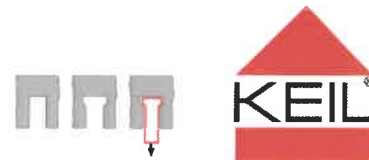




Declaration of Performance

DoP no. 0793-CPR-8.1-24



1. Unique Identification code of the product-type: **KEIL undercut anchor KH for fixing in Mineralit facade panels**
2. Type number: **KH 8,5**
3. Intended use or uses of the construction product: **Fastener of external wall claddings. Special anchor for the rear fixing of facade panels made of Mineralit**
4. Manufacturer: **Mineralit Mineralgusswerk Laage GmbH, Heinrich-Lanz-Strasse 4, 18299 Laage, DEUTSCHLAND**
5. Authorised representative: -
6. System or systems of assessment and verification of constancy of performance: **System 2+**
7. Harmonised Standard: -
8. European evaluation document: **EAD 330030-00-0601**
European Technical Assessment: **ETA-20/0322**
Technical Assessment Body: **ETA-Danmark A/S**
Notified Body: **0793 – Güteschutz Beton**

9. Declared Performance:

Mechanical resistance and stability (BWR 1)

Essential characteristic	Performance
Characteristic load bearing capacity and displacements	The anchor corresponds to the drawings and specifications given in Annex A2-A3. The characteristic material values, dimensions and tolerances of the anchor not indicated in Annex A2-A3 shall correspond to the respective values laid down in the technical documentation of this European Technical Assessment. The characteristic values for the design of the façade panels with rear fixing by the anchor are given in Annex C1-C2.
Durability	The anchors are made from stainless steel (material no. 1.4401, 1.4571 or 1.4404)

Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	The anchors are made from steel classified as Euroclass A1 in accordance with EN 13501-1 and Commission Delegated Regulation 2016/364

10. The performance of the product identified in points 1 and 2 is in conformity with the declared performance in point 9. This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 4. Signed for and on behalf of the manufacturer by:



Gerda Söhngen
Managing Director
Engelskirchen, 06.10.2020



Dipl.-Ing. Georg Miebach
Product Manager

Table C1 Characteristic values for the design of the anchor and façade panel

Characteristic values of facade pane	panel thickness		$h =$	mm	$12 < h < 13$
	characteristic resistance to bending stress		$\sigma_{rk,5\%} =$	N/mm ²	24,5
	partial safety factor ¹⁾		$\gamma_M =$	-	2,0
	modulus of elasticity		$E =$	N/mm ²	19293
	thermal coefficient		$\alpha_T =$	1/°C	16 µm/mK
	density		$\gamma =$	g/cm ³	2,35
Characteristic values of the anchor	characteristic resistance to	tension load ²⁾	$N_{rk,5\%} =$	kN	1,5
		shear ²⁾	$V_{rk,5\%} =$	kN	3,7
	setting depth		$h_s =$	mm	8,5
	edge distance ³⁾		a_{ex} or $a_{ey} \geq$	mm	See annex A2
	spacing		a_x or $a_y \geq$	mm	See annex A2
	partial safety factor ¹⁾		$\gamma_M =$	-	2,0

¹⁾ In absence of other national regulations.

²⁾ In case of coincident stress of an anchor due to tension and shear load following equation shall be observed:

$$\frac{N_{Ed}}{N_{Rd}} + \frac{V_{Ed}}{V_{Rd}} \leq 1,0$$

³⁾ For small fitted pieces, differential and fill-in pieces the edge distance and spacing shall be chosen constructively

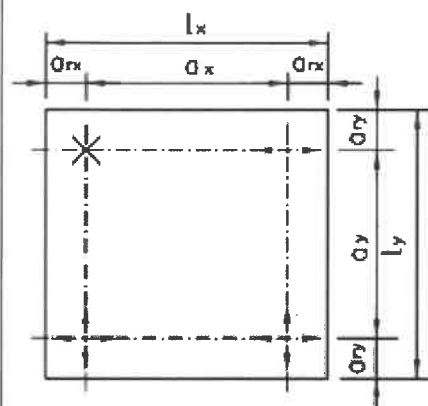
⁴⁾ The maximum of distance is governed by the load bearing capacity of the panel and determined through the static calculation

KEIL undercut anchor for fixing in facade panels made of Mineralit®

Characteristic values for the design of the anchor and façade panel

Annex C1
of European
Technical Assessment
ETA-20/0322

Definition of edge distance and spacing



Legend:

$a_{Rx,y}$ = edge distance – distance of an anchor to the panel edge

$a_{X,y}$ = spacing – distance between anchors

L_x = greater length of the façade panel

L_y = smaller length of the façade panel

✕ = fixed point (fixed bearing)

+ = horizontal skid (loose bearing)

x = horizontal and vertical skid (loose bearing)

Torsion of the load-bearing profile due to dead loads of the façade panel

In case of flush fixing of the anchor and when using horizontal load-bearing profiles:

Due to torsion of the load-bearing profile resulting from dead load of the façade panel the following load $N_{Sk,V}$ shall be considered in direction to the anchor axes:

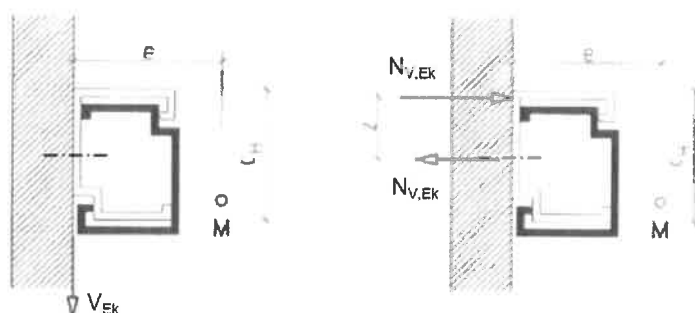
$$N_{V,Ek} = V_{Ek} \cdot 2e/c_H$$

Where

V_{Ek} = shear load due to dead load of the façade panel

e and c_H [mm] see figure

M shear centre

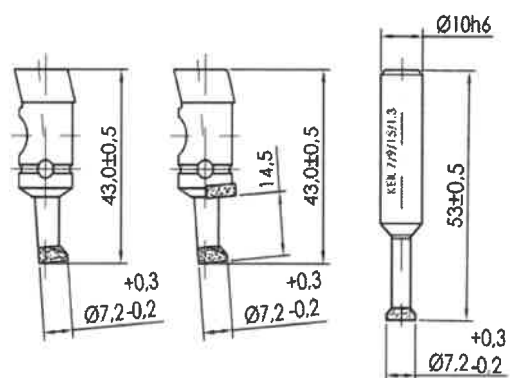


KEIL undercut anchor for fixing in facade panels made of Mineralit®

Definition of edge distance and spacing
Torsion of load-bearing profile

Annex C2
of European
Technical Assessment
ETA-20/0322

DIA 15/1,3	DIA 15/1,3 with countersink	CNC 15/1,3



measuring device

bolt

bottom part of measuring calibrator

tester for max. cylindrical drill hole diameter (optional)
(alternatively internal cylindrical gauge)

inscription with setting depth h_s

measuring calibrator with inserted bolt

0-0,3mm

facade panel

feeler gauge 0,4mm

fitted hole

Annex A3

of European
Technical Assessment
ETA-20/0322

Anchors sleeve dimension

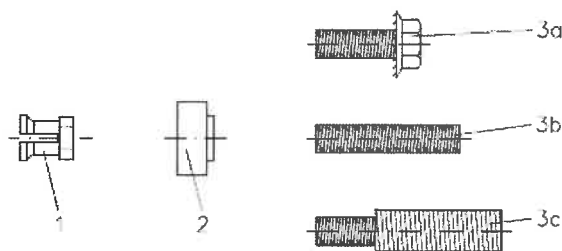
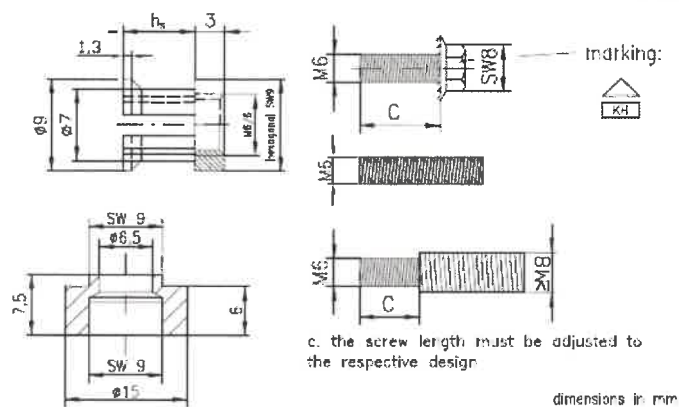


Table 1: Dimensions and Materials

No.	Description	Material
1	anchor sleeve	stainless steel DIN EN 10 088-1.4404
2	spacer disc Kn	Aluminium 3 1645
3a	hex bolt with locking ratchets	stainless steel DIN EN 10 088-1.4401, 1.4404 o. 1.4578
3b	threaded pin	stainless steel DIN EN 10 088-1.4401, 1.4404 o. 1.4578
3c	threaded bolt	stainless steel DIN EN 10 088-1.4401, 1.4404 o. 1.4578



size of façade plate	(l x b) [mm ²]	1200x1200	600x900	600x600
thickness of façade plate	h [mm]	12 ≤ h ≤ 13		
edge distance	min a _n < a _n < max a _n [mm]	150 ≤ a _n ≤ 250	60 ≤ a _n ≤ 120	60 ≤ a _n ≤ 120
edge distance	min a _n < a _n < max a _n [mm]	150 ≤ a _n ≤ 250	75 ≤ a _n ≤ 150	60 ≤ a _n ≤ 120
admissible wind load	w < [kN/m ²]	2,2		
number of anchors (rectangular arrangement)	[-]	4		
embedment depth/drill hole depth	h _a = h ₁ > [mm]	8,5		
coverage of drill hole	u > [mm]	2		
diameter of drill hole	Ø d _a [mm]	7		
diameter of undercut	Ø d ₁ [mm]	9		
diameter of the clearance hole in the agraffe	[mm]	7		
Thickness of agraffe material	[mm]	1.5 ≤ t _{ak} ≤ 3		
threaded length of screw	c [mm]	11,5 + t _{ak}		

KEIL undercut anchor for fixing in facade panels made of Mineralit®

Parts of anchor and characteristic values for anchor installation

Annex A2
of European
Technical Assessment
ETA-20/0322