

Approval body for construction products
and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and
Laender Governments



European Technical Assessment

ETA-17/0387
of 22 November 2017

English translation prepared by DIBt - Original version in German language

General Part

Technical Assessment Body issuing the
European Technical Assessment:

Deutsches Institut für Bautechnik

Trade name of the construction product

K-Fix for KRION LUX facade panel

Product family
to which the construction product belongs

Fastener for rear fixing for facade panels made of acrylic
resine and natural mineral aluminium hydroxide.

Manufacturer

Butech Building Technology S.A
Porcelanosa Group
Ctra. Vila-real - Puebla de Arenoso (DV-20), Km 2,5
12540 VILA-REAL, CASTELLON
SPANIEN

Manufacturing plant

Plant 1

This European Technical Assessment
contains

14 pages including 3 annexes which form an integral part
of this assessment

This European Technical Assessment is
issued in accordance with Regulation (EU)
No 305/2011, on the basis of

EAD 330030-00-0601

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Specific Part

1 Technical description of the product

The K-Fix is a fastener made of stainless steel, consisting of a cap with a slot and a screw. The cap is put into the drill hole of the façade plate. The screw is fixing the cap with the special substructure L-profile or T-profile made of aluminium EN AW 6005 T6. After fixation the K-Fix is glued with a cover plate.

The product description is given in Annex A. The material values, dimensions and tolerances of the components of the fastener not indicated in the annexes shall correspond to the values laid down in the technical documentation¹.

2 Specification of the intended use in accordance with the applicable European Assessment Document

The performances given in Section 3 are only valid if the fastener is used in compliance with the specifications and conditions given in Annex B.

The verifications and assessment methods on which this European Technical Assessment is based lead to the assumption of a working life of the fasteners of at least 50 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

3 Performance of the product and references to the methods used for its assessment

3.1 Mechanical resistance and stability (BWR 1)

Essential characteristic	Performance
Characteristic resistance for tension and shear loads	See Annex C 1
Fastener distances	See Annex C 1
Durability	Corrosion Resistance Class (CRC) II according to EN 1993-1-4:2015

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Class A1
Resistance to fire	No performance assessed

4 Assessment and verification of constancy of performance (AVCP) system applied, with reference to its legal base

In accordance with EAD No. 330030-00-0601 the applicable European legal act is: [97/161/EC].

The system to be applied is: 2+

¹ The technical documentation comprises all information of the holder of this ETA necessary for the production, installation and maintenance of the fastener; these are in particular design drawings. The part to be treated confidentially is deposited with Deutsches Institut für Bautechnik and, as far as this is relevant to the tasks of the approved bodies involved in the procedure of attestation of conformity, shall be handed over to the approved body.

5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable European Assessment Document

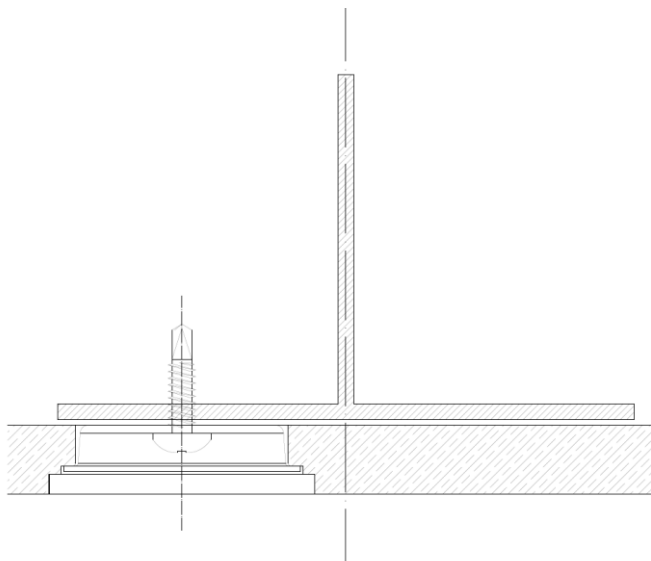
Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited with Deutsches Institut für Bautechnik.

Issued in Berlin on 22 November 2017 by Deutsches Institut für Bautechnik

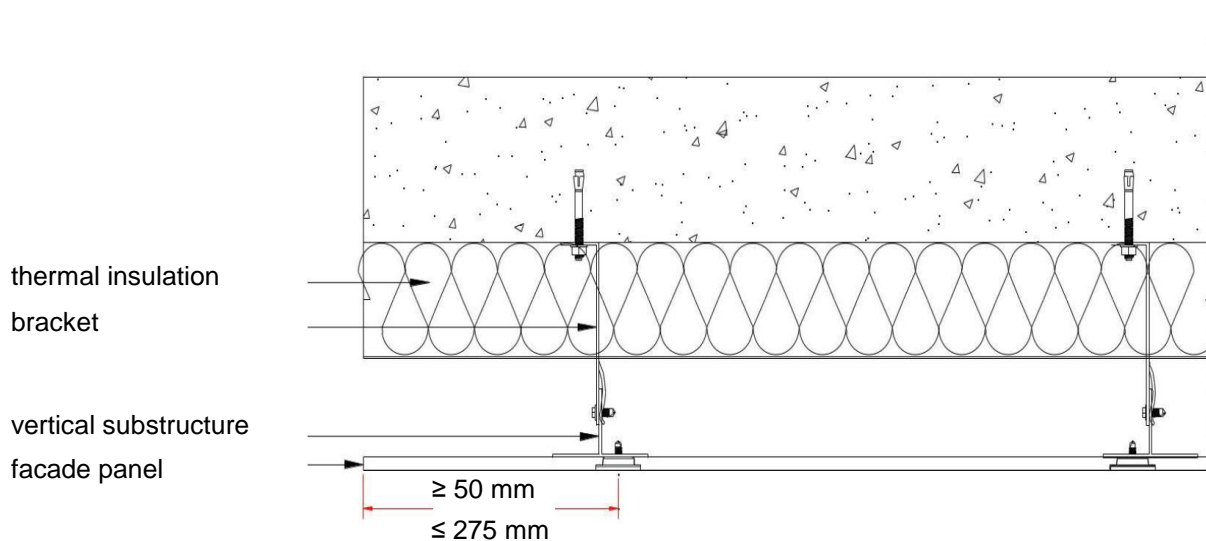
BD Dipl.-Ing. Andreas Kummerow
Head of Department

beglaubigt:
Aksünger

Installed fastener



Fixing example



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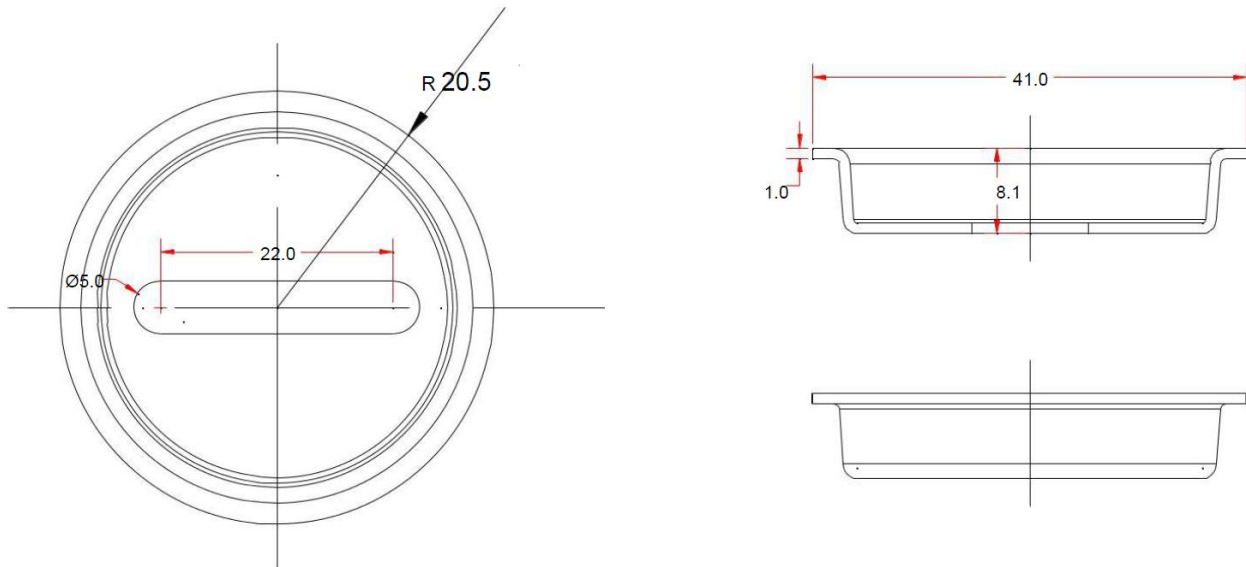
K-Fix for KRION LUX facade panel

Product description
Installed fastener and fixing example

Annex A 1

K-Fix (dimension in mm)

Cap



Screw

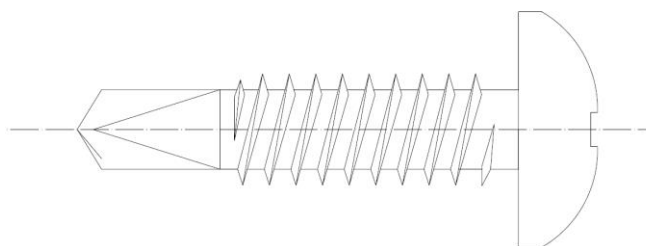


Table A1: Dimensions and Materials

Fastener type		K-Fix
embedment depth	$h_s =$ [mm]	7
installation torque moment	T_{inst} [Nm]	10
Materials		
cap	Stainless steel according to EN 10088:2014	
screw	Stainless steel according to EN 10088:2014	

K-Fix for KRION LUX facade panel

Product description
Dimensions and Materials

Annex A 2

Specifications of intended use

Anchorage subject to:

- Static and quasi-static loads.

Use conditions (Environmental conditions):

- According to EN 1993-1-4:2015 according to the Corrosion Resistance Class of the fastener (see section 3.1)

Base materials:

- The bending strength of KRION LUX-façade panels shall be determined according to EN ISO 178:2013-09.
- The characteristic values of the façade panel correspond to Table B1.

Table B1: characteristic values of the façade panels – geometrical and physical properties

Nominal thickness of façade panel	$h_{nom} \geq$	[mm]	12
Mean value of modulus of elasticity	$E_{mean} =$	[N/mm ²]	9000
thermal expansion coefficient	$\alpha_T =$	[1/K]	$37,2 \times 10^6$
Density	$\gamma =$	[kN/m ³]	18,5
bending resistance	$\sigma_{5\%}^{1)} \geq$	[N/mm ²]	68,4

¹⁾ 5 %-Quantil by a confidence level of 75 % and unknown standard deviation

Substructure:

Table B2: characteristic values of the aluminium profile

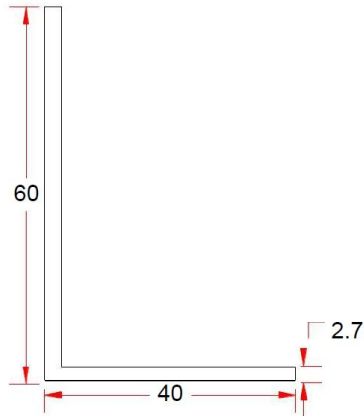
thickness of the profile	$t =$	[mm]	2,7
Aluminium alloy EN AW 6005 T6 according to EN 573-3:2013	$R_{m,min} =$	[N/mm ²]	270

K-Fix for KRION LUX facade panel

Intended use
Specifications

Annex B 1

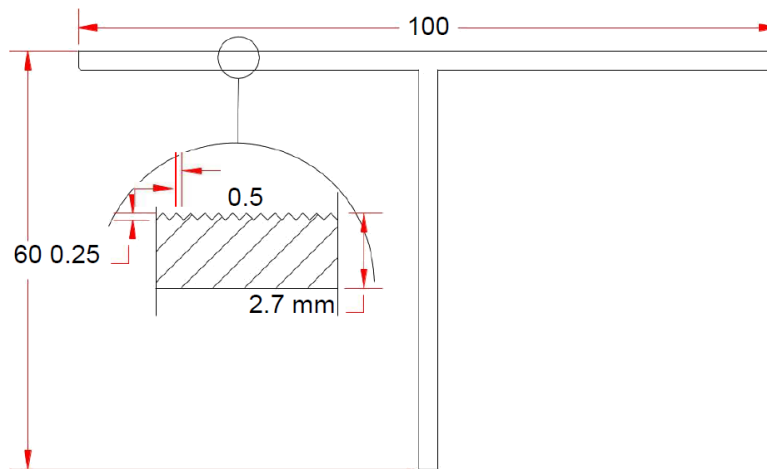
L-Profile



L 60.40.2.7 | Aluminium 6005 T6 épaisseur de 2,7 mm
CARACTÉRISTIQUES MÉCANIQUES ET GÉOMÉTRIQUES

SECTION mm ²	POIDS kg/m	PÉRIMÈTRE mm	Xc mm	Ixc cm ⁴	r xc mm	Yc mm	Iyc cm ⁴	r yc mm
262.5	0.709	199	40.98	9.96	19.47	30.98	3.66	11.80

T-Profile



T 100.60.2 | Aluminium 6005 T6 épaisseur de 2,7 mm
CARACTÉRISTIQUES MÉCANIQUES ET GÉOMÉTRIQUES

SECTION mm ²	POIDS kg/m	PÉRIMÈTRE mm	Xc mm	Ixc cm ⁴	r xc mm	Yc mm	Iyc cm ⁴	r yc mm
315.94	0.836	335	50	9.579	17.41	47.98	15.507	22.15

K-Fix for KRION LUX facade panel

Intended use
Specifications

Annex B 2

Design:

General:

- Each façade panel is fixed with at least four fasteners in a rectangular arrangement via single agraffes on the substructure (for small panels or small fitted pieces, differential or fill-in pieces the number and position of the fasteners shall be chosen constructively).
- Edge distance and spacing shall be observed. For small fitted pieces, differential and fill-in pieces the edge distance and spacing shall be chosen.
- The substructure is constructed such that the façade panels are fixed technically strain-free via skids (loose bearings) and one fixed point (fixed bearing) - the fixed point may be placed at the panel edge or in the panel field.
- Two fixing points of the façade panel are designed such that they are able to carry the dead load of the façade panel.
- Constraint loads shall be into account for design, if constraint loads exists.
- When using agraffes on horizontal load-bearing profiles the fixing points of a façade panel situated horizontally at the same height are fastened in each case to the same load-bearing profile.
- Verifiable calculation notes and drawings shall be prepared taking account of the loads to be anchored, the nature and strength of the base materials and the dimensions of the anchorage members as well as of the relevant tolerances. The position of the fastener is indicated on the design drawings.

Verification ultimate limit state:

Anchorage are designed under the responsibility of an engineer experienced in anchorages and facade construction.

$$\frac{N_{Ed}}{N_{Rd}} \leq 1$$

$$\frac{V_{Ed}}{V_{Rd}} \leq 1$$

$$\frac{N_{Ed}}{N_{Rd}} + \frac{V_{Ed}}{V_{Rd}} \leq 1,3$$

N_{Ed} : Design value of the tensile force

$$N_{Ed} = N_{Ek,w} \cdot \gamma_F$$

$N_{Ek,w}$: characteristic value of the tensile force of wind load

γ_F : partial safety factor according to EN 1990:2010

N_{Rd} : design value of the tensile load-bearing capacity

$$N_{Rd} = N_{Rk} / \gamma_M$$

N_{Rk} : characteristic value of the tensile load-bearing capacity according to Table C1

$\gamma_M = 1,8$; recommended partial safety factor, in absence of national regulations

V_{Ed} : design value of the shear force

$$V_{Ed} = V_{Ek} \cdot \gamma_F$$

V_{Ek} : characteristic value of the shear force

γ_F : partial safety factor according to EN 1990:2010

V_{Rd} : design value of the shear load-bearing capacity

$$V_{Rd} = V_{Rk} / \gamma_M$$

V_{Rk} : characteristic value of the shear load-bearing capacity according to Tabelle C1

$\gamma_M = 1,8$; recommended partial safety factor, in absence of national regulations

K-Fix for KRION LUX facade panel

Intended use
Specifications

Annex B 3

Installation:

- The drillings are done at the factory or on construction site under workshop conditions; in the case of drillings on construction site the execution is supervised by the responsible project supervisor or a skilled representative of the project supervisor.
- Bore holes are drilled with a special drill bit according to Annex B 5 and a special drilling device.
- The drilling dust is removed from the drill hole
- the geometry of the drill hole is checked on 1 % of all drillings. The following dimensions shall be checked and documented according to manufacturer's information and testing instructions by means of a measuring device according to Annex B 5:
 - Geometry of the drill hole.
 - The distance between façade surface and frame of the cap is 7 mm. (see Annex B 5).

If the tolerances are exceeded, the geometry of the drill hole shall be checked on 25 % of the drillings performed. No further drill hole may exceed the tolerances otherwise all the drill holes shall be checked. If the tolerances are not kept the drill hole may not be used for anchorages.

Note: Checking the geometry of the drill hole on 1 % of all drillings means that on one of the 25 panels (this corresponds to 100 drillings in façade panels with four fasteners) one drilling shall be checked. If the tolerances given in Annex A 1 are exceeded 25 % of the drillings in each panel shall be checked, i.e. on each of the 25 panels, one drilling shall be checked.

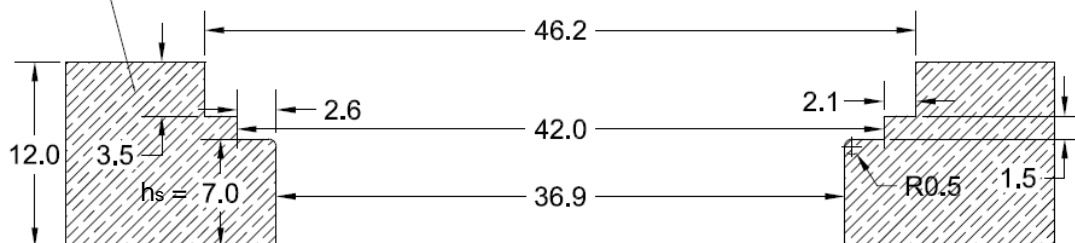
- During transport and storage on site the façade panels are protected from damages; the façade panels are not be hung up jerkily (if need be lifters shall be used for hanging up the façade panels); façade panels and reveal panels respectively with incipient cracks are not be installed.
- The direction of the slot in the cap shall be determined
- The façade are installed by skilled specialists and the laying instructions of the manufacturer shall be paid attention to.
- The façade panels are arranged in a "reclined" or "upright" position, they also may be fixed at façade soffits.

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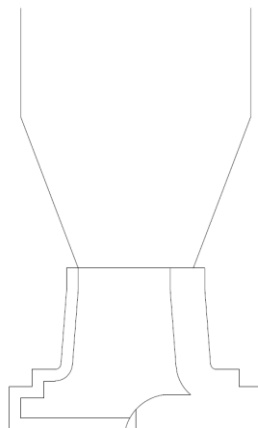
K-Fix for KRION LUX facade panel	Annex B 4
Intended use Specifications	

Drill hole:

Facade panel



Drill bit:



Example of measurement device

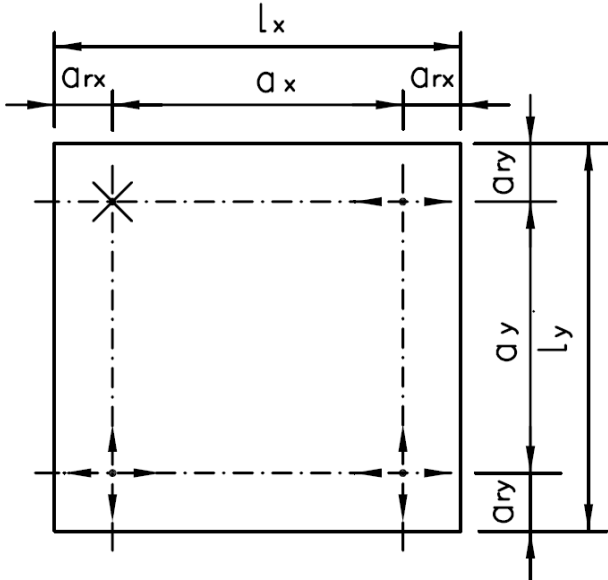


K-Fix for KRION LUX facade panel

Intended use
Drill hole geometry and drill bit

Annex B 5

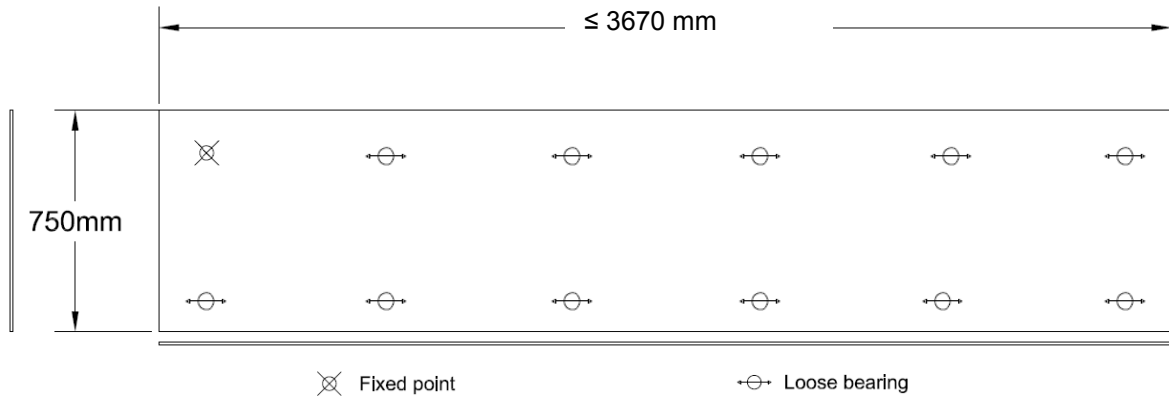
Definition of edge distance and spacing



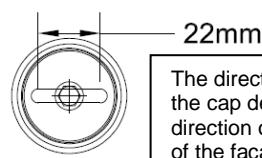
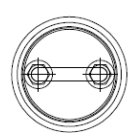
Legend:

- $a_{rx,y}$ = edge distance – distance of a fastener to the panel edge
- $a_{x,y}$ = spacing – distance between fasteners
- L_x = greater length of the façade panel
- L_y = smaller length of the façade panel
- * = fixed point (fixed bearing)
- ↔ = horizontal skid (loose bearing)
- ↕ = horizontal and vertical skid (loose bearing)

Example for fixed point and loose bearing



⊗ Fixed point ⊖ Loose bearing



22mm
The direction of the slot in the cap depends on the direction of the expansion of the façade system

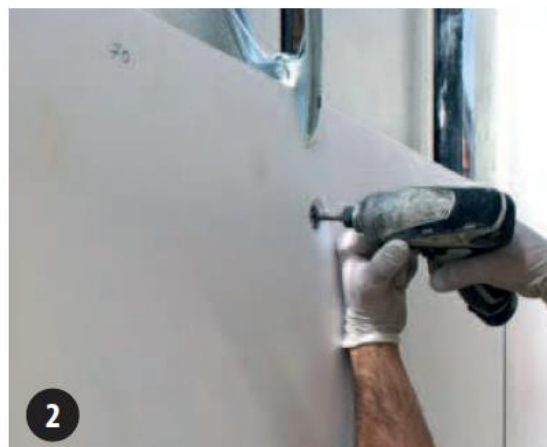
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K-Fix for KRION LUX facade panel	Annex B 6
Intended use Edge distance and spacing	

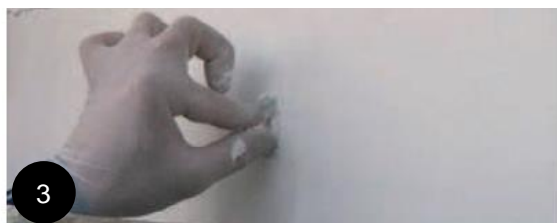
Installation instruction



1
butech aluminum profile (L-and T-profile) as facade substructure

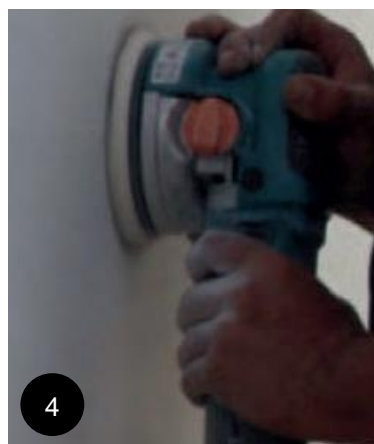


2
Insert the K-Fix cap in the bore hole and screw in the K-Fix cap and the substructure with the K-Fix screw.



3
Ensure that the facade panel caps are clean and dry before fixing.

Insert facade panel cap and glued with KRION adhesive, use so that it overflows.



4
After 24 hours, surface sanding may be carried out to remove any roughness, marks or excess adhesive and obtain the KRION® final finish.

K-Fix for KRION LUX facade panel

Intended use
Installation instruction

Annex B 7

Characteristic values of the fastener in KRION LUX façade panel

Table C1:

embedment depth	$h_s =$	[mm]	7
characteristic resistance to	tension load	$N_{Rk} =$	2,2
	shear load	$V_{Rk} =$	2,4
		[kN]	
edge distance	$a_r \geq$	[mm]	50
spacing	$a \geq$	[mm]	150

K-Fix for KRION LUX facade panel

Performance
Characteristic values of the fastener in KRION LUX façade panel

Annex C 1