

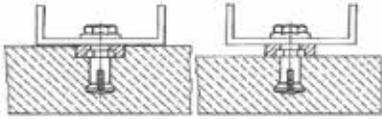
# TILE EZE™



## CONCEALED ANCHORING SYSTEM

For Facade Panels





## VARIANCE IN CLADDING MATERIAL THICKNESS

Tolerances in panel thickness are compensated for in one simple drilling step. The KEIL anchoring method allows for an adjustment up to 5mm in thickness variance within the cladding material. This is a common amount for natural stone or man-made cement panels.

## SAFETY- MONITORING:

Drilled holes are continuously checked by a monitoring tool to insure accuracy of the drilled anchor hole. Correct depth is imperative to allow the anchor to fully expand into the undercut hole.

## TESTING AND PERFORMANCE:

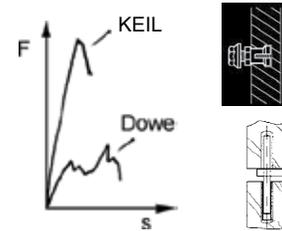
### Wind Load and Hurricanes

- ▶ Wind load factor depends on the density or hardness of the cladding material and substructure.
- ▶ Live hurricane tests were performed when Hurricane Ike hit Houston, TX in 2005 and Irma made landfall in Naples, FL in 2017. Neither hurricane sustained damages to the newly finished ceramic tile facades.
- ▶ The KEIL system passed several inspections in Miami/Dade County.

### Seismic Testing and Earthquakes

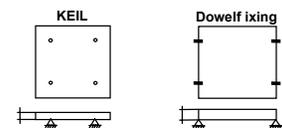
- ▶ KEIL anchoring was tested in Europe with US equipment.
- ▶ Prestigious buildings that have used the KEIL system have already survived earthquakes.
- ▶ The Buddha Church Teahouse building in Christchurch, NZ was shaken by several earthquakes from 2010 to 2016 where over 60% of the old city buildings were heavily damaged or destroyed. The Teahouse survived with no damage to the facade.
- ▶ The City of Santiago de Chile was impacted by an earthquake in 2009. Three buildings in the city center and a hospital with KEIL anchored facades were not affected.
- ▶ An earthquake in a Taiwan rail station in 1999 was completely intact after a major and catastrophic earthquake damaged several other buildings.

**Maximum possible pull-out loads:**  
 Comparison of the systems: KEIL – Dowel  
 Load – displacement graph:  
 (Performance factor 2-7 higher for KEIL than dowel)



**Optimal position of anchors:**

Necessary panel thickness or comparable performance of KEIL and dowel systems:

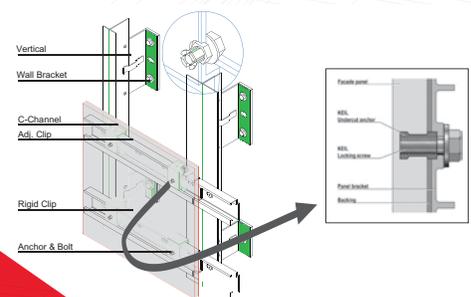


Positions of KEIL anchors are optimized and so the maximum bending stress is reduced by 50%. This allows reduction of panel thicknesses  $d$  in relation to dowel system by factor 1 : 1.4.  
 (= 30% less material for the same performance)

## KEIL ANCHOR SUPPORT STRUCTURE

The support structure is the static link between the external/internal structural wall and the facade cladding.

Aluminum has been the leading material for most construction. Aluminum support structures can be adjusted in three dimensions and can lay against the building, which allows the structure to be free from stress. Any unevenness and wall projections can be compensated for to achieve a perfect horizontal and vertical alignment.





## THE KEIL ANCHOR FACTS

The KEIL anchor was developed for mechanical, non adhesive concealed anchoring, for interior and exterior applications.

The anchor is used worldwide in the facade industry for rain screens, and/or wall cladding.

***The aesthetics of the facade face is not compromised by any visible fastening components!***

The position of the concealed anchors, on the back of each panel, can be determined without restrictions. The performance of the facade will be more effective and synchronous with the requirements of specific materials.

## APPEARANCE

The facade of a building provides a unique appearance. Designers can imagine many possibilities with different facade materials but many feel that their ideas are impractical due to anchoring restrictions.

***The KEIL concealed anchoring method supports and encourages architects who wish to achieve a stylish and impressive design vision!***

There are no limits to creativity. Whether elegant, traditional, modern, delicate, or unconventional, even the boldest facade designs can be implemented with the KEIL system.

The KEIL anchor is the perfect choice for architects and designers when specifying thin materials and non visible attachments.

## MAINTENANCE

No staining, dirt, or rust streaks on the surface of the facades take place as the attachment components are situated on the back of the facade material.



## VARIOUS CLADDING MATERIALS

*More than 50 different types of materials may be used with the KEIL Concealed Facade Anchor, with the highest degree of safety!*

**Natural stone** such as granite, marble, limestone, sandstone, jura stone, and slate.

**Man-made cladding panels** such as fiber cement, UHPC, GFRC, crystallized or "bio glass", HPL, and solid surface materials.

The load on the foundation and the building is substantially reduced by using thinner, light weight panels.

## CONSTRUCTION TIME, LABOR, AND SHIPPING

The KEIL system drastically reduces the work involved as fewer anchoring points are required versus other methods of attachment. It also creates an economic advantage by allowing thinner panels to be used, particularly if rare and expensive cladding material is requested.

Thinner panels cost less for shipping and handling as well as installation.

Quick, simple, and safe!

The KEIL undercut holes can be drilled at the plant or workshop under controlled conditions. The KEIL anchors and hanger attachments can then be installed at the job site. This avoids possible damage during handling and transportation because the material can be stacked without the anchors and clips protruding from the material.

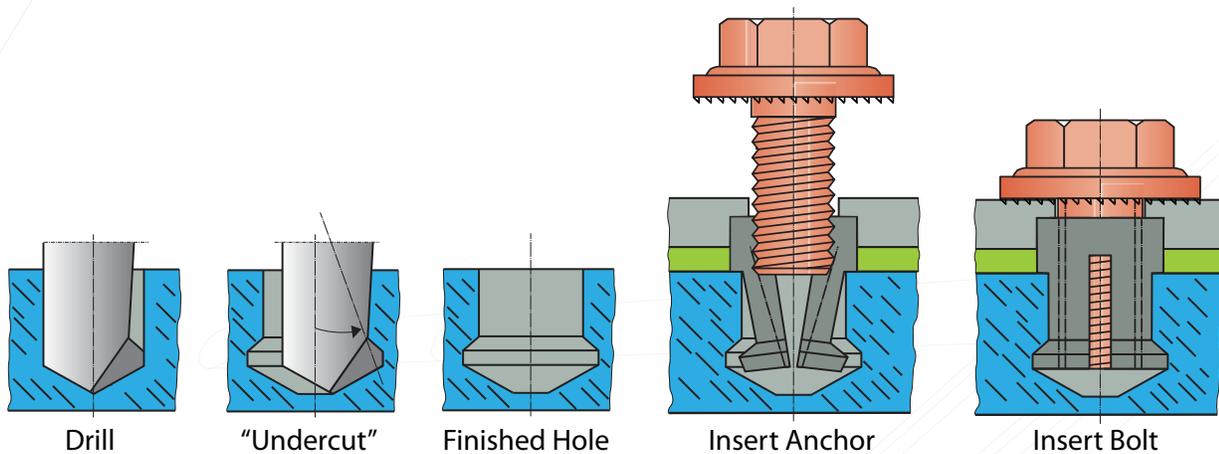


## KEIL ANCHOR DRILL MACHINE

The drilling of the undercut hole is obtained by using the KEIL Drilling machine or CNC machine with various KEIL drill bits. Different drill bits are utilized for different materials, both wet and dry, and are all made available by KEIL.

### The KEIL Undercut Hole

For the application of the KEIL anchor, a "mushroom" like hole is drilled into the material using the KEIL patented undercut method.



## THE KEIL CONCEALED ANCHOR

- ▶ A KEIL anchor consists of two parts: the anchor and the matching bolt.
- ▶ KEIL anchors are made from the highest quality A4 stainless steel.
- ▶ The KEIL anchor geometry matches the KEIL undercut hole and ensures a stress free attachment to the material.
- ▶ Extreme climate changes such as heat or cold contributes to different expansion or contraction of cladding materials. While these factors can cause damage with traditional cladding systems, the "stress free fit" of the KEIL anchor eliminates damage of the facade panel due to extreme temperature conditions.
- ▶ When determining the correct size of KEIL anchor, the cladding material thickness is a decisive factor. The thicker the selected material, the longer the anchor. The longest anchor is always selected as this will increase the load factor or tension force of the cladding material.
- ▶ The length of the anchor bolt depends on the anchor length and the wall thickness of the attachment clip.

The patented KEIL drilling technique carries out the cylindrical and undercut drilling in one step with only one tool.

Speedy performance for drilling time!



$h_S = 4,0\text{mm}$



$h_S = 5,5\text{mm}$



$h_S = 7,0\text{mm}$



$h_S = 8,5\text{mm}$



$h_S = 10,0\text{mm}$



$h_S = 11,5\text{mm}$



$h_S = 13,0\text{mm}$



$h_S = 15,0\text{mm}$

$h_S$  = Insertion depth  
Other dimensions on request.



# **TILE EZE**

P.O. Box 111390 Naples, Florida 34108

1.800.476.3737

[info@tile-eze.com](mailto:info@tile-eze.com)

[keilanchor.com](http://keilanchor.com)