VJ Technology

TECHNICAL DATA SHEET

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.

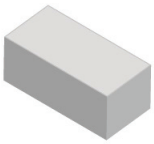
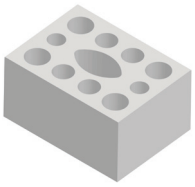
solid bricks			M8	M10	M12	M16	IG-M6	IG-M8	IG-M10
nominal drill hole diameter	d_o	[mm]	10	12	14	18	10	12	16
embedment depth	h_{ef}	[mm]	80	90	100	100	90	100	100
bore hole depth	h_o	[mm]	80	90	100	100	90	100	100
diameter of clearance hole in fixture	d_f	[mm]	9	12	14	18	7	9	12
diameter of steel brush	$d_b \geq$	[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 16x130 16x200	16x85 16x130 16x200	20x85 20x130 20x200	20x85 20x130 20x200	16x85 16x130 16x200	20x85 20x130 20x200	20x85 20x130 20x200
nominal drill hole diameter	d_o	[mm]	12	16	16	20	20	16	20	20
embedment depth	h_{ef}	[mm]	80	85 130 200	85 130 200	85 130 200	85 130 200	85 130 200	85 130 200	85 130 200
bore hole depth	h_o	[mm]	85	90 135 205	90 135 205	90 135 205	90 135 205	90 135 205	90 135 205	90 135 205
diameter of clearance hole in fixture	d_f	[mm]	9	9	12	14	18	7	9	12
diameter of steel brush	$d_b \geq$	[mm]	14	18	18	22	22	18	22	22

E410+/EC410+

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/mm²]	density [kg/dm³]	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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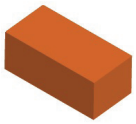
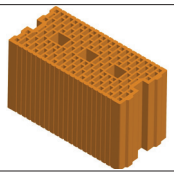
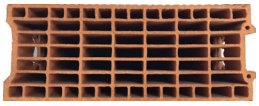
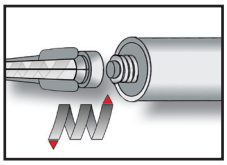
Tested stones

	type	figure	dimensions l x b x h [mm]	compressive strength [N/mm²]	density [kg/dm³]	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 aerated concrete AAC		≥ 499 x 240 x 249	≥ 2	≥ 0,6	e.g. Porrit (D)

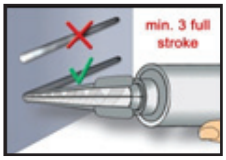
E410+/EC410+

Installation instructions

Preparation of cartridge

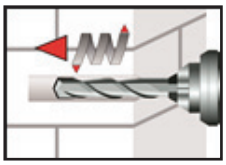


1. Remove the cap and attach the supplied static-mixing nozzle to the cartridge and load the cartridge into the correct dispensing tool. In case of a foil tube cartridge, cut off the clip before use. For every working interruption longer than the recommended working time (Table B4) as well as for new cartridges, a new static-mixer shall be used.

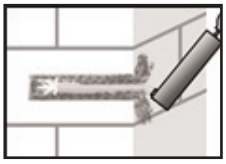


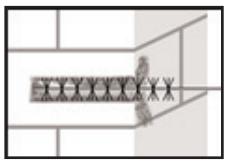
2. Initial adhesive is not suitable for fixing the anchor. Prior to dispensing into the anchor hole, squeeze out separately a minimum of three full strokes, for foil tube cartridges six full strokes and discard non-uniformly mixed adhesive components until the mortar shows a consistent grey colour.

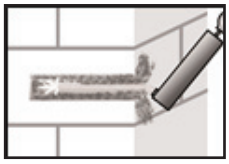
Installation in solid masonry (without sleeve)



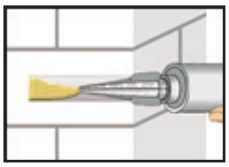
3. Holes to be drilled perpendicular to the surface of the base material by using a hard-metal tipped hammer drill bit. Drill a hole, with drilling method according to Annex C4-C45, into the base material, with nominal drill hole diameter and bore hole depth according to the size and embedment depth required by the selected anchor. In case of aborted drill hole the drill hole shall be filled with mortar.



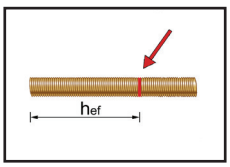




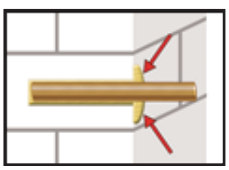
4. Blow out from the bottom of the bore hole two times. Attach the brush to a drilling machine or a battery screwdriver, brush the hole clean two times, and finally blow out the hole again two times.

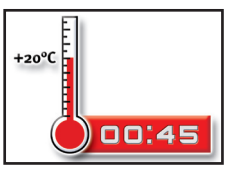


5. Starting from the bottom or back of the cleaned anchor hole, fill the hole up to min two-thirds with adhesive. Slowly withdraw the static mixing nozzle will avoid creating air pockets. Observe the gel-/ working times given in Table B4.

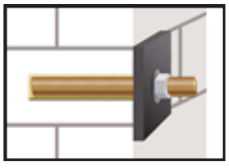


6. The position of the embedment depth shall be marked on the threaded rod. Push the threaded rod into the anchor hole while turning slightly to ensure positive distribution of the adhesive until the embedment depth is reached. The anchor shall be free of dirt, grease, oil or other foreign material.





7. Be sure that the anular 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).

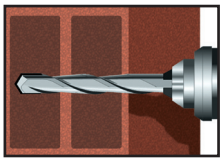


9. After full curing, the fixture can be installed with up to the max. installation torque (see parameters of brick Annex C4 to Annex C45) by using a calibrated torque wrench.

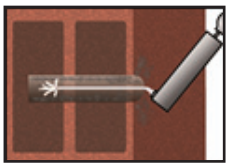
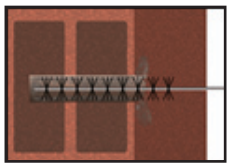
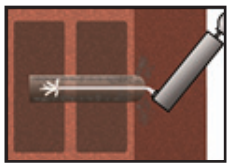
E410+/EC410+

Installation instructions

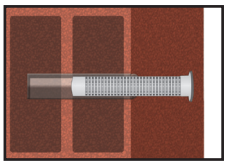
Installation in solid and hollow masonry (with sleeve)



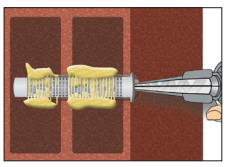
3. Holes to be drilled perpendicular to the surface of the base material by using a hard-metal tipped hammer drill bit. Drill a hole, with drill method according to Annex C4 – C45, into the base material, with nominal drill hole diameter and bore hole depth according to the size and embedment depth required by the selected anchor.

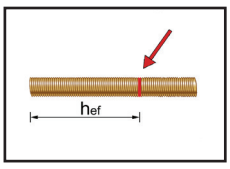
4. Blow out from the bottom of the bore hole two times. Attach the brush to a drilling machine or a battery screwdriver, brush the hole clean two times, and finally blow out the hole again two times.

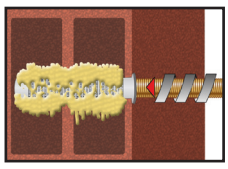


5. Insert the perforated sleeve flush with the surface of the masonry or plaster. Only use sleeves that have the right length. Never cut the sleeve.

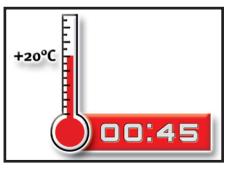


6. Starting from the bottom or back fill the sleeve with adhesive. For embedment depth equal to or larger than 130 mm an extension nozzle shall be used. For quantity of mortar attend cartridges label installation instructions.Observe the gel-/ working times given in Table B4.

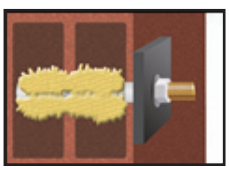




7. The position of the embedment depth shall be marked on the threaded rod. Push the threaded rod into the anchor hole while turning slightly to ensure positive distribution of the adhesive until the embedment depth is reached. The anchor shall be free of dirt, grease, oil or other foreign material.



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.

E410+/EC410+

Cleaning - masonry

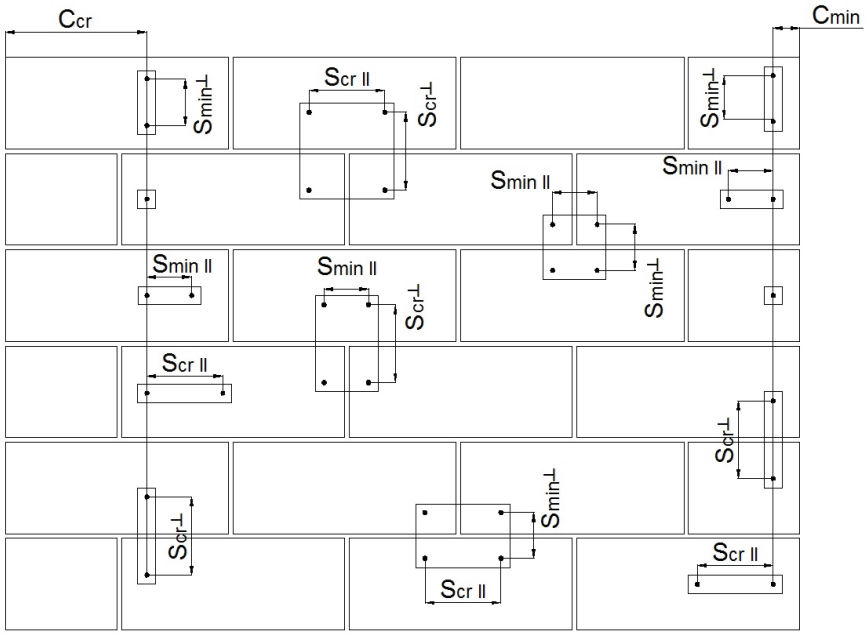
- Brush:

- Blower

Calculation of recommended loads

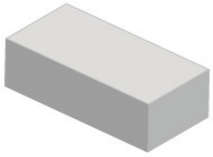
The recommended loads are only valid under the following conditions. For a more detailed design see ETA-17/0378 and or UKTA-22/6266:

- 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



E410+/EC410+

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						

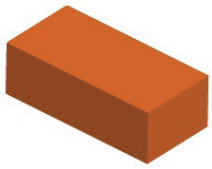
1) Conditions and assumtions for the recommended loads see page 15

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

3) not covered by ETA/UKTA

E410+/EC410+

recommended loads in masonry

solid clay brick Mz-1DF		**dimensions** ≥ 240 x 115 x 55	**compressive strength** ≥ 10 N/mm²	**density** ≥ 1,6 kg/dm³	**producer** 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

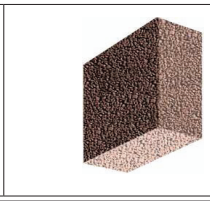
[1] Conditions and assumtions for the recommended loads see page 15

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

[3] not covered by ETA/UKTA

E410+/EC410+

recommended loads in masonry

solid light weight concrete 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	$s_{cr,II}$	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	0,57						
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 concrete 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	$s_{cr,II}$	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	0,57	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 assumtions 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 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	$s_{cr,II}$	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	$s_{cr,II}$	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							

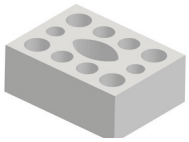
[1] Conditions and assumtions for the recommended loads see page 15

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

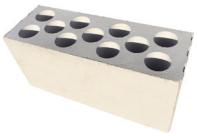
[3] not covered by ETA/UKTA

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 assumtions for the recommended loads see page 15

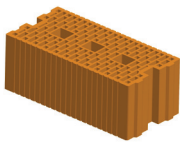
[2] Reduction factors see ETA 17/0378 and or UKTA-22/6266 [3] not covered by ETA/UKTA

E410+/EC410+

recommended loads in masonry

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)

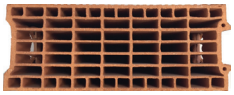
			M8	M8	M10	M12	M16	IG M6 [3]	IG M8 [3]	IG M10 [3]
perforated sleeve			12	16	16	20	20	16	20	20
anchorage depth	h_{ef}	mm	80	85; 130; 200						
minimum wall thickness	h_{min}	mm	240							
installation torque	T_{inst}	Nm	2							
drilling method			rotation drilling							
critical edge distance	c_{cr}	mm	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 assumtions 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)

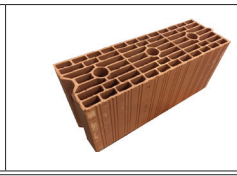
			M8	M8	M10	M12	M16	IG M6 [3]	IG M8 [3]	IG M10 [3]
perforated sleeve			12	16	16	20	20	16	20	20
anchorage depth	h_{ef}	mm	80	85; 130						
minimum wall thickness	h_{min}	mm	200							
installation torque	T_{inst}	Nm	2							
drilling method			rotation drilling							
critical edge distance	c_{cr}	mm	120							
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 assumtions 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 assumtions 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 assumtions 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+

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		•
Isopropyi 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).