

Approval body for construction products
and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and
Laender Governments



European Technical Assessment

ETA-17/1028
of 31. Mai 2022

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

KRION Facade kit

Product family
to which the construction product belongs

Ventilated cladding kit comprising of "KRION facade
panel" cladding material and associated fixing

Manufacturer

KRION SOLID SURFACE S.A.U.
Ctra. Vila-real-Puebla de Arenoso, Km.1
12540 VILA-REAL (CASTELLÓN)
SPANIEN

Manufacturing plant

Plant 1

This European Technical Assessment
contains

20 pages including 15 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 090062-00-0404

**European Technical Assessment
ETA-17/1028**

English translation prepared by DIBt

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Specific Part

1 Technical description of the product

KRION Façade kit for ventilated external wall claddings complies with the family B of EAD 090062-00-0404. The cladding kit consists of solid white acrylic-based cladding elements (façade panel) mechanically fastened to the subframe by specific anchor called k-fix system and c-bolt system. The façade panel are anchored at least by 4 anchors as listed in section 2 of this document.

The "KRION façade panel" is a solid surface made of one-third of acrylic resin and two-third of natural mineral aluminium hydroxide with white colour and a thickness of 12 mm.

The product description is given in Annex A.

KRION Façade kit for ventilated external wall claddings consists of:

- Cladding element:
KRION LUX façade panel with maximal dimension of 1500 x 3680 x12 mm (smaller panels may be used).
- Cladding fixing:
 - a) K-Fix system according ETA 17/0387: 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. The product description is given in the mentioned ETA.
 - b) KRION Keil system (c-bolt) according ETA 16/0979: The KRION Keil is a fastener made of stainless steel, consisting of a crosswise slotted anchor sleeve with an M6 internal thread, at the upper edge of which a hexagon is formed to it and a respective hexagon bolt with an integrated tooth lock washer. Alternatively, instead of the hexagon bolt with an integrated tooth lock washer, a threaded pin or threaded rod is used. The product description is given in the mentioned ETA.

The subframe, brackets and fixings between brackets and substrate are not part of the kit assessed in this ETA. Detailed information and data of all the components are given in the annexes of this ETA and in the associated test reports to this ETA.

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

KRION Façade kit is intended to be used as part of external wall claddings in ventilated or non-ventilated façades (rainscreens). The walls are made of masonry (clay, concrete or stone), concrete (cast on site or as prefabricated panels), metal frame in new or existing buildings (retrofit).

The subframe like vertical or horizontal load profiles with associated elements are aluminium elements.

The characteristics of the walls shall be verified prior to use of KRION Façade kit, especially regarding conditions for reaction to fire classification and for mechanical fixing of KRION Façade kit.

The performances given in Section 3 are only valid if the anchor is used in compliance with the specifications and conditions given in this ETA.

The provisions made in this European Technical Assessment are based on an assumed working life of at least 25 years for KRION Façade kit. 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.

KRION Façade kit is made of non-load bearing construction components. They do not contribute directly to the stability of the wall on which they are installed, but they can contribute to its durability by providing enhanced protection from the effect of weathering.

KRION Façade kit is not intended to ensure the airtightness of the building envelope.

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

3.1 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire (façade panel)	Class B-s1, d0 acc. to EN 13501-1 ¹⁾ Class E acc. to EN 13501-1 ¹⁾
fire resistance	No performance assessed
¹⁾ The conditions, for which this classification is valid, are detailed in Annex B 2.	

Note: A European reference fire scenario has not been laid down for façades. In some Member States, the classification of external wall claddings according to EN 13501-1 might not be sufficient for the use in façades. An additional assessment of external wall claddings according to national provisions (e.g. on the basis of a large-scale test) might be necessary to comply with Member State regulations, until the existing European classification system has been completed.

3.2 Safety and accessibility in use (BWR 4)

Essential characteristic		Performance
Wind load resistance (for the assembled kit)		No performance assessed
Resistance to horizontal points load		No performance assessed
Impact resistance		No performance assessed
Mechanical resistance Family B	Cladding element KRION façade panel	See Annex C 1
	Connection between the cladding element and its fixing system	See Annex C 2
Resistance to seismic actions		No performance assessed
Hygrothermal behaviour		No performance assessed

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

In accordance with EAD 090062-00-0404, July 2018 the applicable European legal act is: [2003/640/EC].

System of attestation of conformity applicable to cladding kit is: 2+

In addition, for uses subject to regulations on reaction to fire¹ the applicable AVCP systems regarding reaction to fire is 1 depending on the conditions defined in the said Decision.

5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD

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

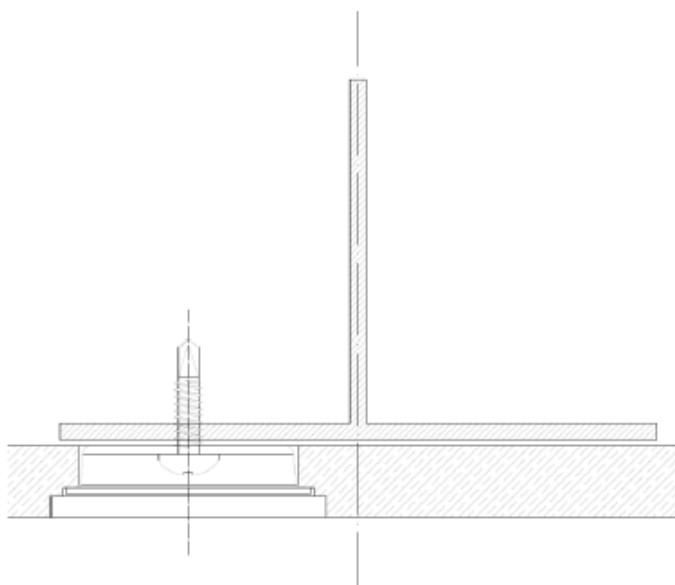
Issued in Berlin on 31 May 2022 by Deutsches Institut für Bautechnik

Renée Kamanzi-Fechner
Head of Section

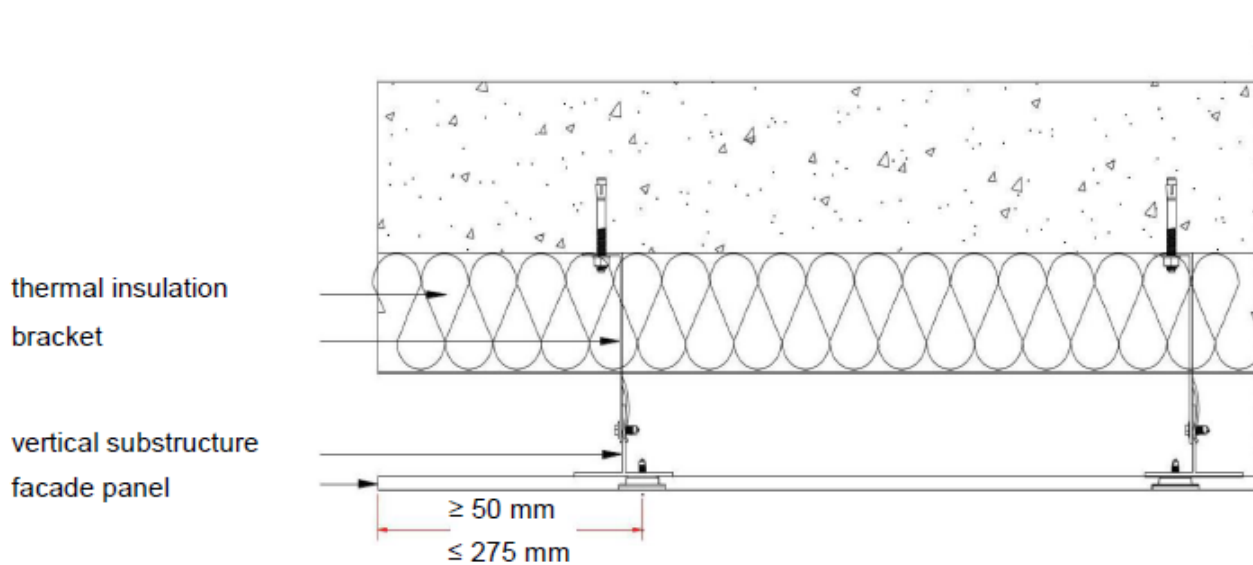
beglaubigt:
Beckmann

¹ Including propensity to undergo continuous shouldering, where relevant.

Installed fastener



Fixing example



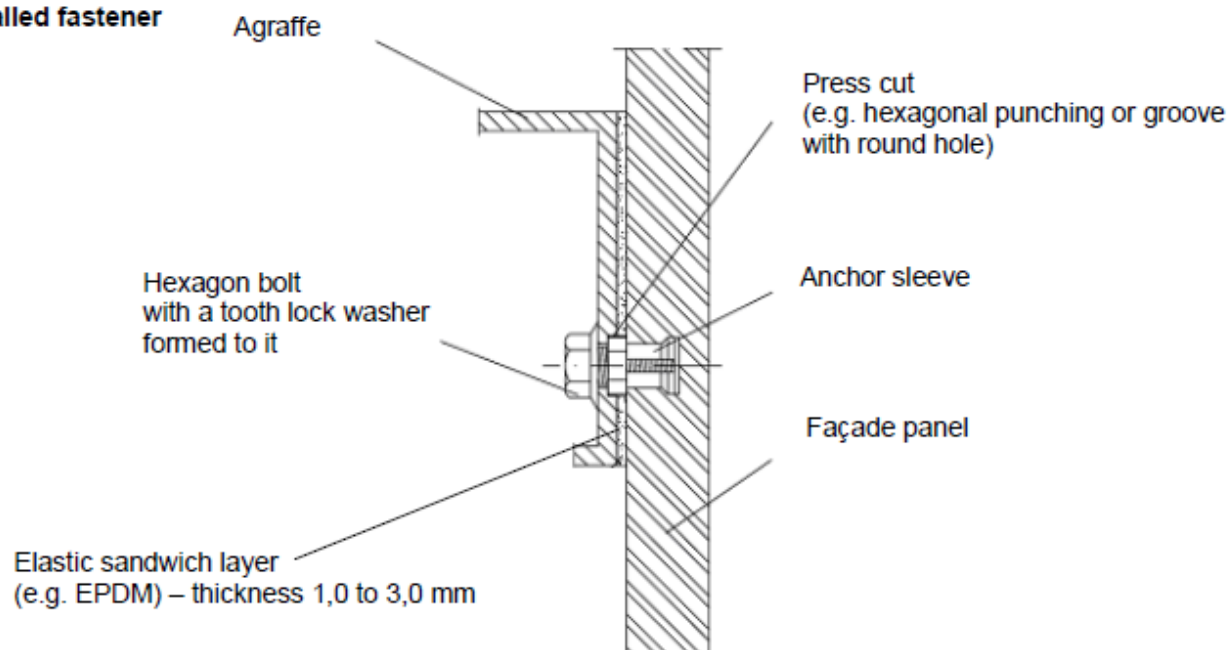
KRION Facade kit

Product description

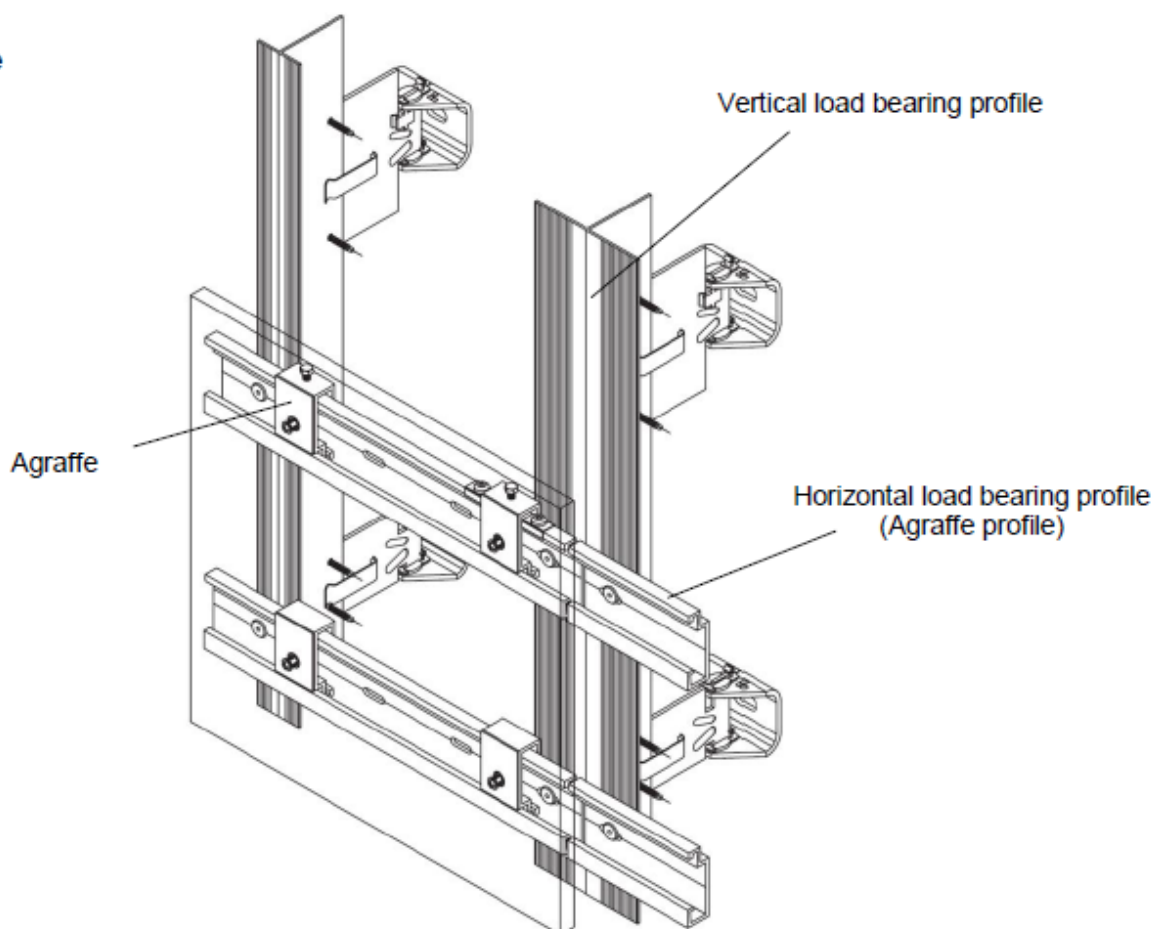
Installed fastener and fixing example for K-FIX

Annex A 1

Installed fastener



Fixing example



KRION Facade kit

Product description

Installed fastener and fixing example for KRION Keil

Annex A 2

Specifications of intended use

Scope

According to the EAD 090062-00-0404 / Cladding family B

Anchorage subject to:

Static and quasi-static loads

Design

The design of the external wall claddings for ventilated façades using KRION Façade kit and the associated fastener should take into account:

- It is assumed that the substrate wall meets the necessary requirements regarding the mechanical strength (resistance to static and dynamic loads) and the airtightness, as well as the relevant resistance regarding watertightness and water vapour.
- The verification of the designed system by means of calculation, taking into account the mechanical characteristic values of the kit components in order to resist the actions (dead loads, wind loads, etc.) applying on the specific works. National safety factors and other national provisions must be followed.
- The design of the façade panels and their fixing shall be carried out according to the conditions given in ETA 16/0979 or ETA-17/0387, the national regulations must be considered.
- The selection and verification of the brackets which support the subframe vertical profiles considering compatible materials (e.g. aluminium alloy) and the mechanical resistance (vertical and horizontal resistance) according to the envisaged actions obtained from the mechanical calculation of the designed system. Bracket resistance should be verified according to assessment given in EAD 090062-00-0404.
- The selection and verification of the anchors between the brackets and the external walls (substrate), taking into account the substrate material and the minimum resistance required (pull-out and shear resistance) according to the envisaged actions obtained from the mechanical calculation of the designed system.
- The accommodation of the designed system movements to the substrate or structural movements.
- The execution of singular parts of the façade; some examples of construction details are indicated in Annex A1.
- The corrosion protection of the designed system metallic components taking into account the category of corrosivity of the atmosphere of works (e.g. acc. ISO 9223).
- The drainability of the ventilated air space between the cladding elements and the insulation layer or the external wall accordingly.
- An insulation layer is usually fixed on the external wall and should be defined in accordance with a harmonized standard or an European technical assessment and taking into account the section 3.1 of this ETA.
- Because the joints are not watertight, the first layer behind ventilated air space (e.g. insulation layer) should be composed by materials with low water absorption.

KRION Façade kit

Intended use
Specifications - general

Annex B 1

Specifications of intended use

Scope

According the EAD 090062-00-0404 / Cladding family B

Reaction to fire

For the classification of the Reaction to fire for the façade panel in use the following application parameters must be considered:

Case a) - class B-s1, d0 acc. to EN 135501-1

- colour white; panel thickness 12mm; nominal density approx. 1750kg/m³
- claddings with closed, non-ventilated air gap ≥ 20 mm
- mechanically fixed on bar shaped subframe of metal
- substrate and thermal insulation behind the air gap with class A1 or A2-s1-d0 acc. EN 13501-1 ($d \geq 20$ mm, $\rho = 35$ kg/m³, distance ≥ 20 mm)
- with overlapping joints or with glued joints if a waterglass-based adhesive is used
- open joints must be closed/covered with metallic profiles
- EAD 090062-00-0404 Annex O must be considered

Case b) - class E acc. to EN 135501-1

- colour white; panel thickness 12mm; nominal density approx. 1750kg/m³
- claddings ventilated air gap with width of the air gap ≥ 20 mm
- mechanically fixed on bar shaped subframe of metal
- substrate with class A1 or A2-s1-d0 acc. EN 13501-1 ($d \geq 20$ mm, $\rho = 35$ kg/m³, distance ≥ 20 mm)
- with overlapping joints or with glued joints if a waterglass-based adhesive is used
- with open joints or with joints closed/covered with metallic profiles
- EAD 090062-00-0404 Annex O must be considered

KRION Facade kit

Intended use
Specifications - general

Annex B 2

Installation K-Fix (acc. ETA-17/0387 of 22. November 2017):

- 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 of ETA-17/0387 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 of ETA-17/0387:
 - Geometry of the drill hole.
 - The distance between façade surface and frame of the cap is 7mm.

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 of ETA-17/0387 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.

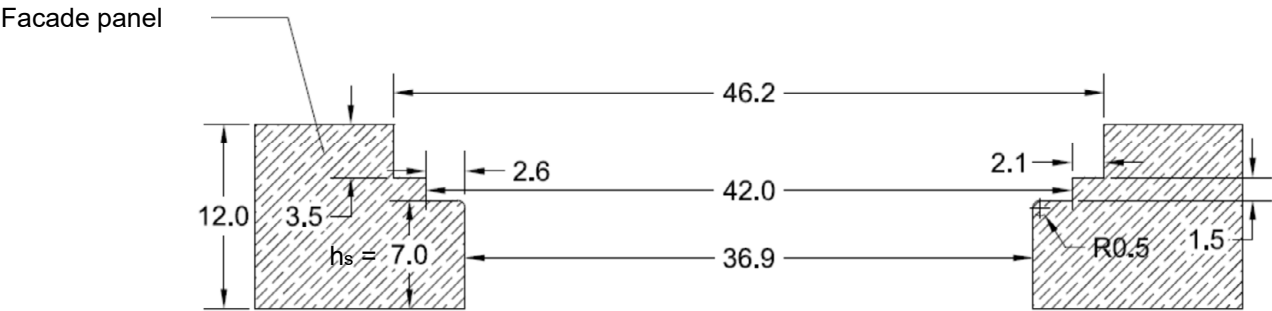
- During transport and storage on site the façade panels are protected from damages; the façade panels are not be hung up jerkily (if need be lifters shall be used for hanging up the façade panels); façade panels and reveal panels respectively with incipient cracks are not be installed.
- The direction 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.

KRION Facade kit

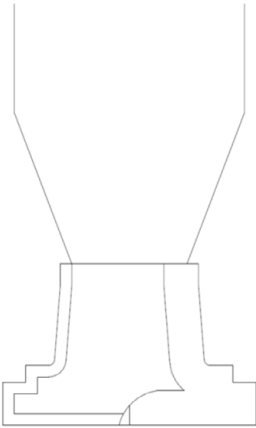
Intended use
Installation – K-Fix

Annex B 3

Drill hole:



Drill bit:

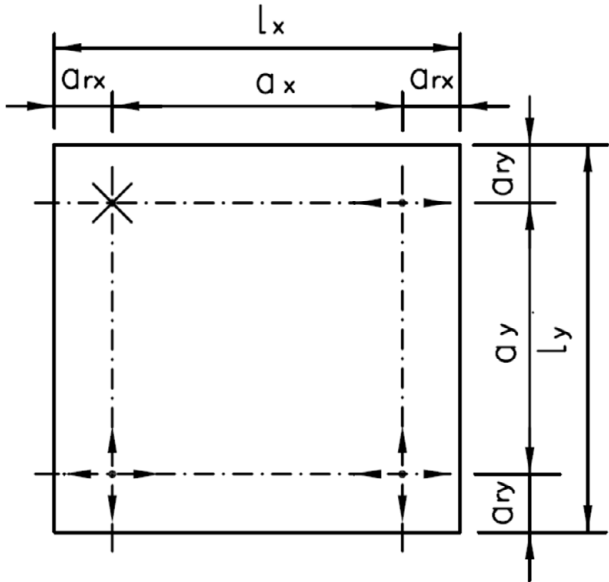


Example of measurement device



KRION Facade kit	Annex B 4
Intended use Edge distance and spacing – K-Fix	

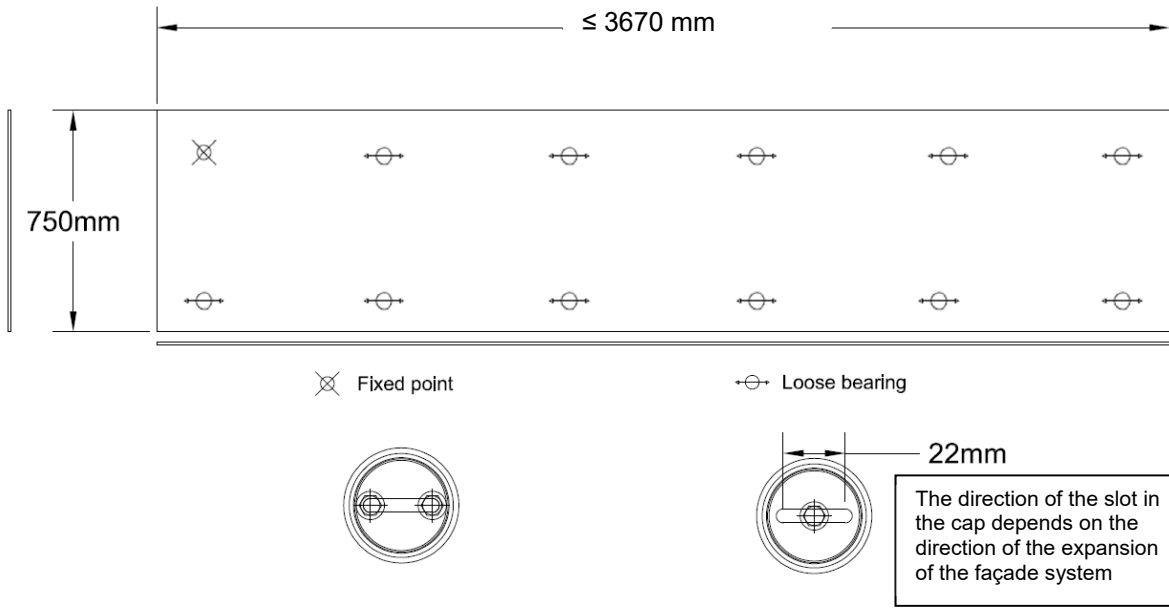
Definition of edge distance and spacing



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
- $\times$ = fixed point (fixed bearing)
- $\leftrightarrow$ = horizontal skid (loose bearing)
- $\leftrightarrow \updownarrow$ = horizontal and vertical skid (loose bearing)

Example for fixed point and loose bearing



KRION Facade kit

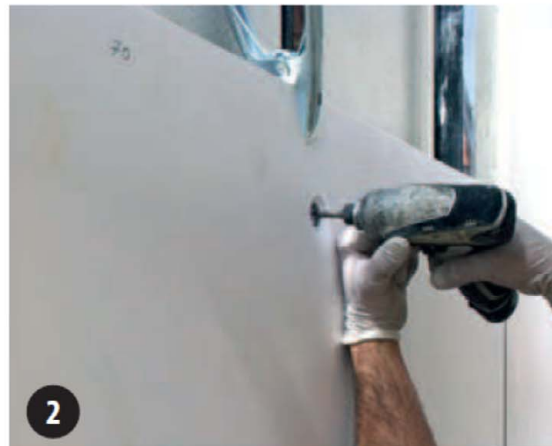
Annex B 5

Intended use
Edge distance and spacing – K-Fix

Installation instruction



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

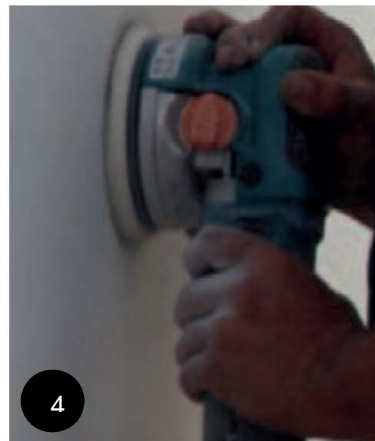


2
Insert the K-Fix cap in the bore hole and screw in the K-Fix cap and the substructure with the K-Fix screw.



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.

KRION Facade kit

Intended use
Installation instruction – K-Fix

Annex B 6

Installation KRION Keil (acc. ETA-16/0979 of 5. December 2017):

- The drillings are done at the factory or on site under workshop conditions; when making the drillings on 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 4 of ETA-16/0979 and a special drilling device.
- The drilling dust is removed from the drill hole
- In case of aborted hole: new drilling at a minimum distance away of twice the depth of the aborted 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 4 of ETA-16/0979:
 - Volume of the undercut drill hole.
 - Depth position of the undercut; the distance between the lower edge of the measuring device and the façade panel is between 0,0mm and 0,3mm.

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 controlled. Drilling holes falling below or exceeding the tolerances shall be rejected.

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 2, Table A1 of ETA-16/0979 are exceeded the extent of the control shall be increase to 25 % of the drillings, i.e. one drilling each shall be checked on all the 25 panels.

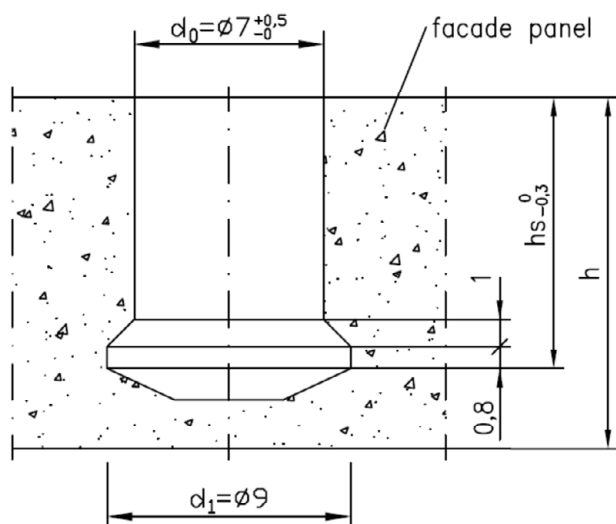
- During transport and storage on site the façade panels are protected from damages; the façade panels are not be hung up jerkily (if need be lifters shall be used for hanging up the façade panels); façade panels and reveal panels respectively with incipient cracks are not be installed.
- The façade 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.

KRION Facade kit

Intended use
Installation – KRION Keil

Annex B 7

Geometry of the drill hole

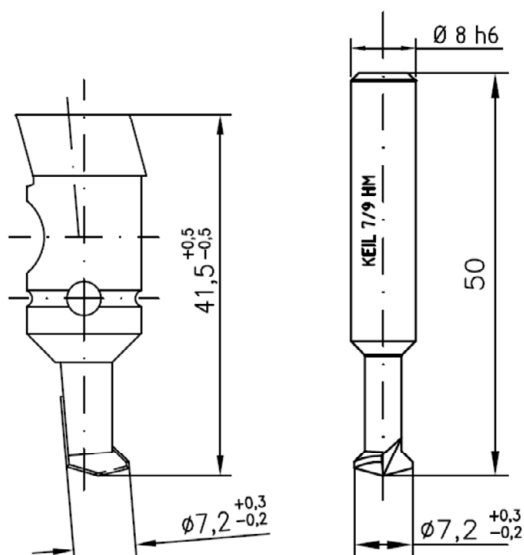


Geometry of the KEIL facade drill

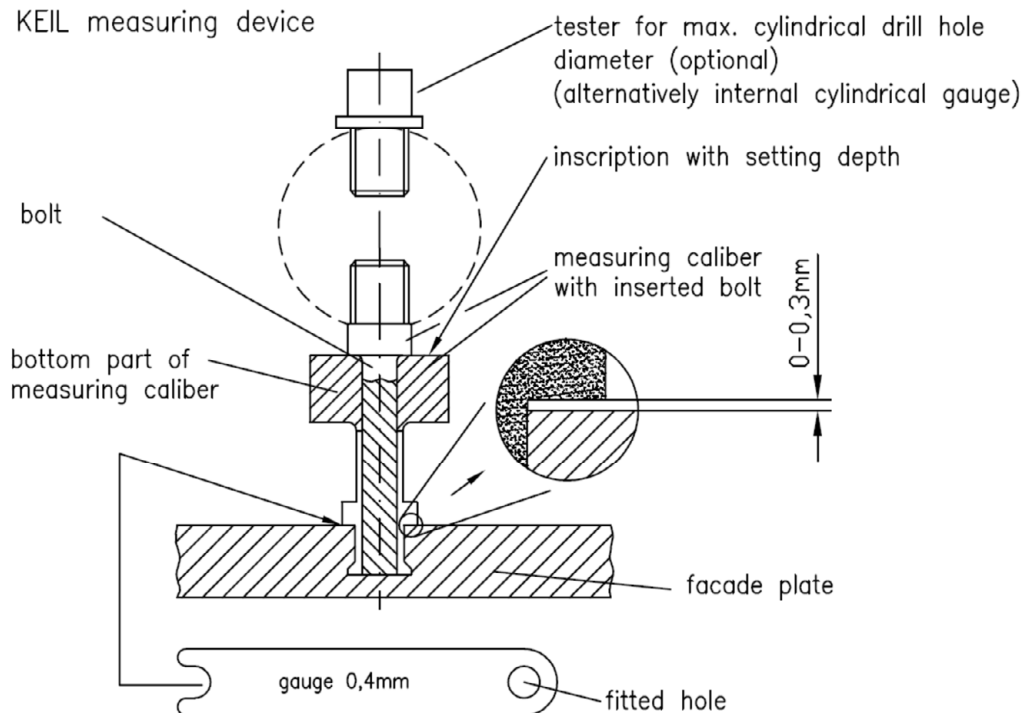
for KEIL facade drill bit 7/9

HM 12/0,8

HM CNC 13/0,8



KEIL measuring device



KRION Facade kit

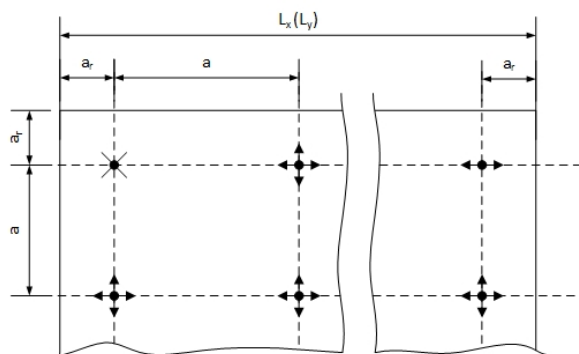
Intended use

Bore hole geometry, drill hole geometry and measurement device - KRION Keil

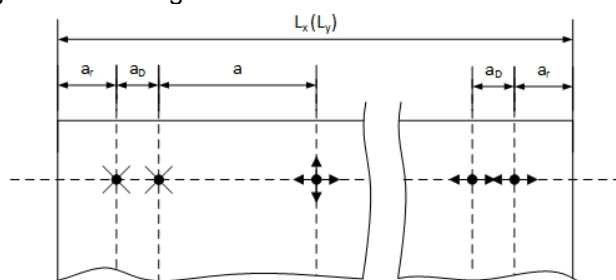
Annex B 8

Definition of edge distance and spacing

single fixing



fixing with double agraffes



Legend

a = spacing – distance between fasteners

a_D = spacing – distance between fasteners of double agraffes

a_r = edge distance – distance between fastener and panel edge

L_x = length of the facade panel in horizontal direction

L_y = length of the facade panel in vertical direction



= fixed point (locating bearing) between facade panel and substructure



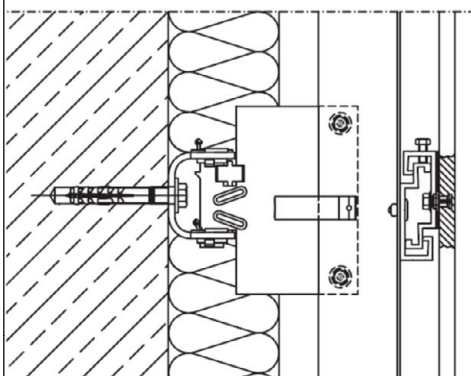
= horizontal sliding point (floating bearing) between panel and substructure



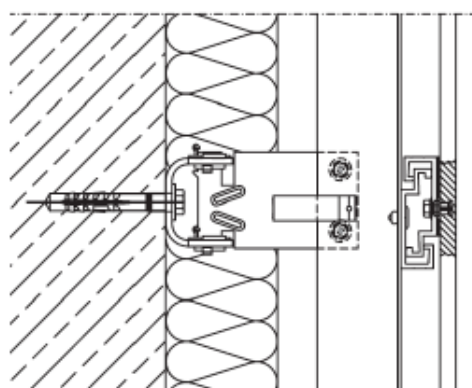
= horizontal and vertical sliding point between facade panel and substructure

Example for fixed point and loose bearing

fixed bearing (fixed point)



loose bearing (skid)



KRION Facade kit

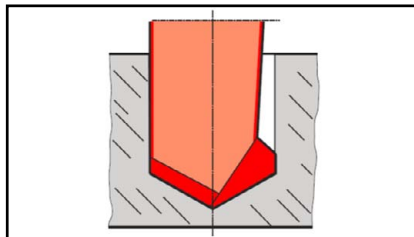
Intended use

Definition of edge distance and spacing - KRION Keil

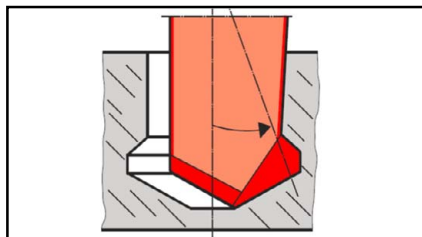
Annex B 9

Installation instructions

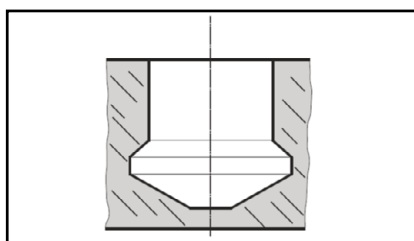
1. Drilling the undercut hole



a) Cylindrical drilling

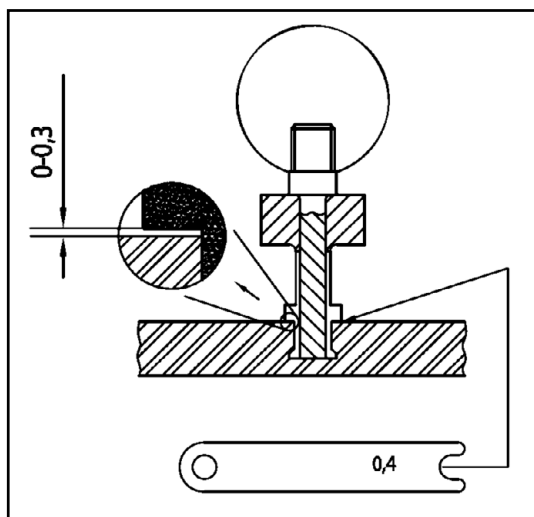


b) Undercutting and cleaning



c) Finished undercut hole

2. Checking the undercut hole



With KEIL depth control guide

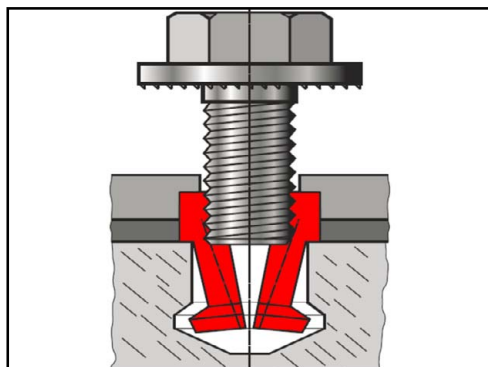
KRION Facade kit

Intended use

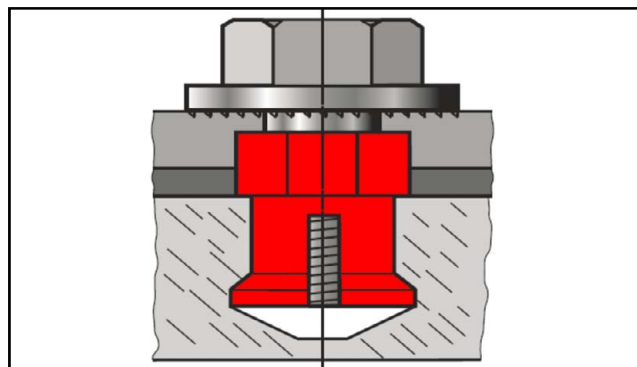
Installation instructions - KRION Keil

Annex B 10

3. Installation of fastener (sleeve and screw)

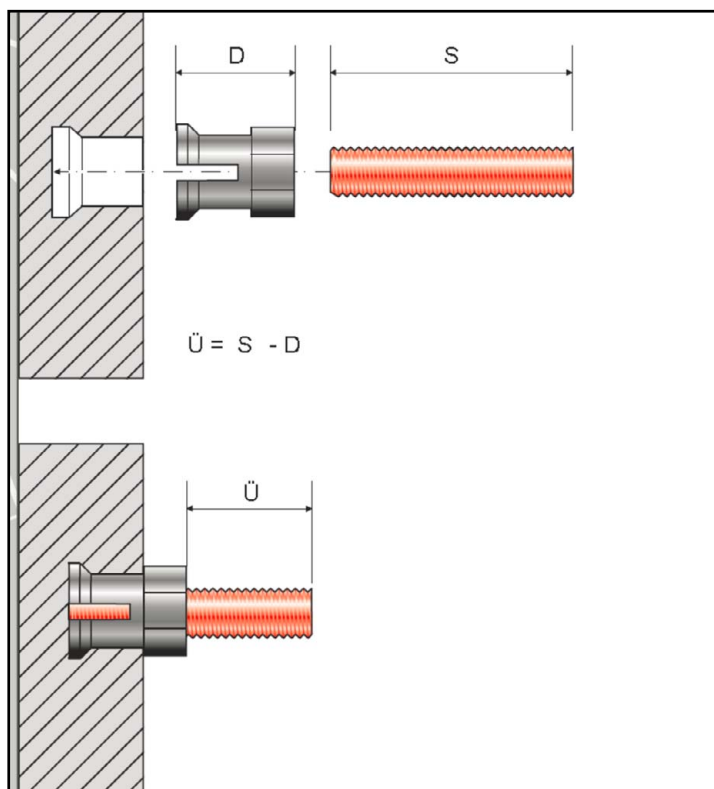


a) Insert the sleeve in the undercut hole and drill the screw in the sleeve



b) Installed undercut anchor

4. Installation of fastener (sleeve and grub screw)



a) Insert the sleeve in the undercut hole

b) Drill the grub screw in the sleeve

c) Installed undercut anchor

KRION Facade kit

Intended use
Installation instructions - KRION Keil

Annex B 11

Table C1: Characteristic values and performances of the façade panel

characteristic values of Kron façade panel	panel thickness	$h \geq$	[mm]	12
	char. resistance to bending stress ¹⁾	$\sigma_{U,Rk} =$	[N/mm ²]	68,0
	Mean value of modulus of elasticity	$E_{mean} =$	[N/mm ²]	9.000
	thermal coefficient	$\alpha_T =$	[1/K]	37,2 x 10 ⁶
	dead load ²⁾	$g_k =$	[kN/m ²]	0,22
	Nominal density	$\rho =$	[kg/m ³]	1750

¹⁾ 5%-Quantil by a confidence level of 75 % and unknown standard deviation without effects of aging (UV-radiation), freeze thaw cycles and temperature

²⁾ panel thickness 12mm

KRION Facade kit

Performance
characteristic values of the KRION façade panels

Annex C 1

Table C2-1: Characteristic values and performances of k-fix fastener
(acc. ETA-17/0387 of 22. November 2017)

characteristic values of k-Fix	embedment depth	$h_s =$	[mm]	7
	char. resistance to tension load	$N_{Rk} =$	[kN]	2,2
	char. resistance to shear load	$V_{Rk} =$	[kN]	2,4
	edge distance	$a_r =$	[mm]	50
	spacing	$a =$	[mm]	150

Table C2-2: Characteristic values and performances of KRION Keil fastener
(acc. ETA-16/0979 of 15. December 2017)

characteristic values of k-Fix	embedment depth	$h_s =$	[mm]	7	
	char. resistance to tension load	$N_{Rk} =$	[kN]	2,4 ¹⁾	2,6 ¹⁾
	char. resistance to shear load	$V_{Rk} =$	[kN]	2,7 ¹⁾	3,2 ¹⁾
	edge distance	$a_r \geq$	[mm]	50	100
	spacing	$a \geq$	[mm]	100	
	Double agraffe	$a_0 \geq$		45	
	1) depend on the edge distance				

KRION Facade kit

Performance
characteristic values of the fixing

Annex C 2