HÖRMANN SCHÖRGHUBER

PORTAL 31

INFORMATION FOR ARCHITECTS
FROM HÖRMANN AND SCHÖRGHUBER

INDUSTRIAL STRUCTURES

SANAA
AUER WEBER
WESTPHAL ARCHITEKTEN
CH2M HILL


14


08


08


20


20


26

CONTENTS

Title image: Production hall on the Vitra campus in Weil am Rhein, Germany
Photographer: Vitra AG, Birsfelden, Switzerland

EDITORIAL

Dear Readers,

First and foremost, we would like to thank you for your active participation in our 2013 reader survey. Among other things, we wanted to know how you like the contents and visuals of the PORTAL. The results make us proud: Over 90% of our readers have rated our magazine good or very good (read more on page 33). This means the results from our last survey in 2009 have once again improved. For us, this is both an incentive and an obligation. We would like to make the PORTAL even better, and we have another occasion, too: the coming edition is the celebration of our tenth anniversary. We will celebrate among other things with a slight redesign. No need to worry – you will still recognise the PORTAL after the changes take effect – you are, after all, satisfied with the look. Now, let's turn to the current issue. Our choice of industrial architecture is a controversial topic. Just how much function can good design tolerate? SANAA provides the answer with its production hall in Weil am Rhein that they designed for Vitra. With a few tricks, they turn a seemingly trivial task into sophisticated architecture. The new building of the Technisches Betriebszentrum in Munich by Auer Weber is as functional as it is simple, but features a consistent design. Westphal Architekten from Bremen use historical building structures to create a residential and office building from a former warehouse in their native city for friends of both classic and modern classic cars alike. And by popular request in the reader survey, the "Technology" section now contains details and descriptions of unique solutions using Hörmann and Schörghuber doors and gates.

Christoph Hörmann Martin J. Hörmann Thomas J. Hörmann
Personally liable general partners

INDUSTRY
WORKING CONDITIONS IN DEVELOPING AND NEWLY INDUSTRIALISING COUNTRIES

In Asia's developing and newly industrialising countries, the exploitation of employees is not always apparent at first glance in modern global market factories. But illegal excessive working times, low wages, monotonous jobs, a military atmosphere and an extensive lack of rights characterise the everyday life of many employees.

The motorway from Southern Chinese Shenzhen to the provincial capital of Guangzhou, located three hours away, goes past countless industrial areas. One factory building after the other. Many do not bear a visible name. In these simple functional buildings, anononymous factories manufacture products for the global market. The end users are thousands of kilometres away. They only consider the price and not the manufacturers with hard-to-pronounce names. There, millions of itinerant labourers produce toys, shoes, purses, textiles and electronics.

Suppliers under fire

The Pearl River Delta in China's southern province of Guangdong is dubbed the "workbench of the world". People from interior provinces move there because they are promised a chance for social advancement. But many of the factories are simply sweatshops where they exploit workers. Only occasionally does a factory carry the logo of an international brand, which in most cases hangs proud on one of the more representative buildings of modern industrial architecture. Some factories have even made a name for themselves as suppliers or act as independent producers for global corporations. This is how Foxconn from Taiwan became the second largest electronics producer in the world. The company primarily supplies Apple, but also produces for Apple's competition. In China, Foxconn employs one million people in state-of-the-art factories that do not look like sweatshops at first glance. But in 2010, a wave of suicides of Chinese Foxconn employees made the headlines. This provided indications of the actual conditions in the factories. The wave of suicides was fostered by the extremely long working hours with mandatory overtime, monotone jobs, military command, victimisation, isolation and lack of prospects of the young workers. As early as in 2006, an internal Apple report determined that one fourth of Foxconn employees did not have a single day off during the week. 35 per cent worked over 60 hours per week, even though only 54 hours are permitted by law. A lack of days off and excessive overtime also violate Apple's own regulations. In February of 2011 Apple itself complained of child labour and bonded labour. Facilitators demanded provisions from future employees who then began their jobs in debt. Apple was also forced to concede that employees were poisoned while cleaning touchscreens. As this is still the case, the American-Chinese labour law organisation China Labor Watch began a campaign in March of 2014, demanding that Apple stop using the Leukaemia-causing chemicals n-hexane and benzene in touchpad production. Because Apple's own

audits can be verified, the criticism continued. This is why in 2012 the corporation announced for the first time that the Fair Labor Association (FLA) would begin investigations. The industry-oriented organisation confirmed excessive, illegal working hours. 43 per cent of those questioned had even experienced accidents at work. 14 per cent complained about only partially paid overtime. Nevertheless, 34 per cent wanted to work even more, which is understandable considering 64 per cent said that they were unable to cover their basic needs with their wages.

Symptomatic violations

The ongoing violations of national laws, the core labour standards of the International Labour Organization (ILO) and the company's own code of conduct are not limited to Apple's producers; they are symptomatic for the entire industry. The value chain of the electronics industry, perceived as highly engineered, dominates manual labour of unskilled workers in developing and newly industrialising countries. Most of the employees can be replaced, as they have only been trained on the job. There is no independent workers' representation. China's Federation of Trade Unions, the ACFTU, is under the control of the communist party. In the companies, the union leaders, if they exist at all, are part of the management. They organise recreational activities but do not represent the interests of the employees. The suppression of independent trade unions is not limited to authoritarian states such as China or Vietnam. When 200 employees at the Indonesian factory belonging to the South Korean Samsung corporation succeeded in establishing a trade union for the first time in October of 2012, it was quickly disbanded. The trade union members were fired.

Shortage of workers

In Cambodia, the government deployed the military police against striking textile employees in January 2014. At least four strikers were shot. Most of the 650,000 seamsters and seamstresses, 400,000 of which work for international fashion brands, went on strike to double the minimum wage of (converted) 57 euros or were locked out. Initially, the government offered them a 20 per cent raise, but then relied on repression. Companies where export production in China has become too expensive are relocating to Vietnam, Cambodia and Bangladesh. In China, despite the lack of workers' representation, the minimum wages set by the state were increased several times. Nominally, they have quintupled over the last decade, but in reality they have

PORTRAIT

Sven Hansen
Born in 1961 in Hamburg, Asia editor at the taz in Berlin since 1997, and has been organising trips to Vietnam for taz readers since 2010. Prior to this, he worked as the coordinator of the Asian House in Cologne, and as a freelance journalist for radio, print, and online media from Germany, Austria, Switzerland and South Korea. He also organised journalist trips to India and China for journalists.network. In his publications "India: The Barefoot World Power" and "China: Decreed Harmony, Unchained Capitalism," which both appeared in the Edition Le Monde diplomatique, he appears as author and publisher.

Photo: Private

Not until the collapse of the Rana Plaza factory building near Dhaka, where over 1,127 people lost their lives and 2,438 others were injured did the attention of the public turn to working conditions in developing countries. (previous page)
Ramshackle buildings are not the problem with Apple supplier Foxconn. Here, the real issues are extremely long working hours with mandatory overtime, monotonous jobs and a military command. The company landed in headlines after a wave of employee suicides. (left)
Tightly packed, employees sit side by side in a tailor shop in Bangladesh. In addition to poor pay and excessive working hours, the treatment of employees is the main point that different organisations such as the ILO criticise. (centre)
Eventually, the employees fought back and rallied for better working conditions. It did not help them much. The demonstrations were broken up by the state with violence. (right)

Photos: © dpa Picture-Alliance GmbH

tripled. The reason: a growing shortage of workers which can primarily be traced back to the one-child policy. The employees in export factories are generally younger than 30. China's current youth is more educated and ambitious than their parents. Corporations such as Foxconn relocate their factories to the low-cost back country and rely more heavily on employing pupils as interns. They are provided with only a brief training phase and no further instruction, and can be exploited for months. They have even fewer rights than itinerant labourers, as minimum wage does not apply to them.

Rana Plaza

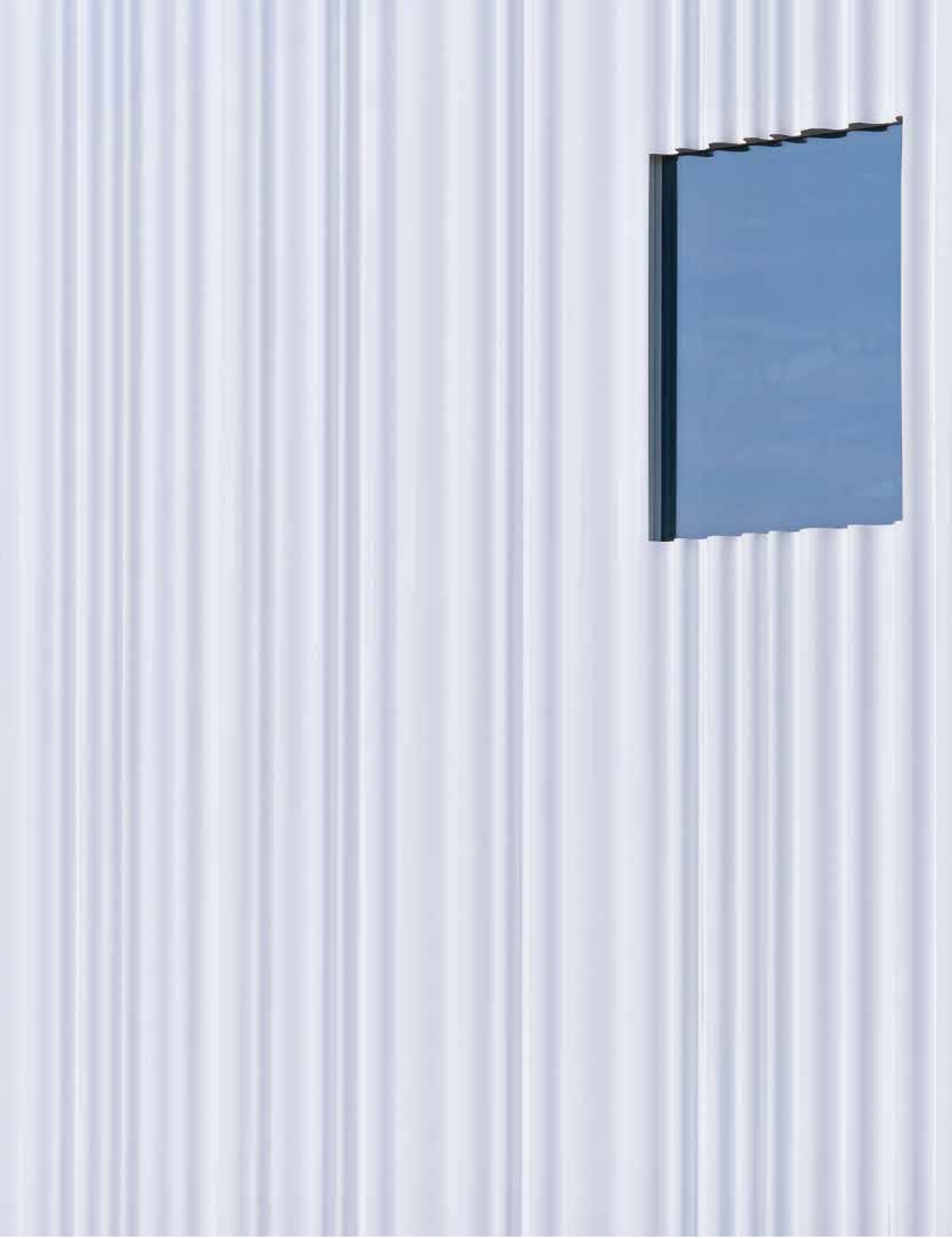
In Bangladesh the textile industry, as the most important export sector, time after time makes headlines due to factory fires and building collapses. The buildings are rarely architectonically sophisticated. The focus is placed on producing as much as possible in as little space as possible. The seamstresses are sometimes even locked in the factories. In April 2013, over 1,127 people died when the Rana Plaza factory building near Dhaka collapsed, while 2,438 others sustained injuries. The owner, a politician from the ruling party, had four additional storeys added to the building, bribing the construction supervision agency in the process. The "Clean Clothes Campaign" has long urged international fashion brands to assume responsibility for their producers and implement basic standards. The collapse of Rana Plaza, whose victims to date have barely received compensation, seems to at least have provided leverage for a fire safety and security treaty. But in March of 2014, Bangladesh's influential textile factories declared that they would not be able to correct the structural defects within the four to six months required. Inspectors of international textile chains came across cracks in beams, low-quality construction materials, overloaded floors, exposed cables, insufficient fire protection and unapproved storeys.

Employees are not actively involved in the investigations of international corporations at their producers in China, Bangladesh or elsewhere, which are in most cases reactions to the pressure of consumer organisations. The corporations do not want to give workers more rights under any circumstances. Their focus is on preventing excesses that may damage their reputations without changing anything about their low-wage policy and the underlying structures.

PRODUCTION HALL ON THE VITRA CAMPUS IN WEIL AM RHEIN

Vitra's mastermind Rolf Fehlbaum thought long and hard before taking his decision. Then it was clear: SANAA would construct the new production hall, while Herzog & de Meuron took to the visitors' centre. It could have very well happened the other way round. But Fehlbaum believed that SANAA's calm, reserved, almost polite architectural style and the new task for both designers would be the more exciting combination.

The VitraHaus by Herzog & de Meuron's is the more spectacular design of the two most recent buildings constructed on the furniture manufacturer's premises. Their stacked houses were on everyone's lips – in marked contrast to the production hall erected at the same time by the Japanese architecture firm SANAA at the other end of the campus. It was already in operation, though one essential detail was missing for the ceremonial opening: the facade. But one thing at a time: at the south end of the Vitra Campus, a 12,000 m² production hall was bursting at the seams. The task was to demolish the ageing hall and to replace it with a building sized at 20,000 m². After extensive analyses, SANAA suggested revising the specifications and constructing a single, round building instead of four orthogonal bodies. The architects justified this shape with logistics and production processes that require maximum flexibility. The round structure allows for deliveries and collections at different parts of the building as required – seen from the outside, there are no defined front or back sides. Only the covered path to the neighbouring hall provide a location. Inside the building is a different story. As the hall was erected during ongoing operations, it had to be sectioned into two construction stages. A fire protection wall divides the circle into two halves at the centre, which are protected from spreading fire by Hörmann fire sliding doors. The northern section is home to high-bay storage with arriving materials, while the centre accommodates the fitting zone and the southern section the collection warehouse. The loading ramps face the west and east. Though the outside is round, the inside is organised orthogonally. Not only do the rows of high-bay storage give the room a structure, but numerous narrow transom lights contribute to the overall organised look. The roof provides the building with a majority of the required daylight. As everything inside with the exception of the ceiling heating is painted white or, as with the concrete and the floor, features a light grey, the rooms give the impression of being well lit. And the facade? This is the detail that makes the SANAA building special. Approximately 1.80 metres wide and 11 metres high, vacuum-formed, wave-like elements made of acrylic glass hang in front of the concrete wall. It consists of two layers: one external, colourless and transparent and one internal, opaque-white. Three differently shaped panels that can also be rotated 180° form the basis of the facade. They surround the building in various combinations. Speaking of 'round': the layout does not correspond to a mathematically correct circle. The diameter is between 156 and 159 metres. At dimensions of this magnitude and from a ground-level perspective, this deformation is barely noticeable. Architects Kazuyo Sejima and Ryue Nishizawa originally played with the idea of this type of basic shape while designing their museum in Kanazawa. According to them, they were too inexperienced back then and chose a different design for pragmatic reasons.



PRODUCTION HALL ON THE VITRA CAMPUS IN WEIL AM RHEIN

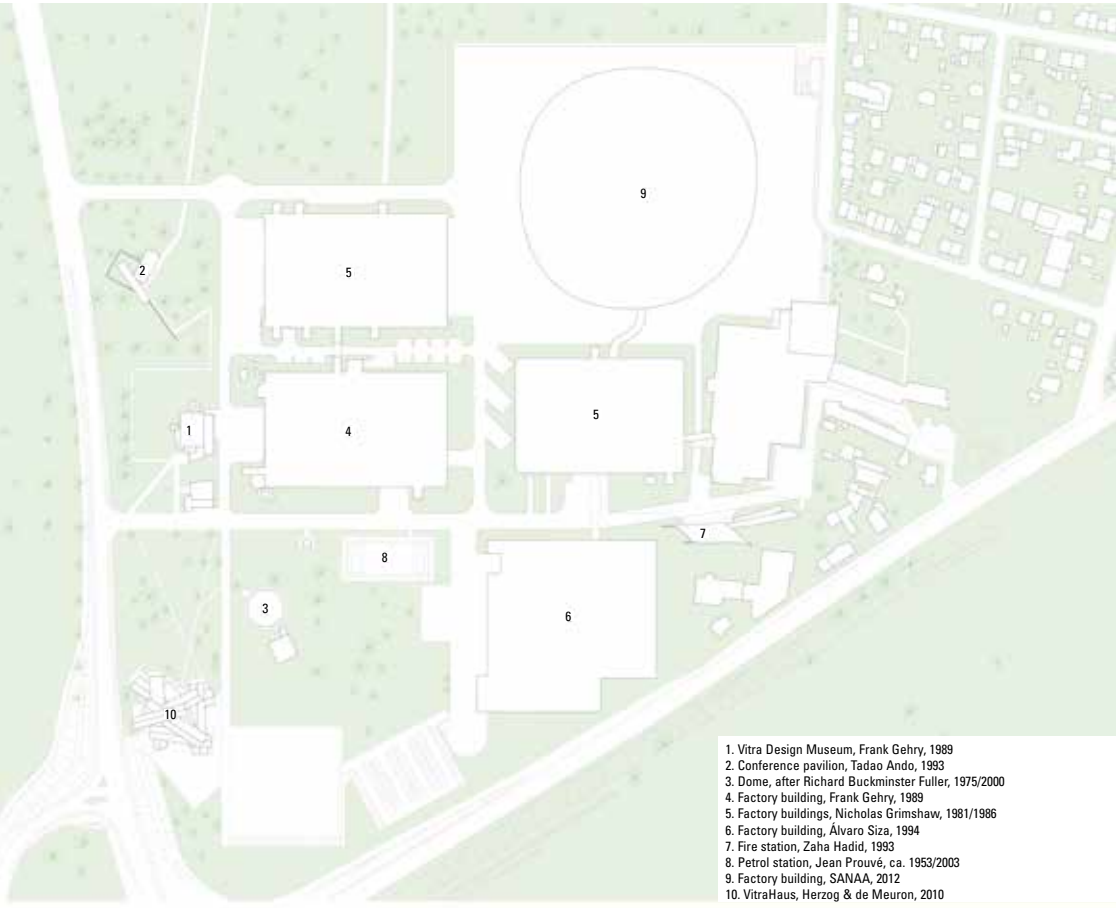
The facade consists of two layers of acrylic glass, one transparent and the other opaque. This results in structural depth. The panels corrugated with different radii further contribute to this effect. (previous page).
The round shape of the building visually takes away from the magnitude – it no longer appears so massive. (top)
The bright colours inside, as well as the transom lights, ensure a high level of light. According to Vitra, power consumption has sunk by 60%. (below)

A curved, covered path leads to the neighbouring production hall, designed by Nicolas Grimshaw. (bottom left)
The majority of the facade is closed. Only the loading ramps pierce through the shell. Windows? Only few are scattered across the facade. (bottom right)

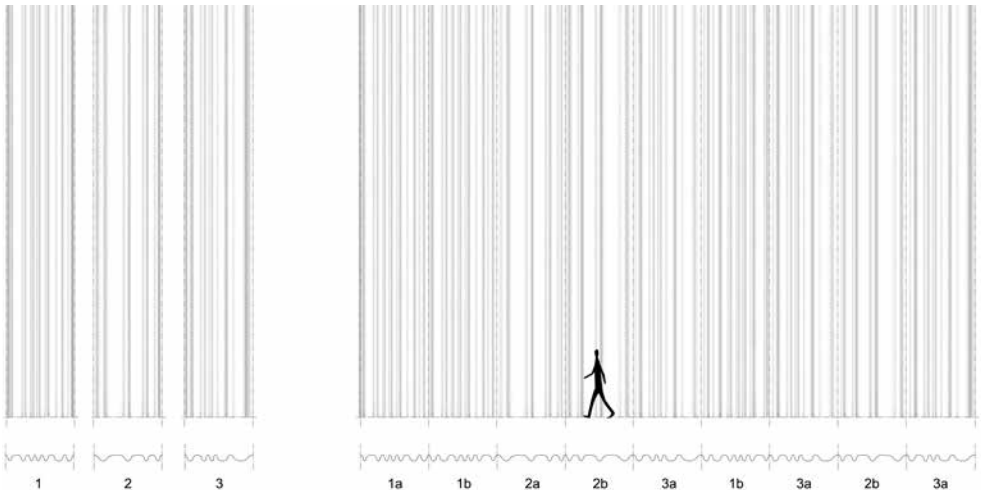
PRODUCTION HALL ON THE VITRA CAMPUS IN WEIL AM RHEIN

A fire protection wall divides the building into two halves. Hörmann fire sliding doors prevent fire from spreading if required. (top)
Small administration offices line the concrete wall. (bottom left)
Only a bird's eye view reveals that the shape isn't a mathematically correct circle, but rather a slightly deformed one – similar to the shape of the moon one day before a full moon. (bottom right)

Layout (top)
Section and view of the three basic facade elements (bottom left)
Different combination options for the facade elements, original – a, and rotated 180° – b (bottom right)



1. Vitra Design Museum, Frank Gehry, 1989
2. Conference pavilion, Tadao Ando, 1993
3. Dome, after Richard Buckminster Fuller, 1975/2000
4. Factory building, Frank Gehry, 1989
5. Factory buildings, Nicholas Grimshaw, 1981/1986
6. Factory building, Álvaro Siza, 1994
7. Fire station, Zaha Hadid, 1993
8. Petrol station, Jean Prouvé, ca. 1953/2003
9. Factory building, SANAA, 2012
10. VitraHaus, Herzog & de Meuron, 2010



PROJECT DATA

OWNER
Vitra AG, Birsfelden, Switzerland

ARCHITECTURAL DESIGN
Saana, Tokyo, Japan

LOCAL ARCHITECTURAL PARTNER
nkbak, Frankfurt, Germany

SUPPORT STRUCTURE PLANNING
SAPS, Tokyo, Japan
Bollinger + Grohmann, Frankfurt, Germany

GROSS FLOOR AREA
20,455 m²

DIAMETER
156 x 159 m

BUILDING VOLUME
206,600 m³

FACADE AREA
5,740 m²

LOCATION
Vitra Campus
Charles-Eames-Straße 2,
Weil am Rhein, Germany

PHOTOS
Julien Lanoo
Christian Richters
©Vitra
www.vitra.com

HÖRMANN PRODUCTS
Fire sliding doors

TECHNISCHES BETRIEBSZENTRUM IN MUNICH

At first, it doesn't sound exactly spectacular: two parallel building blocks, enclosed by a monotonous, grey skin. The new Technisches Betriebszentrum could be described in just a few words. But this would do it injustice. Because this simplicity allowed the architects from Auer Weber to turn a boring commercial building into an eye-catching piece of art.

Germany's metropolises have a problem: an ever-growing traffic volume. And Munich has long been at the very front. The economic powerhouse attracts many workers, so the housing demand is high, and the prices rise accordingly. Many have no choice but to live on the outskirts of the city or to move to the countryside and commute – and waste their time stuck in traffic, because many commuters still swear by cars. To get the traffic flow on the streets back under control to some degree, the city relies on sophisticated traffic management systems. They are controlled in Munich's Technisches Betriebszentrum, which was constructed by the architecture firm Auer Weber. But this new building houses not only the traffic management headquarters, but also the builder's yards for the other transport services. The building stands in a heterogeneous setting at Allacher Straße. To the north, there is an industrial area, to the south a small garden area, and to the west and east are residential areas. Auer Weber responds to these different gauges with a very reduced, clear cubature. Two long building blocks stand parallel at a right angle to the main street, aligning themselves with the other commercial buildings. They look virtually identical: Both are cladded with a shell made of expanded metal, which wraps around the building spaced at 30 to 150 centimetres. Seen from a distance, the buildings appear to be closed completely; reflections on the matt glossy material make them glisten in different shades of colour, depending on the lighting of the surroundings. But when approaching, the observer at least gets a glimpse of the different uses through the mesh. Despite having the same look, both bars have a major difference: current planning leaves the steel building unheated. This is where the storage rooms for all kinds of materials, such as cables, traffic signs, traffic lights and street lights, as well as the garage for the fleet, are located. On the top floor and on the roof, a parking deck offers additional space for service and employee vehicles. The opposing building features heated rooms: the traffic management centre, the workshops and a cafeteria on the ground floor and management on the upper floors. Hörmann industrial doors with excellent thermal insulation ensure that the heating energy stays in the rooms. Three atria are cut into the structure to allow light into the offices, all of which are aligned to the facade and can be ventilated and aerated. The ventilation system at the traffic management centre and in the installations room is cooled using fountain technology with ground water. A chip heater, supported by a gas heater as needed, provides heat. Both blocks are connected by two bridges. A slanted glass ceiling covers the walkway which serves for loading and unloading. The fleet and storage rooms can be reached by means of industrial sectional doors. The inner rooms benefit from light falling into the walkway thanks to the glazing. Photovoltaic elements integrated in the glass are used both to generate energy and for protection against the sun.

TECHNISCHES BETRIEBSZENTRUM IN MUNICH

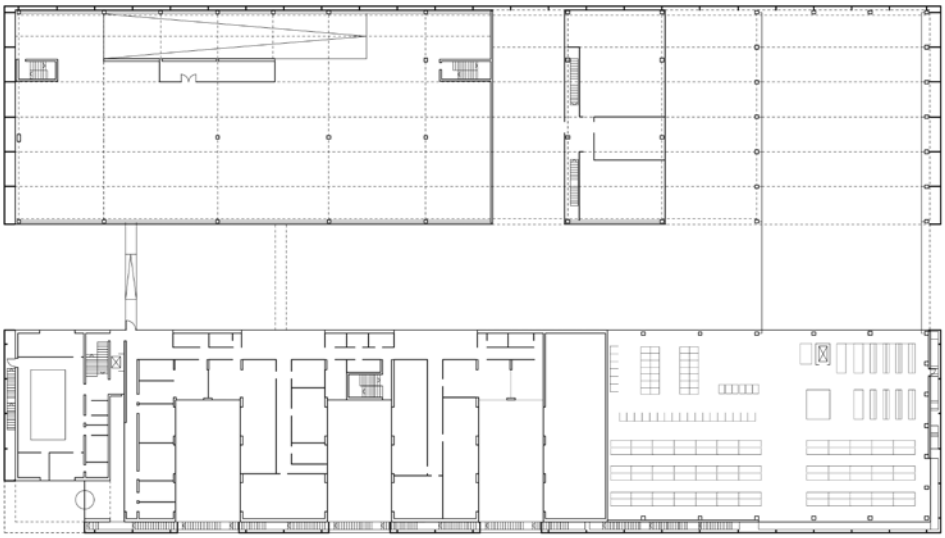
The skin made of expanded metal is spaced 40 to 150 centimetres to the massive building body. (previous page)
Cuts into the office building blocks mark the entrance in the ground floor and the atria in the top floor. (top)
The area between the inner and outer shells houses the emergency staircases. (bottom left)
Exceptionally insulated, 10-m-wide Hörmann sectional doors close off the hall at the front side, ensuring energy efficiency. (bottom right)

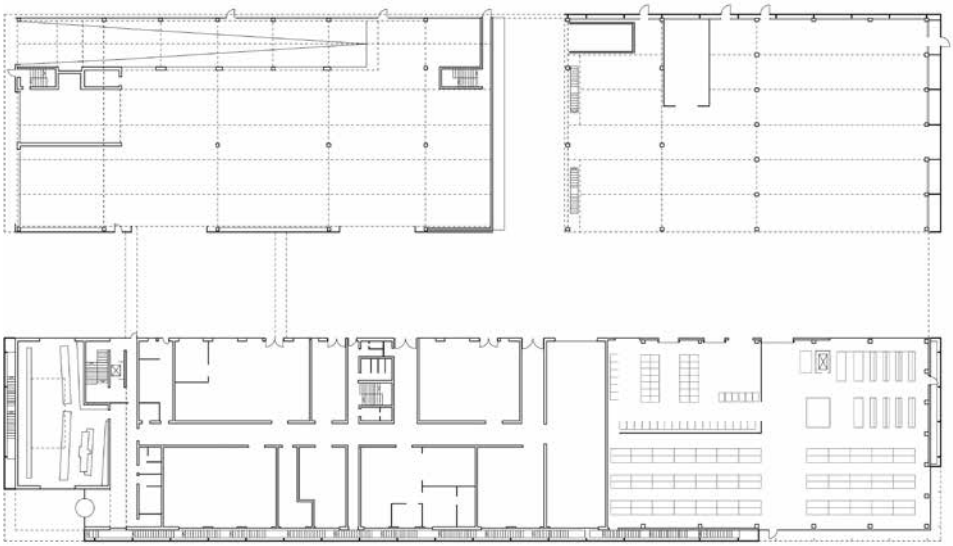
The fleet and storage rooms can be reached from within the covered walkway by means of industrial sectional doors. The inner rooms benefit from light falling into the walkway thanks to the glazing. (top)
Up close, the shell made of expanded metal reveals what it's hiding. (bottom left)
Inside the building, spare parts are stored and defective articles wait to be repaired. (bottom right)

TECHNISCHES BETRIEBSZENTRUM IN MUNICH

The Technisches Betriebszentrum houses Europe's most modern traffic management centre. The traffic situation can be monitored and, ideally, controlled on a 17-metre-wide multimedia wall. (top)
The high-bay storage spans two storeys and holds all kinds of spare parts. (bottom left)
Hörmann's flexible high-speed doors ensure smooth, efficient processes. (bottom right)

Floor plan for the top floor (top)
Floor plan for the ground floor (below)





PROJECT DATA

OWNER
State Capital Munich, Germany

DESIGN
Auer Weber, Munich, Germany

SUPPORT STRUCTURE PLANNING
Mayr | Ludescher | Partner,
Munich, Germany

GROSS FLOOR AREA
17,600 m²

UTILISED SPACE
13,200 m²

COSTS
41.2 million euros

LOCATION
Schragenhofstraße 6,
Munich – Moosach, Germany

PHOTOS
Stephan Falk, Berlin, Germany

HÖRMANN PRODUCTS
Industrial sectional doors
Fire-rated doors
Flexible high-speed doors

SCHUPPEN EINS IN BREMEN

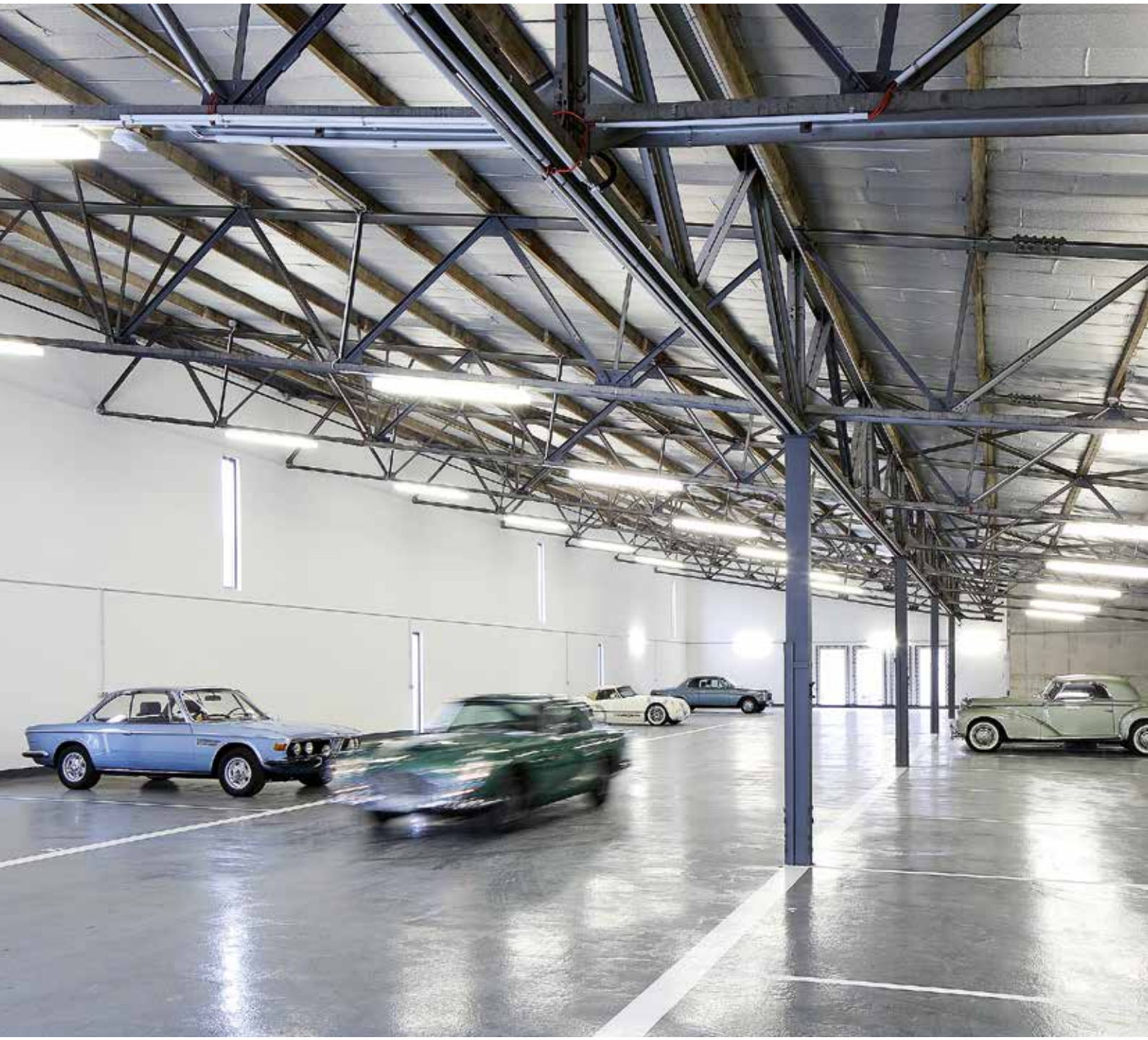
A building for auto enthusiasts – what might that look like? Westphal Architekten from Bremen have the answer. They planned the conversion of a heritage-protected shelter, which once served as a reloading point for the international port of Bremen. They gutted the building and placed workshops, shops, offices and apartments between the massive reinforced concrete columns – everything a homage to man's favourite toy: the car.

Even if its residents don't like to hear it, Bremen is always somewhat overshadowed by the nearby metropolis of Hamburg. But while heated debates are still being held about the prestigious Elbphilharmonie project in Hafencity, Hamburg, Bremen's port area is also quietly, almost secretly undergoing a remarkable transformation: the smaller of the two Hanseatic cities is also redesigning its North Sea coast. At the turn of the millennium, the Bremen senate resolved to restructure the area northwest of the old town into the "Überseestadt", an 'overseas city'; three years later, the master plan was presented. By 2025, over three square kilometres – approximately twice the area of Hafencity in Hamburg – are to home 450 companies, creating approximately 9,000 jobs. Exclusive apartments on the water are intended to draw wealthy buyers to the Weser. Unlike in Hamburg, with this project Bremen is foregoing prestigious architecture, instead focusing on the careful integration of the industrial heritage. This includes the 405-metre-long listed Schuppen Eins, that runs along the Europahafen port. In 1959, the building was erected as a reloading point for cargo of all types. It stayed in operation until 1993, until the port company went out of business. It subsequently served purely as a storage building, was later empty and in 2007 it was purchased in halves by two investors and renovated extensively. The Bremen firm Westphal Architekten was responsible for the north-western part. KJH Verwaltungs GmbH & Co. KG owns the building. Managing Director Klaus Hornung set the topic: the car should be set at the centre of the building – literally. The ground floor is dedicated to both classic and modern classic cars. An approximately 150-metre-long, slightly off-centre boulevard is lined with workshops and shops dedicated to automobiles. To preserve the industrial and workshop character, they are separated only by translucent glass elements – that allow sufficient light to enter the 50-metre building. The rooms also include gastronomy offerings and, as a highlight, the Mobileum, where Bremen's automotive history is told in temporary exhibitions. An intermediate floor homes the associated offices reachable via a gallery but also internally. Cars play a special role in the top floor, as well: more offices are neighboured by twenty exclusive maisonette apartments facing the Europahafen port. The residents are transported along with their automobiles directly to their approximately 160-square-metre homes by means of two lifts. In addition to the private single garages – equipped with Hörmann doors – there are two additional unheated halls for classic car owners who may not have enough space for their jewels at home. To ensure sufficient light, the ceiling features cut-out sections above the access lane and fully glazed industrial doors ensure transparency inside. Atria, as well as bays reminiscent of the architecture of the Bremer Haus lead the way.


SCHUPPEN EINS
AL-DAR

Westphal Architekten emphasized a true-to-original facade design. This is why the massive steel concrete carrier was kept visible, for example. (previous page)
Facing the harbour basin, the facade surfaces are for the most part glazed, while... (top)
... the rooms in the inner area are mainly separated by industrial glass, allowing a high level of light to enter the building thanks to their translucency – as here in one of the offices on the top floor. (below)

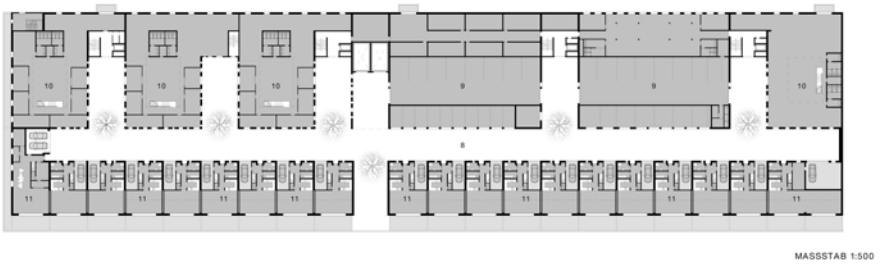
Large-area halls offer classic car enthusiasts a secure place for their jewels in the top floor. Condensation and rust don't stand a chance here. (below)

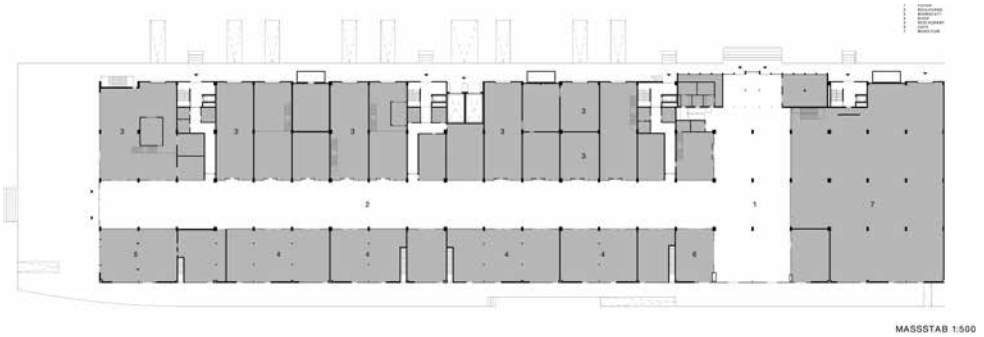


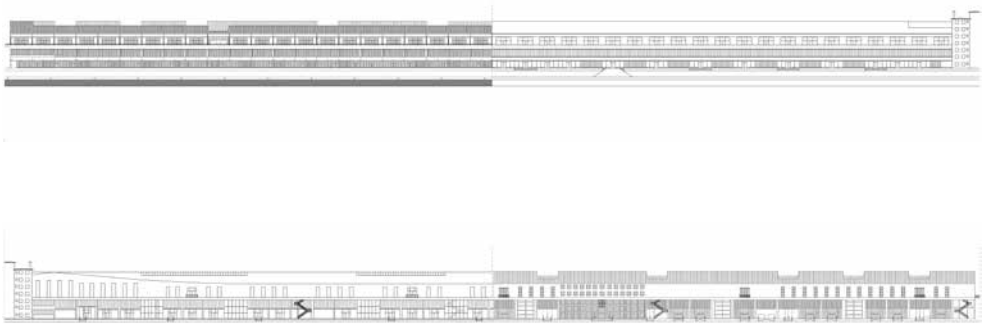
SCHUPPEN EINS IN BREMEN

A twelve-metre-wide boulevard leads through the ground floor of the building. It is lined with workshops and shops, whose translucent industrial glazing offers a glimpse of what is happening inside. Only the transparent doors provide actual insight. (top)
Access to the shops and workshops with their approximately 8.5-metre-high rooms is ensured by Hörmann fully glazed aluminium doors. (bottom left)
Rolling shutters secure the large garages on the top floor. (bottom centre)
The residents of the twenty freehold flats have their own garages with Hörmann up-and-over doors. (bottom right)

Top floor
Ground floor
Section
View toward south
View toward north
(from top to bottom)







PROJECT DATA

OWNER
KJH Verwaltungs GmbH & Co. KG,
Bremen, Germany

DESIGN
Westphal Architekten, Bremen, Germany

SUPPORT STRUCTURE PLANNING
Prof. Bellmer Ingenieurgruppe,
Bremen, Germany

GROSS FLOOR AREA
30,102 m²

UTILISED SPACE
29,129 m²

GROSS VOLUME
172,684 m³

Costs
€28 million

LOCATION
Konsul-Smidt-Straße 20-26, Bremen,
Germany

PHOTOS
Conné van d'Grachten, Ulm, Germany
Stephan Falk, Berlin, Germany

HÖRMANN PRODUCTS
Industrial sectional doors with and without wicket door (external doors)
Fully glazed industrial sectional doors (internal doors)
Up-and-over garage doors
Rolling grilles

BOEHRINGER INGELHEIM IN SHANGHAI

For the internationally renowned pharmaceutical company Boehringer Ingelheim, the American engineering firm CH2M Hill drafted both the master plan and the addition of a packaging centre and a new laboratory building. They are located on the premises of the Zhangjiang Hi-Tech Park in Pudong – Shanghai's Silicon Valley, where primarily biotechnology, IT and microelectronic technology companies have set up shop.

When Albert Boehringer founded the company Boehringer Ingelheim in 1885 in Ingelheim am Rhein, he surely never dreamed that his name would one day be known across the world. The roots of the pharmaceutical manufacturer lie even further back; for a while, there were even two companies with the same name, resulting in in the addition of the words "Mannheim" – and "Ingelheim". The invention of Laudanon, a pain medication based on opium, in 1915 marked the company's take-off. Less than ten years later, the pharmaceutical company began to expand, first nationally, then internationally after the Second World War. In 1986, the Biotechnikum was established in Biberach, Germany; today it is the largest production plant for cell culture biopharmaceuticals in Europe. In 1993, the two sites in Biberach and Ingelheim were consolidated under a single management; Biberach concentrated on research, while Ingelheim focused on production – with the exception of biopharmaceutical production. Today, Boehringer Ingelheim is represented with subsidiaries on a global scale, and, as of 1994, on the ever-growing Chinese market. There, the American engineers of CH2M Hill expanded the plant at Zhanjiang Hi-Tech Park in Pudong, Shanghai, to include a packaging centre. In addition, a new building for the chemical research and development laboratory was erected. In 2009, CH2M Hill developed the master plan for the 2.5 square kilometre large grounds. This was then followed by concrete projects.

The expansion of the factory allows for the development of new competences and capacities, as well as a more effective supply chain to support the ambitious business plan of Boehringer Ingelheim in China. The plant in Shanghai is to become a competitive, regional supply centre. The project includes a packaging centre to house state-of-the-art packaging equipment, new laboratories for quality monitoring, as well as an automated warehousing and logistics area for reliable, high-quality delivery. The purpose of the building is obvious – yet the efforts put into the design are unmistakeable: all the buildings are cladded with horizontal silver-grey or anthracite-coloured facade plates. This horizontality is contrasted by the vertical window elements that either lie flush with the facade as a bar or slightly protrude from the facade as box windows. The only splashes of colour are the thermally-insulated, bright blue Hörmann rolling shutters that seal the loading areas, ensuring energy efficiency. Inside, the Hörmann single- and double-leaf fire-rated doors are each equipped with a vision field and painted in a bright grey colour that gives them a subtle contrast to the white walls. While the building systems can be seen in the packaging centre, the open-plan offices feature suspended ceilings. Glass walls separate the meeting rooms. Some fittings and the low partitions between the cubicles reflect the blue of the doors and are the only colour accent inside the building.

BOEHRINGER INGELHEIM IN SHANGHAI

Horizontality characterises the closed facade sections, while the window openings feature a vertical layout. (previous page)
Hörmann rolling shutters lead to the packaging centre. (top)
State-of-the-art technology and flexible Hörmann high-speed doors ensure smooth processes in the packaging centre. (bottom left)
The open-plan offices are designed to be bright. Only blue partitions set colour accents. (bottom centre)
Light grey internal doors with glazing cut-outs stand out from the white walls with their anthracite-coloured frames and ensure transparency.
(bottom right)

Glass walls separate the meeting rooms. Hörmann's fire-rated doors are also equipped with vision fields. (top left)
In emergencies, anti-panic locks in double-leaf escape doors meeting fire protection requirements ensure easy opening. (top right)
In the packaging centre, Hörmann insulated rolling shutters form coloured accents. (below)

PROJECT DATA

OWNER
Boehringer Ingelheim AG & Co. KG, Ingelheim, Germany

DESIGN
CH2M Hill, Meridian, Colorado, USA

SUPPORT STRUCTURE PLANNING
CH2M Hill, Meridian, Colorado, USA

UTILISED SPACE
25,000 m²

COSTS
€70 million

LOCATION
Zhangjiang High-Tech Park, Shanghai, China

PHOTOS
Zhou Zi Han, Shanghai, China

HÖRMANN PRODUCTS
Roller garage doors
Flexible high-speed doors
Dock levellers
Dock shelters and seals
Single and double-leaf fire-rated doors
Single and double-leaf multi-function doors
Single and double-leaf cleanroom doors
Stainless steel multi-function doors
Steel internal doors
Single and double-leaf steel sliding doors
All-glass doors

Hörmann intensifies collaboration with architects
November of last year, Hörmann set up a new department for architecture consultation. The company hopes the intensified collaboration will help to develop ideas with planners and support them in their daily work with a more targeted focus. Jörg Egener, the head of the new Architecture Consultation department on the advantages for planners:

What challenges do planners face every day?
To meet current customer requirements, planners must always stay on top of state-of-the-art technology and have profound product knowledge. Constant innovations, further developments, changing legal frameworks and wide product ranges can unnerve architects.

What role do planners play for Hörmann?
They combine several roles into one. On the one hand, they are idea providers for us thanks to their practical experience, and on the other hand they are the professional, cost-conscious and creative heads. This is why it is important for us to contact them as early as possible in a project and support them with our technical and produce expertise.

How did the idea for the Architecture Consultation department come about?
Our fourteen German sales branches receive many questions from planners each day. By staffing the department with experienced specialist advisers, these questions are channelled. This allows architects and structural engineers to take better advantage of our expertise and decades of experience with doors and gates to minimise any planning errors and provide our planners with competent, prompt, uniform responses to their questions. To meet the wide variety of requirements, we started with eight employees from different areas, from industrial business management assistants to architects.

What does the department do?
Our goal is to be able to provide planners with solution-oriented consultation across specialisations from the planning to the implementation of their construction projects. This requires close collaboration; we can be reached by phone or e-mail, but also offer on-site consultation to be close to the projects. For us, creating synergies in cooperation with our subsidiary, Schörghuber KG Spezialtüren aus Holz, and their ten German sales offices and two regional sales offices

is also important. Furthermore, we offer topic-specific architect events recognised by architects' chambers.

What does Hörmann expect from the new department?
We would like to intensify collaboration with planners and push doors and operators forward. In addition, we hope close collaboration with planners will increase end customer satisfaction even more. We're hoping for clear, open communication between the department and the planners. So that they can consider the frequently unimagined technical options and wide range of products, we count on them contacting us at an early planning stage.

What advantages does the new department offer planners?
This type of cross-specialisation consultation for multiple product groups is unique. In collaboration with the factories, project-specific solutions are developed. In future, we want planners to receive quicker, more competent information and technical fitting data and sketches of the products for further planning and support in creating specifications. Topics such as fire protection and energy efficiency for door and loading technology in industrial buildings are highly complex, just as the requirements placed on doors in barrier-free environments, for example. In such cases, it's recommended to get specialists on board early in the process. Together with the specialist departments at our fourteen sales branches and our factories, we aim to offer the best solution in terms of technology, appearance and economy. We also find it important for the planners to have permanent contacts at the Hörmann Architecture Consultation department.

How can planners take advantage of what the Architecture Consultation department has to offer?
The architect forum on our website has two telephone numbers and e-mail contacts for consultation in the areas of fire-rated and smoke-tight doors and industrial door systems. For private residential construction, the specialist advisers can be found via the sales office search. Hörmann's architects' programme with texts for invitation of tenders, drawings and sections can be downloaded free-of-charge on the Internet or delivered as a CD.

Jörg Egener
Head of Architecture Consultation at Hörmann VKG since 2013

Career at Hörmann:
1998
Specialist Adviser (Office) Project Department for Fire and Smoke Protection, Steinhagen regional sales office

1999
Specialist Construction Manager Project Department for Fire and Smoke Protection, Steinhagen regional sales office

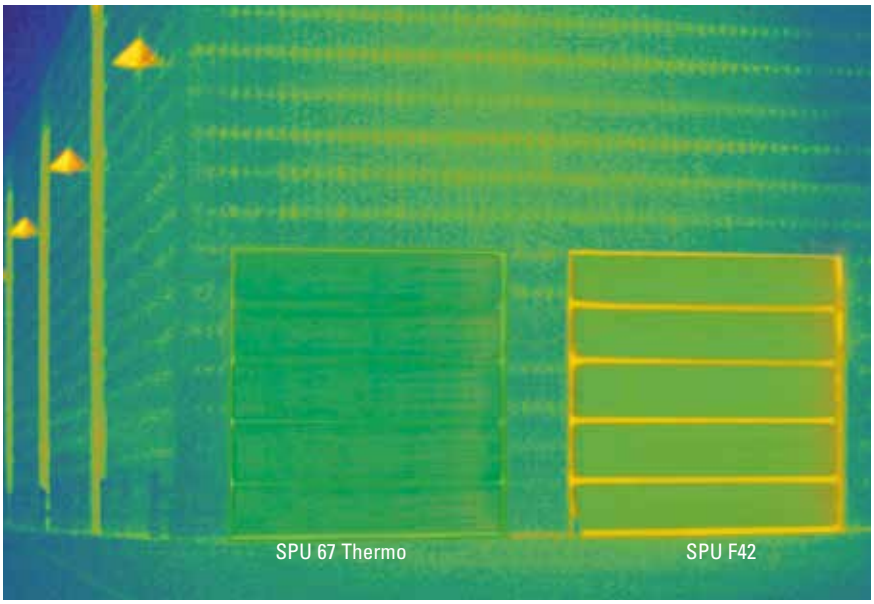
2006
Managing Director of a subsidiary belonging to the Hörmann Group

2008
Product Manager Fire and Smoke Protection, Hörmann VKG

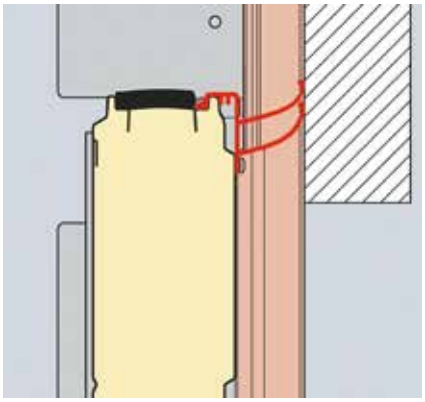
HÖRMANN CORPORATE NEWS

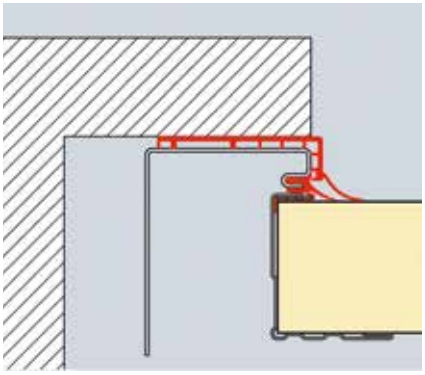
UP TO 55% IMPROVED THERMAL INSULATION FOR INDUSTRIAL DOORS

Hörmann optimises its industrial door programme in terms of thermal insulation, now offering doors with a leaf thickness of 67 mm and a thermal break as standard. This allows the doors to achieve up to 55 per cent improved thermal insulation (infrared image bottom right). They are available as double-skinned, especially insulated steel sectional doors, glazed aluminium doors with steel bottom sections that allow more daylight to enter or fully glazed aluminium doors for even more light and transparency. These new, especially energy-efficient doors match the programme with a 42 mm door leaf. This means that on request, doors from both programmes can be installed in a building without affecting the appearance – a feature that is presently only available from Hörmann. SPU 67 Thermo steel sectional doors achieve the thermal insulation value through the thermal break between the outer and inner sheets. With an additional seal, the so-called ThermoFrame, the frame is separated from the brickwork, improving thermal insulation by up to 21% depending on the door type. The partially (APU 67 Thermo) or fully (ALR 67 Thermo) glazed aluminium doors also achieve excellent thermal insulation due to a three-chamber profile technology, in which the external and internal profiles are separated by a plastic spacer profile. The standard triple Duratec glazing achieves up to 40 percent better thermal insulation and is the only version in this form on the market with maximum scratch resistance and thus permanently transparent glazing. In order to make sure that opening the entire door is not necessary for every pedestrian passage, more than 20 percent of the industrial doors are equipped with wicket doors. The new doors can also be equipped with the wicket door with trip-free threshold, only available from Hörmann. The stainless steel threshold is only up to ten millimetres high depending on the door size, and reduces the risk of tripping and makes it easier to wheel things through. So that the energy kept in the hall thanks to the 67-mm-thick door leaf is not lost through the wicket door, the latter is also equipped with profiles with thermal break – currently the only solution of this type on the market. Thus SPU 67 Thermo with ThermoFrame and wicket door still achieves an excellent U-value of up



to 0.75 W/(m²·K). The standard clear passage of 905 mm – in conjunction with other prerequisites – fulfils the requirements of barrier-free construction and an escape route for up to five people. Operators of commercial properties should also place particular emphasis on safety in addition to energy efficiency. According to EN 13241-1, doors must automatically stop and return during the closing process if people or objects are located under the door. Power-driven Hörmann industrial doors are delivered with an optosensor: a photocell integrated into the external seal as standard, which performs as described above. The optosensor can be replaced by a leading photocell without surcharge, which allows the door to stop and travel back upwards before it can make contact with persons or objects beneath the door. The third solution from the manufacturer also offers this advantage: a light grille that is integrated into the frame and is thus protected against damage. In addition, it allows faster running of the door due to the large area of coverage by light beams. Faster running speeds in turn prevent excessive energy loss when opening and closing the door.





THE CRIMINAL INVESTIGATION DEPARTMENT RECOMMENDS BURGLAR-PROOF TIMBER DOORS

Burglar protection has gained importance in recent years. This year, Bavarian state police once again issued a manufacturer directory of tested and certified break-in-resistant doors. It shows: Schörghuber has the largest range of timber doors. Both in the private and public sectors, the demand for break-in-resistant doors is growing steadily. In combination with fire and smoke protection, as well as acoustic insulation, these doors face high requirements. Not only do the doors have to be secure, but they often also have to have maximum opening dimensions – and the door design also plays a role relative to the building's representative architecture. Schörghuber has found intelligent solutions without sacrificing sophisticated design and its usual variety of design possibilities. For timber doors, Schörghuber offers the top class RC4. The test certificate attests to the entire door – not just the door leaf, but rather the interaction of all its components. Schörghuber can offer all of its individual parts in the corresponding quality. This results in a wide variety of combination options – including design options. Side elements and transom lights in conjunction with wooden rebate frames add to the programme. Even double-leaf doors with a width of up to 3000 mm are available up to a resistance class of RC3. Doors with integrated safety class as light openings achieve the same class. Doors with timber frames and solid timber rebate frames are available up to a class of RC3. In case of higher safety requirements, steel frames are a must. One special feature of this type of doors is their acoustic insulation of up to 50 dB. Smoke-tightness and fire protection up to T90 is possible in all cases. These properties are complemented by a wide range of tested fittings, spanning from concealed hinges to electro-mechanic locks and touch bars. As an optional extra, Schörghuber offers a surface detector system with its own insurance-related VdS approval.

THE FAMILIAR SCHÖRGHUBER QUALITY EVEN ON A TIGHT BUDGET

With three new products, doors from Schörghuber are now also attractive to building owners who don't want to do without a versatile design despite

Photo: Daniel Vieser

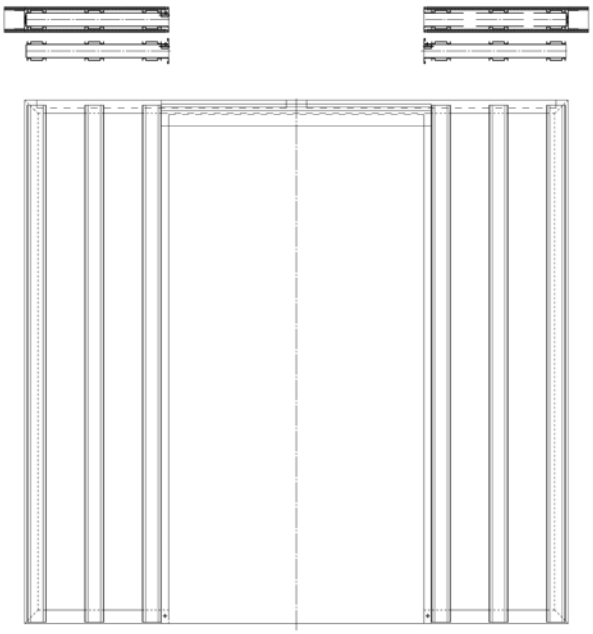
SCHÖRGHUBER CELEBRATES SUCCESSFUL EXHIBITION APPEARANCE AT THE FEUERTRUTZ

For Schörghuber, participating in the FeuerTRUTZ specialist exhibition was a great success. The manufacturer for special doors took part in this event for the first time and saw a great number of interested visitors to its stand, where around 5,000 visitors had the opportunity to see for themselves that fire protection doesn't have to bar design, and vice versa. Sales Manager Simone Sklaschus was pleased with the interest of the specialist audience: "The 2014 FeuerTRUTZ exhibition was a complete success for Schörghuber. Our stand was highly frequented. Many visitors came with concrete need for consultation and sometimes were even interested in concrete solutions for current projects." Schörghuber presented innovative new products, equipped with high-quality technology in an appealing design. The wide variety of door design possibilities was an important point for visitors to the exhibition. The technical implementation was met with keen interest as well. For example, the simple operation of special doors in schools, nursing homes, care facilities and hospitals was a dominant topic of discussion. Schörghuber presented its solutions on the exhibited door elements using free-wheel closers and automatic operators.

a tight budget. The single-leaf RT-1 model is the first project door with tubular chipboard insert available from the Bavarian manufacturer. This light, cost-effective variant can be feature any surface and matches the design of the function doors. As with the entire project door program, the RT-1 is certified to the maximum stress class 4 and thus guarantees a long service life. The two-piece project wooden profile frame also recently added to the program, compared to the three-piece frames, consists of only two parts – the core and reveal frame are glued together. This new frame still has the same appearance as the standard wooden profile frames for function doors, can feature any surface and be combined with all fittings. The new white lacquer surface finish offers a further design option. Doors and frames can be coated in the colours Pure white and Traffic white using the UV roller paint method. This is a cheaper alternative to premium coating in spray-paint quality with nearly consistent quality.

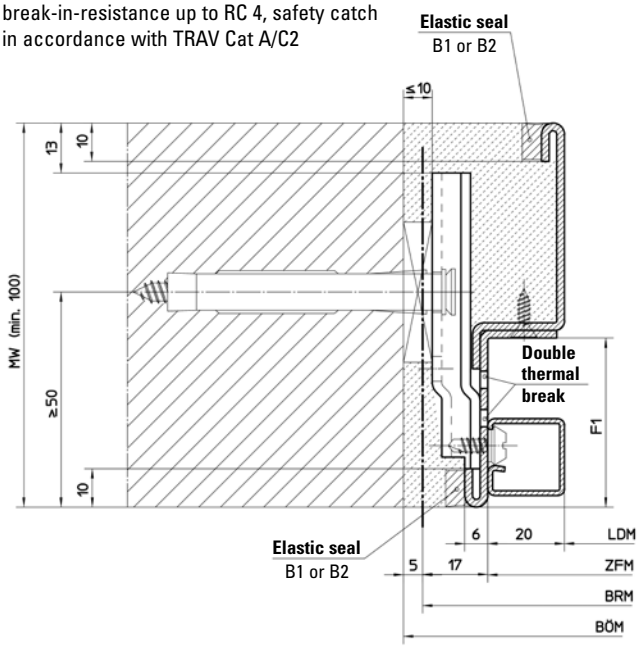
HÖRMANN IN DETAIL
FRAMES WITHOUT FACE

Model: All-glass sliding door HW-SL, box design, double-leaf **Frame depth:** 6 mm **Wall type:** Unplastered brickwork, concrete, partition walls



Application areas:
Sliding doors with a box design are primarily used in tight spaces. Single-leaf sliding doors are used in hotels and for sanitary facilities in nursing homes. The double-leaf variant serves primarily in construction projects as a room divider.

Model: Fire-proof glazing HW-130 F **Frame depth:** 6 mm **Wall type:** Unplastered brickwork, concrete, partition walls **Requirements:** F30 fire-retarding
Optional: Increased acoustic insulation, screen, thermal insulation, break-in-resistance up to RC 4, safety catch in accordance with TRAV Cat A/C2

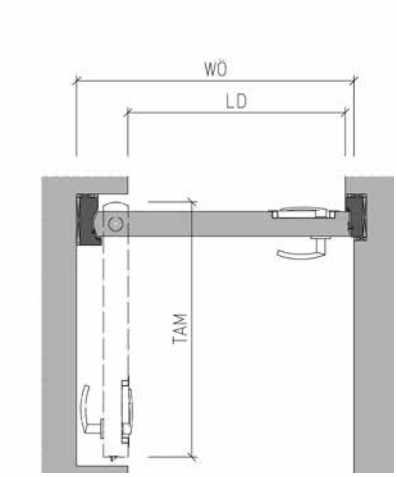


Application areas:
Visibility windows are used as single or multiple elements for more light and better visibility. For example, between operations office and production, between warehouse and shipping, as well as in administrative wings and technological areas. Individual solutions can be implemented with rail partitions, beam recesses and slopes for stairways.

SCHÖRGHUBER IN DETAIL
RECESSED DOORS

Product: Schörghuber recessed door. **Model:** 16 N (T30 single-leaf), 26 N (T30, double-leaf), 8 N (T90, single-leaf), 24 N (T90, double-leaf). **Frames:** Solid timber block frame, wooden rebate frame. **Requirements:** Fire protection (T30, T90), smoke protection, acoustic insulation (SD 32, SD37), burglar protection (RC 2). **Wall type:** Solid wall, partition wall, cladded steel/timber supports. **Dimensions:** Wall opening width x height: single-leaf max. 1586 x 3043 mm, double-leaf max. 3086 x 3043 mm. **Surfaces:** HPL, veneer, premium paint. **Closing devices:** Floor door closer and top dowel swivel (standard version). Concealed door closer or automatic hinged door operators (to choose depending on equipment and element size).

Application areas:
Recessed doors offer maximum functionality for everyday use: As the door leaves are flush with the wall when opened completely, the maximum clear passage width for the hall is maintained. This allows for the combination of openness with escape route and accessibility requirements. Space-saving frames and fittings round off the overall look. Open doors fit in the wall without attracting any attention.



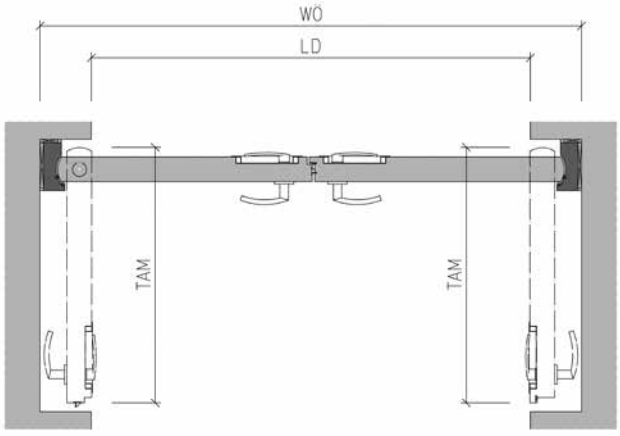
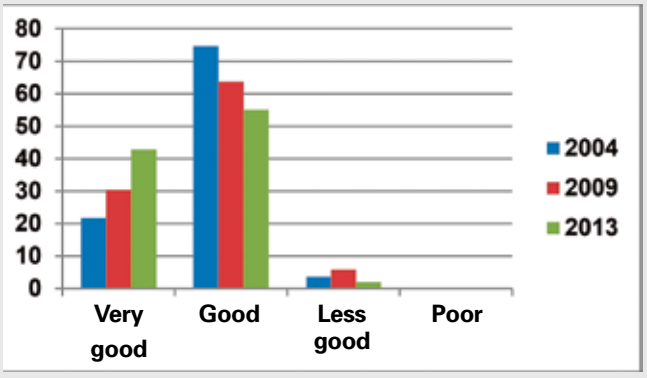


Photo: Andreas Muhs

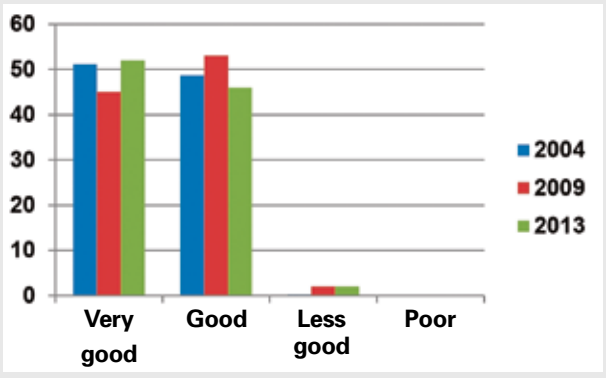
Photo: Markus Ebener

2013 READER SURVEY

This year's issue 32 marks ten years for the architect magazine PORTAL. With around 11,000 subscribers and circulation of approximately 60,000 the company-owned journal has become regular reading for many planners.
As in 2004 and 2009 Hörmann carried out a survey in 2013 to get an idea of the user's view of the layout as well as the contents. Active participation provided the company with many suggestions and gave Hörmann insight into topics currently keeping planners busy. Compared with the previous surveys, the editorial content of the PORTAL now appeals even more to readers. The majority of readers rated the editorial content as good or very good, as was the design in 98% of cases. Our request to describe the PORTAL with one word was met with exclusively positive responses. Among other adjectives named, planners find the magazine informative and innovative, inspiring and exciting, as well as rich in variety and interesting. Along with many other aspects, the topics, the presented projects and the layout with the large-scale pictures and figures were emphasised. Most readers have been devoted to the PORTAL for two to five years, and many of them even longer than five years; a majority of them collect the architect magazines to show their customers ideas and product solutions from the projects presented. The survey has revealed that around 60% of the readers access online databases for bid texts, the majority of whom use the Heinze online database. Ausschreiben.de and STLB-Bau play a rather subordinate role.
Though the PORTAL was rated good or very good overall, the editing team received many ideas and suggestions how to give the PORTAL even stronger appeal. We intend to meet the need for more product details and technical information. Starting with this issue, there will be two additional "technology pages". Furthermore, there is demand for more construction panel information, drawings and plan sketches. These points will also receive a stronger focus in future. Despite the positive feedback on the design, the team would like to surprise readers with a "soft relaunch" of the layout in celebration of the anniversary edition PORTAL 32. Readers who participated in the survey were given the chance to win two VIP football tickets for a game played by the German national team. The winner was drawn shortly before this issue went to press. The team would like to congratulate architect firm Frank Wiegleb. Two architects from the Wiegleb firm will watch the Germany versus Cameroon game on 1 June in Gladbach, Germany. The editing team would like to say thanks for the extensive feedback and is always open to new ideas, exciting projects or suggestions for improvement.



Assessment of the editorial content. (Indicated in percent)



Design assessment. (Indicated in percent)

RECENTLY IN … ISTANBUL

PORTRAIT

Selva Gurdogan,
studied at the Southern California Institute for Architecture, receiving a degree with honours. She then worked at the Office for Metropolitan Architecture in Rotterdam and in New York for four years. In 2006, she finally founded Superpool in Istanbul together with Gregers Tang Thomsen. In addition to architecture, the office also places a major focus on the analysis of urban developments. Exhibitions and awards document their work. Most recently, Superpool was commissioned to create the scenography of the 2nd Istanbul Design Biennial. In addition, they are participating in the "Uneven Growth: Tactical Urbanisms for Expanding Megacities" exhibition at New York's Museum of Modern Art.
www.superpool.org

Photo: Pınar Gediközer

What makes Istanbul such a likeable, liveable city?
I like Istanbul because of its complexity. There are so many different things that hold this extremely hard to grasp city together.

What is your favourite building in Istanbul – and why?
Istanbul Manifaturacılar Çarsısı (IMC) is one of my favourites. It's on a hillside near the aqueduct and the Süleymaniye mosque, adapted perfectly into the topography.

No city is perfect – Istanbul included. What do you think could be improved?
Istanbul has to become a "walkable" city. The city is congested with cars. Pedestrians here don't have it easy. Often, the narrow footpaths are even blocked by parked cars.

Where do you go or what do you do if you want to enjoy some peace away from the hustle and bustle of the city?
To unwind, I like to visit the markets in the historical district of Eminönü – the former heart of Istanbul. I can find moments of peace there. Walks through the old markets in the city are the best medicine against the daily routine.

What cultural event in Istanbul is the most innovative, and why?
The "amber" festival, where art, media and technology coalesce, is very exciting. At the same time, it's a platform where current topics are discussed – for example with a focus on "open data, open city".
(Photo bottom right)

What's your favourite bar or restaurant to visit after work?
Lokanta Maya in Karaköy (photo bottom left).

Where are young, talented artists and their works waiting to be discovered?
Salt Galata and Salt Beyoglu are my favourite galleries.

How does Istanbul inspire you?
Istanbul is a city that lives off of the enormous self-initiative of its residents. That is my inspiration. Hopefully, Istanbul will remain so versatile and creative.

Photo: Orhan Cem Çetin

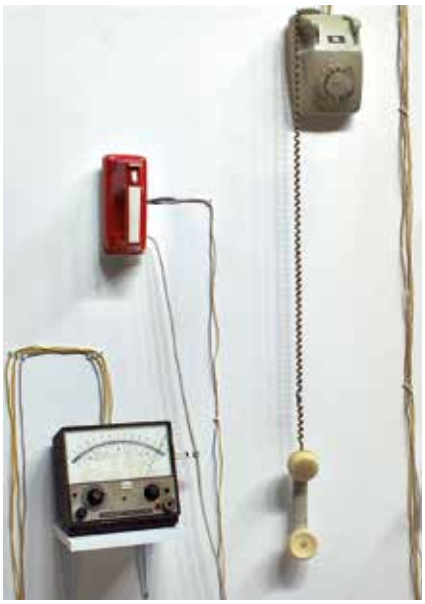


Photo: amber

ARCHITECTURE AND ART
Peter Krauskopf

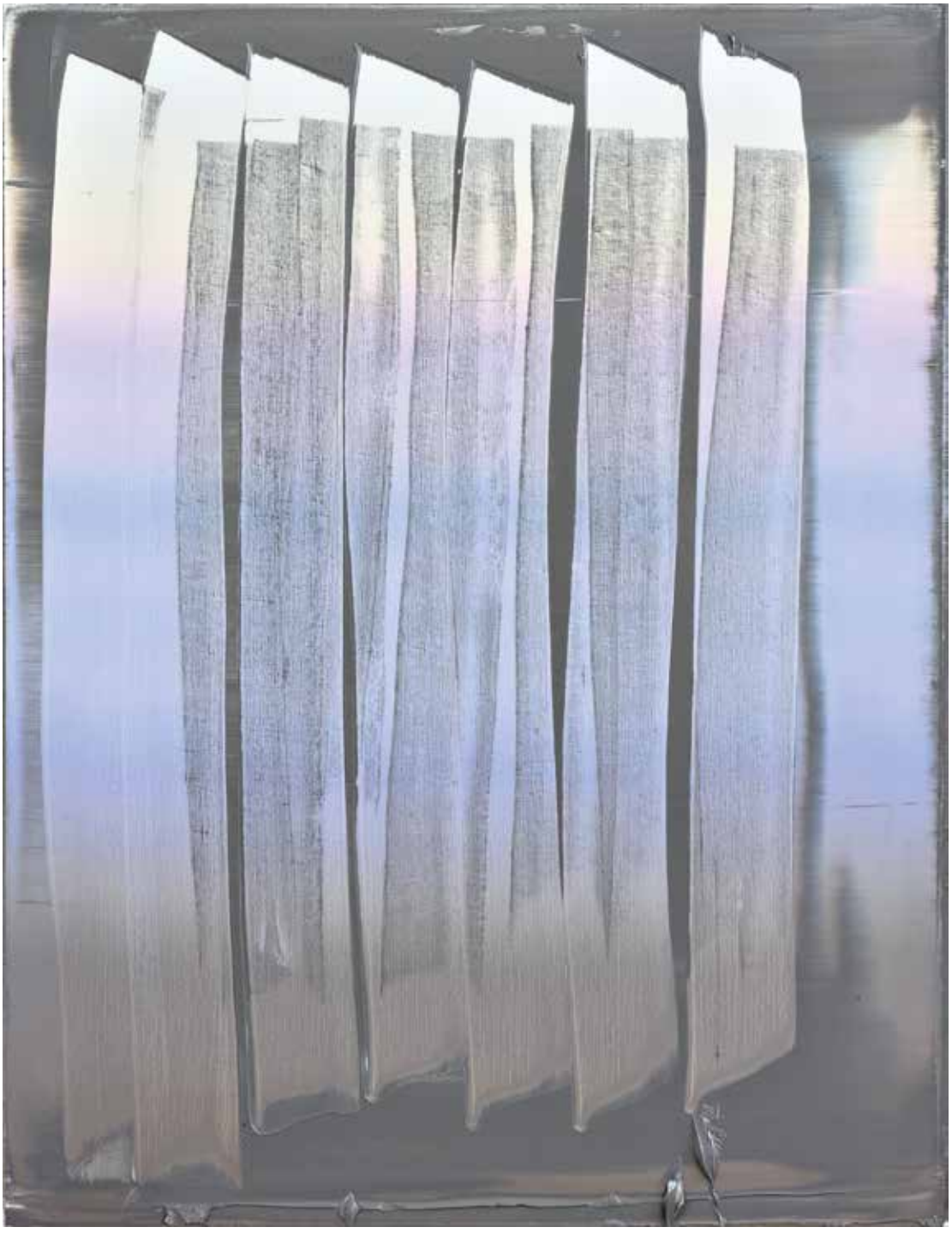
Peter Krauskopf keeps busy with the process of repainting. All of his pictures – the vividly coloured, smaller panels, as well as the larger formats in monochrome colour gradients – have one thing in common: they all seem abstract at first glance. In truth, they represent materialisations of time: on homogeneous, smooth undercoats, consisting either of polished, multifaceted, previously discarded pictures or monochrome backgrounds, Krauskopf takes one single action which creates the picture. He uses a squeegee or a paintbrush to apply a wide stroke of paint evenly across existing imagination. The result is a symbiosis between an image of the past and its completion in the present. This is the meaningful moment of painting for the artist who lives and works in Berlin. This moment is echoed in the title of the exhibition: "Block". Repainting is equivalent to rewriting time. Peter Krauskopf understands the act of repainting to be an act that reflects his examination of the phenomenon of time. In the sense of Edmund Husserl and Paul Ricoeur, his is a question of the relation of objective time that allows for subjectification – and of the sense of time constructed by subjectivity. In this respect, Peter Krauskopf's new works can be considered collages on the phenomenon of time: they join the museum of images in his head – particularly American colour-field painting of the 1960s, German romanticism and Dutch painting from the 17th century – with the intuition of the painter in the here and now.

In multi-layered painting processes, Peter Krauskopf canvasses colours for their resistance and substance and tries to check and exhaust their individual qualities until they have narrative structures resulting from their repainting: Untitled, B 091113, oil - linen, 130 x 100 cm, 2013, (right), Untitled, B120912, oil - linen, 40 x 30 cm, 2012 (bottom left), "Altes Bild", B080114, oil - linen, 45 x 40 cm, 2014 (bottom right).

PORTRAIT

Peter Krauskopf,
Born in 1966, completed his studies in painting at the University for Graphics and Book Art in Leipzig, Germany, in 1997 as master student under the direction of Prof. Arno Rink. Since then, his works have been on display in numerous institutional solo exhibitions, including at the Galerie Neue Meister hosted by the Albertinum, Dresden (2012), the Galeria Vilaseco Hauser, La Coruña (2013) and in the Kunsthalle in Emden (2013). Peter Krauskopf's works are represented in many public collections. He lives and works in Berlin.

Galerie Jochen Hempel
Lindenstraße 35
10969 Berlin, Germany
www.jochenhempel.com



PREVIEW

Topic of the next PORTAL issue:
Construction in the countryside

The topic of the upcoming PORTAL is very diversified. "Construction in the countryside" is not limited to only agricultural buildings. It's much more about excellent architecture outside of crowded areas. Buildings that are not under the spotlight due to their location on the countryside yet can still convince with their high quality. These can be residential buildings, conversions, churches, kindergartens, fire stations – and of course farms both old and new. It promises to be a multifaceted read. What's more: we are celebrating ten years of PORTAL. We have taken the occasion to give the magazine a new finish. You are sure to find something quite surprising in this issue.

Photo: Daniel Najock

IMPRINT

HÖRMANN AND SCHÖRGHUBER IN DIALOGUE

Constructing with Hörmann or Schörghuber: Your project in PORTAL

Every four months PORTAL reports on current architecture and the surrounding conditions in which it is created. If you would like, also soon with your projects! Send us information on the buildings in which you have used Hörmann or Schörghuber products – as a brief documentation with plans and informative photos, up to A3 scale, by post or e-mail:

Hörmann KG
Attn.: Lisa Modest
Upheider Weg 94–98
DE-33803 Steinhagen
l.modest.vkg@hoermann.de

Schörghuber KG
Attn.: Reinhold Fellner
Neuhaus 3
DE-84539 Ampfing
Reinhold.Fellner@schoerghuber.de

PUBLISHED BY
Hörmann KG Verkaufsgesellschaft
P.O. Box 1261
DE-33792 Steinhagen
Upheider Weg 94–98
DE-33803 Steinhagen
Telephone: +49 5204 915-167
Fax: +49 5204 915-341
Internet: www.hoermann.com

Schörghuber Spezialtüren KG
P.O. Box 1323
DE-84536 Ampfing
Neuhaus 3
DE-84539 Ampfing
Telephone: +49 8636 503-0
Fax: +49 8636 503-811
Internet: www.schoerghuber.de

EDITORS
Lisa Modest (Hörmann KG)

Architect's Mind GmbH
Stuttgart, Germany
www.architectsmind.de

Dr. Dietmar Danner
Daniel Najock
Christina Dragoi

PRINTERS
Drukkerij Paesen nv
Industrieweg noord 1199
B-3660 Opglabbeek

Photo: Hartmuth Klemme/Hörmann KG

The Schörghuber fast-track programme.

The new benchmark in variety, design and speed

- Duty category 4 (E) and PEFC-certified timber materials as standard at no surcharge
- Standard and special elements with fire protection, smoke protection, acoustic insulation, burglar protection and wet room functions
- Continuous elements up to heights of 2515 mm, elements with transom panel or horizontal profile and glass transom panel up to heights of 3000 mm
- Timber doors and timber frames available for delivery in 8 or 15 workdays, depending on the style, steel frames available from 48 hours

Schörghuber
Special doors

www.schoerghuber.de

Issue 06.2014 / Print 07.2014 / HF 86714-EN / P.1.697