Leviat®
A CRH COMPANY

HALFEN

INDUSTRY

CONCRETE

FAÇADES

PRODUCT RANGE

Leviat®
A CRH COMPANY

We are one team.
We are Leviat.

Leviat is the new name of CRH's construction accessories companies worldwide.

Under the Leviat brand, we are uniting the expertise, skills and resources of HALFEN and its sister companies to create a world leader in fixing, connecting and anchoring technology.

The products you know and trust will remain an integral part of Leviat's comprehensive brand and product portfolio. As Leviat, we can offer you an extended range of specialist products and services, greater technical expertise, a larger and more agile supply chain and better, faster innovation.

By bringing together CRH's construction accessories family as one global organisation, we are better equipped to meet the needs of our customers, and the demands of construction projects, of any scale, anywhere in the world.

This is an exciting change. Join us on our journey.

Read more about Leviat at Leviat.com

Our product brands include:

Ancon®

HALFEN

PLAKA

60 locations

sales in **30+** countries

3000 people worldwide

Imagine. Model. Make.

Leviat.com


BOSSARDarena

Quality that connects

With over 20,000 high-quality product references, we are one of the world's most successful companies in the fields of **concrete, façade technology, and mechanical connections for industry.** From anchor channel and reinforcement to lifting anchors and tension rod sytem – our comprehensive product portfolio offers you technical connection solutions for building and industrial applications.

Architects and engineers use our products and software in their designs. Building contractors, precasters and merchants use our broad range in commercial and residential buildings, civil engineering projects and in transportation and infrastructure. Industrial customers incorporate our modular mechanical connections into on and off-highway vehicles, factories, chemical plants and power generation projects.

High quality has always distinguished our products – and impressed customers all over the world. Make your vision a reality with our products. Our technical support team provides you with engineering assistance tailored to your project. In every case their goal is to find the best solution for your project, and will accompany you every step of the way.

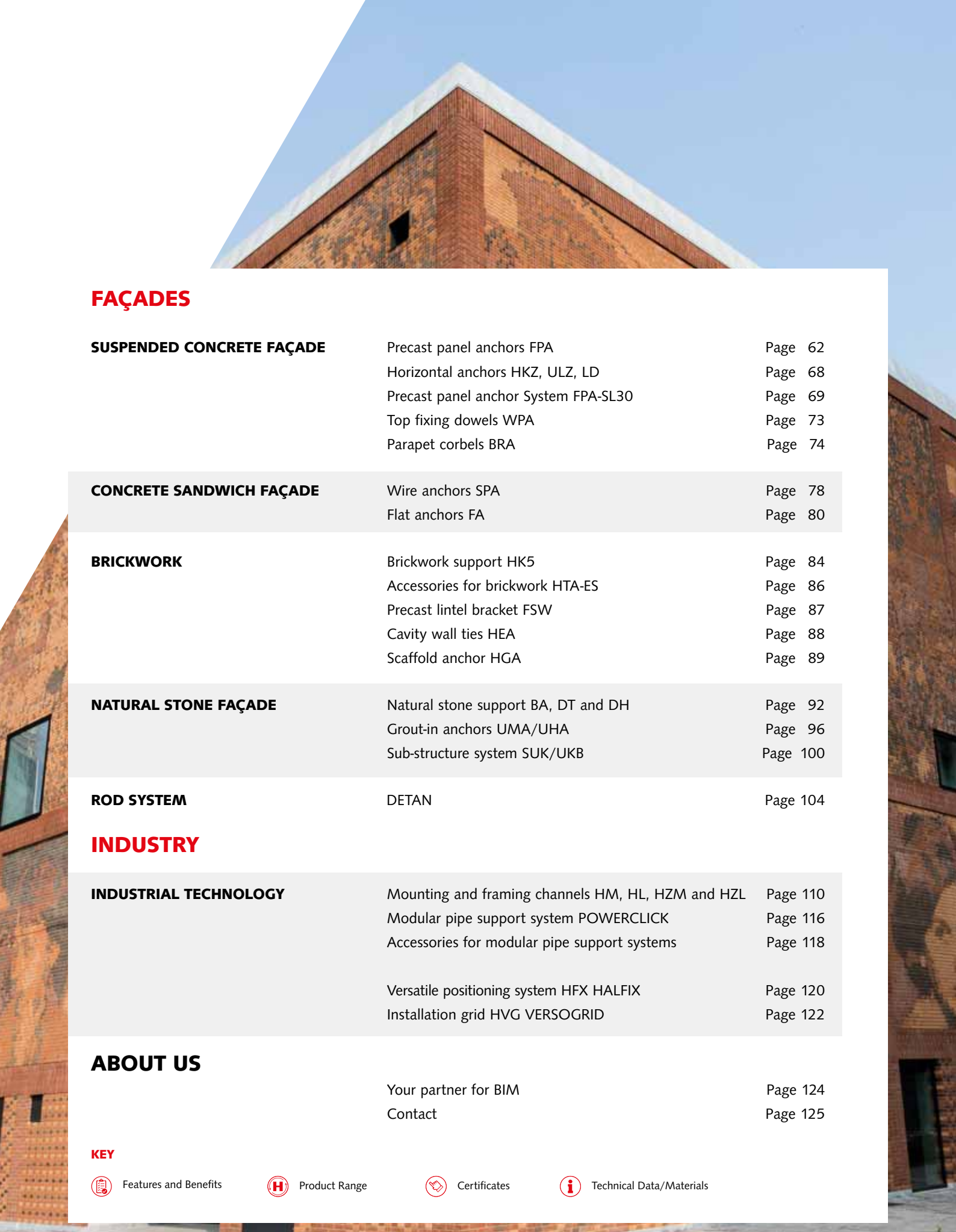
Passion, competence and the highest standards in technology, quality and safety constantly drive us to improve, and provide impetus for innovation.

In this catalogue, we present our extensive range for you – with the most important facts about our products. Please do not hesitate to contact us if you have any questions.

CONTENTS

VISIT US ONLINE!

Our website includes our technical catalogue, CAD and BIM data, dimensioning tools as well as our installation instructions – and the important contacts in your country – just visit us on **www.halfen.com!**



FAÇADES

INDUSTRY

ABOUT US

KEY

Features and Benefits | Product Range | Certificates | Technical Data/Materials

Casa della Memoria, Milan (Italy), ©tomjasny.com

CONCRETE TECHNOLOGY

Intelligently secured with our Fixing Systems

We offer a range of intelligent alternatives to drilling and welding. If you need to fix something to concrete - you'll find a way in the our product range!

We are best known for our original product – the HALFEN Cast-in channel – which still forms the core of our business today. The current range of channels is much broader than those early days, when sales of our product grew alongside the increasing usage of reinforced concrete. Today's range includes toothed channels to transfer longitudinal as well as shear and tension loads, and hot-rolled channels for dynamic loads. Channels with special anchors designed for cracked concrete are also available, as well as custom channels for corners, curved channels for tunnels and accessories such as site-applied end anchors.

More than just a wide range of channels, we offer a whole range of comprehensive fixing solutions, even for complex building situations.

Materials and finishes

Our selection of steels and finishes means that you will have the right materials to suit the required conditions, right up to high performance demand situations – using HCR steels (High Corrosion Resistance). These are specified when certain concentrations of chlorides, sulphur and nitrogen oxides are present. They are generally used in road tunnels, indoor swimming pools or in the chemical industry.

EDF R & D, Paris (France), ©tomjasny.com

HALFEN CAST-IN CHANNELS
The Classic

They are the ideal solution for all kinds of permanently adjustable fixings that are easy to install: HALFEN Cast-in channels. We offer you the right channel for every situation – whether for the construction of lifts, tunnels, stadiums or buildings with precast elements. Excellent adjustability is just one of their many advantages: Ease of installation means that you will save time and reduce costs.

The most important features and benefits at a glance:

- Easy to install: No dust, no noise, no vibrations – HALFEN Cast-in channels contribute considerably to a safe workplace
- Cost-effective: They are the ideal basis for permanently flexible, adjustable fixings
- Strong: HALFEN Cast-in channels are distinguished by their high load capacity and are often tested under the most adverse conditions for their fire resistance, seismic and dynamic capacity
- Demonstrably good: They are DGNB certified for ecological buildings and are approved by building authorities in Europe, China and the USA
- Intuitive: Our software ensures accurate dimensioning for optimum design of HALFEN Cast-in channels
- Adaptable: The curved channel HTA-CS is suitable for applications such as tunnel segments and architecturally demanding buildings
- Safe: The HZA-PS channel is ideal for use in safety-relevant areas of nuclear power plants and nuclear facilities
- Efficient design: A torque wrench is all that is needed to fix components to cast-in HALFEN Channels

Application areas:

HALFEN Cast-in channels are suitable for a wide variety of connection situations - for example fixing:

- Façades and precast concrete elements
- Stadium seating
- Catenary and signalling wires in tunnels
- Guide channels in lift shafts
- Pipelines under bridges
- And much more

See also Technical Product Information HALFEN Cast-in channels B

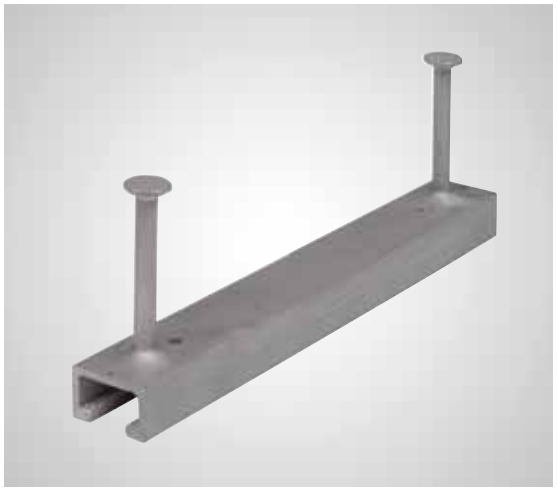
HALFEN CAST-IN CHANNELS

HTA-CE

Application: Fixing elements and other secondary building elements to concrete

Properties

- Adjustable
- Hot-rolled profile can be dynamically loaded
- Suitable for installation in cracked and uncracked concrete



HZA, toothed

Application: Fixing to concrete where mechanical resistance to longitudinal loads is required

Properties

- Adjustable
- Load-bearing in the longitudinal direction
- Suitable for installation in cracked and uncracked concrete
- Hot-rolled version is resistant to dynamic loads*

*valid for hot-rolled and toothed cast-in channels type DYNAGRIP®

HZA-PS Power solution, toothed

Application: Fixing to concrete in safety-relevant areas of nuclear power plants and nuclear facilities

Properties

- As for HZA channels
- Load-bearing even under special loading circumstances such as earthquakes, aircraft impact, explosions – for cracks in the concrete up to a width of 1.5 mm

HALFEN CAST-IN CHANNELS

HTA-CE-CS and HZA-CS, curved

Application: Curved channels are designed and produced for specific projects. For example curved segments for road, rail and utility tunnel construction, waste water treatment plants or other curved structures

Properties

- Adjustable fixing
- Cost effective solution for repetitive mounting
- Suitable for installation in cracked and uncracked concrete
- Hot-rolled version is resistant to dynamic loads

HGB Balustrade Fixings

Application: Fixing of balustrades and handrails to the edge of balcony slabs

Properties

- The shape of the forged anchor head allows good load transfer in thin concrete components
- Adjustable fixing
- Also suitable for fixing of fall protection during the construction phase

INNOVATION!

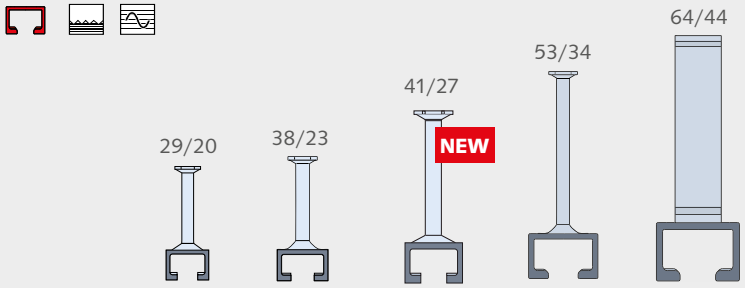
HTA-CE 50/30P and HTA-CE 40/22P with increased load capacity

Application: Fixing of all types of building components

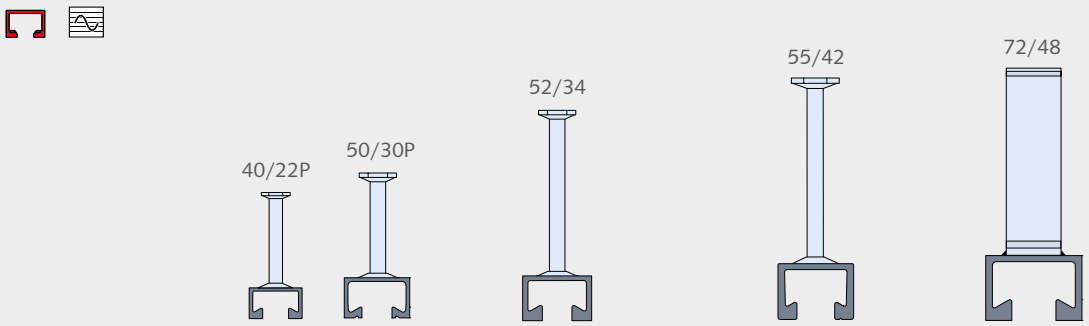
Materials for efficient corrosion protection:

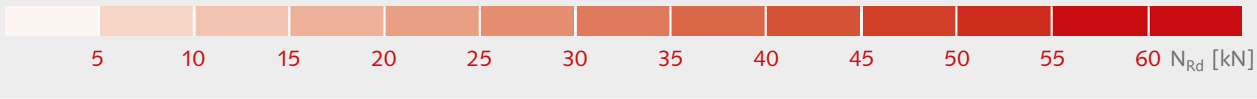
- Highly corrosion-resistant steel (HCR) for structures subject to particularly aggressive conditions
- Stainless steel (A4) for applications with increased corrosion protection demands
- Hot-dip galvanized steel (FV) for indoor or other areas subject to benign conditions

LOAD CAPACITIES FOR HALFEN CAST-IN CHANNELS: HOT-ROLLED, TOOTHED



LOAD CAPACITIES FOR HALFEN CAST-IN CHANNELS: HOT-ROLLED





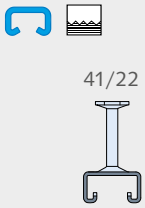
Toothed

Suitable for dynamic loads

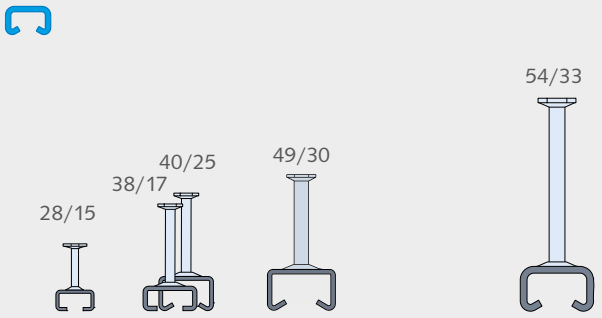
Hot-rolled

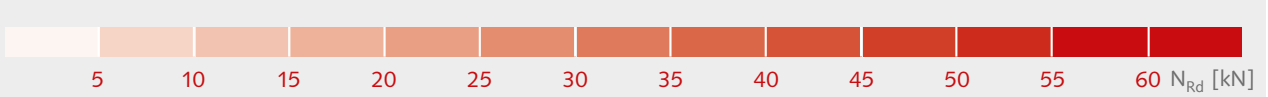
Cold-rolled

LOAD CAPACITIES FOR HALFEN CAST-IN CHANNELS: COLD-ROLLED, TOOTHED



LOAD CAPACITIES FOR HALFEN CAST-IN CHANNELS: COLD-ROLLED





Our technical support team will gladly advise you in more detail about optimal load classes and load combinations to ensure a cost-effective outcome.

Certificates

- HTA: European Technical Assessment (ETA)
- **NEW!** HZA: European Technical Assessment (ETA)
- DGNB – EPD: Environmental product declaration
- HPD: Health product declaration
- ICC – ESR

Fatigue

The design resistances according to the ETA for all hot-rolled channels HTA-CE are listed in ETA 09/0339.

Fire protection

The dimensions for fixings exposed to fire must comply with the conditions of the Technical Reports TR 020 "Evaluation of anchorages in concrete concerning resistance to fire".
The corresponding characteristic values are listed in the appendices of ETA-09/0339.

See also Technical Product Information HALFEN Cast-in Channels B

HALFEN HTU
Profiled Metal Sheet Fixing Channels

HTU Cast-in channels in beams or columns are ideal for attaching profiled metal sheets or sandwich panels. HALFEN HTU Cast-in channels combined with self-tapping screws have become a standard solution in the commercial construction industry. Self-tapping screws can be used as fasteners. They absorb tensile forces (during wind suction loads) and also shear forces (to secure the plate effect of the roof construction) and transfer them savely to the concrete.

The most important features and benefits at a glance:

- The type marking on the top of the channel allows quick and easy identification of the channel; even after installation.
- Easy-to-install: Thanks to the optimized design, the channel is directly installed in the concrete cover. Conflict with existing reinforcement is therefore avoided.
- Economical: the innovative geometry minimizes the need for multiple channel types, reducing procurement, transport and storage costs.
- Efficient: Due to the reduced profile cross-section, fixing of metal sheets using self-tapping screws is easier.

Certificates

› General building authority approvals Z-21.4-2096

Materials

› (SV) Sendzimir galvanized steel

HALFEN DEMU FIXING ANCHORS

T-FIXX® and Bolt Anchor 1988 and 1985

HALFEN DEMU Fixing anchors are used as permanent anchorages for the transmission of tensile forces, shear loads or a combination of both. Components can be securely and permanently fixed in the concrete with these anchors.

Application areas:

- Fixing of braces
- Connections of precast concrete elements
- Fixing balcony and bridge balustrades
- Fixing of utilities
- Fixing steel ladders, stairs and profiles
- Anchoring of safety fittings

The most important features and benefits at a glance:

- Clear, complementary product range in various lengths and diameters
- T-FIXX®: particularly suitable for fixings with small edge distances and in thin concrete elements
- Bolt anchors with high steel bearing capacities as an ideal supplement
- For transferring tensile loads (N), shear loads (Q) and the combination of both (N+Q)
- European Technical Assessment with fire protection classification
- Supplied with data clip for clear identification

- Comprehensive product range with different sizes (threads up to M42) and a selection of materials
- Sleeve sockets with ISO threads
- Extensive accessories for easy installation

Certificates

- With European Technical Assessment ETA-13/0222 (T-FIXX®) and ETA-13/0401 (Bolt anchors)
- State of the art dimensioning (CEN/TS 1992-4-1/2)

Materials

- Electroplated steel
- Hot-dip galvanized
- Stainless steel

Product Range

	T-FIXX®	Bolt anchors
Loads	**Moderate loads**	**High loads**
Application	› Moderate loads › Attachments with small edge distances (also used in high-strength concrete) › Thin-walled concrete elements › Concrete load capacity is generally determinant › Generally suits moderate demand fixings in standard strength concrete	› High loads › Attachments without influence of edges › High steel bearing capacity required › Also used in high-strength concrete
Examples of use	› Bridge and balcony balustrades › Supply lines, cantilever brackets › Stadium seats › Steel ladders and stairs › Precast concrete element to element connections › Aligning braces on precast concrete elements › Windows	› Large bridge and balcony handrails with widely spaced fixing points › Supply lines, cantilever brackets › Stadium seats › Steel ladders and stairs › Large precast element to element connections
Dimensioning concept/ Calculation	✓ According to CEN/TS 1992-4-1/2	✓ According to CEN/TS 1992-4-1/2
Design software	✓	✓
ETA	✓ ETA-13/0222	✓ ETA-13/0401

See also Technical Product Information DEMU Fixing Anchors DEMU-FIX

HALFEN HLX
Lift-Box

The HALFEN Lift-Box is an auxiliary aid for the installation and maintenance of lifts. It ensures a safe, temporary fixing point when working on the lift. It is set in the concrete as an attachment point in the shaft ceiling. Even heavy lift equipment can be temporarily attached.

The most important features and benefits at a glance:

- High load capacity (1500 kg, 2000 kg, 4000 kg)
- CE marking in compliance with ETA European Technical Assessment
- Modern plastic design
- Execution with loop and chain-link
- Automatic release and self-locking chain-link
- Easy to fold back
- Protection against twisting
- Complete pre-assembled unit.
- Quick and easy to install
- Usable for minimum slab thickness of 150 mm due to small edge distances
- Detailed, multilingual installation and usage instructions
- CAD Data

HALFEN HLX Lift-Box with automatically releasing and self-locking chain link or attachment point with loop

Product Range

The HALFEN HLX Lift-Box is delivered to site as a complete pre-assembled unit

Certificates

- European Technical Assessment ETA-17/0488
- CE marking in compliance with ETA

Technical Data

- Load classes 1500 kg, 2000 kg, 4000 kg

Attachment point for personal protective equipment

Secure with your personal protective equipment to the HALFEN PSA Anchor point, e.g. when working in lift shafts. The attachment point consists of a fixing anchor, data clip and a fixing eye, to provide a fall protection attachment point for one or two people.

The most important features and benefits at a glance:

- Quick and easy to install
- System tested in compliance with the DGUV test

Certificates

- Tested for suitability for protection against two people falling according to the DGUV test following CEN/TS 16415

Product Range

HALFEN PSA Attachment in application: HALFEN DEMU T-FIXX® Fixing anchor cast in concrete with reusable eyebolt for reliable fixing of personal fall protection equipment.

Identification cap for marking the fixing anchor as suitable for use as a personal fall protection anchor point

Approved **Fixing anchor** (stainless steel):
HALFEN DEMU T-FIXX® M16, A4, ETA-13/0222

(Order number: 0020.270-00508)

Suitable **eye-bolt** (stainless steel)
available separately:
RUD PSA INOX STAR M16

(Order number: 0742.260-00001)

See also Technical Product Information HALFEN HLX Lift-Box

HALFEN HB
Anchor Bolt Systems

The HALFEN Anchor bolt systems offer you a balanced product range of the highest quality. A new addition is the universal injection system HB-VMU plus for almost all applications and substrates. This system can not only be used in cracked and uncracked concrete, but is also approved by building authorities for use with fixings in 15 different types of masonry. A perforated sleeve from our range is also required for use in perforated masonry.

The most important features and benefits at a glance:

- Safe: approved anchor bolt range for masonry and/or concrete. Design software available for download
- Strong: high loads in all substrates, also approved to some extent for seismic conditions
- Simple: coordinated bolt anchor range to complement other products from us, e.g. in the areas of façades and assembly technology
- Versatile: alternative fixing solution to anchor channels

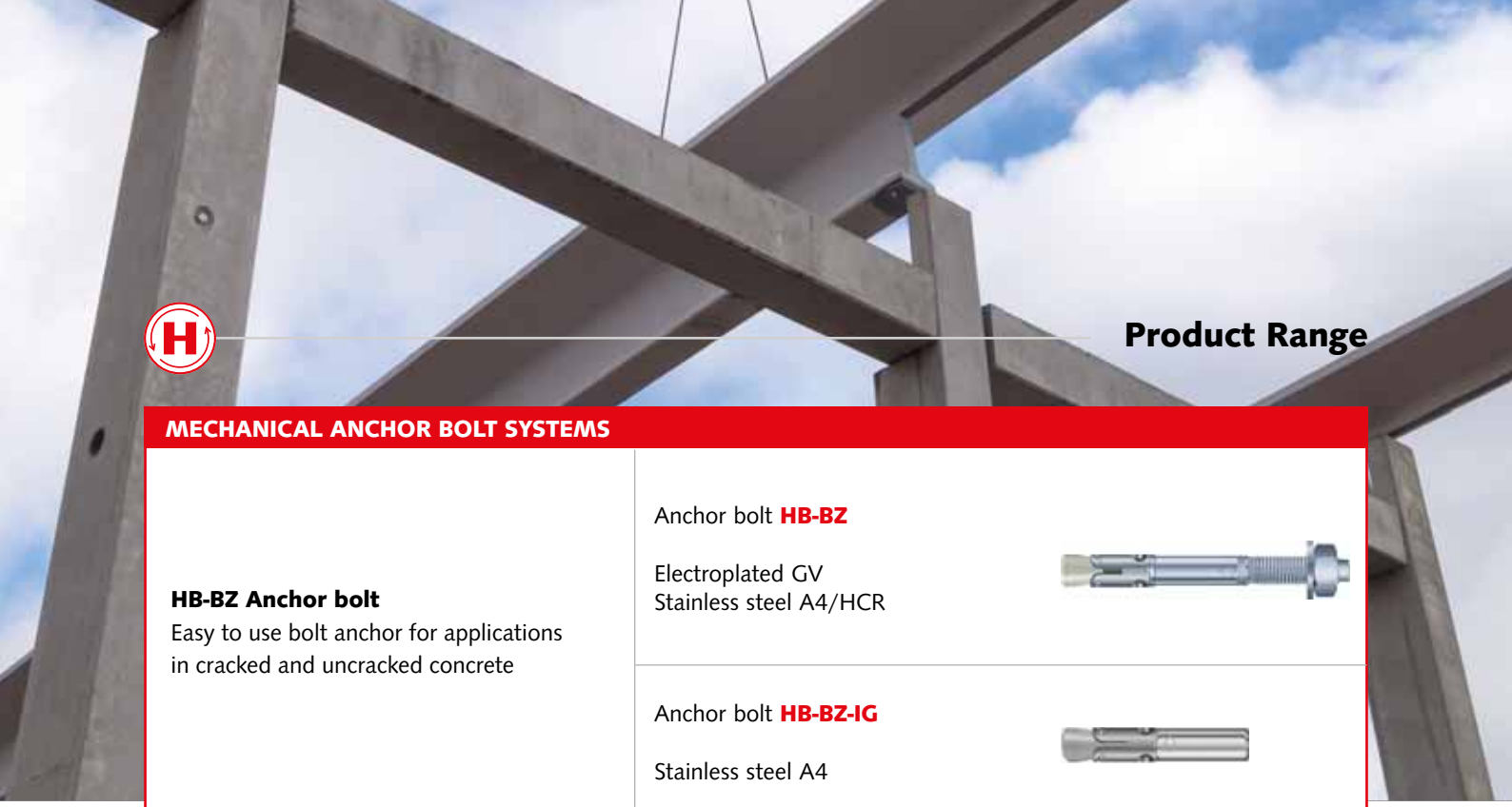
Application areas:

- Steel construction
- Cantilever brackets
- Balustrades
- Framework constructions
- Cable lines
- Technical equipment in tunnels
- Swimming pools
- Façade constructions
- High-bay racks
- and much more

Depending on the material, it is recommended for use in dry interior environments (GV and FV options), in outdoor areas, and humid environments (A4 options) as well as in areas subject to aggressive conditions (HCR options).

Certificates

- All anchor bolt systems are building authority approved (ETA)



Product Range

MECHANICAL ANCHOR BOLT SYSTEMS

HB-BZ Anchor bolt Easy to use bolt anchor for applications in cracked and uncracked concrete	Anchor bolt **HB-BZ** Electroplated GV Stainless steel A4/HCR	
	Anchor bolt **HB-BZ-IG** Stainless steel A4	
HB-B Anchor bolt Easy to use bolt anchor for applications in uncracked concrete	Anchor bolt **HB-B** Electroplated GV Stainless steel A4	
	Anchor bolt **HB-B-IG** Stainless steel A4	

CHEMICAL ANCHOR BOLT SYSTEMS

Injection system HB-VMZ The strongest anchor – suitable for high loads with small edge distances. For use in both cracked and uncracked concrete	Injection system **HB-VMZ** Electroplated GV Stainless steel A4/HCR	
Composite anchors HB-V The classic compound anchor – an easy to install and cost-effective solution for simple fixings in uncracked concrete	Composite anchor **HB-V** Electroplated GV Hot-dip galvanized FV Stainless steel A4	
Injection system HB-VMU plus The most versatile anchor – for use in cracked and uncracked concrete as well as in masonry	Injection system **HB-VMU plus** Electroplated GV Stainless steel A4	

See also Technical Product Information HALFEN Anchor Bolt System HB

ANCHOR BOLT SYSTEMS

	MECHANICAL ANCHOR BOLT SYSTEMS									CHEMICAL ANCHOR BOLT SYSTEMS			
	Anchor bolt HB-BZ	Anchor bolt HB-BZ A4	Anchor bolt HB-BZ HCR	Anchor bolt HB-BZ-IG A4		Anchor bolt HB-B	Anchor bolt HB-B A4	Anchor bolt HB-B IG A4		Injection system HB-VMZ	Injection system HB-VMU plus		Composite anchors HB-V
													
Cracked concrete	■	■	■	■						■	■		
Uncracked concrete	■	■	■	■		■	■	■		■	■		■
Perforated masonry											■		
Solid block masonry											■		
ETA	■	■	■	■		■	■			■	■		■
Fire test	■	■	■	■		■	■			■	■		■
Tunnel fire test			■							■			
Approval for seismic conditions	■	■	■							■	■		
Electroplated	■					■				■	■		■
Steel, hot-dip galvanized													■
Stainless steel A4		■		■			■	■		■	■		■
Stainless steel HCR, 1.4529			■							■			
Design software	■	■	■	■		■	■	■		■	■		■

Materials

- Electroplated
- Hot-dip galvanized
- Stainless steel A4
- Stainless steel HCR – highly corrosion-resistant steel 1.4529 – on request

The Albaufstieg, Germany, ©tomjasny.com
Tunnel in the Neckar-Alb region of Hesse

Proven technology with our reinforcement systems

The choice of reinforcement technology impacts fundamentally on the concreting process. Quality and performance define the final outcome.

When building with precast concrete elements, you benefit from a number of advantages, including the high quality that results from the controlled production process under plant conditions, and the time saved at the building site. In-situ concreting can be subject to a wide range of factors - some known and some unforeseen. Pour cycles, construction joints, temporary voids and the vagaries of a hectic construction site require modern and innovative reinforcement solutions.

In the reinforcement technology sector, we are able to offer you multiple structural connection systems – for balconies and precast components, lifts, walls, bridges and tunnels. Our pioneering product range provides comprehensive and cost-effective solutions for numerous building situations. All components are perfectly coordinated to complement each other, therefore ensuring the highest level of reliability in design.

Choose reinforcement technology that is practical, easy to install and offers the highest level of quality and safety.

Henninger Turm, Frankfurt am Main (Germany), ©tomjasny.com

HALFEN HIT

Balcony Connections HALFEN Iso-ElemenT

HALFEN HIT Iso-Elements offer you a versatile connection system for balconies and cantilevered building elements.

The balcony elements provide optimum thermal insulation and also meet the requirements of the highest fire protection class – as standard. Discover all the advantages for yourself now!

The most important features and benefits at a glance:

- Thermal insulation fire protection material of Building Materials Class A1 – non-flammable insulating material
- Use as fire barrier on façades with ETICS (external thermal insulation composite system) made from EPS foam/ styrofoam
- REI120 – high fire protection class as standard
- EnEV – Building authority approved Ψ values
- Symmetrical HIT elements for cantilever slabs with even more installation safety
- HIT elements - now with more robust and durable cores - to resist damage during handling and installation
- Element lengths 25 cm, 50 cm and 100 cm for more rapid assembly
- Reliability in design – all the required certifications have already been considered
- Optimised cutting process in the HIT design software

Certificates

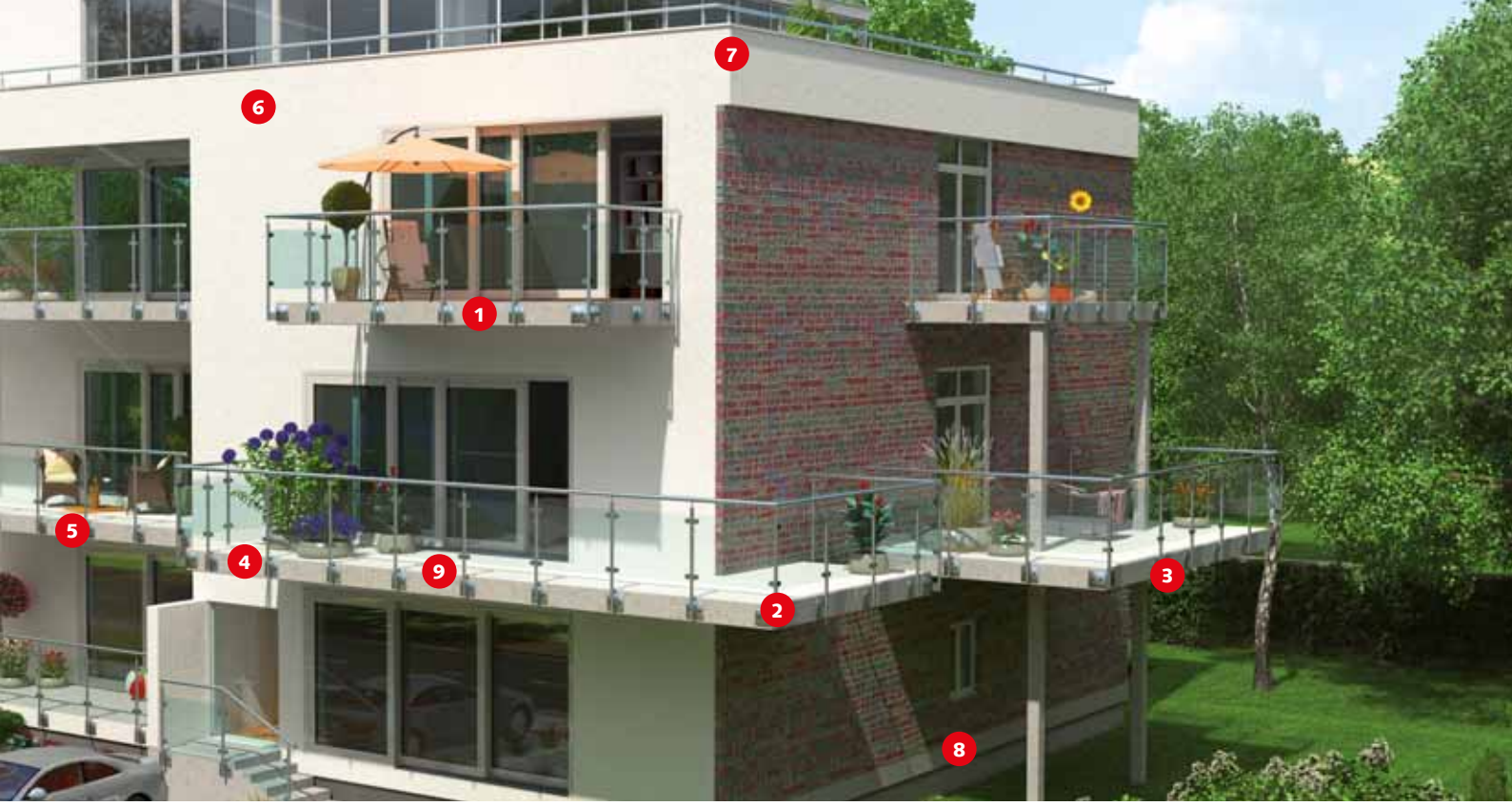
- Certificates from Passive House Institute in the highest category "Certified Passive House Components" for HIT-SP ZVX with a slab height of up to 24 cm
- Certified as energy-saving components with as little as 80 mm insulation thickness for cantilevered and supported balcony slabs
- ETA – European Technical Assessment
- The European Technical Assessment ETA-18/0189 generally allows the HALFEN HIT-HP/-SP Insulated connections to be cut to size

Technical Data

Calculate the performance characteristics of the building quickly and professionally – with the HALFEN Ψ Calculator on our website!

HIT Insulated connections are available in two product options:

- HIT-HP High Performance with an insulating thickness of 80 mm
- HIT-SP Superior Performance with an insulating thickness of 120 mm



Product Range

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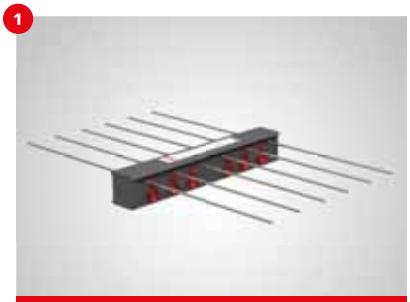


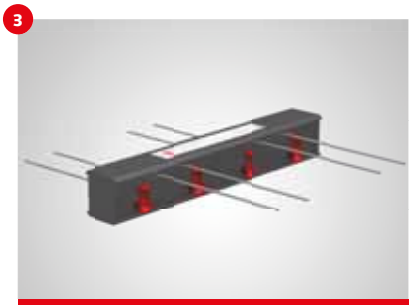
Cantilevered balcony
HIT-MVX

2

NEW

Cantilevered corner balcony
HIT-MVXL, HIT-FK COR

3

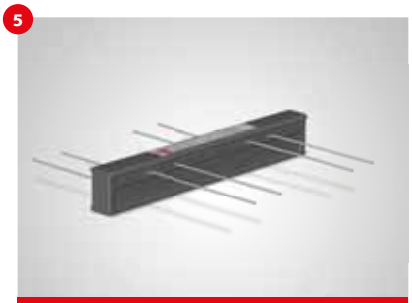


Simply supported balcony
HIT-ZVX or HIT-ZDX

4

Balcony with support – a second variation
HIT-MVX-OU

5

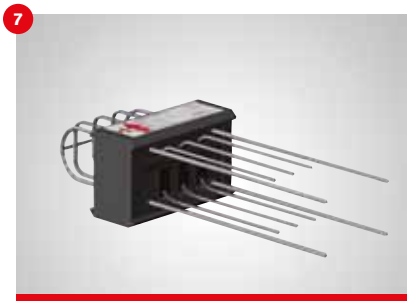


Loggia
HIT-ZVX without CSB bearing, HIT-DD

6

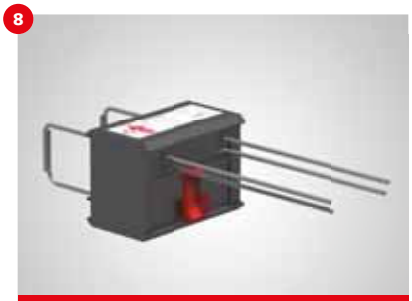
Roof parapet
HIT-AT

7



Parapet
HIT-FT

8



Cantilever
HIT-OTX

9

Additional element
HIT-HT

See also Technical Product Information HALFEN HIT Insulated Connection

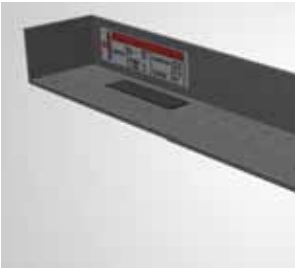
HALFEN HBB, HTT, HTF, HTPL

Impact sound Insulation Products

A particularly distinct and unpleasant type of structure-borne noise transmission is footfall noise. Inadequate impact sound insulation, especially in the staircases of residential buildings, can cause annoying resonances. Using the HALFEN Impact sound insulation system, monolithic stair elements can be acoustically decoupled from adjoining components. Our Sound insulation products provide the solution to considerably reduce impact sound transmission.

The most important features and benefits at a glance:

- Good sound insulating properties over a wide range of bearing pressures



HTF Impact sound element:

- Used with precast stair elements in landing slab
- Flexible to suit all stair widths
- The width can be adjusted as required with insulation and mounting strips
- Perforated interfaces for quick cutting of elements to the correct length

HBB Box:

- For in-situ cast or precast concrete landing slabs
- Simple and quick installation
- Fire resistance class R90 or
  supporting element and bi-trapez bearing with fire resistance class R90
- Impact sound insulation element with Building Authority Approval no. Z-16.32-455

HTT Impact sound element:

- For connection of precast stairs to in-situ concrete landings
- Reliability in planning with type test
- Fire protection rating up to R120
- Available in 3 different load classes

Technical Data

HTT Impact sound insulation element

- Available for stair widths of 90–200 cm

HTF Impact sound insulation element

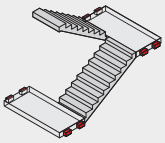
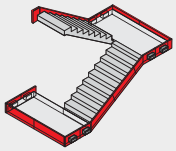
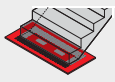
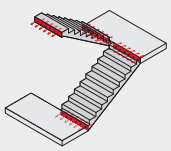
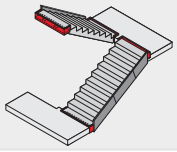
- Available for stair widths of 100 cm and 120 cm
- The width can be adjusted as required with insulation or mounting strips

HBB Box

- Box available for three landing thicknesses (d = 16/18/20 cm)

Product Range

- HBB Box
- HTT Impact sound insulation element
- HTF Impact sound insulation element
- HTF-B
- HTPL

	1	HBB bi-Trapez-Box Impact sound insulation element for installation of on-site or precast concrete landing slabs
	2	HTPL Joint element for lateral decoupling of a flight of stairs from a wall
	3	HTF-B Impact insulation element for acoustic decoupling under a precast concrete stair element and a ground-floor slab
	4	HTT Impact sound insulation element for connection of an on-site cast concrete or precast staircase to an on-site cast concrete landing-slab
	5	HTF Impact sound insulation element for installing precast concrete stairs to landing slabs

See also Technical Product Information HALFEN Impact Sound Insulation ISI

HALFEN HBS-05
Coupler Systems

HALFEN HBS-05 Screw connections for reinforced concrete can be combined in any way and also with the HSC Stud connector system. As a result, they can be used to make almost every reinforcement joint. Take advantage of the enormous versatility in our range of screw connections!

The use of top quality raw materials together with the consistent manufacturing quality at our production plant guarantees the highest levels of safety and quality.

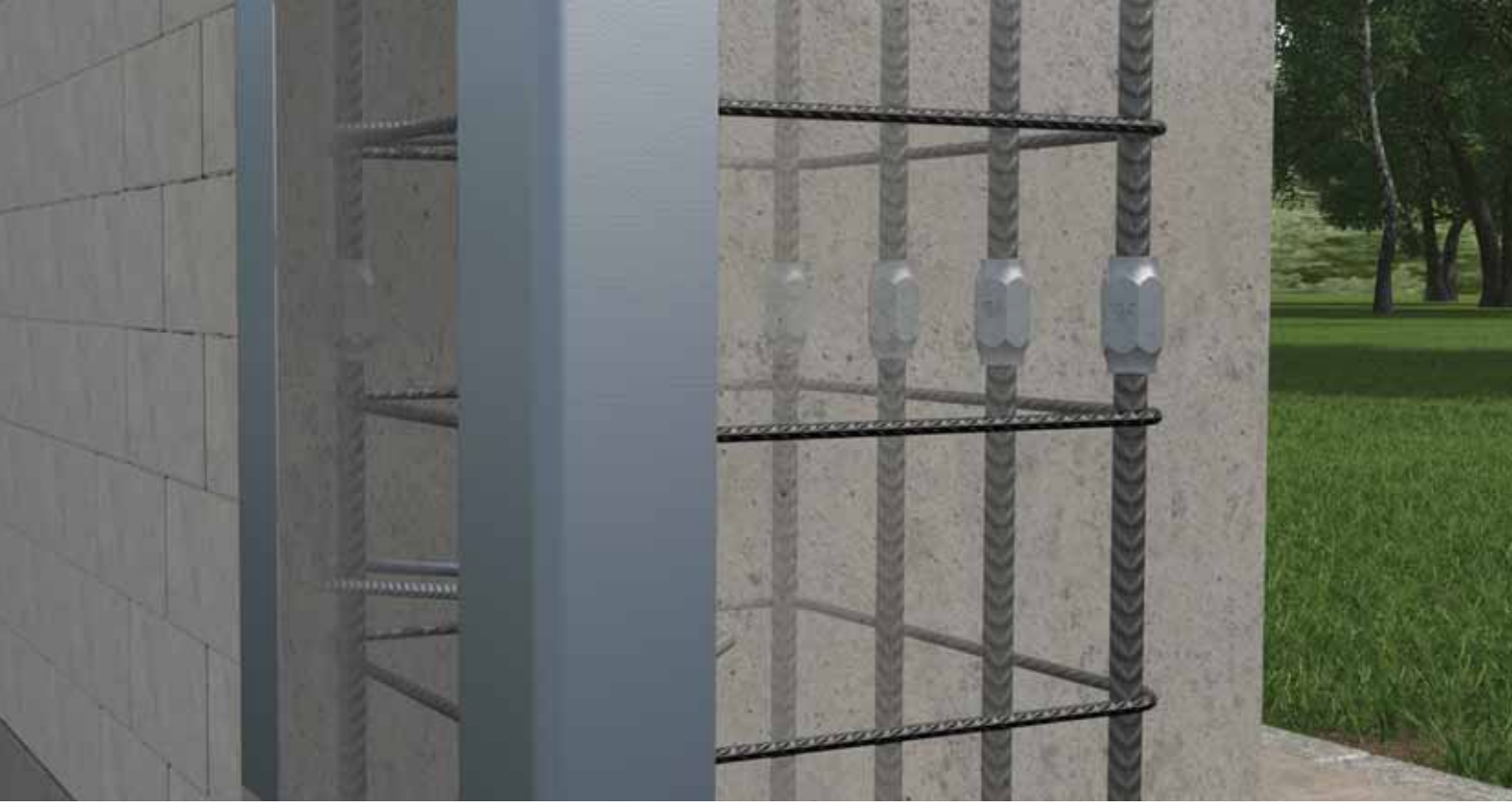
The most important features and benefits at a glance:

- No torque wrench needed – only a simple visual check is required
- Screw socket bars HBS-05-S are particularly suited for use in vertical reinforcement connections
- Forged head socket bars HBS-05-B can be nailed directly to the formwork using the integrated nailing plate
- HBS-05-A Connection bar can be used for both socket bar types – the screw socket or forged socket types
- Exceptional load capacity: HBS-05-A fulfils the high demands required under exceptional loads, such as explosion or impact
- HBS-05-Seismic: high ductility under alternating cyclic loading means high seismic resistance
- HBS-05-P Position sleeve set to connect axially fixed, non-sliding, non-rotatable socket and connecting bars. For example in slab crane openings
- HBS-05-E types can be used for reinforcement connections with short anchoring lengths, or as weld-on end anchors

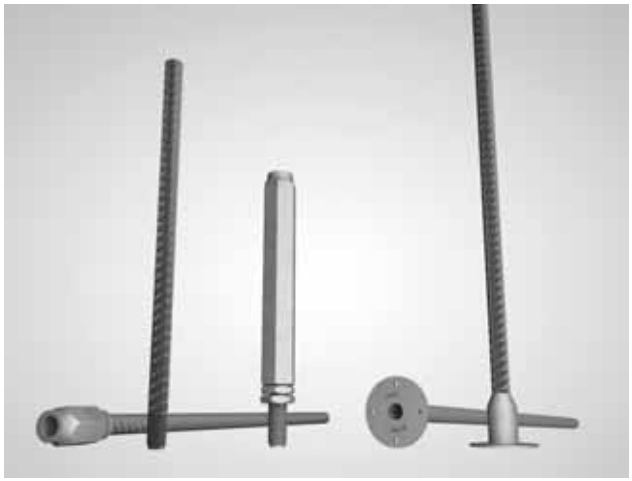
Certificates

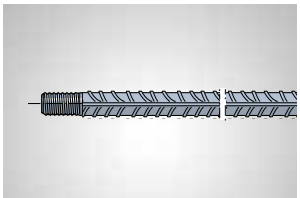
HALFEN HBS-05 Screw connections fulfil national and international dimensioning standards. Comprehensive expert reports and test reports provide proof of their suitability even under extreme loads.

- General approval Z-1.5-189 by the DIBt building authority
- Approval also for loads that are not predominantly static and for high fatigue resistance, e.g. for use in bridges or crane runways
- Multiple country-specific approvals, test reports and expert reports confirm compliance with the dimensioning criteria of international standards

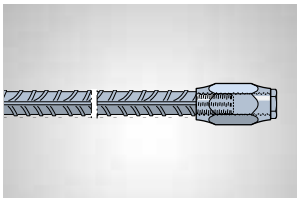


Product Range

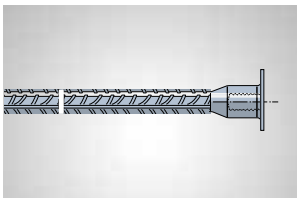




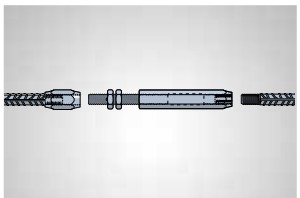
HBS-05-A Connection bars - suitable for both socket bar types



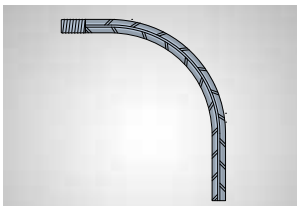
HBS-05-S Screw socket bars



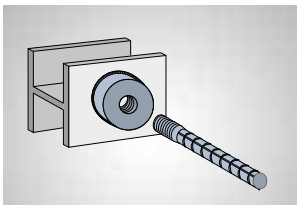
HBS-05-B Forged socket bar, with integrated nailing plates



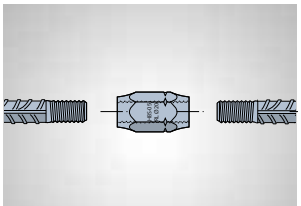
HBS-05-P Position sleeve set



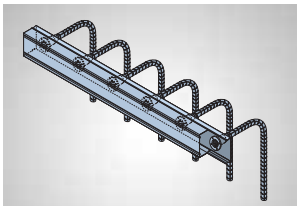
HBS-05-AG/-ALG Curved connection bars



HBS-05-E End and weld-on anchors



HBS-05-R-/L Connecting socket with right-left thread



HBS-05-Box with socket bars

Other options available

Technical Data

- Extensive product range for bar diameters from 12 mm – 32 mm
- Colour coding ensures easy identification of individual components
- Bar diameters 12 mm – 28 mm can be dynamically loaded according to the approval
- Forged socket bars can be nailed directly to the formwork

See also Technical Product Information HALFEN Screw Connections HBS-05

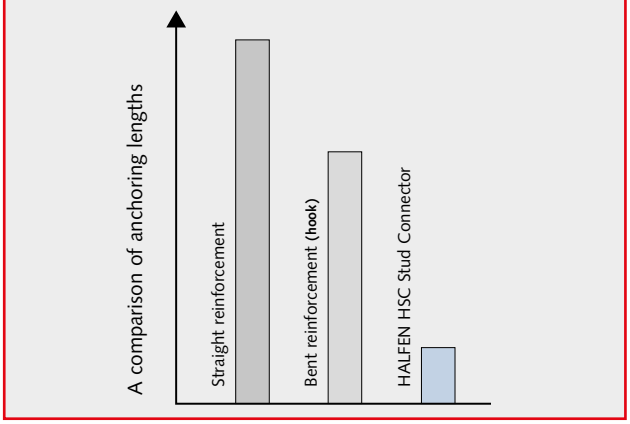
HALFEN HSC
Reinforcement Connections

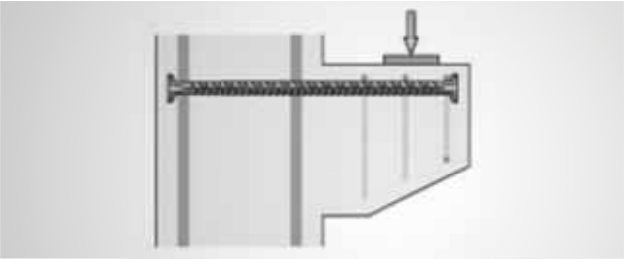
The HALFEN HSC Stud connector was specifically developed as a cost-effective alternative to traditional tensile reinforcement for corbels and framework nodes. It simplifies the construction of reinforced concrete due the extremely short anchoring length required. The product eliminates the typical problems associated with conventional reinforcement layout, and transmission of forces from bars into the concrete. As a result, the amount of installed reinforcement required can be significantly reduced. This also simplifies the reinforcement layout – reducing the risk of errors and facilitating any pre-pour inspection and approval procedures. The HALFEN HSC Stud connector saves you a considerable amount of time and provides an extraordinary degree of flexibility in construction work with corbels.

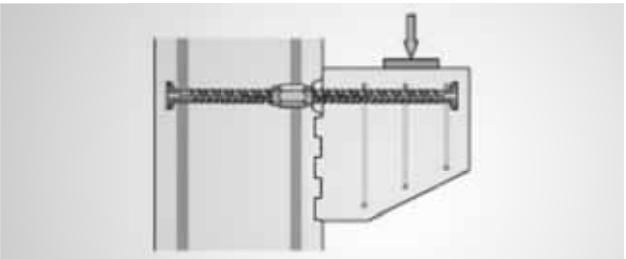
The most important features and benefits at a glance:

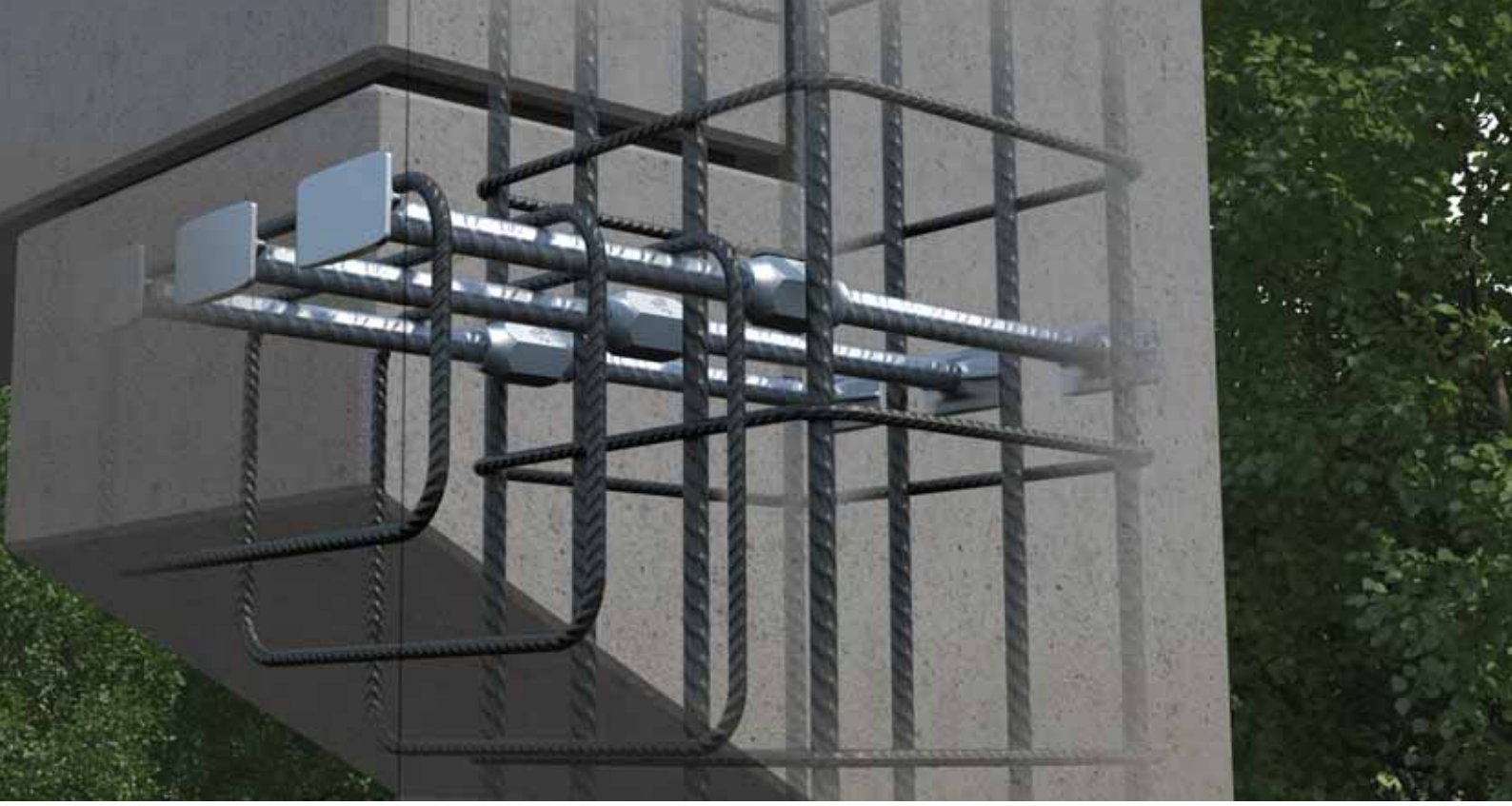
- Secure anchoring of high tensile forces in corbels and framework nodes
- 100% anchoring with specially shaped, forged anchor heads
- Time-saving installation - assembly without special tools
- High application safety thanks to the simplified reinforcement layout
- Reduced amount of steel required due to efficient anchoring
- Screw connection eliminates need for expensive formwork penetration
- High degree of reinforcement by laying head to head
- Can be arranged in multiple layers
- Flexible and economical
- Separate reinforcement of columns and corbels possible (stirrups do not cross the joints)
- Minimal thread slippage through a tapered thread
- The anchor head can be aligned horizontally or vertically to best suit installation conditions
- Solutions for monolithic corbels, and those cast in a second step

EXTREMELY SHORT ANCHORING LENGTHS







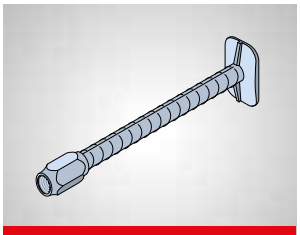


Product Range

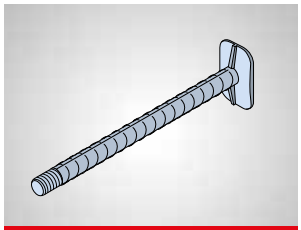
Discover real flexibility in combination with HBS-05 Screw connections!

The complete system for all applications:

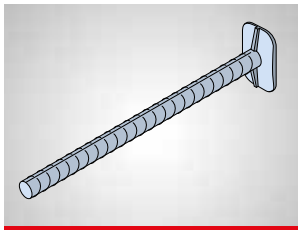
- Corbels
- Framework end nodes
- Beam supports
- Slab supports
- Stepped supports
- Framework corners



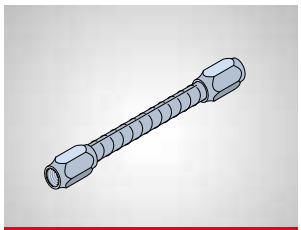
HSC-S



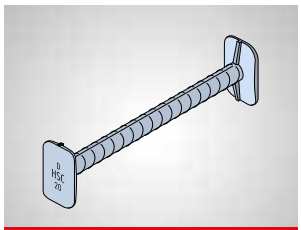
HSC-A



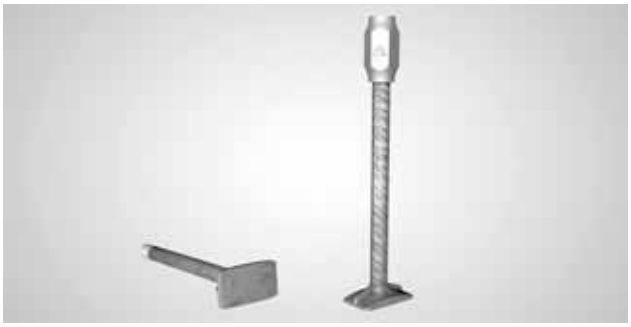
HSC-H



HSC-SD



HSC-HD



Technical Data/Materials

- Diameters 12 mm, 16 mm, 20 mm and 25 mm
- Also available in stainless steel B500NR

Certificates

- Reliable design; general building authority approvals according to EC 2
- Approvals for loads that are both predominantly static or non-static
- Design software for corbels is easy to use and available for download. Verifiable static calculation output, with an item list!

See also Technical Product Information HALFEN Stud Connector HSC

HALFEN HUC

Structural Steel Connections And Steel Corbels

The HUC Universal connection is a simple and effective solution for connection of steel elements and structures to reinforced concrete across a broad variety of situations. Using the steel-to-concrete connector HSC-B, a wide variety of steel fabrications can be simply and securely bolted to concrete elements. Both axial and shear forces, as well as bending moment – either separately or in combination – can be securely transferred. No additional sitework is required – simply tighten the bolts, and the job is done.

The compact HSCC Steel corbels are available in 34 type tested, standard sizes. This dramatically simplifies the design process. Furthermore, in comparison to traditional concrete corbels, the HSCC has double the load capacity. Beam heights can be reduced, as the beam ends need only accommodate a much shallower corbel.

The most important features and benefits at a glance:

HSC-B Concrete to steel connection

- HSC-B Structural steel connection for carrying axial forces, shear forces and bending moments – without additional constructive measures
- No site welding is required and no penetrations are needed in the formwork: easy to install on the formwork with matching positioning plates and supplied mounting bolts
- No special tools required: The steel end plates are bolted to the cast-in socket array using standard type bolts
- Durable - a choice of materials and corrosion protections
- 34 type tested HSCC Steel corbels – with up to double the load capacity and lower profile than traditional solutions
- Also suitable for loads that are not predominantly static
- One-sided and two-sided connections, as well as curved anchors available
- A range of optional HSC-B anchor bar layouts, including single and multiple layer
- Secure load transfer with short anchoring lengths, even into thin elements
- HSC parts are prefabricated, laser cut and 100 % dimensionally accurate, including the critical positioning and end plates

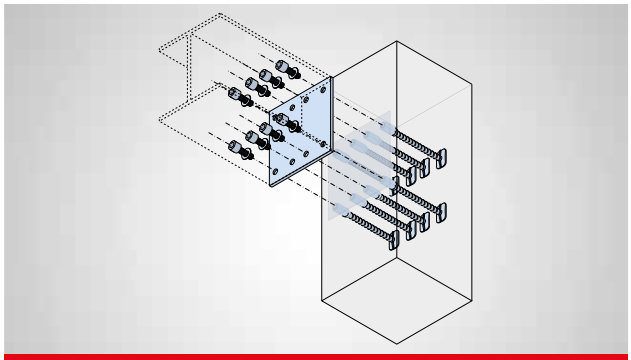
HSCC Steel Corbels

- Flexible when connecting: Steel corbels or steel beams or connecting plates can be connected over the front plate, e.g. for the DETAN Rod system or for fixing cables
- Simplified demolition of buildings and recycling of building materials with bolted connections

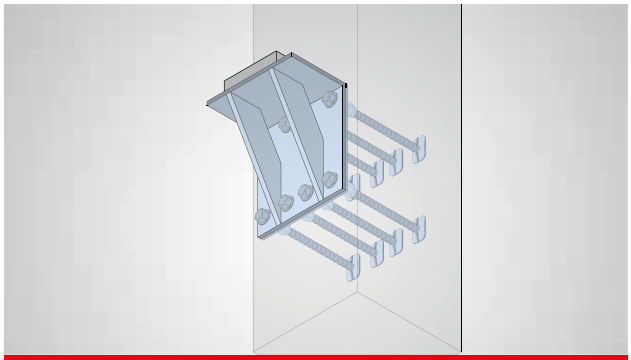
Technical Data

- Durable – optional corrosion protection for the sockets
- Diameters 12 mm, 16 mm, 20 mm and 25 mm
- Design software for the steel connection and selection of steel corbels

Product Range



HSC-B Steel-to-concrete connection



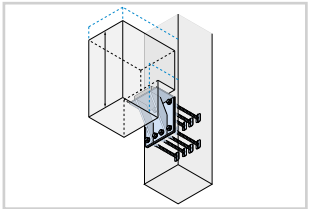
HSCC Steel corbels

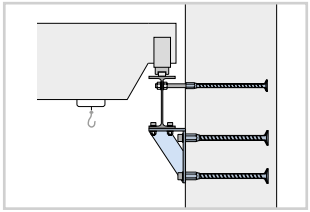
Certificates

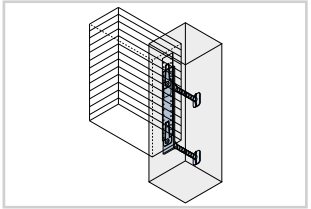
- Building authority approval for all system components
- Verification of load capacity with the N-Q – interaction diagram or HUC design software

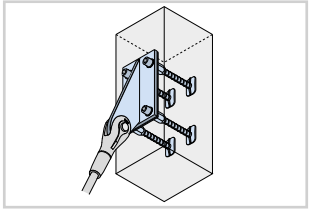
Materials

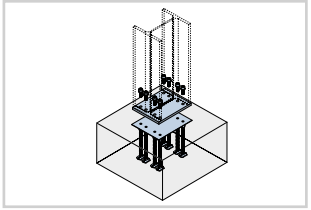
- Hot-dip galvanized
- Electroplated
- Stainless steel A4

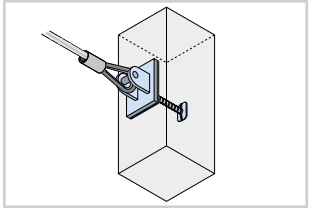












See also Technical Product Information HALFEN Universal Connection HUC

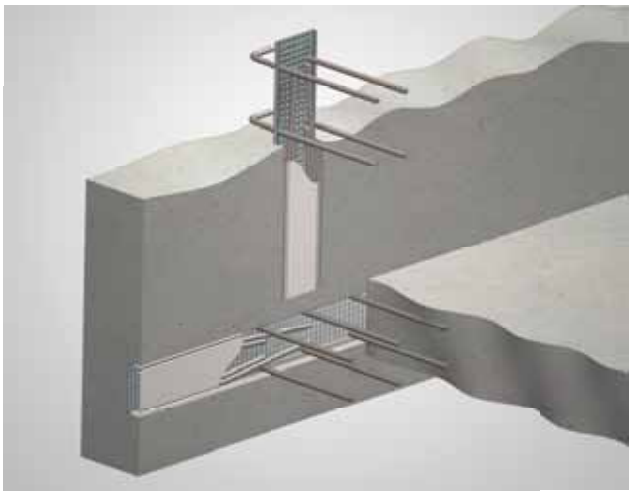
HALFEN HBT
Rebend Connections

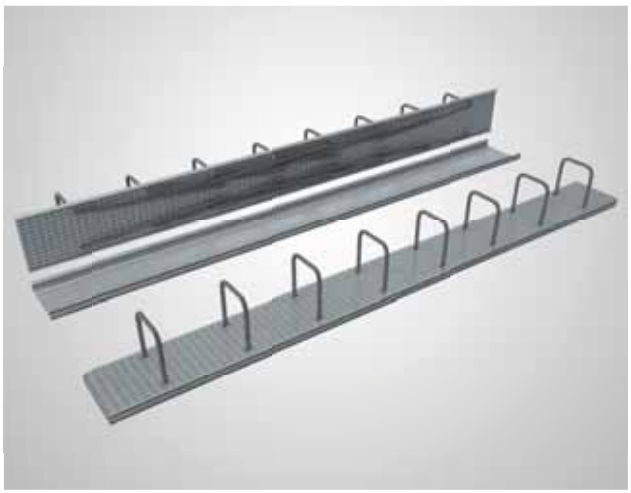
Our HBT Rebend connections are widely used for the connection of in-situ and precast concrete components across different pours.
HBT provides high shear force bearing capacities due to the simplified dimensioning concept compliant with general building authority approval.

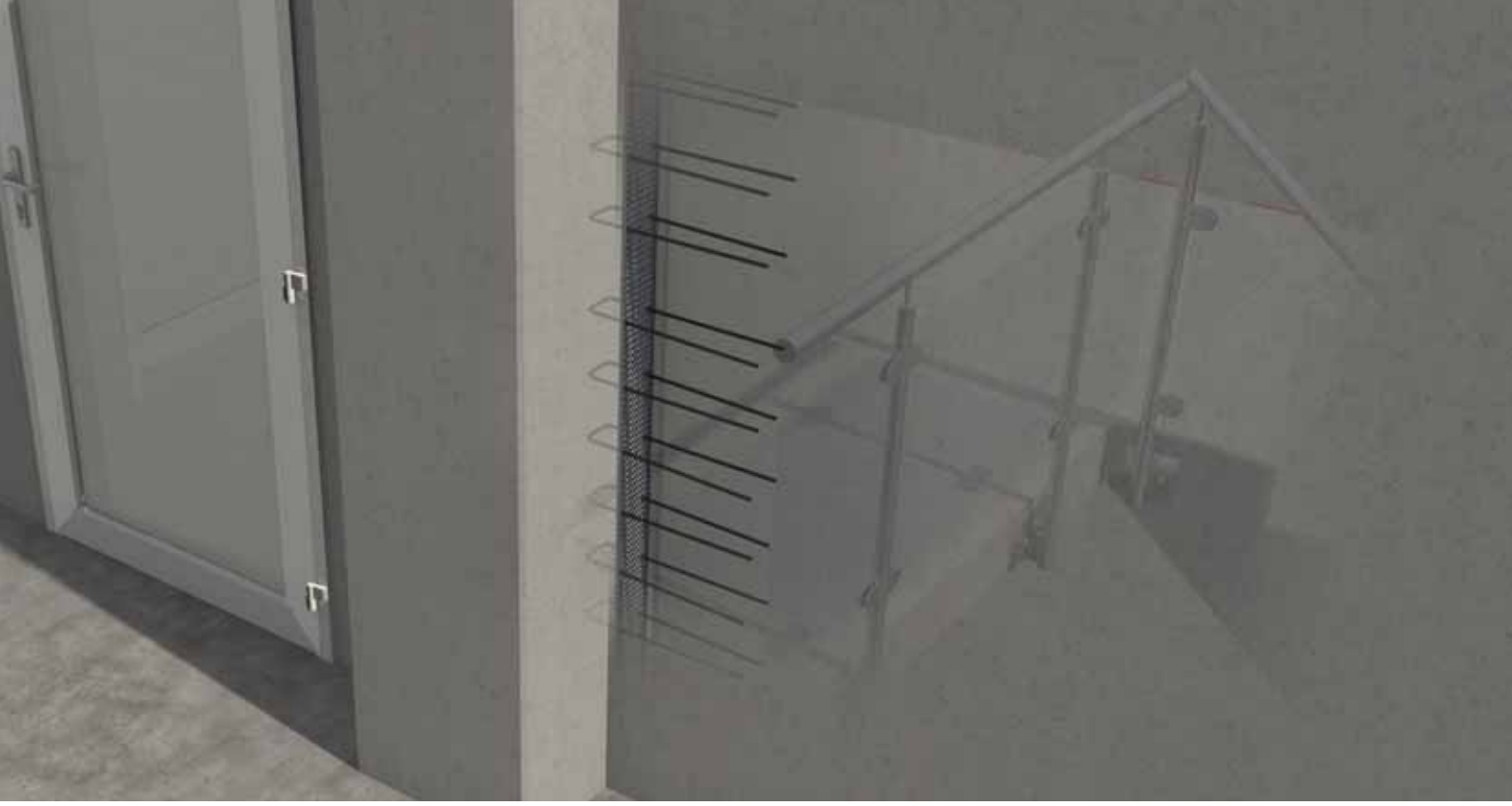
We provide 57 combinations of stirrup types and widths.
Standard boxes in 0.80 m and 1.25 m lengths are available to suit the most common conditions – for both single and double layer reinforcement.

The most important features and benefits at a glance:

- Robust steel profile and cover do not buckle when handled or during concreting
- Ideal for thin components or precast elements with shallow concrete cover due to reduced box heights
- Transfer of both shear and longitudinal forces with standard box types
- Common approach for both structural connections and for statically relevant connections – no risk of confusion on-site or in precast plant
- Special dimpled profile ensures optimum transfer of shear loads in the joint – the box profile does not act as a bondbreaker
- Profile and cover made from galvanized steel to protect against corrosion
- Eliminates the risk of leaving any plastic in the concrete
- Box shape and end-caps prevent the ingress of concrete during pour
- Easy to nail or glue to the formwork
- Pre-punched hole in the cover makes removal after stripping the formwork quick and easy

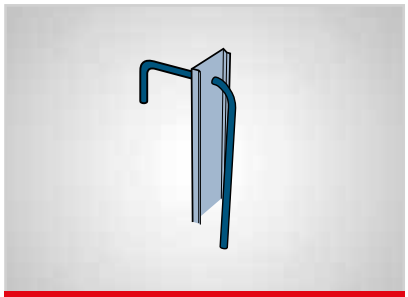




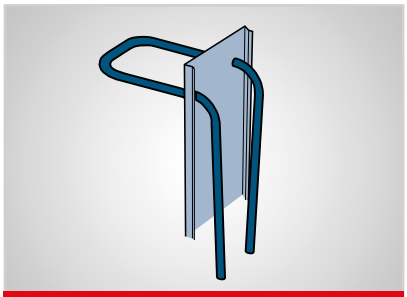


Product Range

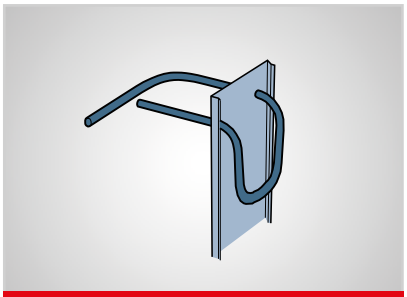
Single-layer and double-layer connections. Many other design options available.



Type 1



Type 5



Type 7

Technical Data

- Available in bar diameters: 8 mm, 10 mm and 12 mm
- Standard box lengths: 1.25 m and 0.80 m, other lengths available on request
- 7 different box widths suit element thicknesses from 6–23 cm – custom boxes are available to suit larger wall thicknesses
- 13 stirrup types available, for both single and double layer connections
- Stirrup: B500B (stainless steel B500B NR available on request)

Certificates

- Building authority approval (DIBt) for the HBT Rebend connection
- Simple design approach according to the approval with just two basic cases of loading – loads transverse or longitudinal to the direction of the joint
- Verification of combined load transverse and longitudinal to the joint is available if required
- Tables with type tested bearing capacities on the basis of the approval and EC2

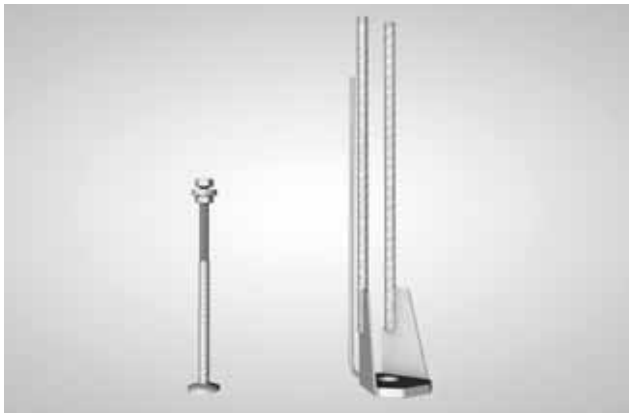
See also Technical Product Information HALFEN Rebend Connection HBT

HALFEN HCC
Column Shoes

The HALFEN HCC Column shoe is a rapid and simple bolted solution to connect precast columns to in-situ slabs or footings, or for column-to-column connections on-site. This engineered and prefabricated, dry-bolt system makes columns very rapid to erect, and eliminates the need for props or braces. The connection is easy to adjust and immediately load-bearing.
The principle: The column shoe is cast into the columns in the precast plant, and the anchor bolts are concreted on site into the footing with the optional setting jig. The columns are then simply dropped over the HAB Anchor bolts, and the nuts tightened while held by the crane. Checking for plumb and tightening the nuts is fast. The foot of the column can be grouted at any later time. The entire propping operation is eliminated, and it is not necessary to wait for grout to set in order to load the column.

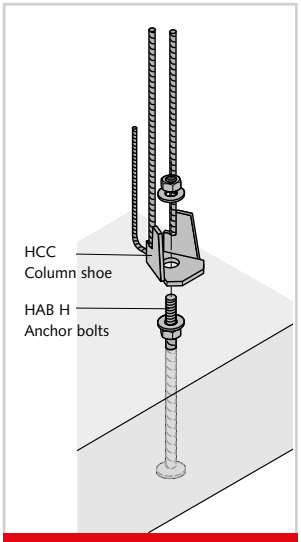
The most important features and benefits at a glance:

- Dry-bolt system for rapid erection of precast columns
- For connection to slabs, footings and stacking of columns
- Eliminates props and braces
- Simple installation and adjustment with standard tools
- A comprehensive range of installation accessories is available – for secure fixing in the precast plant, and rapid erection on-site
- Seismic variant available for earthquake zones

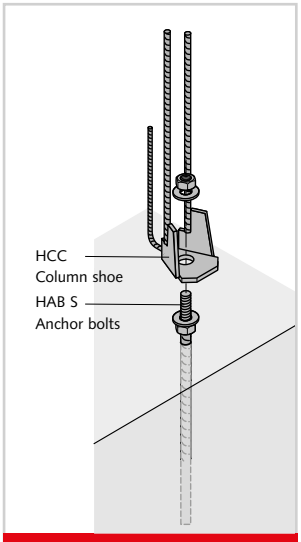


Certificates

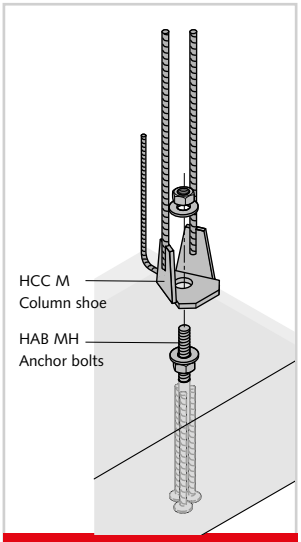
- HAB anchor bolts are generally approved by building authorities, HCC type tested
- 10 different, type tested HCC load classes from 62 to 937 kN
- User-friendly design software for selecting HAB Anchor bolts and HCC Column shoes



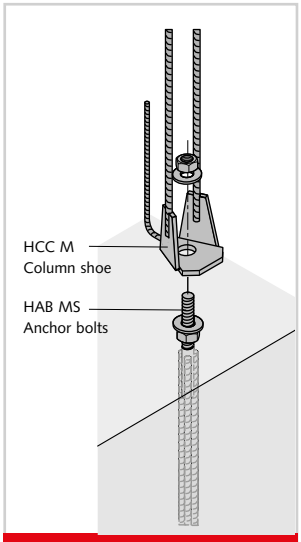
Due to their shallow installation depth, HAB H Anchor bolts are suitable for use in flat components, such as, slabs, strip footings or walls with sufficient edge distance



HAB S Anchor bolts are suitable for use thicker components with sufficient fixing depth. Due to increased depth, edge distances can be reduced compared to HAB H Anchor bolts



For higher loads in flat components, HAB MH Anchor bolts are used in slabs, strip footings and walls with sufficient edge distances



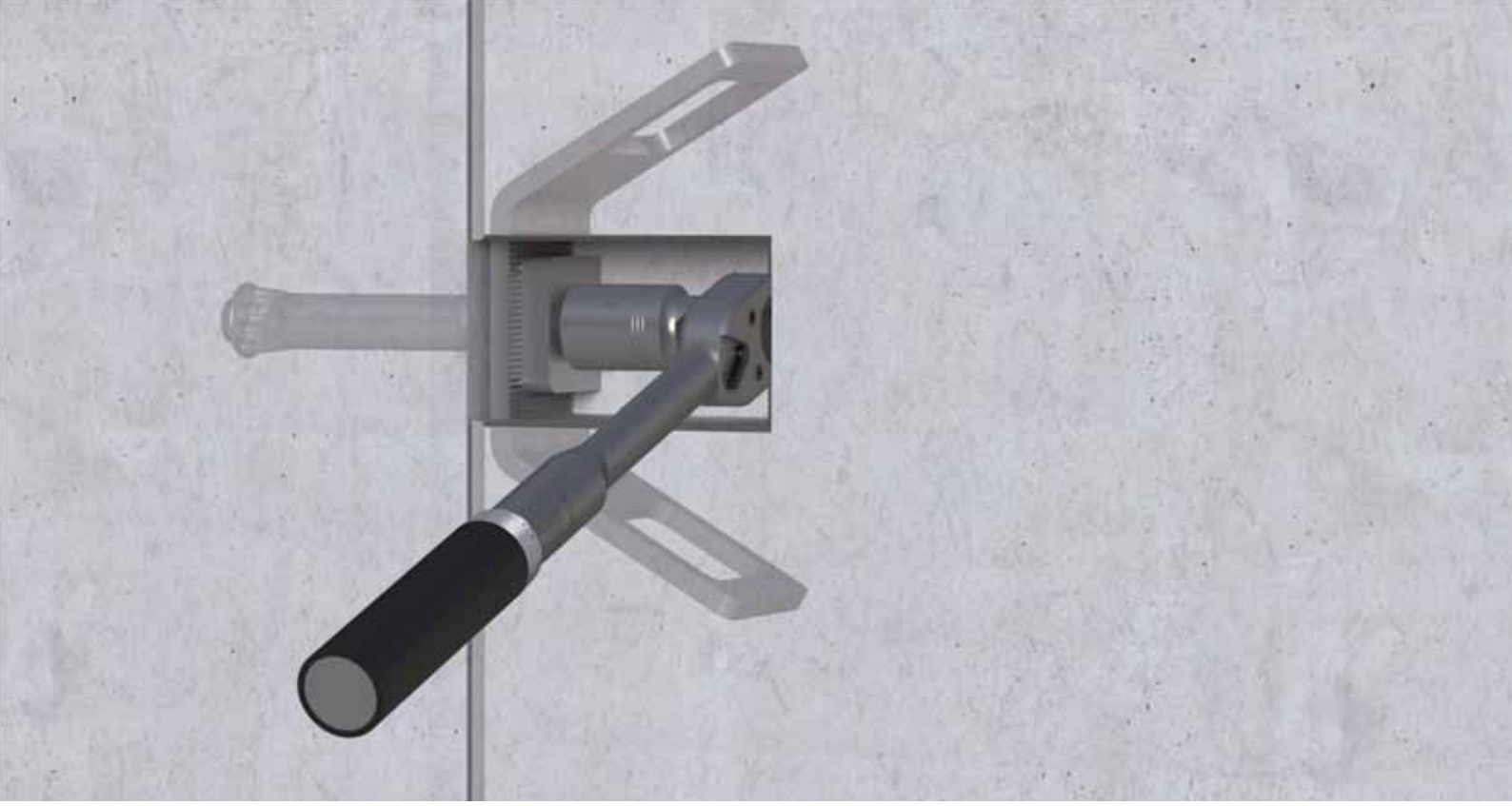
For higher loads in thicker components, HAB MS Anchor bolts are used. Due to increased depth, edge distances can be reduced compared to HAB MH Anchor bolts

HALFEN HEK
Precast Connections

The cost-effective solution for quick and simple element to element connection: HEK has been specially developed for the requirements of the precast industry. Rapidly assembled, this dry connection is instantly load-bearing.

The most important features and benefits at a glance:

- Dry, bolted connection for simple, quick and cost-effective assembly on site
- Sufficiently sized hole to account for casting irregularities and site tolerances
- Immediately load-bearing element to element connection
- Multifunctional product for use in numerous applications and connection
- Does not require any special tools, compressed air or power supply
- Transfers tension and shear loads
- No bracing or propping required
- Can be assembled in any weather
- General building approval
- Easy-to-use design software



Product Range

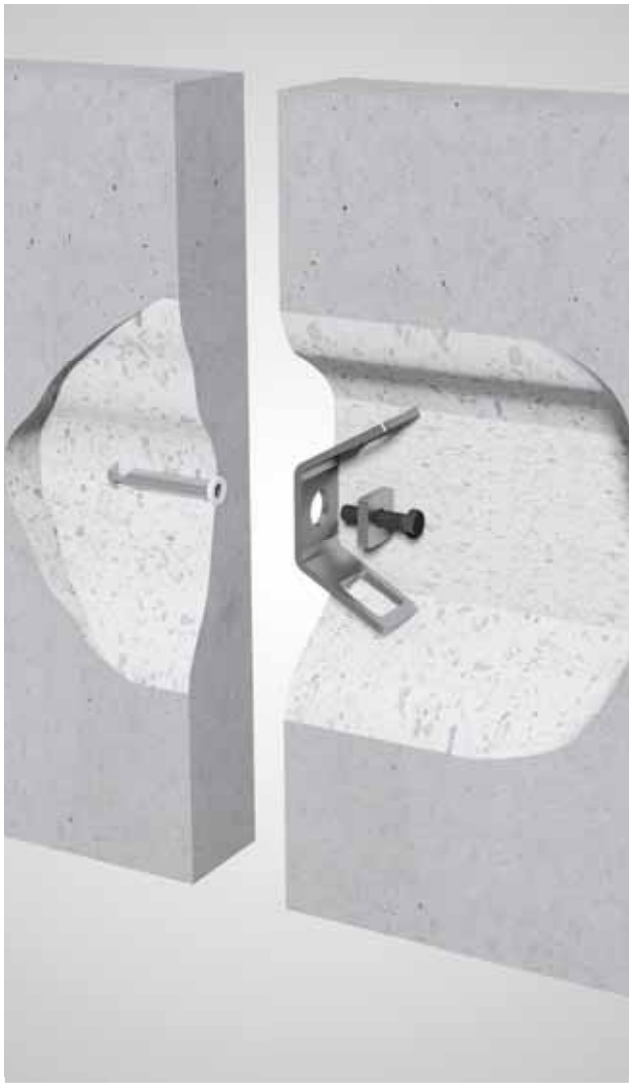
The HALFEN HEK Precast coupler consists of a serrated main plate, threaded insert with fixing bolt, and matching serrated counter plate.

- HEK Precast connection – for shear loads along or cross-wise to the connection joint
- Counter plate to suit M16 or M20 fixing bolts
- HEK Recess former sets to suit thicknesses from 100 mm
- HEK Fixing set jig – for quick and secure installation in the precast plant

A wide range of connection needs can be met with just one connector.

The right fixing for many elements:

HALFEN HEK can be combined with DEMU T-FIXX®, DEMU Bolt anchors or DEMU Fixing anchors.



Technical Data

- Hot-dip galvanizing provides protection against corrosion
- For element thicknesses from 100 mm

See also Technical Product Information HALFEN Precast Coupler HEK

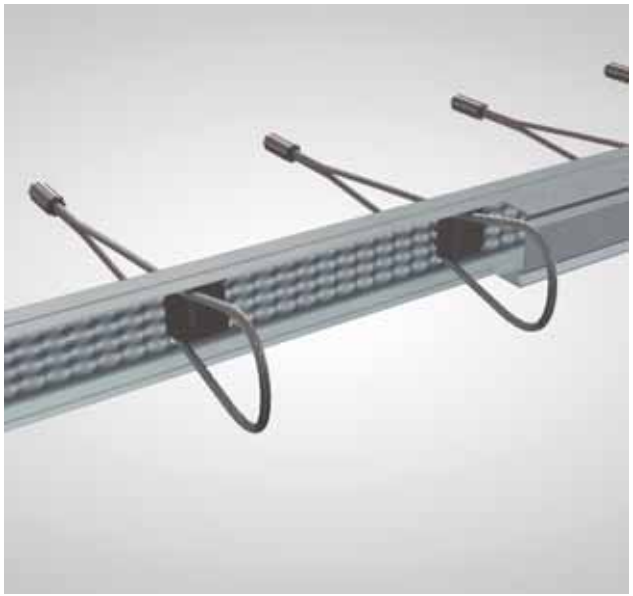
HALFEN HLB LOOP BOX

Precast Connections

The Loop box rapidly provides a reinforced keyed joint at panel edges, ready for grouting. The key difference to regular keyway reinforcement boxes are the flexible cable loops which spring out into the correct position when the cover is opened - there is no need to spend any time at all on bending out work. Similarly, the cable loops can spring out of the way during placement of the panel - there is no reinforcement protruding from the panel edges to interfere with positioning, even the final panel can be dropped directly into place, to close the gap in a concrete wall which exactly matches the panel width.

The most important features and benefits at a glance:

- Robust steel casing with pre-punched nail holes for secure nailing to the formwork
- Concealed keyway – no exposed grouting to finish
- Self-unfolding cable loop reinforcement – zero interference during erection and placement
- Range of recess formers and single loop boxes for simple layout and installation
- Also suitable for adhesion to steel formwork
- No special tools required for cutting or installation
- HLB-MIX non-shrink grout

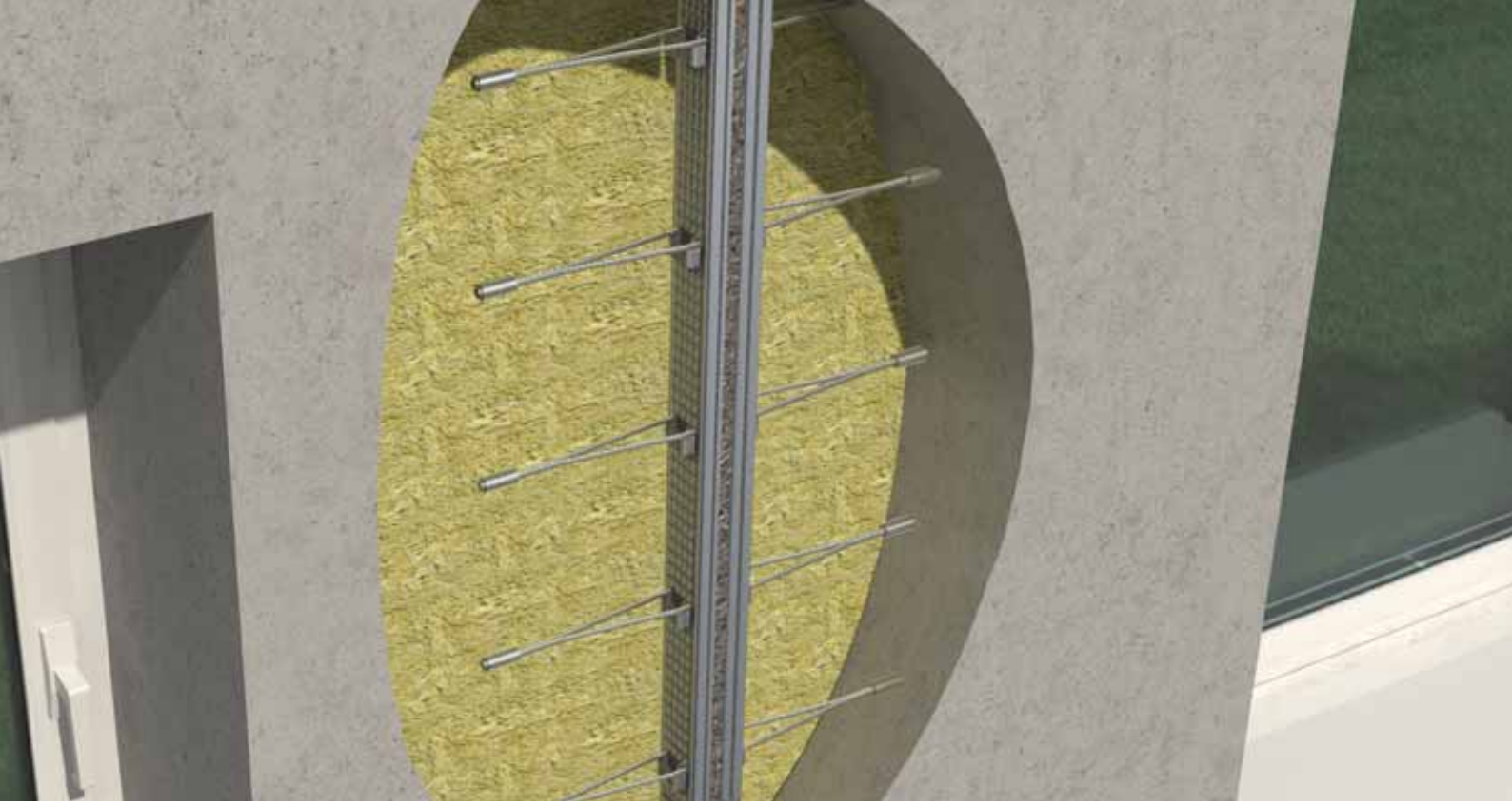


Technical Data

Information regarding box type, manufacturer and production date is clearly shown on each individual label – parts can be easily recorded and traced in a logistics and warehouse system

Certificates

- General building authority approvals Z-21.8-1869 and Z-21.8-1871

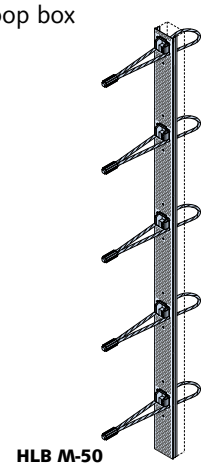


Product Range

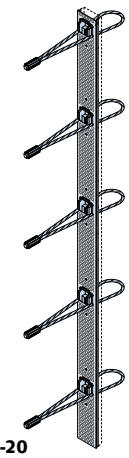
- HLB M Multi Loop box for structural connections – available with 3 keyway depths up to 100 mm. From 4 to 8 cable loops per box. Standard length 1180 mm.
- HLB S Single Loop box for structural connections
- HLB Spacer recess former – provides keyway recess between boxes, when required
- HLB Mix joint mortar – 25 kg dry bag

HLB M

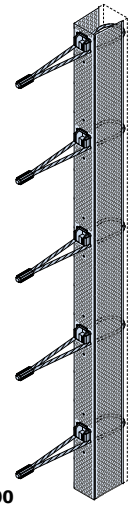
Multi Loop box



HLB M-50



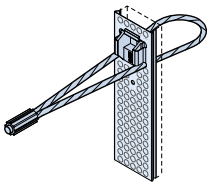
HLB M-20

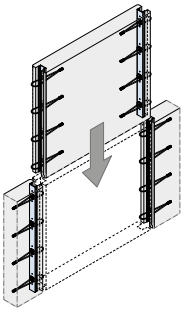


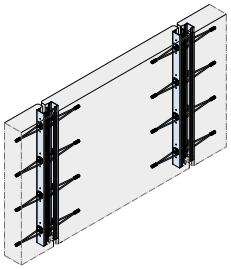
HLB M-100

HLB S

Single Loop box







See also Technical Product Information HALFEN Loop Box HLB

HALFEN HDB

Punching shear reinforcement and shear reinforcement

With HDB Punching shear reinforcement, concrete slab soffits can be made completely flat – cost effectively and securely. HDB rails consist of up to 10 double-headed studs welded to a spacer bar, and are used as shear or as punching reinforcement. Slab thickness determines stud length; the rail is supplied as a complete element, ready to drop into place in the formwork. Standard rails with 2 and 3 studs per mounting bar can be combined as required.

Our design software is at your disposal as a powerful and convenient tool to determine the shear and punching shear reinforcement required.

The most important features and benefits at a glance:

HDB Punching shear reinforcement

- Flat slab construction – reduced formwork costs, lower floor-to-floor heights
- Increased load capacity compared to traditional stirrups or bent bars
- Simple and quick 'drop-in' installation. Rapid pre-pour inspection
- Accessory clip-bars available to facilitate installation

HDB-S Shear reinforcement

- Shear reinforcement with an improved non-slip composite
- Particularly suitable for thin concrete slabs – using HDB-S, reinforcement cross-section can be reduced by up to 20 %
- Efficient installation

Product Range

HDB Punching shear reinforcement and shear reinforcement

Technical Data

- For slab thicknesses from 18 cm
- Rapid and simple 'drop-in' installation from above, after the main reinforcement has been laid.
- Can also be installed in element slabs
- Standardised product range - custom items with short delivery times, standard items are available off-the-shelf
- Double-headed studs with 10 – 25 mm diameters
- Standard elements with 2 or 3 double-headed studs
- Custom elements with 4 to 10 double-headed studs

Certificates

- Approved as punching shear reinforcement by the German Centre of Competence for Construction (DIBt) in Berlin for use in building projects throughout Europe (ETA)
- Building authority approval as a shear reinforcement by the German Centre of Competence for Construction (DIBt) in Berlin
- User-friendly design software calculates the optimum shear reinforcement and punching shear reinforcement according to selected national and international standards and approvals

HALFEN HSD
Shear Dowels

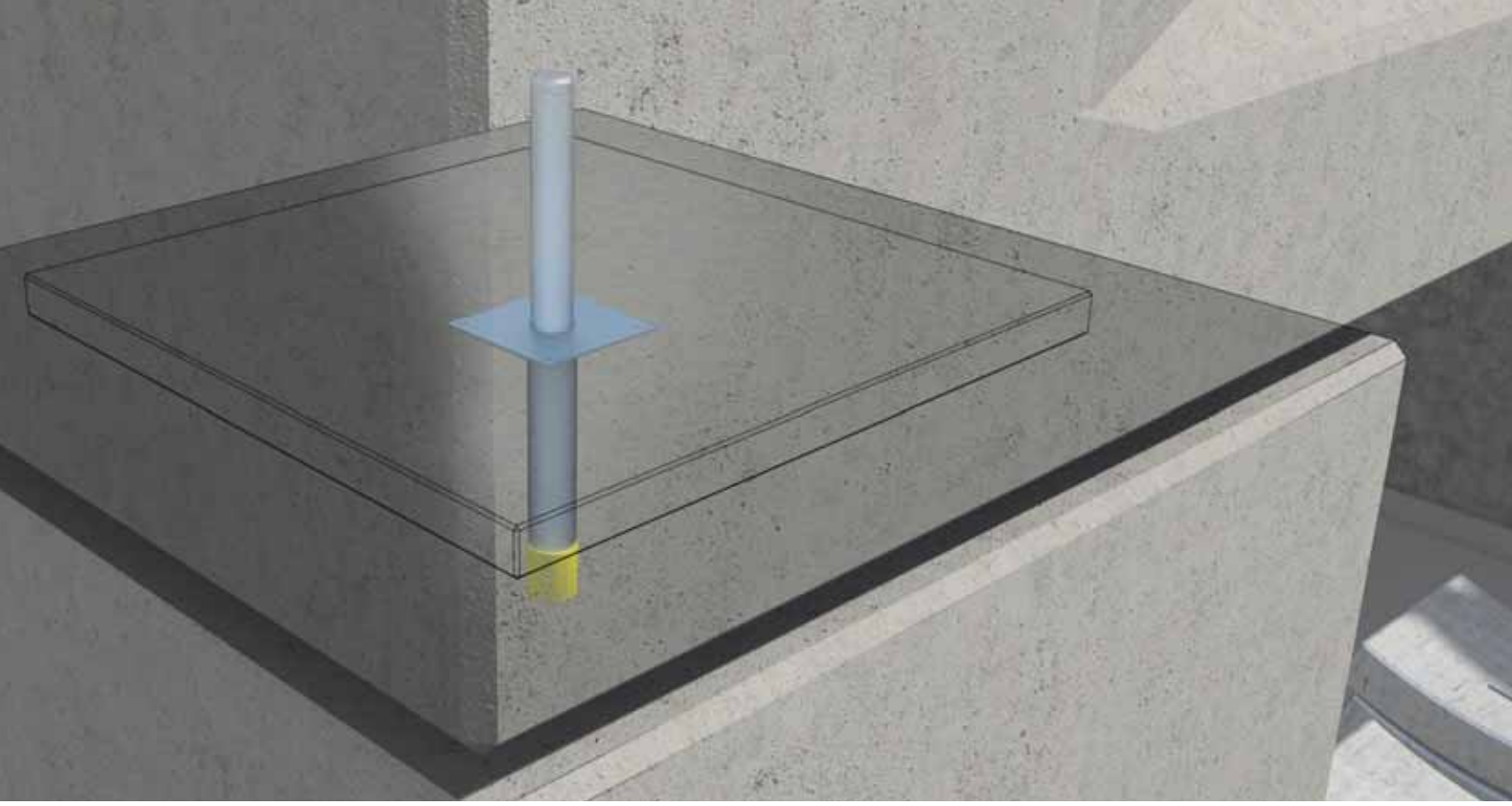
Expansion joints prevent the uncontrolled forming of cracks in concrete structures, and the damage resulting from leaks and corrosion.

The HALFEN HSD Shear dowel system is used to transfer shear forces across construction joints, thereby preventing differences in height from differential settlement. Depending on the version selected, horizontal movement in the joints is permitted in either the longitudinal direction, or both longitudinal and transverse directions. These movements occur through shrinkage, creep or due to temperature fluctuation.

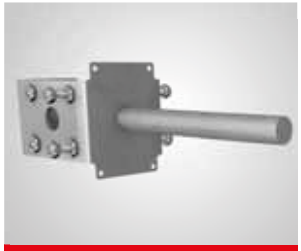
The HALFEN HSD-CRET Shear dowel system is used for transferring particularly high shear forces, generally in large in-situ structures. HSD single shear dowels are for example used in precast elements.

The most important features and benefits at a glance:

- Time saving thanks to the simple formwork and easy installation
- System solution for fire protection up to F120
- Simple geometry for forming joints
- Space optimization as double columns are not needed
- Economical solution for sectional construction phases
- High durability through the use of hot-dip galvanising or corrosion-resistant stainless steels
- HSD-F Fire protection sleeves can be supplied for all dowel sizes and joint widths



Product Range



HSD-CRET Dowel

HSD-S Sleeve

HSD-D Dowel

HSD-SV Sleeve

HSD-CRET Sleeve with fixing magnets

Technical Data

HSD-CRET Heavy duty shear dowel system

- With diameters from 22–40 mm
- Also available in larger diameters on request
- Also available as a seismic variant on request
- Sliding sleeve with fixing magnets can be supplied for HSD-CRET

HSD Single shear dowel system

- In diameters 20 mm, 22 mm, 25 mm, 30 mm; hot-dip galvanized or stainless steel
- Dowel sleeves made from plastic or stainless steel
- Dowel sleeves with additional lateral mobility

Certificates

- Intuitive operation, user-friendly HSD design software available for free download
- The HSD-CRET Heavy duty shear dowel has a general approval from the German Centre of Competence for Construction (DIBt) in Berlin

See also Technical Product Information HALFEN Shear Dowel System HSD

HALFEN HBJ
Adjustment Aid

The HALFEN HBJ Betojuster is available in two versions.
The HBJ-W is used for adjusting and aligning precast concrete elements, in particular for walls, prefabricated garages and concrete form shapes.
The HBJ-S is used to align precast reinforced concrete columns with formed foundation, carriageway and railway platform slabs, stairs and precast foundations.

The HBJ Betojuster provides the building contractor with an easy and therefore a safe method for precise vertical adjustment of components, without risk of injury to the installer, or of damage to concrete components from the use of tools.

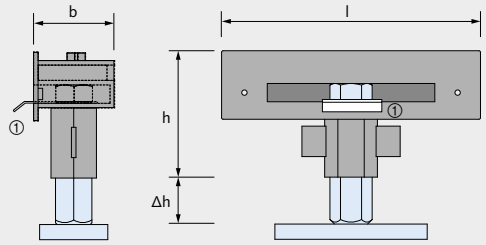
Adjustment requires minimal effort and is done with standard tools. The minimal construction height ensures the Betojuster stays below the final floor height. The screw slots do not need to be grouted.

The most important features and benefits at a glance:

- Two versions available: HBJ-W and HBJ-S
- Simple height adjustment – without damage, spalling or cracking
- Less crane time: once elements are placed, secured and shored, the crane is available to lift the next element
- Requires only standard tools
- Minimal effort required
- Specifically designed for areas where access is restricted

Product Range

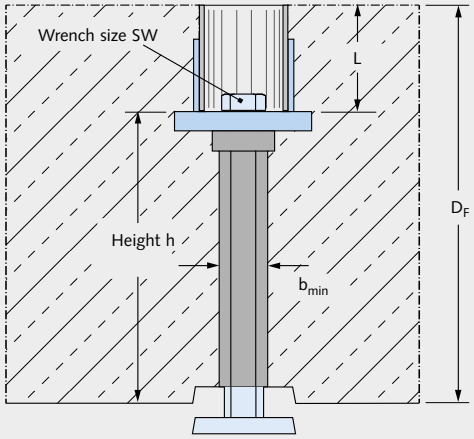
HALFEN HBJ-W



① Retaining plate for the screw socket

Construction height (without pressure distribution block)	h [mm]	75
Adjustment range	Δh [mm]	+35
Construction depth	b [mm]	53
Construction length	l [mm]	170
Minimum wall thickness	d [mm]	60
Wrench size adjustment screw	SW [mm]	24
Load capacity for each betojuster	F [kN]	50
	F_D [kN]	67.5

HALFEN HBJ-S



Types		HBJ-S-V-6.0 / HBJ-S-H-6.0	HBJ-S-V-10.0 / HBJ-S-H-10.0
Construction height	h [mm]	183	
Adjustment range	Δh [mm]	+100	
Minimum foundation height*	D_f [mm]	250	280
Minimum blinding layer height	d_n [mm]	120	150
Maximum column weight	[kN]	260	500
Minimum width	b_{min} [mm]	30	42
Wrench size adjustment screw	SW [mm]	24	30
Load capacity for each betojuster	F [kN]	60	100
	F_d [kN]	81	135

*With C30/37

See also Technical Product Information HALFEN Betojuster HBJ

Transported safely with HALFEN Lifting Systems

Lifting systems carry a heavy burden: Their performance is decisive not just for the success of the project, but also for the safety of the people on site.

HALFEN Lifting systems provide you with tailored solutions for lifting and transport of precast concrete components. We have the right product for each specific requirement: Whether it is for pipes, thin composites, slim columns, or at low temperatures – our lifting systems fit the bill because they are made from the highest quality materials, with high-grade workmanship, to guarantee absolute product safety.

Through our use of killed steel, we are able to ensure the highest levels of safety, quality and peformance in our lifting systems. They are fully tested, and certified to numerous country-specific requirements. There is no risk of mis-matching, as only system components that are compatible with each other can be connected.

Stormen Kulturkvartalet, Bodø (Norway), ©Ole H. Krokstrand

HALFEN DEHA KKT
Spherical Head Anchors

The HALFEN DEHA Spherical head lifting anchor is a high quality, and cost-effective universal quick-clutch system for transporting all types of precast concrete elements. It can be used even for very heavy precast elements with anchor loads up to 45 tonnes.
Notably, we are one of the few manufacturers to offer a specific turning and lifting link, designed to turn and lift heavy concrete pipes safely and easily.

Spherical Head Locking Cover

The unique HALFEN Spherical head locking cover is an optional accessory, which permits secure closure of the recess void, while still permitting access to the anchor head – the stainless steel cover plate is removed by loosening the central screw. Suitable for concrete manhole or access shaft covers.

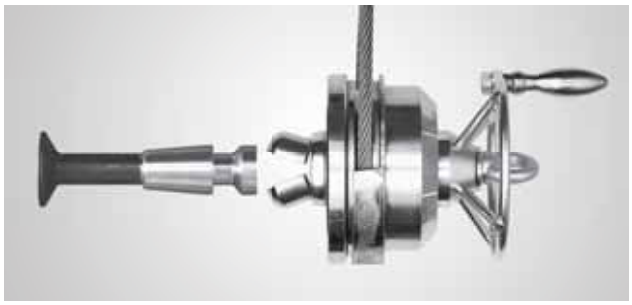
The most important features and benefits at a glance:

Spherical head lifting anchor

- Easy to handle
- Clutching action takes only seconds
- Safe lifting, even of large components
- 10 load classes from 1,3 to 45,0
- Wide range of products for every application
- Turning and lifting link available for lifting and transport of pipe sections
- Concrete cover 10 mm – 23 mm or 50 mm (Pipe anchor 6003)

Spherical head locking cover

- Suitable for load classes from 1,3 to 5,0
- Delivered as a complete set
- Stainless steel construction guarantees high corrosion resistance
- Allows access to the anchor head and secure closure of the recess void



Certificates

- CE marking according to Machinery Directive MD 2006/42 EC

CE

Technical Data

Application	Product	Load class
Anchor for walls, beams	Spherical head anchor (6000) Spherical head rod anchor (6050) Spherical head eye anchor (6001)	1,3–45,0 2,5–15,0 1,3–20,0
Anchor for sandwich panels	Offset spherical head anchor (6002) Offset spherical head rod anchor (6052)	1,3–20,0 2,5–15,0
Anchor for ceilings, slabs	Spherical head anchor (6000) Spherical head plate anchor (6010)	1,3–45,0 2,5–10,0
Special pipe anchor	6003	10,0–32,0
Pipe layer	6112	2,5–20,0
Quick fitting anchor	6073	1,3–5,0
Erection anchor	6006	2,5–5,0
Narrow foot spherical head anchor	6000 D	10,0–32,0
Lifting link	Universal head lifting link (6102)	1,3–45,0
Turning and lifting clutch (pipe)	6116	1,3–32,0
Hoisting hook	6105	2,5–20,0
Accident recovery unit	6104	20,0

Product Range

- HALFEN DEHA KKT Spherical head anchor range – comprehensive product range for all types of precast elements
- Extensive selection of accessories, allows nearly any transport or lifting application
- HALFEN DEHA KKT Spherical head locking cover:
  Set consisting of 1 ring plate, 1 cover plate, 1 recess former incl. punching plate and socket as well as a countersunk screw. The matching spherical head lifting anchors are not included in the scope of delivery.

HALFEN DEHA KKT Spherical head anchor

HALFEN DEHA KKT Spherical head locking cover

See also Technical Product Information DEHA Spherical Head Lifting Anchor System KKT

HALFEN FRIMEDA TPA
Lifting Anchor System

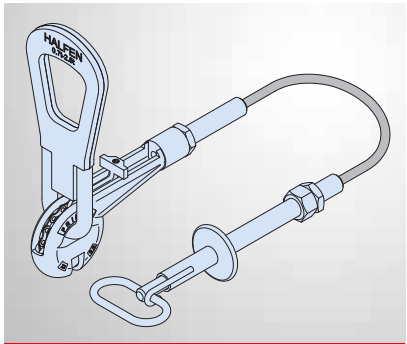
The HALFEN FRIMEDA Lifting anchor system is a high-quality and cost-effective system for transporting all types of precast elements. The erection anchor allows lifting of elements cast horizontally where a tilting table is not used. The lifting links can also be released remotely, which allows faster cycle times on high-rise sites, as well as increased safety. Our extensive range of anchors and accessories provide the perfect solution for nearly all lifting requirements.

The most important features and benefits at a glance:

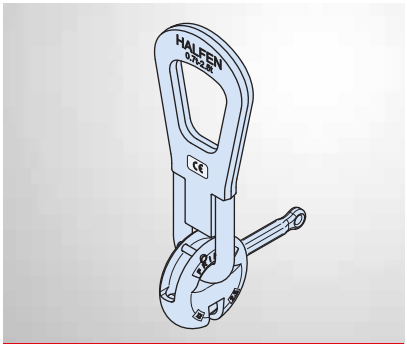
- Safe transport even of large elements
- Load classes from 1,25 to 26,0
- Easy to handle
- Wide range of products for every application
- Erection anchors available to prevent edge failure
- Remote release device available
- TPA-VA Lock cover: Can be detached/accessed: with load classes from 2,5 to 26,0
- Concrete cover 10 mm – 23 mm

Product Range

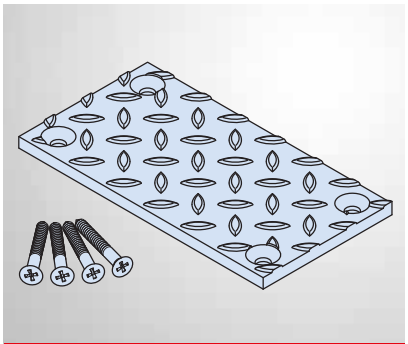
The HALFEN FRIMEDA quick-clutch lifting system consists of a recess former, flat steel anchors cast into a precast concrete element, and a lifting clutch. The design of the lifting clutch and anchor allows for lifting in any direction. A key advantage of this system is the availability of specially designed erection anchors, which permit the handling of thin elements, without damage to the concrete. Lifting clutches can be released directly by hand at the clutch head, or remotely, using one of two remote-release accessories.



TPA-F2 Remote-release ring clutches (manual)



TPA-R1 Ring clutch with steel shackle



TPA-VA Lock covering plate

The TPA-VA Lock covering plate is a non-slip, stainless-steel, recess cover, which still permits repeated access to the anchor head.

Technical Data

Application	Product	Load class
Anchor for walls, beams	TPA-FS Spread anchor TPA-FZ Two hole anchor TPA-FU Universal anchor	1,4–26,0 1,4–26,0 1,25
Anchor for sandwich panels	TPA-FX Sandwich panel transport anchor	2,5–17,0
Anchor for soffits, slabs	TPA-FS Spread anchor TPA-FP Plate anchor TPA-FF Flat foot anchor	1,4–26,0 1,4–10,0 1,4–26,0
Erection anchor	TPA-FA Erection anchor (double-sided) TPA-FE Erection anchor (unilateral)	1,4–22,0 1,4–22,0
Double head column anchor	TPA-FD Double-head anchor	2,5–22,0
Garage anchor	TPA-FG Garage anchor	4,0
Lifting link	TPA-R1 Ring clutch with shackle TPA-R2 Ring clutch with wire cables TPA-R3 Ring clutch with wire cables	1,25–26,0 1,25–26,0 26,0
Remote release device	TPA-F1 Ring clutch (pneumatic) TPA-F2 Ring clutch (manual)	2,5–22,0 2,5–22,0

TPA-FD Double-head anchor

TPA-FS Spread anchor

Certificates

› CE marking according to Machinery Directive MD 2006/42 EC

CE

HALFEN HD

Socket Lifting Anchor with higher load classes

The HD Socket anchor offers impressive load capacity over other socket anchor systems, with an upper limit of 250 kN. The sleeves also have an integrated sleeve protection. This stops dirt getting into the sleeves.

The HD Socket anchor is your go-to choice for thin concrete elements. Smaller sleeve diameter means the anchors can be installed in thinner elements. The HD Socket anchors are lifted using an HD Lifting clutch, a HD Perfect head lifting clutch or a HD Rotary head lifting clutch. Alternatively, a HD Adapter can be screwed in and the concrete element can be lifted and transported within seconds using a standard KKT Universal head lifting link.

The most important features and benefits at a glance:

- Safe lifting, even of large components
- Load classes from 1,3 to 25,0
- Integrated sleeve protection against dirt and water ingress
- Especially suitable for thin wall elements
- Light but robust lifting device
- Very small recess only in element surface
- Concrete cover 10 mm – 20 mm

Mould for recess fillers 6329 –
renders HD recess barely perceptible

Certificates

- CE marking for the entire range of anchors and lifting devices

CE

Technical Data

Application	Product	Load class
Anchor for walls, beams	HD Anchor (6360) HD Rod anchor (6361) HD Plain anchor (6376)	1,3–25,0 1,3–15,0 1,3–10,0
Anchor for sandwich panels	Offset HD Rod anchor (6361G)	5,0–15,0
Anchor for soffits, slabs	HD Anchor (6360) HD Plate anchor (6370)	1,3–25,0 1,3–7,5
Special anchor specially designed for wind turbine towers	Segment anchor (6352)	20
Adapter	For Universal head lifting link (6102)	
Lifting links	HD Lifting clutch – increased load uptake (6362) HD Rotary head lifting clutch (6367) HD Perfect head lifting clutch (6377) Segment lifting link(6312) Rotary segment lifter (6312 D)	1,3–15,0 1,3–25,0 1,3–15,0 20,0 20,0
Hoisting hook	HD Lifting clutch with safety cable (6362-HH)	1,3–15,0

Product Range

See also Technical Product Information HALFEN HD-Socket Lifting System HD

HALFEN DEHA HA
Socket Lifting Anchors

The HALFEN DEHA Socket anchor consists of a round steel anchor foot and a pressed threaded socket, into which a lifting device for transport, (e. g. loop lifter) is screwed.

The most important features and benefits at a glance:

- Cost-effective lifting device
- Load capacity of the anchor up to 12.5 t
- Anchors for slabs also available
- Wide range of products for all applications
- Permanent cover plug
- Concrete cover 10 mm – 20 mm

Certificates

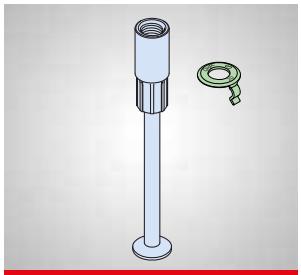
- CE marking according to Machinery Directive MD 2006/42/EC

CE

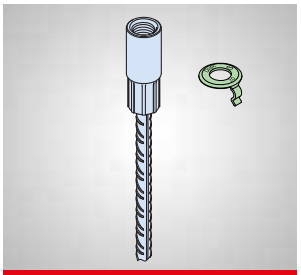
Technical Data

Application	Product	Load class
Anchor for walls, beams	HA Combi anchor (6351) HA Rod anchor (6319) HA Plain anchor (6372)	0,5–12,5 0,5–12,5 0,5–6,3
Anchor for ceiling, slabs	HA Combi anchor (6351) HA Threaded plate anchor (6346) HA Crown anchor (6380) HA Short anchor (6308)	0,5–12,5 0,5–6,3 0,5 0,5
Adapter	For Universal head lifting link (6102)	
Lifter	HD/HA Perfect head lifting clutch (6377/6313) HA Loop lifter (6311) HD Rotary head lifting clutch (6367)	0,5–12,5 0,5–12,5 1,3–15,0

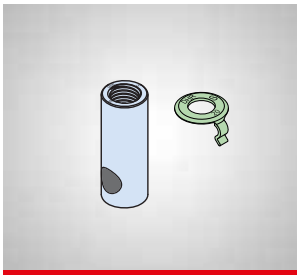
Product Range



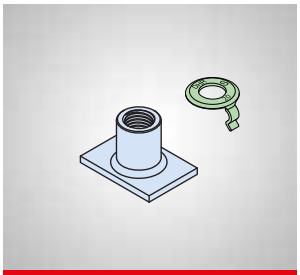
HA Combi anchor 6351



HA Rod anchor 6319

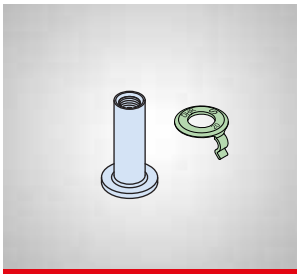


HA Plain anchor 6372



HA Threaded plate anchor 6346

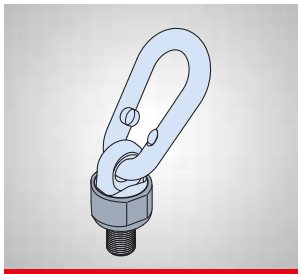
HA Crown anchor 6380



HA Short anchor 6308

Perfect head lifting clutch 6377/6313

HA Loop lifter 6311



HD Rotary head lifting clutch 6367

See also Technical Product Information DEHA Socket Anchor System HA

FAÇADE TECHNOLOGY

Modern and functional:
The Suspended Concrete Façade

Suspended concrete façades offer architects and designers the opportunity to specify a simple yet effective building cladding, or to work with a material which can provide their buildings with an elegant and sophisticated external skin. Concrete façade panels can combine aesthetics, economy, thermal performance and speed. They give the owner long-term durability and more resistance to damage than other façade systems.

The FPA façade panel anchors provide quick and easy anchoring of suspended concrete precast systems. We have presented our proven fixing system on the following pages for you.

With the HALFEN FPA system, we are offering you secure and reliable fasteners, even for demanding building fronts. It is not for nothing that our products are the clear favourite in many precast plants.

U-Arena, Nanterre (France), ©tomjasny.com

HALFEN FPA

Precast Panel Anchors

The HALFEN FPA system facilitates quick and easy anchoring of concrete façade panels onto a concrete sub-structure.
Used in combination with horizontal fixings, such as the DS Spacer bolt and the HFV Dowel restraint, it is a proven and reliable fixing method for suspended concrete panels.

Materials

- All system parts are made from stainless steel

Certificates

- Approved by building authorities (FPA and DS)
- CE marking according to EN 1090 (FPA)

The most important features and benefits at a glance:

HALFEN FPA & DS
Precast Panel Anchors and Spacer Bolts

- FPA are available in load groups of 5.0 kN up to 56.0 kN
- Extensive product range with a large selection of accessories
- Three-dimensional adjustment
- Quick and easy to assemble
- Verifiable design software
- Upper FPA parts available in 6 options
- DS spacer bolts available in various length and diameters

HALFEN HFV
Dowel Restraints

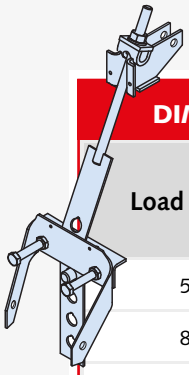
- Supplied in different versions
- Available in load groups 2.5 kN and 5.0 kN

Product Range

The precast panel anchors consists of 3 parts: a component cast into the back of the panel, an anchorage to the structure, and an installation part consisting of a perforated strap and threaded rod.

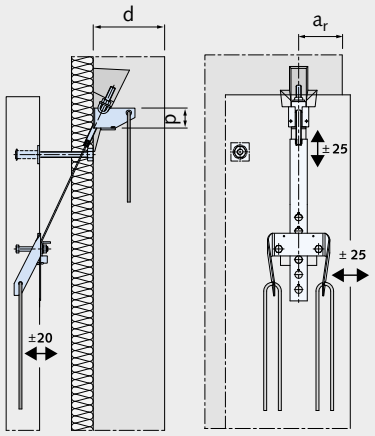
We recommend the use of an approved DS Spacer bolt and an HFV Dowel restraint to transfer the compressive forces and to adjust the distance to the walls.

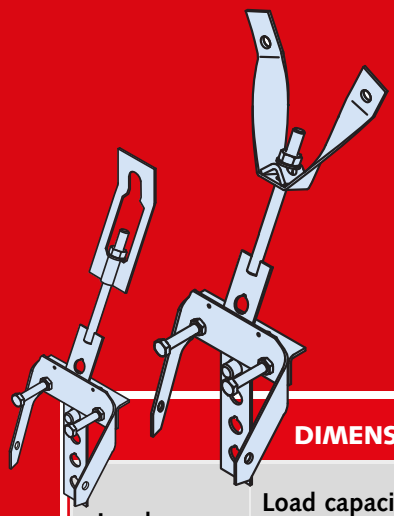
See also Technical Product Information HALFEN Concrete Façade Anchor Systems FB



DIMENSION TABLES: FPA-3

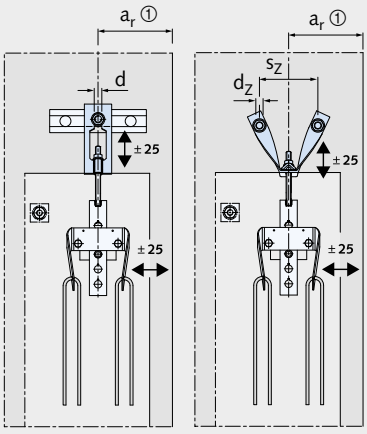
Load group	Load capacity $F_{V,Rd}$ [kN]	d_{min} [mm]	Lateral edge distance $a_{r,\ min}$ [mm]
5.0	6.75	100	70
8.0	10.80	115	80
11.5	15.53	125	90
16.0	21.60	140	120
22.0	29.70	160	130
34.0	45.90	180	150
46.0	62.10	240	170
56.0	75.60	300	200



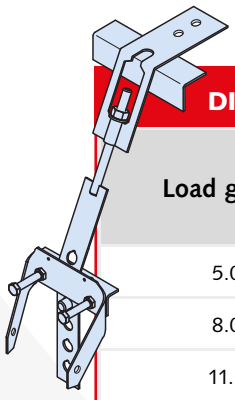


DIMENSION TABLES: FPA-5 AND FPA-5Z

Load group	Load capacity $F_{V,Rd}$ [kN]	Hole diameter assembly component d [mm]	Hole diameter assembly component d_Z [mm]	s_Z [mm]
5.0	6.75	13	8.5	120
8.0	10.80	17	10.5	135
11.5	15.53	21	12.5	160
16.0	21.60	21	12.5	160
22.0	29.70	21	16.5	170
34.0	45.90	25	22.5	190
46.0	62.10	28	25.0	250
56.0	75.60	31	25.0	315

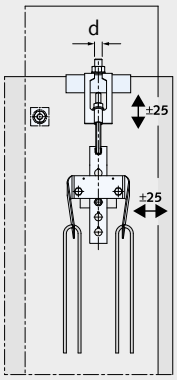


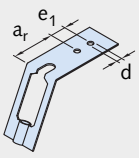
① a_r depending on fixing method to sub-structure



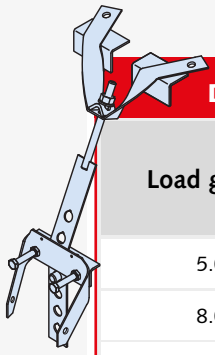
DIMENSION TABLES: FPA-5A

Load group	Load capacity $F_{V,Rd}$ [kN]	Hole diameter assembly component d [mm]	Distance between holes e_1 [mm]	Edge distance a_r [mm]
5.0	6.75	11	24	110
8.0	10.80	13	28	135
11.5	15.53	17	37	155
16.0	21.60	21	46	210
22.0	29.70	21	46	210
34.0	45.90	25	55	260
46.0	62.10	On request	On request	On request
56.0	75.60	On request	On request	On request





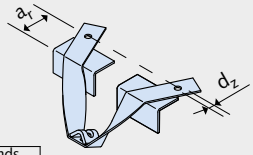
Clamp bracket FPA-5A



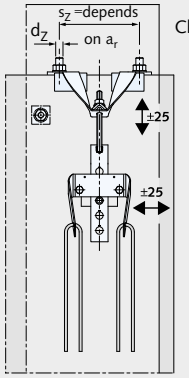
DIMENSION TABLES: FPA-5AZ

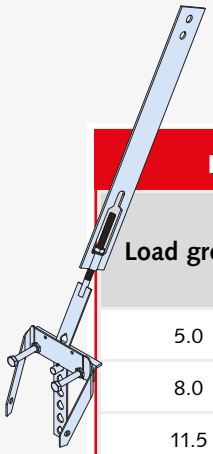
Load group	Load capacity $F_{V,Rd}$ [kN]	Hole diameter assembly compo-nent d_z [mm]	a_r max ① [mm]
5.0	6.75	8.5	100
8.0	10.80	10.5	110
11.5	15.53	12.5	135
16.0	21.60	12.5	140
22.0	29.70	16.5	170
34.0	45.90	22.5	200
46.0	62.10	25.0	230
56.0	75.60	25.0	280

① Greater a_r-values possible as custom, on request



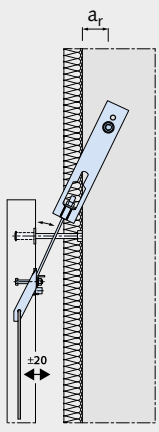
Clamp bracket FPA-5AZ

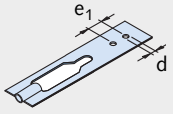




DIMENSION TABLES: FPA-5S

Load group	Load capacity $F_{V,Rd}$ [kN]	Hole diameter assembly component d [mm]	Distance between holes e_1 [mm]	Edge distance a_r [mm]
5.0	6.75	11	24	100
8.0	10.80	13	28	130
11.5	15.53	17	37	150
16.0	21.60	21	46	175
22.0	29.70	21	46	210
34.0	45.90	25	55	260





Clamp bracket FPA-5S

See also Technical Product Information HALFEN Concrete Façade Anchor Systems FB

Dowel

HALFEN HFV Dowel restraints – upper parts

HALFEN HFV Dowel restraints – lower parts

HFV 3

HFV 1

HFV 2

HFV 5

HFV 8

HFV 4

HFV 5

HFV 7

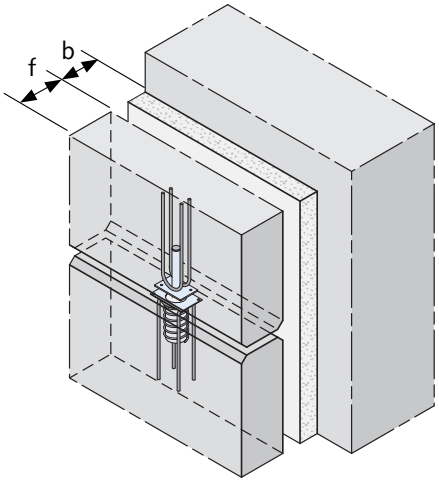
Combination without HFV 3

HFV 8

HFV 9

Combination example

Upper part	HFV 8
Dowel	HFV 3
Lower part	HFV 4



Order example: HFV - 8 3 4 - 2.5

- Dowel restraint
- Upper part type
- Dowel type
- Lower part type
- Load group

HALFEN HFV DOWEL RESTRAINTS (PLASTIC)

Type	Upper and lower parts								Dowel	
	HFV 1		HFV 5		HFV 9				HFV 3	
Load group	B [mm]	L [mm]	W [mm]	L [mm]	40 x 100 B [mm]	40 x 100 L [mm]	32/60 x 120 W [mm]	32/60 x 120 L [mm]	D [mm]	L [mm]
2.5	18	100	16.5	100	40	100	32/60	120	16	170
5.0	22	100	20.5	100					20	170

LOAD CAPACITIES F_{Rd} [kN]

Load group	Type	Slab thickness [mm]							
		Without reinforcement				With spiral reinforcement HFV B			
		80	100	120	140	80	100	120	140
2.5	HFV 1	1.5	2.5	3.6	3.7	2.7	3.7	3.7	3.7
	HFV 5	2.4	3.3	3.7	3.7	3.7	3.7	3.7	3.7
	HFV 9	2.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
5.0	HFV 1	1.5	2.5	3.6	4.8	2.8	4.0	5.2	6.6
	HFV 5	2.5	3.6	4.8	6.0	5.5	6.7	7.5	7.5
	HFV 9	2.7	3.7	4.9	6.3	4.9	6.1	7.3	7.5

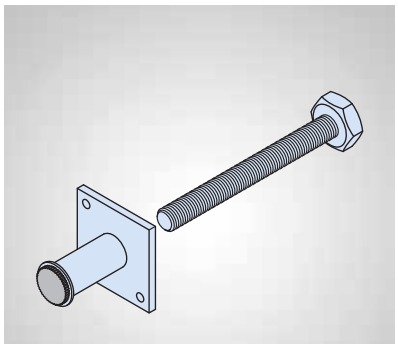
The values shown are valid for C30/37 with single layer reinforcement and a cavity width of ≤ 20 mm (for C35/45 the load capacities can be increased by 10%). With double layer reinforcement (edge reinforcement near to the sleeve), the full load capacity (7.5 kN) can be assumed for a slab thickness of ≥ 120 mm even without additional reinforcement.

HALFEN HFV DOWEL RESTRAINTS (STAINLESS STEEL)

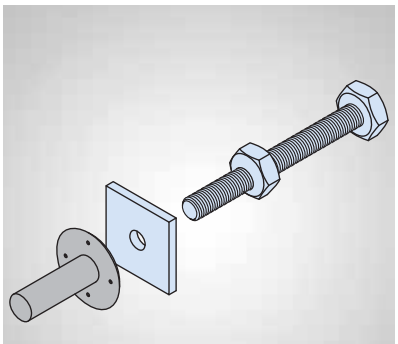
Type	HFV 2		HFV 4		HFV 7		HFV 8	
Load group	B [mm]	L [mm]	W [mm]	L [mm]	W [mm]	L [mm]	W [mm]	L [mm]
2.5	17	110	44	100	16	170	17	100
5.0	21	120	44	100	20	170	21	100

With a joint width ≤ 20 mm and a minimum slab thickness of 80 mm

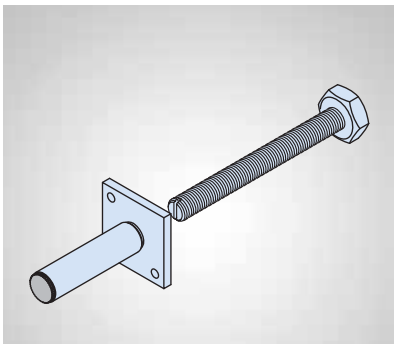
Technical Data
Spacer Bolts



DS 13 – with tensile and compressive sockets



DS 18 – with pressure plate



DS 25 – with compressive sockets to be drilled on from the front

LENGTHS OF DS SPACER BOLTS [mm]

Type	M10		M12		M16		M20		M24		M27		M30	
Wrench size	19		24		30		41		36		41		46	
Spacer bolts	DS 13/25	DS 18	DS 13/25	DS 18	DS13/25	DS 18	DS13/25	DS 18	DS 13/25	DS 18	DS 13	DS 18	DS 13	DS 18
Cavities [mm]	40–220	40-200	40-220	40-200	40-400	40-280	40-400	40-280	60-400	–	100-400	–	100-400	–

Further lengths for all diameters available on request

See also Technical Product Information HALFEN Concrete Façade Anchor Systems FB

HALFEN
Horizontal Anchorage

We offer horizontal anchors in different versions for a wide variety of boundary conditions – including the WDK/WDI Wind anchor made of plastic or stainless steel, HKZ Restraint ties, LD Adjustable restraint, SPV Restraint with turnbuckle, HFV Dowel restraint and ULZ Universal ties. The following functions are possible in this area of use:

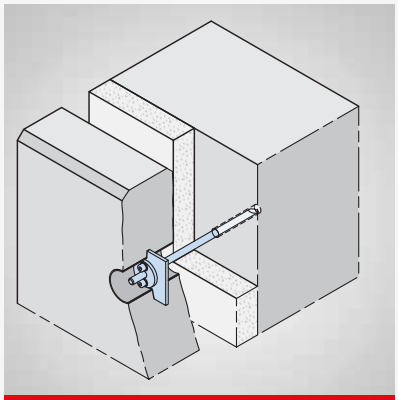
- Horizontal anchors to transfer the pressure and tensile forces that are aligned with each other in parallel or at right angels
- Horizontal anchors to align panels arranged above or next to each other with dowel restraints

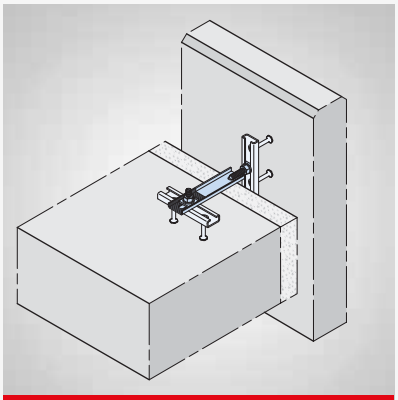
The product selection is based on load, dimensions, spacing distance and accessibility. We offer a wide range of anchors with different load groups for this application.

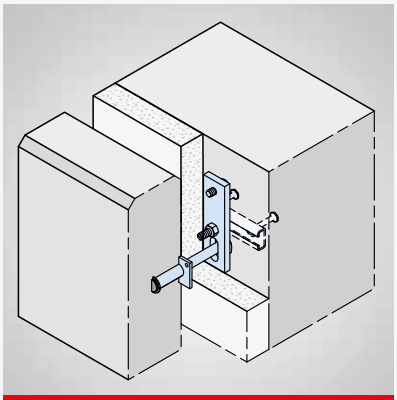
The most important features and benefits at a glance:

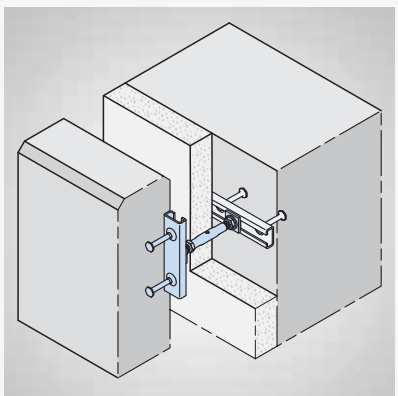
- Different types available
- Choose from different load groups
- Can be installed from the front
- Adjustable
- Suitable for a wide range of distances and cavities

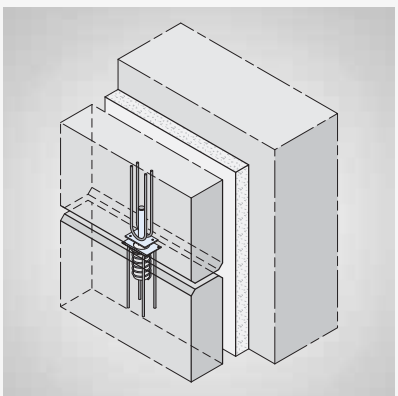
Product Range

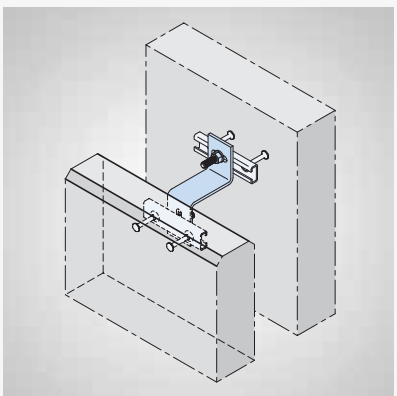

WDK/WDI Wind anchor


HKZ Restraint tie


LD Adjustable restraints


SPV Restraint with turnbuckle


HFV Dowel restraint


ULZ Universal tie

HALFEN

SL30 Façade anchor system for thin large-format concrete façade panels

Thin, large-format concrete façade panels with a thickness of only 30 mm are now possible using the new HALFEN FPA-SL30 Fixing system.

The quick and simple installation of the tried and tested FPA system has not been changed;a supporting structure is not required.

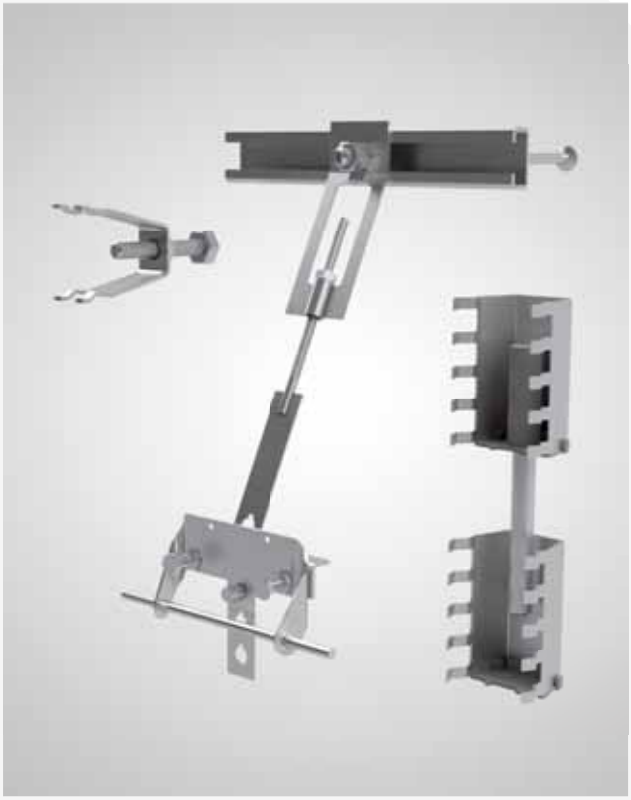
Used in combination with horizontal fixings, such as the DS-SL30 Spacer bolt and the HFV-SL30 Dowel restraint, it is a proven and reliable fixing method for thin, large-format, suspended concrete façade panels.

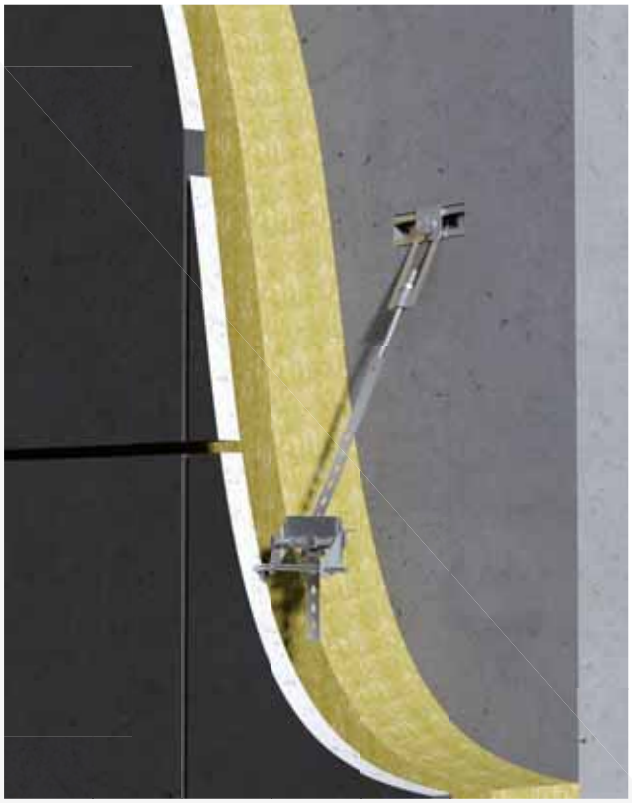
The most important features and benefits at a glance:

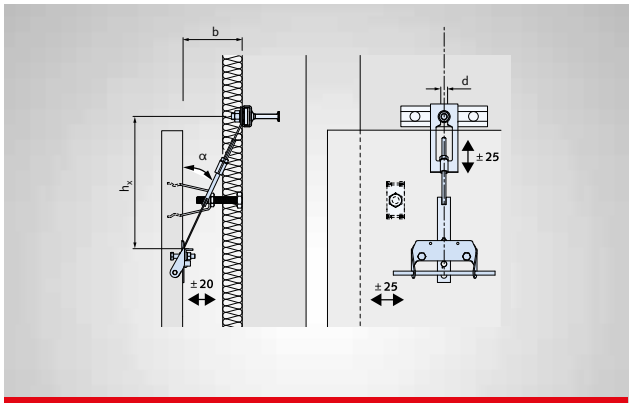
- Building authority approved
- Adjustable in all directions
- Easy and quick installation
- Verifiable design software
- Top bracket/cast-in component available in different variants
- Extensive product range with a wide range of accessories

The use of textile reinforcement eliminates the need for concrete coverings ≥ 25 mm. This allows production of concrete panels with minimal thickness e.g. as low as 3 cm. In addition to the direct increase of usable floor space compared to the overall footprint of the building, this also has other advantages: For example, sustainability (resource efficient construction), production costs (lower material costs), transport costs (reduced panel weight).

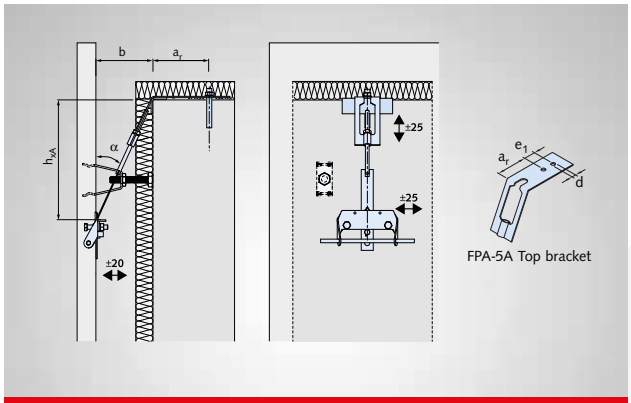
Using thin façade panels also provide an interesting solution for renovating or upgrading existing façades.





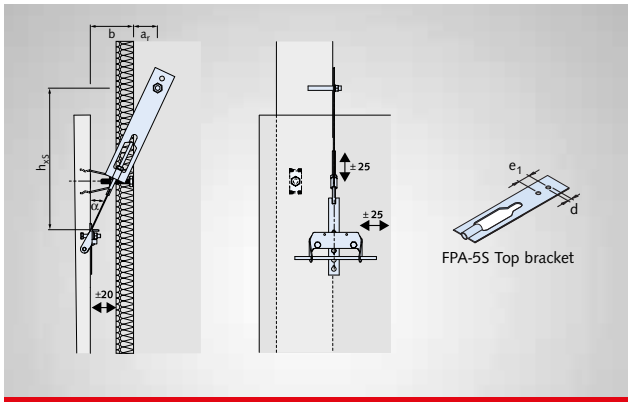


FPA-5-SL30



FPA-5A Top bracket

FPA-5A-SL30



FPA-5S Top bracket

FPA-5S-SL30

Photo: Firmengruppe Max Bögl / tomjasny.com

Reference project: maxmodul – office building TF2

SPECIFICATIONS

Type	Load group	Load capacity $F_{V,Rd}$ [kN]	Nominal angle α ② with wall spacing b = 80 – 350 mm	Hole diameter installation component d [mm]	Hole spacing e_1 [mm]	edge distance a_r [mm]
FPA-5-SL30	**5.0**	6.75 ①	25.0°	ø 11	–	–
FPA-5A-SL30	**5.0**	6.75 ①	25.0°	ø 11	24	110
FPA-5S-SL30	**5.0**	6.75 ①	25.0°	ø 11	24	100

① For edge distances < 60 cm (br) or < 75 cm (cr), see building authority approval no. Z-21.8-2067.
② For more information about perforated straps, see the Technical Product Information for the FPA-SL30 System.

Horizontal anchor – thin façades

Transfer of horizontal compression and tension loads

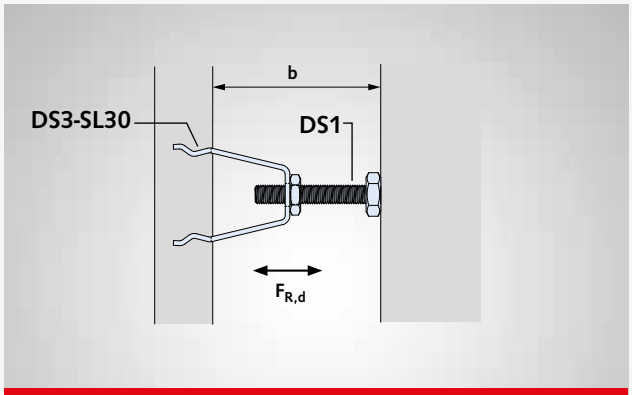
We have two different building authority approved systems for transferring horizontal pressure and tensile loads and adjusting correct wall spacings:

- DS13-SL30 spacer bolts with tensile/pressure sockets are installed at the upper edge of the panel.
- To facilitate assembly, dowels are commonly used to connect façade panels together which are installed one on top of another. This is done with HFV-SL30 anchoring elements installed close to the edges of adjacent panel edges and connected to each other using HFV-3 dowels and grout.

Appropriate anchors may be required to account for wind suction due to the low dead weight of thin façade panels. The LD and LD-A Adjustable restraints used together with DS13-SL30 tension/pressure anchors provide an effective solution.

HALFEN DS13-SL30
Spacer bolt

Application: Transfer of pressure loads
The minimum strength of the two DS3-SL30 and DS1 components determines the compressive strength of the DS13-SL30. For tensile loads the load capacities of the DS3-SL30 apply.



DS13-SL30

TENSION LOAD CAPACITIES F_{Rd} [kN] DS3-SL30

Condition	for edge distance cx,cy ≥ 150	for edge distance cx,cy ≥ 250
noncracked	4.5	6.6
cracked	2.6	3.8

PRESSURE LOAD CAPACITIES F_{Rd} [kN] DS3-SL30

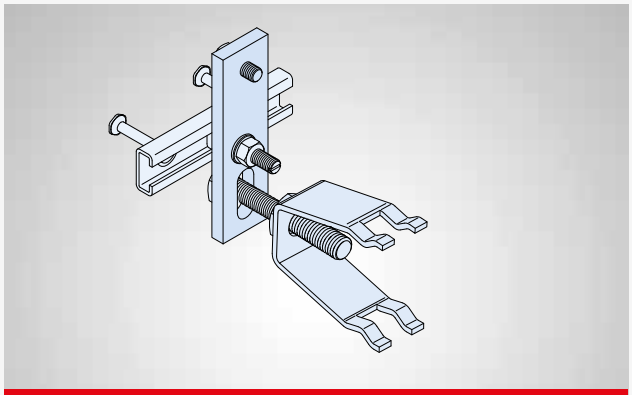
Condition	for edge distance cx,cy ≥ 150	for edge distance cx,cy ≥ 250
noncracked	7.0	7.5
cracked	5.0	5.4

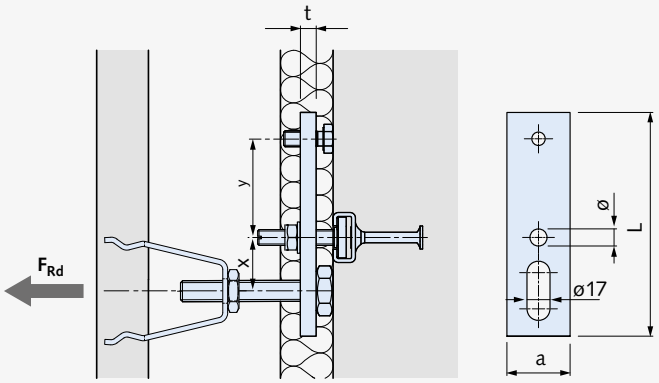
PRESSURE LOAD CAPACITIES F_{Rd} [kN] DS1

Wall spacing b [mm]							
80 – 250	280	300	320	340	360	380	400
≥ 7.5	6.3	5.7	4.8	4.3	3.6	3.3	3.0

HALFEN LD
Adjustable restraint

Application: For tension and compression loads


HALFEN LD Adjustable restraint



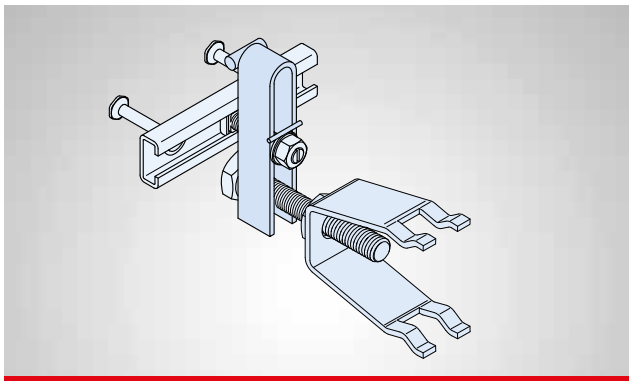
HALFEN LD ADJUSTABLE RESTRAINT

Type	Load group	Load capacity F_{Rd} [kN]	L [mm]	a [mm]	t [mm]	x ± 15 [mm]	y [mm]	ø [mm]	Recommended fixing ①	HALFEN T-bolt ②
LD	2.0	3.00	161	40	10	38	75	11	HTA-CE 28/15	HS 28/15 M10×40
	3.5	5.25	170	48	12	40	75	13	HTA-CE 38/17	HS 38/17 M12×50

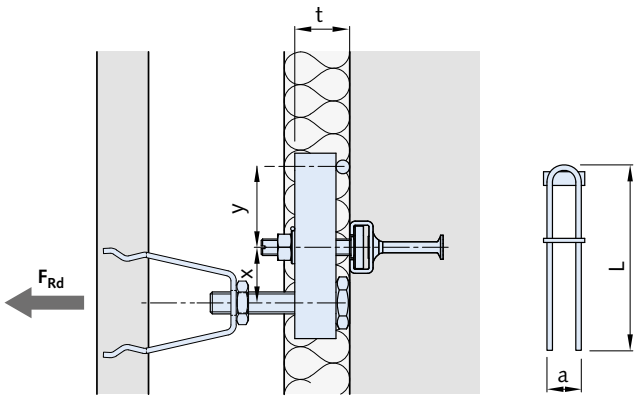
① 150, 200 and 250 mm short pieces must be ordered separately.
Verification of the anchors must be provided taking the respective boundary conditions into account.
② Please order the HALFEN T-bolt separately.
The allowable load capacities for the DS13-SL30 must be observed.

HALFEN LD-A
Adjustable restraint

Application: Tension and pressure loads



HALFEN LD-A Adjustable restraint



HALFEN LD-A ADJUSTABLE RESTRAINT

Type	Load group	Load capacity F_{Rd} [kN]	L [mm]	a [mm]	t [mm]	x ±15 [mm]	y [mm]	Spacer bolt	Recommended fixing ①	HALFEN T-bolts ②	Washer DIN
LD-A	1.8	2.70	130	21	33	40	60	M12	HTA-CE 28/15	HS 28/15 M10×50	DIN 9021
	3.5	5.25	135	21	41	40	60	M12	HTA-CE 38/17	HS 38/17 M12×80	DIN 125

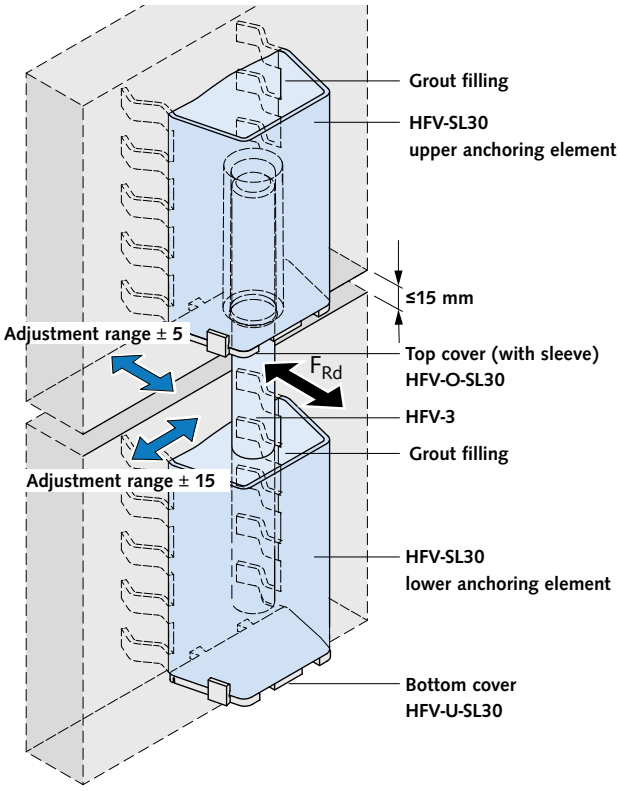
① 150, 200 and 250 mm short pieces must be ordered separately.
Verification of the anchors must be provided taking the respective boundary conditions into account.

② Please order the HALFEN T-bolt separately.
The allowable load capacities for the DS13-SL30 must be observed.

HALFEN HFV-SL30
Anchoring body

Application: Dowels for connecting panels one on top of another

HALFEN HFV-SL30 Anchoring body



LOAD CAPACITY F_{RD} [kN]

Condition	Standard dowel	Double dowel
noncracked/ cracked	2.7	4.3

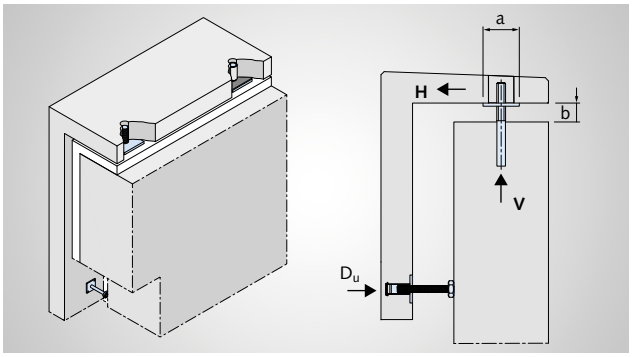
For further information about the HFV-SL30, see the Technical Product Information for the FPA-SL30 System.

HALFEN WPA
Top Fixing Dowels

The HALFEN WPA Top fixing dowel is your fixing solution for concrete façade panels, which because of their shape, cannot be fixed from above. Using a flexible sleeve and elastomer support with one of the two top fixing dowels, the fixing can be installed largely free of constraints.

The most important features and benefits at a glance:

- Fixing for angled panels
- Aesthetic building finish
- Reliable installation
- Three-dimension adjustability



Technical Data

DIMENSION TABLE: WPA

Load group	Thread M	$N_{d,max}$ [kN]	Distance ① b [cm]	$H_{k,max}$ [kN]
5.0	M24 x 1.5	6.75	2.0 ②	2.20
			4.0	1.55
			6.0	1.15
			8.0	0.88
8.0	M28 x 1.5	10.80	2.0 ②	3.90
			4.0	2.90
			6.0	2.20
			8.0	1.75
11.5	M30 x 1.5	15.53	2.0 ②	4.20
			4.0	3.10
			6.0	2.30
			8.0	1.75
16.0	M35 x 1.5	21.60	2.0 ②	6.50
			4.0	4.80
			6.0	3.70
			8.0	2.90
22.0	M39 x 1.5	29.70	4.0	6.30
			6.0	4.85
			8.0	3.85
34.0	M45 x 1.5	45.90	4.0	8.80
			6.0	6.80
			8.0	5.40

① The values include a vertical adjustment range of ±20 mm
② Maximum vertical adjustment can only be made upwards

See also Technical Product Information HALFEN Concrete Façade Anchor Systems FB

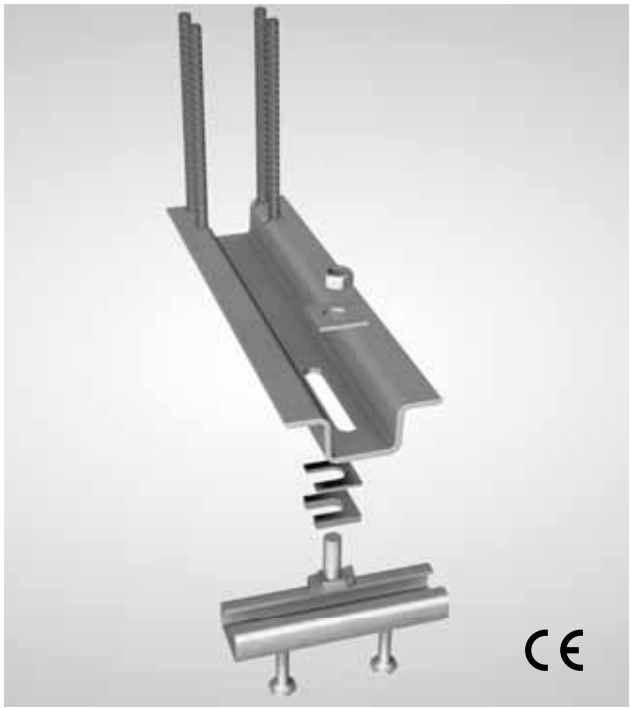
HALFEN BRA
Parapet Corbels

The HALFEN Parapet corbels allow fast and reliable fixing when installing parapet elements to balconies or reinforced concrete roof slabs. Use two corbels for each parapet element to ensure even load distribution.

The corbels can be adjusted in two horizontal directions when they are fixed to HALFEN Cast-in channels. They can also be adjusted vertically with the appropriate mounting accessories from us.
For easier vertical adjusting the parapet corbels are also available with adjustment screws.

The most important features and benefits at a glance:

- Cost-effective application using 8 different profile dimensions
- High level of prefabrication
- High bending-stiffness ensures connection without additional brackets
- Quick to install – easy to adjust
- Verifiable calculation software
- Type tested
- Suitable for different parapet clearances
- Made of stainless steel for high corrosion protection
- Adjustable in all directions



Product Range

BRA-L4 Types

BRA-A
- Suspended version (downward rebars)

BRA-AJ
- Suspended version
- Adjustable (downward rebars)

BRA-N
- Standard version (upward rebars)

BRA-NJ
- Standard version
- Adjustable (upward rebars)

Technical Data

LOAD CAPACITY, CROSS SECTION VALUES									
		BRA 1	BRA 2	BRA 3	BRA 4	BRA 5	BRA 6	BRA 7	BRA 8
$M_{i,Rd}$	[kNcm]	190	204	374	616	750	1032	1294	1730
$M_{pl,y,d}$	[kNcm]	270	335	558	857	1137	1630	1986	2439
$M_{pl,z,d}$	[kNcm]	246	313	531	849	1082	1524	1905	2455
$V_{z,R,d}$	[kN]	19.4	21.3	32.1	39.0	51.2	61.4	73.7	97.0
$Z_{R,d}$	[kN]	18.9	18.9	23.6	23.6	37.4	37.4	52.5	93.4
$D_{R,d}$	[kN]	38.7	38.7	45.3	45.3	68.0	68.0	79.3	79.3
$N_{R,d}$	[kN]	10.0	17.0	17.0	17.0	26.0	26.0	26.0	26.0
$N_{pl,d}$	[kN]	182	204	303	379	484	579	702	903
I_y	[cm^4]	11.78	16.12	30.31	56.88	78.82	135.39	165.45	204.04

Certificates

- To verify the vertical and horizontal loads (e.g. from the dead weight, wind load and hand-rail load) the bearing resistances are confirmed with a type test
- CE marking according to EN 1090

Particularly cost-effective:
Concrete sandwich panel façades

Sandwich panel façades offer you a particularly cost-effective 2-in-1 solution. They bring together the supporting structure and the façade in a single building element. The clear advantage being rapid erection of a finished enclosure on-site. In addition, thanks to their very low heat transfer characteristics, they also provide high thermal insulation performance.

The following pages present two reliable systems for the fixing of concrete sandwich façades.

Quality Hotel Friends, Stockholm (Sweden)

HALFEN SPA AND FA

Fixing systems for concrete sandwich panel façades

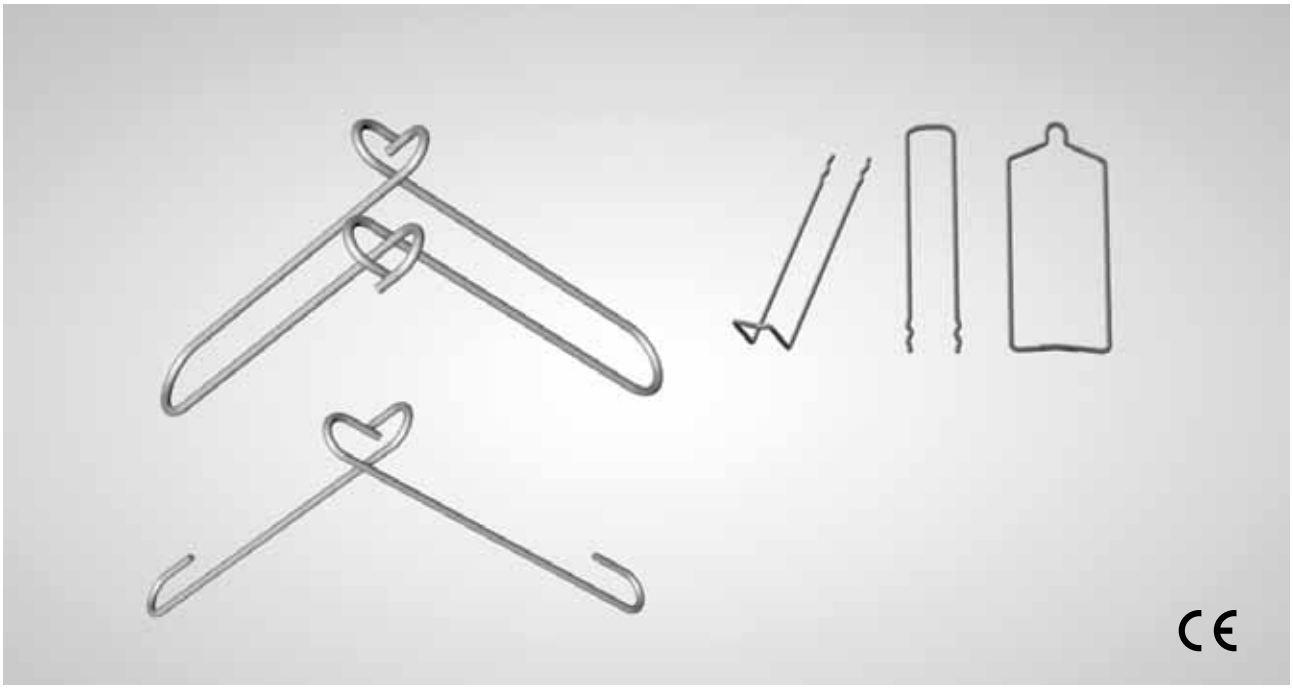
We offer you two different fixing systems:
SPA Wire anchors and the FA Flat anchors. They connect the structural bearing layer and the facing layer.

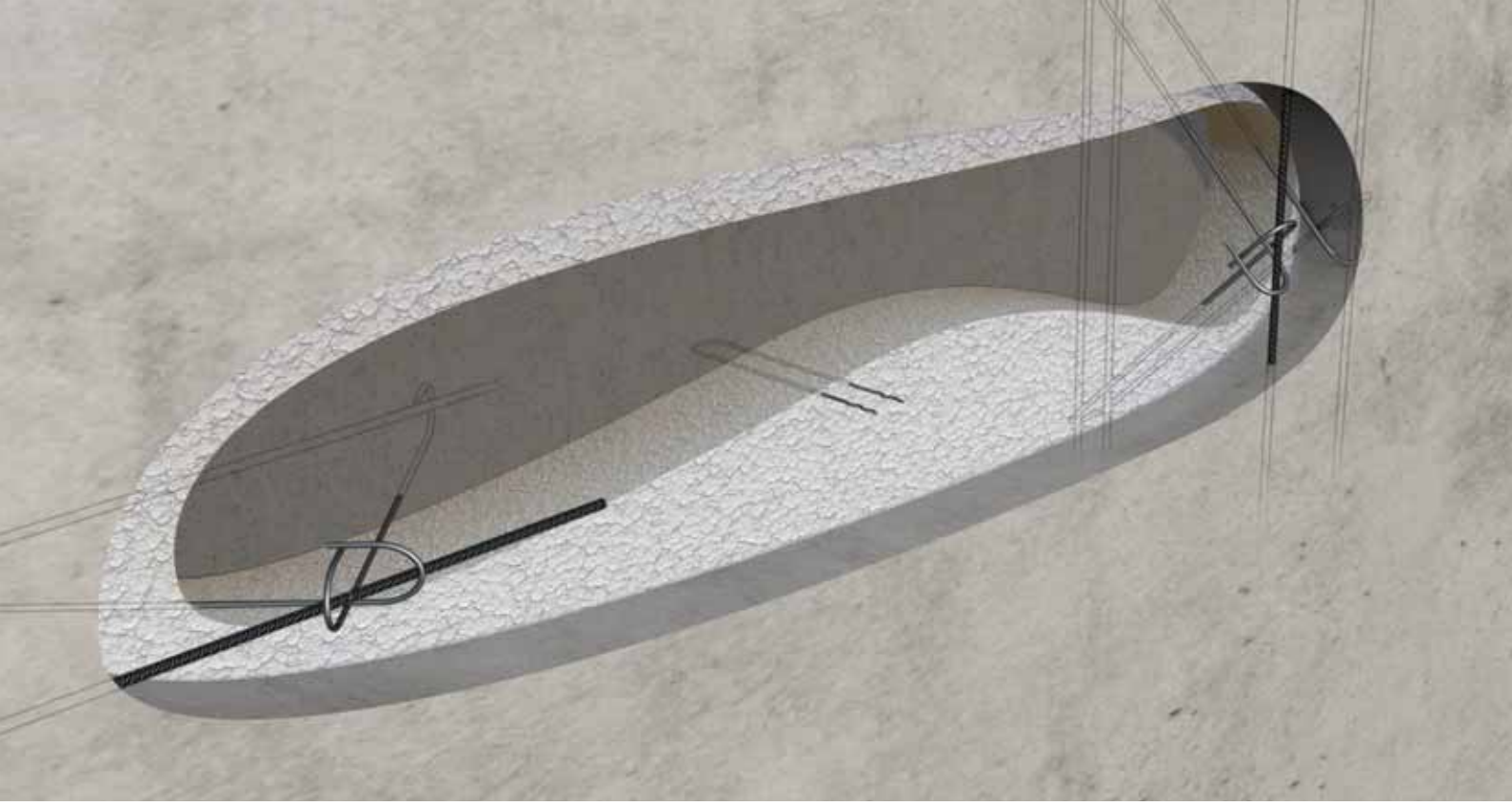
In both systems, the support anchors transfer the dead load of the facing layer as well as proportionate horizontal forces resulting from wind and temperature, to the support layer.

The most important features and benefits at a glance:

- Easy and quick to install in the precast plant
- Technically perfected system
- Can also be used cost-effectively with very thick insulating layers
- Minimal impact on thermal transmission
- SPA and FA systems can be mixed
- Verifiable design software with DICAD 3D interface

Product Range





HALFEN SPA
Wire Anchors

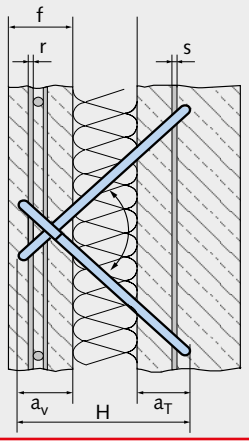
With the SPA system, two SPA Supporting anchors are usually installed symmetrically to the central axis in both load directions. An additional SPA Supporting anchor needs to be installed perpendicular to the main load direction as a horizontal anchor to carry transport and assembly loads.

In the remaining area of the panel, approved pins ensure horizontal forces are transferred and warping of the facing layer is prevented.

Technical Data

MINIMUM EMBEDMENT DEPTH a AND CHOICE OF ANCHOR HEIGHT H:

Type	Description			
	SP-SPA-1-05 SP-SPA-2-05	SP-SPA-1-07 SP-SPA-2-07	SP-SPA-1-09 SP-SPA-2-09	SP-SPA-1-10 SP-SPA-2-10
ø	5.0	6.5	8.5	10.0
a_V	≥ 49	≥ 50	≥ 53	≥ 54
a_T	≥ 55	≥ 55	≥ 55	≥ 55
H	$a_v + b + a_T$	$a_v + b + a_T$	$a_v + b + a_T$	$a_v + b + a_T$
f ①	≥ 60	≥ 60	≥ 60	≥ 60



All dimensions are in [mm]
① In accordance with EN 1992-1-1/NA:2013-04 the required slab thickness is: f_{min} ≥ 70 mm

Certificates

- Building authority approved
- CE marking according to EN 1090

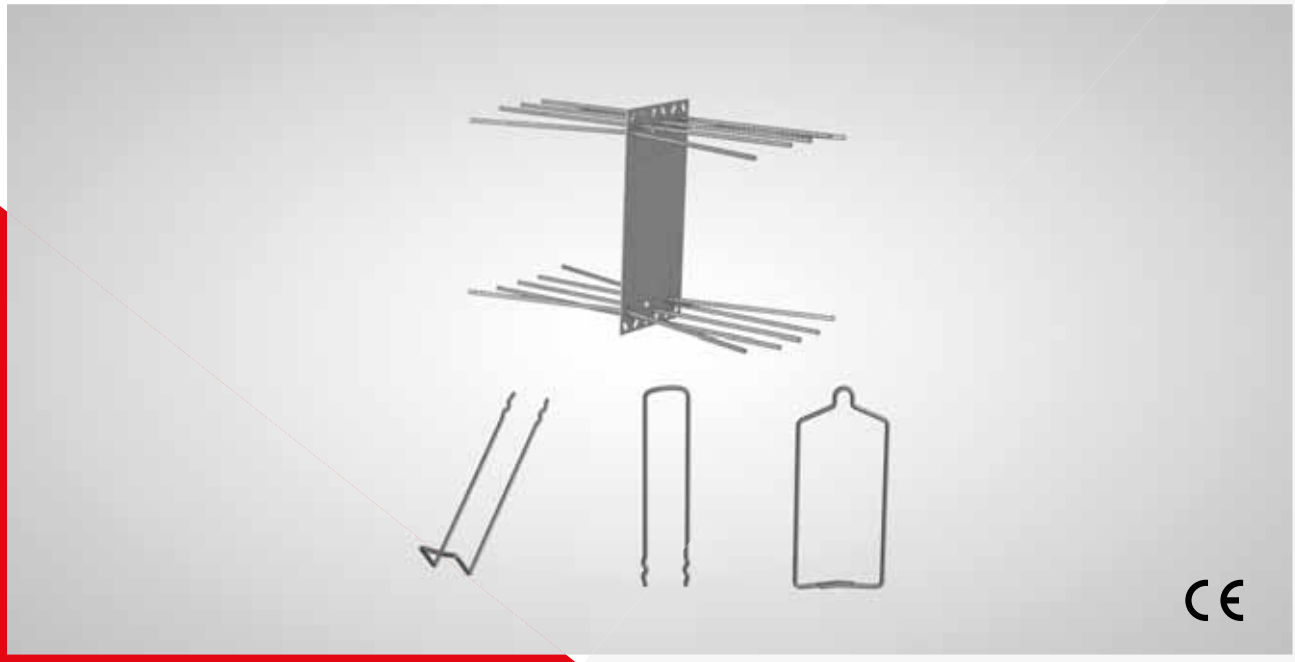
See also Technical Product Information HALFEN Sandwich Panel Anchors SP

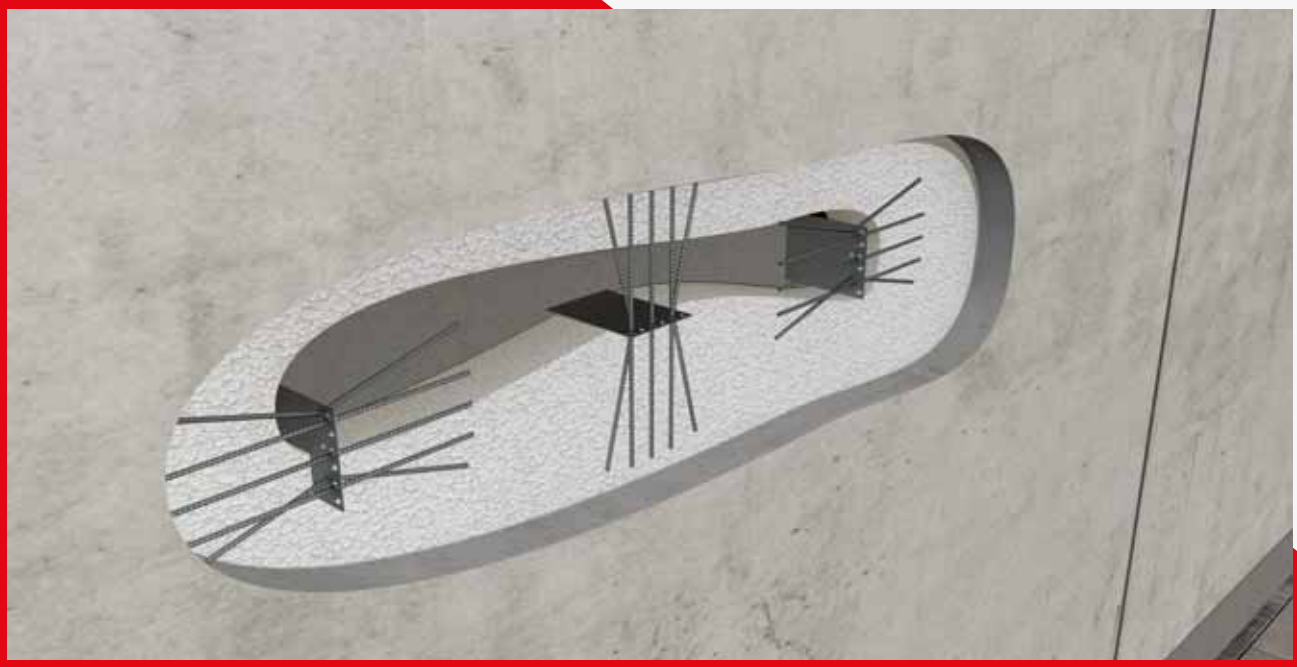
HALFEN FA
Flat Anchors

In the FA system the support anchors also transfer the dead weight of the facing layer and proportionate horizontal forces from wind and temperature influences to the support layer. When using two FAs, the anchors should be positioned symmetrically to the centre line in each direction. An additional supporting anchor should be added as a horizontal anchor, perpendicular to the main load direction.

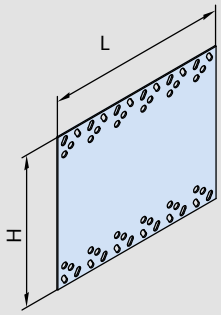
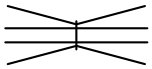
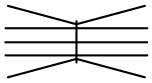
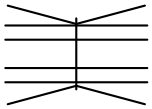
In the remaining area of the panel, approved pins ensure horizontal forces are transferred and warping of the facing layer is prevented.

Product Range





ADDITIONAL REINFORCEMENT

Flat anchors	Length L [mm]	Symbol	Anchoring bars B500A, B500B
	80		2 × 4 ø 6 mm l = 400 mm
	120		2 × 5 ø 6 mm l = 400 mm
	160, 200, 240, 280 320, 360, 400		2 × 6 ø 6 mm l = 400 mm 2 × 7 ø 6 mm l = 400 mm

Anchor height H: from 150 mm to 280 mm. Other heights on request.

The most important features and benefits at a glance:

- Suitable for higher loads and large panels
- Verifiable design software with DICAD 3D interface
- The SPA and FA systems can be combined

Certificates

- Building authority approved
- CE marking according to EN 1090

See also Technical Product Information HALFEN Sandwich Panel Anchors SP

Contemporary masonry:
Brickwork Support

Attractive, cost-effective and long-lasting: Brickwork is one of the most popular façade materials – and quite rightly so! It offers sustainable protection against noise, heat, cold and the effects of the weather, making it suitable for both new construction as well as for renovation projects.

Brickwork offers impressive visuals, without significant ongoing maintenance costs. We ensure long-lasting and secure anchoring of the façade with its proven brickwork support brackets, which carry dead loads.

Engage in the wildest flights of design fancy – with our brickwork fixing solutions!

The "Steinblume", Monte Generoso (Switzerland), ©tomjasny.com

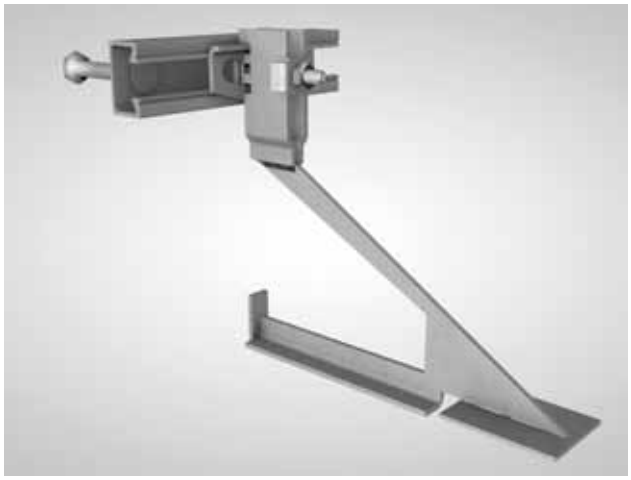
HALFEN HK5
Brickwork support

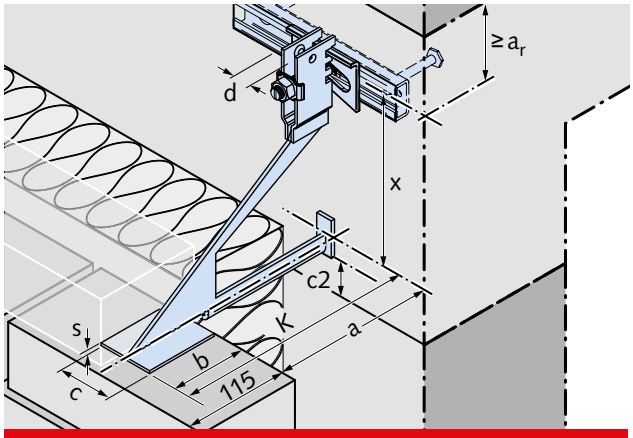
Our Brickwork support brackets are the engineered solution to transfer the loads from brick cladding to the building structure.

The latest generation of brickwork support brackets offers significant advantages: Thanks to the optimised, slim geometry, thermal transmission can be further reduced by up to 27% in comparison with the previous model. Additional insulating steps are no longer required, such as the installation of strip insulation between the brackets and the supporting wall. The HALFEN HK5 Brickwork support bracket is able to carry 14% higher dead loads than its predecessor. This means fewer brackets and shorter installation times. Brickwork façades are now more cost-effective and energy-efficient than ever.

The most important features and benefits at a glance:

- Suitable for different projections and load classes
- Many different support bracket types, for multiple situations
- Vertical adjustment ±20 mm
- Available in Lean Duplex stainless steel for resistance and economy (L4)
- Can be fixed to the structure using anchor channels or post-installed anchors
- Optimized geometry and material reduces thermal conductivity





HK5-U

Certificates

- Building authority approved bracket head
- Type tested bracket for a cantilever up to 350 mm
- CE marking

Product Range

Individual support bracket

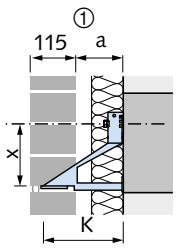
- HK5-UV
- HK5-UT
- HK5-W
- HK5-WV
- HK5-U
- HK5-S
- HK5-SV

Angle support bracket

- HK5-F
- HK5-FV
- HK5-FR
- HK5-FRL
- HK5-P
- HK5-PV

Technical Data

SELECTION OF BRICKWORK SUPPORT ANCHORS HK5



Measurements in mm

Cavity a [mm]	Load class F_V =4.0 kN (F_{Rd} = 5.4 kN)		Load class F_V = 8.0 kN (F_{Rd} = 10.8 kN)		Load class F_V = 12.0 kN (F_{Rd} = 16.2 kN)	
	Cantilever length K	x	Cantilever length K	x	Cantilever length K	x
40 ± 15	130	150	130	200	130	264
60 ± 15	150	150	150	200	150	264
80 ± 15	170	150	170	200	170	264
100 ± 15	190	150	190	200	190	264
120 ± 15	210	150	210	200	210	264
140 ± 15	230	175	230	250	230	314
160 ± 15	250	175	250	250	250	314
180 ± 15	270	180	270	270	270	334
200 ± 15	290	200	290	290	290	354
220 ± 15	310	220	310	310	310	374
240 ± 15	330	240	330	330	330	394
260 ± 15	350	260	350	350	350	414
Support plate b × c × s	80 × 60 × 3		80 × 60 × 4		100 × 80 × 5	
Notched bracket width d	12.5		16.5		16.5	

-U
-UV
-UT
-W*
-WV*

* HK5-W only for load classes 4.0 kN and 8.0 kN / HK5-WV only for load class 4.0 kN ① Other brick dimensions are also possible

See also Technical Product Information HALFEN Brickwork Support FM

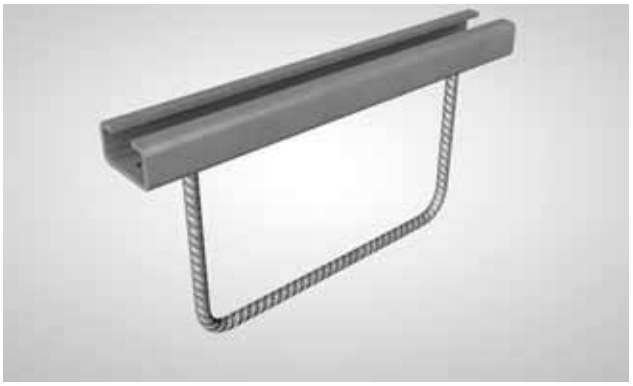
HALFEN HTA-ES CAST-IN CHANNEL FOR PRECAST LINTELS

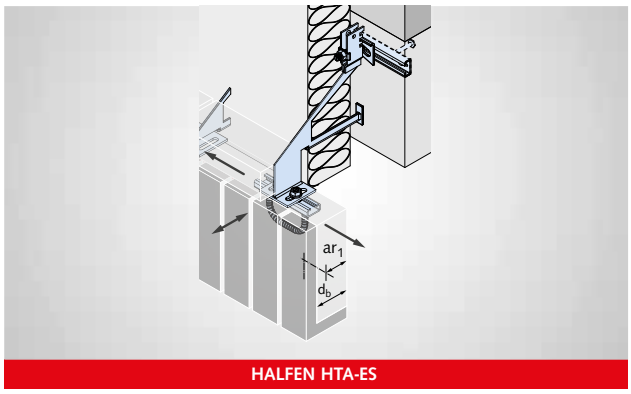
Accessories for brickwork

Wider window openings require higher capacity lintels. Precast concrete lintels are a high-quality alternative to visible steel angles. Precast lintels can be securely anchored to the HK5-S Bracket with the HTA-ES. This makes assembly with the T-head bolts quick and easy.

The most important features and benefits at a glance:

- HALFEN Cast-in channels cast into the concrete
- Adjustable fixing
- Quick, economical installation
- Bolting instead of welding
- Building authority approval





HALFEN HTA-ES

Technical Data

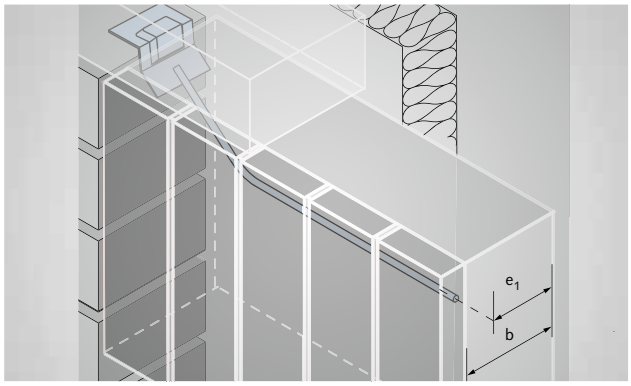
CAST-IN CHANNEL FOR PRECAST LINTELS HTA-ES

HALFEN Channel	HTA-ES 28/15	HTA-ES 38/17	HTA-ES 49/30
Rated resistance for concrete C30/37	F_V = 3,5 kN (F_{Rd} = 4,7 kN)	F_V = 7,0 kN (F_{Rd} = 9,5 kN)	F_V = 10,5 kN (F_{Rd} = 14,2 kN)
Rated resistance for concrete C40/50	F_V = 4,0 kN (F_{Rd} = 5,4 kN)	F_V = 8,0 kN (F_{Rd} = 10,8 kN)	F_V = 12,0 kN (F_{Rd} = 16,2 kN)
Installation set: HALFEN Bolt including nut + washer	2 × HS 28/15–M10 x 30 2 × US M10 (DIN 9021)	2 × HS 38/17–M10 x 30 2 × US M10 (DIN 9021)	2 × HS 50/30–M12 x 40 2 × US M12 (DIN 125)
Material	Stainless steel W 1.4404, 1.4571 (A4) or Duplex steel 1.4062, 1.4162, 1.4362 (L4), HCR on request		

HALFEN FSW
Precast Lintel Bracket with bar

The precast lintel bracket with bar is used to anchor precast lintels, for example, the HTA-ES. Cast into each end of the lintel. The two brackets either side of the lintel are set in the brickwork joints allowing it to span the opening.

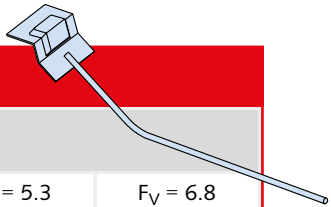
Advantage: Alternative to fixing a precast lintel with brickwork support brackets.



The most important features and benefits at a glance:

- The load is transfered from the facing lintel into the masonry
- Concealed anchors in precast lintels
- Type tested

Technical Data



PRECAST LINTEL BRACKET WITH BAR FSW

	Load level per bracket [kN]					
	F_V = 3.5 (F_{Rd} = 4.7)	F_V = 2.6 (F_{Rd} = 3.5)	F_V = 3.9 (F_{Rd} = 5.3)	F_V = 5.1 (F_{Rd} = 6.9)	F_V = 5.3 (F_{Rd} = 7.2)	F_V = 6.8 (F_{Rd} = 9.2)
Precast lintel bracket with bar	FSW – 3.5–80	FSW – 2.6–60	FSW – 3.9–60	FSW – 5.1–60	FSW – 5.3–80	FSW – 6.8–80
Material	**Rod: B500**		**Bracket: W 1.4404 or 1.4571 (A4) or Duplex 1.4062, 1.4162, 1.4362 (L4)**			

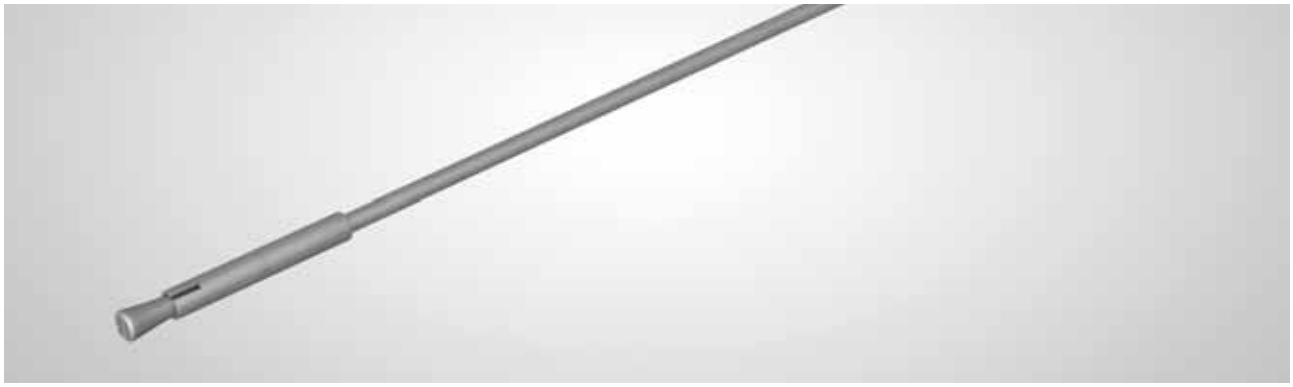
See also Technical Product Information HALFEN Brickwork Support FM

HALFEN HEA
Cavity Wall Ties

Cavity wall ties securely transfer wind loads impacting on the surface of the brickwork to the building structure. The HEA is particularly user-friendly and quick to install.

The most important features and benefits at a glance:

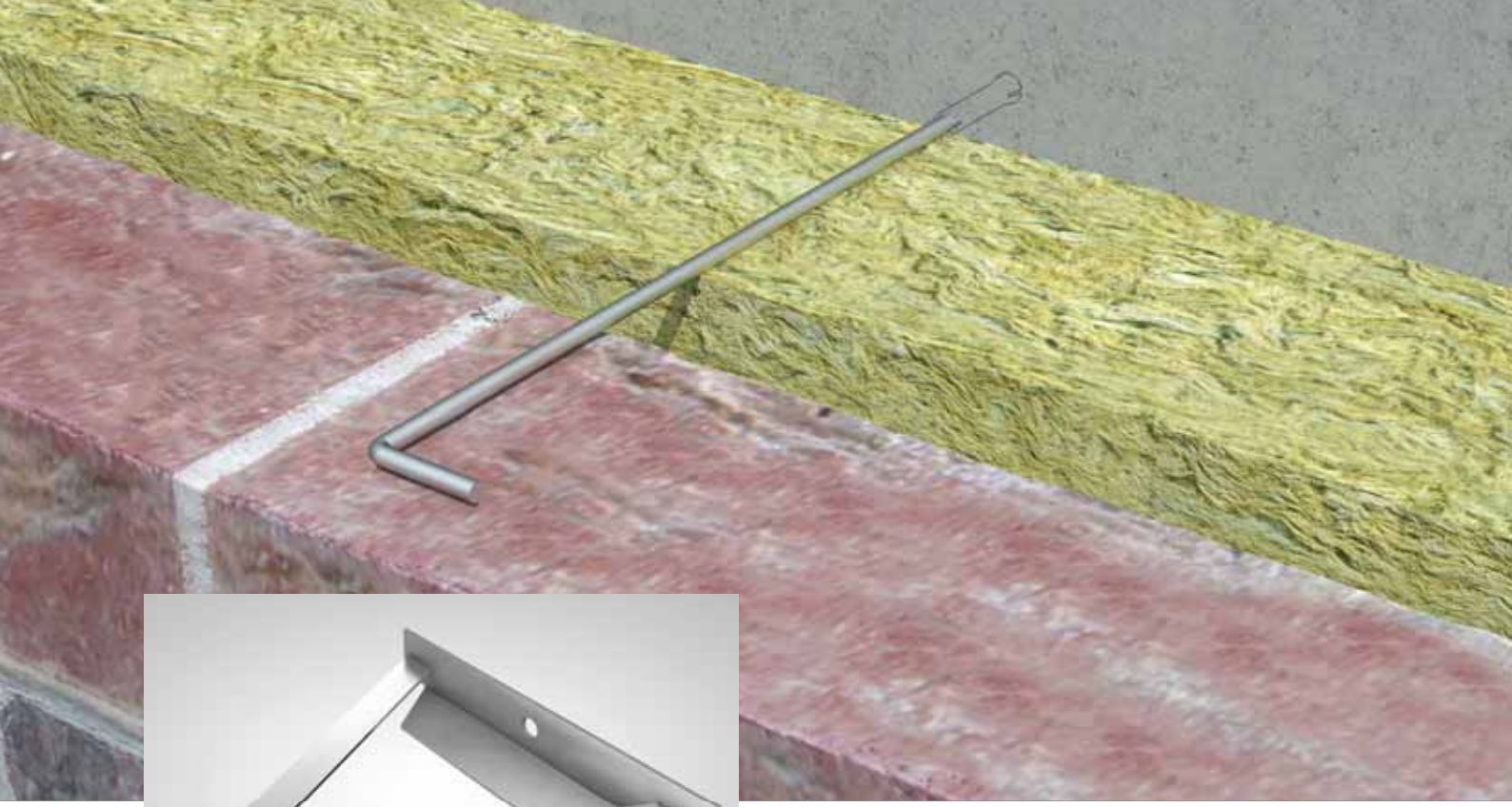
- Building authority approved
- Quick and easy to install
- Large cantilevers possible
- No corrosion thanks to the use of stainless steel



Technical Data

CAVITY WALL IMPACT ACHORS HEA

Article description L/⌀ [mm]	Cavity a [mm]	Number of anchors per m² according to the approval Z-21.1-910
HEA-160/4	0–45	
HEA-200/4	45–85	
HEA-250/4	85–135	
HEA-300/4	135–185	
HEA-200/5	45–85	
HEA-250/5	85–135	
HEA-300/5	135–185	



HALFEN HGA
Scaffold Anchors

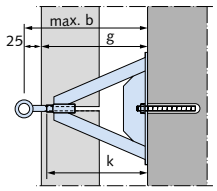
HGA-Q HALFEN Scaffold anchors are suitable for fixing scaffolding to ETICS façades as well as brick/masonry or concrete panel façades. The HALFEN Scaffold anchors remain in the building after removing the scaffolding but are hidden, and do not affect the aesthetics of the façade. This also ensures that scaffolding can be erected at a later date without needing new anchor points.

The most important features and benefits at a glance:

- Rapid installation using post-installed anchors
- According to EN 12810 / EN 12811 resp. DIN 4420 and DIN 4426
- Body material is stainless steel
- The main body remains hidden in the façade – therefore the anchor is available for future use
- CE marking

Technical Data

SCAFFOLD ANCHORS HGA-Q

Plan view	Scaffold anchor article description	k ① [mm]	g [mm]
	HGA-Q 160	160	165–180
	HGA-Q 185	185	190–205
	HGA-Q 210	210	215–230
	HGA-Q 235	235	240–255
	HGA-Q 260	260	265–280
	HGA-Q 285	285	290–305
	HGA-Q 310	310	315–330
	HGA-Q 335	335	340–355
	HGA-Q 360	360	365–380
HALFEN Bolt anchors for uncracked concrete	**HB-B-12-10-25/105-A4**		
HALFEN Injection anchors for cracked and uncracked concrete	**HB-VMZ-A-70 – M12-25/115-A4**		

① Further sizes on request

See also Technical Product Information HALFEN Brickwork Support FM

Create elegant accents:
Natural stone façades

Natural stone façades project a refined image and represent exclusivity and stability. Stone can be used to create elegant flourishes, or give the building a modern and clean look.

Stone façades are generally mechanically anchored to the building structure and rear-ventilated. HALFEN Natural stone systems offer precise and reliable fixing, with virtually unlimited possibilities.

Reliable, durable and precise – our fixing solutions meet the highest demands.

Etisalat, Dubai (United Arab Emirates)

HALFEN BODY ANCHOR

Natural stone support

HALFEN Body anchors are adjustable in 3 dimensions, and are suitable for both natural stone and composite panels. They are fixed to HALFEN Cast-in channels set into the structure, or using approved HALFEN Post-installed anchors.

Spanning projections of 30–300 mm, the standard version has a maximum load capacity of 1,300 N! Our body anchors can be used in both horizontal or vertical joints, and are immediately load-bearing. This saves time and accelerates the construction progress.

The most important features and benefits at a glance:

- Different projections and load capacities
- Adjustable in all three dimensions
- Quick fixing using post-installed anchors or cast-in channels
- Custom versions available to suit requirements

Body Anchor DT

Materials

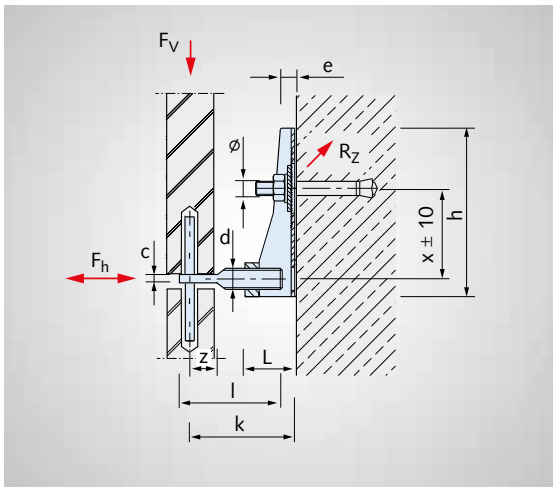
- Available in A4 and A2

Certificates

- The monitoring and certification authority of the LGA (Bavarian state trade institute) Nuremberg awarded the "LGA tested Quality" to HALFEN Body anchors. The quality certificate is the first independent seal of quality for the production and design of this type of cladding system.
- CE marking

Product Range

HALFEN Body anchors provide you a wide variety of solutions for natural stone façade requirements.

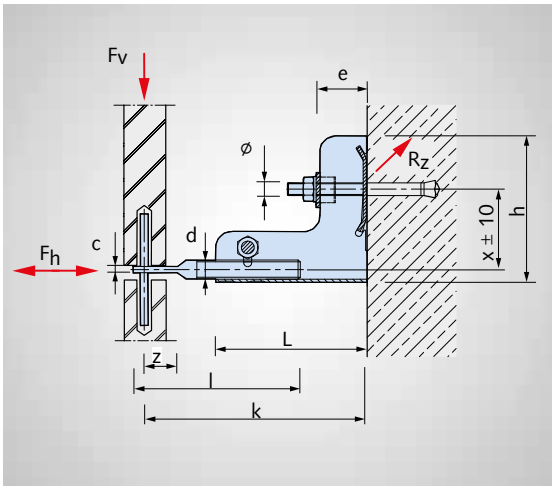


HALFEN BA
Body Anchor

Properties

- For projections between 60 mm and 120 mm
- Load capacity from 600 N to 1,300 N

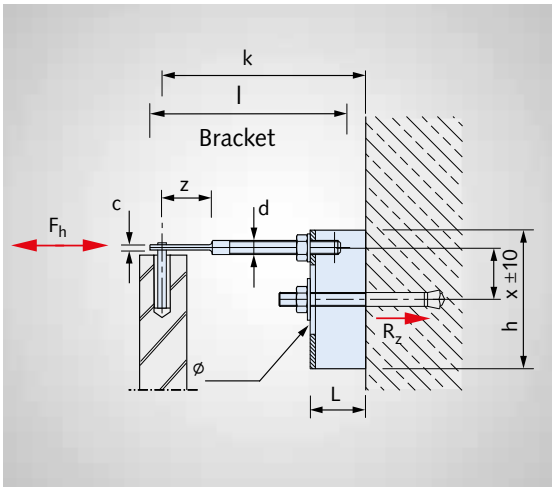
See also Technical Product Information HALFEN Natural Stone Support Systems FS



HALFEN DT
Body Anchor

Properties

- For projections between 140 mm and 300 mm
- Load capacity from 400 N to 1,300 N
- The spade bolt is fixed with a clamping bolt



HALFEN DH
Body Anchor

Properties

- HALFEN DH is a restraint anchor; only suitable for wind loads
- For projections between 60 mm and 320 mm
- Load capacity from 850 N to 1,300 N

BODY ANCHOR BA

Version	Perm. load	Projections		
	F_V [N]	k [mm]	min k [mm]	max k [mm]
606	900	60	52	70
608	600	80	65	90
610	600	100	80	120
612	600	120	100	140
1308	1300	80	70	100
1310	1300	100	90	120
1312	1300	120	105	135

Perm. F_h = exist. F_V

BODY ANCHOR DT

Version	Perm. load	Projections		
	F_V [N]	k [mm]	min k [mm]	max k [mm]
414	400	140	120	170
416	400	160	140	190
418	400	180	160	210
420	400	200	180	230
422	400	220	200	250
424	400	240	220	270
426	400	260	240	290
428	400	280	260	310
430	400	300	280	330
1314	1300	140	120	170
1316	1300	160	140	190
1318	1300	180	160	210
1320	1300	200	180	230
1322	1300	220	200	250
1324	1300	240	220	270
1326	1300	260	240	290
1328	1300	280	260	310
1330	1300	300	280	330

Perm. F_h = exist. F_V

BODY ANCHOR DH

Version incl. counter nut	Perm. load	Projections		
	F_h [N]	k [mm]	min k [mm]	max k [mm]
1006	850	60	53	68
1008	850	80	73	88
1010	850	100	93	108
1712	1300	120	105	134
1714	1300	140	125	154
1716	1300	160	145	174
1718	1300	180	165	194
1720	1300	200	185	214
1722	1300	220	205	234
1724	1300	240	225	254
1726	1300	260	245	274
1728	1300	280	265	294
1730	1300	300	285	314
1732	1300	320	305	334

See also Technical Product Information HALFEN Natural Stone Support Systems FS

HALFEN UMA & UHA
Grout-in Anchors

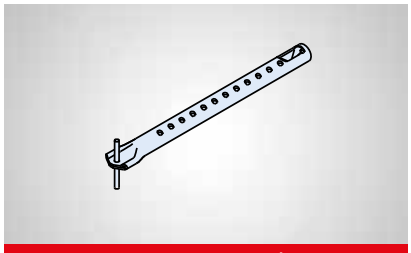
HALFEN Grout-in anchors are traditionally used to connect natural stone or concrete façade panels to a load-bearing structure of concrete or masonry. HALFEN UMA Support anchors are available for a variety of load ranges. The matching HALFEN UHA Restraint anchor is used to absorb wind loads. HALFEN Grout-in anchors can be used in both horizontal and vertical joints.

The most important features and benefits at a glance:

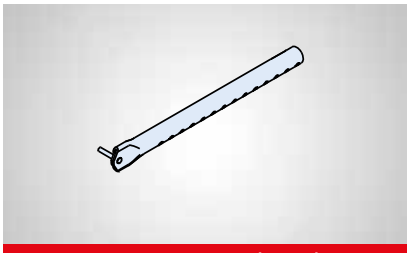
- For different projections and load ranges
- Can be fixed in concrete or masonry
- Adjustable in all three dimensions
- Low material costs
- Flexible system with a large range of standard anchors
- Custom anchors available

HALFEN UMA
Support Anchor

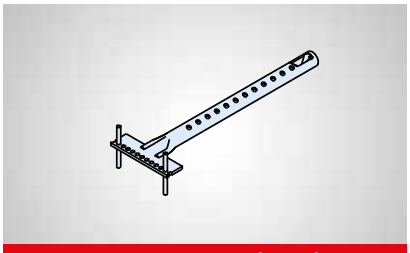
Support anchors can bear both vertical and horizontal loads. Depending on the diameters and anchor lengths they can support a projection of up to 300 mm and loads up to 4300 N. The anchor can be adjusted in 3 dimensions using a sufficiently sized hole filled with cement mortar. The anchors are type tested (design 1 and 2). Depending on the building situation, there are 6 different standard designs to choose from. In addition, customer-specific special designs are available which enable even the most complex installation situations.



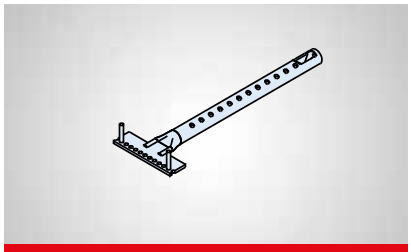
Design 1: Support anchor with loose pin



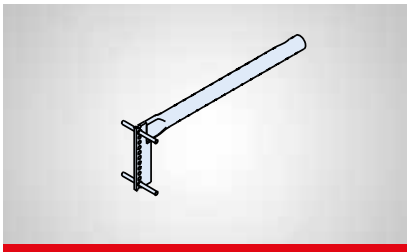
Design 2: Support anchor with fixed half-pin



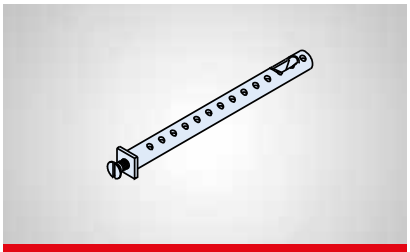
Design 3: Support anchor with 2 loose pins and 2 sleeves



Design 4: Support anchor with 2 fixed half-pins



Design 7: Support anchor with L-bracket, 2 loose pins and 2 sleeves

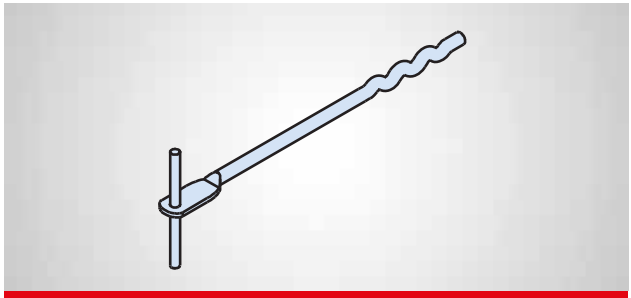


Design 8: Threaded anchor with thread and countersunk screw (UMA 16 and above) + 2 EPDM washers

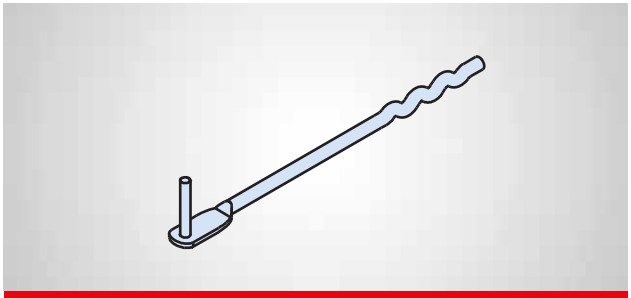
See also Technical Product Information HALFEN Natural Stone Support Systems FS

HALFEN UHA
Restraint Anchors

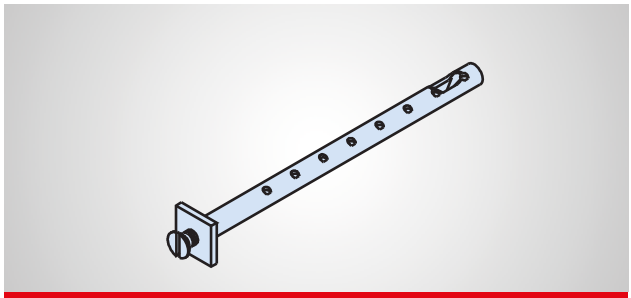
HALFEN UHA Restraint anchors are used to resist the horizontal compressive and tensile forces resulting from wind loads. It is used in combination with the UMA Grout-in anchor and mainly at edges and at corners for parapet slabs. The restraint anchor is type tested and offers you the same advantages as the UMA Grout-in anchor. It can transfer loads of up to 2,500 N. The restraint anchor is available in three standard designs.



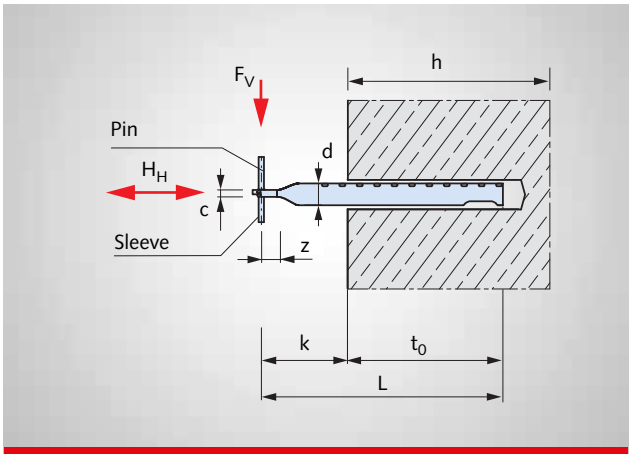
Design 1: Restraint anchor with loose pin and sleeve



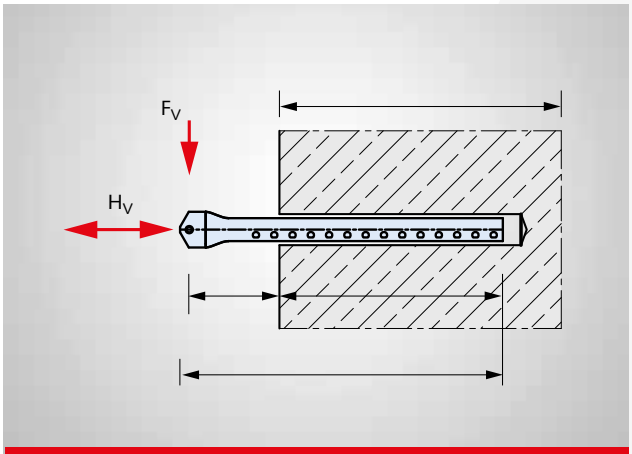
Design 2: Restraint anchor with half-pin, fixed



Design 8: Threaded anchor with thread + countersunk screw (only for UMA size 10) + 2 EPDM washers



Horizontal joint layout (here: HALFEN UMA)



Vertical joint layout (here: HALFEN UMA)

Concrete ≥ C20/25 ②		Grout-in anchor								Restraint anchor ④ (standard mortar)			Restraint anchor ⑤ (dry ready-to-use mortar)		
Projections k [mm]	Anchor type	UMA 10	UMA 12	UMA 16	UMA 18	UMA 22	UMA 25	UMA 28	UMA 33	UHA 5	UHA 7	UHA 10	UHA 5	UHA 7	UHA 10
	Drill hole ⌀ i	⌀ 20	⌀ 22	⌀ 26	⌀ 28	⌀ 32	⌀ 35	⌀ 40	⌀ 45	⌀ 15	⌀ 17	⌀ 20	⌀ 15	⌀ 17	⌀ 20
	Embedment depth ③	t_0 ≥ 90	t_0 ≥ 90	t_0 ≥ 90	t_0 ≥ 90	t_0 ≥ 90	t_0 ≥ 90	t_0 ≥ 110	t_0 ≥ 110	t_0 ≥ 90	t_0 ≥ 90	t_0 ≥ 90	t_0 ≥ 120	t_0 ≥ 120	t_0 ≥ 120
	Substrate thickness	h ≥ 150	h ≥ 150	h ≥ 150	h ≥ 150	h ≥ 154	h ≥ 160	h ≥ 190	h ≥ 200	h ≥ 120	h ≥ 124	h ≥ 130	h ≥ 150	h ≥ 154	h ≥ 160
40 50 60	F_V	275	420	800	1380										
	H_H	649	880	1173	1319					523			1131		
	H_V	325	496	944	1319					523			1131		
	L	150	150	150	150					150			180		
70 80 90	F_V	215	325	620	1030										
	H_H	508	767	1173	1319					523	733		1131	1584	
	H_V	254	384	732	1216					523	733		1131	1584	
	L	180	180	180	180					180	180		210	210	
100 110 120	F_V	170	265	505	820	1330	1750	2720	4300						
	H_H	401	626	1173	1319	1613	1833	2509	2957	523	733		1131	1584	
	H_V	201	313	596	968	1570	1833	2509	2957	523	733		1131	1584	
	L	210	210	210	210	210	210	230	230	210	210		240	240	
130 140 150	F_V			425	690	1100	1465	2240	3540						
	H_H			1003	1319	1613	1833	2509	2957	523	733	733	1131	1584	1584
	H_V			502	815	1299	1730	2509	2957	523	733	733	1131	1584	1584
	L			240	240	240	240	260	260	240	240	240	270	270	270
160 170 180	F_V				595	930	1265	1930	3005						
	H_H				1319	1613	1833	2509	2957	523	733	733	1100	1584	1584
	H_V				702	1098	1493	2278	2957	523	733	733	1100	1584	1584
	L				270	270	270	290	290	270	270	270	300	300	300
190 200 210	F_V				525	820	1100	1695	2615						
	H_H				1240	1613	1833	2509	2957	523	733	733		1584	1584
	H_V				620	968	1299	2001	2957	523	733	733		1584	1584
	L				300	300	300	320	320	300	300	300		330	330
220 230 240	F_V				470	730	975	1510	2335						
	H_H				1110	1613	1833	2509	2957		733	733		1584	1584
	H_V				555	862	1151	1783	2757		733	733		1584	1584
	L				330	330	330	350	350		330	330		360	360
250 260 270	F_V				420	660	875	1360	2100						
	H_H				992	1558	1833	2509	2957		733	733			1584
	H_V				496	779	1033	1606	2479		733	733			1584
	L				360	360	360	380	380		360	360			390
280 290 300	F_V					600	795	1240	1920						
	H_H					1417	1833	2509	2957			733			
	H_V					708	939	1464	2267			733			
	L					390	390	410	410			390			

② Concrete C12/15 with pull-out tests possible. ③ min t_0 ≥ 80 mm; according to test reports higher loads are possible with greater embedment depth
④ According to procedure A, DIN 18516-3, 6.3.7.2. ⑤ According to procedure C, DIN 18516-3, 6.3.7.4.

See also Technical Product Information HALFEN Natural Stone Support Systems FS

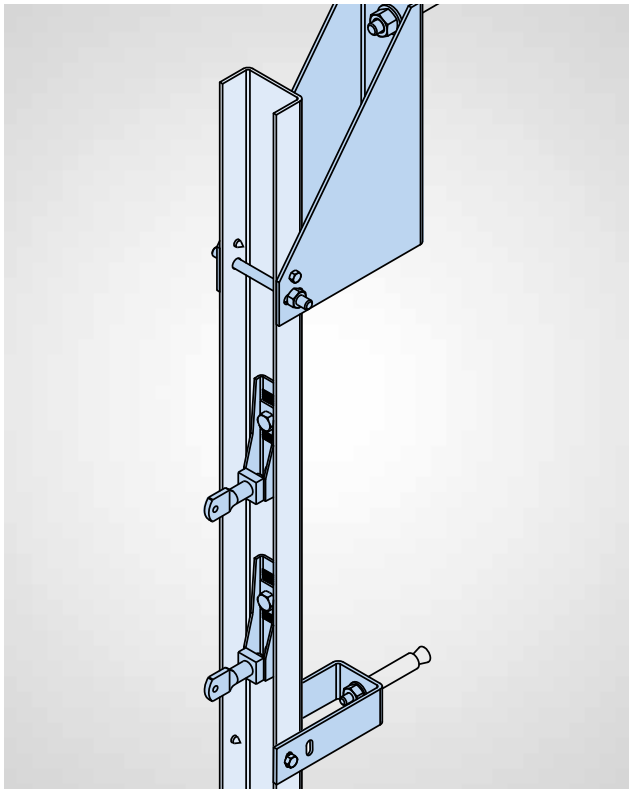
HALFEN SUK & UKB
Natural Stone Support Systems

Natural stone facades with large cantilevers are often best realised with adaptable support systems that can be individually modified for a building project. The HALFEN Support system consists mainly of a series of vertical channels and restraint brackets. The Vertical channels only require fixing to the main load-bearing structure at comparatively large spacings. This greatly reduces the number of overall connections.

The advantage of the HALFEN support system is fewer penetrations of the thermal insulation or respectively, the building envelope. This reduces the number of thermal bridges to a minimum. The support system can also span large non-load-bearing surfaces. Pre-installing the HALFEN support system can also significantly accelerate overall façade installation.

The most important features and benefits at a glance:

- The entire sub-structure assembly can be completed prior to the installation of any stone
- Spans non load-bearing sections of the main structure
- Adaptable and easy to install
- Large projections possible
- Minimises thermal bridges
- Further variations possible with special designs and using other from our Installation accessories



Product Range

We offer you two sub-structure systems for different requirements:

HALFEN SUK
Stainless Steel Support System

The HALFEN SUK Stainless steel support system is suitable for cavities ≥ 160 mm and high loads. It can be used both for new constructions and renovation projects. The key advantages are the capacity to span large vertical distances, and bridge large horizontal projections from the supporting structure. The use of A4 grade stainless steel makes the system highly corrosion resistant.

Fewer fixing points to the main structure means a rapid installation time, and better thermal performance.

HALFEN UKB
Aluminium Support system

The HALFEN UKB System is particularly easy to install and economical. It consists of support and restraint brackets and aluminium channels that run vertically. HALFEN Body anchors type BA-606 are fixed to the aluminium channels quickly and easily using self-tapping screws. The system combines the advantages of body anchors and channel systems.

See also Technical Product Information HALFEN Natural Stone Support Systems FS

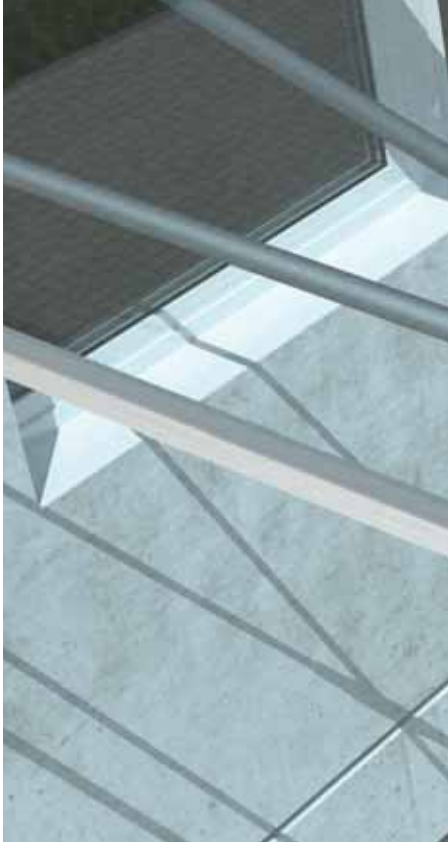

DEUTSCHLAND

Clarity and Perfection: the DETAN Rod System

DETAN rod systems are used in a variety of applications – as truss elements and wind bracing in roofs and walls, tie rods for timber and steel beams, and glass façade and canopy tension members. Matching compression elements are also available. The lightness and clarity of the rod system, along with a range of unobtrusive and elegant connection elements, lend the project a unique and modern aesthetic.

With a full range of matching elements and accessories, even complicated structures and installations can be successfully completed, both internally and externally.

Deutscher Pavillon, Expo 2015, Mailand (Italy), ©tomjasny.com



HALFEN DETAN ROD SYSTEMS:
Now with up to 15 % higher load capacity

Modern architecture not only strives for practical and functional solutions, but also exceptionally designed buildings. With the DETAN Rod system, We offer an innovative product solution, which meets all the requirements for maximum aesthetics, technological reliability and quality.

The technically perfected system is extremely easy to install and can be used to achieve a lightweight and filigree design.

The most important features and benefits at a glance:

- Innovative and filigree support structure
- Project-based configuration in terms of the system diameter and lengths
- High steel bearing capacity
- Large selection of diameters
- Available in hot-dip galvanized and stainless steels
- Brushed threads make HDG assembly fast and easy
- Seal set for maximum corrosion protection
- Free design software and consultation
- Matching compression rods available
- Rod marking and project-specific labelling ensure correct part identification

Application areas:

- Lattice frame elements and wind bracing in roofs and walls
- Suspension of pylons and canopies
- Bracing of timber and steel support beams
- Back-bracing of glass façades
- Suspension of pedestrian bridges

DETAN Cross coupler

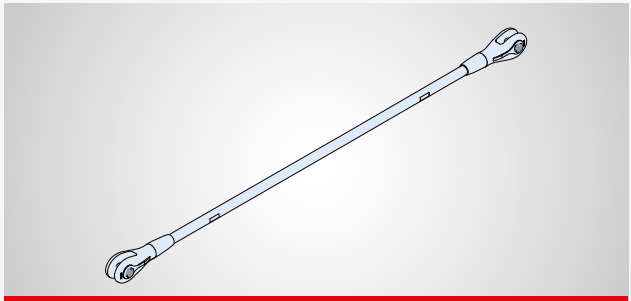
DETAN Tension and compression rods

DETAN Fork

DETAN Anchor disc

See also Technical Product Information DETAN Rod System DT

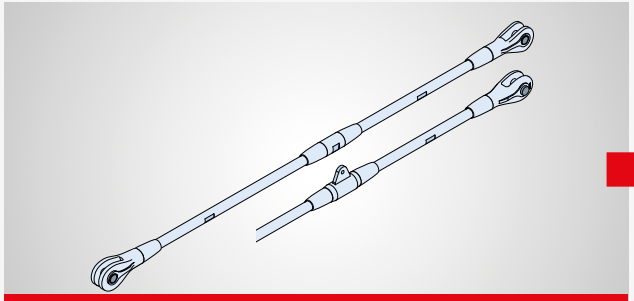
Basic system:



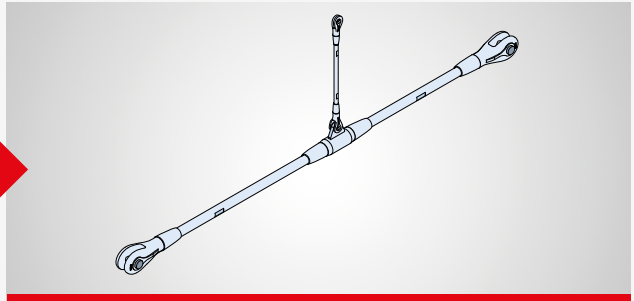
DETAN Tension rod

DETAN Tension rod system – Product Range

System options:

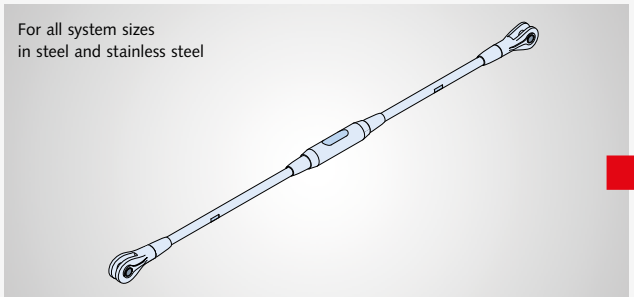


With couplers or couplers with lug

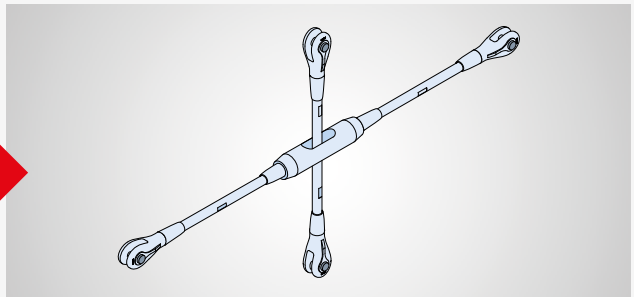


Suspensions consist of a system option with coupler with a lug and a basic system

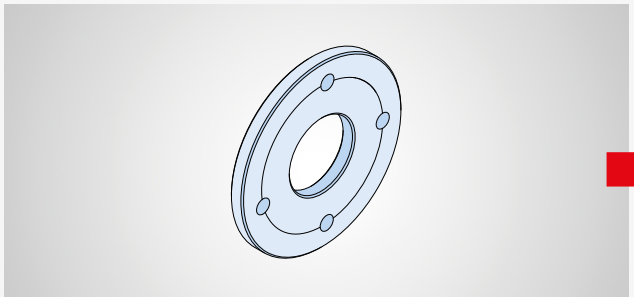
Cross bracing:



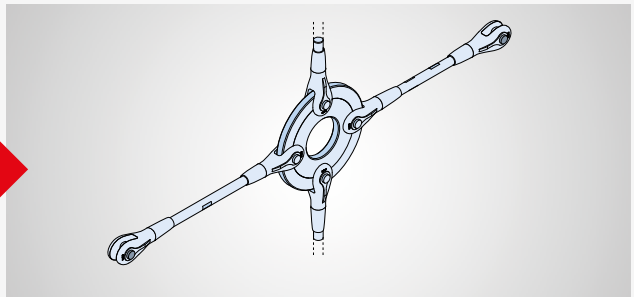
With cross coupler for cross bracing



Cross bracing consists of one system option with cross coupler and a basic system



Anchor disc for cross bracing



Cross bracing consists of one anchor disc and up to 8 basic systems

System load capacities; system- and available rod lengths; material specification, steel strength grade S355 (diameter d_s 10–12) or S470/S520

System ø d_s [mm]	10	12	16	20	24	27	30	36	42	48	52	56	60	76	85	95
System load capacities																
Load capacity $F_{t,R,d}$ [kN]	21.3	30.94	81.22	126.9	182.7	238.1	290.6	423.4	581.1	763.7	911.3	1052.4	1224.5	2016.2	2493.7	3161.6
Available minimum system length L [mm]																
mill finish, hot-dip galvanized	250	310	360	440	520	560	600	700	810	940	990	1050	1160	1480	1640	1810
Available maximum system length L with one rod [mm]																
mill finish, hot-dip galvanized	6060	6070	12080	12100	12120	12140	12140	12170	12220	12260	12270	12290	12320	15430	15480	15530
Available maximum rod length [mm]																
mill finish, hot-dip galvanized	6000						12000							15000		

In accordance with ETA-05/0207 the partial safety value for the table above are assumed as γ_{M0} = 1.0 and γ_{M2} = 1.25

Design load $F_{t,R,d}$ according to annex B11 of ETA-05/0207. The load capacities of in this table were determined on the basis of different available material strengths. The up to 15% higher design values can be achieved with strength class S520. The design values of all strength classes can be found in annex B11 of ETA-05/0207.

Load capacities, system and available rod lengths; Stainless steel

System ø d_s [mm]	6	8	10	12	16	20	24	27	30
Dimension values load capacities									
Load capacity ① $N_{R,d}$ [kN]	9.42	17.13	27.14	39.44	73.32	114.6	165.0	215.0	262.4
Available minimum system length L [mm]									
polished	190	210	250	310	360	440	520	560	600
Available maximum system length L with one rod [mm] ②									
polished	3040	6050	6060	6070	6080	6100	6120	6140	6140
Available maximum rod length [mm]									
polished	3000				6000				

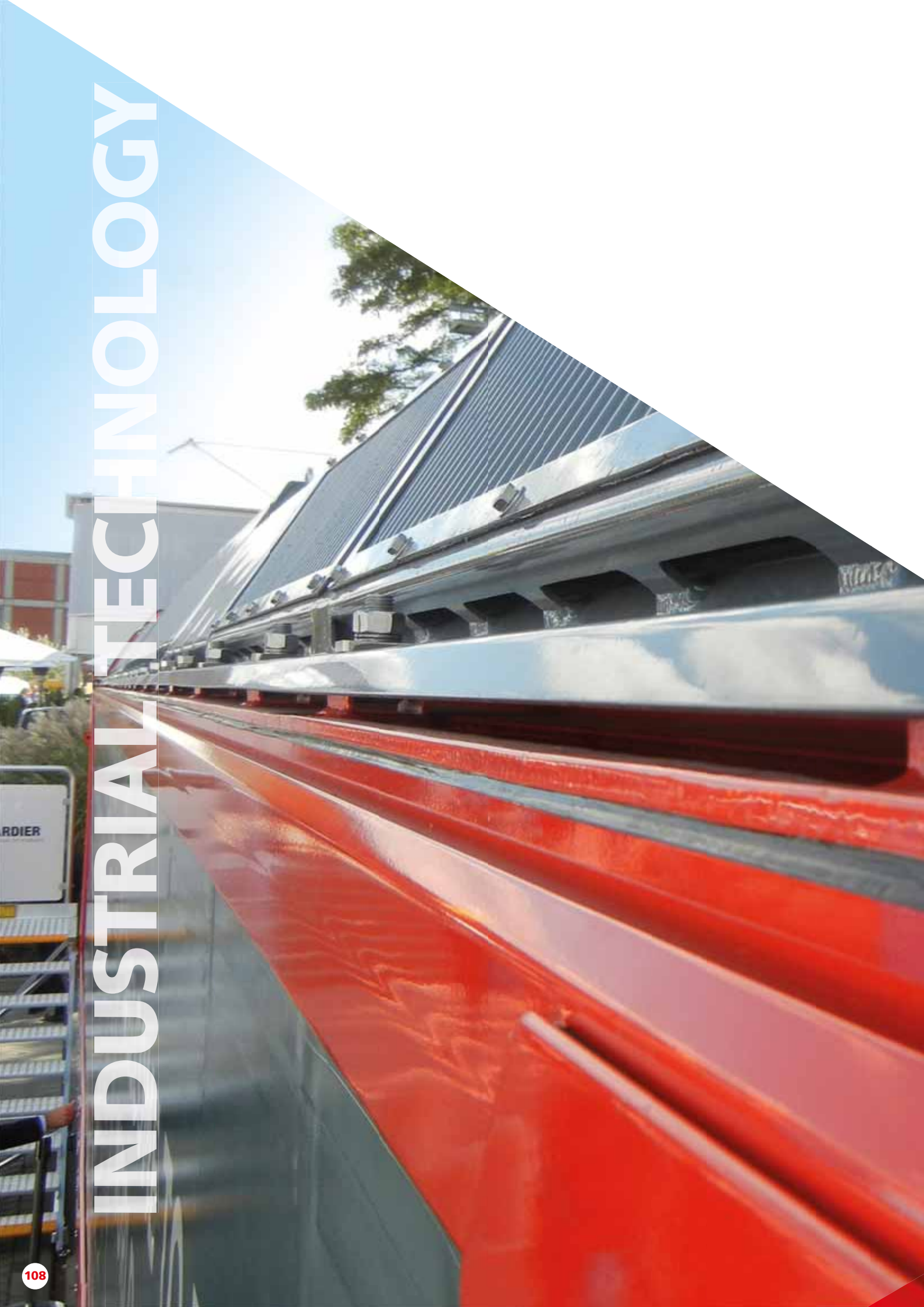
In compliance with ETA Assessment 11/0311 the partial safety values for the table above are assumed as γ_{M1} = 1.1 and γ_{M2} = 1.25
If other partial safety values are to be applied, the load capacities have to be calculated according to ETA Assessment 11/0311
① $N_{R,d}$: Design load according to type test S-WUE/120315 DETAN-E in accordance with ETA Assessment 11/0311
② Longer system lengths L consisting of several rods with connecting couplers are possible

Certificates

› European Technical Assessment (ETA): ETA-05/0207 (steel) and ETA-11/0311 (stainless steel)

See also Technical Product Information DETAN Rod System DT

INDUSTRIAL TECHNOLOGY



Easy to install with our Industrial Technology

With adjustable, bolted connections, the HALFEN Mounting and Framing system offers versatile and modular mechanical connection solutions: You can easily adapt the system to suit different situations. HALFEN Mounting and framing channels, together with the corresponding HALFEN T-bolts and threaded plates, form the basis for our system. They are used in numerous areas:

- Plant construction
- Mechanical engineering
- Steel construction
- Special vehicle engineering
- Conveyor systems
- Supply lines in tunnel and bridge construction
- Offshore supply lines

Together with our customers, we are continuously finding new applications for our system solutions, to face the challenges presented by a changing industry.

Bombardier Traxx

HALFEN
Mounting and Framing Channels

HALFEN Mounting and framing channels, used in combination with HALFEN Bolts and threaded plates provide all the benefits of a permanently adjustable bolt connection. Whether for low or very high loads: our extensive Industrial technology range has an economical solution guaranteed to meet your requirements.

With this sustainable installation system, components are quickly and easily installed, dismantled, adjusted and moved – again and again! The systems are a supporting and fixing element in one.

The most important features and benefits at a glance:

- Full flexibility in positioning and dimensioning a bolted connection
- Large selection of corrosion protection options
- Quick assembly and adjustment of equipment and mechanical components
- Easy to change or update entire plants without any mechanical work
- No specialists required to carry out modifications on site
- Dust-free and low noise levels for modification work carried out on site
- Clever modular system
- High level of safety due to visual marking of correct installation on HALFEN T-bolts
- No more welding in hazardous environments
- Heat damage to the corrosion protection of installed elements from welding is eliminated

Certificates

- CE marking according to EN 1090-1 for hot-rolled channels
- CE marking for cantilever brackets with declared design values according to EN 1993-1

We provide our customers with assured safety through its CE markings.
The CE marking with the Declaration of Performance covers:

- Certification of the production and the factory's in-house production control system according to EN 1090-2
- Details of design values with the calculations and trials on which they are based.
- Our engineers are certified according to EN 1090-1 for the drafting of planning services
- Quality assurance over the entire value added chain

Technical Data

› HALFEN Mounting and framing channels are offered with or without holes and in mill finish, hot-dip galvanized and a range of stainless steels

See also Technical Product Information HALFEN Flexible Framing Connections MT-FFC and HALFEN Flexible Bolt Connections MT-FBC

Materials

Versions

- Hot-dip galvanized FV or mill finish WB
- Sendzimir galvanized SV
- Stainless steel A4 1.4571/1.4404
- Stainless steel A2 1.4301/1.4307
- Stainless steel HCR 1.4547/1.4529
- HZM / HZL serrated profiles

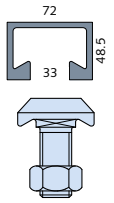
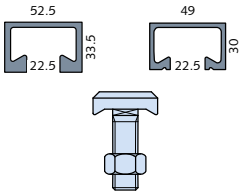
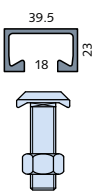
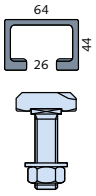
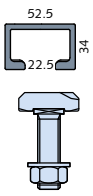
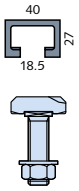
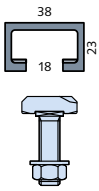
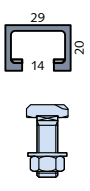
Steel structures

A4/L4: Steel in Corrosion Resistance Category (CRC) III according to EN 1993-1-4:2015-10, table A.3

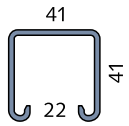
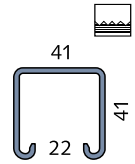
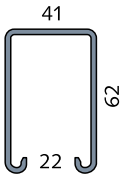
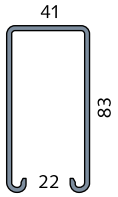
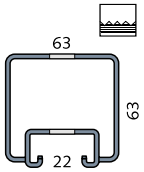
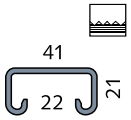
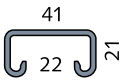
A2 Steel in Corrosion Resistance Category (CRC) II according to EN 1993-1-4:2015-10, table A.3

HCR: Steel in Corrosion Resistance Category (CRC) V according to EN 1993-1-4:2015-10, table A.3

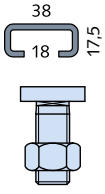
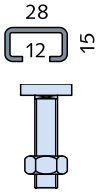
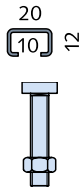
HEAVY DUTY MOUNTING AND FRAMING SYSTEM

Hot-rolled				Hot-rolled, toothed				
HM 72/48	HM 52/34	HM 50/30	HM 40/22	HZM 64/44	HZM 53/34	HZM 41/27	HZM 38/23	HZM 29/20
Maximum point-load capacity [kN] 47.0	Maximum point-load capacity [kN] 25.9	Maximum point-load capacity [kN] 14.4	Maximum point-load capacity [kN] 8.2	Maximum point-load capacity [kN] 38.1	Maximum point-load capacity [kN] 30.9	Maximum point-load capacity [kN] 17.8	Maximum point-load capacity [kN] 12.8	Maximum point-load capacity [kN] 7.8
								
HS 72/48, HSR 72/48, GWP 72/48	HS 50/30, HSR 50/30, GWP 50/30		HS 40/22, HSR 40/22, GWP 40/22	HZS 64/44	HZS 53/34	HZS 38/23	HZS 38/23, HS 38/17	HZS 29/20, HS 28/15

MEDIUM DUTY MOUNTING AND FRAMING SYSTEM

Cold-rolled	Cold-rolled, serrated	Cold-rolled		Cold-rolled, serrated		Cold-rolled
HM 41/41, HL 41/41	HZM 41/41, HZL 41/41	HM 41/62, HL 41/62	HM 41/83, HL 41/83	HZL 63/63	HZM 41/22, HZL 41/22	HM 41/22, HL 41/22
Maximum point-load capacity [kN] 5.6	Maximum point-load capacity [kN] 5.6	Maximum point-load capacity [kN] 5.6	Maximum point-load capacity [kN] 5.6	Maximum point-load capacity [kN] 5.6	Maximum point-load capacity [kN] 5.6	Maximum point-load capacity [kN] 5.6
						
						
HZS/HS 41/41, HZS 41/22, GWP 41/41, GWP 41/22						

LIGHT DUTY MOUNTING AND FRAMING SYSTEM

Cold-rolled		
HM 38/17	HM 28/15, HL 28/15	HM 20/12, HL 20/12
Maximum point-load capacity [kN] 4.8	Maximum point-load capacity [kN] 3.9	Maximum point-load capacity [kN] 2.24
		
HS 38/17, GWP 38/17	HS 28/15, GWP 28/15	HS 20/12, GWP 20/12

See also Technical Product Information HALFEN Flexible Framing Connections MT-FFC and HALFEN Flexible Bolt Connections MT-FBC

Product Range

Explore our unique range of channels and accessories. Choose from a wide selection of standard profiles with excellent load capacity values!

Heavy Duty HALFEN Mounting and framing channels, hot-rolled

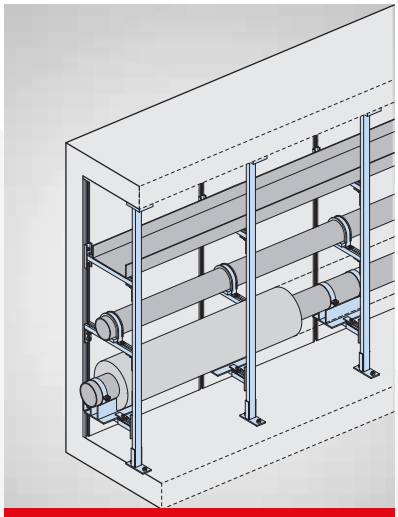
- For heavy loads
- For dynamic loads
- For welding on steel structures

Medium Duty HALFEN Mounting and framing channels, cold-rolled/hot-rolled

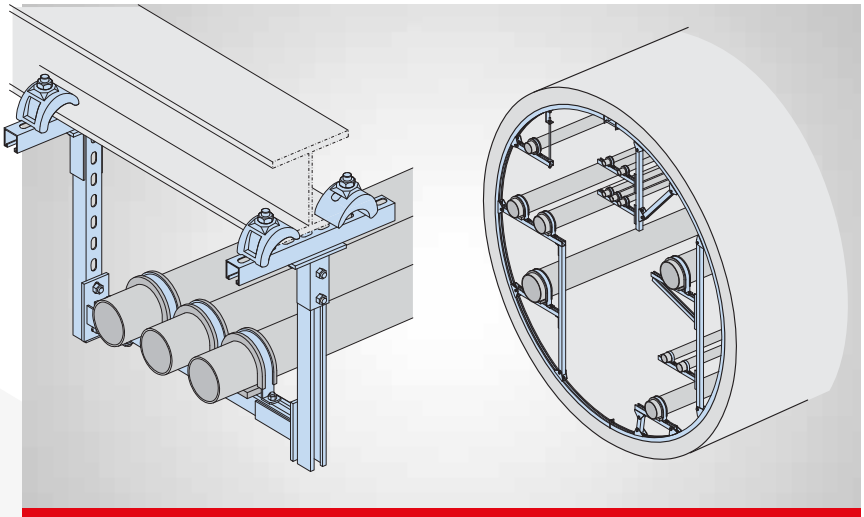
- For medium loads
- With only one bolt/threaded plate type
- Compatible with the HALFEN Powerclick system

Light Duty HALFEN Mounting and framing channels, cold-rolled

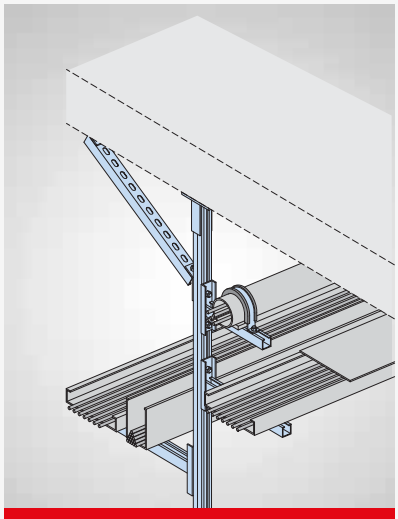
- For light loads
- Compact channel dimensions



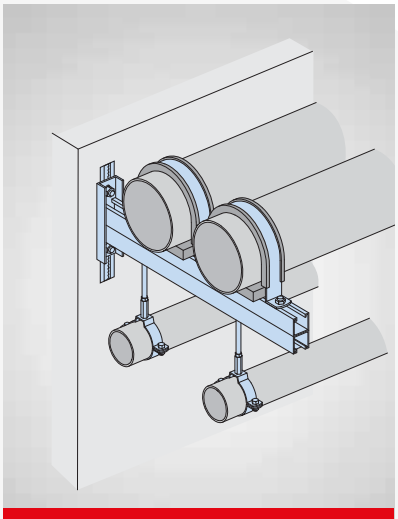
Arrangement of pipelines and cable tray in service gallery



Attachment of a framing construction consisting of HALFEN Framing channels and connecting parts on steel beams with HALFEN Beam clamps



Laying of pipelines and cables with height adjustable bolted-on cantilever brackets



Pipe fittings on a HALFEN Bracket

See also Technical Product Information
HALFEN Flexible Framing Connections MT-FFC and HALFEN Flexible Bolt Connections MT-FBC

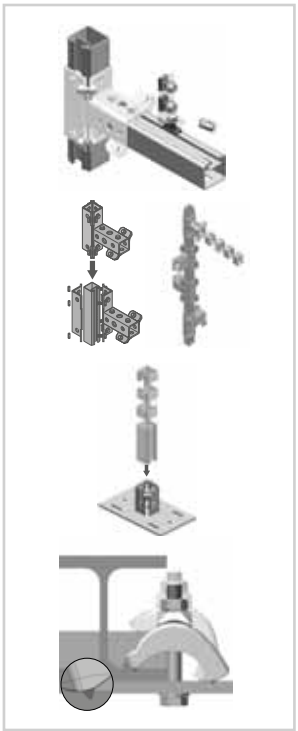
HALFEN POWERCLICK

Modular pipe support systems

The patented HALFEN POWERCLICK system has become proven technology for pipe supports in large scale industrial plant projects. It is innovative, efficient and permanently adjustable. Therefore, the HALFEN POWERCLICK system meets the high demands for a simple, versatile, time and cost-effective system for use in modern plant construction and mechanical engineering.

The most important features and benefits at a glance:

- Multi-functional component types
- Short assembly times
- The majority of parts are ex-stock, and available for immediate delivery!
- Most components are delivered pre-assembled, easy to store, and ready for use on site!
- Optimum adjustment range
- Lower weight than conventional steel construction with similar torsional stiffness
- Safe due to defined load capacity
- Mechanically interlocking parts



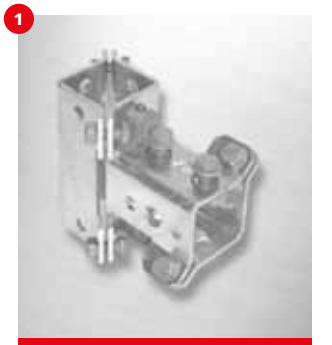
Certificates

- The HALFEN POWERCLICK system is patented

Product Range

Multi-functional components with the HALFEN POWERCLICK HCS system 63:

- One channel profile for all pipe supports
- One corner connector in two types allows 112 connection combinations
- One beam clamp for all beam sizes for connection to the structural steelwork

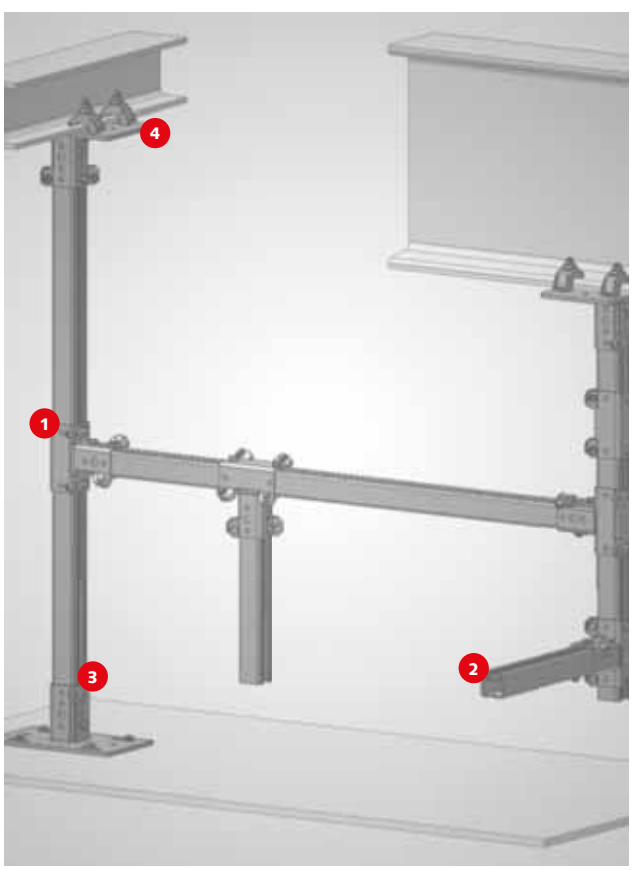


Corner connector

Channel profile

Base support

Beam clamps



See also Technical Product Information HALFEN POWERCLICK System 41 + 22 PC 41, System 63 PC63 and Accessories PC Z

HALFEN ACCESSORIES FOR MODULAR PIPE SUPPORT SYSTEMS

HALFEN's extensive range of products is rounded off with its large selection of accessories.
You can get everything from a single source whilst ensuring the highest level of safety and quality.

HALFEN
Cantilevers

For complete support systems use HALFEN Cantilever brackets, which are made from HALFEN Mounting and framing channels, and offer all their advantages. They allow quick, safe and adjustable installation.

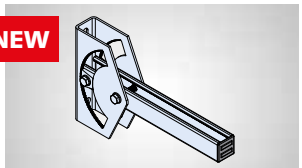
The most important features and benefits at a glance:

- Verified load capacity
- Easy and quick to install
- Compatible with System 41 brackets and with the HALFEN POWERCLICK system

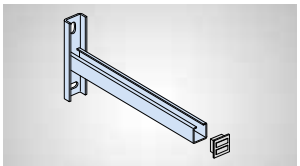
Product Range

HALFEN Cantilevers come in different finishes and are suitable for low and high load levels.

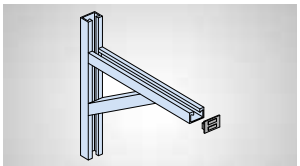
NEW



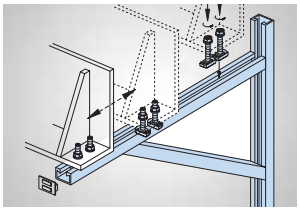
Flexible HALFEN Cantilever bracket KON 41/V

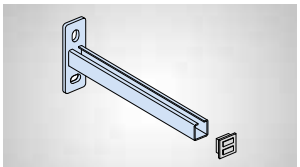


KON 41/1



KON 52/2





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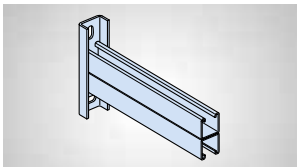

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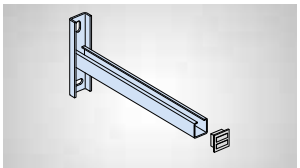

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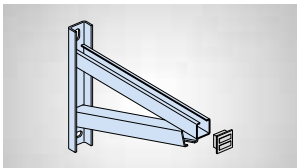

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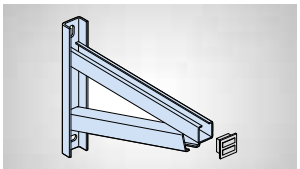

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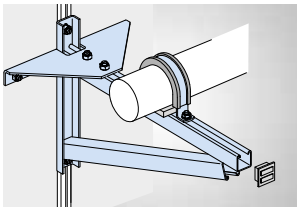


Technical Data

No need for any mechanical reprocessing on site, no damage to corrosion protection

Certificates

- CE marking according to EN 1090-1
- CE marking for cantilever brackets with declared design values according to EN 1993-1

HALFEN
Pipe Clamps

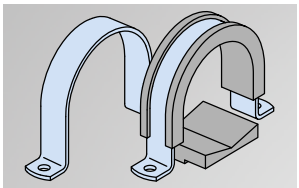
HALFEN Pipe clamps have been designed for adjustable installations in pipework constructions for use with all HALFEN Mounting and framing channels. The material sizes have been designed to suit typical requirements, so that a combination of the HALFEN POWERCLICK system with HALFEN Pipe clamps is a most cost-effective solution. Connection to the frame with HALFEN T-bolts means piping layout can be easily changed or upgraded at any time!

The most important features and benefits at a glance:

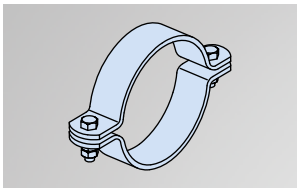
- A wide range of applications:
  Covering pipe diameter range of 15 – 530 mm axially braced and/or sliding pipe fitting
- Hot-dip galvanized and stainless steel available
- Matching pipe rests and EPDM insulators also available

Product Range

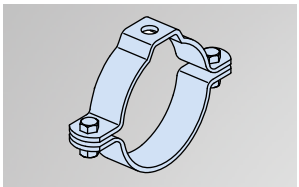
HALFEN Pipe clamps come in different versions and are suitable for low and high loads.



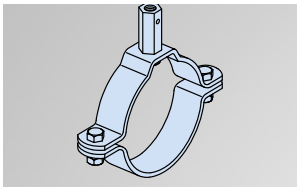
HRS-A/HCS-RAD
Alpha pipe clamp



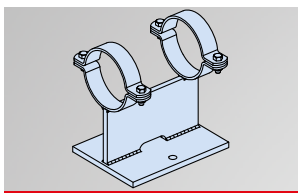
HRS-B
Beta pipe clamp



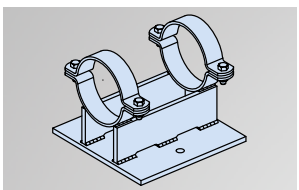
HRS-G
Gamma pipe clamp



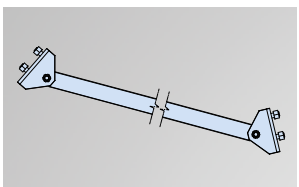
HRS-D
Delta pipe clamp



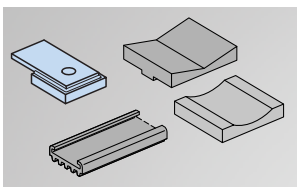
HRG-1
Pipe shoe



HRG-2
Pipe shoe



GST
Hinged brace



Spacer clips, pipe supports, rubber insulation

See also Technical Product Information HALFEN Flexible Framing Connections MT-FFC and HALFEN POWERCLICK Accessories PC Z

HFX HALFIX

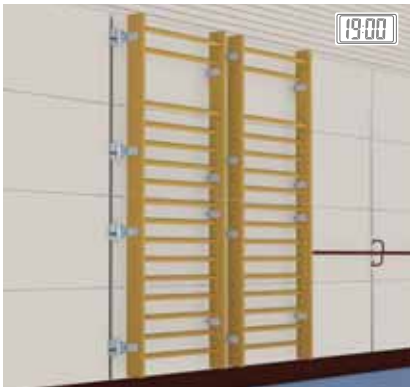
The versatile positioning system

The HALFIX system is used where interior fit-outs, public facilities or multi-purpose buildings need to be adapted quickly and cost effectively to meet changing daily requirements. At a time when the population is steadily rising and dedicated single-use building space for education and sports-based facilities is limited, it is essential that optimum use is made of the space available. Consider that purpose-built facilities are often only used for about 20 to 40% of the time. This is where versatile, future-proof and cost-effective interior fit-out solutions are required.

Once the walls are fitted with the HALFIX Channels, areas in a building (for example, schools, sports halls, fitness studios, classrooms) can be rapidly re-purposed by the building occupants to suit multiple uses through the quick and easy removal and repositioning of various elements.

The most important features and benefits at a glance:

- Rapid re-adaptation of space:
  - Quickly and simply interchange between different uses
  - Rooms can be used for many different purposes - even those currently unknown
- Future-proof:
  - Change building use without the need to modify the underlying structure - no engineers, no sub-contractors, no architects required!
  - No need for engineering calculations of individual fixing points
- Cost-effectively reconfigure rooms or even entire buildings
- Increased use of facilities
- Multiple fixing points can be pre-assigned
- Positive interlocking fixing system
- Does not hinder access to building services
- No need for any specialist contractors or workers to change interior purpose



Product Range

The HALFIX Channel 53/34 forms the basis for the system. It is combined with a specially developed inlet and a matching adapter bolt. The adapter bolt allows load-bearing elements to be fixed securely or removed from the inlets in a matter of seconds.

Advantage of the system: When they are not in use, the inlets can simply remain in the channel for later re-use. No need for removal.

HALFIX Base Channels

Depending on the existing conditions, you can choose between the floor-to-ceiling channel system and the wall mounted channel system. As soon as the channels are installed, the room can be converted to different uses.


HALFIX Panel-mounting Channel

For the installation of climbing, acoustic and high-impact panels, panel-mounting channels are available.




HALFIX Fastening System

HALFIX Power System

A heavy-duty fastening system for the connection of slacklines, climbing ropes and nets to the base channel. Two Power inlets and a special heavy-duty power attachment are used. The system has been designed as a heavy load anchorage in accordance with DIN 79400.

HALFIX Classic System

The Classic Inlet is used to mount various sports and recreation equipment, or to connect room dividers, furniture and multi-media equipment to the base channel. Fixing points are easily moved or removed, according the needs of the activity.


HALFIX Accessories

Protect channel covers and Inlet covers prevent pinching.

4-Hole adapter plate for the quick installation of different kinds of surface mounted panels, to suit the intended use of the space.

HALFEN HVG VERSOGRID

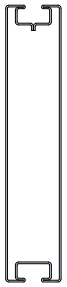
Installation grid as a versatile fixing system

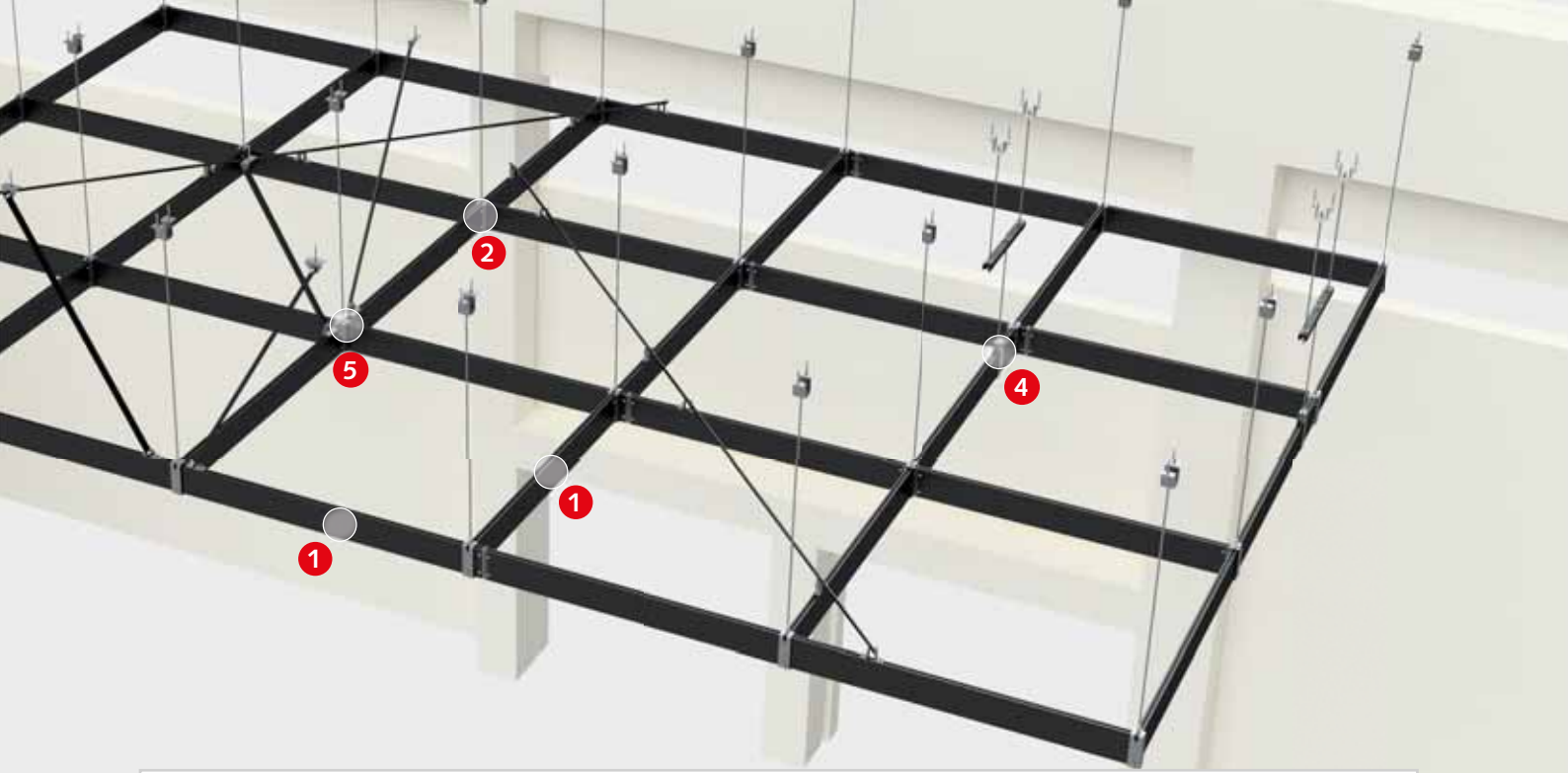
Whether in exhibition halls, train stations and airports or other large indoor venues with fluctuating public traffic, suspension systems must be designed for maximum flexibility and adaptability. Roof and ceiling elements – beams, girders, existing building services or unevenness in the main building structure – often make installation difficult when large display screens or panels, loudspeakers or spotlights or other objects and paraphernalia need to be installed.

HALFEN VERSOGRID provides an innovative solution:
The installation grid creates a level plane below concrete roofs or steel girder structures – requires minimal time and installation work.

The most important features and benefits at a glance:

- Light-weight: The main profiles and the cross elements only weight 5.5 kg per metre.
- Fast installation: Simple and quick installation and removal of the cross elements – no bolts required.
- Variable: Suspension is also possible via the cross elements, if pipes, services e.g. are located above the main profiles.
- Minimal visible joints: All butt joints have ±1 mm longitudinal tolerance to allow for temperature expansion and installation tolerances.

Main profiles and accessories		Weight	max. allowable point load capacity	Connect using system components to	Standard colour selection
	HS 28/15	5,5 kg/m	3,0 kN	Concrete	**strip-galvanized or powder coated** Traffic yellow **RAL 3020** Traffic orange **RAL 2009** Traffic red **RAL 3020** Traffic blue **RAL 5017** Traffic green **RAL 6024** Traffic white **RAL 9016** Signal grey **RAL 7004** Graphite black **RAL 9011** Each RAL colour is available in two finishes **(matt or high gloss)**
	HVG-HM 40/200				
	Suspension ring bolt HVG-SR			Steel	

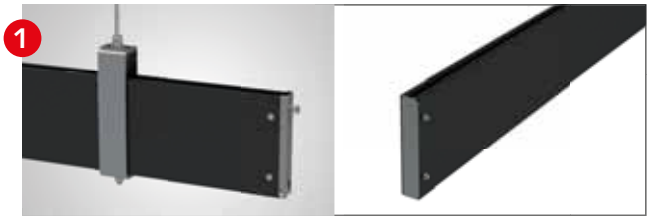


Technical Data

The HALFEN HVG VERSOGRID Installation grid is a system for installation of lighting and media equipment. It is ideal for regular configuration and re-configuration of suspended loads. The double slot profile allows components to be fastened to both the top and bottom over the entire length of the profile.

Depending on load requirements grid spacings between 1.0 m and 6.0 m are possible. Using a single channel type for both the main profiles and cross elements provides a flush installation plane. This makes the cross elements equally suitable for suspension. Using the system components the installation grid is fastened either to concrete with dowels or with clamps to steel girders.

Product Range

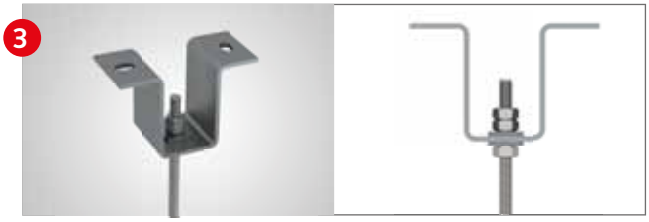


HVG-HM 40/200 Double slot profile as a main profile or cross element 2000 mm < l < 6000 mm with profile connector as a interlocked slot-in connection, or with an end cap

HVG-SU Suspension unit, freely adjustable

HVG-CC Cross connector with suspension point

HVT-VB Vertical bracer, freely placeable over the length of the profile



HVG-HB Hat bracket for connecting to concrete

HVG-SR Suspension ring bolt for attaching load-bearing elements

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Worldwide contacts for Leviat:

Australia
Leviat
98 Kurrajong Avenue,
Mount Druitt, Sydney, NSW 2770
Tel: +61 - 2 8808 3100
Email: info.au@leviat.com

Austria
Leviat
Leonard-Bernstein-Str. 10
Saturn Tower, 1220 Wien
Tel: +43 - 1 - 259 6770
Email: info.at@leviat.com

Belgium
Leviat
Borkelstraat 131
2900 Schoten
Tel: +32 - 3 - 658 07 20
Email: info.be@leviat.com

China
Leviat
Room 601 Tower D, Vantone Centre
No. A6 Chao Yang Men Wai Street
Chaoyang District
Beijing · P.R. China 100020
Tel: +86 - 10 5907 3200
Email: info.cn@leviat.com

Czech Republic
Leviat
Business Center Šafránkova
Šafránkova 1238/1
155 00 Praha 5
Tel: +420 - 311 - 690 060
Email: info.cz@leviat.com

Finland
Leviat
Vädursgatan 5
412 50 Göteborg / Sweden
Tel: +358 (0)10 6338781
Email: info.fi@leviat.com

France
Leviat
18, rue Goubet
75019 Paris
Tel: +33 - 1 - 44 52 31 00
Email: info.fr@leviat.com

Germany
Leviat
Liebigstrasse 14
40764 Langenfeld
Tel: +49 - 2173 - 970 - 0
Email: info.de@leviat.com

India
Leviat
309, 3rd Floor, Orion Business Park
Ghodbunder Road, Kapurbawdi,
Thane West, Thane,
Maharashtra 400607
Tel: +91 - 22 2589 2032
Email: info.in@leviat.com

Italy
Leviat
Via F.lli Bronzetti 28
24124 Bergamo
Tel: +39 - 035 - 0760711
Email: info.it@leviat.com

Malaysia
Leviat
28 Jalan Anggerik Mokara 31/59
Kota Kemuning, 40460 Shah Alam
Selangor
Tel: +603 - 5122 4182
Email: info.my@leviat.com

Netherlands
Leviat
Oostermaat 3
7623 CS Borne
Tel: +31 - 74 - 267 14 49
Email: info.nl@leviat.com

New Zealand
Leviat
2/19 Nuttall Drive, Hillsborough,
Christchurch 8022
Tel: +64 - 3 376 5205
Email: info.nz@leviat.com

Norway
Leviat
Vestre Svanholmen 5
4313 Sandnes
Tel: +47 - 51 82 34 00
Email: info.no@leviat.com

Philippines
Leviat
2933 Regus, Joy Nostalg,
ADB Avenue
Ortigas Center
Pasig City
Tel: +63 - 2 7957 6381
Email: info.ph@leviat.com

Poland
Leviat
Ul. Obornicka 287
60-691 Poznań
Tel: +48 - 61 - 622 14 14
Email: info.pl@leviat.com

Singapore
Leviat
14 Benoi Crescent
Singapore 629977
Tel: +65 - 6266 6802
Email: info.sg@leviat.com

Spain
Leviat
Polígono Industrial Santa Ana
c/ Ignacio Zuloaga, 20
28522 Rivas-Vaciamadrid
Tel: +34 - 91 632 18 40
Email: info.es@leviat.com

Sweden
Leviat
Vädursgatan 5
412 50 Göteborg
Tel: +46 - 31 - 98 58 00
Email: info.se@leviat.com

Switzerland
Leviat
Hertistrasse 25
8304 Wallisellen
Tel: +41 - 44 - 849 78 78
Email: info.ch@leviat.com

United Kingdom
Leviat
A1/A2 Portland Close
Houghton Regis LU5 5AW
Tel: +44 - 1582 - 470 300
Email: info.uk@leviat.com

USA / Canada
Leviat
6467 S Falkenburg Rd.
Riverview, FL 33578
Tel: (800) 423-9140
Email: info.us@leviat.us

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