Nr: 302ECM

PRESTANDADEKLARATION

Produkttypens unika identifikationskod:

ESSVE Ankarmassa ECM (ESSVE ECM Chemical Anchor)

Avsedd användning/avsedda användningar:

ESSVE ECM Ankarmassa är avsedd för infästning av pinnbult, gängstång eller armeringsjärn i betong enligt följande förutsättningar:

Anchorages subject to:
- Static and quasi-static loads

Base materials:
- Reinforced or unreinforced normal weight concrete according to EN 206-1:2000.
- Strength classes C20/25 to C50/60 according to EN 206-1:2000
- Non-cracked concrete

Temperature range:
- I: -40°C to +40°C (max. long term temp. +24°C and max. short term temp. +40°C)
- II: -40°C to +80°C (max. long term temp. +50°C and max. short term temp. +80°C)

Use conditions (Environmental conditions):
- Structures subject to dry internal conditions (zinc coated steel, stainless steel).
- Structures subject to external atmospheric exposure (including industrial and marine environment) and to permanently damp internal condition, if no particular aggressive conditions exist (stainless steel or high corrosion resistant steel).
- Structures subject to external atmospheric exposure and to permanently damp internal condition, if other particular aggressive conditions exist (high corrosion resistant steel).

ESSVE ECM Ankarmassa är avsedd för infästning av pinnbult, gängstång eller armeringsjärn i tegel enligt följande förutsättningar:

Anchorages subject to:
- Static and quasi-static loads

Base materials
- Solid brick masonry (Use category b), according to Table 5 (Brick N° 1 - Brick N° 5)
- Hollow brick masonry (Use category c), according to Table 5.
- Mortar strength class of the masonry M2,5 at minimum according to EN 998-2:2010.
- For other bricks in solid masonry and in hollow or perforated masonry, the characteristic resistance of the anchorages may be determined by job site tests according to ETAG 029, Annex B and under consideration of the β-factor to Table 11.

Note: The characteristic resistance for solid bricks are also valid for larger brick sizes and larger compressive strength of the masonry unit.

Temperature range:
- T_a: -40°C to +40°C (max. short term temp. +40°C and max. long term temp. +24°C)

Use conditions (Environmental conditions):
- Structures subject to dry internal conditions (zinc coated steel)

Use categories in respect of installation and use:
- Category d/d
- Category w/d

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Tillverkare:

ESSVE Produkter AB
BOX 7091
164 07 Kista
Sweden

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System för bedömning och fortlöpande kontroll av prestanda:

System 1

Europeiskt bedömningsdokument:

ETAG 001-Part 1 and Part 5, edition 2013 (för betong)
ETAG 029, edition 2013 (för tegel)

Europeisk teknisk bedömning:

ETA-16/0676 issued on 2016-08-10 (för betong)
ETA-16/0679 issued on 2016-08-10 (för tegel)

Tekniskt bedömningsorgan:

TECHNICKY A ZKUSEBNI USTAV STAVEBNI PRAHA s.p.

Anmält/anmälda organ:

1020

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Angiven prestanda:

Väsentliga egenskaper	Prestanda	Harmoniserad teknisk specifikation
Characteristic values of resistance for threaded rods under tension loads in non-cracked concrete	Table 1	ETA-16/0676 (2016-08-10)
Characteristic values of resistance for threaded rods under shear loads in non-cracked concrete	Table 2	
Displacement under tension load (threaded rod) in concrete	Table 3	
Displacement under shear load (threaded rod) in concrete	Table 4	
Types and dimensions of masonry block and bricks	Table 5	ETA-16/0679 (2016-08-10)
Installation parameters in solid and hollow masonry	Table 6	
Edge distances and spacing in masonry	Table 7	
Characteristic resistance under tension and shear loading in masonry	Table 8	
Characteristic bending moment in masonry	Table 9	
Displacements under tension and shear loads in masonry	Table 10	
β-factors for job site tests according to ETAG 029, Annex B (for masonry)	Table 11	

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Table 1 – Characteristic values of resistance for threaded rods under tension loads in non-cracked concrete

Anchor size threaded rod				**M8**	**M10**	**M12**	**M16**	**M20**	**M24**
Steel failure									
Characteristic tension resistance		$N_{Rk,s}$	[kN]	$A_s \times f_{uk}$					
Combined pullout and concrete cone failure									
Temperature range I: 40°C/24°C	dry and wet concrete	$\tau_{Rk,uncr}$	[N/mm²]	8.0	7.0	7.0	7.0	7.0	6.0
	flooded bore hole	$\tau_{Rk,uncr}$	[N/mm²]	8.0	7.0	7.0	7.0	7.0	6.0
Temperature range II: 80°C/50°C	dry and wet concrete	$\tau_{Rk,uncr}$	[N/mm²]	6.5	6.0	6.0	6.0	6.0	6.0
	flooded bore hole	$\tau_{Rk,uncr}$	[N/mm²]	6.5	6.0	6.0	6.0	6.0	6.0
Increasing factor for concrete Ψ_c		C25/30		1.04					
		C30/37		1.08					
		C35/45		1.13					
		C40/50		1.15					
		C45/55		1.17					
		C50/60		1.19					
Factor according to CEN/TS 1992-4-5 Section 6.2.2.3		k_8	[-]	10.1					
Concrete cone failure									
Factor according to CEN/TS 1992-4-5 Section 6.2.2.1		k_{ucr}	[-]	10.1					
Edge distance		$c_{cr,N}$	[mm]	$1.5\ h_{ef}$					
Axial distance		$s_{cr,N}$	[mm]	$3.0\ h_{ef}$					
Splitting Failure									
Edge distance		$c_{cr,sp}$	[mm]	$2.0\ h_{ef}$			$1.5\ h_{ef}$		
Axial distance		$s_{cr,sp}$	[mm]	$2\ c_{cr,sp}$					
Installation safety factor (dry and wet concrete)		$\gamma_2 = \gamma_{inst}$		1.0					
Installation safety factor (flooded bore hole)		$\gamma_2 = \gamma_{inst}$		1.2					

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Table 2 – Characteristic values of resistance for threaded rods under shear loads in non-cracked concrete

Anchor size threaded rod			**M8**	**M10**	**M12**	**M16**	**M20**	**M24**
Steel failure without lever arm								
Characteristic tension resistance	$V_{Rk,s}$	[kN]	0.5 x A_s x f_{uk}					
Ductility factor according to CEN/TS 1992-4-5 Section 6.3.2.1	k_2		0.8					
Steel failure with lever arm								
Characteristic bending moment	$M^0_{Rk,s}$	[Nm]	1.2 x W_{el} x f_{uk}					
Concrete pry-out failure								
Factor k in equation (27) of CEN/TS 1992-4-5 Section 6.3.3 Factor k in equation (5.7) of Technical Report TR 029	$k_{(3)}$	[-]	2.0					
Installation safety factor	$\gamma_2 = \gamma_{inst}$		1.0					
Concrete edge failure								
Effective length of anchor	l_f	[mm]	$l_f = \min(h_{ef}; 8\ d_{nom})$					
Outside diameter of anchor	d_{nom}	[mm]	8	10	12	16	20	24
Installation safety factor	$\gamma_2 = \gamma_{inst}$		1.0					

Table 3 – Displacement under tension load (threaded rod) in concrete

Anchor size threaded rod			**M8**	**M10**	**M12**	**M16**	**M20**	**M24**
Non-cracked concrete C20/25								
Tension load	F	[kN]	6.3	6.3	9.9	19.8	29.8	37.7
Displacement	δ_{N0}	[mm]	0.1	0.1	0.2	0.5	0.6	0.8
	$\delta_{N\infty}$	[mm]	0.4	0.4	0.4	0.4	0.4	0.4

Table 4 – Displacement under shear load (threaded rod) in concrete

Anchor size threaded rod			**M8**	**M10**	**M12**	**M16**	**M20**	**M24**
Non-cracked concrete C20/25								
Shear load	F	[kN]	5.2	8.3	12.0	22.4	35.0	50.4
Displacement	Δ_{V0}	[mm]	0.1	0.2	0.3	0.5	0.8	0.9
	$\Delta_{V\infty}$	[mm]	0.2	0.3	0.5	0.8	1.2	1.4

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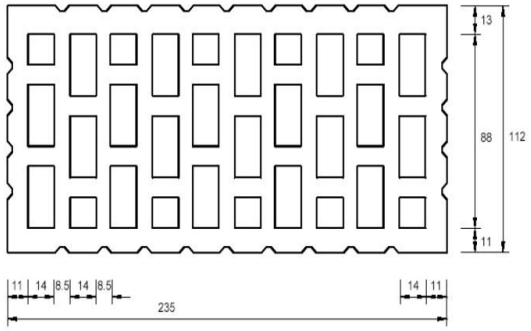
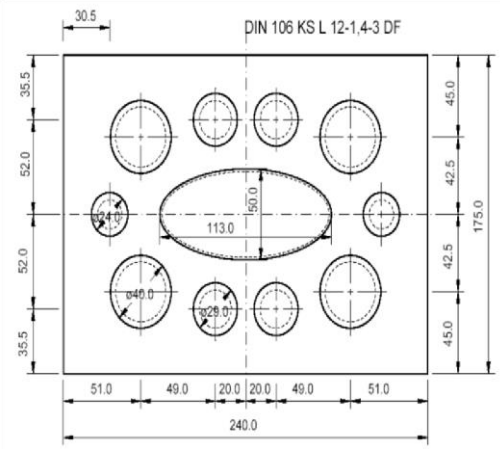
Table 5 – Types and dimensions of masonry block and bricks

Brick N° 1



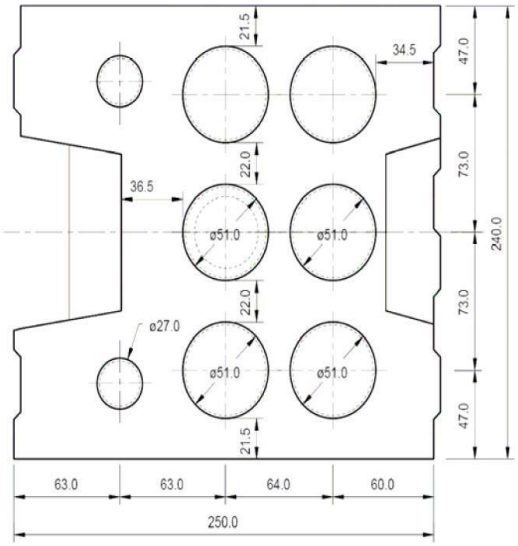
Hollow clay brick HLz 12-1.0-2DF according to EN 771-1
length/width/height = 235 mm / 112mm / 115 mm
$f_b \geq 12$ N/mm²
$\rho \geq 1.0$ kg/dm³

Brick N° 2



Hollow sand lime brick KSL 12-1.4-3DF according to EN 771-2
length/width/height = 240 mm / 175 mm / 113 mm
$f_b \geq 12$ N/mm²
$\rho \geq 1.4$ kg/dm³

Brick N° 3



Hollow sand lime brick KSL 12-1.4-8DF according to EN 771-2
length/width/height = 250 mm / 240 mm / 237 mm
$f_b \geq 12$ N/mm²
$\rho \geq 1.4$ kg/dm³

Brick N° 4

Solid clay brick Mz 12-2.0-NF according to EN 771-1
length/width/height = 240 mm / 116 mm / 71 mm
$f_b \geq 12$ N/mm²
$\rho \geq 2.0$ kg/dm³

Brick N° 5

Solid sand lime brick KS 12-2,0-NF according to EN 771-2
length/width/height = 240 mm / 115 mm / 70 mm
$f_b \geq 12$ N/mm²
$\rho \geq 2.0$ kg/dm³

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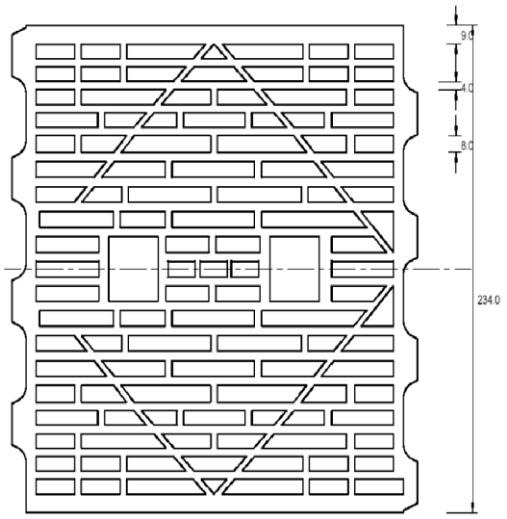
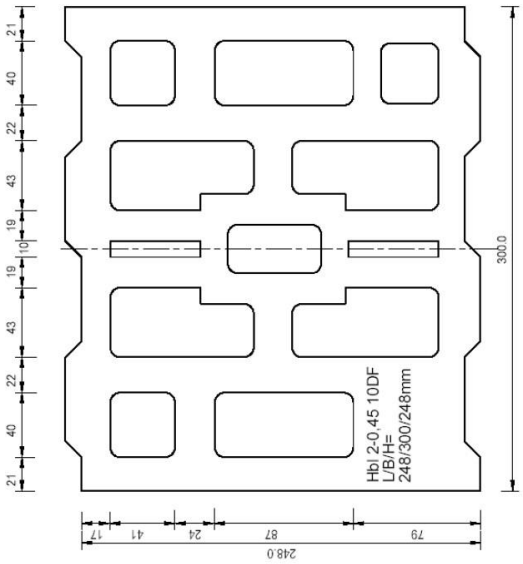
Brick N° 6



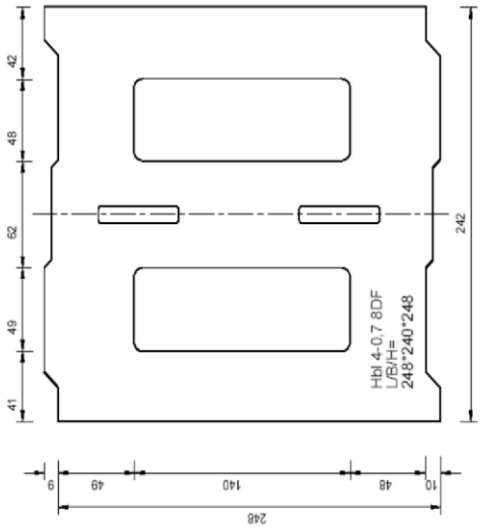
Hollow clay brick HLzW 6-0,7-8DF according to EN 771-1
length/width/height = 250 mm / 240 mm / 240 mm
$f_b \geq 6$ N/mm²
$\rho \geq 0.8$ kg/dm³

Brick N° 7



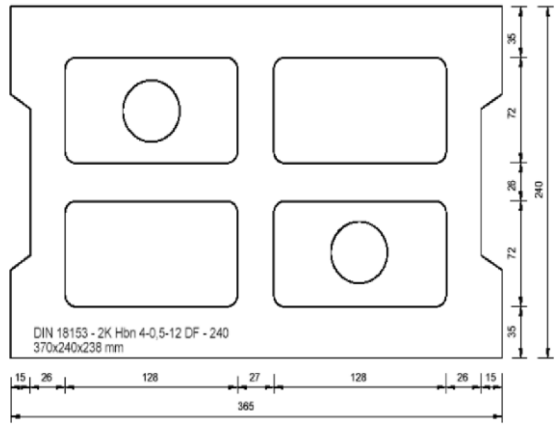
Lightweight concrete hollow block Hbl 2-0.45-10DF according to EN 771-3
length/width/height = 250 mm / 300 mm / 248 mm
$f_b \geq 2.0$ N/mm²
$\rho \geq 0.45$ kg/dm³

Brick N° 8



Lightweight concrete hollow block Hbl 4-0.7-8DF according to EN 771-3
length/width/height = 250 mm / 240 mm / 248 mm
$f_b \geq 4.0$ N/mm²
$\rho \geq 0.7$ kg/dm³

Brick N° 9



Concrete masonry unit Hbn 4-12DF according to EN 771-3
length/width/height = 370 mm / 240 mm / 238 mm
$f_b \geq 4$ N/mm²
$\rho \geq 1.2$ kg/dm³

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Table 6 – Installation parameters in solid and hollow masonry

Anchor type			**Anchor rod**									**Internal threaded socket**					
Size			**M8**	**M10**	**M12**	**M8**		**M10**		**M12**		**M8**		**M10**		**M12**	
Internal threaded socket	d_{to}xl_t	[mm]	-	-	-	-		-		-		12x80		14x80		16x80	
Sieve sleeve	l_s	[mm]	-	-	-	85		85		85		85		85		85	
	d_s	[mm]	-	-	-	15	16	15	16	20		15	16	20		20	
Nominal drill hole diameter	d_0	[mm]	15	15	20	15	16	15	16	20		15	16	20		20	
Diameter of cleaning brush	d_b	[mm]	20±1	20±1	22±1	20±1		20±1		22±1		20±1		22±1		22±1	
Depth of the drill hole	h_0	[mm]	90														
Effective anchorage depth	h_{ef}	[mm]	85									80					
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	9	12	14	9		12		14		9		12		14	
Torque moment	$T_{inst} \leq$	[Nm]	2														

Table 7 – Edge distances and spacing in masonry

Anchor rod									
Base material [1)]	**M8**			**M10**			**M12**		
	$c_{cr} = c_{min}$	$s_{cr\parallel} = s_{min\parallel}$	$s_{cr\perp} = s_{min\perp}$	$c_{cr} = c_{min}$	$s_{cr\parallel} = s_{min\parallel}$	$s_{cr\perp} = s_{min\perp}$	$c_{cr} = c_{min}$	$s_{cr\parallel} = s_{min\parallel}$	$s_{cr\perp} = s_{min\perp}$
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
Brick N° 1	100	235	115	100	235	115	120	235	115
Brick N° 2	100	240	113	100	240	113	120	240	113
Brick N° 3	100	250	237	100	250	237	120	250	237
Brick N° 4	128	255	255	128	255	255	128	255	255
Brick N° 5	128	255	255	128	255	255	128	255	255
Brick N° 6	100	250	240	100	250	240	120	250	240
Brick N° 7	100	250	248	100	250	248	-	-	-
Brick N° 8	100	250	248	100	250	248	120	250	248
Brick N° 9	100	370	238	100	370	238	120	370	

[1)] Brick N° according to Table 5

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Table 8 – Characteristic resistance under tension and shear loading in masonry

Base material	Anchor rods $N_{Rk} = V_{Rk}$ [kN] 1)			Internal threaded sockets $N_{Rk} = V_{Rk}$ [kN] 1)		
	M8	M10	M12	M8	M10	M12
Brick N° 1	2.5	2.0	2.0	1.5	2.5	2.5
Brick N° 2	0.75	1.2	0.5	0.6	0.75	0.9
Brick N° 3	0.75	1.2	0.5	-	0.75	0.4
Brick N° 4	1.5	1.5	3.0	2.0	3.0	4.0
Brick N° 5	0.75	0.9	1.5	2.0	1.5	0.9
Brick N° 6	1.2	1.2	0.9	0.9	1.5	0.6
Brick N° 7	0.6	0.3	-	0.5	0.3	0.75
Brick N° 8	0.6	1.5	1.2	-	0.4	0.6
Brick N° 9	2.5	1.5	2.5	0.6	1.2	

1) For design according ETAG 029, Annex C: $N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,s}$; $N_{Rk,pb}$ according to ETAG 029, Annex C. For $V_{Rk,s}$ see Annex C1, Table C2; Calculation of $V_{Rk,pb}$ and $V_{Rk,c}$ according to ETAG 029, Annex C

Table 9 – Characteristic bending moment in masonry

Size			M8	M10	M12
Steel grade 5.8	$M_{Rk,s}$	[Nm]	19	37	66
Steel grade 8.8	$M_{Rk,s}$	[Nm]	30	60	105
Steel grade 10.9	$M_{Rk,s}$	[Nm]	37	75	131
Stainless steel grade A2-70, A4-70	$M_{Rk,s}$	[Nm]	26	52	92
Stainless steel grade A4-80	$M_{Rk,s}$	[Nm]	30	60	105
Stainless steel grade 1.4529 strength class 70	$M_{Rk,s}$	[Nm]	26	52	92
Stainless steel grade 1.4565 strength class 70	$M_{Rk,s}$	[Nm]	26	52	92

Table 10 – Displacements under tension and shear loads in masonry

Base material	F [kN]	δ_{N0} [mm]	$\delta_{N\infty}$ [mm]	δ_{V0} [mm]	$\delta_{V\infty}$ [mm]
Solid bricks	$N_{Rk} / (1.4 \cdot \gamma_M)$	0.6	1.2	1.0 1)	1.5 1)
Perforated and hollow bricks		0.4	0.28	1.0 1)	1.5 1)

1) The hole gap between bolt and fixture shall be considered additionally

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Table 11 – β-factors for job site tests according to ETAG 029, Annex B (for masonry)

Brick N°	N° 1	N° 2	N° 3	N° 4	N° 5	N° 6	N° 7	N° 8	N° 9
β-factor	0.62	0.28	0.22	0.48	0.26	0.43	0.42	0.36	0.60

Prestandan för ovanstående produkt överensstämmer med den angivna prestandan. Denna prestandadeklaration har utfärdats i enlighet med förordning (EU) nr 305/2011 på eget ansvar av den tillverkare som anges ovan.

Undertecknat på tillverkarens vägnar av:

Kista 2016-09-12

Viktor Bukowski
Product Developer/Technical expert – Fasteners