

# Loads

## Frame fixing DuoXpand

Permissible loads<sup>1/2/3)</sup> of a single anchor as part of a multiple fixing of non-structural systems. For the design the complete current assessment ETA-21/0324 has to be considered.

Type			DuoXpand 8		DuoXpand 10		
Anchor diameter	d	[mm]					
<b>Anchorage in concrete <math>\geq</math> C16/20<sup>4)</sup></b>							
Anchorage depth	$h_{nom} \geq$	[mm]	50	70	50	70	-
Permissible tensile load $N_{perm}$		[kN]	1.39	1.59	1.59	1.79	-
Permissible shear load $V_{perm}$	zinc coated screws (gvz)	[kN]	4.23	4.23	5.98	5.98	-
	stainless steel screw (R)	[kN]	3.93	3.93	5.98	5.98	-
Minimum member thickness	$h_{min}$	[mm]	80	100	80	100	-
Characteristic edge distance	$c_{ct,N}$	[mm]	50	50	50	50	-
Characteristic spacing	a resp. $s_{ct,N}$	[mm]	65	70	70	80	-
Minimum spacing with an edge distance	$s_{min}$	[mm]	50	50	50	50	-
	$c \geq$	[mm]	100	100	100	100	-
Minimum edge distance with a spacing	$c_{min}$	[mm]	50	50	50	50	-
	$s \geq$	[mm]	100	100	100	100	-
<b>Anchorage in masonry<sup>5/6)</sup></b>							
Anchorage depth	$h_{nom}$	[mm]	50	70	50	70	140
Permissible load $F_{perm}$ in solid brick Mz, e.g. Ziegelwerk Nordhausen	$\geq NF; \geq 10 [N/mm^2] / \rho \geq 1.8 [kg/dm^3]$	[kN]	0.43	0.43	0.26	0.26	-
	$\geq NF; \geq 20 [N/mm^2] / \rho \geq 1.8 [kg/dm^3]$	[kN]	0.86	1.00	0.57	0.57	-
Permissible load $F_{perm}$ in solid sand-lime brick KS, e.g. Wemding	$\geq NF; \geq 10 [N/mm^2] / \rho \geq 2.0 [kg/dm^3]$	[kN]	0.43	0.57	0.57	0.57	-
	$\geq NF; \geq 20 [N/mm^2] / \rho \geq 2.0 [kg/dm^3]$	[kN]	1.00	1.14	1.14	1.14	-
Permissible load <sup>7)</sup> $F_{perm}$ in lightweight concrete block Vbl, e.g. KLB	$\geq 2 DF; \geq 2 [N/mm^2] / \rho \geq 1.4 [kg/dm^3]$	[kN]	0.11	0.17	0.09	0.17	-
	$\geq 2 DF; \geq 4 [N/mm^2] / \rho \geq 1.4 [kg/dm^3]$	[kN]	0.21	0.34	0.17	0.34	-
Permissible load <sup>7)</sup> $F_{perm}$ in vertically perforated brick HLZ, e.g. Schlagmann	$3 DF; \geq 10 [N/mm^2] / \rho \geq 0.9 [kg/dm^3]$	[kN]	0.21	0.34	0.21	0.34	-
	$3 DF; \geq 12 [N/mm^2] / \rho \geq 0.9 [kg/dm^3]$	[kN]	0.26	0.43	0.26	0.43	-
Permissible load $F_{perm}$ in perforated sand-lime brick KSL, e.g. Wemding	$3 DF; \geq 8 [N/mm^2] / \rho \geq 1.4 [kg/dm^3]$	[kN]	0.26	0.21	0.17	0.26	-
	$3 DF; \geq 16 [N/mm^2] / \rho \geq 1.4 [kg/dm^3]$	[kN]	0.43	0.43	0.34	0.57	-
Permissible load <sup>7)</sup> $F_{perm}$ in hollow lightweight concrete blocks Hbl, e.g. Knobel, DE	$16 DF; \geq 2 [N/mm^2] / \rho \geq 0.7 [kg/dm^3]$	[kN]	0.14	0.14	0.21	0.21	-
	$16 DF; \geq 4 [N/mm^2] / \rho \geq 0.7 [kg/dm^3]$	[kN]	0.26	0.26	0.43	0.43	-
Permissible load <sup>7)</sup> $F_{perm}$ in hollow lightweight concrete blocks Hbl, eg. Sepa Parpaing, FR	$\geq 2 [N/mm^2] / \rho \geq 1.0 [kg/dm^3]$	[kN]	0.09	-	0.14	0.14	-
	$\geq 4 [N/mm^2] / \rho \geq 1.0 [kg/dm^3]$	[kN]	0.21	0.14	0.26	0.26	0.14
Minimum member thickness	$h_{min}$	[mm]	115	115	115	115	200
Minimum spacing (single anchor)	$a_{min}$	[mm]	250	250	250	250	250
Minimum spacing (anchor group)	$s_{min}$	[mm]	100	100	100	100	100
Minimum edge distance (anchor group)	$c_{min}$	[mm]	100	100	100	100	100
<b>Anchorage in aerated concrete<sup>8)</sup></b>							
Anchorage depth	$h_{nom} \geq$	[mm]	70	-	70	-	-
Permissible load $F_{perm}$ in aerated concrete, acc.to EN 771-4:2011+A1:2015	AAC 2	[kN]	0.11	-	0.14	-	-
	AAC 4	[kN]	0.27	-	0.21	-	-
	AAC 6	[kN]	0.54	-	0.32	-	-
Permissible load $F_{perm}$ in reinforced aerated concrete, acc. to EN 12602:2016	AAC 4; $f_{ck} \geq 4 N/mm^2$	[kN]	-	-	0.18	-	-
	AAC 6; $f_{ck} \geq 6 N/mm^2$	[kN]	-	-	0.32	-	-
Minimum member thickness	$h_{min}$	[mm]	100 / 175 <sup>8)</sup>	-	100 / 175 <sup>8)</sup>	-	-
Minimum spacing (single anchor)	$a_{min}$	[mm]	250	-	250	-	-
Minimum spacing (anchor group)	$s_{min}$	[mm]	100 / 80 <sup>8)</sup>	-	100 / 80 <sup>8)</sup>	-	-
Minimum edge distance (anchor group)	$c_{min}$	[mm]	100	-	100	-	-

<sup>1)</sup> Valid for zinc coated screws (gvz) and for screws made of stainless steel (R). For exterior use of the zinc coated screws measures against incoming humidity according to assessment have to be taken.

<sup>2)</sup> The required partial safety factors for material resistance as well as a partial safety factor for load actions  $\gamma_L = 1.4$  are considered.

As a single anchor counts e.g. an anchor with a minimum spacing a according to the ETA.

<sup>3)</sup> Valid for temperatures in the substrate up to +50 °C (resp. short term up to +80 °C). For long term temperatures up to +30 °C higher permissible loads may be possible.

<sup>4)</sup> For concrete specifications in C12/15, see ETA.

<sup>5)</sup> Stone property data in min. compressive strength  $[N/mm^2]$  and bulk density  $[kg/dm^3]$ . Corresponding mean compressive strengths according to EN 771 and other brick variants or brick geometries are listed in the ETA.

<sup>6)</sup> Load data are valid for tensile load, shear load and oblique load under any angle. For bending moments and invisible or not mortar-filled joints the design specifications of the ETA must be observed.

<sup>7)</sup> Rotary drilling method.

<sup>8)</sup> Only valid for groups of anchors in AAC with compression strength  $\geq 6 N/mm^2$ .