

HALFEN SUB STRUCTURE SYSTEMS

Introduction

All HALFEN sub structure systems are designed to transfer the load of the external cladding to the structural frame of the building. HALFEN sub structures typically consist of a series of vertical rails spanning floor to floor which only require restraint at quite wide vertical spacings. This minimizes the number of connections to the inner skin and consequently the frequency with which the insulation/waterproofing is breached. For this reason they are typically used as backing structure for rainscreen and thin stone cladding panels with open or mastic-pointed joints.

Fewer connections to the inner skin reduces thermal bridging thus assisting in the achievement of the new European energy saving requirements. The advance erection of the frame ensures rapid installation of the stone cladding.

HALFEN offers primarily two product lines for sub structures to accommodate different situations and life cycle requirements:

- stainless steel structures SUK
- aluminium structures UKB and UKH

The **HALFEN SUK** stainless steel structure is suitable for durable constructions in difficult environmental conditions and for high load requirements.

The **HALFEN UKB SYSTEM** is suitable for refurbishments because of its light weight and easy post fix installation.

The **HALFEN UKH SYSTEM** supports the use of undercut fixing technology which can enable a reduction in the stone panel thickness (subject to calculation) and easy replacement of damaged panels.

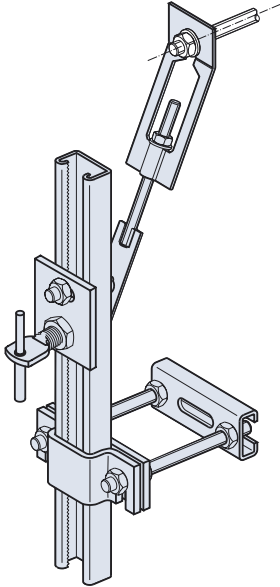


Art Gallery, Middlesbrough/UK (picture ①②③)
Capital East, London/UK (picture ④)

HALFEN NATURAL STONE SUB STRUCTURES

HALFEN SUK: Stainless Steel Sub Structure

HALFEN SUK: Stainless Steel Sub Structure



The HALFEN SUK System is an adjustable suspended channel system with support and restraint anchors that are continuously variable in height, for cavity ≥ 160 mm. Ideal for new builds and refurbishments. Particularly suited for natural stone façades with large and varying distances to the load-bearing wall. The system is easy to install with few, simple components.

Fastening to slab edges, steel structures, ceiling joists or concrete walls spaced approx. 3.0m apart (height between floors), on HALFEN channels for maximum adjustment or with drilled bolts.

Widely spaced fixings facilitate a speedy mounting of the stainless steel sub structure and thus also a quick installation of the natural stone panels.

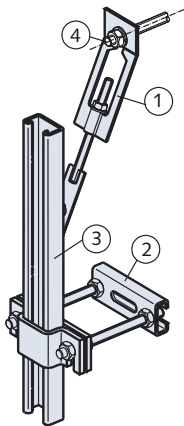
Material:

Stainless steel 1.4571/1.4401 AISI 316 (A4)

For smaller cavities and specific details please contact HALFEN.

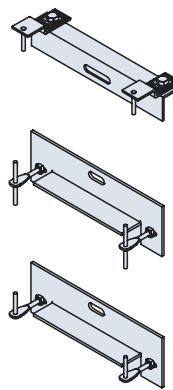
SUK Channel Sub Structure

- 1) SUK-F
Façade anchor for fixing onto HALFEN channels or for post fixing using drilled bolts
- 2) SUK A
Spacer for horizontal support of the toothed channel
- 3) SUK-Z
SUK-Z-41/22
SUK-Z-41/41
Toothed channel
- 4) HALFEN bolt M10
(When fastening on HALFEN channels or site drilled bolts)



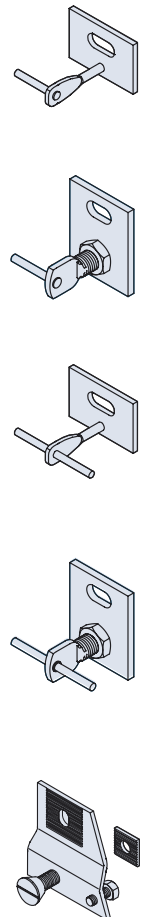
SUK Anchor for horizontal joints

- 5) SUK-DH-0,8-2
double restraint anchor with 2 x 1/2 pin, pressed
- 6) SUK-DT-1,2-1
double support anchor with 2 x 1/1 pin, loose
- 7) SUK-DT-1,2-2
double support anchor with 2 x 1/2 pin, pressed

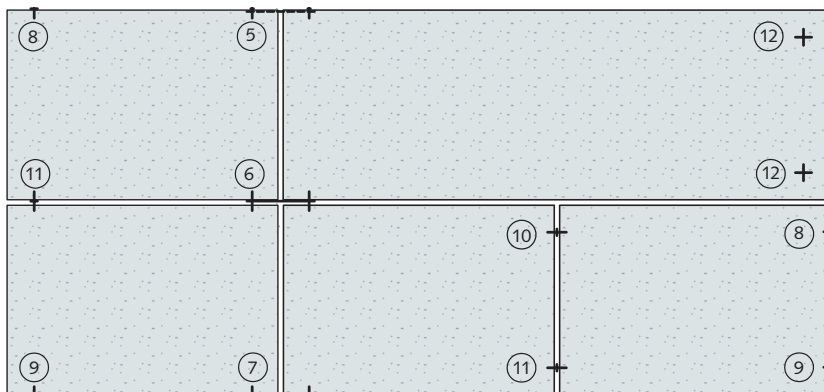


SUK Anchor for vertical and horizontal joints

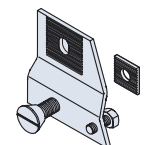
- 8) SUK-HS-1,6-2
restraint anchor, with 1/2 pin, pressed
- 9) SUK-TSG-0,8-2-M12
SUK-TSG-1,5-2-M16
support anchor, with 1/2 pin, loose
- 10) SUK-HS-1,6-1
restraint anchor, with 1/1 pin, loose
- 11) SUK-TSG-0,8-1-M12
SUK-TSG-1,5-1-M16
support anchor, with 1/1 pin, loose



Design example



- 12) SUK-SV-0,8-8
screw connection with countersunk screw M12



HALFEN NATURAL STONE SUB STRUCTURES

HALFEN UKB

HALFEN UKB: Aluminium Sub Structure with Body Anchor

The HALFEN UKB System is a continuously variable aluminium sub structure, with vertical aluminium channel sections running in the ventilated cavity between structure and natural stone rainscreen or sealed cavity of thin stone claddings. This type of construction reduces thermal conductivity to a minimum. The customer fastens the HALFEN body anchors BA 606 on the vertical channels from the front using either bolts self-drill and tap screws. Individual loads on the BA 606 may not exceed **0.7 kN**.

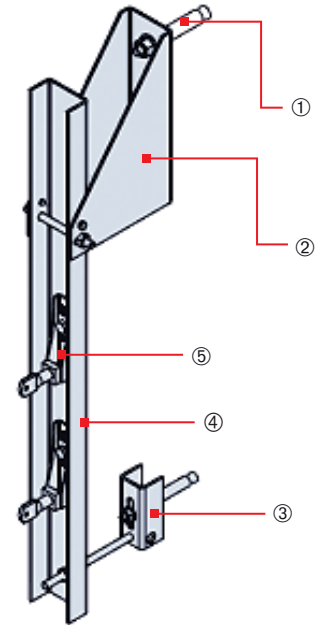
The sub structure UKB accommodates **cavities between 200 and 320 mm** and adjustments of ± 20 mm in all three directions. The **rail support brackets**, made of stainless steel 1.4571/AISI 316 (A4) have been designed for dead loads of **up to 3.5 kN**. They are fastened to HALFEN channels or to the supporting structure using site drilled bolts.

Material:

Aluminium

Stainless steel 1.4571 AISI 316 (A4)

For smaller cavities and specific details please contact HALFEN.



- ① Fastening with bolts M12
- ② Support bracket
- ③ Compression tension brace
- ④ Vertical aluminium channel
- ⑤ HALFEN Body Anchor BA 606



Reiss-Museum, Mannheim / Germany

HALFEN NATURAL STONE SUB STRUCTURES

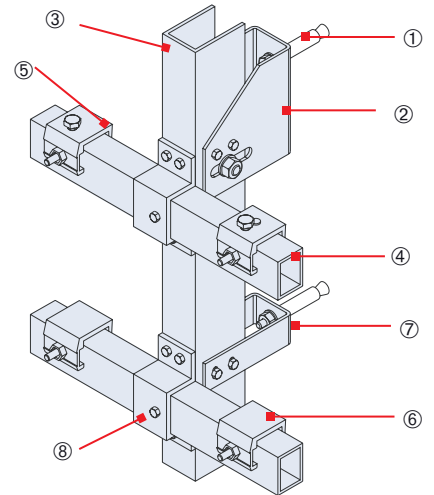
HALFEN UKB

HALFEN UKH: Aluminium Sub Structure for Undercut Bolts

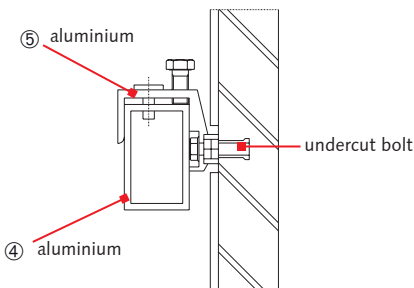
With the HALFEN-UKH it is possible to accommodate **cavities of up to 350 mm**. The vertical aluminium channel sections and the crosswise running torsion-resistant rectangular aluminium hollow sections are connected on site with joining brackets using self-drill and tap screws.

As the horizontal rails slide freely within the rail support bracket, temperature stresses are avoided. The stainless steel **support brackets** have been designed for dead loads of **up to 3.5 kN**. They are fastened to HALFEN channels or to the supporting structure using site drilled bolts.

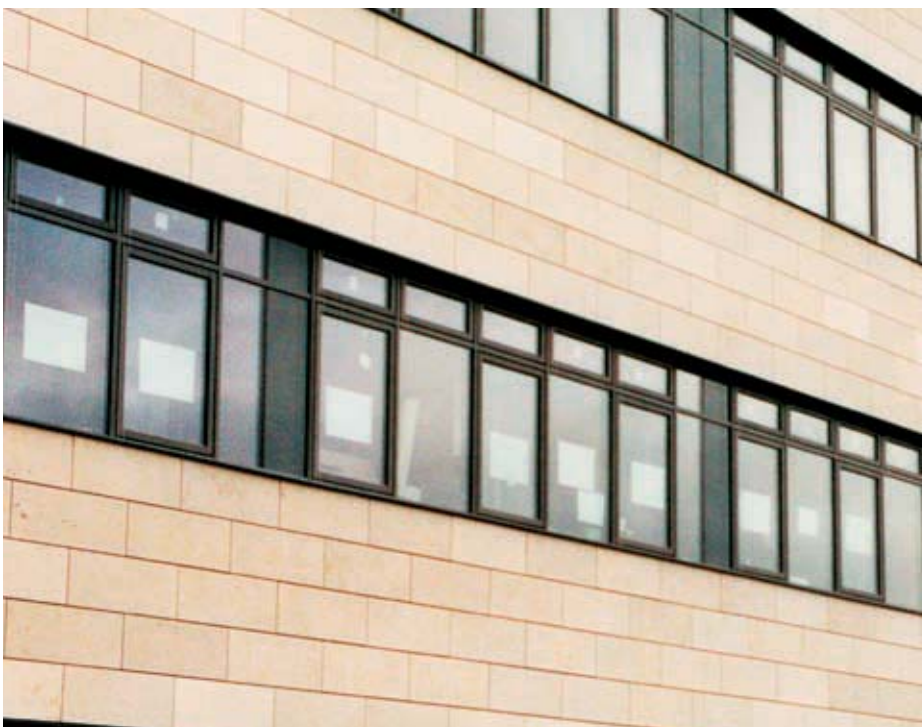
The panels are attached to the UKH using aluminium support and restraint brackets that are fixed to the natural stone slab using undercut bolts, without the anchoring parts being visible. Should any of the panels be damaged, they can be easily replaced by raising the panels above, allowing the damaged panel to be removed. The sub structure is provided with an in and out adjustment of ± 30 mm and the facade sub structure can be installed at any position by means of the fastenings. The support fastenings of the slabs enable an additional fine adjustment of the slabs.



- ① Fastening to concrete
- ② Support bracket
- ③ Vertical aluminium channel
- ④ Horizontal aluminium channel
- ⑤ HALFEN stone support hook bracket with adjusting screw
- ⑥ HALFEN stone restraint hook bracket
- ⑦ Rail restraint bracket
- ⑧ Rail support bracket



Material:
Aluminium
Stainless steel 1.4571/AISI 316 (A4)



State Institute for Pharmaceutical Products, Bonn/Germany