

## HALFEN-DEHA Systems

In 1929 HALFEN started to produce adjustable connection systems in Germany. Today, HALFEN produce an extensive range of products for the construction industry which are available worldwide. HALFEN's range of fixings for stone facades cater for both natural and reconstituted stone in almost any thickness. They can also accommodate a wide variety of backing structures including concrete, brick or blockwork and metal frames. Some of the HALFEN stone fixings can be combined with other products from the HALFEN range such as cast-in channels to provide an even more flexible fixing solution. To compliment the range of stone façade fixings HALFEN's unrivalled expertise gained from our worldwide project experience in stone facades is available to offer advice on specific applications.



## General Background to different Stone Façades

When natural or reconstituted stone has been chosen as a cladding material it is necessary to give consideration to the following key areas for the purposes of choosing the most appropriate fixing system:

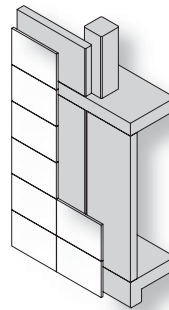
- 1) Type of structural material (e.g. concrete/block)
- 2) Design of cavity (e.g. ventilated/full fill insulation)
- 3) Design of stone joint (e.g. open/closed )
- 4) Size of stone (e.g. thickness/panel size)
- 5) Design life of building

Once these considerations have been made HALFEN can advise on the most suitable fixing method. Included in this catalogue are typical examples of backing structures that can be fixed to using HALFEN systems, some of which are illustrated opposite.

**Examples** of the systems are provided to give an overview of how the system will work in typical situations. Design information is given for individual stone support systems.

**Illustrations and photographs** of projects that have been completed using HALFEN stone support systems are shown throughout.

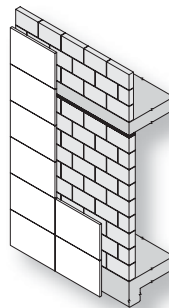
**Principles** which should be considered in the design of a stone façade are discussed.



### Concrete Structures

Concrete structures can be combined with all kinds of natural stone façade

- Thin Stone
- Rainscreen
- Thick Stone

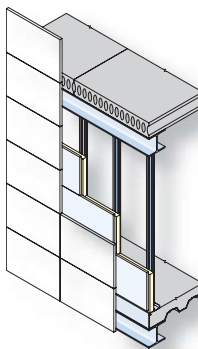


### Blockwork and Brickwork

Loadbearing blockwork and brickwork are especially suitable for Grout-in Anchors whether for

- Rainscreen façades or
- Thin stone and cavities with or without insulation.

High loads and large cavities can be accommodated



### Infill Panel System

Structures with a light weight infill panel system, which do not allow load-bearing fixings between floors, require a load bearing sub structure for the stone façade. The sub structure can support:

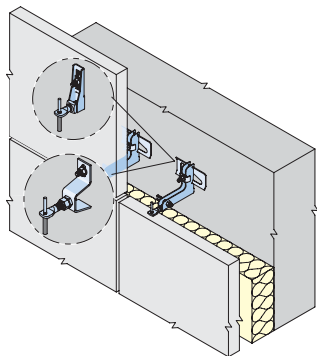
- Thin Stones or
- Rainscreen facades

Insulation and large, varying cavities can be accommodated.

# HALFEN-DEHA WORLDWIDE LEADER IN NATURAL STONE SUPPORT SYSTEMS

## Body Anchor

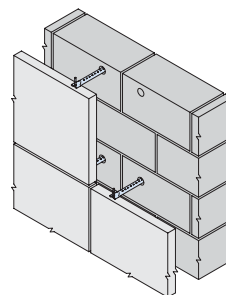
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Body Anchor Type	Max. projection [mm]	Vertical Load/anchor [kN]	Page
HRM	130	0.5	6
BA	120	1.3	6
DT	240	1.3	6
DH	240	-	6

## Grout In Anchor

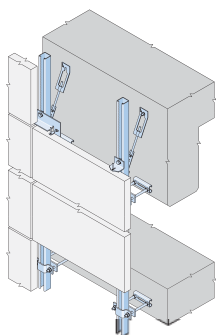
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Grout In Anchor	Max. projection [mm]	Vertical Load/anchor [kN]	Page
UMA	300	4.0	9
UHA	300	-	9

## Sub Structure Systems

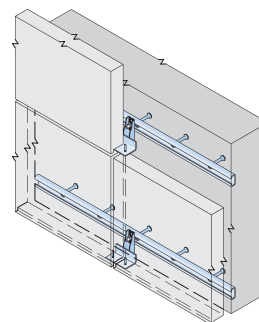
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SUB Structures	Max. projection [mm]	Vertical Load/anchor [kN]	Page
SUK	360	1.5	13
UKB	310	1.2	14
UKH	320	1.2	15

## Thick Stone Supports

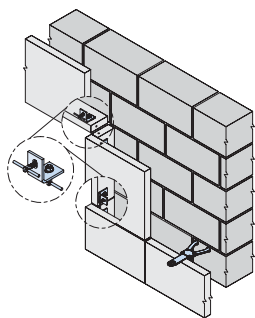
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Support Brackets	Max. projection [mm]	Vertical Load/anchor [kN]	Page
HK4	250	10.5	16
HMA	200	3.0	16

## Accessories

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Accessory Type	Page
Corner Reveal Fixings	18
Scaffold Anchors	19
Soffit Anchor	20
Fixing Methods	20

## Calculation Principles

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Principle	Page
Calculating the weight of the panel	21
Designing size and thickness of panels	21
Standards and design information	22

## FEATURES — BENEFITS — APPLICATIONS

### HALFEN Body-Anchor

#### Features

Easy to use in conjunction with cast-in channels for maximum adjustability. For reduced pre-planning they can be post fixed with drilled bolts or HCB concrete bolts. Different HALFEN Body-Anchor designs cover many applications from small to large cavities and from low to high loads.

#### Benefits

- Adjustable in three dimensions
- Flexible fixing methods
- Toothed plate and washer: mechanical force transmission
- Independently tested
- Small drill holes: time and cost saving, reduced dust and sound pollution

### Applications



HALFEN Body-Anchor

### HALFEN Grout-in Anchor

#### Features

HALFEN Grout-in anchors are a simple and cost effective way of fixing stone. Their tubular cross section gives the same load capacity whether they are used in vertical or horizontal joints. Adjustment in three axes is achieved by positioning of the anchor in the oversize hole drilled into the backing structure.

#### Benefits

- Approved calculation
- Tubular cross-section: same load capacity in any orientation
- Smaller drill-holes compared to flat anchors
- Good adjustability in mortar
- Suitable to large cavities and high loads

### Applications



HALFEN Grout-in Anchor

### HALFEN Sub Structures / SUK – stainless steel

#### Features

All HALFEN sub structure systems are ideal for new buildings and refurbishments. Particularly suitable for natural stone facades with large and varying distances to the load-bearing wall (e.g. rainscreen construction). Ideal for critical environmental conditions with long design life requirements. This is especially the case when high corrosion-resistance is required.

#### Benefits

- Adjustable suspended channel system
- Assists in meeting the new European energy-saving requirements
- Minimized fastenings in load-bearing structure: reduce thermal-bridging, energy-loss and pollution when installing
- Easy and quick installation
- Stainless steel, approved and durable.

### Applications



HALFEN Sub Structures – Stainless Steel

## FEATURES — BENEFITS — APPLICATIONS

### HALFEN Sub Structure UKH/UKB – aluminium

#### Features

Light and easy to handle sub structure in combination with approved HALFEN Body-Anchors and for the under-cut fixing of thin stones.

Flexible design features and easy adaptation on building-site. Cost-saving constructions when larger projections above 200 mm are required.

#### Benefits

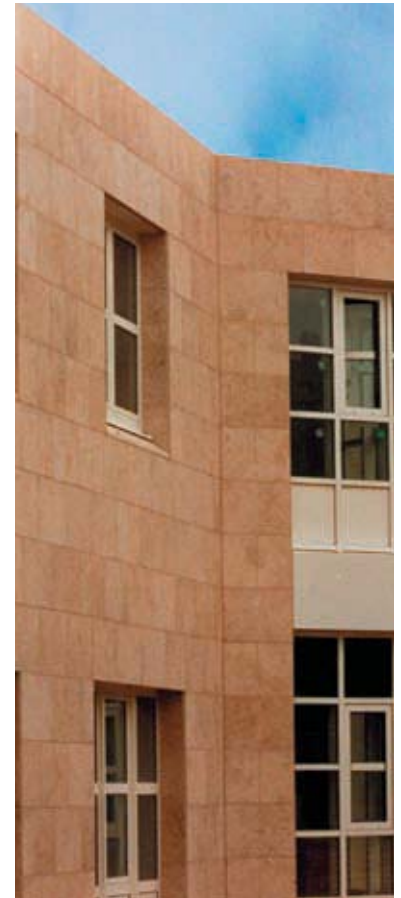
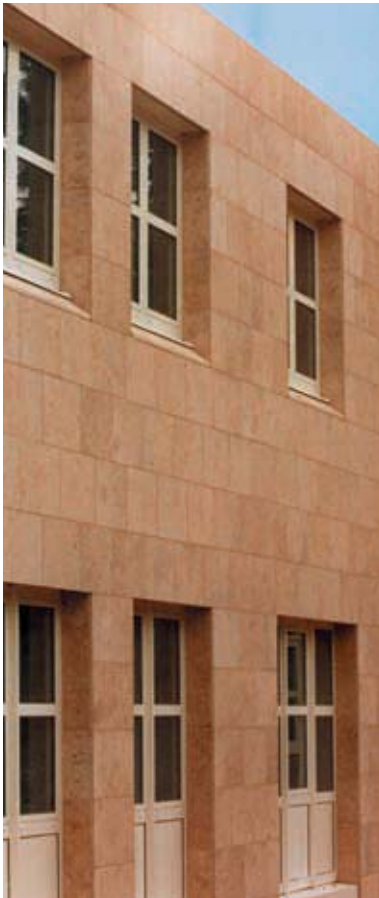
- Adjustable suspended channel system
- Suitable for under-cut fixings
- Assists in meeting the new European Energy-Saving requirements
- Fewer fixings in the load bearing structure: reduced thermal bridging, energy loss & pollution during installation
- Easy and quick installation

### Applications



HALFEN Sub Structures – Aluminium

### Reference



State representation – Lower Saxony, Bonn / Germany