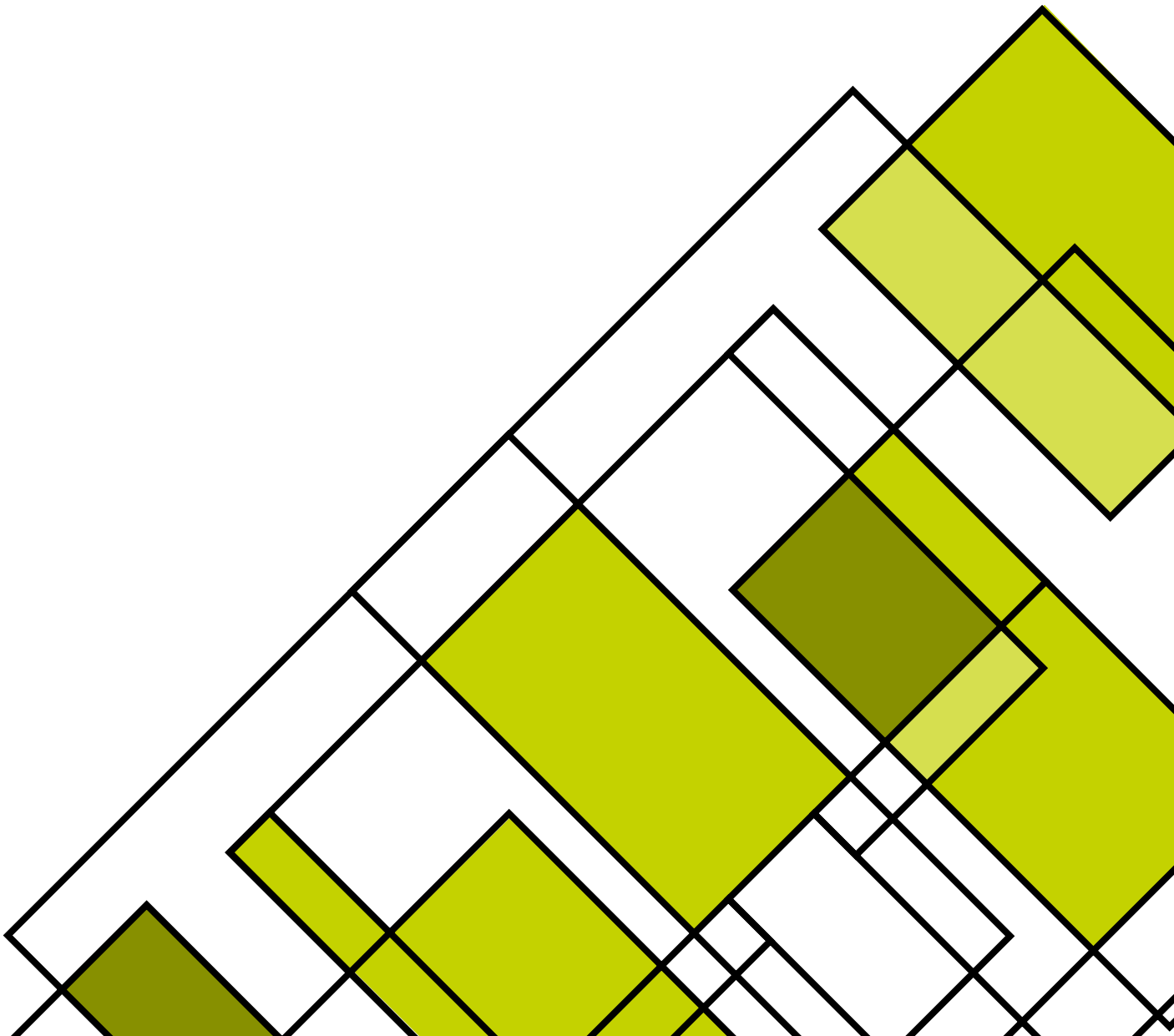


System for ventilated facades

# DOLCKER

## DOL-TC14



# DOLCKER

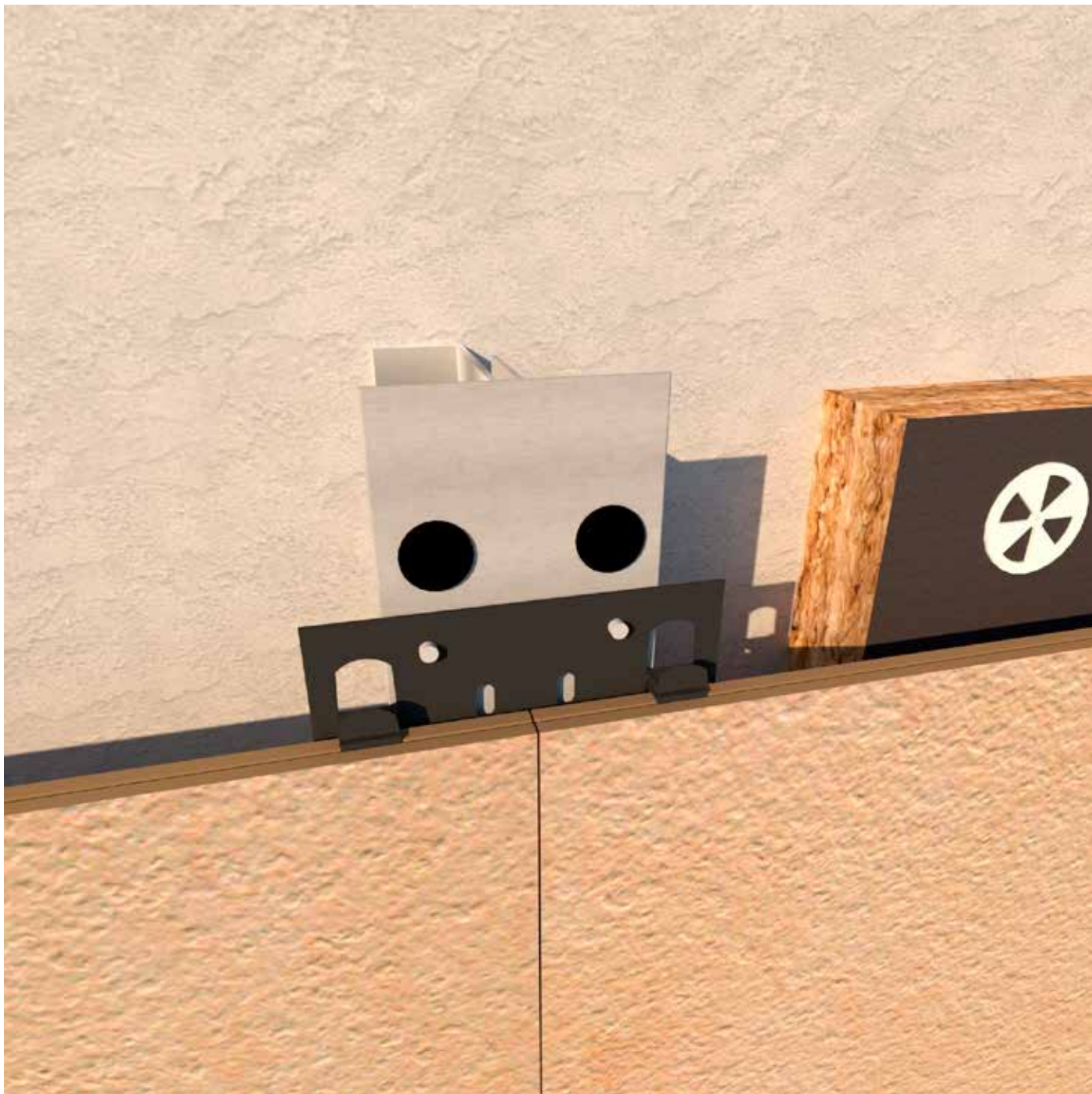
S Y S T E M  

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DOL-TC14

## SYSTEM DOL·TC14

System for 14 mm thick porcelain ceramic ventilated facades with hidden staples



## 1. FACADE'S DESCRIPTION

El sistema DOL-TC14 para fachadas de cerámica con grapa oculta es un sistema seguro, fácil y sencillo de instalar. Todos y cada uno de los elementos que componen este sistema están fabricados con materias primas de máxima calidad.

Se trata de un de fijación mecánica oculta mediante una subestructura que está compuesta por escuadras (ménsulas) regulables de aluminio de alta calidad de 3 mm de espesor con función de separadora, que también transmiten esfuerzos y que van fijadas a la estructura base del edificio (pared de ladrillo o forjado de hormigón)

Para evitar puentes térmicos DolceStone puede suministrar como opción ménsulas con sistema DolceCor (proyectado de corcho en la escuadra) o DolceThermic (consistente funda que envuelve la escuadra evitando el puente térmico)

Sobre estas ménsulas se fijan mediante tornillos autorroscantes de acero inoxidable los montantes verticales de aluminio extruidos en forma de "T" y "L" de 2 mm de espesor.

A los montantes se anclan las grapas de acero inoxidable de 1mm de espesor atornilladas a los perfiles. Estas grapas retienen a la pieza cerámica mediante la introducción de sus uñas de 8 mm de salida en las ranuras practicadas en el canto de las piezas cerámicas, consiguiendo así una fachada de estética pura y limpia.

Finalmente entre la cerámica y el perfil se aplica una fijación química mediante un cordón de masilla de poliuretano, logrando así una absorción de las vibraciones de la cerámica a causa de vientos o dilataciones.



## 2. DESCRIPTIVE MEMORY

El sistema DOL-TC14 está compuesto por:

MÉNSULAS dobles regulables L de (salida 60-160) x (160 x 40 mm) y ménsulas simples regulables L de (salida 60-160) x (80 x 40 mm) de aluminio AWAI MgSi (6060-T6 o 6063-T5) y 3 mm de espesor atornillados mediante un anclaje expansivo en caso de forjados de hormigón y anclaje de taco de nylon con tornillo de cabeza hexagonal de retención de acero inoxidable AISI 304 (AISI 316 si es ambiente marino) en caso de pared de ladrillo.

PERFILES VERTICALES T (100 x 50 mm) de aluminio AW-AI MgSi (6060-T6 o 6063-T5) y 3 mm de espesor atornillados mediante 4 tornillos autotaladrantes nº3 de 5,5 x 22 con arandela de EPDM de acero inoxidable AISI 304 (AISI 316 si es ambiente marino) a las ménsulas.

GRAPAS ocultas intermedias, de arranque y laterales (150 x 75 mm) de acero inoxidable AISI 304 (AISI 316 si es ambiente marino) y 1 mm de grosor con salida de 8 mm y junta de 5 mm atornillados mediante 2 tornillos autotaladrantes nº 2 de 4,2 x 14 de cabeza plana de acero inoxidable AISI 304 a los perfiles verticales.

Placa porcelánica DOLCKER, de baja absorción de espesor 14 mm con ranuras slop mecanizada según diseño con un valor de fuerza de rotura alto. Las cerámicas son diseñadas longitudinalmente por los cantos con sujeción mediante grapas de arranque en la zona inicial y la final de la fachada, y mediante grapas intermedias en las zonas intermedias de la fachada.

Fijador de masilla dulce-elastic (supera la prueba de envejecimiento), para evitar vibraciones de las piezas y absorber las dilataciones del sistema así como la caída de pieza en caso de rotura. Se aplicara un mínimo de 4 fijaciones químicas por pieza.







### 3. MATERIALS AND COMPONENTS OF THE SYSTEM

#### CORBELS

"L"-shaped aluminum fixings that function as adjustable spacers for the transmission of loads from the façade substructure to the base structure of the building (vertical wall of the building) by means of anchors.

To avoid thermal bridges, DolceStone can supply, as an option, brackets with the DolceCor system (cork projected on the bracket) or DolceThermic (consistent cover that surrounds the bracket avoiding thermal bridge)

#### PHYSICAL AND MECHANICAL CHARACTERISTICS

The corbels are made of extruded aluminum EN AW-ALMgSi (6005A) with T6 treatment.

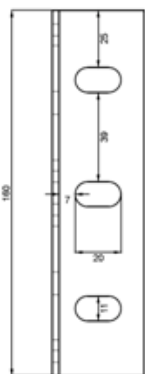
ALUMINUM FACTS	
Designation	
Symbolic	EN AW-Al MgSi
Numeric	AW 6005 <sup>a</sup>
Treatment	T6
Rule	UNE-EN 755-2
	UNE-EN 12020-1
Physical properties	
Specific weight	2,70g/cm <sup>3</sup>
Linear thermal expansion coeff.	23,6·10e-6 K <sup>-1</sup> (20/100)°C
Modulus of elasticity	70.000 MPa
Poisson's ratio	0,33
Mechanical properties	
Tensile strength (Rm)	≥ 270 N/mm <sup>2</sup>
Elastic limit (Rp0,2)	≥ 225 N/mm <sup>2</sup>
Elongation (A)	≥ 8%
Elongation (A50 mm)	≥ 6%
Brinell Hardness 90	90

## CORBEL U VARIABLE OUTLET 60 – 110 MM SUPPORT

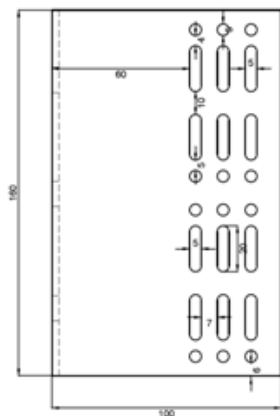
### DIMENSIONAL CHARACTERISTICS

There are two types, support and retention and of different dimensions as detailed in the following table:

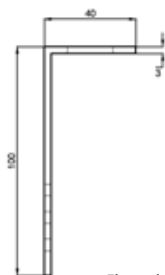
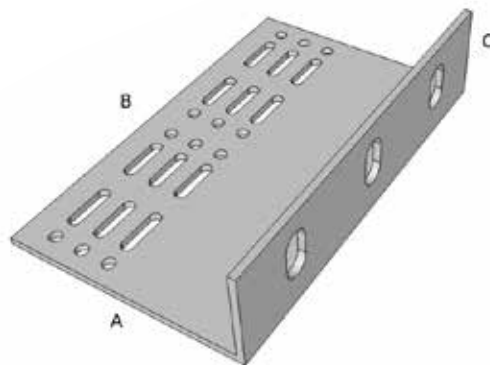
Corbel Dual variable output 60 – 120 mm Lift



Front elevation view



Side elevation view



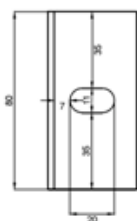
Floor elevation view

Standard measures Double corbel

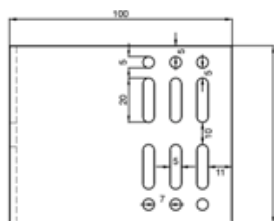
A	B	C
60	160	40
80	160	40
100	160	40
120	160	40

*\*Measures in mm.*

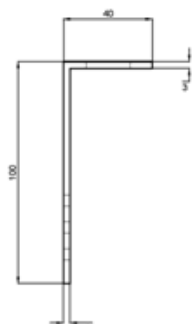
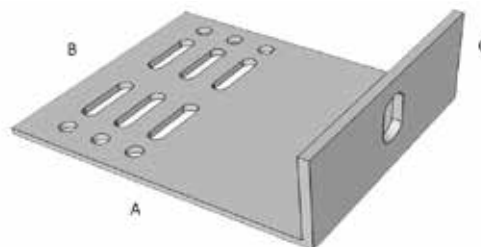
Simple variable output corbel 60 – 120 mm Retention



Front elevation view



Side elevation view



Floor elevation view

Standard measures Double corbel

A	B	C
60	160	40
80	160	40
100	160	40
120	160	40

*\*Measures in mm.*



To avoid thermal bridges, DolceStone can supply, as an option, brackets with the DolceCor system (cork projected on the bracket) or DolceThermic (consisting of a cover that surrounds the bracket, avoiding thermal bridge).

### **DolceCor**

Projected cork on the bracket



### **DolceThermic**

Consistent cover that surrounds the bracket avoiding thermal bridge



### **Advantages of sprayed cork**

- Impervious to water and other liquids: thanks to the aforementioned air cells, which also do not have a capillary structure makes it practically impossible for water or oil to enter.
- Low specific weight.
- Low thermal conductivity: which makes it an excellent insulator.
- Vibration absorption: quality that is applied for acoustic insulation.
- High coefficient of friction: useful when the architect seeks non-slippery solutions.
- In addition, cork offers interesting chemical properties that give it stability over time and resistance to sun exposure.

## PROFILE

Vertical extruded aluminum profiles. Usually the profile is manufactured in black lacquer in the form of "L" and "T" that are attached to the brackets by means of stainless steel self-tapping screws.

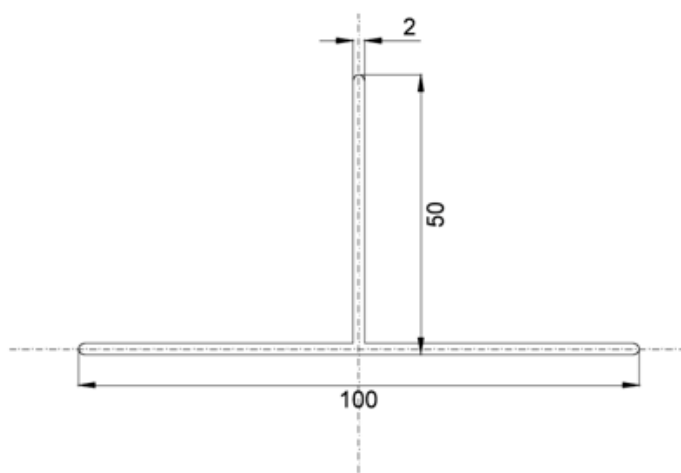
## PHYSICAL AND MECHANICAL CHARACTERISTICS

The profiles are made of extruded aluminum EN AW-ALMgSi (6005A) with T6 treatment.

ALUMINUM FACTS	
Designation	
Symbolic	EN AW-Al MgSi
Numeric	AW 6005 <sup>a</sup>
Treatment	T6
Rule	UNE-EN 755-2
	UNE-EN 12020-1
Physical properties	
Specific weight	2,70g/cm <sup>3</sup>
Linear thermal expansion coeff.	23,6·10e-6 K-1 (20/100)°C
Modulus of elasticity	70.000 MPa
Poisson's ratio	0,33
Mechanical properties	
Tensile strength (Rm)	≥ 270 N/mm <sup>2</sup>
Elastic limit (Rp0,2)	≥ 225 N/mm <sup>2</sup>
Elongation (A)	≥ 8%
Elongation (A50 mm)	≥ 6%
Brinell Hardness 90	90

## DIMENSIONAL CHARACTERISTICS

Aluminum “T” profile for shared ceramics

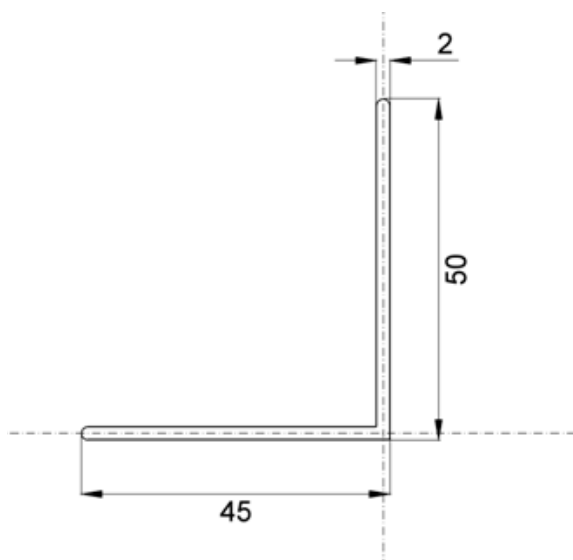


PROFILE T DATA	
Section	280,220 mm <sup>2</sup>
Theoretical weight	0,757 Kg/m
Alloy	6063
Treatment	T-5
Moment of inertia	$I_x = 15,330 \text{ cm}^4$
	$I_y = 5,704 \text{ cm}^4$
Perimeter	0,337 m
Tolerances	UNE-EN 755-9



*\*The profiles are usually lacquered in black, with the possibility of lacquering in the color desired by the architect*

Aluminum "L" profile for corners or window joints



PROFILE L DATA	
Section	186 mm <sup>2</sup>
Theoretical weight	0,502 Kg/m
Alloy	6063
Treatment	T-5
Moment of inertia	I <sub>x</sub> = 3,66 cm <sup>4</sup>
	I <sub>y</sub> = 4,74 cm <sup>4</sup>
Perimeter	0,189 m
Tolerances	UNE-EN 755-9



RAL color table

RAL 1000	RAL 4007	RAL 7008
RAL 1001	RAL 4008	RAL 7009
RAL 1002	RAL 4009	RAL 7010
RAL 1003	RAL 5000	RAL 7011
RAL 1004	RAL 5001	RAL 7012
RAL 1005	RAL 5002	RAL 7013
RAL 1006	RAL 5003	RAL 7015
RAL 1007	RAL 5004	RAL 7018
RAL 1011	RAL 5006	RAL 7021
RAL 1012	RAL 5007	RAL 7022
RAL 1013	RAL 5008	RAL 7023
RAL 1014	RAL 5009	RAL 7024
RAL 1016	RAL 5010	RAL 7026
RAL 1018	RAL 5011	RAL 7030
RAL 1017	RAL 5012	RAL 7031
RAL 1018	RAL 5013	RAL 7032
RAL 1019	RAL 5014	RAL 7033
RAL 1020	RAL 5015	RAL 7034
RAL 1021	RAL 5017	RAL 7035
RAL 1023	RAL 5018	RAL 7036
RAL 1024	RAL 5019	RAL 7037
RAL 1027	RAL 5020	RAL 7038
RAL 1028	RAL 5021	RAL 7039
RAL 1032	RAL 5022	RAL 7040
RAL 1033	RAL 5024	RAL 7042
RAL 1034	RAL 6000	RAL 7043
RAL 3000	RAL 6001	RAL 7044
RAL 3001	RAL 6002	RAL 7045
RAL 3002	RAL 6003	RAL 7046
RAL 3003	RAL 6004	RAL 7047
RAL 3004	RAL 6006	RAL 8000
RAL 3006	RAL 6008	RAL 8001
RAL 3009	RAL 6007	RAL 8002

*\*The profiles are usually lacquered in black, with the possibility of lacquering in the color desired by the architect*

## DOL-F PROFILE

Aluminum fixings in the form of "F" that work to finish the encounters with the windows such as the jambs or lintels.

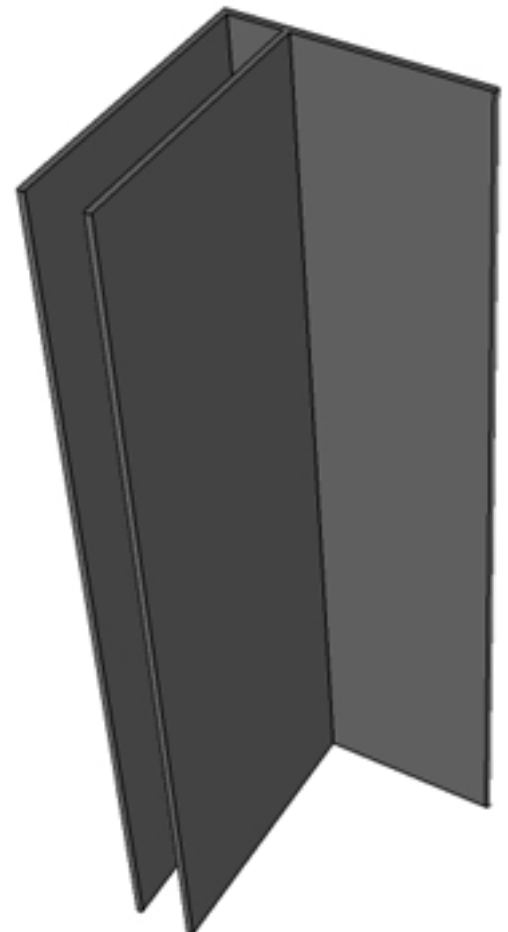
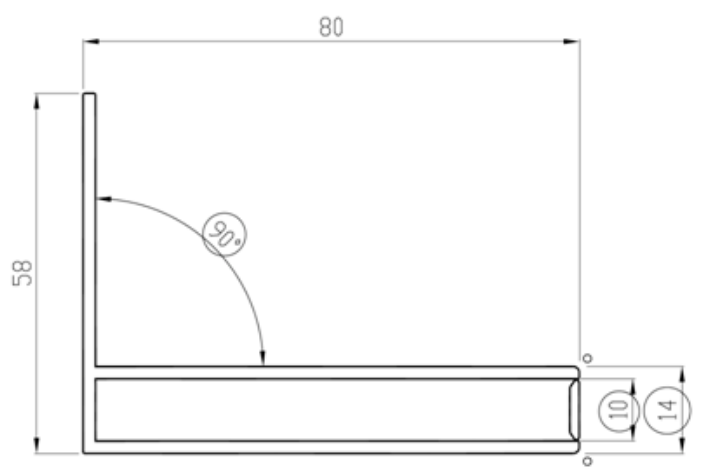
They are screwed with self-drilling screws to the sub-frames of the windows and with the possibility of lacquering the desired color.

## PHYSICAL AND MECHANICAL CHARACTERISTICS

DOL-F profiles are made of extruded aluminium.

ALUMINUM FACTS	
Physical properties	
Specific weight	2,70g/cm <sup>3</sup>
Linear thermal expansion coeff.	23,6•10e-6 K-1 (20/100)°C
Modulus of elasticity	70.000 MPa
Poisson's ratio	0,33
Mechanical properties	
Tensile strength (Rm)	≥ 270 N/mm <sup>2</sup>
Elastic limit (Rp0,2)	≥ 225 N/mm <sup>2</sup>
Elongation (A)	≥ 8%
Elongation (A 50 mm)	≥ 6%
Brinell Hardness	90

## DIMENSIONAL CHARACTERISTICS



PROFILE F DATA	
Section	444 mm <sup>2</sup>
Theoretical weight	0,199 Kg/m
Alloy	6063
Treatment	T-5
Approximate perimeter	0,454 m
Tolerances	UNE-12020-2



## STAPLES

They are responsible for holding each plate that forms the exterior cladding. In each plate, the upper fixings are for retention and the lower ones are for support.

## PHYSICAL AND MECHANICAL CHARACTERISTICS

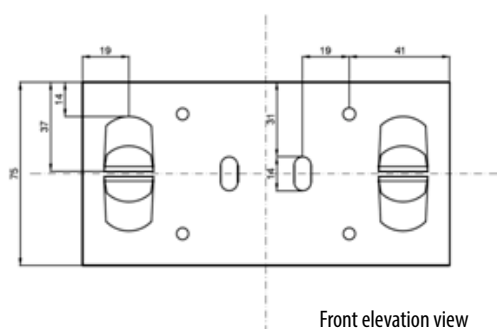
The clips are made of AISI 304 stainless steel.

ALUMINUM FACTS	
Designation	
ASMT	AISI 304
Numeric	1.4301
Symbolic	X5CrNi18-10
Rule	UNE-EN 10088-2
Physical properties	
Specific weight	7,93g/cm <sup>3</sup>
Linear thermal expansion coeff.	17,3•10e-6 K-1 (20/100)°C
Modulus of elasticity (to 20°C)	190.000 MPa
Poisson's ratio	0,33
Mechanical properties	
Tensile strength (Rm)	540 – 750 N/mm <sup>2</sup>
Elastic limit (Rp0,2)	≥ 230 N/mm <sup>2</sup>
Elongation (A)Brinell	≤ 45%
Hardness	183

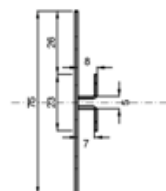
## DIMENSIONAL CHARACTERISTICS

There are 3 types of staples:

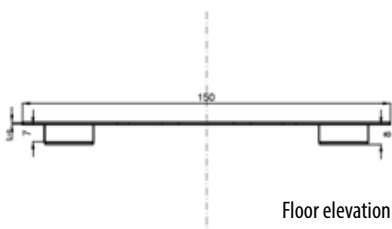
Concealed center staple with 8 mm exit with 6 mm joint



Front elevation view



Side elevation view

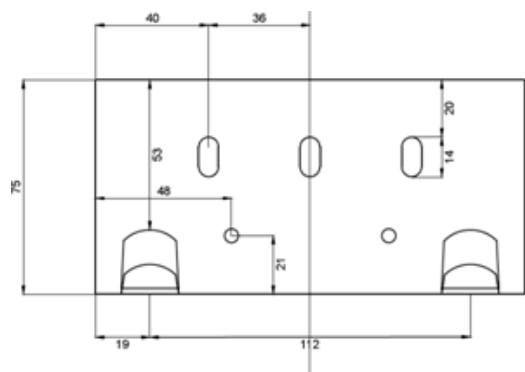


Floor elevation view

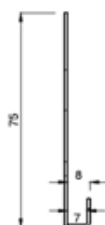


*The staples usually come lacquered in black, with the possibility of lacquering in the color desired by the architect.*

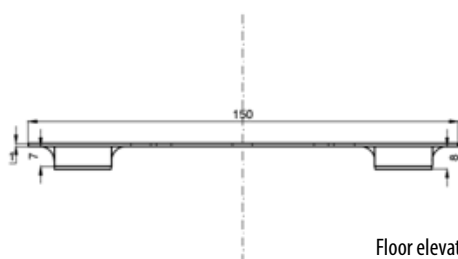
### Concealed 8 mm Exit Starter Staple



Front elevation view



Side elevation view

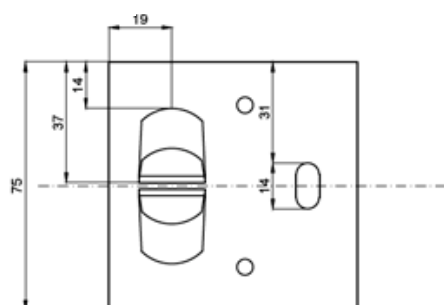


Floor elevation view

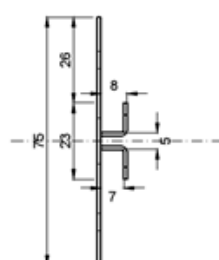


*The staples usually come lacquered in black, with the possibility of lacquering in the color desired by the architect.*

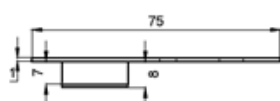
### Concealed lateral clamp with 8 mm exit with 6 mm joint



Front elevation view



Side elevation view



Floor elevation view



*The staples usually come lacquered in black, with the possibility of lacquering in the color desired by the architect.*

## ANCHORS

The anchors used between the bracket and the vertical wall are the following:

- For slabs: Stainless expansive support anchor



**ARTICLE** Metal anchor I X  
**MATERIAL** Stainless Steel A2  
**DIAMETER** 8 and 10 mm.  
**LENGTH** 75 - 80 - 120

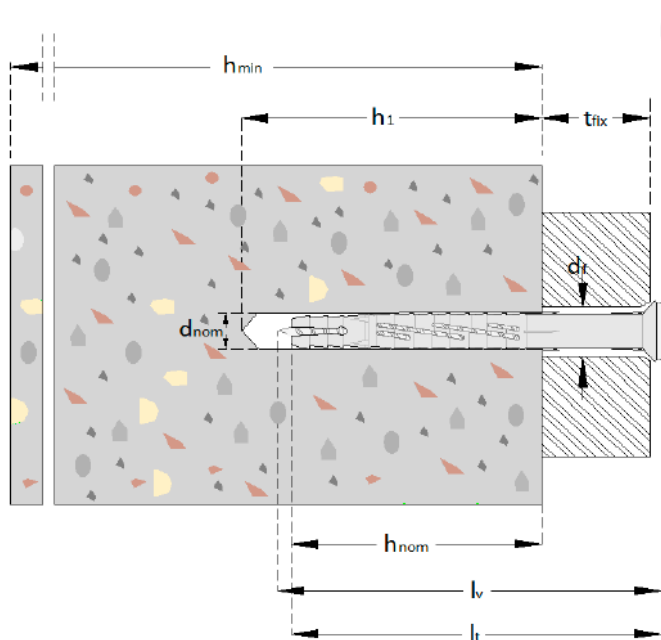
### CHARACTERISTICS / PLACEMENT DATA

Metallic expansion anchor by thread for medium loads.  
 Composed by: anchor body, expansion plate, nut and A2 stainless washer

Tightening torque for diameter 8: Minimum: 20 Nm - Maximum: 25 Nm

Tightening torque for diameter 10: Minimum: 40 Nm - Maximum: 45 Nm

- For brickwork: Nylon plug anchor with retaining hexagonal head screw



$d_{nom}$ : Anchor diameter

$l_t$ : Anchor length

$d_v$ : Screw diameter

$l_v$ : screw length

$t_{fix}$ : Maximum thickness to set

$d_0$ : Drill hole diameter

$h_1$ : Minimum depth of the hole to be drilled

$h^*$ : Minimum thickness must be equal to the thickness of the face of the block plus the thickness of the element to be fixed

$h_{min}$ : Minimum thickness of masonry

$h_{nom}$ : Anchor Depth Minimum Length

$h_{ef}$ : Minimum effective anchor depth

$d_f$ : Drill diameter

T: 6 lobes (torx)

$C_{min}$ : Minimum Allowable Edge Distance

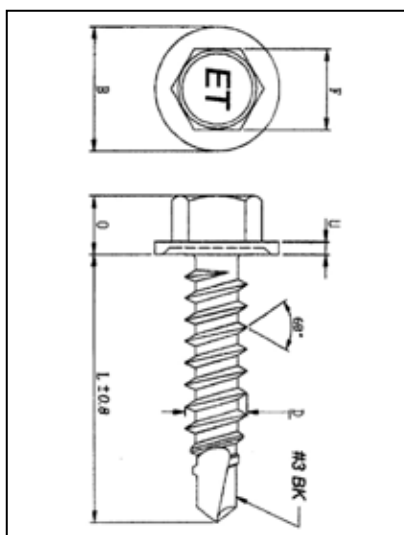
$S_{min}$ : Minimum spacing between anchors

Material Code	Anchor Size	Size Screw	$t_{fix}$ (mm)	$d_0^{1)}$ (mm)	$h_1$ (mm)	$h_{min}$ (mm)	$h^*^{2)}$ (mm)	$h_{nom}$ (mm)	$h_{ef}$ (mm)	$d_f$ (mm)	T	$C_{min}^{3)}$ (mm)	$S_{min}^{3)}$ (mm)
	$d_{nom} \times l_t$ (mm)	$d_v \times l_v$ (mm)											
VS8108080	8 x 80	6 x 85	10	8	90	120	25	70	70	9	30	90	90
VS8108100	8 x 100	6 x 105	30				45						
VS8108120	8 x 120	6 x 125	50				65						
VS8108140	8 x 140	6 x 145	70				85						
VS8110080	10 x 80	7 x 85	10	10	90	120	25	70	70	11	40	100	100
VS8110100	10 x 100	7 x 105	30				45						
VS8110120	10 x 120	7 x 125	50				65						
VS8110140	10 x 140	7 x 145	70				85						
VS8110160	10 x 160	7 x 175	90				105						
VS8110200	10 x 200	7 x 205	130				145						
VS8110230	10 x 230	7 x 235	160				175						

## SCREWS

The screws used between vertical profiles-cantilevers and vertical profile-horizontal profile are as follows:

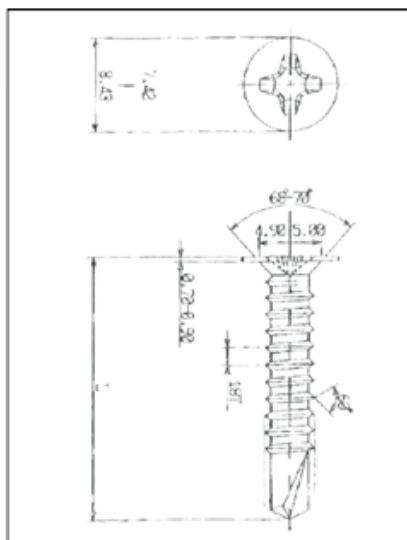
- 5.5 x 22 stainless steel self-drilling screw with EPDM washer



<b>ARTICLE</b>	Self-drilling screw tip nº3
<b>FAMILY CODE</b>	DKH-5
<b>MATERIAL</b>	INOXA2
<b>COVERING</b>	According to the requirement
<b>NOMINAL DIAMETER</b>	5.5 mm.
<b>STANDARD OF MANUFACTURING</b>	DIN 7604K
<b>LENGTH</b>	From 18 to 60mm.

FEATURES			
<b>PULLING RESISTANCE</b> (1) (A) (Depending on the thickness of the aluminum sheet for Ø 5,5 mm.)	2,0 mm	2,0 kN	
	3,0 mm	2,7 kN	
	4,0 mm	6,8 kN	
<b>TORSION RESISTANCE</b>		10,4 N-m	
<b>SHEAR STRENGTH</b> (1) (B) (According to screw Ø )	4,8 mm	9,3 kN	
	5,5 mm	11,1 kN	
	6,3 mm	14,1 kN	
<b>SELF DRILLING TIMES</b> (2)		1,8 s	

-Staples-Profiles: Flat head lacquered stainless steel self-drilling screw 4.2 x 14



<b>ARTICLE</b>	Self-drilling screw point nº 2 of 4.2 x 14
<b>FAMILY CODE</b>	DXP361
<b>MATERIAL</b>	INOX A2
<b>COVERING</b>	_____
<b>NOMINAL DIAMETER</b>	4,2 mm.
<b>STANDARD OF MANUFACTURING</b>	CABEZA ESPECIAL
<b>LENGTH</b>	14 mm.

## CARACTERÍSTICAS

<b>PULLING RESISTANCE</b> (1) (A) (Depending on the thickness of the aluminum sheet for Ø 4,2 mm.)	2,0 mm	1,44 kN	 
	2,5 mm	1,60 kN	
	3,0 mm	1,84 kN	
<b>TORSION RESISTANCE</b>		8,30 N·m	
<b>SHEAR STRENGTH</b> (1) (B) (According to screw Ø )	4,2 mm	7,62 kN	
<b>SELF DRILLING TIMES</b>		1,6 s	



## POLYURETHANE PUTTY

4 chemical fixing points will be added per piece unit to improve and reinforce the fixing and gluing of the piece to the horizontal profile. The chemical fixation prevents the piece from moving as a result of the action of the wind, allows the sliding clips to absorb the expansion of the façade, and serves as a damper for possible noise between the profile and the plate.

Sikaflex-111 Stick & Seal neutral polyurethane adhesive putty or similar is used.

## CERAMIC PIECE

According to documentation provided by DolceStone S.L., the cladding pieces are made of porcelain ceramic of nominal dimensions.






## CERAMIC PIECE




### PHYSICAL AND MECHANICAL CHARACTERISTICS

Ceramic pieces are classified as dry-pressed ceramic tiles with low water absorption according to the UNE-EN 14411 standard, with the following characteristics declared by the manufacturer:

CARACTERÍSTICAS DIMENSIONALES DIMENSIONAL CHARACTERISTICS		UNE- EN-ISO 10545 Test Nº	UNE-EN- 14411(1) <b>ISO 13006</b> <b>Anexo G</b> ISO 13006 Annexe G	DOLCKER Valores 1ª Calidad / Values 1st Quality
				<b>MATE 60X120 14mm</b> Calibre: 1 597,2x1197,2
	LONGITUD Y ANCHURA LENGHT AND WIDTH	2	0,6%	±0,2%
	ESPESOR THICKNESS	2	5,0%	±5,0%
	RECTITUD DE LOS LADOS WARPAGE OF EDGES	2	0,5%	±0,2%
	ORTOGONALIDAD WEDGING	2	0,5%	±0,25%
	CURVATURA CENTRAL Y LATERAL CENTRAL AND EDGE CURVATURE	2	0,5%	±0,2%
	ALABEO WARPAGE	2	0,5%	±0,2%
	ABSORCIÓN DE AGUA WATER ABSORPTION	3	0,5% máx 0,6%	≤0,1%

CARACTERÍSTICAS MECÁNICAS MECHANICAL CHARACTERISTICS		UNE- EN-ISO 10545 Test Nº	UNE-EN- 14411(1) <b>ISO 13006</b> <b>Anexo G</b> ISO 13006 Annexe G	DOLCKER Valores 1ª Calidad / Values 1st Quality
				<b>MATE 60X120 14mm</b> Calibre: 1 597,2x1197,2
	FUERZA DE ROTURA BREAKING STRENGHT	4	≥1300N	≥5000N
	RESISTENCIA A LA FLEXIÓN FLEXURAL STRENGHT	4	Media 35/min 32 Average 35/min 32	≥45 N/mm <sup>2</sup>
	RESISTENCIA AL IMPACTO IMPACT RESISTANCE	5	MD	0,85
	RESISTENCIA A LA ABRASIÓN PROFUNDA DEEP ABRASION RESISTANCE	6	< 175 mm <sup>3</sup>	< 145 mm <sup>3</sup>
	DILATACIÓN TÉRMICA LINEAL LINEAR THERMAL EXPASION	8	MD	<7,5 x10 <sup>-6</sup> °C <sup>-1</sup>
	CHOQUE TÉRMICO THERMAL SHOCK	9	MD	Resiste Resists
	RESISTENCIA A LA HELADA FROST RESISTANCE	12	Exigido Required	Resiste Resists
	REACCIÓN AL FUEGO REACTION TO FIRE	No Exigido No Required	No Exigido No Required	A1/A1fl
	DILATACIÓN POR HUMEDAD MOISTURE EXPANSION	No Exigido No Required	Valor Declarado Declared Value	-----

CARACTERÍSTICAS HIGIÉNICAS HYGIENIC CHARACTERISTICS			UNE- EN-ISO 10545 Test Nº	UNE-EN- 14411(1) <b>ISO 13006</b> <b>Anexo G</b> ISO 13006 Annexe G	DOLCKER Valores 1ª Calidad / <b>Values 1st Quality</b>  <b>MATE 60X120 14mm</b> Calibre: 1 597,2x1197,2
	RESISTENCIA QUÍMICA CHEMICAL RESISTANCE	ÁCIDOS BAJA CONCENTRACIÓN LOW CONCENTRATION ACIDS	13	MD	CLASE LA
		ÁCIDOS ALTA CONCENTRACIÓN HIGH CONCENTRATION ACIDS	13	MD	CLASE HA
		BASES BAJA CONCENTRACIÓN LOW CONCENTRATION ALKALI	13	MD	CLASE LA
		BASES ALTA CONCENTRACIÓN HIGH CONCENTRATION ALKALI	13	MD	CLASE HA
	RESISTENCIA A LAS MANCHAS STAINS RESISTANCE		14	MD	4
	PRODUCTOS DOMÉSTICOS DE LIMPIEZA Y SALES DE PISCINA HOUSEHOLD DETERGENTS AND ADDITIVES FOR SWIMMING-POOLS		13	Mínimo UB Minimum UB	CLASE LA

NORMAS COMPLEMENTARIAS ADDITIONAL NORMS			UNE- EN-ISO 10545 Test Nº	UNE-EN- 14411(1) <b>ISO 13006</b> <b>Anexo G</b> ISO 13006 Annexe G	DOLCKER Valores 1ª Calidad / <b>Values 1st Quality</b>  <b>MATE 60X120 14mm</b> Calibre: 1 597,2x1197,2
	DESLIZAMIENTO (Péndulo) <b>ANTISLIP</b>	UNE-ENV 12633	Clase 1/2/3		CLASE 1 15<RD≤35
	DESLIZAMIENTO (Pies calzados) <b>ANTISLIP</b>	DIN 51130	R9/R10 R11/R12		R9
	DESLIZAMIENTO (Pies descalzos) <b>ANTISLIP</b>	DIN 51097	A/B/C		-----
	DESLIZAMIENTO (DCOF) <b>ANTISLIP</b>	ANSI A137.1 Apdo. 9.6	MD		-----
	MATERIAL RECICLADO <b>RECYCLED MATERIAL</b>	ISO 14021	MD		Según Modelo Depending Model
	RESISTENCIA DE LOS COLORES A LA LUZ COLOR RESISTANCE TO LIGHT	DIN 51094	No Exigido No Required		Resiste Resists

## DIMENSIONAL CHARACTERISTICS

The standard manufacturing dimensions of ceramic pieces are defined in the following table:

600 mm x 1200 mm  
 500 mm x 1200 mm  
 300 mm x 1200 mm  
 500 mm x 1000 mm  
 450 mm x 900 mm  
 800 mm x 800 mm  
 600 mm x 900 mm  
 600 mm x 600 mm  
 600 mm x 300 mm

\* For specific designs, other plate dimensions smaller than those described can be obtained by machining, with equivalent tolerances and with the same thicknesses, as long as the stresses to which they are going to be subjected are less than those defined in this document.

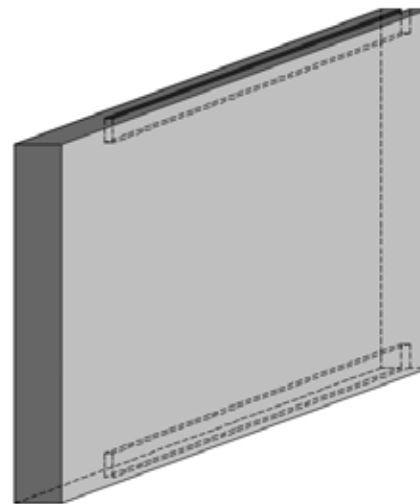
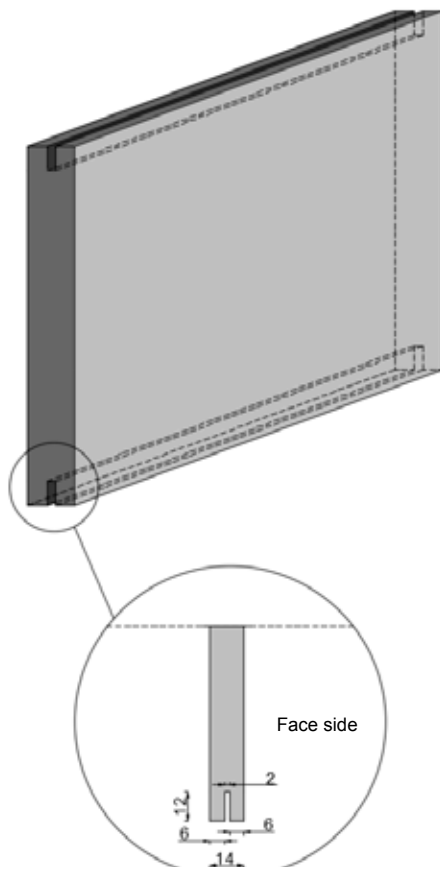
## FIBERGLASS MESH

The ceramic has the option of being supplied with a safety mesh on the back of the piece. This mesh prevents pieces of the piece from coming off in the event of any blow.

- Composition:	Fiberglass
- Weight:	98 g/m <sup>2</sup> ± 5%
- Distance to thread axes:	12,5 x 11,8 mm
- Tensile breaking load:	
• Longitudinal:	1.650 N / 5 cm
• Transversal:	1.400 N / 5 cm

One-component polyurethane adhesive is used to fix the mesh.

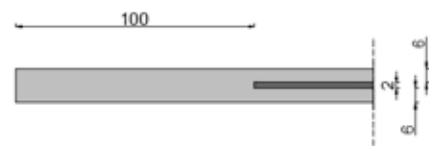
## STUDY SLOTS



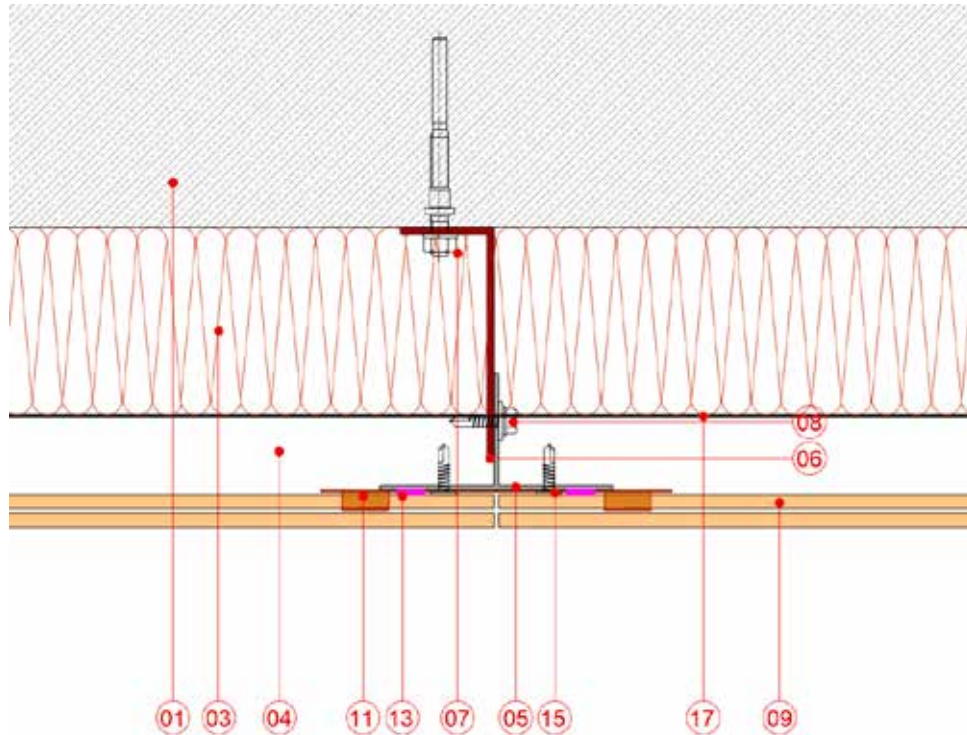
Standard slot



Corner slot



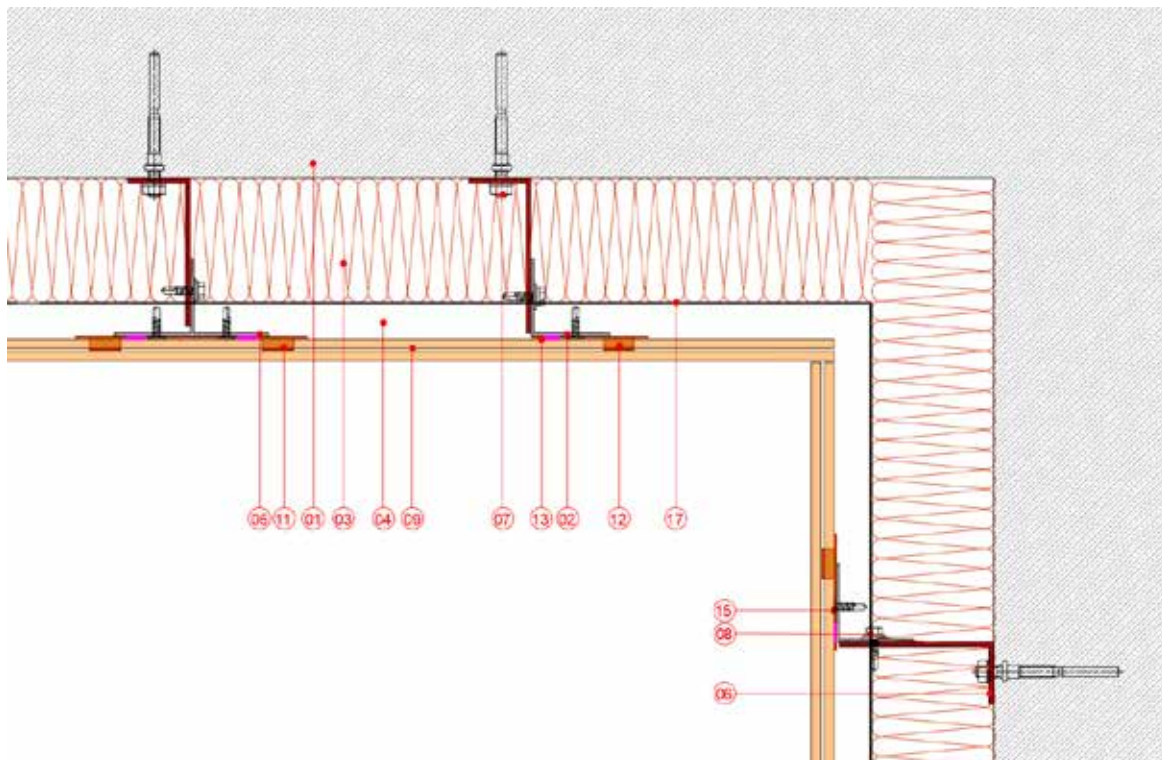
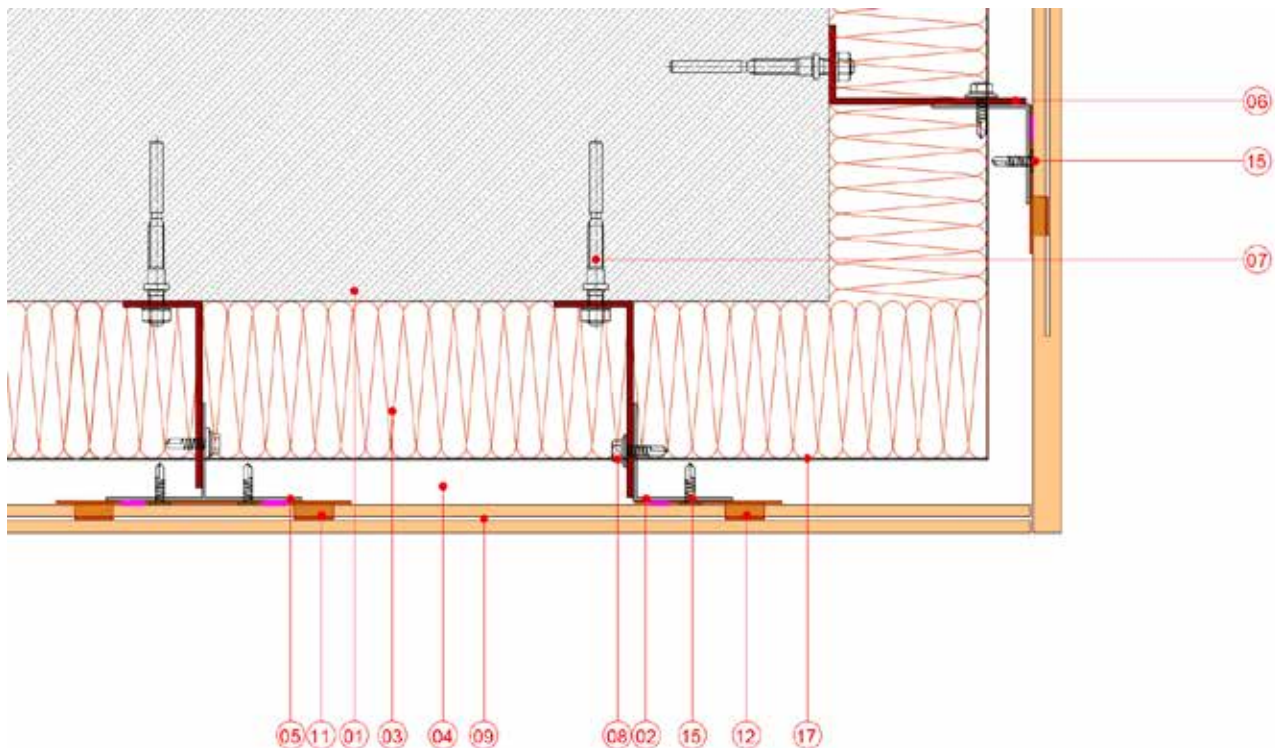
## TYPE DETAILS - System DOL-TC14



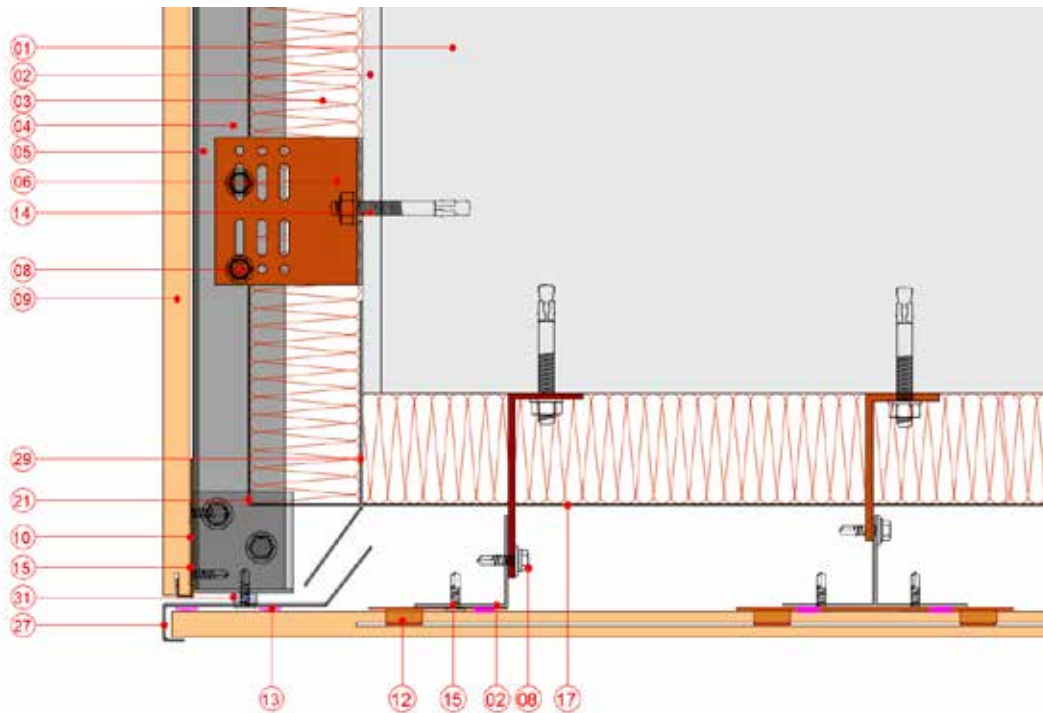
- 01 Masonry or concrete wall
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- 21 Angular
- 22 Nail Taco
- 23 extruded
- 24 Sealed Window
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- 26 Waterproofing Sheet
- 27 Lacquered Folded Aluminum Sheet
- 28 Extruded F Profile
- 29 Separator
- 30 Expanded Polystyrene
- 31 Washer
- 32 Composite panel



## - Corner details:

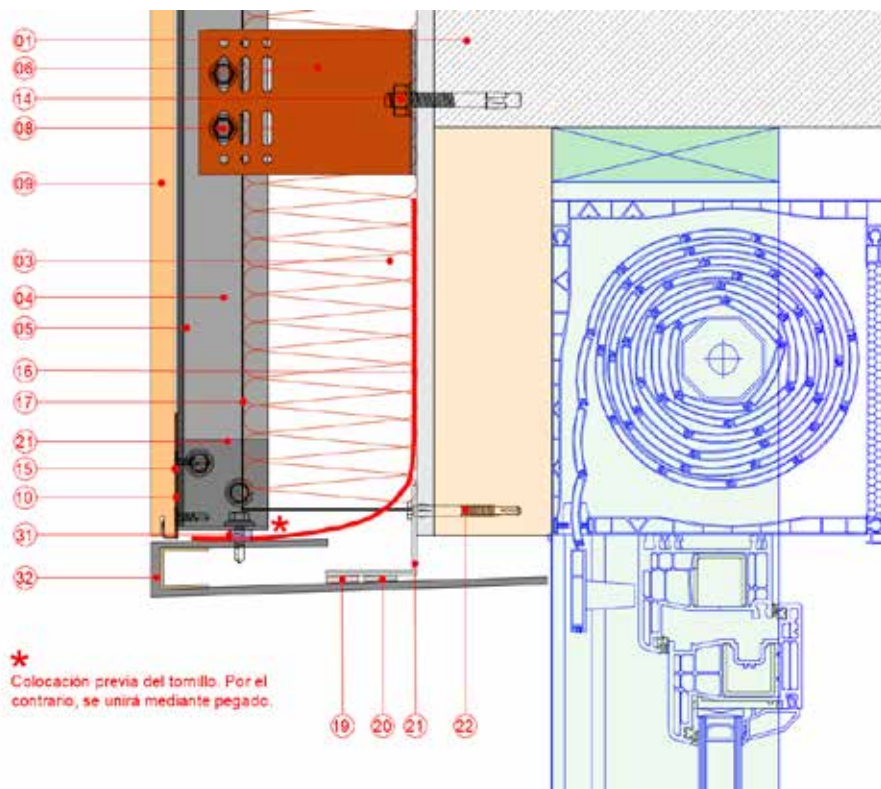


## - Ceramic ceiling placement detail



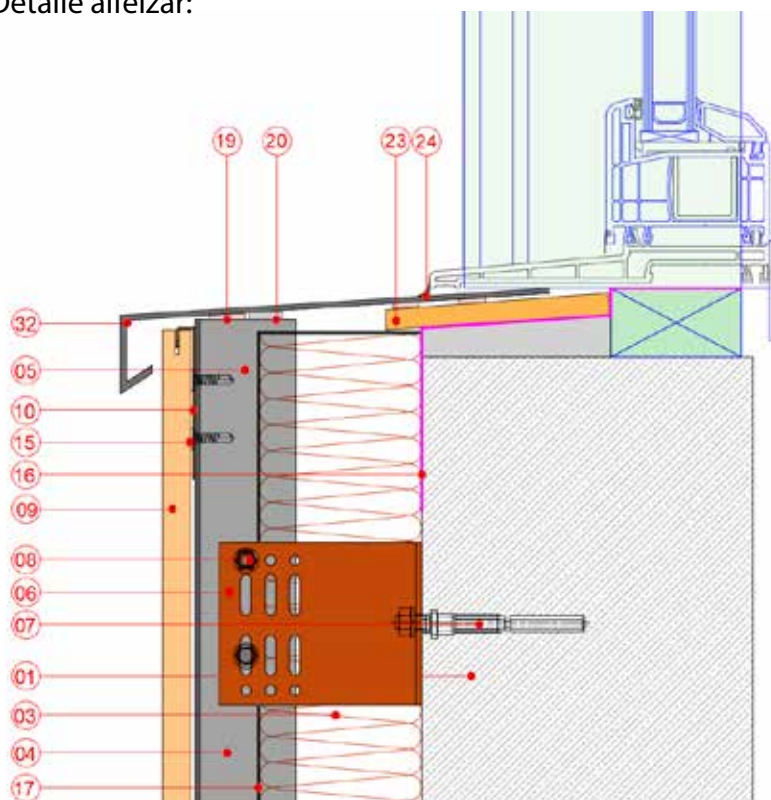
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## - Lintel detail:

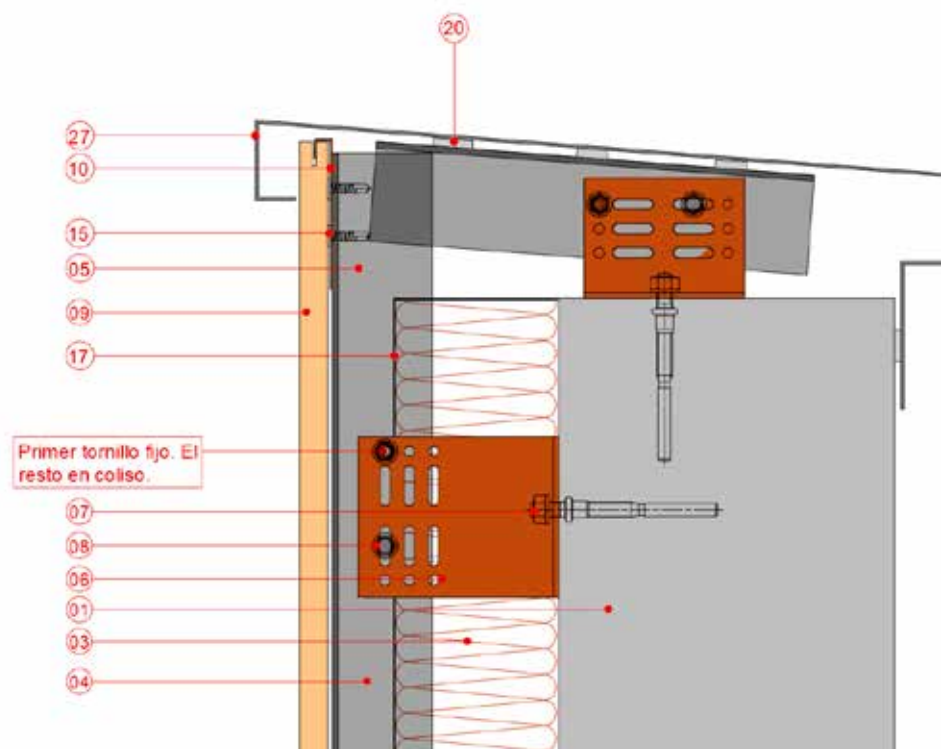


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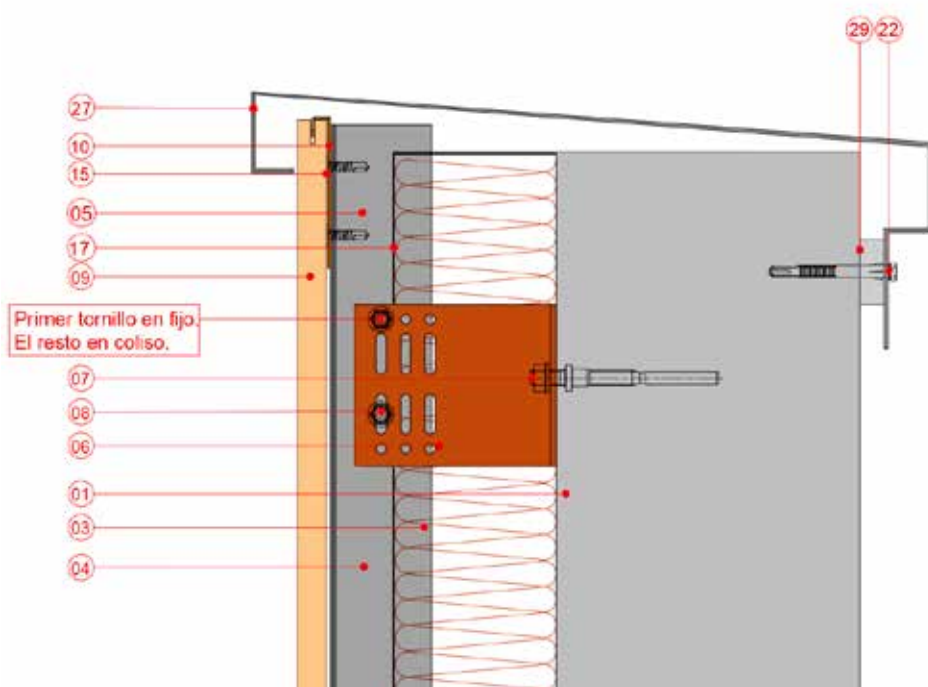
## - Detalle alfeizar:



# - Cover details:

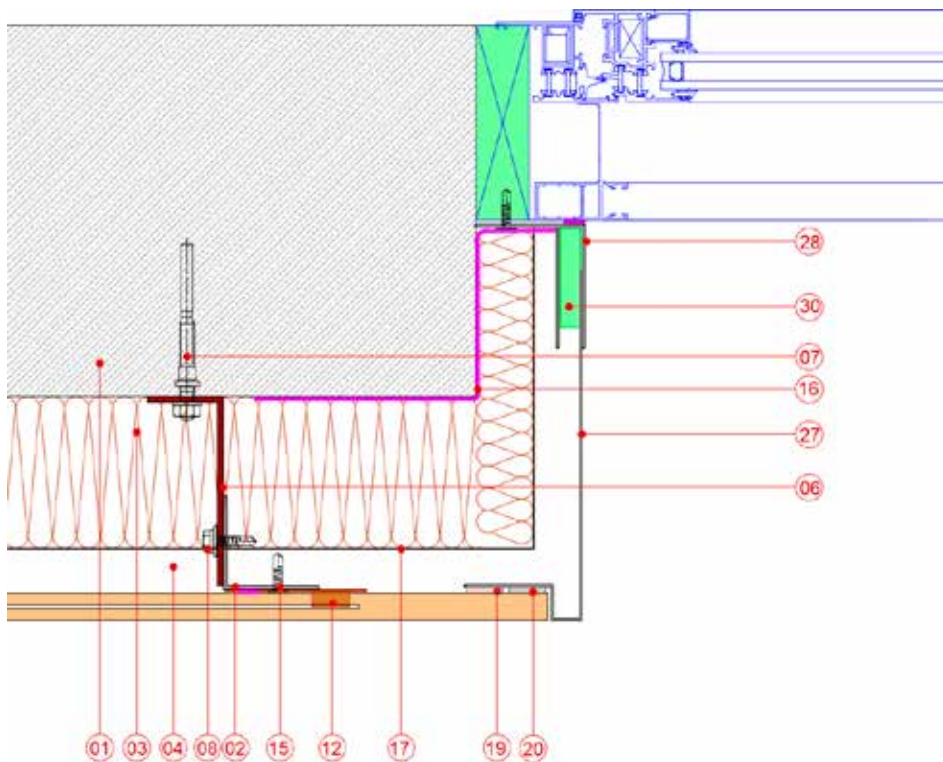


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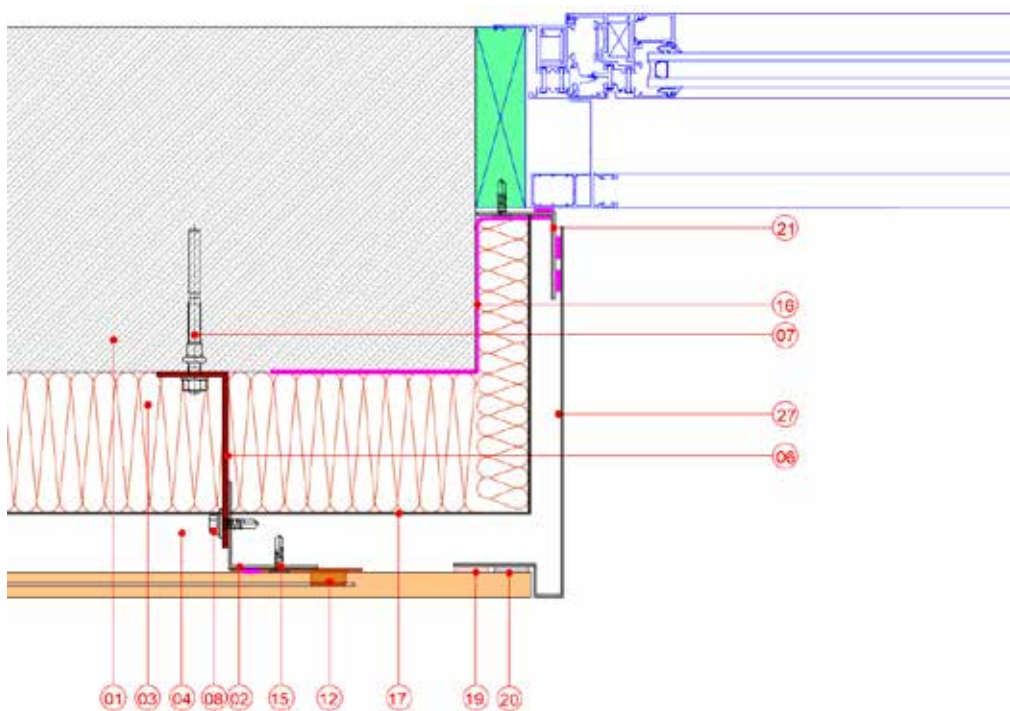




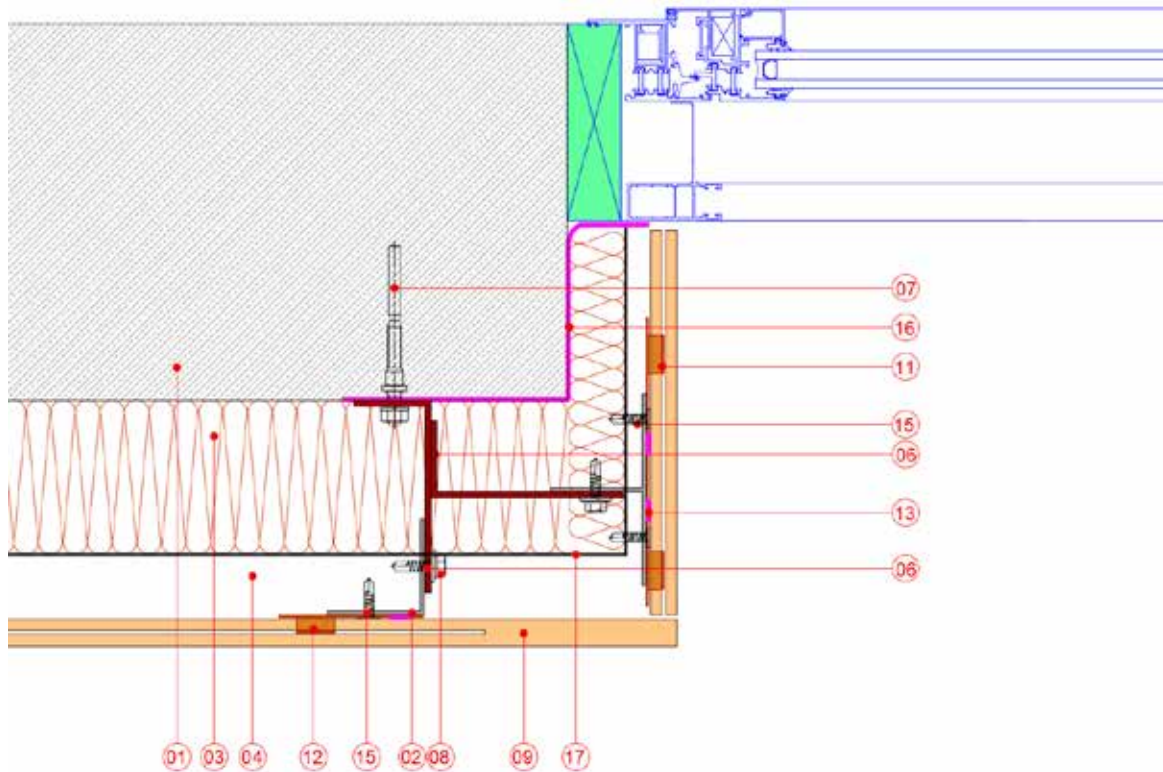
## - Trim details



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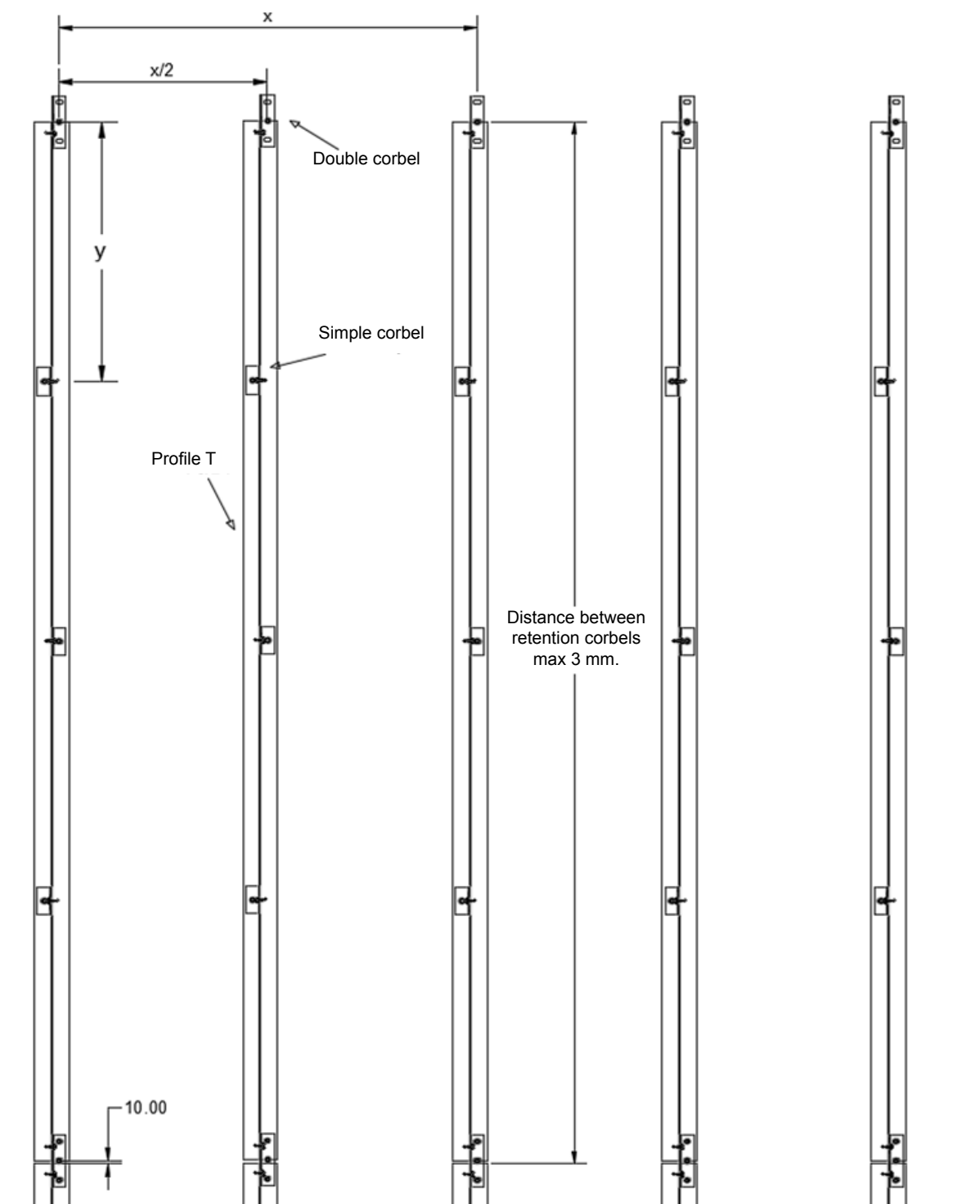


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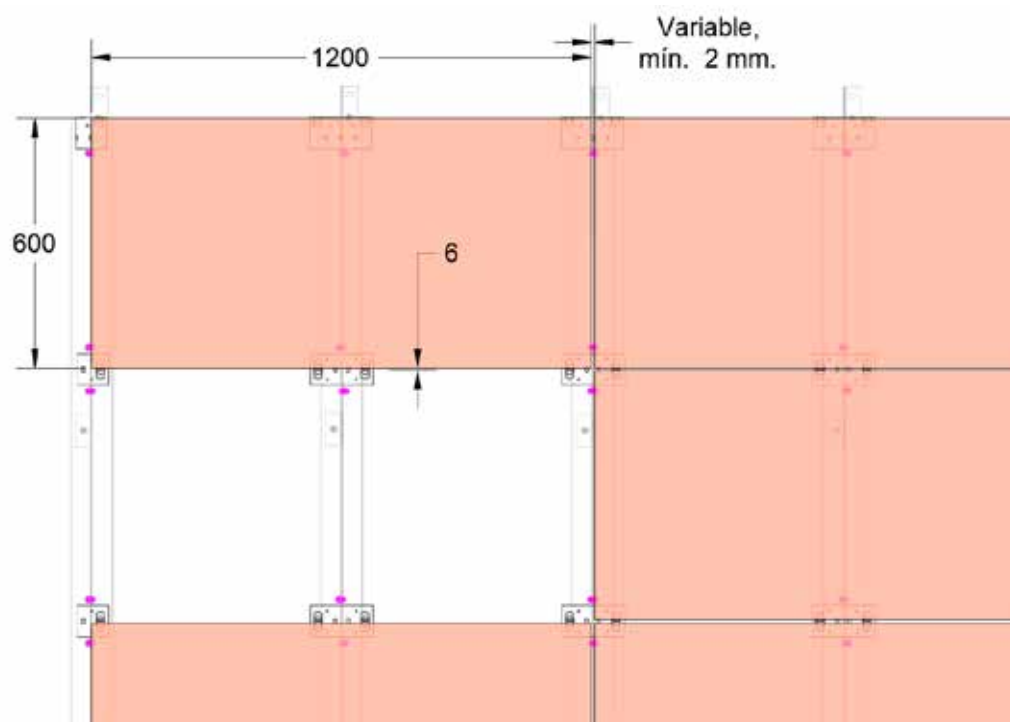
## PLACEMENT OF THE VENTILATED FACADE



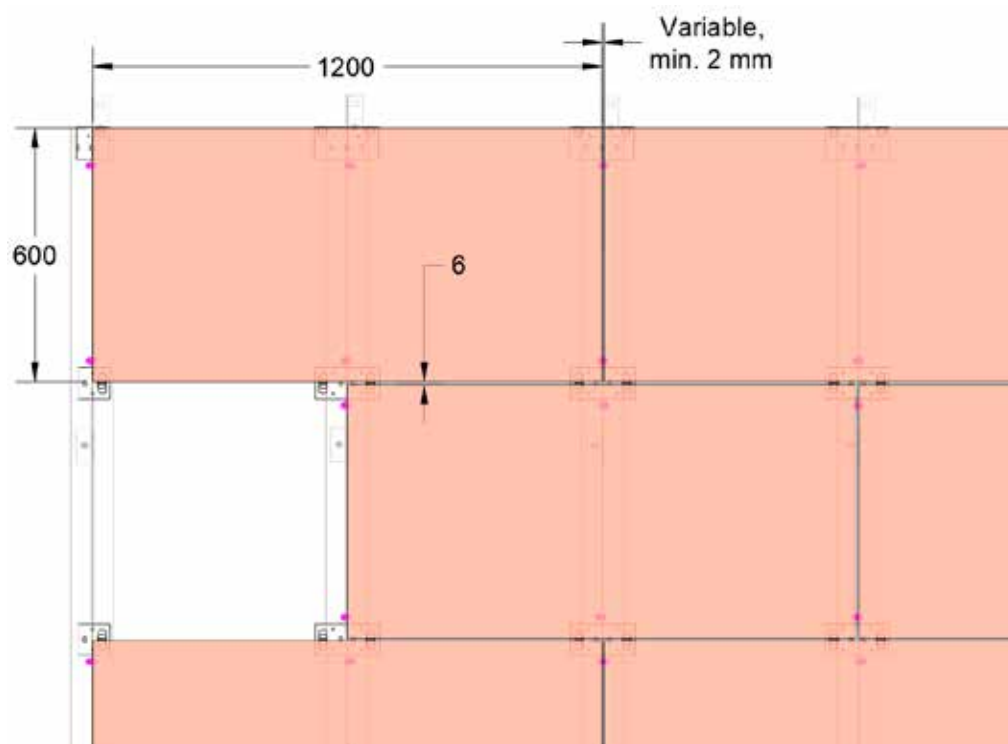
$x$ : Depending on the length of the ceramic.

$y$ : Depending on the characteristics of the work. Never higher than 0.75 m..

### Running joint installation



### Matajunta installation





## 4. START-UP

### GENERAL SPECIFICATIONS

For each work and in view of the architectural project, a technical project of the ventilated façade will be carried out in which the elements to be used and their layout will be calculated and determined.

Said project will include the plans and construction details necessary for the correct understanding and subsequent installation of the system by the construction personnel.

In any case, DolceStone, S.L., provides all the necessary data to carry out the project and the execution of the ventilated façade; must provide, if requested, technical assistance during the project and execution phases, including the resolution of singular points.

The assembly of the DOL TC14 ventilated façade system must be carried out by specialized personnel authorized by DolceStone, S.L., under its control and technical assistance, using the previously described fixing elements.

The ceramics already placed must not be under tension and must have sufficient freedom of movement. For these purposes, sufficient margin must be provided in the holes when making the joints, thus enabling expansion due to humidity and temperature.

### PREPARATION OF THE SUPPORT AND SYSTEM OF FIXATION

On site, before assembling the system, the stability and bearing capacity of the support must be checked and whether the anchors provided for in the technical project are adequate for it, by means of the proper pull-out tests according to the work control plan, supervised by the optional address.

In the event that the planned anchorage is not adequate, it must be replaced with the approval of the Project Management, taking the necessary precautions in terms of position and number of anchorages.

The installer of the façade will give his prior consent to the support before placing the system. The substructure must be properly aligned in order to guarantee the flatness of the cladding system.

The fixing system must anticipate the expansion of the plates and be defined according to:

- Wind loads
- Maximum distances between fixing points of the panels
- Format and dimensions of the panels
- Expansion joints of the building and the components

### VENTILATED AIR CHAMBER

The existence of a continuous air chamber, between 3 and 10 cm thick, ventilated by ascending natural convection behind the cladding, must be taken into account.

## 5. ASSEMBLY

The steps of the assembly of the ventilated facade must be the following:

1. Stakeout
2. Placement of corbels
3. Placement of vertical profiles
4. Placement of thermal insulation
5. Placement of horizontal profiles
6. Placement of sliding clips
7. Placement of ceramics, with establishment of joints and application of adhesive putty in the grooves made in the ceramic.
8. Placing the ceramic in the lower strip of the facade

### LAYOUT

The facade will be reconsidered checking the planimetry of the support to be covered, verifying the plan for a good choice of anchorage.

The axes of the vertical profiles will be placed according to the dimensions of the covering tile, at a distance equal to or less than 120 cm, depending on the format of the tile, as defined in the project and justified by calculation.

The characteristics of the support, both in collapse and in flatness, must meet the conditions set out in the CTE, as well as in the corresponding regulations and provisions in force.

### PLACEMENT OF THE BRACKETS

First of all, the "L" spacer profiles will be fixed on the supporting wall or the beams and/or edges of the slab using suitable anchors.

A placement and distribution of the vertically aligned spacers will be carried out, distributed between slab edges. The vertical distance will depend on the type and condition of the support and, in turn, on the loads that it has to transmit to it, provided that the support allows it, less than 1 meter.

### PLACEMENT OF THE VERTICAL PROFILES

The vertical "T" or "L" profiles will be placed, fixing

them to the "L" brackets with the screws described above, with a maximum distance between them of 120 cm depending on the size of the ceramic piece.

The flatness of the frameworks of vertical extruded aluminum profiles must be guaranteed through the appropriate anchoring system, in order to ensure the flatness of the cladding system.

The vertical profiles, perfectly aligned, will be fixed with fixed and elongated holes to the brackets, in such a way that they guarantee the adequate movement of the substructure and a good planimetry. To do this, they are fixed to a fixed hole at their upper end, the lower ones being slotted.

The minimum horizontal joint between vertical profiles will be 2 mm for each linear meter of profile.

### PLACEMENT OF INSULATION

Whenever it is applied, the entire exterior face of the vertical wall and the resistant structure of the building will be covered according to the specifications of the project.

### PLACEMENT OF STAPLES

The staples are placed on the vertical "T" or "L" profile, starting with the lower ones and at a distance between them that will be determined by the tile format being laid and its position.

Before placing the ceramic pieces, a bead of polyurethane adhesive putty is applied to the vertical profiles in the areas where they will touch the ceramic pieces.

### PLACEMENT OF CERAMIC PIECES

As it is a fixation with hidden staples, it is placed in the following way: the ceramic piece is attached to the lower staples, perfectly fitting the upper pins of the staples into the lower grooves of the ceramic piece. Then the upper staples are placed, fitting perfectly on the upper slots. The pieces are thus stabilized.

The ceramic pieces will usually be fixed to staples arranged in their four corners. In the case that by calculation it is necessary, the pieces will be fixed at their four corners and at the midpoint of their horizontal dimension, by means of two additional staples fixed to an intermediate vertical profile.

## JOINTS

The joints between the ceramic pieces must always be open.

The vertical joint must be  $\geq 1$  mm and a maximum of 3 mm and the horizontal joint must be 5 mm.

Placement of the ceramic pieces in the lower part of the façade

Finally, the lower row of ceramic pieces is placed together with the starting staples.

## 6. MAINTENANCE

For the cleaning of the ceramic pieces, the recommendations of the manufacturer of the same will be followed, being its cleaning similar to that of the usual ceramic tiles.

In case of replacement of parts, the difference in tone with respect to those previously placed must be taken into account.

## 7. COMPLIANCE WITH NATIONAL REGULATIONS

### SE – STRUCTURAL SAFETY

The DOLCKER & CLIP System for cladding ventilated facades with ceramics does not contribute to the stability of the building, and therefore the Basic Structural Safety Requirements do not apply to it.

However, it must be taken into account that the structural behavior of the ventilated facade must be such that it does not compromise compliance with the rest of the Basic Requirements, and in particular those of Safety of Use and Habitability, as indicated in the Law of Ordinance of the building: Safety of use in such a way that the normal use of the building does not pose a risk of accident for people (article 3.1.b.3), and other functional aspects of the construction elements or facilities that allow satisfactory use of the building (article 3.1.c.4).

The use of the **DOL-TC14** System for cladding ventilated facades with ceramics requires the development of a technical project in accordance with current regulations.

In the project, the stability, resistance and admissible deformations will be verified, justifying the adequate composition of the system to withstand the mechanical stresses that may derive from the actions

corresponding to the ultimate limit states and service.

The calculation will be specified based on the location and height of the building and the characteristic resistance values of the panel. Likewise, special attention will be paid to the localized instability phenomena that the wind can produce in certain parts of buildings, especially in tall buildings.

The support of the ventilated façade system, usually constituted by an enclosing wall, must comply with the essential structural safety requirements that are inherent to it, considering the actions and stresses that the ventilated façade system transmits to it.

The joint between the substructure of the system and the rear enclosure must be planned so that during the period of use the extreme limit stresses or the durability limit values are not exceeded.

### SI- SAFETY IN CASE OF FIRE

The composition of the enclosure, including the insulation, must comply with the CTE, Basic Fire Safety Document (DB-SI), in regard to fire stability, as well as the reaction to fire of the materials that comprise it.

In accordance with Decision 96/603/CE of the

Commission of October 4, 1996, fired clay products obtain a class A1 reaction to fire classification (without contribution to fire) without the need for tests.

The cladding material meets the requirement demanded in CTE-DB-SI (SI-2 point 1.4) regarding exterior propagation, for the exterior cladding materials of the façade and the interior surfaces of the ventilated chambers of the façade.

As in all ventilated façade systems, in the event of a fire, propagation by the chimney effect may occur, for which reason the fire behavior specifications of the materials must be respected and, where appropriate, provide for fire break zones.

## **SU - SAFETY OF USE**

The CTE does not specify requirements related to the safety of use for ventilated facade systems. However, it is recommended that for the lower areas of buildings, in accessible areas for public use, an intermediate vertical profile should be placed.

## **HS - HEALTH**

The complete enclosure solution must guarantee the minimum degree of impermeability required for the building to which it is incorporated, as described in the CTE-DB-HS, in order to satisfy the basic requirement of protection against moisture (HS 1).

As the System is described in the Technical Report, the ventilated air chamber may be considered a "very high resistance barrier to filtration" (B3) as described in the CTE-DB-HS, HS 1, section 2.3 .2, provided that:

- The dimensions of the air chamber are respected, joints and amount of ventilation openings described above.
- The insulating material must be non-hydrophilic and be located between the air chamber and the vertical wall.

There is, in the lower part of the chamber and when it is interrupted, a system for collecting and evacuating the water filtered into it (as described in section 2.3.3.5 of the CTE-DB-HS, HS-1). In any case, special attention must be paid, in the design

of the facades, to the incorporation of windows and lighting elements, as well as the correct solution of singular points, exterior fixings, etc., to achieve adequate watertightness. at these points, avoiding the accumulation and filtration of water.

The verification of the limitation of surface and interstitial condensation humidity must be carried out in accordance with the provisions of section HE-1 (Limitation of energy demand) of the CTE-DB-HE (HE-1, point 3.2.3).

The components of the system, as declared by its manufacturer, do not contain or release dangerous substances in accordance with national and European legislation.

## **HR - PROTECTION AGAINST NOISE**

The complete enclosure solution, and fundamentally the support wall plus the insulation, must comply with the requirements of the CTE-DB-HR in terms of protection against noise.

The constructive solution of the meeting of the facade with the vertical separation elements will be studied, so as to avoid the transmission of noise by flanks.

## **HE - ENERGY SAVING**

The complete construction solution for the enclosure must meet the requirements of the CTE-DB-HE in terms of hygrothermal behaviour.

The System, as described in the Technical Report, for the purposes of calculating the thermal transmittance, as described in Appendix E of the CTE-DB-HE, the air chamber will be considered a "highly ventilated air chamber", and the total thermal resistance of the enclosure will be obtained by neglecting the thermal resistance of the air chamber and of the other layers between the air chamber and the outside environment, and including an external surface resistance corresponding to still air, equal to the resistance inner surface of the same element (HE-1, Appendix E).

## 8. POINTS TO CONSIDER

### USE OF THE PRODUCT. START-UP

In the execution of singular points such as sills, lintels, jambs, breastplates, etc., the tightness of the same, and its previous waterproofing if necessary, as well as the correct evacuation of water avoiding its accumulation must be taken into account.

### LIMITATIONS OF USE

For those cases that are outside the field of application of said Basic Document, or when wind actions higher than those considered in the CTE-DB-SE-AE are foreseen, it will be necessary to carry out a specific study to determine the wind actions.

### WASTE MANAGEMENT

The specifications of Royal Decree 105/2008, which regulates the Production and Management of Construction and Demolition Waste, as well as the applicable regional and local regulations, will be followed.

### TERMS OF SERVICE

According to the durability tests carried out and the site visits, it is considered that the System behaves satisfactorily in accordance with the requirements related to durability; provided that the facade, installed as described in this document, is subject to proper use and maintenance, in accordance with the provisions of the CTE.



**DOLCESYSTEM**  
**QUALITY**

**DOLCESYSTEM** ✓  
**GUARANTEED**



## 9. ANNEX

### EXTRACTION RESISTANCE TEST OF DIFFERENT ANCHORS FOR VENTILATED FAÇADE

The tested systems are:



NYLTX set consisting of expansion and compression nylon plug with anti-rotation wings and hexagonal screw with ring and torx footprint.



Expansion anchor with ring 10x90 Zinc-plated steel

The test method consists of the following steps:

- 1.- Drill with hammer and 10mm bit, for the Nyltx plug, and 10mm drill for the anchor expansive 10x90
- 2.-The assembly is fixed with the help of a suitable screwdriver and nozzle
- 3.-The dynamometer is mounted, the red marker of maximum tension or starting point is set to zero and the extraction is started.

With the following significant results:

#### EXPANSIVE ANCHORAGE 10x90



3 equal values of 1,400 Kg

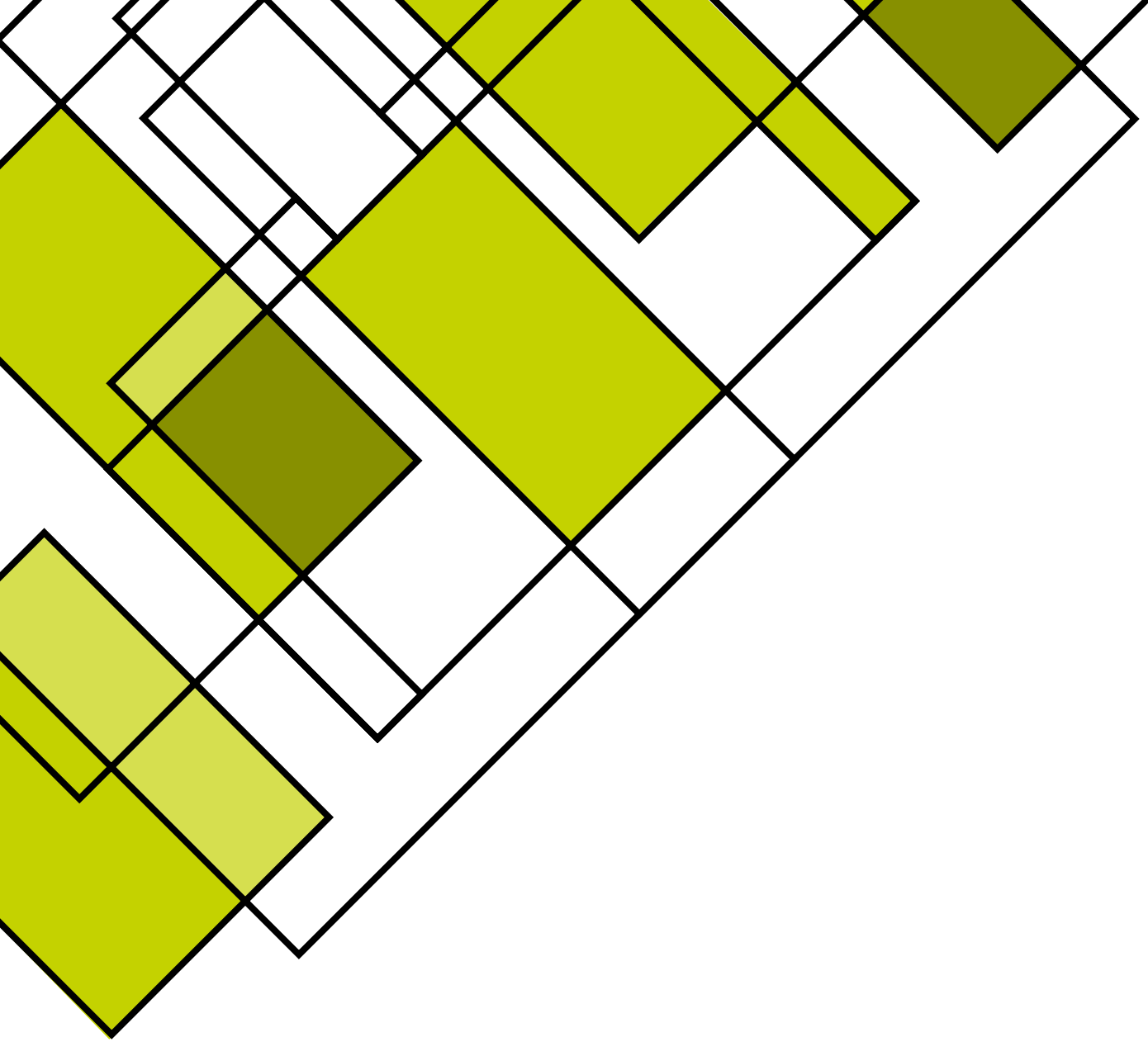
#### HIGH PERFORMANCE 10X80 NYLON ANCHORAGE

The plug has been tested in various situations of the closing wall:



With the following values: 700 Kg - 450 kg - 400 Kg.

ETANCO, S.A.  
May 12, 2017



# **DOLCKER**

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Portal A - 5 A and B  
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