

**DETAN ROD SYSTEMS**  
Innovative Product Solutions



A history in aesthetics  
**Perfection in DETAN**





## **PERFECTION IN DETAN**

### **A history in aesthetics**

Modern architecture always strives to find a balance in practical, functional and aesthetically exceptional solutions.

With the DETAN Rod system HALFEN provides a quality driven, innovative product solution with maximal aesthetical and safety relevant characteristics. The highly developed technical system is easy to install and is suitable for filigree support systems as well as for use in lightweight construction projects; the system is (ETA) certified. European Technical Approvals: ETA-05/0207 (S460) and ETA-11/0311 (stainless steel).

HALFEN is one of the leading international companies in concrete anchorage, façade fixing, connection and framing technology. Since HALFEN was founded in 1929, our objective has been to provide customers with innovative, customized solutions for their projects. We achieve this using the highest standards in technology, quality and safety.

HALFEN innovations set the standard for the entire industry – this includes the DETAN Rod system. This brochure highlights typical applications, product references, specifications and solutions for the DETAN Rod system.





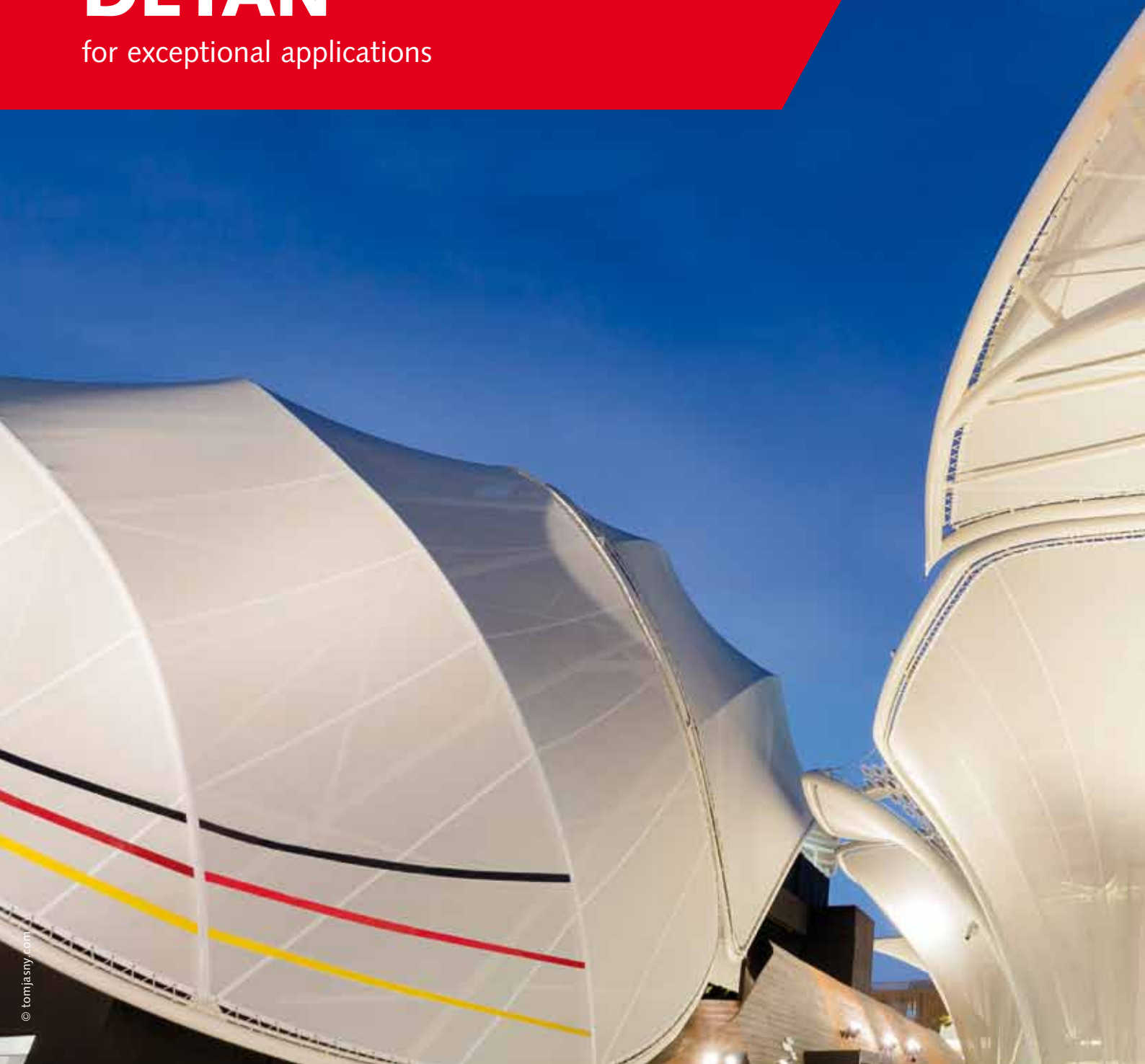
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# DETAN

for exceptional applications







# Specifications and solutions.

Complex structures for interior and outdoor environments with aesthetically designed details can be realized with the tension rod system.



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## **Application**

- › Lattice construction for a canopy roof

## **Application specifications**

- › Filigree construction method
- › Minimal weight
- › Safe and easy installation

## **SOLUTION**

Stabilizing the structure using tension and pressure rods.



© tomjasny.com

## **Application**

- › Load transfer and bracing in an exceptional project

## **Application specifications**

- › Intelligent combination of tension and pressure rods
- › Uniform design
- › Preambled rod systems to avoid time-consuming on-site assembly

## **SOLUTION**

Simple and filigree node design with aesthetically pleasing fork-heads.





### **Application**

- › Rod-trussed roof beams

### **Application specifications**

- › High corrosion protection
- › Smooth transition from the fork-head to the tension rod using a counter-nut
- › Adaptable to simple steel structures

### **SOLUTION**

Hot-dip galvanized rod systems and threads for roof-beam tension rods in humid environments.



### **Application**

- › Safe transfer of compressive loads in a roof structure

### **Application specifications**

- › High stability of the roof structure
- › Uniform appearance
- › Optimal diameter of the pressure rods

### **SOLUTION**

Optimal calculation of DETAN Compression rods. Compression rods with hot-dip galvanized threads to ensure durable corrosion protection.

DETAN Rod systems for exceptional applications

## EXPO 2015 Milan



The German pavilion is a forerunner when it comes to environmental protection, alternative energy and food for the future.

The architectural design is an impressive depiction of the German geographic and agricultural landscape.

The HALFEN DETAN Rod system meets the highest aesthetic, technical and quality demanded for the construction of the German Pavilion. The filigree tensile and pressure bars discreetly combine both function and aesthetics to form a pleasing architectural ensemble.

The resulting structure is a filigree frame of steel rods and bars with a white paint finish, covered with textile to form a stylised leaf roof.

**EXPO 2015** – World Exposition, Milan, Italy



The unusual shape presented a challenge for the tensile and pressure rod systems used for bracing and tensioning structure.

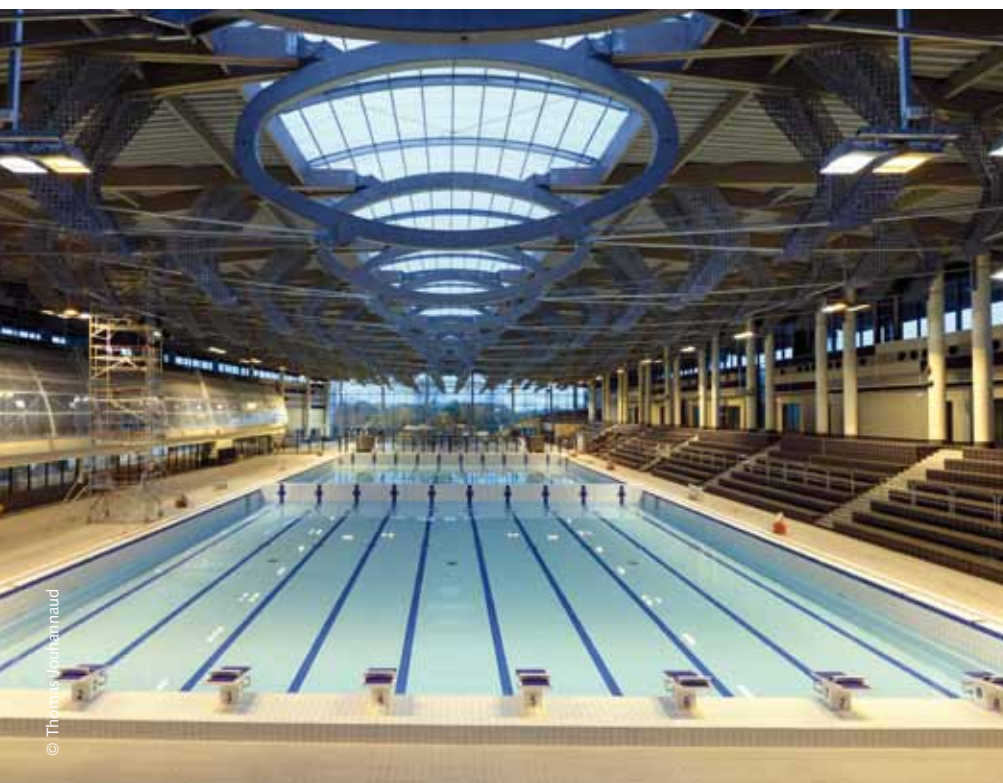


The top of the structure is finished with a textile to form a stylised leaf roof.



DETAN Rod systems for exceptional applications

# L'Aquapolis



The aquatic sports centre is located in Limoges in France. Various fun pools are distributed over 2.400 m<sup>2</sup> as well as a 25 and a 50 metres competition size facility. Numerous fitness, water sport activities and relaxation zones are also available.

Construction was completed after 3 years and the centre was opened in January 2015.

In the Aquapolis project the impressive DETAN structure uses hot-dipped galvanized elements as tension chords for the roof beams with 12, 16, 24, 30, 36, 56 and 76 mm diameters.

**L'Aquapolis Centre aquatique à Limoges Métropole –**  
Aquatic, sports and health centre, Limoges, France



The distinctive tensioning of the roof elements.



Connection with flange, fork-head and tension rod.





# DETAN

in hotel and apartment projects









# Specifications and solutions.

Pre-assembled and efficient structural bracing accelerate the construction progress



## **Application**

- › Roof support structure

## **Application specifications**

- › Various lengths and spans required
- › Large number of individual connections
- › Minimal weight

## **SOLUTION**

The filigree and high-quality finish creates aesthetically designed connections.



## **Application**

- › Cross-bracing for a glass façade

## **Application specifications**

- › Aesthetic coupler
- › Minimale weight
- › Transparent design

## **SOLUTION**

Filigree and effective bracing for the glass façade with a disc coupler.





### **Application**

- › Structural steel elements in an indoor-environment

### **Application specifications**

- › Easy, but precise assembly
- › Safe installation
- › Capable of tension and pressure loads

### **SOLUTION**

The combination of tension and compression bars ensures a consistent style.



### **Application**

- › Support structure for a glass-façade

### **Application specifications**

- › Unobtrusive bracing and suspension of the glass-façade
- › Safe installation
- › Aesthetic appearance

### **SOLUTION**

DETAN fits unobtrusively into the architectural ensemble whilst still defining the overall design.

DETAN Rod systems im hotel and apartment projects

## Student accommodation in Grønneviksøren



The apartment building in Grønneviksøren which is close to Bergen was completed in 2013 after 4 years of construction. The building complex covers an area of 21.750 m<sup>2</sup>.

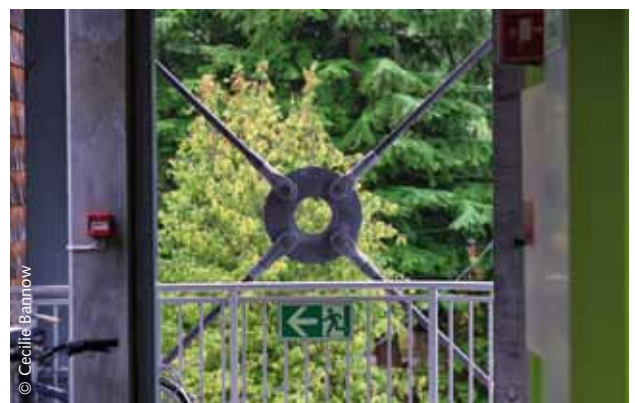
The student housing consists of 17 different buildings of different heights with 8 floors. In total there are 727 apartments each between 16,5 and 60m<sup>2</sup> in size for up to 1000 students.

HALFEN supplied the 42 mm diameter DETAN S460 Tension rod system with disc couplers. The filigree tension rod system highlights the open construction of the building fitting perfectly into the surroundings. The DETAN Tension rod system is especially impressive at night when the lights shine on the various coloured floors of the student housing.

**Student accommodation in Grønneviksøren** – Apartment building for students, Bergen, Norwegen



Stabilizing wind-bracing element with an anchor disc coupler typifies this very imaginative steel structure.



Cross connection



DETAN Rod systems im hotel and apartment projects

## Kaunis Bertta



Kaunis Bertta is a small apartment complex with 2 subterranean garages. The balconies are suspended with diagonally installed tension rod made of stainless steel. The fork heads are connected to connection flange-panels cast in the concrete behind the outer edge of the balconies. This allows column-free suspension of the balconies.

Dependable and safe planning was guaranteed by the reliable and excellent service. The stainless steel tension rod system is regulated in European technical approval ETA-11/0311. The stainless steel tension rods ensure durable corrosion protection.

**Kaunis Bertta** – Apartment building, Helsinki, Finland



Double-sided balcony suspension.



Extensive system solutions allows complex structures and aesthetic designed details to be realized in both indoor and outdoor environments.







# DETAN

in stadium and arena projects

# Specifications and solutions.

Numerous bracing solutions provide architects with maximum creative freedom



## Application

- › Cross-bracing of the struts made possible with disc couplers

## Application specifications

- › Maximum safety
- › Simple installation
- › Extensive product range

## SOLUTION

High safety and simple assembly with a coordinated product range.



## Application

- › Bracing for glass-structures and suspension of pedestrian bridges

## Application specifications

- › Efficient design
- › Architectural pleasing design

## SOLUTION

Light, apparently gravity defying construction with no disrupting support elements.





### **Application**

- Cross couplers

### **Application specifications**

- High corrosion protection
- Flexibel Design
- Bracing in horizontal and vertical planes

### **SOLUTION**

All types of bracing for canopies and roofs are possible. Quick and simple installation.



### **Application**

- Cross-bracing for flexibel roof structures

### **Application specifications**

- Very high load capacities
- High planning reliability
- Optimized calculation

### **SOLUTION**

Flexibel and easy to install roof structure.

DETAN Rod systems in stadium and arena projects

## Iceberg-Skating Palace

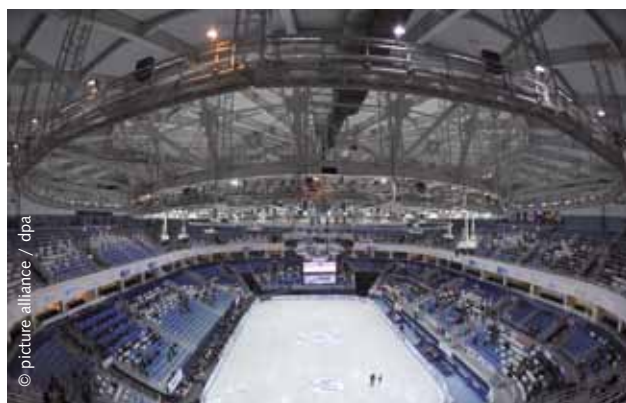


The Iceberg Skating Palace was built for the XXII Olympic Winter Games which took place from the 7<sup>th</sup> to the 23<sup>rd</sup> of February 2014 in Sochi, Russia. Figure skating and short track speed skating events were held in the multi-function. The concept for the design of the arena allows the building to be dismantled after the games and be re-erected in another city.

The DETAN Tension rod system is a dominant element in the design of the Iceberg-Palace in Sochi. The rod system is used as bracing in the roof and to support the visible media paraphernalia.

HALFEN supplied the 20 to 95 mm diameter DETAN Tension rod system for the bracing in the roof structure.

**Iceberg-Skating Palace** – Olympic-Stadium/multifunctional arena  
Sochi, Russia



Complex bracing of the roof structure with disc couplers.



Tension rods with up to 95 mm in diameter were used.



DETAN Rod systems in stadium and arena projects

## O<sub>2</sub> World Berlin



The Mercedes-Benz Arena – previously known as O<sub>2</sub> World Berlin is a multi-functional, events venue in Berlin.

It is the second largest multi-function arena in Germany; the largest being the Lanxess Arena in Cologne. The total area is 60.000 m<sup>2</sup> with 4.200 tons steel used in its construction. Daimler AG has secured the naming rights for 20 years.

In this project the HALFEN DETAN Rod system is used as cross-bracing reinforcement in the grandstand elements.

Exceptionally-long rod systems could be achieved using couplers.

**O<sub>2</sub> World Berlin** – multifunctional arena  
Berlin, Germany



Stabilizing the structure with the HALFEN DETAN Tension rod system.



The coupler with flange is used for intermediate suspension in very long tension rod systems to avoid sagging caused by the system's dead weight.



# DETAN

in airport projects







# Specifications and solutions.

Airports with their large buildings and often large glass façades require a combination of transparent design with a maximum in safety and security



## Application

- Entrance zone of airport buildings

## Application specifications

- Flexible length of the tension rods
- Efficient design

## SOLUTION

Filigree design for short and exceptionally long tension rod system; lengths from 200 mm to 15 m are possible.



## Application

- Visitor areas, arrival and departure zones in airports

## Application specifications

- Simple and precise installation
- Aesthetic design with no turnbuckles

## SOLUTION

Small, efficient fork-heads with minimum weight and maximum corrosion protection for the load critical threads.





### **Application**

- Internal bracing for the façade of an airport building

### **Application specifications**

- Simple and precise installation
- Unrestricted daylight
- Aesthetic design

### **SOLUTION**

Interior bracing in the façade of the airport building without restricting the amount of daylight.



### **Application**

- Pre-assembly of framework

### **Application specifications**

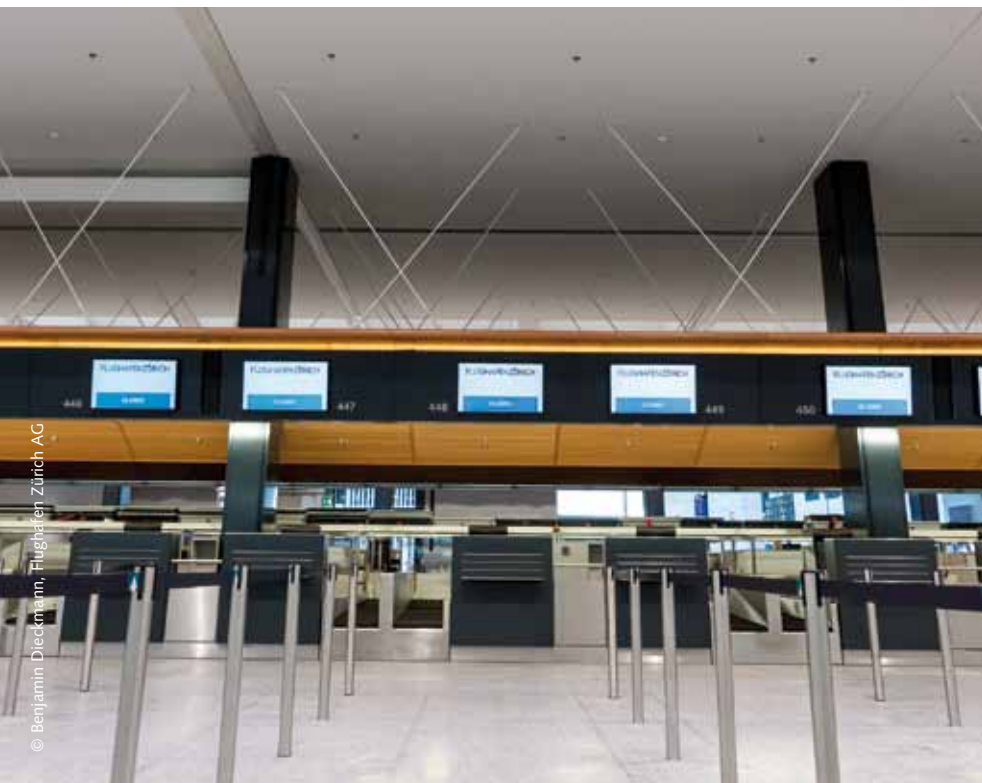
- Bracing for the latticed framework construction
- Sturdy design
- Simple installation

### **SOLUTION**

Pre-assembled filigree and unobtrusive bracing avoiding extensive, on-site installation-work.

DETAN Rod systems in airport projects

## Airport in Zurich



© Benjamin Diekmann, Flughafen Zürich AG

The Zurich airport is a first class airport in the heart of Europe and the Swiss gateway to the rest of the world. The airport is well connected internationally, nationally as well as regionally.

In April 2012 the main building phase in terminal two started with widespread reconstruction; including operational, visual and also commercial improvements. Apart from the large check-in located on level two, terminal two also houses arrivals and various retail and office facilities.

HALFEN could contribute substantially to the visual up-grade in the re-design of the check in building with the installation of the filigree and seemingly gravity defying DETAN Tension rod system. The architect was heavily involved in the decision to use the HALFEN Tension rod system.

**Zurich airport** – Zurich, Switzerland



Bracing a suspended installation.



Fork-head with coupler to adjust the system length.



DETAN Rod systems in airport projects

## Airport in Munich



The multifunctional Munich airport is located just outside the Bavarian capital.

In 2007, terminal 2 was re-designed with a new passenger traffic management system. This included an additional 16 air bridges, a skywalk and 2 departure structures.

HALFEN Tension rod system were used for suspension and bracing of the complex stairwell modules. All rod-systems were delivered pre-assembled and ready-to-install into the steel structure. The visible elements of the DETAN Tension rod system were used as design elements. The result is an elegant, aesthetic structure.

**Munich airport** – Munich, Germany



Connection node with welded flange and fork-head; with a white-paint coating.



Suspension and bracing of the stair-well structure.

DETAN Rod systems in airport projects

# Airport Oslo-Gardermoen



The Oslo Airport required a further terminal to cope with an estimated increase in passenger numbers to a total of 28 Mio per year. After the planned opening in April 2017 Oslo-Gardermoen will be the biggest airport in Scandinavia.

The new terminal includes a sophisticated tension rod structure of hot-dipped cross couplers and pretension couplers. A hydraulic pretension unit for 60mm diameter rods was used in installation. The long adjustment lengths allowed high flexibility in planning and installation of the steel tension rods to the structure. HALFEN supported and provided the contractor with technical assistance.

## Airport Oslo-Gardermoen – Oslo, Norway



The bracing with coupler combines form and function and results in impressive architecture.



Controlled pretension process using the pretension hydraulic unit and the pretension coupler.



DETAN Rod system

## New cross coupler – smallest possible cross-bracing angle of 40°

**NEW!**



The HALFEN DETAN cross-coupler is an alternative to the anchor disc cross coupler; both are static-loadable crossing points. Adding to the HALFEN product portfolio, the new cross-coupler has the same minimum crossing angle of 40° for two bars as the anchor disc has with four bars. You can now choose between the disc cross coupler and 4 fork heads or alternatively use a single cross-coupler. In both cases the same load capacity is guaranteed. The new cross-coupler is also available in two finishes.

- Steel, hot-dip galvanized
- Stainless steel

DETAN Rod system

## DETAN Pretensioning unit



The exact application of a pretension load is very difficult in system size 30 mm and upwards. The hydraulic pretensioning unit makes installation easy. The HALFEN pretensioning unit for 30 to 60 mm diameter rods ensures clever load transfer using protective flanges, therefore avoiding any surface damage.

Easy Pretensioning:

- Functional, simple and robust
- Power source independent
- No damage to the zinc coating of the tension rods







# DETAN

in infrastructure projects



# Specifications and solutions.

A decisive factor in infrastructure construction is the reliability of the bracings



## Application

- › Harbour pedestrian bridge

## Application specifications

- › Large spans for pedestrian and cycle bridges.
- › Corrosions protection
- › Efficient design

## SOLUTION

Long rod systems using couplers for use in pedestrian and cycle bridges.



## Application

- › Visitor areas, arrival and departure areas in airports

## Application specifications

- › Simple and accurate installation
- › Aesthetic design with no turnbuckles

## SOLUTION

A filigree, suspended bracing of the connecting walkways.





### **Application**

- Canopies and roofs for train stations

### **Application specifications**

- Easy visual control
- Low weight
- Safe installation

### **SOLUTION**

Light and airy tension system design of glass canopies and roofs.



### **Application**

- Cross-bracing

### **Application specifications**

- Horizontal and vertical bracing
- Visible filigree structure

### **SOLUTION**

The numerous bracings are formed by staggered tension rods in a plane.

DETAN Rod systems in infrastructure projects

## Karhumäen, pedestrian bridge



This pedestrian bridge is located in the immediate vicinity of the Helsinki airport. The bridge spans the ring rail line which connects the airport to the train station. Half of the 18 km long, double-track line between Vantaankoski and Tikkurila leads under the airport in a tunnel system. It is designed for speeds up to 120 km/h and is monitored by two electronic signal-boxes as well as being remote-controlled from Helsinki.

The DETAN Rod system is used as cross-bracing reinforcement in the top of the lattice framework. All parts of the rods and the threads are hot-dip galvanized; this treatment is essential to guarantee durable corrosion protection for the exposed rod system.

**Pedestrian bridge in Karhumäen–** Vantaa, Finland



Horizontal bracing of the lattice framework.



Cross coupler – used between two tension rods – with minimal possible angle of 40°.



DETAN Rod systems in infrastructure projects

## Vilssteg, pedestrian bridge



The Vilssteg bridge, a landmark of the Mäandertals (a valley in southern Germany) replaced the wooden bridge at the site of the historic crossing to Marklkofen. The client's brief was to create a structure as filigree as possible that fits best into the landscape.

In-keeping with the boundary conditions and for reasons of creativity a single pylon design with tensioned rods was used to support the steel bridge. The Vilssteg has a total length of 48 m and the pylon projects approximately 14 m above ground level.

A tension bar system of 30 meters with several couplers was installed. The long adjustment lengths provided a high degree of flexibility in planning and construction of the tension rod steel structure.

**Pedestrian bridge in Vilssteg** – Marklkofen, Germany



Aesthetic connection of 2 and 3 filigree fork-heads to the support structure.



Connection flange with fork-head.



MST-factory





# DETAN

in façade projects

# Specifications and solutions.

The appearance of a façade can be improved with carefully planned, structurally required struts and bracing.



## Application

- Visible bracings of support structures in interior and exterior environments

## Application specifications

- Tension rod with large spans
- Corrosion protection
- Efficient design

## SOLUTION

A large selection of connection couplers with or without lugs, results in a fascinating overall design.



## Application

- Vertical façade bracing

## Application specifications

- Simple and safe installation
- Aesthetic appearance with no turnbuckles
- Filigree connection

## SOLUTION

Visual appealing, filigree connection using DETAN Fork-heads.





### **Application**

- Cross-bracing in the façade

### **Application specifications**

- Amount of daylight will not be compromised
- Safe installation
- Different load capacities and span lengths

### **SOLUTION**

The reliable and filigree tension rod structure ensures daylight-flooded interior spaces.



### **Application**

- Horizontal façade bracing

### **Application specifications**

- Filigree bracing
- Intentional visible design element with seamless transition of fork and tension rod
- Reliable calculation with the HALFEN Software

### **SOLUTION**

Perfectly-designed node connection with 4 filigree fork-heads; a combination of reliability, function and aesthetics.

DETAN Rod systems in façade projects

# Heureka Science Centre



The Heureka Science Centre is located north of the Finnish capital Helsinki in Vantaa. The permanent exhibition has over 100 hands-on technical experiments. It has a special effects cinema and a planetarium. There is also an exhibition in the grounds illustrating the geological formation of Finland.

The building is characterised by filigree bracing with DETAN anchor disc couplers on the outside of the large glass façade. The design of the bracing fits seamlessly in the filigree and cleverly crafted glass façade.

**Heureka Science Centre** – Science/museum  
Vantaa, Finland



Architectural pleasing tension-bracing with disc couplers.



Filigree bracing with coloured DETAN Tension rod installed on the outside of the glass façade.



DETAN Rod systems in façade projects

## Stary Browar



The Stary Browar is a culture and business building in the centre of the Polish town of Poznań. It is located in the premises of a former brewery, Browar Huggerów, which was built in 1876 and was in operation until 1980.

The original outer shape of the brewery was retained. The shopping and business area has offices, numerous restaurants, bars and cafés, and approximately 100 shops distributed over 4 levels.

The International Council of Shopping Centers presented the Stary Browar with a Design and Development Award for its architectural design.

The DETAN Rod system is used as the tension and bracing for the roof beams and also used as the load bearing structure for the glass-façade.

**Stary Browar** – Culture and business centre  
Poznań, Poland



Filigree, transparent glass façade.



Aesthetically pleasing tensioning and bracing of the roof elements.



# DETAN

interiors







# Specifications and solutions.

The filigree tension and pressure rods perfectly round off the interior architectural design in most types of structure.



## Application

- › Support structure between various floor level

## Application specifications

- › Easy, but precise installation
- › Safe installation
- › Aesthetic design

## SOLUTION

Filigree and effective bracing of the individual floors.



## Application

- › Tension elements for the roof structure

## Application specifications

- › Low dead weight
- › Easy adjustment
- › Varying strut angles

## SOLUTION

Filigree, light, floating tension system in the roof support structure.





### **Application**

- Support structure for escalators

### **Application specifications**

- Safe in construction
- Aesthetic design
- Simple installation

### **SOLUTION**

Unobtrusive and elegantly designed escalator structure.



### **Application**

- Support structure in front of the walls

### **Application specifications**

- No turnbuckles
- Large spans
- Varying strut angles

### **SOLUTION**

Standard disc-connections with up to 8 fork heads are possible.

DETAN Rod systems in interiors

# Aspen Valley Ranch



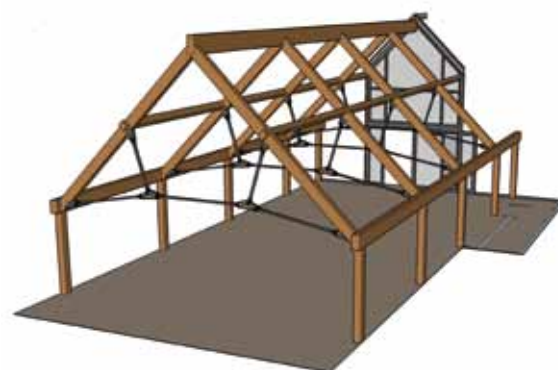
The Aspen Valley Ranch was sold in August 2014 for \$27 million. With an area of 813 acres, it is one of the largest ranches in Roaring Fork Valley, a very affluent region in West Colorado. The spacious main ranch house consists of 5 bedrooms and bathrooms, accommodation for a manager and a stable.

The DETAN Rod system was used in this project as trapezoidal bracing for the lattice-truss roof structure. The filigree design of the fork-heads and connecting plates is further emphasised by the small diameter (24 mm) of the disc coupler; all-in-all a unique construction in wood and steel.

**Aspen Valley Ranch – Ranch**  
Woody Creek, USA



Aesthetically pleasing tension and strut roof system; perfect combination of steel and wood.



2D/3D design of the roof construction.



DETAN Rod systems in interiors

## Ice stadium in Samoëns



Ice-hockey games, events, competitions and last but not least family leisure activities on ice; all this is on offer at the ice-rink at Samoëns, in the Grand-Massif, Haute Savoie, France. The total surface of the ice is 600 m<sup>2</sup>. Building started in May 2014 and work was completed in May 2015.

The filigree HALFEN DETAN Tension rod system accentuates the aesthetic ambience of wood-designed buildings; the system was installed using a hydraulic pre-tensioning unit.

Client: Commune de Samoëns  
Architect Com.: Richard Plottier  
Timber construction company: Arbonis

**Ice stadium in Samoëns** – Samoëns, France



The tension rods are carefully pretensioned using the DETAN pretension appliance.



Architectural demanding connection in wood and steel.







# DETAN

further applications

HOSPITAL

# Specifications and solutions.

The HALFEN DETAN Tension rod system can be used to achieve aesthetically pleasing, complex structures in both interior and exterior environments.



## Application

- Suspension of projecting canopy

## Application specifications

- High corrosion protection; including for the structural connection
- Simple and accurate assembly
- Low dead weight

## SOLUTION

High quality finish: hot-dip galvanized, stainless steel and powder-coated.



## Application

- Support structures for lifts/elevators

## Application specifications

- Low dead weight
- Easy adjustment
- Aesthetic design

## SOLUTION

A wide range of lengths and diameters provides diverse solutions for individual designs.





### **Application**

- Tension system for timber constructions

### **Application specifications**

- Aesthetic design
- Minimal weight
- Safe construction

### **SOLUTION**

The slender, filigree tension rod system results in an aesthetically pleasing timber roof structure.



### **Application**

- Projecting canopy suspension

### **Application specifications**

- Filigree and unobtrusive canopy suspension system
- Exceptional structures
- Durable corrosion protection

### **SOLUTION**

Installation with double rods to emphasise the filigree design.

DETAN Rod systems – further applications

# Yale University Cancer Hospital



The Yale Center for cancer therapy is a collaboration of national and international scientists and physicists in the Yale School of Medicine and the Smilow Cancer Center in New Haven. This cooperation provides the best available methods for prevention, diagnosis and treatment of cancer.

That HALFEN DETAN Rod system is an example of impressive canopy suspension construction.

**Yale University Cancer Hospital** – New Haven, USA



The fan shaped roof suspension was made possible using the HALFEN DETAN system. Couplers are used to adjust the rod lengths increasing flexibility in planning and installation of the steel structure.



System extension using couplers.



DETAN Rod systems – further applications

## Parmly Billings Library



The PARMLY Billings library was opened on 6<sup>th</sup> January 2014. Infiltrated by natural sunlight the building has a radiant, welcoming atmosphere. The library was inaugurated on February 1, 2014 with over 1,000 guests attending. The Architect team offered guided tours of this architecturally sophisticated and state of the art modern building.

The HALFEN DETAN Tension rod system in stainless steel was installed on every floor of the building and has a dominant role in the design of the PARMLY Billings library. Anchor disc cross couplers in the bracing were integrated into this imaginative building. The pressure bars consist of tubes with welded cone at each end. The forks have left and right threads accordingly.

**Parmly Billings Library** – Billings, USA



The filigree system fits seamlessly into the glazed-façade.



Horizontal bracing of the sun-panels with a filigree structure of fork-heads, tension rods, anchor disc couplers and pressure rods.

DETAN Rod systems – further applications

## Sanofi Office building



Sanofi, a leading healthcare company and provider of health solutions, provide a comprehensive program of medical solutions and therapies. The health centre in Toulouse consists of 19 buildings covering an area of over 54,000 m<sup>2</sup> including offices, laboratories, and conference centres.

The HALFEN DETAN rod system was installed as vertical and horizontal bracing with disc couplers for the Sanofi office building. The galvanized rod system with additional powder coating ensures excellent corrosion protection.

**Sanofi Office building** – Toulouse, France



Horizontal and vertical bracing with anchor disc couplers.



The protective coating (duplex-coating) can have two purposes: architectural design using colour and increasing the corrosion protection.



DETAN Rod systems – further applications

## Airport multilevel parking Hanover



The new multi-storey parking garage at Hanover Airport was completed in just six months. 600,000 m<sup>2</sup> of ceiling panels were installed in record time in the 22 m high building. 190 tons of reinforcing steel was required in addition to the 2,000 m<sup>3</sup> of concrete in the foundations. There are 2,800 parking spaces on 7 floors. Particularly well-designed are the 2 circular (entry and exit) access ramps.

The HALFEN DETAN tension rod system could not have been left out of this design. The aesthetically pleasing cross-bracings in the façade segments inconspicuously blend into the steel structure. The hot-dipped galvanization of the rod systems and the threads ensure durable corrosion protection. The DETAN rod system is ETA (European technical approval) certified. Together with the excellent professional advice this provides high reliability when planning.

**Airport multilevel parking – Hanover, Germany**



Safe and aesthetic pleasing connection with cross-coupler, counter-nuts and tension rods (during installation).



Fork-head (during installation) as connection element.

# NEW!

## Advantages

The improved DETAN Rod system:



### State-of-the-art corrosion protection: Fork-heads

- > Hot-dip galvanized fork-heads and tension rods
- > Set of required seals as standard



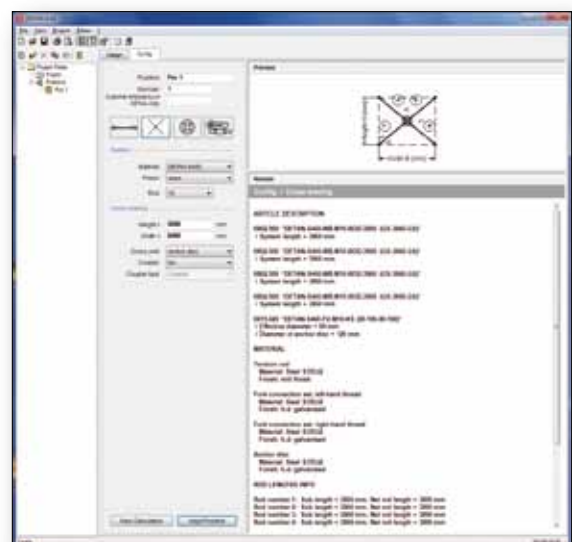
### European wide safety: approvals/type tests

- > Marked and distributed in Europe according to ETA (European Technical Approval)
- > Type tested rod system with reference tables including load capacity design values



### Perceptible quality: Tension rods

- > Machined-milled spanner-flats
- > Post-production galvanization
- > Brush-finished, hot-dip galvanized rod threads
- > Pin-marker-printed positions numbers, system lengths and customer reference numbers
- > Comprehensive marking of the rods with easy-to-remove labels



### Calculated safety: Software

- > HALFEN DETAN Software now according to ETA (European Technical Approval)
- > Static calculation and configuration



More information for DETAN Rod systems:  
catalogue, approvals, type tests are available  
on the internet at: [www.halfen.com](http://www.halfen.com)  
Products • Tension rod systems  
DETAN Rod system • product information



#### Optimised protective packaging

- › Protects even the longest tension rod systems against damage in transport
- › Multilingual installation manual is included with each delivery-package and ensures a trouble-free, easy installation.



#### Innovation: new cross coupler

- › Installation friendly; can replace the anchor disc coupler and the four necessary connecting fork-heads



#### Adaptable concepts: pressure rods

- › Matches the DETAN system perfectly; technically and visually
- › 6 standard rods and further rod diameters on request



#### Individual Design: Powder coatings

- › Support service for custom colour schemes
- › Powder coatings provide additional corrosion protection



## Always at your service

Want to know more about  
HALFEN in a particular country

An initial compilation of information  
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