

**Declaration of Performance**  
DoP TNUX-n-en



1. Product type: Frame plastic anchor TNUX
2. Identification:
  - TNUXA Frame plastic anchor with countersunk head
  - TNUXE Frame plastic anchor with hexagonal head with integrated washer
  - TNXA4 Frame plastic anchor with countersunk head, stainless steel version
  - TNXE4 Frame plastic anchor with hexagonal head with integrated washer, stainless steel version
3. Intended use "a":
  - Generic type: Plastic anchor of 8 & 10 diameter for multiple use for non-structural applications
  - Base material: Concrete with strength class C12/15 at minimum and C50/60 at maximum according to EN 206-1:2000-12  
Cracked and non-cracked concrete.
  - Material / durability: Polyamide, PA 6, light grey color.
    - a) Carbon Steel grade 5.8, galvanized min. 5 microns acc. to ISO 2081 to be used in dry internal conditions.
    - b) Stainless Steel A4/70 (AISI 316) acc. to ISO 3506-1 and EN 10088-3 to be used in dry internal conditions and also to external atmospheric exposure (including industrial and marine environment) or exposure in permanently damp internal condition if no particular aggressive conditions exist.
  - Loading: Static or quasi static loads.
  - Temperature range: -40 °C to +40 °C (max long term temperature: +24 °C; max short term temperature: +40 °C).  
-40 °C to +80 °C (max long term temperature: +50 °C; max short term temperature: +80 °C).
  - Fire resistance: TNUXØ10 fire resistance at least 90 minutes (R90) if the admissible load  $F_{Rk}/(\gamma_M \cdot \gamma_F) \leq 0.8kN$ .
  - Assumed working life: 50 years.
- Intended use "b":
  - Generic type: Plastic anchor of 8 & 10 diameter for multiple use in solid masonry for non-structural applications.
  - Base material: Solid masonry. Mortar strength class  $\geq$  M2.5 EN 998-2.
  - Material / durability: Polyamide, PA 6, light grey color.
    - a) Carbon Steel grade 5.8, galvanized min. 5 microns acc. to ISO 2081 to be used in dry internal conditions.
    - b) Stainless Steel A4/70 (AISI 316) acc. to ISO 3506-1 and EN 10088-3 to be used in dry internal conditions and also to external atmospheric exposure (including industrial and marine environment) or exposure in permanently damp internal condition if no particular aggressive conditions exist.
  - Loading: Static or quasi static loads.
  - Temperature range: -40 °C to +40 °C (max long term temperature: +24 °C; max short term temperature: +40 °C).  
-40 °C to +80 °C (max long term temperature: +50 °C; max short term temperature: +80 °C).
  - Fire resistance: TNUXØ10 fire resistance at least 90 minutes (R90) if the admissible load  $F_{Rk}/(\gamma_M \cdot \gamma_F) \leq 0.8kN$ .
  - Assumed working life: 50 years.

Intended use "c":

Generic type:	Plastic anchor of 8 & 10 diameter for multiple use in hollow masonry for non-structural applications.
Base material:	Hollow masonry. Mortar strength class $\geq$ M2.5 EN 998-2.
Material / durability:	Polyamide, PA 6, light grey color. a) Carbon Steel grade 5.8, galvanized min. 5 microns acc. to ISO 2081 to be used in dry internal conditions. b) Stainless Steel A4/70 (AISI 316) acc. to ISO 3506-1 and EN 10088-3 to be used in dry internal conditions and also to external atmospheric exposure (including industrial and marine environment) or exposure in permanently damp internal condition if no particular aggressive conditions exist.
Loading:	Static or quasi static loads.
Temperature range:	-40 °C to +40 °C (max long term temperature: +24 °C; max short term temperature: +40 °C). -40 °C to +80 °C (max long term temperature: +50 °C; max short term temperature: +80 °C).
Fire resistance:	TNUXØ10 fire resistance at least 90 minutes (R90) if the admissible load $F_{Rk}/(\gamma_M \cdot \gamma_F) \leq 0.8kN$ .
Assumed working life:	50 years.

Intended use "d":

Generic type:	Plastic anchor of 8 & 10 diameter for multiple use in aerated concrete blocks for non-structural applications.
Base material:	Aerated concrete blocks. Mortar strength class $\geq$ M2.5 EN 998-2.
Material / durability:	Polyamide, PA 6, light grey color. a) Carbon Steel grade 5.8, galvanized min. 5 microns acc. to ISO 2081 to be used in dry internal conditions. b) Stainless Steel A4/70 (AISI 316) acc. to ISO 3506-1 and EN 10088-3 to be used in dry internal conditions and also to external atmospheric exposure (including industrial and marine environment) or exposure in permanently damp internal condition if no particular aggressive conditions exist.
Loading:	Static or quasi static loads.
Temperature range:	-40 °C to +40 °C (max long term temperature: +24 °C; max short term temperature: +40 °C). -40 °C to +80 °C (max long term temperature: +50 °C; max short term temperature: +80 °C).
Fire resistance:	TNUXØ10 fire resistance at least 90 minutes (R90) if the admissible load $F_{Rk}/(\gamma_M \cdot \gamma_F) \leq 0.8kN$ .
Assumed working life:	50 years.

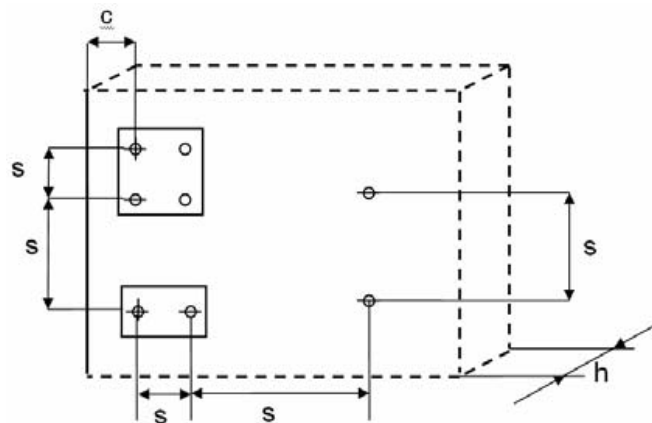
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|----|--------------------------------------|--|
| 4. | Manufacturer:                        | Index Fixing Systems. Técnicas Expansivas S.L.<br>Segador, 13<br>26006 Logroño, La Rioja, ESPAÑA   |
| 5. | Authorized representative:           | Not applicable   |
| 6. | System of assessment of performance: | 2+   |
| 7. | Harmonized standard:                 | Not applicable   |
| 8. | European technical assessment :      | Tech. assessment body:<br>issued:<br>on the basis of:<br>performed:<br><br>under system:<br>and issued   |
|    |                                      | Instituto de Ciencias de la Construcción Eduardo Torroja (IETcc); notified body 1219.<br>ETA 14/0467<br>ETAG 020, parts 1, 2, 3 y 4.<br>Determination of product type, initial inspection of the manufacturing plant and continuous surveillance of FPC.<br>2+<br>Certificate CE 1219-CPR-0088 |

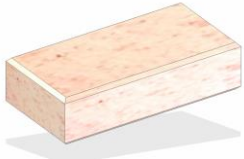
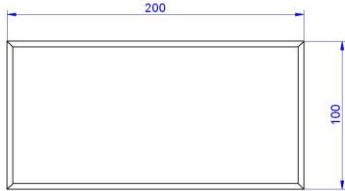
9. Declared performances:


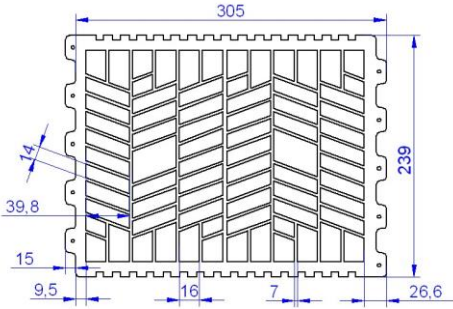
Installation parameters			TNUX-n Ø8		TNUX-n Ø10	
			Zinc plated	Stainless steel	Zinc plated	Stainless steel
$d_{nom}$	Outside diameter of anchor:	[mm]	8		10	
$d_0$	Nominal diameter of drill bit:	[mm]	8		10	
$d_f$	Fixture clearance hole diameter:	[mm]	8 ÷ 8,5		10 ÷ 11,0	
$d_f$	Fixture clearance hole diameter AAC:	[mm]	8 ÷ 8,2		10 ÷ 10,2	
$L_{min}$	Minimum anchor length:	[mm]	80		80	
$L_{max}$	Maximum anchor length:	[mm]	250		300	
$h_1$	Depth of drilled hole:	[mm]	90		90	
$h_{nom}$	Overall anchor embedm. depth in the concrete:	[mm]	70		70	
$h_{ef}$	Effective anchorage depth:	[mm]	70		70	
$t_{fix}$	Fixture thickness:	[mm]	L – 70		L – 70	
$d_s$	Screw diameter:	[mm]	6		7	
$l_s$	Length of screw:	[mm]	L + 6		L + 6	
$l_t$	Length of screw thread:	[mm]	80		80	
T	Hexalobular socket number (ISO 10664):	[-]	30		40	
SW	Wrench size (for hexagonal head only):	[mm]	10		13	
	Installation temperature:	[°C]	0 ÷ +40			
	Service temperature:	[°C]	-40 ÷ +80			
	maximum long term temperature:	[°C]	+50			
	maximum short term temperature:	[°C]	+80			
Characteristic resistance of screws						
$N_{Rk,s}$	Characteristic tension resistance:	[kN]	11,3	13,2	15,3	17,9
$\gamma_{Ms}$	Partial safety factor: <sup>*)</sup>	[-]	1,64	1,87	1,64	1,87
$V_{Rk,s}$	Characteristic shear resistance:	[kN]	6,5	7,6	9,0	10,5
$\gamma_{Ms}$	Partial safety factor: <sup>*)</sup>	[-]	1,36	1,55	1,36	1,55
$M_{Rk,s}$	Characteristic bending resistance:	[Nm]	10,2	11,9	16,8	19,6
$\gamma_{Ms}$	Partial safety factor: <sup>*)</sup>	[-]	1,36	1,55	1,36	1,55
<p>*) In absence of other national regulations.            Shear loads acting on an anchor may be assumed to act without lever arm if both of the following conditions are fulfilled.</p> <ul style="list-style-type: none"> <li>The fixture shall be made of metal and in the area of the anchorage be fixed directly to the base material either without an intermediate layer or with a leveling layer of mortar with a thickness <math>\leq 3</math> mm.</li> <li>The fixture shall be in contact with the anchor over its entire thickness. (Therefore the diameter of clearance hole in the fixture <math>d_f</math> has to be equal or smaller than the value given in installation parameters table)</li> </ul> <p>If these two conditions are not fulfilled the lever arm is calculated according to ETAG 020, Annex C. The characteristic bending moment is given in table above</p>						

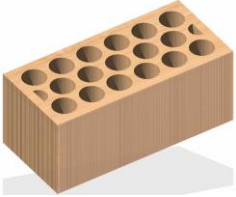
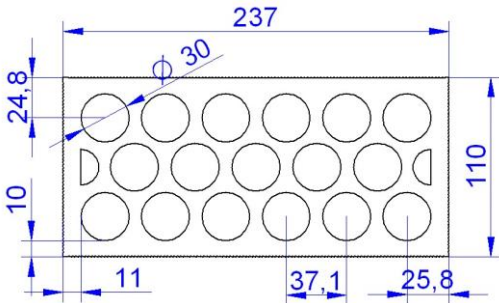
Characteristic resistance in cracked and uncracked concrete (use category "a")				TNUX-n Ø8		TNUX-n Ø10	
				Zinc plated	Stainless steel	Zinc plated	Stainless steel
<b>Plastic sleeve pull out resistance for use in concrete</b>							
Temperature range				24/40°C	50/80°C	24/40°C	50/80°C
N <sub>Rk,p</sub>	Characteristic pull out resistance:	C12/15	[kN]	2,5	2,5	3,5	3,0
		≥ C16/20	[kN]	3,5	3,5	5,0	4,5
Y <sub>Mp</sub>	Partial safety factor: <sup>*)</sup>		[-]	1.8			
<b>Concrete cone failure and concrete edge failure for single anchor and anchor group</b>							
N <sub>Rk,c</sub>	Tension resistance: <sup>**)</sup>	[kN]	$N_{Rk,c} = 7.2 \sqrt{f_{ck,cubo}} \cdot h_{ef}^{1.5} \frac{c}{c_{cr,N}} \quad \text{con:} \quad h_{ef}^{1.5} = \frac{N_{Rk,p}}{7.2 \cdot \sqrt{f_{ck,cubo}}}; \frac{c}{c_{cr,N}} \leq 1$				
V <sub>Rk,c</sub>	Shear resistance: <sup>**)</sup>	[kN]	$V_{Rk,c} = 0.45 \sqrt{d_{nom}} \left( \frac{h_{nom}}{d_{nom}} \right)^{0.2} \cdot \sqrt{f_{ck,cubo}} \cdot c_1^{1.5} \left( \frac{c_2}{1.5c_1} \right)^{0.5} \left( \frac{h}{1.5c_1} \right)^{0.5} \quad \text{con:} \quad \left( \frac{c_2}{1.5c_1} \right)^{0.5} \leq 1; \left( \frac{h}{1.5c_1} \right)^{0.5} \leq 1$ <p>c<sub>1</sub>: edge distance closest to the edge in loading direction.  c<sub>2</sub>: edge distance perpendicular to direction 1.  f<sub>ck,cubo</sub>: nominal characteristic concrete compression strength (based on cubes)</p>				
Y <sub>Mc</sub>	Partial safety factor: <sup>*)</sup>	[-]	1.8				
<b>Displacements under tension loads</b>							
N	Service tension load in concrete:	[kN]	1.19		1.79		
δ <sub>N0</sub>	Displacements:	[mm]	0.77		0.81		
δ <sub>N∞</sub>		[mm]	1.54		1.62		
<b>Displacements under shear loads</b>							
V	Service tension load in concrete:	[kN]	1.19		1.79		
δ <sub>V0</sub>	Displacements:	[mm]	0.70	0.12	0.83	0.34	
δ <sub>V∞</sub>		[mm]	1.05	0.18	1.24	0.51	
<b>Minimum thickness of the member, edge distance and spacing in concrete</b>							
Concrete type			C12/15	≥ C16/20	C12/15	≥ C16/20	
h <sub>min</sub>	Minimum thickness of the member:	[mm]	100		100		
c <sub>cr,N</sub>	Characteristic edge distance: <sup>***)</sup>	[mm]	140	100	140	100	
s <sub>min</sub>	Minimum allowable spacing: <sup>***)</sup>	[mm]	85	60	100	70	
c <sub>min</sub>	Minimum allowable edge distance: <sup>***)</sup>	[mm]	85	60	100	70	
<sup>*)</sup> In absence of other national regulations <sup>**) Design method according to ETAG 020, annex C  <sup>***) Intermediate value by linear interpolation </sup></sup>							


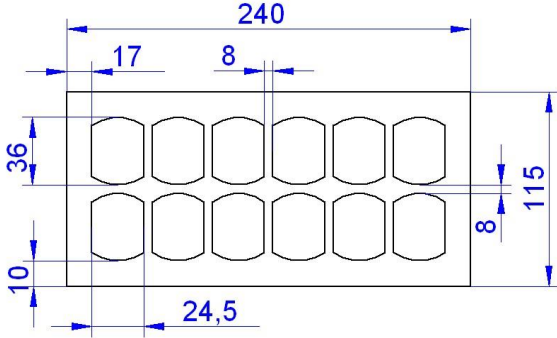
### Scheme of edge distance and spacing in concrete



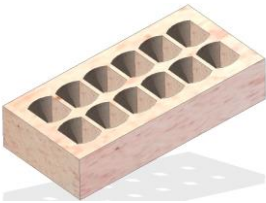
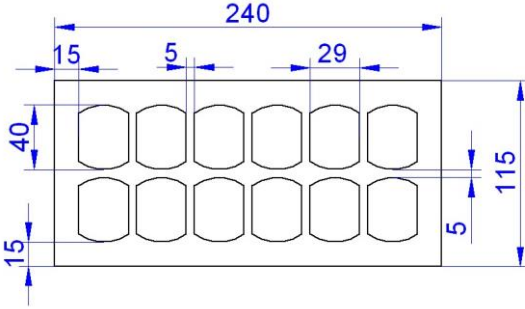
Characteristic resistance in solid masonry (use category "b")			Performance	
			TNUX-n Ø8	TNUX-n Ø10
<b>Brick no 1: Adoquín 200 x 100 x 50 mm. Ladrillería Técnica.</b>				
Use category	B			
Size:	200 x 100 x 50 mm			
Type:	EN 771-1			
Manufacturer:	Ladrillería Técnica S.A.			
Commercial name:	Adoquin			
Bulk density class $\rho$ :	2060 kg/m <sup>3</sup>			
Minimum compressive strength $f_B$	30 N/mm <sup>2</sup>			
Drill method	Rotary + hammer			
<b>Plastic sleeve pull out failure</b>				
$F_{rk}$	Characteristic resistance <sup>*)</sup>	[kN]	1,5	2,0
$\gamma_{Mc}$	Partial safety factor: <sup>**)</sup>	[-]	2.5	
<b>Displacements under tension loads</b>				
N	Service tension load in solid masonry:	[kN]	0,26	0,26
$\bar{\delta}_{N0}$	Displacements:	[mm]	0,46	0,19
$\bar{\delta}_{N\infty}$		[mm]	0,92	0,38
<b>Displacements under shear loads</b>				
V	Service shear load in solid masonry:	[kN]	0,26	0,26
$\bar{\delta}_{V0}$	Displacements:	[mm]	0,22	0,22
$\bar{\delta}_{V\infty}$		[mm]	0,33	0,33
<b>Minimum spacing, edge distance and member thickness</b>				
$h_{min}$	Minimum thickness of the member:	[mm]	100	100
<b>Single anchor</b>				
$s_{min}$	Minimum spacing	[mm]	250	250
$c_{min}$	Minimum edge distance:	[mm]	100	100
<b>Anchor group</b>				
$s_{1,min}$	Spacing perpendicular to free edge:	[mm]	200	200
$s_{2,min}$	Spacing parallel to free edge:	[mm]	400	400
$c_{min}$	Minimum edge distance:	[mm]	100	100
				
<p>*) Characteristic resistance <math>F_{Rk}</math> for tension, shear or combined tension and shear loading, is valid for single plastic anchor, for a group of two or four plastic anchors with spacing equal or larger than the minimum spacing <math>s_{min}</math>.</p> <p>**) In absence of other national regulations.</p> <p>The characteristic values of resistance of the anchor for use in solid masonry are independent of the load direction (tension, shear or combined tension and shear) and the mode of failure.</p> <p>The characteristic resistances given above for use in solid masonry are only valid for the base material and the bricks according this table or larger brick sizes and larger compressive strength of the masonry unit.</p> <p>The influence of larger embedment depths, lower mortar strength and/or different bricks, regarding base material, size of the units, compressive strength, has to be detected by job site tests according to annex E.</p> <p>The mortar strength class of the masonry has to be M5 according to EN 998-2:2003 at minimum.</p> <p>The distance between single plastic anchors or a group of anchors should be a <math>\geq 250</math> mm.</p> <p>If the vertical joints of the wall are designed not to be filled with mortar then the design resistance <math>N_{Rd}</math> has to be limited to 2,0 kN to ensure that a pull-out of one brick out of the wall will be prevented. This limitation can be omitted if interlocking units are used for the wall or when the joints are designed to be filled with mortar.</p> <p>If the joints of the masonry are not visible the characteristic resistance <math>F_{Rk}</math> has to be reduced with the factor <math>\alpha_j = 0,5</math>.</p> <p>If the joints of the masonry are visible (e.g. unplastered wall) following has to be taken into account:</p> <ul style="list-style-type: none"> <li>- The characteristic resistance <math>F_{Rk}</math> may be used only, if the wall is designed such that the joints are to be filled with mortar.</li> <li>- If the wall is designed such that the joints are not to be filled with mortar then the characteristic resistance <math>F_{Rk}</math> may be used only, if the minimum edge distance <math>c_{min}</math> to the vertical joints is observed. If this minimum edge distance <math>c_{min}</math> cannot be observed then the characteristic resistance <math>F_{Rk}</math> has to be reduced with the factor <math>\alpha_j = 0,5</math>.</li> </ul>				


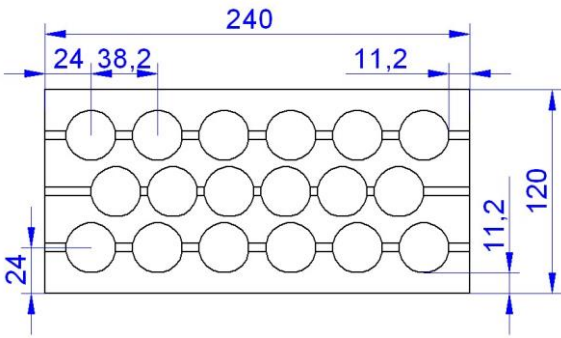
Characteristic resistance in hollow or perforated masonry (use category "c")			Performance	
			TNUX-n Ø8	TNUX-n Ø10
<b>Brick no 2: Termoarcilla de 24: 237 x 305 x 191 mm. Cerabrick</b>				
Use category	c			
Size:	237 x 305 x 191 mm			
Type:	EN 771-1			
Manufacturer:	Cerabrick Grupo Cerámico			
Commercial name:	Termoarcilla de 24			
Bulk density class $\rho$ :	855 kg/m <sup>3</sup>			
Minimum compressive strength $f_B$ :	12.5 N/mm <sup>2</sup>			
Drill method:	Rotary			
<b>Plastic sleeve pull out failure</b>				
$F_{rk}$	Characteristic resistance: <sup>1)</sup>	[kN]	0,75	0,5
$\gamma_{Mc}$	Partial safety factor: <sup>2)</sup>	[-]	2,5	
<b>Displacements under tension loads</b>				
N	Service tension load in hollow masonry:	[kN]	0,21	0,14
$\bar{\delta}_{N0}$	Displacements:	[mm]	0,80	0,30
$\bar{\delta}_{N\infty}$		[mm]	1,60	0,60
<b>Displacements under shear loads</b>				
V	Service shear load in hollow masonry:	[kN]	0,21	0,14
$\bar{\delta}_{V0}$	Displacements:	[mm]	0,18	0,12
$\bar{\delta}_{V\infty}$		[mm]	0,27	0,18
<b>Minimum spacing, edge distance and member thickness</b>				
$h_{min}$	Minimum thickness of the member:	[mm]	237	237
<b>Single anchor</b>				
$s_{min}$	Minimum spacing	[mm]	250	250
$c_{min}$	Minimum edge distance:	[mm]	100	100
<b>Anchor group</b>				
$s_{1,min}$	Spacing perpendicular to free edge:	[mm]	200	200
$s_{2,min}$	Spacing parallel to free edge:	[mm]	400	400
$c_{min}$	Minimum edge distance:	[mm]	100	100
				

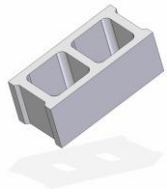
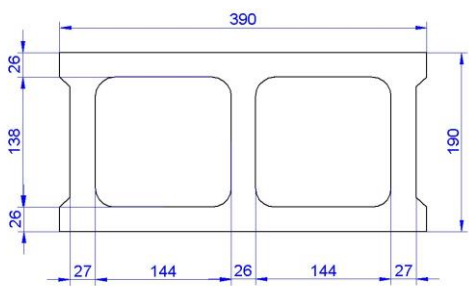
Characteristic resistance in hollow or perforated masonry (use category "c")		Performance		
		TNUX-n Ø8	TNUX-n Ø10	
<b>Brick no 3: Cerámica de 10. 237 x 110 x 100 mm. Jumisa</b>				
Use category	c			
Size:	237 x 110 x 100 mm			
Type:	EN 771-1			
Manufacturer:	Juarez y Millas S.A.			
Commercial name:	Cerámica de 10			
Bulk density class $\rho$ :	1025 kg/m <sup>3</sup>			
Minimum compressive strength $f_B$ :	20 N/mm <sup>2</sup>			
Drill method:	Rotary + hammer			
<b>Plastic sleeve pull out failure</b>				
$F_{rk}$	Characteristic resistance: <sup>*)</sup>	[kN]	0.3	0.5
$\gamma_{Mc}$	Partial safety factor: <sup>**)</sup>	[-]	2.5	
<b>Displacements under tension loads</b>				
N	Service tension load in hollow masonry:	[kN]	0,09	0,14
$\bar{\delta}_{N0}$	Displacements:	[mm]	0,38	0,27
$\bar{\delta}_{N\infty}$		[mm]	0,76	0,54
<b>Displacements under shear loads</b>				
V	Service shear load in hollow masonry:	[kN]	0,09	0,14
$\bar{\delta}_{V0}$	Displacements:	[mm]	0,08	0,12
$\bar{\delta}_{V\infty}$		[mm]	0,12	0,18
<b>Minimum spacing, edge distance and member thickness</b>				
$h_{min}$	Minimum thickness of the member:	[mm]	110	110
<b>Single anchor</b>				
$s_{min}$	Minimum spacing	[mm]	250	250
$c_{min}$	Minimum edge distance:	[mm]	100	100
<b>Anchor group</b>				
$s_{1,min}$	Spacing perpendicular to free edge:	[mm]	200	200
$s_{2,min}$	Spacing parallel to free edge:	[mm]	400	400
$c_{min}$	Minimum edge distance:	[mm]	100	100
				


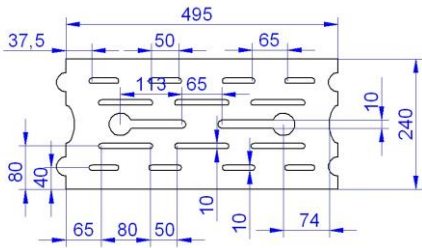
Characteristic resistance in hollow or perforated masonry (use category "c")		Performance		
		TNUX-n Ø8	TNUX-n Ø10	
<b>Brick no 4: Ladrillo caravista hidrofugado 240 x 115 x 50 mm. Ladrítec</b>				
Use category	c			
Size:	240 x 115 x 50 mm			
Type:	EN 771-1			
Manufacturer:	Ladrillería Técnica S.A			
Commercial name:	Hidrofugado			
Bulk density class $\rho$ :	1065 kg/m <sup>3</sup>			
Minimum compressive strength $f_B$ :	20 N/mm <sup>2</sup>			
Drill method:	Rotary			
<b>Plastic sleeve pull out failure</b>				
$F_{rk}$	Characteristic resistance: <sup>1)</sup>	[kN]	0,5	0,9
$\gamma_{Mc}$	Partial safety factor: <sup>2)</sup>	[-]	2,5	
<b>Displacements under tension loads</b>				
N	Service tension load in hollow masonry:	[kN]	0,14	0,26
$\delta_{N0}$	Displacements:	[mm]	0,53	0,48
$\delta_{N\infty}$		[mm]	1,06	0,96
<b>Displacements under shear loads</b>				
V	Service shear load in hollow masonry:	[kN]	0,14	0,26
$\delta_{V0}$	Displacements:	[mm]	0,12	0,22
$\delta_{V\infty}$		[mm]	0,18	0,33
<b>Minimum spacing, edge distance and member thickness</b>				
$h_{min}$	Minimum thickness of the member:	[mm]	115	115
<b>Single anchor</b>				
$s_{min}$	Minimum spacing	[mm]	250	250
$c_{min}$	Minimum edge distance:	[mm]	100	100
<b>Anchor group</b>				
$s_{1,min}$	Spacing perpendicular to free edge:	[mm]	200	200
$s_{2,min}$	Spacing parallel to free edge:	[mm]	400	400
$c_{min}$	Minimum edge distance:	[mm]	100	100
				



Characteristic resistance in hollow or perforated masonry (use category "c")		Performance		
		TNUX-n Ø8	TNUX-n Ø10	
<b>Brick no 5: Clinker Mediterráneo 240 x 115 x 90. Ladrillería Técnica</b>				
Use category	c			
Size:	240 x 115 x 90 mm			
Type:	EN 771-1			
Manufacturer:	Ladrillería Técnica S.A			
Commercial name:	Clinker Mediterráneo			
Bulk density class $\rho$ :	1310 kg/m <sup>3</sup>			
Minimum compressive strength $f_B$ :	40 N/mm <sup>2</sup>			
Drill method:	Rotary+ hammer			
<b>Plastic sleeve pull out failure</b>				
$F_{rk}$	Characteristic resistance: <sup>1)</sup>	[kN]	0,75	1,5
$\gamma_{Mc}$	Partial safety factor: <sup>2)</sup>	[-]	2.5	
<b>Displacements under tension loads</b>				
N	Service tension load in hollow masonry:	[kN]	0,21	0,43
$\delta_{N0}$	Displacements:	[mm]	0,43	0,65
$\delta_{N\infty}$		[mm]	0,86	1,30
<b>Displacements under shear loads</b>				
V	Service shear load in hollow masonry:	[kN]	0,21	0,43
$\delta_{V0}$	Displacements:	[mm]	0,18	0,36
$\delta_{V\infty}$		[mm]	0,27	0,54
<b>Minimum spacing, edge distance and member thickness</b>				
$h_{min}$	Minimum thickness of the member:	[mm]	115	115
<b>Single anchor</b>				
$s_{min}$	Minimum spacing	[mm]	250	250
$c_{min}$	Minimum edge distance:	[mm]	100	100
<b>Anchor group</b>				
$s_{1,min}$	Spacing perpendicular to free edge:	[mm]	200	200
$s_{2,min}$	Spacing parallel to free edge:	[mm]	400	400
$c_{min}$	Minimum edge distance:	[mm]	100	100
				

Characteristic resistance in hollow o perforated masonry (use category "c")		Performance		
		TNUX-n Ø8	TNUX-n Ø10	
<b>Brick no 6: Bloque gero 240 x 120 x 100 mm. Gilva</b>				
Use category	c			
Size:	240 x 120 x 100 mm			
Type:	EN 771-3			
Manufacturer:	Gilva S.A.			
Commercial name:	Bloque Gero			
Bulk density class $\rho$ :	1180 kg/m <sup>3</sup>			
Minimum compressive strength $f_B$ :	10 N/mm <sup>2</sup>			
Drill method:	Rotary + hammer			
<b>Plastic sleeve pull out failure</b>				
$F_{rk}$	Characteristic resistance: <sup>1)</sup>	[kN]	0,75	1,5
$\gamma_{Mc}$	Partial safety factor: <sup>2)</sup>	[-]	2,5	
<b>Displacements under tension loads</b>				
N	Service tension load in hollow blocks:	[kN]	0,21	0,47
$\bar{\delta}_{N0}$	Displacements:	[mm]	1,00	0,54
$\bar{\delta}_{N\infty}$		[mm]	2,00	1,08
<b>Displacements under shear loads</b>				
V	Service shear load in hollow blocks:	[kN]	0,21	0,47
$\bar{\delta}_{V0}$	Displacements:	[mm]	0,18	0,36
$\bar{\delta}_{V\infty}$		[mm]	0,27	0,54
<b>Minimum spacing, edge distance and member thickness</b>				
$h_{min}$	Minimum thickness of the member:	[mm]	120	120
<b>Single anchor</b>				
$s_{min}$	Minimum spacing	[mm]	250	250
$c_{min}$	Minimum edge distance:	[mm]	100	100
<b>Anchor group</b>				
$s_{1,min}$	Spacing perpendicular to free edge:	[mm]	200	200
$s_{2,min}$	Spacing parallel to free edge:	[mm]	400	400
$c_{min}$	Minimum edge distance:	[mm]	100	100
				

Characteristic resistance in hollow o perforated masonry (use category "c")		Performance		
		TNUX-n Ø8	TNUX-n Ø10	
<b>Brick no 7: Bloque caravista 390 x 190 x 190 mm. Gallizo</b>				
Use category	c			
Size:	390 x 190 x 190 mm			
Type:	EN 771-3			
Manufacturer:	José María Gallizo S.L.			
Commercial name:	Bloque cara vista			
Bulk density class $\rho$ :	870 kg/m <sup>3</sup>			
Minimum compressive strength $f_B$ :	5 N/mm <sup>2</sup>			
Drill method:	Rotary			
<b>Plastic sleeve pull out failure</b>				
$F_{rk}$	Characteristic resistance: <sup>1)</sup>	[kN]	1.5	1.5
$\gamma_{Mc}$	Partial safety factor: <sup>2)</sup>	[-]	2.5	
<b>Displacements under tension loads</b>				
N	Service tension load in hollow blocks:	[kN]	0,43	0,43
$\delta_{N0}$	Displacements:	[mm]	0,51	1,00
$\delta_{N\infty}$		[mm]	1,02	2,00
<b>Displacements under shear loads</b>				
V	Service shear load in hollow blocks:	[kN]	0,43	0,43
$\delta_{V0}$	Displacements:	[mm]	0,36	0,36
$\delta_{V\infty}$		[mm]	0,54	0,54
<b>Minimum spacing, edge distance and member thickness</b>				
$h_{min}$	Minimum thickness of the member:	[mm]	190	190
<b>Single anchor</b>				
$s_{min}$	Minimum spacing	[mm]	250	250
$c_{min}$	Minimum edge distance:	[mm]	100	100
<b>Anchor group</b>				
$s_{1,min}$	Spacing perpendicular to free edge:	[mm]	200	200
$s_{2,min}$	Spacing parallel to free edge:	[mm]	400	400
$c_{min}$	Minimum thickness of the member:	[mm]	100	100
				

Characteristic resistance in hollow or perforated masonry (use category "c")		Performance		
		TNUX-n Ø8	TNUX-n Ø10	
<b>Brick no 8: Airblock. 491 x 241 x 190 mm. Viguetas Navarra.</b>				
Use category	c			
Size:	491 x 241 x 190 mm			
Type:	EN 771-3			
Manufacturer:	Viguetas Navarra S.L.			
Commercial name:	Airblock 25			
Bulk density class $\rho$ :	935 kg/m <sup>3</sup>			
Minimum compressive strength $f_B$ :	4 N/mm <sup>2</sup>			
Drill method:	Rotary			
<b>Plastic sleeve pull out failure</b>				
$F_{rk}$	Characteristic resistance: <sup>*)</sup>	[kN]	2,0	1,5
$\gamma_{Mc}$	Partial safety factor: <sup>**)</sup>	[-]	2,5	
<b>Displacements under tension loads</b>				
N	Service tension load in hollow blocks:	[kN]	0,57	0,43
$\delta_{N0}$	Displacements:	[mm]	0,79	0,65
$\delta_{Nse}$		[mm]	1,58	1,30
<b>Displacements under shear loads</b>				
V	Service shear load in hollow blocks:	[kN]	0,57	0,43
$\delta_{V0}$	Displacements:	[mm]	0,48	0,36
$\delta_{Vse}$		[mm]	0,72	0,54
<b>Minimum spacing, edge distance and member thickness</b>				
$h_{min}$	Minimum thickness of the member:	[mm]	241	241
<b>Single anchor</b>				
$s_{min}$	Minimum spacing	[mm]	250	250
$c_{min}$	Minimum edge distance:	[mm]	100	100
<b>Anchor group</b>				
$s_{1,min}$	Spacing perpendicular to free edge:	[mm]	200	200
$s_{2,min}$	Spacing parallel to free edge:	[mm]	400	400
$c_{min}$	Minimum edge distance:	[mm]	100	100
				
<p>*) Characteristic resistance <math>F_{Rk}</math> for tension, shear or combined tension and shear loading, is valid for single plastic anchor for a group of two or four plastic anchors with spacing equal or larger than the minimum spacing <math>s_{min}</math>.</p> <p>**) In absence of other national regulations</p> <p>The characteristic values of resistance of the anchor for use in hollow or perforated masonry are independent of the load direction (tension, shear or combined tension and shear) and the mode of failure.</p> <p>The given characteristic resistances are only valid for the bricks and blocks according this table regarding base material, size of the units, compressive strength and configuration of the voids.</p> <p>The influence of larger embedment depths, lower mortar strength and/or different bricks and blocks (regarding base material, size of the units, compressive strength and configuration of the voids) has to be detected by job site tests according to annex E.</p> <p>The mortar strength class of the masonry has to be M 5 according to EN 998-2:2003 at minimum.</p> <p>The distance between single plastic anchors or a group of anchors should be a <math>\geq 250</math> mm.</p> <p>If the vertical joints of the wall are designed not to be filled with mortar then the design resistance <math>N_{Rd}</math> has to be limited to 2,0 kN to ensure that a pull-out of one brick out of the wall will be prevented. This limitation can be omitted if interlocking units are used for the wall or when the joints are designed to be filled with mortar.</p> <p>If the joints of the masonry are not visible the characteristic resistance <math>F_{Rk}</math> has to be reduced with the factor <math>\alpha_j = 0,5</math>.</p> <p>If the joints of the masonry are visible (e.g. unplastered wall) following has to be taken into account:</p> <ul style="list-style-type: none"> <li>- The characteristic resistance <math>F_{Rk}</math> may be used only, if the wall is designed such that the joints are to be filled with mortar.</li> <li>- If the wall is designed such that the joints are not to be filled with mortar then the characteristic resistance <math>F_{Rk}</math> may be used only, if the minimum edge distance <math>c_{min}</math> to the vertical joints is observed. If this minimum edge distance <math>c_{min}</math> cannot be observed then the characteristic resistance <math>F_{Rk}</math> has to be reduced with the factor <math>\alpha_j = 0,5</math>.</li> </ul>				

Charact. resistance in reinforced autoclaved aerated concrete: AAC2 / AAC6 blocks (use category "d")		Performance				
		TNUX-n Ø8		TNUX-n Ø10		
Temperature range		24/40°C	50/80°C	24/40°C	50/80°C	
<b>AAC2: 625 x 240 x 250 mm</b>						
Use category	d					
Size:	625 x 240 x 250 mm					
Type:	EN 771-4					
Bulk density class $\rho$ :	360 kg/m <sup>3</sup>					
Minimum compressive strength $f_B$ :	2 N/mm <sup>2</sup>					
Drill method:	Rotary					
<b>Plastic sleeve pull out failure</b>						
$F_{rk}$	Characteristic resistance: <sup>1)</sup>	[kN]	0,4	0,3	0,3	0,3
$\gamma_{Mc}$	Partial safety factor: <sup>2)</sup>	[-]	2.0			
<b>Displacements under tension loads</b>						
N	Service tension load in solid masonry:	[kN]	0.14		0.11	
$\bar{\delta}_{N0}$	Displacements:	[mm]	0.65		0.43	
$\bar{\delta}_{N\infty}$		[mm]	1.30		0.86	
<b>Displacements under shear loads</b>						
V	Service shear load in solid masonry:	[kN]	0.14		0.11	
$\bar{\delta}_{V0}$	Displacements:	[mm]	0.28		0.22	
$\bar{\delta}_{V\infty}$		[mm]	0.42		0.33	
<b>Minimum spacing, edge distance and member thickness</b>						
$h_{min}$	Minimum thickness of the member:	[mm]	100		100	
<b>Single anchor</b>						
$s_{min}$	Minimum spacing	[mm]	250		250	
$c_{min}$	Minimum edge distance:	[mm]	100		100	
<b>Anchor group</b>						
$s_{1,min}$	Spacing perpendicular to free edge:	[mm]	200		200	
$s_{2,min}$	Spacing parallel to free edge:	[mm]	400		400	
$c_{min}$	Minimum edge distance:	[mm]	100		100	

Resistencia característica en hormigón reforzado aireado en autoclave: bloques AAC2 / AAC6 (categoría de uso "d")		Prestaciones				
		TNUX-n Ø8		TNUX-n Ø10		
AAC6: 625 x 240 x 250 mm						
Use category	D					
Size:	625 x 240 x 250 mm					
Type:	EN 771-4					
Bulk density class $\rho$ :	710 kg/m <sup>3</sup>					
Minimum compressive strength $f_B$ :	6 N/mm <sup>2</sup>					
Drill method:	Rotary					
<b>Plastic sleeve pull out failure</b>						
$F_{Rk}$	Characteristic resistance: <sup>*)</sup>	[kN]	0,9	0,9	1,5	1,2
$\gamma_{Mc}$	Partial safety factor: <sup>**)</sup>	[-]	2.0			
<b>Displacements under tension loads</b>						
N	Service tension load in solid masonry:	[kN]	0.32		0.54	
$\delta_{N0}$	Displacements:	[mm]	1.28		0.78	
$\delta_{N\infty}$		[mm]	2.56		1.56	
<b>Displacements under shear loads</b>						
$N_{Rk,p}$	Service shear load in solid masonry:	[kN]	0.32		0.54	
$\delta_{N0}$	Displacements:	[mm]	0.64		1.08	
$\delta_{N\infty}$		[mm]	0.96		1.62	
<b>Minimum spacing, edge distance and member thickness</b>						
$h_{min}$	Minimum thickness of the member:	[mm]	100		100	
<b>Single anchor</b>						
$s_{min}$	Minimum spacing	[mm]	250		250	
$c_{min}$	Minimum edge distance:	[mm]	100		100	
<b>Anchor group</b>						
$s_{1,min}$	Spacing perpendicular to free edge:	[mm]	200		200	
$s_{2,min}$	Spacing parallel to free edge:	[mm]	400		400	
$c_{min}$	Minimum edge distance:	[mm]	100		100	
*) Characteristic resistance $F_{Rk}$ for tension, shear or combined tension and shear loading, is valid for single plastic anchor for a group of two or four plastic anchors with spacing equal or larger than the minimum spacing $s_{min}$ .						
**) In absence of other national regulations						
The distance between single plastic anchors or a group of anchors should be a $\geq 250$ mm.						
If the vertical joints of the wall are designed not to be filled with mortar then the design resistance $N_{Rd}$ has to be limited to 2,0 kN to ensure that a pull-out of one brick out of the wall will be prevented. This limitation can be omitted if interlocking units are used for the wall, bed/horizontal beds of blocks are glued together or when the joints are designed to be filled with mortar.						
If the joints of the masonry are not visible the characteristic resistance $F_{Rk}$ has to be reduced with the factor $\alpha_j = 0,5$ .						
If the joints of the masonry are visible (e.g. unplastered wall) following has to be taken into account:						
- The characteristic resistance $F_{Rk}$ may be used only, if the wall is designed such that the joints are to be filled with mortar.						
- If the wall is designed such that the joints are not to be filled with mortar then the characteristic resistance $F_{Rk}$ may be used only, if the minimum edge distance $c_{min}$ to the vertical joints is observed. If this minimum edge distance $c_{min}$ cannot be observed then the characteristic resistance $F_{Rk}$ has to be reduced with the factor $\alpha_j = 0,5$ .						
If no special tests or calculation for the resistance of the member:						
- The design value of shear resistance in the member caused by the anchorage are less than or equal to 40% of the design value of resistance of the member in the critical cross section						
- The edge distance is $\geq 150$ mm for slabs with width $\leq 700$ mm.						
- The spacing of the fixing is a $\geq 250$ mm. For prefabricated reinforced floors units the spacing of fixing is a $\geq 600$ mm. Fixing points are single anchors or groups of 2 or 4 anchors.						

10. The performance of the product identified in points 1 and 2 is in conformity with the declared performance in point 9.

This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 4.

Signed on behalf of the manufacturer by:



Santiago Reig. Technical manager  
Logroño, 25.04.2017