

# INSPI RATI ON

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ACOUSTIC  
SOLUTIONS

In this magazine you will find 18 buildings where the combination of design and acoustics creates first class international architecture.

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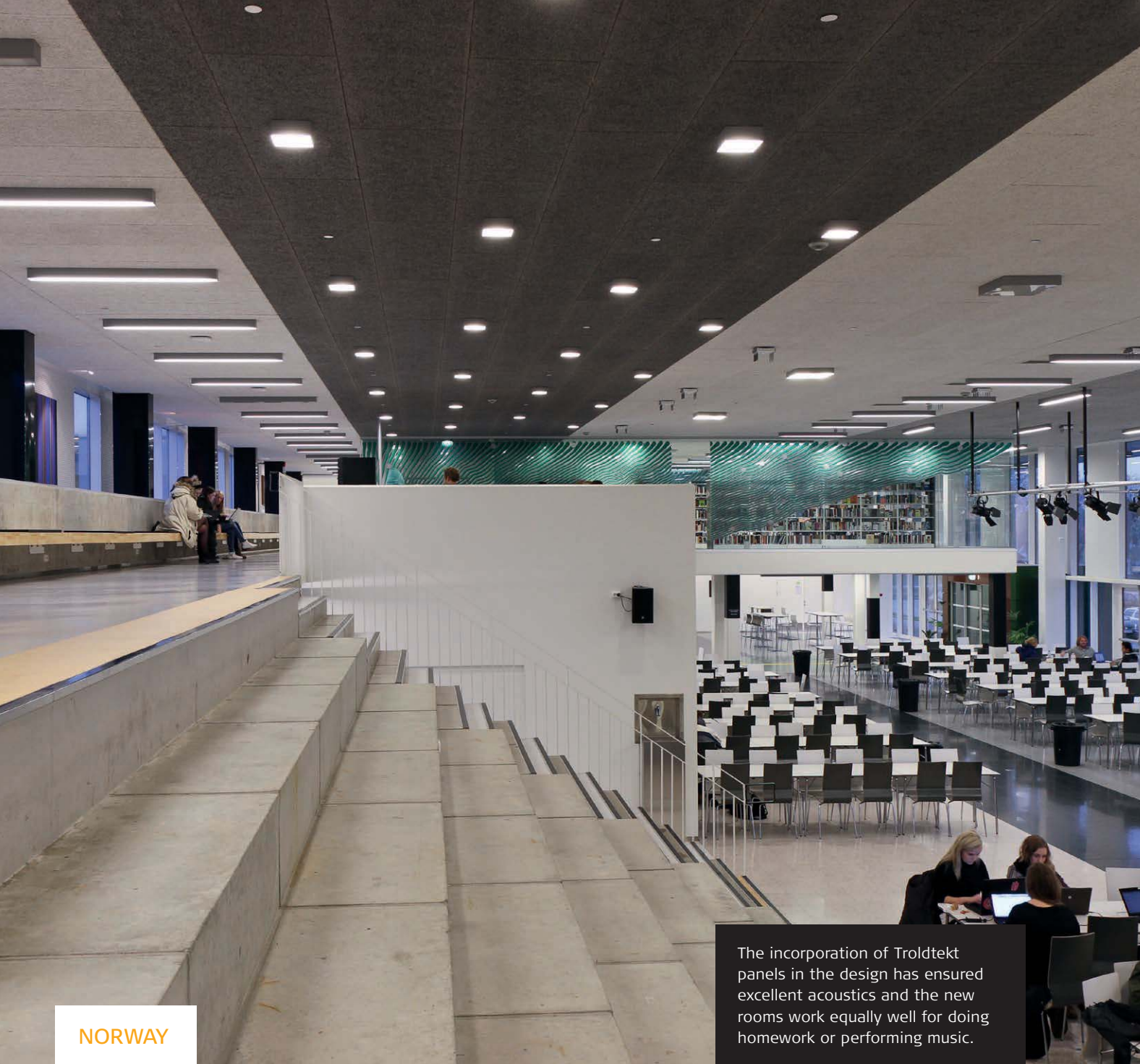
INSPIRATION  
TROLDTEKT®  
NATURAL  
ACOUSTIC  
SOLUTIONS

From Greenland all the way to Southern Germany, this magazine introduces you to a range of different projects which have Troldtekt acoustic solutions. These include pulsating educational institutions, impressive sports facilities, cosy restaurants, offices with a pleasant work environment and also Denmark's first LEED Platinum certified building. All projects possess great architectural quality, good acoustics and a healthy indoor climate.

Enjoy the inspirational tour!







NORWAY

The incorporation of Troldekt panels in the design has ensured excellent acoustics and the new rooms work equally well for doing homework or performing music.

**FACTS**

Architect: CEBRA A/S  
Contractor: Kaspar Strømme AS  
Client: Municipality of Vest-Agder Fylke  
Location: Kristiansand, Norway

**TROLDTEKT PRODUCTS**

Ceiling panels: Troldekt Plus  
Colour: Painted in white, grey & dusty grey  
Structure: Fine  
Edges: K5-FN & K5-N

## KKG, Technical College and High School

This project, at Kristiansand in Norway, involved combining a high school with a technical college, merging two buildings into one so that students could enjoy shared facilities.

Tommy Kosior

Of the five architectural firms invited to participate in the competition, Danish architects CEBRA won by looking at what the project was essentially about – combining two schools into one. The young architectural firm's enthusiasm for its work was recognised in 2008 when it was awarded the Nykredit Architectural Prize for its contribution to renewing the Danish architectural tradition.

The two schools are sited perpendicular to each other and originally functioned independently. To physically

link the two, it made sense to extend the school buildings to create a right angle which would house the shared facilities. However, to avoid this very obvious solution, the winning proposal suggested an elegant and simple solution which allowed the wings to overlap. The school's new architectural identity and wholeness was further emphasised by interlacing horizontal details.

Commenting on the project, architect Mikkel Frost from CEBRA says, "When sitting at the drawing board, you envisage

users behaving in certain ways but it is only once the building is complete that you find out whether your assumptions were correct. It was therefore almost something of a relief to see the space being used on graduation day, when families and friends come to see the students receiving their certificates, hear speeches and to enjoy music being performed. It has also been satisfying to observe the students on a daily basis, sitting immersed in their studies at the tables or hanging out on the long staircase."

One of the reasons why the new rooms work equally well for doing homework or performing music is their excellent acoustics, which is primarily due to the incorporation of Troldekt acoustic panels in their design. The sound absorbing properties of Troldekt are outstanding which is why the product is often specified for educational projects where it is crucial that pupils and students are not disturbed by excessive noise. CEBRA has frequently used Troldekt in their buildings, from sports halls and kindergartens to shops. Troldekt is also an environmentally friendly material, being manufactured from wood and cement, and supplied in a variety of surface structures and every conceivable colour. In this school, three different shades have been combined to emphasise the idea of interweaving bands.

The added extension houses a large canteen for both schools and this doubles

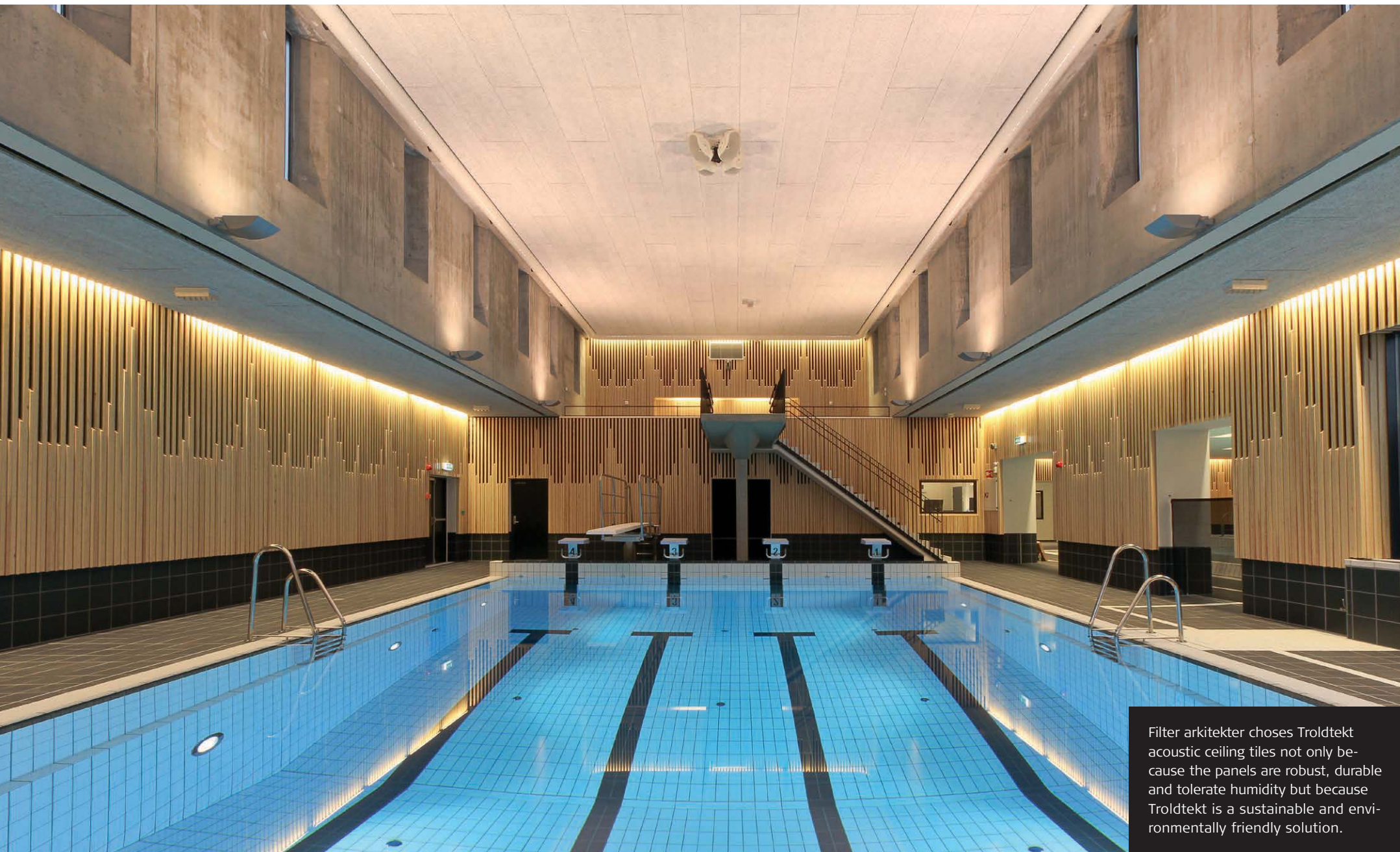
as a venue for large gatherings. A wide section of staircase constitutes an important element in the room, providing seating, encouraging greater social interaction and mixing up the original two schools. From the staircase seating, students look out towards a green area to the south. The staircase also functions as a way of graduating the terrain around the buildings and helps to express the idea of horizontal bands merging. In the extension, there is also a shared auditorium and a library on the upper balcony.

The overlap and uninterrupted lines running through the buildings are reflected in the exterior through large projections and overhangs. The theme is enhanced by overlapping horizontal facade bands.

The school's new centre has a strong graphic design, which extends into the existing wings. This is achieved through

the use of Troldekt acoustic panels, which continue from the new part of the building into the original sections. The ceiling panels are matched in shades of grey that run as parallel bands along the ceilings which also have different lighting armatures. Likewise, dark and light floor surfaces express attractive contrasts while providing a sense of orientation in the rooms. The delicate interplay between the surfaces produces a very attractive sense of coherence and balance between the hard, reflective floor surfaces and the sound-absorbing and more finely textured surfaces of the Troldekt acoustic panels. As an extra finesse, staff, students and visitors alike are inspired by the beat art adorning the school's walls.





Filter arkitekter choses Troldekt acoustic ceiling tiles not only because the panels are robust, durable and tolerate humidity but because Troldekt is a sustainable and environmentally friendly solution.

## Tonstad School and Baths

The school at Tonstad in Norway was originally built in 1965. Over 40 years later, a completely new school of nearly 6700 sqm has been created which links the old with the new. This clever design by Filter Arkitekter offers a wealth of interesting architectural details, externally as well as internally.

Tommy Kosior

Several details are especially aesthetic with wood playing a prominent role. It generates a number of solutions to produce a unified whole. 60% of the project involves refurbishment of the old building and its swimming pool, comprising administration and work areas for teaching staff, while in the new part basic teaching rooms are located around a central core of group together with subject teaching rooms plus new training pool. Externally, the school and pools appear relatively tranquil with dark

façade panels and recessed window areas with oak panels. However, the application of colours in selected areas brightens up the façade while suggesting that this is a place for children. Inside, the school appears very spacious, bright and friendly. Several surfaces are clad with birch veneer contrasted by white woodwork, emphasising the quality workmanship and beautiful to look at. The design appears both classic Nordic and modern, resulting in a coherent integration of the new and old. Parts of the concrete construc-

tion from the existing building have been preserved and trimmed back to the original which has then been insulated.

A good way of unifying the school's new and old spaces was to let the choice of materials create a common theme. This has been done in several ways and works incredibly well. Troldekt acoustic ceiling tiles have been used in the baths, the training pool, the wellness pool, the cloakroom and foyer as well as the gymnasium. Installing Troldekt ceilings meant that sound would be absorbed rather

than reflected, thereby improving the acoustics considerably. This is particularly important in areas with many hard surfaces, such as swimming pools. It is equally important that the ceiling does not reflect light, potentially causing a nuisance for swimmers.

In an architectural context, the Troldekt ceiling enhances the refurbished part of the baths with a simplicity and tranquility well-suited to the space. Lighting has been installed where walls and ceiling meet, setting off the ceiling as a surface in its own right. Ceiling tiles have been removed at random and replaced by glass tiles, above which a light source provides pleasant and diffused lighting. According to the architect, this detail was developed with the contractor. He goes on to describe something that is hidden from the spectator, namely the white tiles used in the recess above to provide optimal light reflection. In the new training pool, with its swim lanes and diving platform, the space



has been designed differently taking into consideration the extra height needed for diving. Here the ceiling surfaces are broken, being lower around the edges of the pool while windows are positioned high up in deep recesses in the concrete wall.

The walls in both the training pool and the existing baths have been carefully detailed to ensure adequate acoustics. They have been clad with wooden strips installed on top of an acoustic liner and 50 mm Rockwool. The strips have been installed in the shape of a wave which is repeated in the school part of the project. Their spacing on the lower part of the wall is quite close in order to prevent visitors and young people from poking their fingers in between and perforating the acoustic liner behind.

For this project, the architect wanted the acoustics to be an integral part of the design solution and not a future problem. Architect Knut Brandsberg Dahl says, "Troldekt was

specified because we also wanted a robust and durable ceiling which will tolerate high humidity and always look good." Importantly, the sustainable tiles complement perfectly the architect's concept with its focus on sustainability and environmentally friendly solutions.

### FACTS

Architect: Filter arkitekter as and Richard Engelbrektsen  
Landscape architect: Bar Bakke as  
Client: Sirdal Municipality  
Location: Tonstad, Norway

### TROLDTEKT PRODUCTS

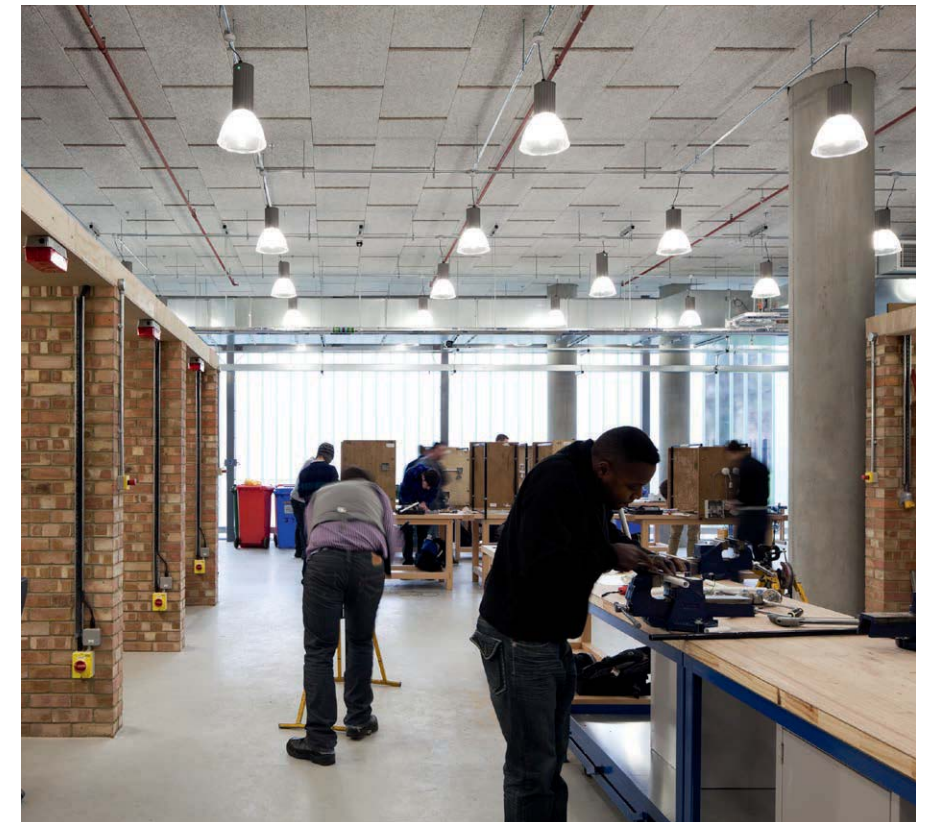
Ceiling panels: Troldekt Plus  
Colour: White-painted  
Structure: Fine  
Edges: K5 & K0-F5





UNITED KINGDOM

City of Westminster College by schmidt hammer lassen architects has been nominated for several architectural awards. In 2011 it was recognised with the prestigious RIBA Award and New London Award, Learning category Award.



## City of Westminster College

The new Campus for London's City of Westminster College is conceived as a flagship to support new ways of teaching and learning. The 24,000 sqm College was the result of a competition won by architects schmidt hammer lassen.

Adam Mørk

It is designed to provide much greater amounts of open learning spaces than typical colleges in the UK and also offers state-of-the-art facilities for students and staff alike. In addition to integrated technology, the students' development is supported by diverse architectural spaces which are adaptable and flexible.

The architects have designed a clean cut, very modern building which exhibits a distinct Scandinavian heritage. Its simple geometric forms and floors rotate around its large terraced atrium. This provides

visual connections from one floor to the other making the atrium the dynamic hub at the heart of the College. On some floors, the large atrium extends to the facade which enhances the relationship between inside and outside, creating light-filled open and inclusive spaces which encourage interaction between students. To support connectivity with the local community, the public facilities such as exhibition area, theatre and cafe are all located near the main entrance. Sound absorption was particularly important in

the large leisure and sports facility and the workshops. The architects' solution was to specify the installation of ceilings comprising Troldekt acoustic tiles. For the College, their main benefits are high sound absorption, resistance to humidity, high durability, natural breathability and low cost life cycle performance.

Although the building design has not been assessed by BREEAM, its M&E services design has followed the guidelines set out by BREEAM in the framework for the Further Education sector.

The choice of colours for the building is inspired by its character and the change of seasons while the light timber panels lining the interior contrast with the exposed concrete surfaces, again underlining its Scandinavian design.

The building is also designed to be sustainable and energy efficient with overall low maintenance, all of which reduces the building's lifespan running cost and its carbon footprint.



### FACTS

Architect: schmidt hammer lassen architects  
Client: City of Westminster College  
Location: London, United Kingdom

### TROLDTEKT PRODUCTS

Ceiling panels: Troldekt  
Colour: Natural wood & white-painted  
Structure: Fine Edges: K0/K5





UNITED KINGDOM

Oakmeadow is one of two schools which Architype architects have designed using Passivhaus principles to offer radically low energy consumption together with optimised comfort for children and staff.

# Oakmeadow Primary School

Oakmeadow Primary School, designed by Architype, is one of the first certified Passivhaus primary schools in the UK. Architype is a UK company of architects well-known for adopting Passivhaus principles of design and construction as the energy target for their projects.

Architype and Greg Townsend

This rigorous international standard uses sound building physics to reduce energy consumption by design which results in simple, robust and long lasting buildings which provide cost savings from day one and continuously throughout the life of the building. The objective is to achieve optimum building comfort with minimum energy requirement – in Architype’s philosophy, a specific thermal energy target of about 80% less than current Building Regulations. Passivhaus standards were developed in Germany over 20 years ago

and have been tried and tested in the design and construction of over 20,000 buildings in northern Europe. To achieve the standard, building form and orientation are critical while construction requires high levels of insulation, the elimination of thermal bridges and high levels of airtightness. Interestingly, although Passivhaus is only now beginning to receive the attention it deserves in the UK, Architype is one of the best known practitioners and have recently designed several schools, including Oakmeadow.

This school, commissioned by Wolverhampton local authority, has a lightweight, super insulated timber frame to achieve Passivhaus airtightness, with a simplified load bearing stud wall, wrapped by an additional layer of insulation created by Larson trusses. The service strategy integrates full MVHR for winter operation, retaining natural passive ventilation for summer day ventilation and night cooling. A major contribution to the comfort of staff and children alike is the use of Troldekt ceiling panels in both classrooms and the



**FACTS**  
Architect: Architype  
Contractor: Fairway Interiors Ltd  
Client: Wolverhampton City Council  
Location: Wolverhampton, United Kingdom

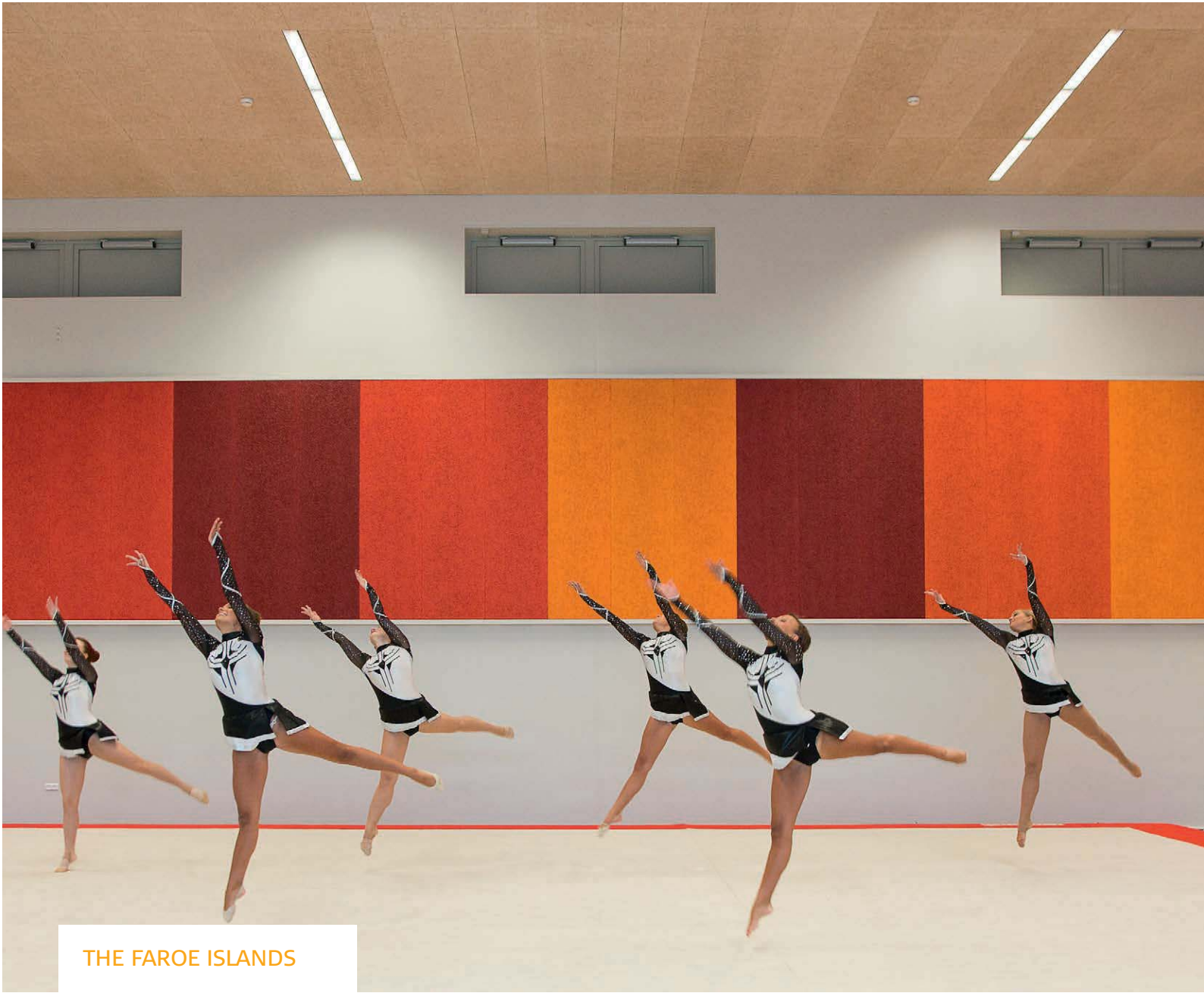
**TROLDTEK PRODUCTS**  
Ceiling panels: Troldekt  
Colour: Natural wood & white-painted  
Structure: Ultrafine  
Edge: K5

sports hall. These not only reduce reverberation time but offer high performance acoustic absorption in critical rooms, particularly the teaching areas which need to be calm, studious and healthy and the play areas which, because of their hard surfaces, are traditionally very noisy. Architype director Jonathan Hines comments, "Oakmeadow is one of two schools we have designed using Passivhaus principles to offer radically low energy consumption together with optimised comfort for children and staff. We are convinced that designing to an energy target is the most logical and effective route to achieving carbon reductions. Troldekt acoustic ceilings are one of the products which have helped to meet our

design and performance objectives - in this case optimising the acoustic environment using a natural and beautiful product." "The children are more alert in the afternoon and are more attentive because the air is so fresh and comfortable. The daylight is just fantastic and the spaces make a big difference. It has raised our spirits and there were whoops of delight on the first day - the children and teachers absolutely love it," said Sara Morris, Headteacher at Oakmeadow School. These days, one of the most important school design considerations is to ensure that children develop in healthy conditions. The result is that architects seek to use sustainable and natural materials, especially

ones with a long record of performance success. Troldekt tiles are made from 100% natural wood fibres mixed with cement. Their benefits are high sound absorption, high durability, natural breathability, low cost life cycle performance and sustainability. Available in various sizes and three grades from ultrafine to coarse, they can be left unpainted or painted in virtually any RAL colour. Under Wolverhampton Council's strict proviso that the Passivhaus school should cost no more than standard schools, the architects delivered the project on time and on budget. Early indications show outstanding performance and user comfort. As a result the architects are now working on other schools for the local authority.





THE FAROE ISLANDS

## Gymnasium in Tórshavn

The area on which the new Torshavn gymnasium has been built is extremely varied in character. The houses are very colourful while the landscape and sky form a strong presence in this part of the world, all of which help to enhance BBP Arkitekter AS' aesthetically-pleasing solution for the town's new gymnasium. The architects won the project in a design-and-build competition on a select tender basis together with turnkey contractor MT Højgaard.

Per á Hædd

The new building is a major addition to the existing Torshavn municipal stadium being situated at the short end of the football ground. Visitors enter by two glass towers and are led to a split-level arrangement – the gymnasium with adjoining changing facilities being on the lower level and a balcony and café and other facilities on the upper level. The design of the gymnasium is very simple but also very flexible and transparent. The gym itself lies below ground level while the changing facilities, meeting rooms, techni-

cal facilities and social areas are positioned along the façade overlooking the lawn. At various intervals, windows allow daylight to filter through to the gym area. On the upper floor balcony, rooms are separated by glass walls, thereby avoiding any obstacles to an uninterrupted view of the gymnasium and its colourful equipment and facilities. The building has been further integrated into the whole stadium area by constructing a stage on the roof facing the lawn. A musical stage can be attached to the building, and the art-

ists can then use the top floor of the building as a backstage facility. The elongated façade has been constructed in a fine combination of clear and frosted glass depending on the activity behind. This element of variation in the façade is a clever reference to the ever-changing skies above. Acoustic quality and robust materials have played an important part from the very beginning, which is why the architects opted for Troldekt ceilings with square edges. These project a warm and friendly tone while



BBP Arkitekter A/S appreciates that they have been able to provide a smooth ceiling surface with integrated lighting from Troldekt. The gym itself has been fitted with transversal armatures while the round ones are perfect for the corridor areas.



**FACTS**  
Architect: BBP Arkitekter A/S  
Contractor: MT Højgaard A/S  
Client: Tórshavn Municipality  
Location: Tórshavn, The Faroe Islands

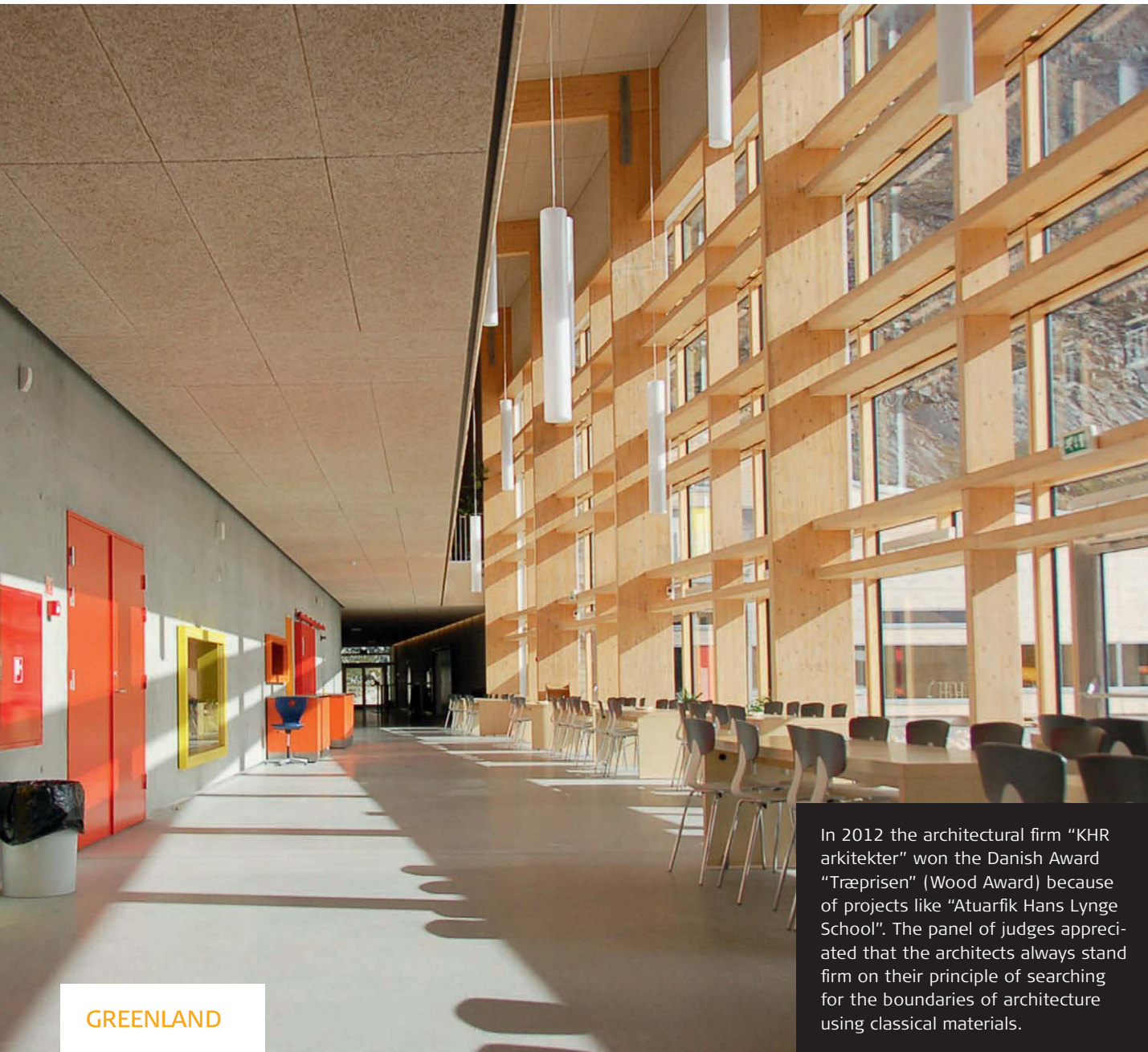
**TROLDTEKT PRODUCTS**  
**Ceiling panels:** Troldekt Plus  
Colour: Natural wood  
Structure: Fine  
Edge: K0  
**Lighting:** Troldekt lightning, Wave longitudinal, Wave round  
**Wall panels:** Troldekt  
Colours: Spray-painted in situ in various shades of red  
Structure: Fine  
Edge: K0

adding a perfect acoustic feel to the room. They are also used on the walls such as in the gymnasium which displays a single row of Troldekt panels in various shades of red. Lise Sehedsted, architect and partner at BBP, says, "The panels were spray-painted in situ and have been a great success". She also expresses her enthusiasm for the integrated Troldekt lighting, such has been used in the gym. "It's great that old-fashioned suspended light armatures in a gym are no longer the only option and that you can now specify a smooth ceiling surface with integrated lighting". The gym itself has been fitted with

transversal armatures while the round ones are ideal for the corridor and other areas. Gyms are often cold, echoing and not particularly welcoming places. However, for this project, careful consideration has been given to the function and performance of the room. Instead of being cheerless, it positively encourages activities and social interaction with its warm colours, transparency, tactile materials and comfortable acoustics. The wall behind the acoustic wall cladding is a warm shade of grey rather than traditional white while the linoleum floors on the balcony are red, creating a perfect visual coherence

between the red gym apparatus and the acoustic wall. The choice of colours, materials and transparency within a strict and functional framework conveys a positive impression of a modern gymnasium where participants can focus on their particular activity in peace and tranquillity irrespective while spectators can enjoy the scene. BBP Arkitekter A/S count numerous cultural or sports-related projects among their references, all with particular focus on the potential of a place, its function, and the use of quality materials. BBP Akitekter A/S has been involved in several projects in Tórshavn, one of which is town planning.





GREENLAND

In 2012 the architectural firm "KHR arkitekter" won the Danish Award "Træprisen" (Wood Award) because of projects like "Atuarfik Hans Lynge School". The panel of judges appreciated that the architects always stand firm on their principle of searching for the boundaries of architecture using classical materials.

## Atuarfik Hans Lynge School

The attention of visitors to the new urban area of Qinnqorput, near Nuuk in Greenland, is often drawn towards to the new school. It appears as a dramatic and beautiful feature of the landscape, emerging from the bold contours of the countryside while simultaneously standing out in stark contrast to the cliffs behind.

KHR arkitekter A/S and BASCON A/S

KHR arkitekter A/S, the architects who designed the new school, can draw on plenty of experience from other construction projects, including the Greenland Institute of Natural Resources and the University Park in Nuuk, both of which are also positioned in open landscape.

Atuarfik Hans Lynge school, which was completed in 2011, is another excellent example of how the external conditions shape the building. It has a magnificent dynamic in the way in which it has been

designed, both indoors and out. The perception of continuity and cohesion is strong while the contrasts between the red elements and the other fine details imbue the building with an architectural richness and interest.

From an architectural perspective, the new school captures the sheer scale of the landscape with its tall entrance section and ribbons of window running through the building with dashes of colour. Inside, the school opens up to reveal an excit-

ing combinations of spaces created with few materials and limited colours. Here, concrete, laminated wood and Troldekt acoustic panels abound, each in its own way contributing a sense of user-friendliness and varying degrees of texture.

KHR designed the school in such a way that the prevailing winds sweep over so snow and meltwater are diverted away from the building which the large roof overhangs offer protection. Despite the demanding climate, the architects have

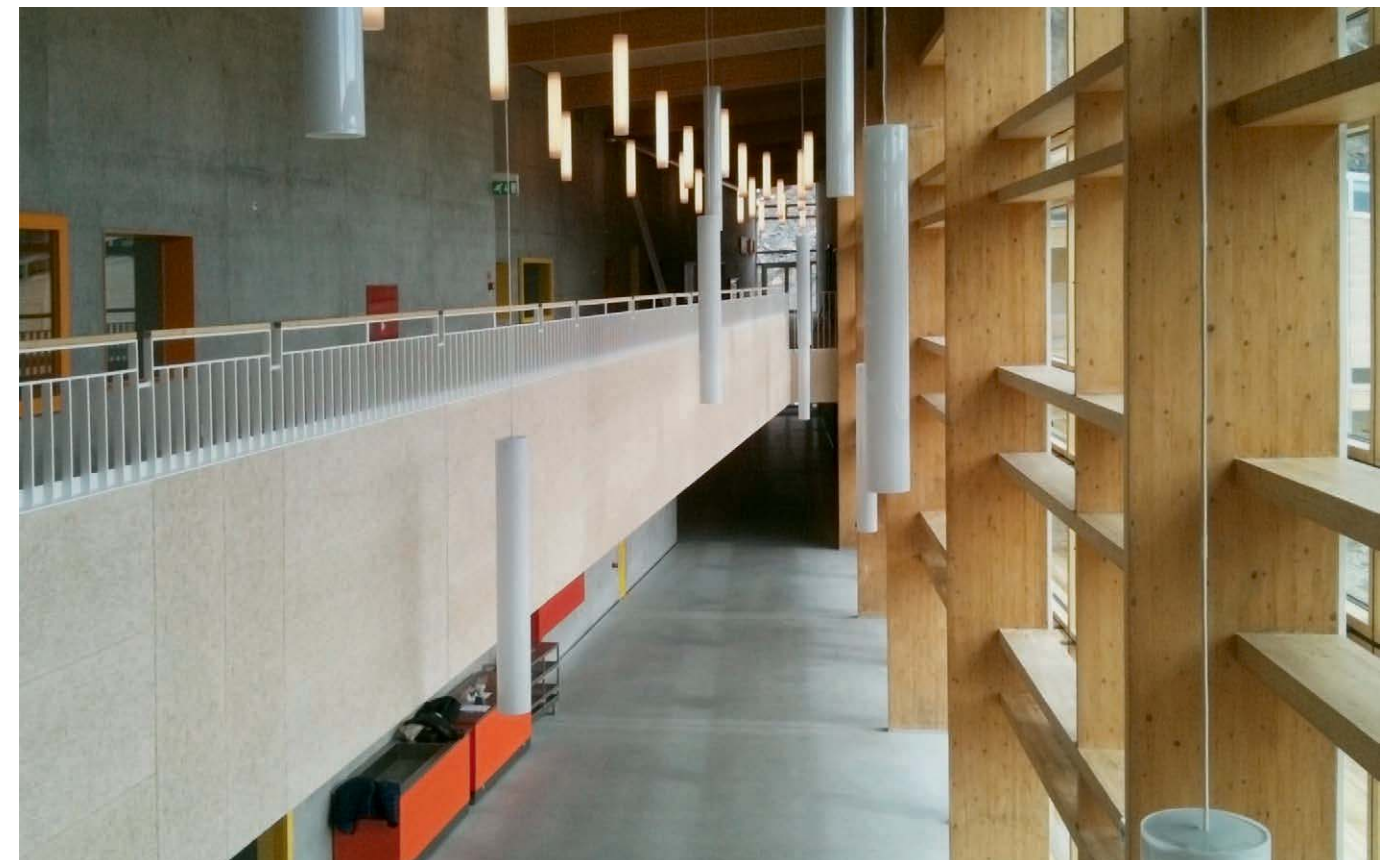


### FACTS

Architect: KHR arkitekter A/S  
Consultant: Bascon A/S  
Client: Municipality of Nuuk  
Location: Qinnqorput, Nuuk, Greenland

### TROLDTEKT PRODUCTS

Ceiling panels: Troldekt  
Colour: Natural wood  
Structure: Fine  
Edges: K5-N & K5-FN



succeeded in imbuing the building with importance at the heart of the area because, apart from teaching local children, it also functions as a culture centre and facility for other activities.

The Greenlandic climate and construction-related challenges were not the only obstacles the project had to overcome. Construction of the school also had to accommodate Greenlandic teaching traditions, which the architects took very seriously. KHR has extensive experience in designing teaching facilities and this is clearly illustrated in this project by their skill in finding the balance between teaching and spatial flow. The shared areas and openness in particular play a key role in the way in which the school is used. The internal windows too

provide a comforting sense of proximity to the landscape and constitute another of the school's attractive features.

Experience from KHR's previous construction projects in Greenland has proved that pine panels work very well and will develop an attractive patina in the cold climate. Consequently, the school is clad in wooden panels while the window frames are made of natural wood. Laminated wood has also been used for the construction in combination with concrete that was largely cast on site and is left exposed inside. Troldekt acoustic panels have been used for the ceilings throughout the school. Their performance and excellent properties help create space with pleasant acoustics, particularly in the classrooms, sports hall and hallways, where

the double-height space demands high performance sound absorption because of the hard surfaces.

Beautiful treatment of the ceilings, particularly around the open spaces, testifies to the architects' sense for detail. The soft and accommodating surfaces are highlighted through precision use of colours, both indoors and out – the clear red tones drawing their inspiration from wild berries in the landscape. The floors are either concrete or edge-on ash parquet with underfloor heating. Great emphasis has been placed on providing a good indoor climate which results from the use of natural materials, particularly Troldekt since this material has been certified sustainable in the highest indoor climate category.





SWEDEN

**FACTS**

Architect: Kim Utzon Arkitekter ApS  
 Engineer: MT Højgaard A/S  
 Client: Kärnfastigheter  
 Location: Helsingborg, Sweden

**TROLDTEKT PRODUCTS**

**Ceiling panels:** Troldekt Plus  
 Colour: Natural wood & natural grey  
 Structures: Fine & coarse  
 Edges: K0/K11

## Dunkers Art Centre

The Dunkers arts centre in Helsingborg, Sweden, is Kim Utzon's personal breakthrough on the international scene. He won the competition for the project ahead of 142 other participants from all over the world. His design was submitted under the title 'Byen ved havet' (The city by the sea).

📷 Torben Eskerod

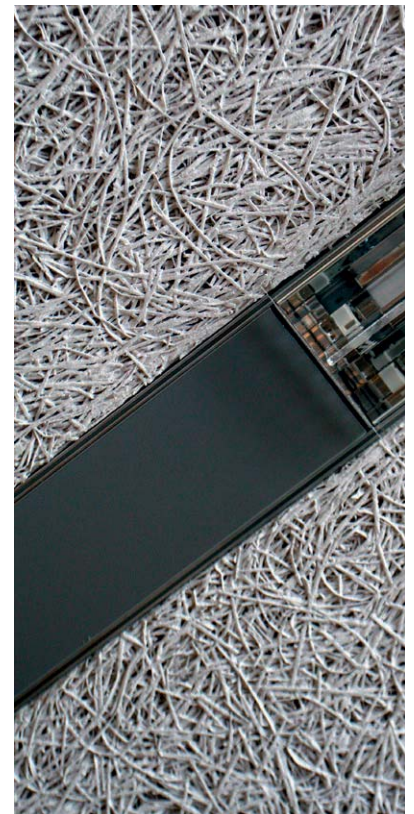
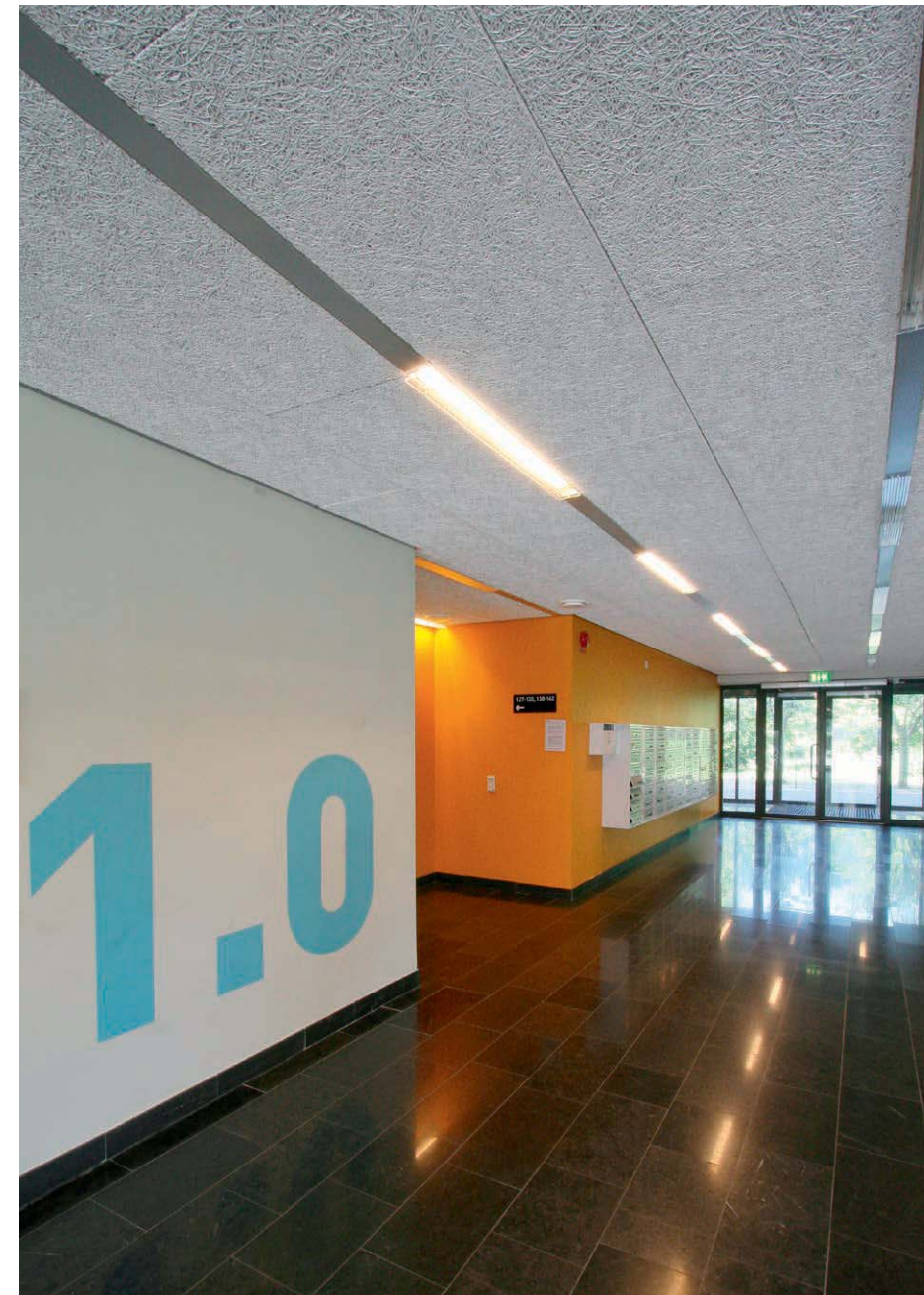
This is very appropriate for the overall expression of the project since the compact complex serves as an active link between the city and the sea with a wide passageway providing direct access from the city square to the quay and the large marina. The arts centre, centrally located on the waterfront opposite Denmark's Kronborg Castle on the other side of the water, hosts a wide variety of cultural activities. Of the building's 16,000 sqm, 10,600 sqm are reserved for various cultural activities while 3,200 sqm are dedi-

cated to exhibitions. Attractions include an art exhibition, a city museum, a concert hall, a theatre, a music school and a restaurant/café.

With this building, Kim Utzon has clearly displayed his peerless architectural style. The choice of materials is disciplined, bordering on the minimalist, while the flow from room to room is a harmonious and interesting tour through "the city streets", often with a magnificent view of the water. The richly varied roof constructions reflect the building's many functions and are aesthetically enhanced

by the extensive use of titanium zinc which provides great visual beauty.

The exhibition area features concrete elements with many surfaces covered with Troldekt Plus acoustic tiles. For example on the lower floor, the ceiling is covered with grey cement-bonded wood wool with a structure varying from fine to coarse. To provide a different environment, the restaurant uses natural wood and fine Troldekt acoustic panels to create a sunken ceiling at a lower angle than the roof.

**FACTS**

Architect: JJW ARKITEKTER A/S  
 Contractor: Nimab Entreprenad  
 Engineer: Rejlers Ingenjörer AB  
 Client: Stadsfastigheter Malmö Syd  
 Location: Malmö, Sweden

**TROLDTEKT PRODUCTS**

**Ceiling panels:** Troldekt  
 Colour: White-painted  
 Structure: Fine  
 Edge: K5-FN  
**Lighting:** Troldekt lighting, Wave longitudinal

## Sommerstaden in Malmö

The Sommarstaden hospital in the very charming town of Malmö is a stunning example of how a 1970s building can be converted, in this case into 144 exclusive rental homes for students. The residences are owned and operated by the Stadsfastigheter Malmö Syd housing association and the project was designed by the Danish architectural firm JJW ARKITEKTER.

📷 Thomas Mølvig

JJW Arkitekter A/S are architects with extensive experience of converting existing buildings, their most famous example being spectacular homes in the old grain silos on the harbour front in Copenhagen. According to Andreas Blomberg, converting this 100 m long hospital into a thriving environment for young people was an exciting challenge.

The one or two apartments vary in size between 24 and 63 sqm and the open plan, light and simple layout makes them pleasant and extremely functional. The 3 m

ceiling height and large window sections also contribute to generating an atmosphere of exclusiveness and spatial excess. A number of the apartments also have access to large balconies overlooking the park to the west.

White-painted Troldekt acoustic panels have been used in the foyer, hallways, stairwells, laundry and common rooms. Andreas Blomberg explains, "When it came to the ceilings, we wanted a solid, impact-resistant material with good acoustic properties. Light-weight panels would obviously not work

in a young people's environment like this, where the residents like to play football in the hallways and party at weekends. We not only wanted a removable, suspended ceiling with full access to all installations but also an aesthetically attractive product with a rustic feel. That is why we chose Troldekt, which is installed on graphite grey steel profiles in 1.80 m lengths due to weight considerations. The lighting consists of integrated Troldekt armatures throughout, creating an elegant spatial effect."





GERMANY

**FACTS**

Architect: ARGE Jäger Jäger Sehlhoff  
Location: Vilsbiburg, Germany

**TROLDTEKT PRODUCTS**

**Wall panels:** Troldekt  
Colour: White-painted  
Structure: Ultrafine  
Edge: K5

## Vilsbiburg Sports Hall

The "Red Ravens", as the Vilsbiburg volleyball players are affectionately known by their fans in this Lower Bavarian town, now enjoy a new multi-purpose sports hall. The requirements set by the German Volleyball League were responsible for ensuring that this volleyball stronghold in the district of Landshut would enjoy a new large facility.

Tommy Kosior and Olaf Wiechers

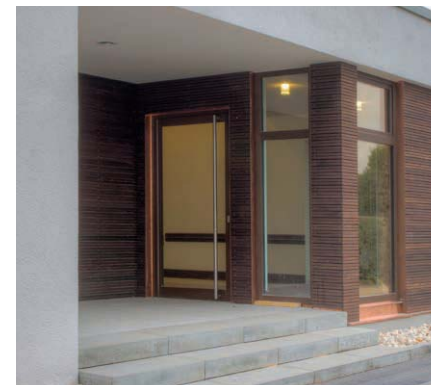
This is because the League standard stipulates minimum dimensions for international ball sports competitions. With a length of 71 m, 54 m wide and 16.4 m high, the arena complies with these requirements and is now the new home of the German Volleyball League team as well as being home to the basketball team and to other sports.

The sports hall, located high in the centre of Vilsbiburg close to the sports park, has a strictly symmetrically designed façade made from Siberian larch with grey-coloured

mineral plaster finish. Its timber panelled and highly insulated external walls, as well as a photovoltaic and solar thermal system and the hall's own cogeneration unit, all form part of the environmentally-friendly design suggested by the local authority and the architect, ARGE Jäger Jäger Sehlhoff.

Inside, the arena offers a comfortable viewing area for 2,000 spectators, with a seating capacity of 1,342. The wide span roof construction with steel lattice beams also houses the lighting. The walls are cov-

ered with screw-installed Troldekt acoustic panels, 2 m long x 600 mm wide and 35 mm thick and with an ultrafine surface coloured in RAL 2010 white. They not only provide a pleasant atmosphere but also ensure optimum acoustics. At the same time, Troldekt natural ceiling panels reduce reverberation times which make them ideal for large areas such as this sports hall. In addition, their open structure makes them suitable for wet rooms while their inherent robustness meets the requirements for ball impact resistance.

**FACTS**

Architect: Stefan Heppner, Nördlingen  
Client: Baldingen municipality  
Location: Baldingen, Germany

**TROLDTEKT PRODUCTS**

**Ceiling panels:** Troldekt  
Colour: White-painted  
Structure: Ultrafine  
Edge: K5

## Baldingen Nursery School

In order to provide more space, Baldingen's local authority decided that the town's existing nursery centre, offering three types of pre-school care, should be expanded to include a multi-purpose room, a staff room and additional toilet facilities. As part of the development, the ceilings and floors were renovated and the building's exterior redesigned and expanded.

Tommy Kosior

Access to the building is via the main entrance on a quiet residential street. The clear aesthetic style of this single storey construction, with its simple façade design comprising beaming white, plastered support structures and timber-plank wall panels, meshes harmoniously with the existing building complex. The floor-to-ceiling windows at the rear guarantee even the smallest children a view of the adjoining fields and meadows.

Architect Stefan Heppner's objective when selecting the interior finishes and ma-

terials, was to create a connection between the existing rooms and the new ones, while complying with the strict requirements for the construction of child care centres. To make this possible, the ceilings and floors of the recreation rooms enjoy Troldekt acoustic panels. Apart from their open structure, which ensure optimum acoustics and low reverberation times as is required in child day care centres, the moisture-regulating performance of the panels, made from natural wood and cement materials,

serve to improve the climate in the rooms. The Troldekt panels are used in the play and sports areas. In the circulation areas too, despite their hard floor and wall surfaces, the panels guarantee the best acoustic conditions.

Now that the all the new and refurbishment work is complete, the children and staff in this child care centre have bright, spacious rooms at their disposal and a noise free and healthy environment which is ideal for children.





KHR architects have carefully chosen and implemented only a very small number of materials which are solid and familiar products which lend themselves to unconventional applications.

DENMARK

## Hillerød Town Hall, Denmark

Hillerød's new town hall is situated some distance from the town centre and stands on the site of the former Trollesminde farm. It was designed by KHR arkitekter who won the competition to preserve the former barn and farm manager's house, thereby retaining historical connections to the site.

Helene Høyer Mikkelsen

Although the barn sits perpendicularly to a new wing, the external materials are similar, so both buildings merge to appear as one large and unified whole.

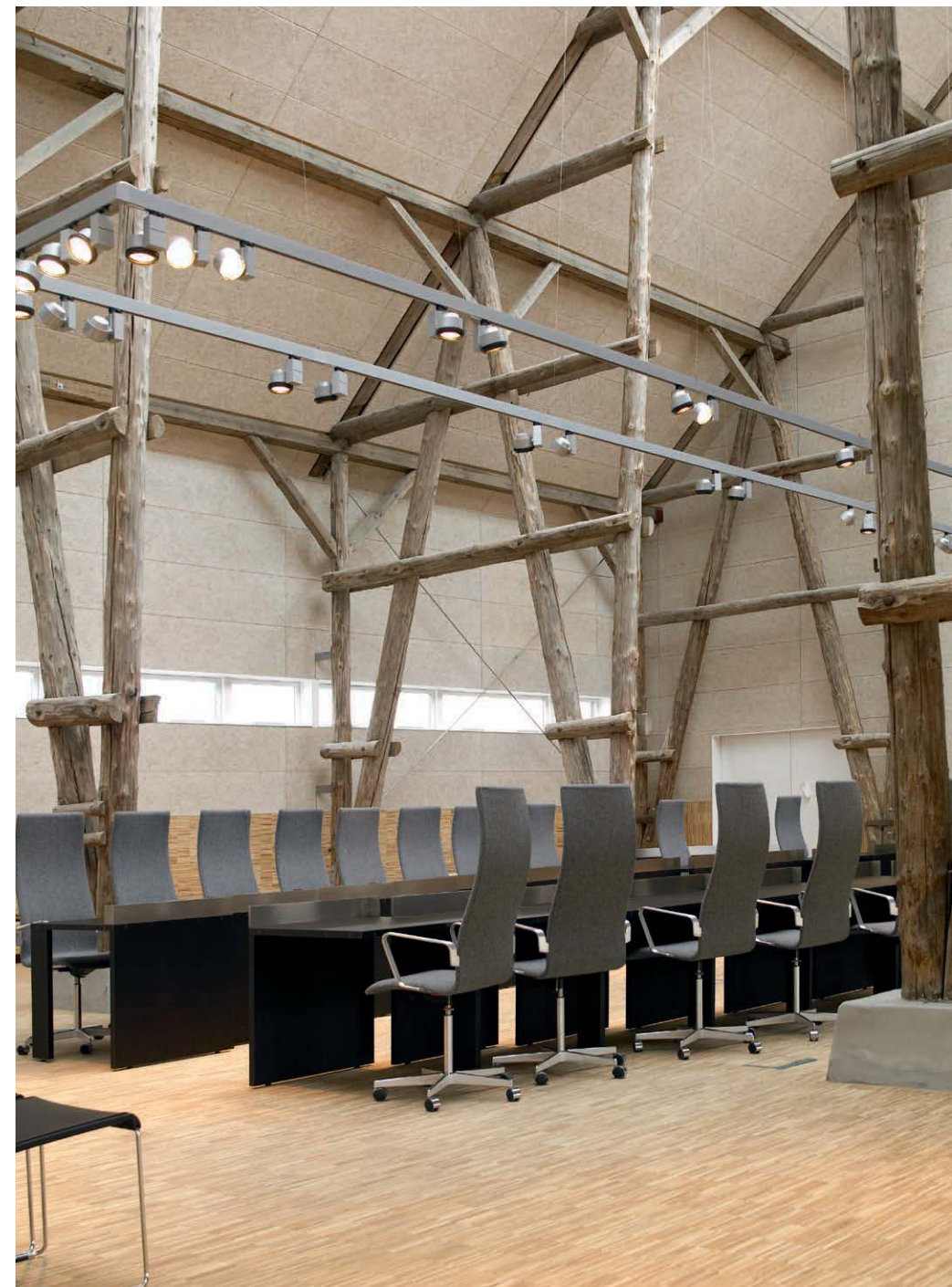
Created from the shell, the barn houses the council chamber and a canteen with full height ceilings and exposed beams. Inspired by the barn's very rustic timber construction, the architects have used Troldekt acoustic panels for both the ceilings and the upper parts of the walls. This ensures a sense of continuity between

the rooms as well as good acoustics. The barn is also directly connected with the extension, which houses the citizens' service function and the various municipal departments.

Close to the entrance and the public functions, an atrium opens up, allowing light to flood into the centre of the building. At the same time, there is an open connection to the office floors above. Creating space and openness throughout the design has provided a sense of unity.

Atriums can be complex spaces but this atrium is unusually calm.

The materials for the new town hall have been carefully chosen and implemented. While only a very small number of different ones have been used; they are solid and familiar products which lend themselves to unconventional applications. On the exterior, slate has been laid on both the roofs and façades, while inside Troldekt acoustic panels, wood and stone are used throughout. This gives the



building a defined textural identity while at the same time highlighting the surfaces, angles and shapes of the architectural design as a whole.

Troldekt not only provides high sound absorption but also emphasises the spaciousness of the interior by providing continuity. Using the same material strengthens coherence between the different building elements. In the atrium the panels are installed in a pattern to strike a fine balance between the vertical concrete columns and the horizontal balcony fronts. Where the two planes meet, neon lights have been installed to inject life into the surfaces. In addition to large areas of Troldekt, on-edge parquet flooring is also used throughout which, like Troldekt, is a vibrant and warm material. The two

surfaces contrast well in the large and very light rooms.

KHR arkitekter often works with natural ventilation, which means that the floors do not have to carry piping, allowing greater ceiling heights. Therefore the open-plan offices at the town hall have extra high ceilings, without generating additional building costs. The window sections are also larger, allowing in more daylight. The indoor climate and the working culture have also been key focus areas during the design and building process. It has therefore made sense to use Troldekt to reduce reverberation times in the large rooms and to create a pleasant and healthy working environment.

In the barn's council chamber, the combination of high ceilings, exposed wooden



### FACTS

Architect: KHR arkitekter A/S  
Contractor: E. Pihl & Søn A/S  
Engineer: Birch & Krogboe A/S  
Client: Municipality of Hillerød  
Location: Hillerød, Denmark

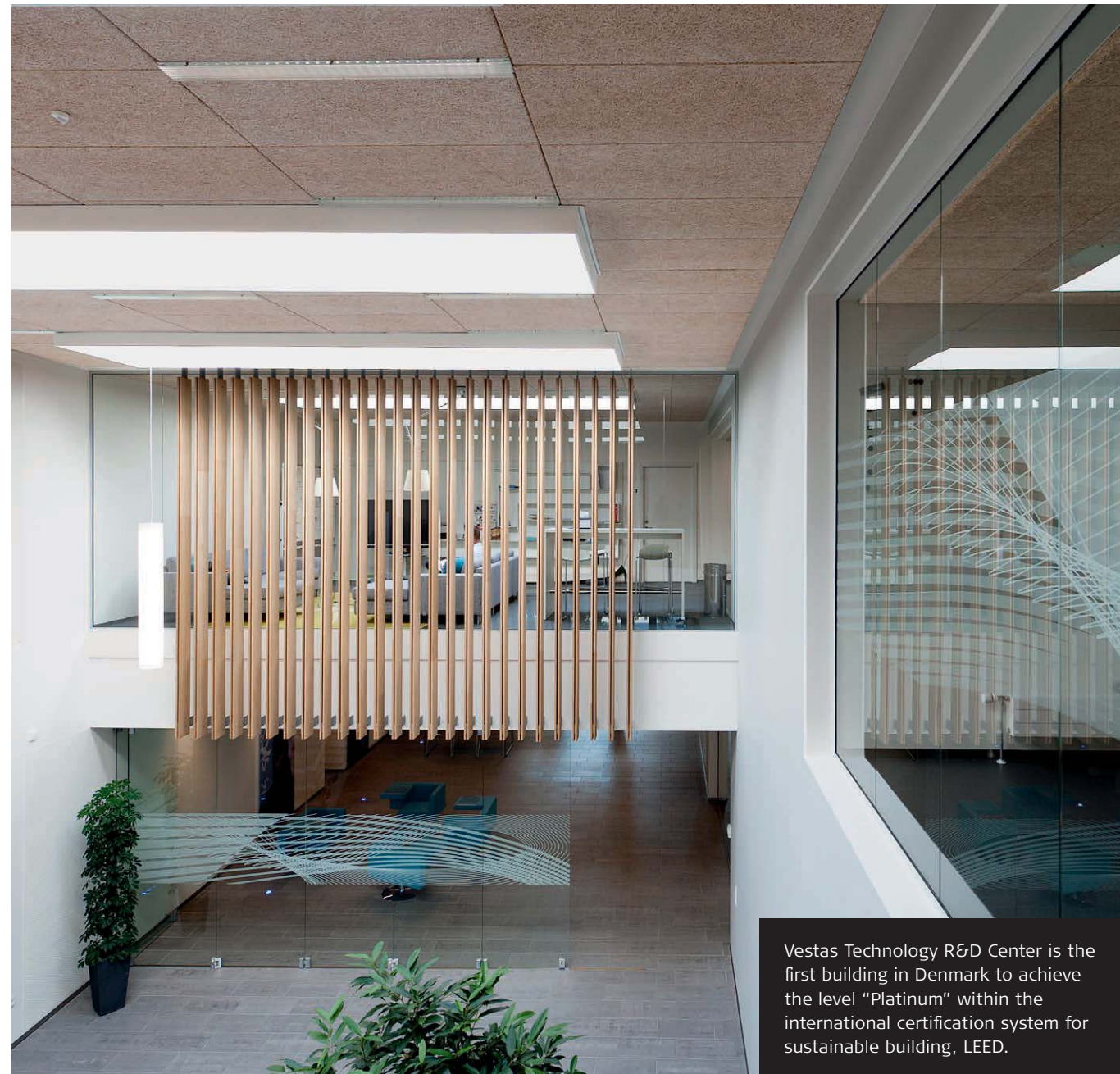
### TROLDTEKT PRODUCTS

**Ceiling and wall panels:** Troldekt  
Colour: Natural wood  
Structure: Fine  
Edges: K5-FN & K5

beams and the other building materials has resulted in a particularly intimate but formal atmosphere. Here the 60 x 240 cm Troldekt panels run all the way from the ridge windows and halfway down the walls, where they meet the edge-on parquet which continues to the floor.

KHR project architect Mikkel Beedholm says that materials are always carefully chosen to suit individual projects and sites. That choice is dictated early in the design phase and is crucial to the final appearance of the building. He believes that Hillerød's new town hall demonstrates the importance of ceilings. He thinks that if over-design and other unnecessary elements are avoided, ceilings can ensure a sense of calm and unity in rooms and are thereby just as important as floor and wall surfaces.





Vestas Technology R&D Center is the first building in Denmark to achieve the level "Platinum" within the international certification system for sustainable building, LEED.

## Vestas Technology R&D Center

Vestas Technology R&D Center in western Jutland is the first platinum-certified LEED building in Denmark. The building was designed by architects aarhus arkitekterne a/s who have created a sustainable facility which encourages ideas for tomorrow's wind turbines.

aarhus arkitekterne a/s

Adjacent to existing production hall 9 at the large Vestas complex in Lem, the Vestas Technology R&D Center has sprung from the ground as an architectural symbol of the company's long-standing green agenda.

"Externally the building has all the characteristics of an traditional industrial grey concrete complex," says Michael Green from aarhus arkitekterne who was the project architect for the building which was completed in 2010. "In fact, looks can be deceiving because inside a radically innova-

tive approach has been taken. This is where engineers and other energy experts are developing the wind turbines of the future – in a highly sustainable environment."

Vestas Technology R&D Center is the first LEED building in Denmark to achieve certification in the platinum category under the US sustainability scheme LEED, one of the world's three leading voluntary certification schemes. Among other things, the LEED scheme awards points to buildings according to their level of resource

consumption and how employee working conditions are integrated into the project. The LEED certification categories also include gold, silver and bronze.

"In addition to positioning rooms and windows so they fully utilise the energy from passive solar heating, we have also endeavoured to create a welcoming work environment and indoor climate – such as 'quiet rooms', informal meeting areas and touch-down workstations," says Michael Green.



### FACTS

Architect: aarhus arkitekterne a/s  
Landscape architect: 1:1 Landskab ApS  
Contractor: Jacobsen & Blindkilde A/S  
Engineer: Rambøll Danmark A/S  
Client: Vestas Wind Systems A/S  
Location: Lem, Denmark

### TROLDTEKT PRODUCTS

**Ceiling panels:** Troldekt  
Colour: Natural wood  
Structure: Ultrafine  
Edge: K5-FN  
**Lighting:** Troldekt lighting, Wave round and Wave transversal

Throughout the process, he worked closely with engineers from Ramboll consultants, one of the few LEED assessors in Denmark. It was Ramboll who was responsible for conducting numerous tests and measurements before, during and after the construction phase.

The Vestas building consists of two distinct and separate areas. One comprises offices and meeting rooms while the other has a public reception and waiting area, cafeteria, courtyard and patio. Seamless transitions were incorporated between the individual sections to provide optimum environments for project work and knowledge-sharing. The further the employees move away from the public zone, the more time they have for contemplation and research.

For all the ceilings – with the exception of the kitchen and changing rooms – Troldekt natural acoustic panels with an

ultrafine structure were chosen. These are integrated with Troldekt lighting.

"Troldekt is excellent for regulating the acoustics while the panels also add structure and warmth to the rooms in contrast to the building's clean cut and conservative façade. The fact that the panels are made from natural materials also suits the building's sustainability theme perfectly," says Michael Green.

The architects at aarhus arkitekterne have worked with sustainable building for many years. They see the three certification schemes – the US LEED, the British BREEAM and the German DGNB – as a good way for developers to provide clear documentation about the social, economic and environmental factors in construction.

Comments Michael Green, "When working with LEED, such as in this project, everything must be measured and weighed. This is a challenging and heavy

process where we constantly have to refer to long checklists for the individual solutions." He stresses that they often need to think very creatively with these tasks which involve many challenges in relation to materials and resource consumption requirements. Only when the building was completed in 2010 could Ramboll send all the documentation to the U.S. Green Building Council, the scheme's supreme authority. The building was then LEED-certified in the highest level platinum category.





In the 2500 seat congress hall a black-painted Troldekt acoustic ceiling ensures good and well-balanced acoustics.

# Tivoli Congress Center

Given the lack of mountains in their country, the Danes’ continual fascination with natural rock formations and high vantage points is a theme which their architects and engineers often pursue. A good example is Copenhagen’s Tivoli Hotel and Congress Center situated close to the city’s new Metropolis Zone. This stunning facility contributes 18,000 sqm of the nearly 73,000 sqm which comprises the whole landscaped complex and includes hotels offering about 1300 rooms.

Thomas Mølvig

Kim Utzon Arkitekter designed the project for the Arp-Hansen hotel group, one of the big players in the rapidly growing hotel market in Copenhagen which is among the 10 top congress cities in the world. Together with a central green pedestrian street, the Center’s architecture is inspired by the natural conditions of the site – the cliffs eroded by the sea and a pleasant adjunct to the Danish landscape. The Tivoli hotel itself rises 13 floors and is topped with a roof terrace commanding

spectacular views of the city. In contrast, like a large rock formation and accessed down stairways from the elevated green promenade, the huge 2500 seat congress hall lies halfway between the two existing hotels. When other conference rooms are in use, there can be over 4000 in the building at any one time. In addition, an external amphitheatre is planned for outdoor performances and public events.

The congress hall is on two levels and has a black-painted Troldekt Plus ceiling

set within very large black triangular lattice girders which act as a strong architectural element and dominate with their span of almost 40 metres. The walls have birch veneer panels with slits to supplement the ceiling’s sound absorption. Here Kim Utzon specifically chose the acoustic panels because of their relatively coarse surface in the ceilings. “Since they are some distance away from the spectators, the unique texture of the material enhances different experiences in the room without appear-



**FACTS**  
Architect: Kim Utzon Arkitekter A/S  
Contractor: Arpe & Kjeldsholm A/S  
Client: Arp-Hansen Hotel Group A/S  
Location: Copenhagen, Denmark

**TROLDTEKT PRODUCTS**  
**Ceiling panels:** Troldekt Plus  
Colour: Natural wood & black-painted  
Structures: Fine & coarse  
Edges: K5 & K11



ing too rough,” comments a satisfied Kim Utzon.

Troldekt acoustic panels have also been used in most rooms including the 1700 sqm lobby which is designed for a variety of purposes. Together with the Oland stone floor, the pale shades of the ceiling inject the only colours into this white-painted space which is flooded with daylight. It also conceals all the services, such as power and sprinkler systems.

As architect Kim Utzon says, “The acoustics in the foyer are well-balanced because the panels are set between the ribs of the structural concrete elements. It’s a tried and tested solution which works beautifully and never lets us down – even when noise levels are high.”







For a cultural venue where music and speech play a big role, the choice of a material which possesses good acoustics properties, is essential.

## Nørre Vosborg

The outstanding restoration of the Nørre Vosborg manor house and estate, which dates back to the 13th century, is renowned. It was one of the largest restoration projects in Denmark and has now been developed into a regional cultural venue and conference centre.

Thomas Mølvig

A new 1444 sqm hotel wing plus new solutions for the 675 sqm north barn and its sister 1095 sqm south barn were designed by Arkitema architects, combining the past with the future in a unified and exciting concept. The new building is a 118 m long independent structure running parallel but not competing with two restored 18th century barns.

The architects chose to use wood, a dramatic but an unpretentious material alongside the frugal red-brick, which reflects

Scandinavian tradition. Planks of radial-sawn Siberian larch laid in a clapboard pattern cover the entire building, including the roof where a narrow aperture runs lengthways allowing light into the hotel rooms and exterior walkways on the first floor.

Straight-edged natural Troldekt acoustic panels are another major choice of the architects, both on the steeply sloping ceilings of the larger barn, converted into a new multi-purpose facility and exhibition

hall, as well as in the hotel rooms. Thomas Carstens, architect and CEO of Arkitema, says, "This choice springs from a wish to have homogeneous materials in two very different buildings. The material possesses good acoustic properties which is very important for a cultural venue where music and speech play a large part. It also has good humidity reducing characteristics which means a healthy indoor climate and reduced ventilation requirements for hotel guests and visitors alike."

Even hotel manager Erik Jorgensen joins in by commenting, "The multi-purpose hall, has seating for 300. It is a stunning space, very large and almost overwhelming – a dream for any event organiser or visitor. The acoustic ceilings are perfect for everything from parties and conferences to concerts and dance."



### FACTS

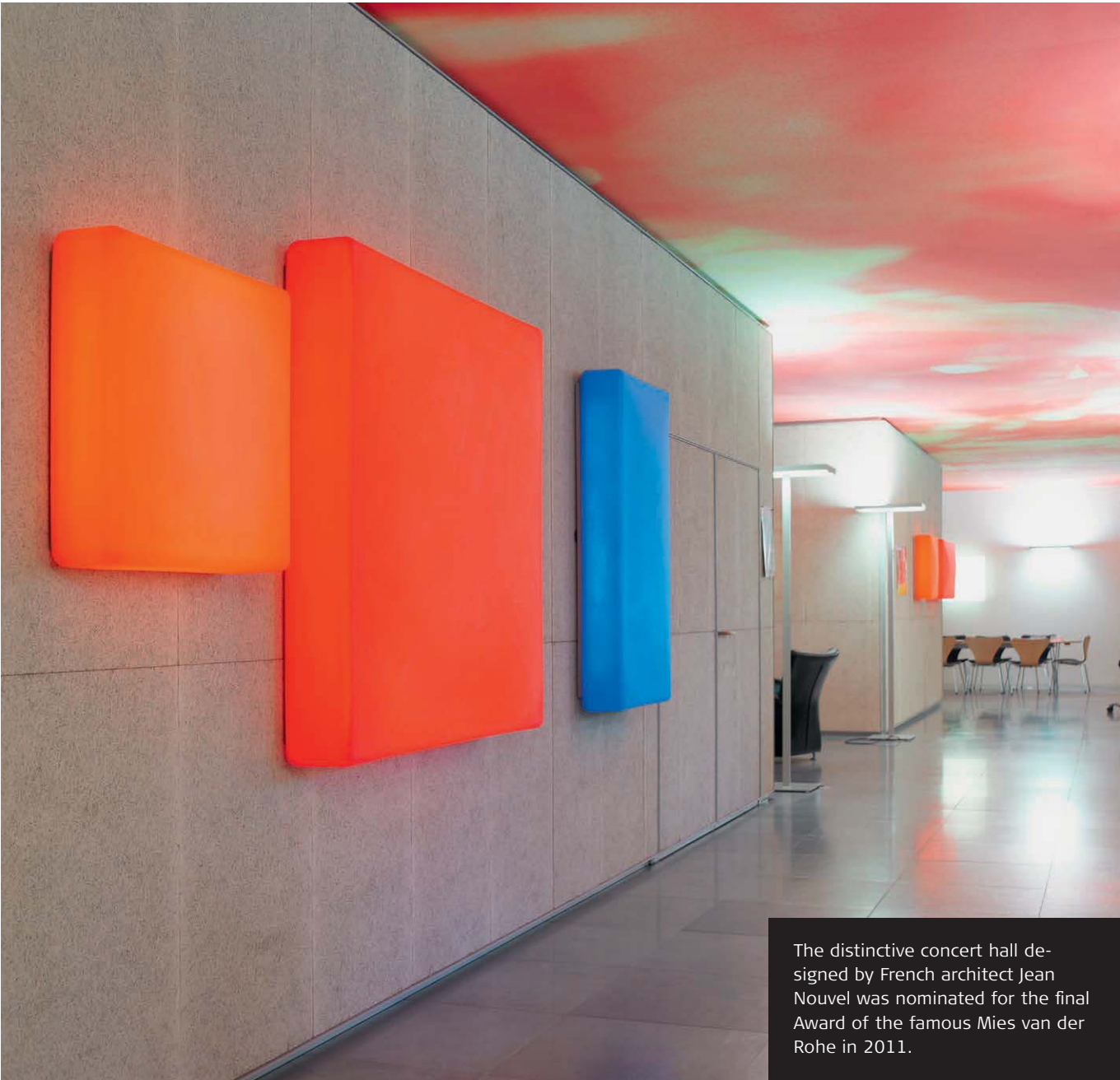
Architect: Arkitema KS  
Engineer: OBH Rådgivende Ingeniører A/S  
Client: Realea A/S  
Location: Vemb, Denmark

### TROLDTEKT PRODUCTS

Ceiling panels: Troldekt  
Colour: Natural wood  
Structure: Fine  
Edge: K0







The distinctive concert hall designed by French architect Jean Nouvel was nominated for the final Award of the famous Mies van der Rohe in 2011.

# Danish Broadcasting Corporation HQ

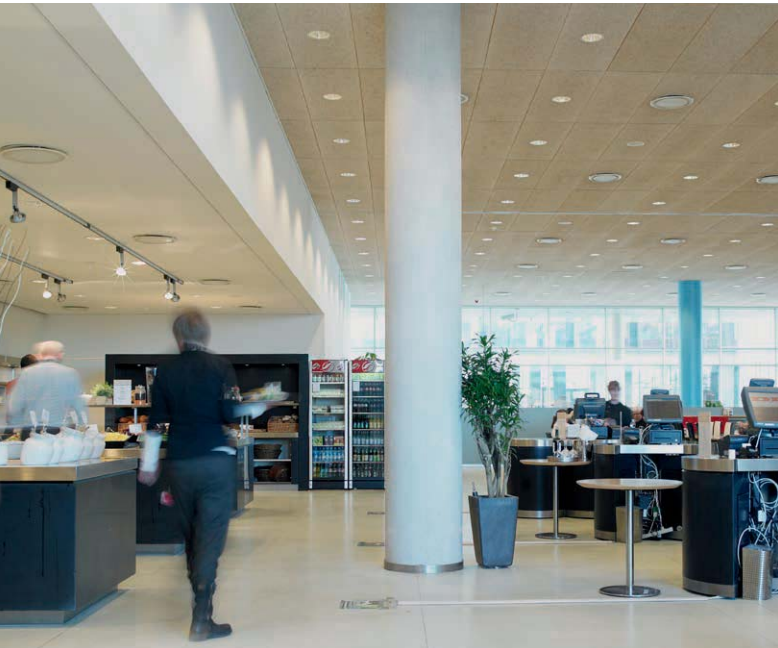
The Danish Broadcasting Corporation's new DR City in Copenhagen comprises four independent buildings. Dominated by the concert hall (Koncerthuset), they are connected by an internal covered 'street' which strengthens communication between the different DR departments and provides a meeting place where employees can do business or socialise.

Helene Høyer Mikkelsen

The concert hall is a distinctive and exciting building designed by the French architect Jean Nouvel. In 2011, out of 343 projects, it was nominated for the final of the famous Mies van der Rohe Award. This stunning building is a vast cube clad in a blue screen on which live images are projected at night. It houses four different size studios each with unique character and acoustic treatments. Jean Nouvel designed all the interiors and was extremely conscientious in his choice of materials,

including Troldekt ceiling panels, with much emphasis on quality and environmental properties. Studio 1 is the very beautiful 28,000 cubic metre concert hall with seating for 1800 people. Despite its size, it is intimate with seating encircling the stage and golden colours on the wavy walls. It has outstanding acoustics which have put it on the global map of large concert halls. The acoustics were designed by Yasuhisa Toyota, world renowned for his expertise in the field.

Another major segment is the Administration building where the entire workforce of 5000 is located in open plan offices together with a shared canteen. It also contains the studios of Copenhagen's local radio station where Troldekt acoustic panels with built-in speakers are installed. The building has different elements centered around the atrium which together make up a fully functional structure. The workplaces are pleasantly arranged, some facing the outer facades while others face



**FACTS**  
**ADMINISTRATION BUILDING**  
Architects: Gottlieb & Paludan and NOBEL Arkitekter A/S  
Contractor: MT Højgaard A/S  
Engineer: Rambøll A/S  
Client: Danish Broadcasting Corporation  
Location: Copenhagen, Denmark

**TROLDTEKT PRODUCTS**  
**Ceiling panels:** Troldekt  
Colour: Natural wood  
Structure: Fine  
Edge: K5-FN  
**Speakers:** Troldekt speakers



**FACTS**  
**THE CONCERT HALL (KONCERTHUSET)**  
Architect: Ateliers Jean Nouvel  
Contractor: MT Højgaard A/S  
Engineer: NIRAS A/S  
Client: Danish Broadcasting Corporation  
Location: Copenhagen, Denmark

**TROLDTEKT PRODUCTS**  
**Ceiling panels:** Troldekt  
Colour: Painted in special colour (orange)  
Structure: Fine  
Edge: K0  
**Wall panels:** Troldekt  
Colour: Natural wood  
Edge: K0

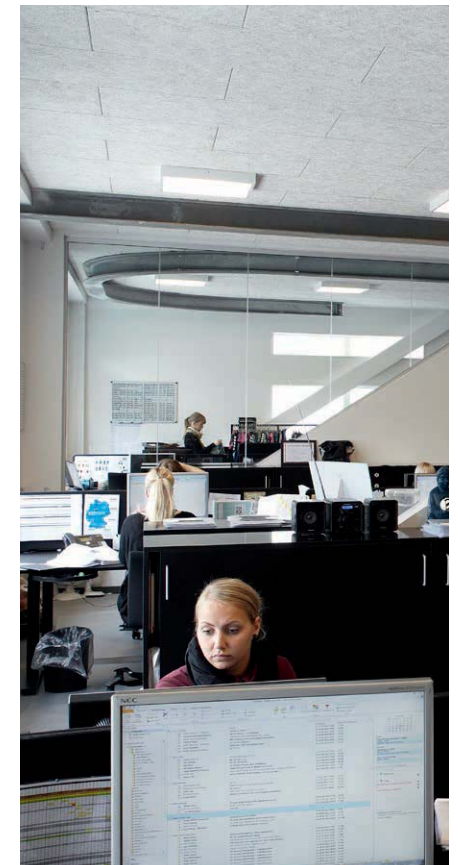
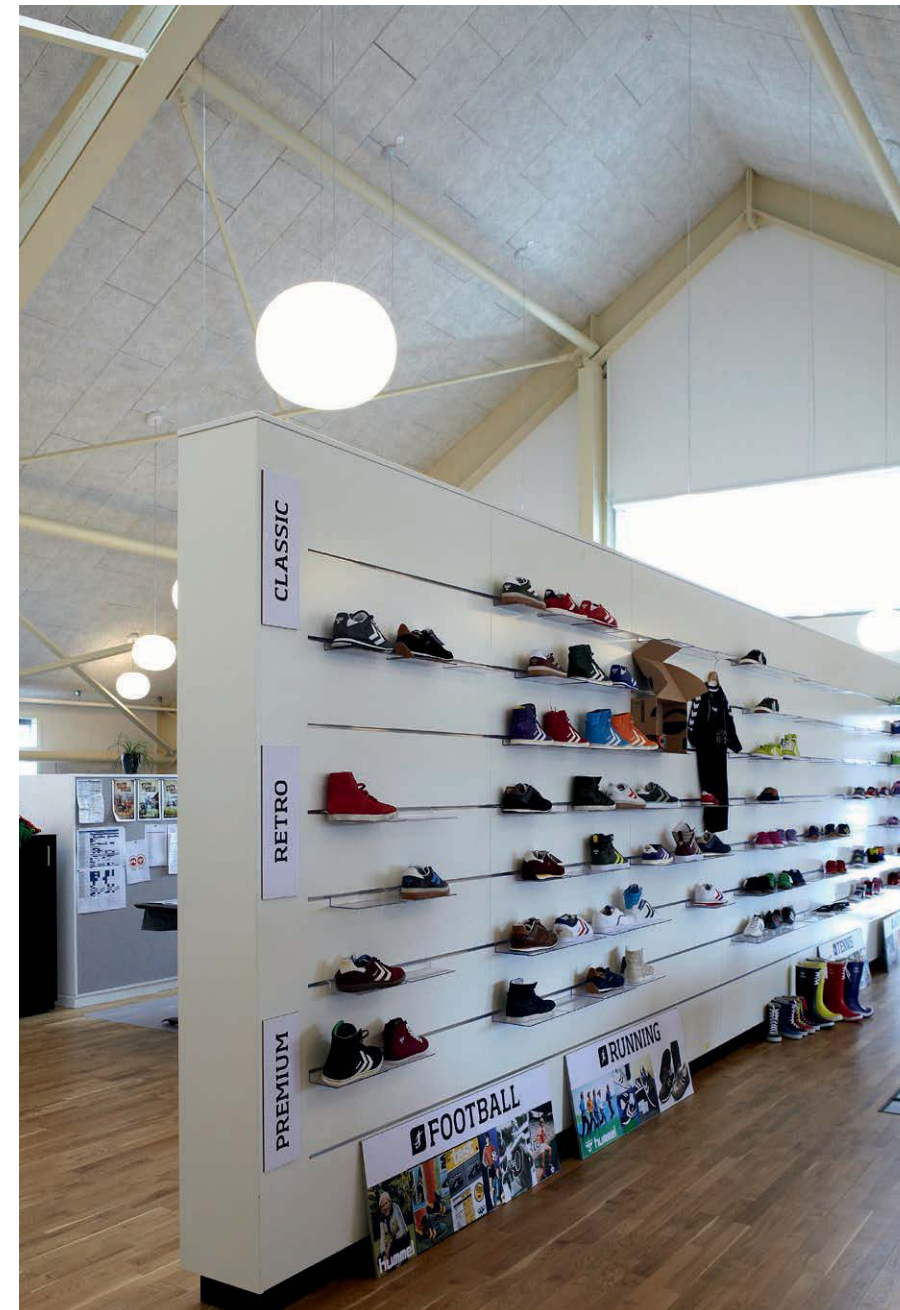
the inner courtyards. Together, the flexible arrangement encourages creativity and interdisciplinary cooperation. The outer skin is a beautiful but simple transparent envelope consisting of tilted glass louvres. Partly open courtyards within are an integral part of the building's naturally ventilated climate and environmental strategy and add a distinctly green character. For the offices, Gottlieb & Paludan + Nobel Arkitekter A/S, also used Troldekt acoustic panels. As project architect

Frederik Ejlers says, "In many ways, Troldekt was the obvious choice. In such a building, there is an obvious need to ensure comfortable acoustics and a healthy indoor climate, both of which these acoustic panels are able to meet. Architecturally, they inject a sense of unified calm across the large open floors and complement the smooth and transparent surfaces."





When converting the former naval submarine facility into an exciting mix of vast showroom and dynamic office environment, several acoustic challenges had to be met and Troldekt was the obvious solution.



#### FACTS

Architect: Olav de Linde  
Engineer: Midconsult A/S  
Client: Olav de Linde  
Location: Aarhus, Denmark

#### TROLDTEKT PRODUCTS

Ceiling panels: Troldekt  
Colour: White-painted  
Structure: Ultrafine  
Edge: K5-N

## Hummel HQ

Danish Hummel's collections are sold in 28 countries and the company has seen almost explosive growth over the past years. One result has been construction of their strategically located head office in the creative environment on the 'cotton quay' in the Port of Aarhus.

Thomas Mølvig

This is the former naval submarine facility which has been converted into an exciting mix of vast showroom and dynamic office environment. It is a superb location with the water, views and raw harbour environment as an integral part of the experience.

The property company Olav de Linde converted the existing industrial hall in consultation with hummel. It is a large building with 4,000 sqm of floor space and ceilings up to 8 m high in the biggest rooms. The entire eastern gable is one

massive glass section with spectacular views of the harbour.

Jan Olesen, project architect at Olav de Linde, says, "The old and new are designed to merge into a coherent and integrated design which dramatically reflects the light from sky and water. The upper level is new and was formed by constructing a continuous floor between the ground floor and the original ceiling. When we had to select ceiling materials for the large rooms on the first floor

and in the side buildings where there is ample height, Troldekt was the obvious choice because architecturally it matches the slightly 'raw' environment while fully meeting the acoustic requirements."

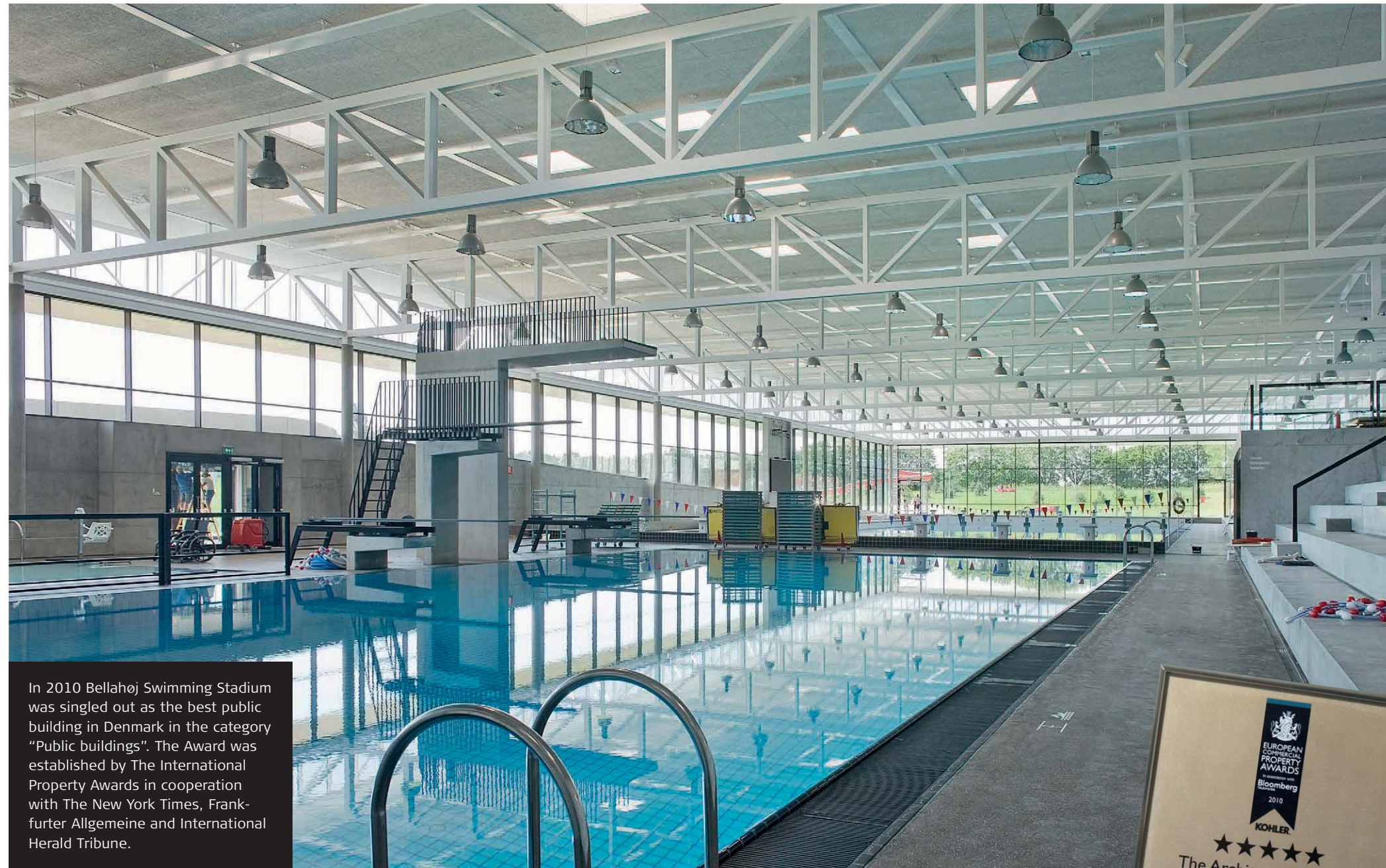
In this project, it was important to find solutions for several acoustic issues. These included noise infection from the showroom adjoining the open offices, handling the potentially incorrect placing of radiant heating panels and finding the right walls and ceiling areas for sound



absorption, while taking into account the large glass façades, together with dampening noise in the showroom and offices to improve the working environment. Again, Troldekt provided the answer.







In 2010 Bellahøj Swimming Stadium was singled out as the best public building in Denmark in the category "Public buildings". The Award was established by The International Property Awards in cooperation with The New York Times, Frankfurter Allgemeine and International Herald Tribune.

## Bellahøj Swimming Stadium

Swimming, particularly in open air pools, has always been a feature of the Bellahøj district of Copenhagen. In the 1950s, this was the site of the one of the earliest high rise residential developments in Scandinavia, featuring modern apartment blocks some up to 10 storeys high. The blocks stand out because of their number and attractive location in an area of green parkland which has been renovated and have become denser with the planting of trees and with a more undulating landscape around the two remaining small outdoor pools.

by Kenneth Nguyen and Arkitema K/S

Now the area enjoys a stunning new swimming Stadium finely scaled to enhance and connect with the townscape and the various sports facilities. The dramatic 5000 sqm building has a very strong horizontal emphasis, dominated by the cantilevered facade of its flat roof glazed in a greenish colour which mirrors and reflects its surroundings. Arkitema architects have positioned the main entrance at the top of rising terraces, creating a meeting place and tranquil oasis near the dense city area. This invites people to

spend time and to socialise on the steps and ramp area, which is stunningly lit at night.

Built to international swimming standards for staging competition swimming and diving events, the Stadium includes a 50 m long pool with seating for up to 1000 spectators plus individual diving and teaching pools, changing rooms and café. On entering beneath the large overhanging roof, visitors experience a wonderful sense of transparency and lightness from the large glass walls which drop away to a view of the outdoor

pools and park beyond. The materials are primarily glass and concrete with distinctive red stair rails. The roof's light steel lattice girders are visible throughout and add to the simplicity of the building's geometry which creates a dramatic sense of space where the colours of the materials and the vast areas of glass complement the blueness of the water and embrace with a sense of openness with the green landscape outside. Like all swimming pools, one problem can be the noise reflected off the hard surfaces and the water.



Here, the architects have solved the problem by installing white-painted Troldekt ceiling panels to create comfortable acoustics for both swimmers and spectators. This design theme is continued in the changing-rooms, with their coloured clothes lockers and tiled surfaces, where again similar white-painted Troldekt acoustic ceilings reduce noise. Today, the Stadium has proved to be an architectural inspiration which links the whole Bellahøj district and provides a valuable social benefit for the inhabitants.



### FACTS

Architect: Arkitema K/S  
Client: Copenhagen municipality  
Location: Copenhagen, Denmark

### TROLDTEKT PRODUCTS

Ceiling panels: Troldekt  
Colour: White-painted  
Structure: Fine  
Edge: K0







## Private house in Herning

In this new single family house near Herning in central Jutland, designed by architect Morten Mygind, noise resulting from poor acoustics has been eliminated.

📍 Morten Mygind Arkitekter MAA and Tommy Kosior

Early on in the design process, the architect broached the issue of acoustics because of his experience that homes with large living rooms, hard floors and high ceilings require sound-absorbing ceilings. In fact the family had already envisaged a home with Trolldtekt panels.

The house consists of a series of interconnected cubes placed on a plot which slopes one metre thereby creating interesting changes in level both inside and out. The design is centred on the

large kitchen/family room. All the floors are tiled, with 3.5 metres to the ceiling, so the white-painted Trolldtekt acoustic panels in ultrafine are an attractive, recurring material which effectively reduces the reverberation time.

Acoustically once the house was complete and furnished, the ceilings have fully lived up to the client's high expectations while creating a sense of coherence throughout as well as on some exterior overhangs.



### FACTS

Architect: Morten Mygind Arkitekter MAA  
Contractor: MesterByg A/S  
Location: Herning, Denmark

### TROLDTEKT PRODUCTS

**Ceiling panels:** Trolldtekt  
Colour: White-painted  
Structure: Ultrafine

#### Trolldtekt® Plus Ideal for retrofitting

With the double-layer Trolldtekt Plus panel, the acoustic ceiling and mineral wool are fitted in one and the same work flow! This saves time at the construction site, while protecting the installer from contact with loose mineral wool. Trolldtekt Plus consists of a Trolldtekt acoustic panel with a layer of non-woven mineral wool on the back.

#### Trolldtekt® lighting Good lighting – pure and simple

Trolldtekt lighting is an aesthetic and simple solution, custom-designed for integration in Trolldtekt ceilings. The acoustic panels are supplied with pre-cut lamp holes so the lighting armatures can be installed on site without having to spend time cutting apertures to size.

#### Trolldtekt® speakers Integrated sound

Trolldtekt speakers are thin speaker units integrated in the Trolldtekt acoustic panels for ceilings or wall cladding. The speakers distribute the sound from the surround sound or stereo system evenly throughout the room. Trolldtekt speakers are also available as framed wall panels, which combine with Trolldtekt decoration.

#### Trolldtekt® decoration A different kind of decoration

Trolldtekt decoration solutions feature works of art by selected artists or individual, digital motifs printed directly on the panels, e.g. for large surfaces or small decoration panels.



## GOOD ACOUSTICS FOR MORE THAN 75 YEARS

At Troldtekt A/S, we believe that acoustic comfort and a healthy indoor climate are key elements of high-quality buildings. Since 1935, we have manufactured Troldtekt acoustic panels from the natural materials wood and cement. We design, develop and manufacture the panels in Denmark – from local materials and under state-of-the-art and eco-friendly conditions.

### The sustainable choice

Our range of natural Troldtekt acoustic panels has achieved Cradle to Cradle certification in the "Silver" category. This certifies that Troldtekt contains no hazardous substances and therefore can be returned to nature as compost. At Troldtekt, we share the holistic approach of the Cradle to Cradle concept and are therefore implementing it in our long term business strategy. When choosing Troldtekt products for sustainable buildings, specifiers can be assured that Troldtekt can provide assessors and auditors documentation for the international sustainable building certifications LEED, BREEAM and DGNB.

### Intelligent architectural solutions

The vision of Troldtekt is to be a trendsetter within intelligent acoustic solutions with focus on a sustainable indoor climate. Therefore, we continuously develop new special products for modern architecture in close cooperation with architects and building consultants. Every other year, we also present the Troldtekt Award to the international architectural or design student who best applies Troldtekt in a different and innovative way.

### An audible difference

Today, Troldtekt acoustic panels are among the leading and preferred solutions for ensuring high quality sound environments. Our panels clad ceilings and walls in offices, commercial and industrial buildings and in public facilities such as schools, kindergartens, cultural centres, sports centres, swimming pools as well as private residences. Troldtekt makes a real audible difference, not least in minimalist architecture where good acoustics are often challenged by the extensive use of hard surfaces.



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