm	s _{cr}								
recommended tension load ¹)		N _{zul} kN	0,57		0,71	0,71	0,57	0,71	0,71		
recommended vertical shear load ¹)		V _{vert.} kN	0,71	1,00							
recommended horizontal shear load ¹)		V _{hori.} kN	0,26								

hollow concrete brick bloc creux B40		dimensions ≥ 499 x 200 x 190 mm	compressive strength ≥ 4 N/mm²				density ≥ 0,8 kg/dm³			producer e.g. Sepa (FR)	
			M8	M8	M10	M12	M16	IG M6 ³)	IG M8 ³)	IG M10 ³)	
perforated sleeve			12	16	16	20	20	16	20	20	
anchorage depth		h _{ef} mm	80	85; 130							
minimum wall thickness		h _{min} mm	200								
installation torque		T _{inst} Nm	2								
drilling method			rotation drilling								
critical edge distance		c _{cr} mm	100	100	100	120	120	100	120	120	
critical axial distance parallel to horizontal joint		s _{cr,ll} mm	495								
critical axial distance perpendicular to horizontal joint		s _{cr,T} mm	190								
minimal edge distance ²)		c _{min} mm	c _{cr}								
minimal axial distance ²)		s _{min} mm	s _{cr}								
recommended tension load ¹)		N _{zul} kN	0,11	0,17	0,17	0,26	0,26	0,17	0,26	0,26	
recommended vertical shear load ¹)		V _{vert.} kN	0,35	0,86							
recommended horizontal shear load ¹)		V _{hori.} kN	0,26								

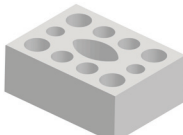
¹⁾ Conditions and assumptions for the recommended loads see page 15

²⁾ Reduction factors see ETA 17/0378 and or UKTA-22/6266

³⁾ not covered by ETA/UKTA

E410+/EC410+

recommended loads in masonry

hollow silica brick KS-L-3DF		dimensions ≥ 240 x 175 x 113 mm	compressive strength ≥ 12 N/mm²				density ≥ 1,4 kg/dm³		producer e.g. Wemding (D)		
			M8	M8	M10	M12	M16	IG M6 ³⁾	IG M8 ³⁾	IG M10 ³⁾	
perforated sleeve			12	16	16	20	20	16	20	20	
anchorage depth		h_{ef}	mm	80	85; 130						
minimum wall thickness		h_{min}	mm	175							
installation torque		T_{inst}	Nm	2							
drilling method			rotation drilling								
critical edge distance		c_{cr}	mm	120							
critical axial distance parallel to horizontal joint		$s_{cr,II}$	mm	240							
critical axial distance perpendicular to horizontal joint		$s_{cr,T}$	mm	120							
minimal edge distance ²⁾		c_{min}	mm	c_{cr}							
minimal axial distance ²⁾		s_{min}	mm	s_{cr}							
recommended tension load ¹⁾		N_{zul}	kN	0,43							
recommended vertical shear load ¹⁾		$V_{vert.}$	kN	0,57	0,71	0,71	0,86		0,71	0,86	0,86
recommended horizontal shear load ¹⁾		$V_{hori.}$	kN	0,26	0,43						

hollow silica brick KS-L 12DF		dimensions ≥ 498 x 175 x 238 mm	compressive strength ≥ 12 N/mm²				density ≥ 1,4 kg/dm³		producer e.g. Wemding (D)		
			M8	M8	M10	M12	M16	IG M6 ³⁾	IG M8 ³⁾	IG M10 ³⁾	
perforated sleeve			12	16	16	20	20	16	20	20	
anchorage depth		h_{ef}	mm	80	85; 130						
minimum wall thickness		h_{min}	mm	175							
installation torque		T_{inst}	Nm	2							
drilling method			rotation drilling								
critical edge distance		c_{cr}	mm	120							
critical axial distance parallel to horizontal joint		$s_{cr,II}$	mm	500							
critical axial distance perpendicular to horizontal joint		$s_{cr,T}$	mm	240							
minimal edge distance ²⁾		c_{min}	mm	c_{cr}							
minimal axial distance ²⁾		s_{min}	mm	s_{cr}							
recommended tension load ¹⁾		N_{zul}	kN	0,11	0,34						
recommended vertical shear load ¹⁾		$V_{vert.}$	kN	0,86	1,71						
recommended horizontal shear load ¹⁾		$V_{hori.}$	kN	0,36							

¹⁾ Conditions and assumptions for the recommended loads see page 15

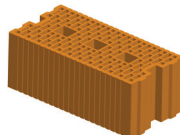
²⁾ Reduction factors see ETA 17/0378 and or UKTA-22/6266 ³⁾ not covered by ETA/UKTA

TECHNICAL DATA SHEET

E410+/EC410+

recommended loads in masonry

autocalved aerated concrete AAC		dimensions ≥ 499 x 249 x 240 mm	compressive strength ≥ 2 N/mm²				density ≥ 0,2 kg/dm³		producer e.g. Porit (D)		
			M8	M10	M12	M16	IG M6 ³⁾	IG M8 ³⁾	IG M10 ³⁾		
perforated sleeve			-	-	-	-	-	-	-		
anchorage depth	h_{ef}	mm	80	90	100	100	90	100	100		
minimum wall thickness	h_{min}	mm	240								
installation torque	T_{inst}	Nm	2								
drilling method			hammer drilling								
critical edge distance	c_{cr}	mm	120	135	150	150	135	150	150		
critical axial distance parallel to horizontal joint	$s_{cr,II}$	mm	240	270	300	300	270	300	300		
critical axial distance perpendicular to horizontal joint	$s_{cr,T}$	mm	240	270	300	300	270	300	300		
minimal edge distance ²⁾	c_{min}	mm	75								
minimal axial distance ²⁾	s_{min}	mm	100								
recommended tension load ¹⁾	N_{zul}	kN	0,89	1,43	1,79	2,32	1,43	1,79	2,32		
recommended vertical shear load ¹⁾	$V_{vert.}$	kN	2,14	3,03	3,57	3,57	1,79	3,21	3,57		
recommended horizontal shear load ¹⁾	$V_{hori.}$	kN	1,29	1,68	2,13	2,32	1,44	1,88	2,01		

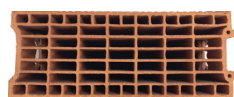
hollow clay brick Hlz-16DF		dimensions ≥ 497 x 240 x 238 mm	compressive strength ≥ 8 N/mm²				density ≥ 0,8 kg/dm³		producer e.g. Unipor (D)		
			M8	M8	M10	M12	M16	IG M6 ³⁾	IG M8 ³⁾	IG M10 ³⁾	
perforated sleeve			12	16	16	20	20	16	20	20	
anchorage depth	h_{ef}	mm	80	85; 130; 200							
minimum wall thickness	h_{min}	mm	240								
installation torque	T_{inst}	Nm	2								
drilling method			rotation drilling								
critical edge distance	c_{cr}	mm	120								
critical axial distance parallel to horizontal joint	$s_{cr,II}$	mm	500								
critical axial distance perpendicular to horizontal joint	$s_{cr,T}$	mm	240								
minimal edge distance ²⁾	c_{min}	mm	c_{cr}								
minimal axial distance ²⁾	s_{min}	mm	s_{cr}								
recommended tension load ¹⁾	N_{zul}	kN	0,34	0,43	0,43	0,57	0,57	0,43	0,57	0,57	
recommended vertical shear load ¹⁾	$V_{vert.}$	kN	0,71	1,14							
recommended horizontal shear load ¹⁾	$V_{hori.}$	kN	0,36								

¹⁾ Conditions and assumptions for the recommended loads see page 15

²⁾ Reduction factors see ETA 17/0378 and or UKTA-22/6266 ³⁾ not covered by ETA/UKTA

E410+/EC410+

recommended loads in masonry

hollow clay brick BGV Thermo			dimensions ≥ 500 x 200 x 314 mm		compressive strength ≥ 6 N/mm²				density ≥ 0,6 kg/dm³			producer e.g. Leroux (FR)	
					M8	M8	M10	M12	M16	IG M6 ³)	IG M8 ³)	IG M10 ³)	
perforated sleeve					12	16	16	20	20	16	20	20	
anchorage depth			h _{ef}	mm	80	85; 130							
minimum wall thickness			h _{min}	mm	200								
installation torque			T _{inst}	Nm	2								
drilling method					rotation drilling								
critical edge distance			c _{cr}	mm	120								
critical axial distance parallel to horizontal joint			s _{cr,II}	mm	500								
critical axial distance perpendicular to horizontal joint			s _{cr,T}	mm	314								
minimal edge distance ²)			c _{min}	mm	c _{cr}								
minimal axial distance ²)			s _{min}	mm	s _{cr}								
recommended tension load ¹)			N _{zul}	kN	0,11	0,14		0,17	0,14				
recommended vertical shear load ¹)			V _{vert.}	kN	0,57								
recommended horizontal shear load ¹)			V _{hori.}	kN	0,36								

hollow clay brick Calibric R+			dimensions ≥ 500 x 200 x 314 mm		compressive strength ≥ 6 N/mm²				density ≥ 0,6 kg/dm³			producer e.g. Terreal (FR)	
					M8	M8	M10	M12	M16	IG M6 ³)	IG M8 ³)	IG M10 ³)	
perforated sleeve					12	16	16	20	20	16	20	20	
anchorage depth			h _{ef}	mm	80	85; 130							
minimum wall thickness			h _{min}	mm	200								
installation torque			T _{inst}	Nm	2								
drilling method					rotation drilling								
critical edge distance			c _{cr}	mm	120								
critical axial distance parallel to horizontal joint			s _{cr,II}	mm	500								
critical axial distance perpendicular to horizontal joint			s _{cr,T}	mm	314								
minimal edge distance ²)			c _{min}	mm	c _{cr}								
minimal axial distance ²)			s _{min}	mm	s _{cr}								
recommended tension load ¹)			N _{zul}	kN	0,21								
recommended vertical shear load ¹)			V _{vert.}	kN	0,71	1,0	1,0	1,71	1,71	1,0	1,71	1,71	
recommended horizontal shear load ¹)			V _{hori.}	kN	0,36								

¹⁾ Conditions and assumptions for the recommended loads see page 15

²⁾ Reduction factors see ETA 17/0378 and or UKTA-22/6266 ³⁾ not covered by ETA/UKTA

E410+/EC410+

recommended loads in masonry

hollow clay brick Urbanbric		dimensions ≥ 560 x 200 x 274 mm	compressive strength ≥ 9 N/mm²			density ≥ 0,7 kg/dm³			producer e.g. Imerys (FR)		
			M8	M8	M10	M12	M16	IG M6	IG M8	IG M10	
perforated sleeve			12	16	16	20	20	16	20	20	
anchorage depth		h _{ef}	mm	80	85; 130						
minimum wall thickness		h _{min}	mm	200							
installation torque		T _{inst}	Nm	2							
drilling method			rotation drilling								
critical edge distance		c _{cr}	mm	120							
critical axial distance parallel to horizontal joint		s _{cr,II}	mm	500							
critical axial distance perpendicular to horizontal joint		s _{cr,T}	mm	274							
minimal edge distance ²⁾		c _{min}	mm	c _{cr}							
minimal axial distance ²⁾		s _{min}	mm	s _{cr}							
recommended tension load ¹⁾		N _{zul}	kN	0,26	0,34						
recommended vertical shear load ¹⁾		V _{vert.}	kN	0,86	1,0	1,0	1,14	1,14	1,0	1,14	1,14
recommended horizontal shear load ¹⁾		V _{hori.}	kN	0,36							

hollow clay brick Porotherm Homebric		dimensions ≥ 500 x 200 x 300 mm	compressive strength ≥ 6 N/mm²			density ≥ 0,7 kg/dm³			producer e.g. Wienerberger (FR)		
			M8	M8	M10	M12	M16	IG M6 ³⁾	IG M8 ³⁾	IG M10 ³⁾	
perforated sleeve			12	16	16	20	20	16	20	20	
anchorage depth		h _{ef}	mm	80	85; 130						
minimum wall thickness		h _{min}	mm	200							
installation torque		T _{inst}	Nm	2							
drilling method			rotation drilling								
critical edge distance		c _{cr}	mm	120							
critical axial distance parallel to horizontal joint		s _{cr,II}	mm	500							
critical axial distance perpendicular to horizontal joint		s _{cr,T}	mm	300							
minimal edge distance ²⁾		c _{min}	mm	c _{cr}							
minimal axial distance ²⁾		s _{min}	mm	s _{cr}							
recommended tension load ¹⁾		N _{zul}	kN	0,26	0,34						
recommended vertical shear load ¹⁾		V _{vert.}	kN	0,57		0,86		0,57		0,86	
recommended horizontal shear load ¹⁾		V _{hori.}	kN	0,36							

¹⁾ Conditions and assumptions for the recommended loads see page 15

²⁾ Reduction factors see ETA 17/0378 and or UKTA-22/6266 ³⁾ not covered by ETA/UKTA

E410+/EC410+

recommended loads in masonry

hollow clay brick Blocchi Leggeri			dimensions ≥ 250 X 120 X 250 mm		compressive strength ≥ 8 N/mm²				density ≥ 0,6 kg/dm³			producer e.g. Wienerberger (IT)		
					M8	M8	M10	M12	M16	IG M6 ³⁾	IG M8 ³⁾	IG M10 ³⁾		
perforated sleeve					12	16	16	20	20	16	20	20		
anchorage depth			h _{ef}	mm	80	85; 130; 200								
minimum wall thickness			h _{min}	mm	h _{ef} + 30mm									
installation torque			T _{inst}	Nm	2									
drilling method					rotation drilling									
critical edge distance			c _{cr}	mm	120									
critical axial distance parallel to horizontal joint			s _{cr,II}	mm	250									
critical axial distance perpendicular to horizontal joint			s _{cr,T}	mm	120									
minimal edge distance ²⁾			c _{min}	mm	c _{cr}									
minimal axial distance ²⁾			s _{min}	mm	s _{cr}									
recommended tension load ¹⁾			N _{zul}	kN	0,17									
recommended vertical shear load ¹⁾			V _{vert.}	kN	0,57									
recommended horizontal shear load ¹⁾			V _{hori.}	kN	0,43									

hollow clay brick Doppio Uni			dimensions ≥ 250 X 120 X 120 mm		compressive strength ≥ 20 N/mm²				density ≥ 0,9 kg/dm³			producer e.g. Wienerberger (IT)		
					M8	M8	M10	M12	M16	IG M6 ³⁾	IG M8 ³⁾	IG M10 ³⁾		
perforated sleeve					12	16	16	20	20	16	20	20		
anchorage depth			h _{ef}	mm	80	85; 130; 200								
minimum wall thickness			h _{min}	mm	h _{ef} + 30mm									
installation torque			T _{inst}	Nm	2									
drilling method					rotation drilling									
critical edge distance			c _{cr}	mm	120									
critical axial distance parallel to horizontal joint			s _{cr,II}	mm	250									
critical axial distance perpendicular to horizontal joint			s _{cr,T}	mm	120									
minimal edge distance ²⁾			c _{min}	mm	c _{cr}									
minimal axial distance ²⁾			s _{min}	mm	s _{cr}									
recommended tension load ¹⁾			N _{zul}	kN	0,26									
recommended vertical shear load ¹⁾			V _{vert.}	kN	0,57									
recommended horizontal shear load ¹⁾			V _{hori.}	kN	0,34									

¹⁾ Conditions and assumptions for the recommended loads see page 15

²⁾ Reduction factors see ETA 17/0378 and or UKTA-22/6266 ³⁾ not covered by ETA/UKTA

TECHNICAL DATA SHEET

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Chemical resistance

Chemical Agent	Concentration	Resistant	Not Resistant
Accumulator acid		•	
Acetic acid	40		•
Acetic acid	10	•	
Acetone	10		•
Ammonia, aqueous solution	5	•	
Aniline	100		•
Beer		•	
Benzene (kp 100-140°F)	100	•	
Benzol	100		•
Boric Acid, aqueous solution		•	
Calcium carbonate, suspended in water	all	•	
Calcium chloride, suspended in water		•	
Calcium hydroxide, suspended in water		•	
Carbon tetrachloride	100	•	
Caustic soda solution	10	•	
Citric acid	all	•	
Chlorine water, swimming pool	all	•	
Diesel oil	100	•	
Ethyl alcohol, aqueous solution	50		•
Formic acid	100		•
Formaldehyde, aqueous solution	30	•	
Freon		•	
Fuel Oil		•	
Gasoline (premium grade)	100	•	
Glycol (Ethylene glycol)		•	
Hydraulic fluid	conc.	•	
Hydrochloric acid (Muriatic Acid)	conc.		•
Hydrogen peroxide	30		•
Isopropyl alcohol	100		•
Lactic acid	all	•	
Linseed oil	100	•	
Lubricating oil	100	•	
Magnesium chloride, aqueous solution	all	•	
Methanol	100		•
Motor oil (SAE 20 W-50)	100	•	
Nitric acid	10		•
Oleic acid	100	•	
Perchloroethylene	100	•	
Petroleum	100	•	
Phenol, aqueous solution	8		•
Phosphoric acid	85	•	
Potash lye (Potassium hydroxide)	10	•	
Potassium carbonate, aqueous solution	all	•	
Potassium chlorite, aqueous solution	all	•	
Potassium nitrate, aqueous solution	all	•	
Sea water, salty	all	•	
Sodium carbonate	all	•	
Sodium Chloride, aqueous solution	all	•	
Sodium phosphate, aqueous solution	all	•	
Sodium silicate	all	•	
Standard Benzine	100	•	
Sulfuric acid	10	•	
Sulfuric acid	70		•
Tartaric acid	all	•	
Tetrachloroethylene	100	•	
Toluene			•
Trichloroethylene	100		•
Turpentine	100	•	

Results shown in the table are applicable to brief periods of chemical contact with full cured adhesive (e.g. temporary contact with adhesive during a spill).