HALFEN HIT INSULATED CONNECTIONS
Thermal insulation connections for balconies and structural components
Designers, architects and building contractors are fully aware when designing cantilevered balconies and other cantilevered components that these need to be considered in the concept for the thermal insulation of a building. This is the only way to meet Energy Saving Ordinance demands and to reduce heat loss.

HALFEN HIT Insulated connections provides a versatile and innovative range of products to meet the requirements.

The new HALFEN HIT Steel to concrete connector is now available to connect filigree steel structures to concrete elements. These reduce thermal bridges with simultaneous high load transfer.

The proven HALFEN HIT Concrete to concrete connections not only ensure optimum thermal insulation, they also comply with the highest fire safety requirements, and can be used in a wide range of installation situations.

This brochure illustrates a selection of possible applications. Our HALFEN engineering team is available to support construction projects with exceptional demands.

Go for quality and innovation with HALFEN HIT Insulated connections.
An evocative landmark, re-interpreted

NEUER HENNINGER-TURM, GERMANY

With a height of 140 metres, the new Henninger Tower in Frankfurt am Main is one of the highest residential buildings in Germany. The architectural design is based on the grain silo of the Henninger Brewery which occupied the site before being demolished in 2013. The new building is now regarded as one of Frankfurt’s landmarks.

The apartments in the tower were designed with spacious balconies, whereby the HIT Balcony connections play their part to ensure the upmarket standard of the residential units.

Location: Frankfurt, Germany
Architects: MEIXNER SCHLÜTER WENDT Architekten
THE HALFEN SHOW HOUSE

All applications at a glance

Welcome to the HALFEN show house. Sit back and enjoy the tour. This unique, virtual building contains numerous examples of our HIT Insulated connections in use. Explore the applications for HIT Insulated connections concrete to concrete in more detail on the following pages, from the insulated corbelled support for brickwork at ground level to the connection of roof parapets.

**HIT Steel to concrete connector elements** for steel-frame balcony applications are now also available.

We can also provide you with custom solutions specifically developed for your specific building projects. Contact us and find out more.
YOUR BENEFITS WITH HIT: CHOSE QUALITY!

HIT STEEL TO CONCRETE CONNECTORS PROVIDE:

› RELIABLE PLANNING AND DESIGN
All steel to concrete connectors are approved by the DIBt* Berlin. Apart from the design concept and the construction specifications, the determination of the equivalent thermal conductivity (λeq) is also regulated.

› ROBUST
The elements are designed to be robust and suitable for on-site installation. They are characterized by a weather-resistant box as reliable protection for the mineral wool insulation core.

› INSTALLATION AID
For easy and quick installation an installation aid is pre-fitted as standard to help assembly and adjustment in the formwork. This reduces the time required for installation and is therefore more cost-effective.

› ADJUSTING THE STEEL COMPONENTS
Connected components are easily and freely adjustable using the integrated angled slotted bracket: Lightly tap with a hammer to adjust.

› RELIABLE SUPPORT OF THE NOTCH
The angled slotted bracket plate has a bevelled edge to ensure facing plates are properly connected. This prevents unintentional movement or twisting of the connecting components. This results in a reliable, friction-locked transfer of the loads.

HIT CONCRETE TO CONCRETE CONNECTIONS PROVIDE:

› OPTIMUM PLANNING RELIABILITY!
HIT insulated connections meet the fire protection requirements of fire resistance class REI 120 and have building authority approved Ψ-values for a compliant, detailed verification of thermal bridges.

› VERSATILE FLEXIBILITY!
HIT insulated connections provide the right solution for every application. With a wide range of products to choose from (HIT-HP with 80mm insulation and HIT-SP with 120mm insulation) with numerous possible combinations.

› RELIABLE INSTALLATION
Thanks to the special shape of the innovative double-symmetrical CSB bearing, the HIT insulated connections for cantilevered balconies (HIT-HP/SP MVX) and Loggias (HIT HP/SP DD and DDL) are symmetrical. This means they can be installed regardless of the direction of the slab or balcony.

› NO ADDITIONAL WORK!
All necessary verification processes have already been considered.

› ECONOMICAL PLANNING!
The HIT planning software is designed to optimize cut-offs. This ensures planning is particularly economical and efficient meaning HIT insulated connections can be installed quickly.

* DIBt German Institute of Construction Engineering.
STEEL BALCONIES
Extremely adaptable

Steel structures, steel balconies, canopies or shading systems are often connected to reinforced concrete elements. Steel’s high thermal conductivity requires an efficient thermal separation in the connection to minimize thermal bridges, to avoid higher energy consumption, and to prevent condensation damage to the structure.

HALFEN HIT Insulation connections for steel-to-concrete application reduce thermal bridges to a minimum with high loads transfer capability.

FEATURES

- DIBT* Berlin: General building approval no. Z-15.7-336 including calculation of equivalent thermal conductivity (λ_eq)
- Insulation thickness: HIT-HP 80 mm, HIT-SP 120 mm
- Insulation material: Non-flammable mineral wool
- HIT-SDV – Individual connections for steel balconies with alternating moment load transfer and shear loads up to 75 kN:
  For slab thickness from 18 cm
- HIT-SMV – Individual connections for steel balconies with moment load transfer and shear load up to 52 kN:
  For slab thickness from 18 cm
- All HIT-SMV Types are suitable for application in semi-precast elements with no additional stirrups required

*DIIt German Institute of Construction Engineering.

YOUR BENEFITS

- ROBUST CONSTRUCTION ELEMENT:
The mineral wool insulation core is protected by a robust box, suitable for construction site applications.

- HIGHLY ADJUSTABLE:
The integrated steel, angled slotted bracket is easily and freely adjustable. The bevelled edge of the bracket ensures reliable and even support of the notch even with the typical manufacturing tolerances for weld seams.

HIT-SZV for supported balconies

- has all the main characteristics of steel to concrete connectors
- for shear loads up to 75 kN
- suitable for application in semi-precast elements
CANTILEVERED BALCONIES
Modern charm in a Mediterranean setting:  
**CASA PORCHE, SPAIN**  

A dream in glass and concrete. This minimalist house in Morales del Vino, Spain, with a floor to ceiling glass façade that visually connects the interior of the building with the outdoor spaces.

The reinforced concrete flat roof has a cantilevered overhang. The thermal-bridge from the inside to the outside portion of the flat roof is technically particularly challenging. However, the HIT Insulated connections used in this project provide optimum thermal insulation.

**Location:** Morales del Vino, Spain  
**Architects:** Julio Pérez Domínguez, Daniel Fernández-Carracedo
System solutions for every building situation

Whether the height is offset or not, the construction is straight or runs around a corner, the HIT Insulated connections offer the optimum solution for every cantilevered balcony. Thanks to the versatile system, you can also combine various connection elements to consider expected horizontal loads including alternating shear loads or moments and transfer them safely to the main slab.
Limited space or offset heights?

Situations where the walls have minimal thickness, or the main slab construction is vertically offset require short balcony connections that are suitable for the load. The HIT-MVX OU and HIT-MVX OD elements have an anchor head bar, which makes a connection to the main slab possible starting with a width of 175 mm.

FEATURES

› Fire protection class REI 120 (F120)
› European Technical Assessment ETA-18/0189
› Insulation thickness: HIT-HP 80 mm, HIT-SP 120 mm
› Insulation material: non-flammable mineral wool
› HIT-MVXL – balcony connection for shear loads up to 426 kN/m for slab thickness from 18 cm
› HIT-DVL – balcony connection with 80 mm mineral wool for moment loads up to 268 kN/m for slab thickness from 16 cm
› HIT-MVX – symmetrical balcony connection for shear loads up to ±192 kN/m for slab thickness from 16 cm
› HIT-MVX OU – balcony connection with an angled anchor head for shear load transfer of up to ±192 kN/m for a slab thickness from 16 cm
› HIT-MVX OD – balcony connection with straight anchor head and for shear loads up to ±155 kN/m for slab thickness from 16 cm
› Supplied in two parts, therefore all HIT-MVX types are perfect for use in semi-precast slabs

YOUR BENEFITS

› HIT-MVXL FOR CHALLENGING CANTILEVER PROJECTS:
Realise even the most challenging balcony projects with the new HIT-MVXL! Transfer even higher shear loads and eliminate the need for additional recesses in the main slab when using semi-precast slabs in corner applications.

› IMPROVED BUILDING PHYSICAL CHARACTERISTICS:
By further optimising the shape of the CSB bearing, the number of support elements can be significantly reduced. This improves the physical structural characteristics by 30%.
CORNER BALCONY
Designed for corners!

From a structural point of view, a reinforced concrete slab projecting around a corner is a potentially critical detail, as high shear loads concentrate at corners. HALFEN also has a HIT solution for this.

FEATURES

- Fire protection class REI 120 (F120)
- European Technical Assessment ETA-18/0189
- Insulation thickness: HIT-HP 80 mm, HIT-SP 120 mm
- Insulation material: non-flammable mineral wool
- HIT-MVXL – balcony connection for shear loads up to 426 kN/m for slab thickness from 18 cm
- HIT-MVX – symmetrical connection for shear load transfer of up to ±192 kN/m for a slab thickness from 16 cm
- HIT-MVXL – tension and shear load bars on one level, no compression bars on the lower level

YOUR BENEFITS

- VERSATILE SYSTEM:
  With the new HIT-MVXL and HIT-DVL elements, unusual balcony designs can now be realized even more efficiently.
- SIMPLE INSTALLATION:
  Avoid conflicts with the rebars in the main slab with the clever reinforcement layout to facilitate on-site installation.
- DESIGNED FOR CORNERS:
  Precast cantilevered corner balconies can also be designed and manufactured with HIT-MVX COR elements.
SUPPORTED BALCONIES
In the Chicago style of the 1900s:

**TERRACE EAST, CANADA**

With its clearly structured stone façade and the large, three-part windows this six-storey building in Moose Jaw, Saskatchewan is unmistakably reminiscent of the Chicago-style of the 1900s. The 36 apartments all have spacious balconies (5.30 m × 5.55 m and 5.30 m × 3.10 m).

The panels incorporated as interior corners are connected with heat-insulating HIT Insulated connections.

**Location:** Moose Jaw, Canada

**Architects:** Anton Tangedal Architect Ltd., Robinson Residential
**HIT-ZVX and HIT-ZDX:**
Reliable connections – without fail

Requirements for balconies on supporting columns vary; for those with supports on the outside, one connection element with shear force transfer in one direction is enough in most cases.

Slabs that project further out pass the columns may require an element with positive and negative shear capacity. There are two variants of the HIT-ZVX and HIT-ZVD: with straight or with bent bars.

**FEATURES**
- Fire protection class REI 120 (F120)
- European Technical Assessment ETA-18/0189
- Insulation thickness: HIT-HP 80 mm, HIT-SP 120 mm
- Insulation material: non-flammable mineral wool
- HIT-ZVX – shear load transfer of up to 356 kN/m for a slab thickness from 25 cm considering verification of the concrete compression brace
- HIT-ZVX – element load-bearing capacity of up to ± 409 kN/m
- HIT-ZDX – element load-bearing capacity of up to ±409 kN/m
- Cantilevered shear load bars in the main slab with minimal anchoring depth (from 175 mm)

**YOUR BENEFITS**
- **GUARANTEED TO TAKE THE LOAD:**
  Playing it safe with the extremely high load-bearing capacities of the HIT-ZVX and HIT-ZVD.
- **SAVES TIME:**
  All the necessary verification processes have already been provided.
- **SIMPLE COMBINATIONS:**
  With planned horizontal loads, HIT-HT elements can be selectively added.

**HIT-HT Types, suitable for horizontal loads**
The solution for continuous slabs

Unlike cantilevered balconies, a loggia is set back into the building. This means that the balcony is part of the continuous slab and is not supported by a wall. To prevent heat loss through the slab that runs out to the exterior of the building, the HIT Insulated connections HIT-DD, HIT-DDL and HIT-ZVX are installed without CSB bearings.

FEATURES

- Fire protection rating REI 120 (F120)
- European Technical Assessment ETA-18/0189
- Insulation material: non-flammable mineral wool
- Insulation material thickness: HIT-DDL – HIT-HP 80 mm; HIT-DD – HIT-HP 80 mm, HIT-SP 120 mm
- HIT-DDL symmetrical balcony connection for alternating moment loads up to ±268 kNm/m for slab thickness from 16 cm
- HIT-DD symmetrical balcony connection for alternating shear loads up to ±243 kN/m for slab thickness from 16 cm

YOUR BENEFITS

- RELIABLE INSTALLATION:
  The HIT-DDL and HIT-DD Elements are symmetrical and can be installed irrespective of the main slab or balcony direction. This helps prevent installation errors.
- CLEVER CONNECTIONS:
  The exceptional performance of the HIT-DDL elements allows greater freedom in architectural design.
ACCESS BALCONIES

The alternative to multiple staircases

An alternative to stairs for connecting multiple flats and apartments is an access balcony. This has an advantage of requiring fewer stairwells to be built. The main advantage however, is fire protection, the open corridor can function as a primary escape route. The standard HIT Insulated connections, concrete to concrete elements used to connect the access balcony to the building already meet the requirements of fire protection class REI 120.

The type of HIT Insulated connections used for connecting access balcony elements vary depending on the construction method. For example, supported slab elements are connected to the building using HIT-ZVX or HIT-ZDX elements.
DESIGN ELEMENTS
Simple elegance in Bremerhaven:

**OCEON 1, GERMANY**

The office building "Oceon 1" is an office and residential buildings in a new district of Bremerhaven. The buildings are grouped around a historic loading crane and link the history of the New Harbour with modern architecture.

The façade of the first office building "Oceon 1" is divided into evenly spaced floor to ceiling windows and sculpturally modelled façade elements made from light white concrete with different surface structures. These elements complement the brass-coloured anodized aluminium profiles of the windows particularly well.

The horizontal slab-elements are connected to the concrete floor-slabs with insulated HIT corbel elements.

**Location:** Bremerhaven, Germany  
**Architects:** WESTPHAL ARCHITEKTEN BDA, Bremen
Parapets and corbels

Architectural details such as parapets, corbels and parapets at roof level must be integrated in the thermal insulation concept. The insulating building envelope should be completely sealed. The HIT Insulated connections offer solutions with exact connections even for small-sized components.

FEATURES

- Fire protection class REI 120 (F120)
- European Technical Assessment ETA-18/0189
- Insulation thickness: HIT-HP 80 mm, HIT-SP 120 mm
- Insulation material: non-flammable mineral wool
- HIT-AT – available in two variants:
  - with short (19 cm) or longer (27 cm) rods
- HIT-FT – available in two versions with shear load transfer in one or both directions
- HIT-OTX – available for two corbel sizes:
  - from 155 mm and from 195 mm

YOUR BENEFITS

- FOR CREATIVE ACCENTS:
  With the HIT Insulated connections you benefit from greater creative freedom, even with small-sized highlights.

- HALFEN QUALITY STANDARD:
  High load-bearing capacities and the reliable quality of HALFEN are typical of all HIT Insulated connections for installation situations from the roof (parapets) to the base (plinth) of a building.
CANTILEVERS
For creative accents in the façade
WALL AND BEAM CONNECTIONS

Protruding wall and beam elements must be considered in the overall thermal insulation concept.

Using the HIT-WT wall connection and the HIT-ST beam connection as insulating elements ensures effective thermal separation and an effective and reliable connection between external and internal building components.

HIT-WT:
Wall connection

HIT-ST:
Beam connection
FEAT URES

- Fire protection class REI 120 (F120)
- Insulation thickness: HIT-HP 80 mm, HIT-SP 120 mm
- Insulation material: non-flammable mineral wool
- HIT-WT – connection for wall elements
  - transfers moment loads up to 801 kNm
  - and shear load up to 208 kN
  - for wall heights from 1.00 m and wall thicknesses of 15 cm
- HIT-ST – point load connections for beams incl. downstand beams
  - transfers moment loads up to 71 kNm
  - and shear load up to 94 kN
  - for element heights up to 100 cm and widths up to 32 cm

YOUR BENEFITS

- EASY TO TRANSPORT:
  HIT-WT elements are delivered in two or three separate units, this helps to simplify transportation. (Top, Middle and bottom parts)
  The HIT-ST is delivered together as one complete element.
- REI 120 QUALITY AS STANDARD:
  Beneficial for future fire protection requirements:
  As standard all HIT elements meet the highest fire protection demands of fire protection class REI 120.
- NEARLY ANY DESIGN POSSIBLE:
  The wall and beam connection elements can be adapted to almost any design. This saves considerable construction time.
FIRE PROTECTION WITH HIT INSULATED-CONNECTIONS
CONCRETE TO CONCRETE CONNECTION

On the safe side!

Since 2016, fire barriers have been an integral part of fire protection measures in External Thermal Insulation Composite Systems (ETICS) made of expanded polystyrene foam (EPS). The fire barrier must be incorporated in the planning of buildings containing thermal insulation made of EPS. The new regulation also states that "accessible, cantilevered external components in the façade", e.g. balconies and access balconies, can act as a fire barrier.

Applies for fire barriers at balconies:
Elements for connecting balconies that meet at least fire protection class REI 30 can be used as a fire barrier.

› HIT-HP and HIT-SP Elements, concrete to concrete connections, are classified with the highest fire protection class as standard (REI 120) This avoids on site mix-ups of connection elements.

WHAT THE FIRE PROTECTION CLASS REPRESENTS:

R The reliable stability of the connection is ensured for the period specified.
E The room-dividing effect of the connection is ensured for the period specified.
I The thermal insulating function of the connection is maintained for the period specified.
120 The characteristics mentioned above are guaranteed for 120 minutes of exposure to fire according to the standard temperature-time curve.

YOUR BENEFITS

› FIRE PROTECTION INCLUDED!
All HIT-HP and HIT-SP Elements, concrete to concrete connection, significantly exceed the minimum requirements for fire protection and can therefore be used as fire barriers on all balconies.

› MAXIMUM PLANNING RELIABILITY!
With HIT-HP and HIT-SP Elements, concrete to concrete connections, you benefit from reliable and safe planning. There are no additional costs to consider for products with a higher fire protection class, because the elements come with it as standard.

› SAFE CONSTRUCTION!
No risk of confusion or mix-ups. Because the HIT-HP and HIT-SP Elements concrete to concrete connections have one high standard of fire protection there is no risk of confusion or mix-ups during installation.
HALFEN –
Your partner for BIM

HALFEN product and detailing plans created by our engineers for your projects are also provided as BIM (Building Information Modeling) CAD files to generate a 3D model of your building. Using BIM software for the design, construction process and maintenance of a building makes it much easier for architects, builders and suppliers to coordinate all aspects of a project. All information relevant to a building is made available in one place. Problems between various building disciplines can be quickly checked. All involved parties can cooperate more effectively resulting in real time and cost saving.

VISIT THE HALFEN CAD-PORTAL:
numerous, versatile and complimentary 2D and 3D files available for download!
When it comes to connecting your components, you need products you can be sure of, products you can rely on. That is why for decades professionals have been choosing HALFEN. Our products are the culmination of continuous optimization and development; they are manufactured with high quality materials in our regularly monitored production facilities. We have a wide range of connecting elements for all your construction projects.

Go for quality – choose “MADE BY HALFEN”.

HTA-CE HALFEN Cast-in Channels
HGB Balustrade fixings
DETAN Rod system – design elements
HALFEN HK5 – Brickwork support systems for brickwork façades
**CONCRETE**

**Fixing Systems**
- HTA / HZA HALFEN Cast-in channels
- HGB Balustrade fixings
- HCA Curtain wall system
- HTU Profiled metal sheet fixing channels
- HKW Corner guards
- DEMU Fixing anchors T-FIXX® / Bolt anchors
- HLX Lift-Box
- HB Mechanical anchor bolt systems
- HVL Mechanical anchor bolt systems

**Reinforcement Systems**
- HIT Balcony connectors
- HBB / HTT / HTF / HTPL Impact sound insulation products
- HBS-05 Coupler systems
- HUC Universal connection
- MBT Reinforcement connections
- HEK Precast connections
- HLB Loop Box
- HBT Rebend connections
- HCC / HAB Column shoes
- HSD Shear dowels
- HBJ Betojuster
- HBS Stud Connector
- HD8 Punching shear reinforcement

**Lifting Systems**
- DEHA KKT Spherical head anchors
- FRIMEDA TPA Lifting anchors
- HD Socket lifting anchors
- DEHA HA Socket lifting anchors

**INDUSTRY**

**Framing Channels**
- HM / HL / HZM Framing channels

**Modular Pipe Support Systems**
- HCS POWERCLICK Modular pipe support systems

**Accessories for Framing Channels and Modular Pipe Support Systems**
- HVT Frame connector
- KON Cantilevers
- HRS Pipe clamps
- HRG, HCS Pipe supports
- RUK Pipe base
- AHS Lift-off safety devices
- HS / HSR / HZS HALFEN T-bolts
- GWP Locking plate

**Versatile Fixing Systems**
- HFX HALFIX Versatile positioning system
- HVG VERSOGGRID Installation grid
ALWAYS THERE FOR YOU

Want to find out more about HALFEN in specific countries?

You can find out all about HALFEN and our products and services on our website. The site also contains our contact details as well as those for our international distribution subsidiaries and partners — all under the same address.

www.halfen.com

Scan the code and see what we offer. We look forward to hearing from you!
HALFEN INTERNATIONAL
Serving the world from the heart of Europe
You can now rely on the "MADE BY HALFEN" quality in over 60 countries worldwide