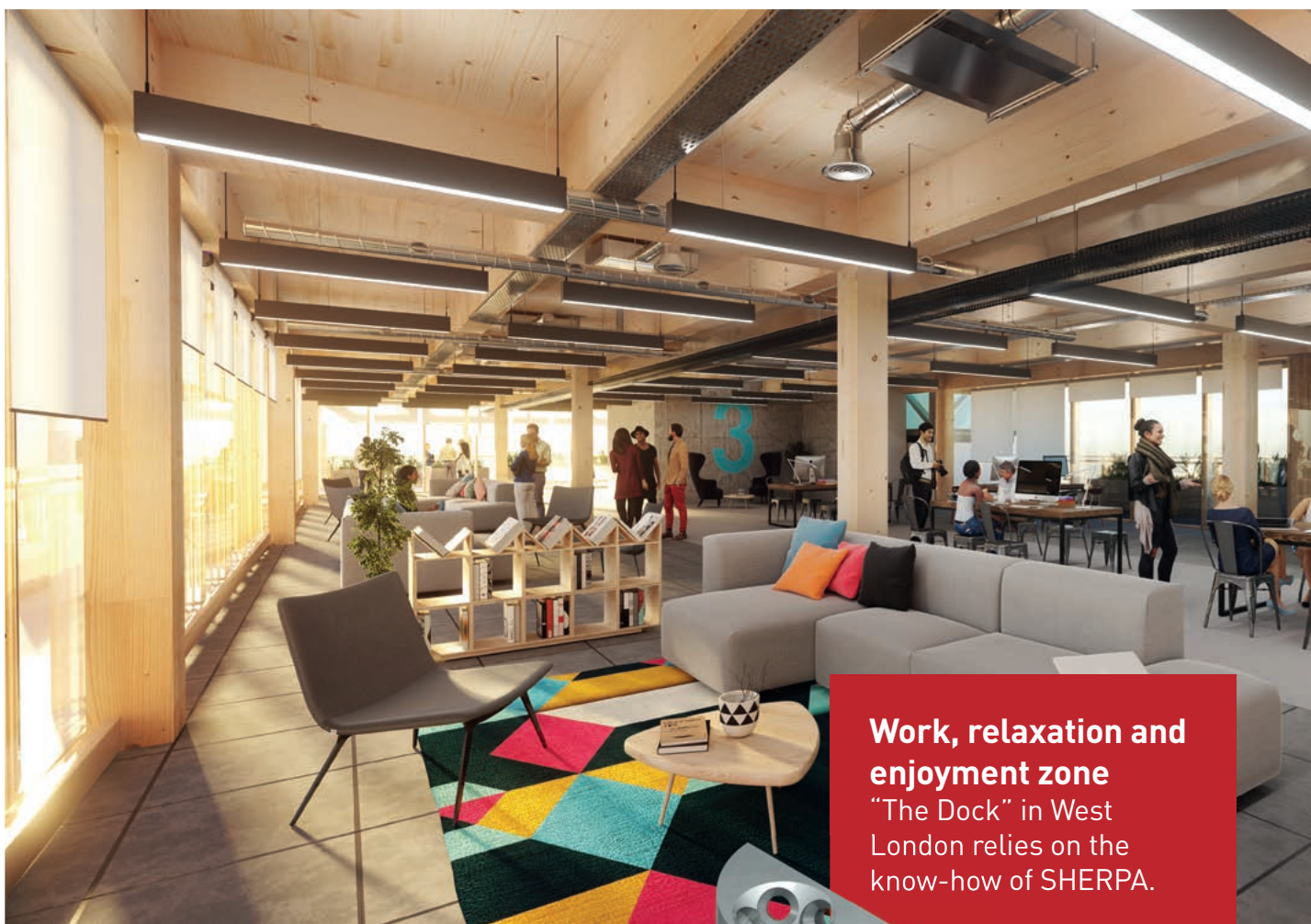


SHERPA news

MAGAZINE
10/2020



Work, relaxation and enjoyment zone
"The Dock" in West London relies on the know-how of SHERPA.



A GENUINE MULTITALENT

CLT-Connector – THE Solution in the cross laminated timber sector

10 YEARS "REALLY INCLINED"

The SHERPA full-thread screw celebrates its anniversary

TRENDS AND POTENTIALS

Interview with Prof. Seim



POWER BASE

All good things come in seven

With only seven Power Base types, all standard prop connections can be made easily, quickly and economically.

THE SOLUTION
FOR ALMOST
ALL PROP
CONNECTIONS

MORE mounting capacity

- Simple assembly thanks to separate end and base plate
- Versatile use without special tools
- Separable and height adjustable under full load
- No drilling or templates necessary

MORE safety

- Integrated cross-pull reinforcement (protection against gaps) through intelligent screw arrangement
- Optimum corrosion protection through high-quality zinc-nickel coating
- Defined up-lift protection through screw cap
- Extensively tested with combined loads
- Massive use of materials for a high safety level

MORE load capacity

- Pressure bearing capacity at max. extension length corresponds to the wooden support
- High load capacity with up-lift forces
- Optional screw length 8x180 mm for load capacity increase

 Height adjustment range: "9 to 30 cm"

 Load capacity: up to max. 138 kN



ETA
ETA-15/0540

FULL POWER

EDITORIAL

Extraordinary times, trend-setting Measures



The last six months have been very stable for us - mainly due to the reliable and valuable cooperation with our customers and long-standing companions. Although we had to put up with the odd delay in the procurement of raw materials, we were able to fulfil all orders.

There for you: personal and remote

The changed framework conditions have taught us much that will continue to shape and support us in the future. In this way, we have succeeded in setting up digital training and also consulting programmes that enable a very flexible and efficient transfer of knowledge and consulting. Long journeys, time-consuming scheduling and coordination are a thing of the past - if the personalities involved want it. Many of our partners use our customised webinar programme for their customers, creating a new customer experience.

It is not clear when trade fairs, symposia and other events can be held again. However, there are new avenues that will enable us to develop proactively and, above all, together. Please use the new opportunities together with us, our team will support you actively.

Vinzenz Harrer

Vinzenz Harrer
Managing Director of
SHERPA Connection Systems GmbH



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SUCCESS STORY

Work, connect, relax, enjoy

In 2021, in the middle of West London, the work, meeting, relaxation and enjoyment zone "The Dock" will be built on approximately 6,000 m². We are proud that we also rely on material and know-how from Styria.



Anyone planning a trip to London next year should make a detour to the west of the city. We are not talking about the film location of the romantic comedy "Notting Hill" - although it is only a stone's throw away. In West London, probably the most prestigious part of the city, a remarkable project (to be completed in the course of next year) is underway in which SHERPA's connectors play a supporting - or rather a connecting - role.

Glass and wood

The existing building "The Gramophone Works" was extended outwards and upwards. Based on the canal side architecture of the past, an impressive 6-storey glass and wood structure with punched, glazed openings was created. The modern and sustainable timber construction in the middle of the so-called creative district offers ultra-modern workplaces, meeting areas, a green roof and a public café connecting Kensal Road with the Grand Union Canal. With continuous breakout rooms and terraces offering inspiring views, this is a place to work, connect, relax and enjoy.

Internal and external sustainability

"The Dock" was designed with sustainability in mind and was awarded the BREEAM certificate before completion. This stands for "Building Research Establishment Environmental Assessment Method" and is the oldest certification system for sustainable building. In addition to the façade combination of wood and exposed concrete, a photovoltaic system was installed on a green roof. With intelligent shading and outdoor terraces, the architects implement the measures both inside and outside. Commuters were also taken into account at the planning stage - there are parking spaces for 130 bicycles.

THE PROJECT PAID ATTENTION TO SUSTAINABILITY:

- Roof greening
- Sun protection
- Photovoltaic system
- 130 bicycle stands
- BREEAM-certified
- Low energy LED lighting



"GETTING THE RIGHT ITEMS TO PRE-FABRICATION ON TIME WAS THE KEY."

TONY EVERLEY,
TT FIXINGS

Frohnleiten and London

The large SHERPA team also includes TT Fixings from Derbyshire/England. The Managing Director, Tony Everly, personally took care of the project on site and the delivery of our products. B&K Structures, with whom TT Fixings has had a long-standing partnership, is responsible for the planning of the project. The key to the success of the project was the precise provision of the required fasteners for pre-fabrication in the factory. "With the excellent support of SHERPA, this was accomplished seamlessly," says Tony Everly of TT Fixings, enthusiastic about the cooperation.



^ **SHERPA products in use:** A total of approx. 120 SHERPA L-Series connectors with 2,000 special screws were used.

OUR PARTNER: TT FIXINGS



Over 40 years of experience

TT Fixings is the largest SHERPA partner dealer in the UK. Planners and contractors benefit from decades of experience, which is evident in every consultation. In addition to technical support, customers also have access to a well-stocked warehouse. This ensures that the right connector is selected and available for each project.

PROJECTPLANNER: B&K STRUCTURES



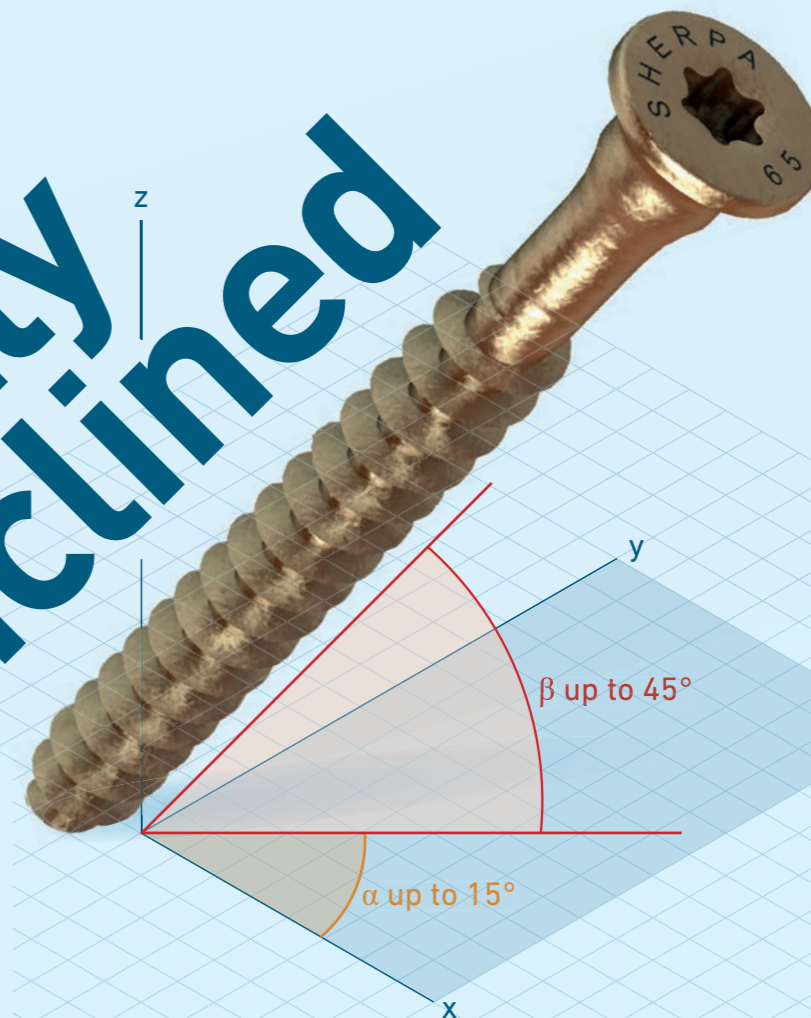
Sustainable timber engineering

B&K Structures is the UK's leading supplier of sustainable timber engineering structures and specialises in the development of hybrid structures. Since 1974, "green" lighthouse projects have been continuously implemented. Each design focuses on the use of wood and steel appropriate to the material. This benefits not only B&K's customers but also nature.

ANNIVERSARY

At SHERPA the "diagonal" full-thread screw celebrates its 10th anniversary. Therefore, we look a little nostalgically into the past.

Really Inclined



It is now ten years since SHERPA initiated a revolution in wood joining technology. We are talking about the "diagonal" full-thread screw, which has changed joining in timber construction permanently. But one thing at a time.

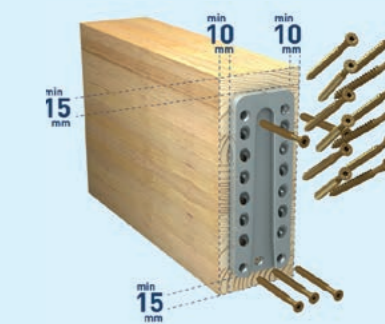
Around the year 2002, the first SHERPA connectors with the simple designations A to F were introduced to the market. The so-called timber construction series soon enjoyed great popularity and was used in a wide variety of constructions worldwide. The acceptance of this connection technology also increased the requirements profile of the customers. The call for higher load-bearing capacity values for larger connections in the field of timber engineering construction became louder. It soon became clear that the screw, which is subject to shear stress, had reached the limit of its capacity and that a new path had to be taken. Around the year 2009, the benefits of the "diagonal" full-thread screw were already new and sufficiently known.

In collaboration with the Technical University of Graz, the new screwing

technology was successfully combined with the connector plates. This was the starting signal for the first SHERPA of the XL and XXL series. The diagonal screwing was not only satisfied with a vertical angle of inclination. For every second screw, a horizontal skew angle was also considered in order to incorporate more wood material and reduce the splitting effect. In 2010, the new SHERPA were presented at the IHF in Garmisch. In 2011, the first approval for timber connectors with load-bearing capacities of up to 280 kN followed. This also marked the end of the well-deserved timber construction series, as the small connectors were also to benefit from the new technology. In 2013, ETA-12/0067 was published, the first approval in which only connectors with slanted screw connections are included.



^ Mounting on the main beam



^ Mounting on secondary beam

INTERVIEW

Trends and potentials in timber construction

Prof. Dr.-Ing. Werner Seim is head of the “Building Maintenance and Timber Construction” Department and Professor of “Building Construction and Building Maintenance” at the University of Kassel. We talked to him about the latest findings and what we could expect in timber construction in the future.



“TIMBER CONSTRUCTION CAN ONCE AGAIN PLAY A PIONEERING ROLE.”

WERNER SEIM,
UNI KASSEL

One of your main topics is new types of structures. Which ones are currently trending?

This is certainly the wood-concrete-composite construction method, which is continuously being developed: with flat or beam-shaped cross-sections, different joining technologies and innovative approaches in prefabrication. Hardwood products are on the rise. It is difficult to predict what will also become established in building practice. At the University of Kassel, we deal with willow weaving and the use of fast-growing plantation woods, among other things. These are issues we are excited about, but I don't dare to predict when they will take hold in practice.

What role does sustainability play in this context?

On sustainability, I am happy to answer by quoting Karl Valentin: “Everything has already been said, but not by everyone”. On a serious note: There is no way around the conversion of construction processes to a circular economy. Timber construction can once again play a pioneering role, in this context.

To what extent is automated production taken into account when planning new types of structures?

The direct linking of programs for planning and control of production will become standard in the future. The manufacturing processes are then already stored in the programs used for design and calculation.

Will this lead to an increase in wooden buildings?

In connection with the digitisation of construction processes, it will be necessary to standardise technical details. This applies to both supporting elements and connections. I am convinced that such standardisation will not restrict creativity in the development



MILESTONES FROM WERNER SEIM

- 2020** Prize for excellence in Teaching, State of Hessen
- 2006** Baden Württemberg timber construction prize
- 2003** Management of the department “Building maintenance and timber construction” at the University of Kassel
- 1999** Professorship at the University of Kassel

of individual structural solutions. It can even lead to winning over architects and engineers, who currently regard timber construction as too complicated or too diverse, as partners.

In which areas do you expect an increase in timber construction?

What we are already seeing is growth in regions that traditionally have a low proportion of timber construction. These are, in particular, the German federal states north of the Main line. This trend is also supported by the fact that more and more architects are interested in planning with wood.

Where do you see development potential on the material side?

I can well imagine that competition with other sectors of the economy for the raw material wood will increase in the coming years. Then material-saving design could become even more important. I see great potential in innovative material combinations which, for example in ceiling constructions, allow sound insulation and vibration proofing to be fulfilled with less material.

How do you see the future of timber construction in the DACH region?

The DACH region will remain the home market for an industry that operates worldwide, with excellently trained experts and innovative medium-sized companies. The current turning point also gives us the opportunity to reflect

on how we want to shape globalisation in the future.

The term digitisation is on everyone's lips at the moment, what does it mean for timber construction?

Fortunately, in the field of timber construction, digitisation is not only being talked about, but consistently implemented. This puts us far ahead of other industries. We are also committed to this in research, e.g. by further developing the design principle of positive-locking connections or programming industrial robots for the production of ceiling elements with optimised use of materials.

CLT-CONNECTOR

A genuine all-rounder

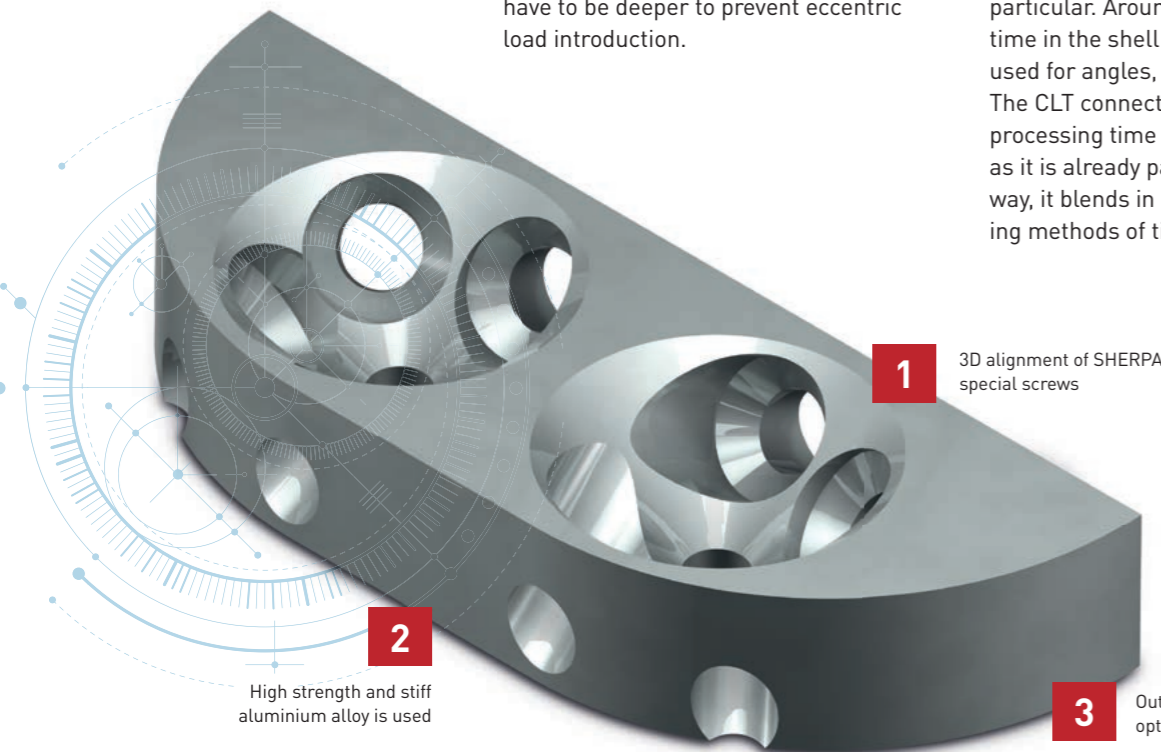
The CLT connector is the first and only standardised connector in the cross laminated timber sector. This makes installation and application in timber construction much easier.

Every building material has individual requirements for the joining technology. Cross laminated timber is no exception. This refers not only to load-bearing capacity and rigidity, but also to the needs of the workflow around prefabrication and assembly. The CLT connector from SHERPA can be used for all connections that are common in practice. This concerns, for ex-

ample, corner, T and longitudinal joints of wall and ceiling connections. The layer structure in terms of number of layers and dimensions is irrelevant. You only have to make sure that there is a minimum thickness of 80 mm. The connector housing is already milled flush with the surface and edges in the cross laminated timber factory and pre-bolted. Depending on the screw length and panel thickness used, the milling may have to be deeper to prevent eccentric load introduction.

Fewer errors, less time required

A high degree of pre-fabrication in timber construction has been the key to success for decades. This is well known to the planners and contractors involved. The time required to make connections on cross laminated timber construction sites has not yet been given sufficient attention. According to statistics, however, there is enormous potential for optimisation in this area in particular. Around 60% of the working time in the shell construction phase is used for angles, anchors and screws. The CLT connector abruptly reduces the processing time on the construction site, as it is already part of the panel. In this way, it blends in perfectly with the working methods of timber construction.



1

3D alignment of SHERPA special screws

2

High strength and stiff aluminium alloy is used

3

Outer radius of 40 mm optimised for production



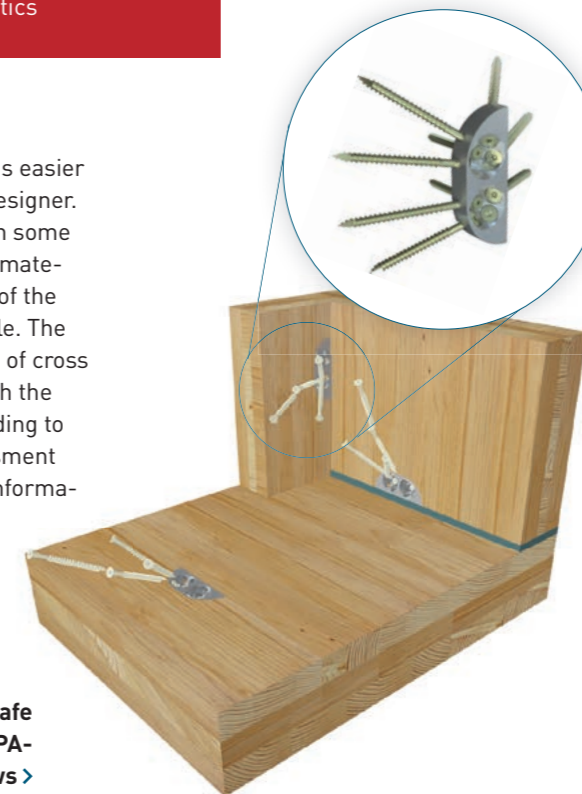
BENEFITS

- Multi-functional in strength and application
- Quality assurance through system
- Can be combined with sound insulation bearings
- Pre-assembled for optimum installation
- Complete element screw connection from inside
- Flush connection ideal for transport and optics

Free sizing tool included

Sizing cross laminated timber is easier than ever before with the CLTdesigner. The current version comes with some practical features, such as the material library and the integration of the SHERPA CLT-Connector module. The module calculates connections of cross laminated timber elements with the SHERPA CLT-Connector according to the European Technical Assessment ETA-18/0083. You can find all information on www.cltdesigner.at.

Simple and safe
Assembly with SHERPA-
special screws >



< Longitudinal, corner and T-joints with a connection



^Josef Kowal is responsible for technical questions concerning SHERPA connection technology

Why was it decided to develop the CLT?

The requirement was to develop a fastener that would suit the material and construction method. In concrete terms: more pre-fabrication, more quality assurance and easier handling on the construction site. Up to now, only elbows, tie rods or single screw connections have been used. However, these products cannot be included in the pre-fabrication process. Our CLT connector is pre-defined and partially screwed out. The times in which system axes had to be recorded or tinkered with, which screw had to be inserted how often in which position, are now a thing of the past.

What were the biggest challenges during development?

To bridge the gap between size, geometry and performance under consideration of different load directions.

ETA

ETA-18/0083



SOUND INSULATION

Silent and quiet

When assessing the sound insulation of components in the installation situation, it is not sufficient to consider the ceilings alone. In this article, we will highlight the importance of sound transmission through flanking for you.

In the case of highly sound-insulating wooden ceilings, the building acoustics can be dominated by flank transmission. For this reason, great attention must be paid to the flank transmission. As a rule, the worst flank is to be used as the design criterion. It should also be noted that walls in solid wood construction have a significantly higher flank transmission in terms of airborne sound transmission than panelled wooden walls. The much stiffer solid wood elements therefore require additional measures in order to achieve the various sound insulation levels. A proven additional measure is the decoupling of the flanking wall by elastomeric bearings, such as REGUFOAM, between ceiling and wall.

Sink and natural frequency

The so-called joint insulation dimension K_{ij} of the ceiling/wall combination provides information about the potential for improvement. Decisive for the effectiveness of an elastomeric bearing such as REGUFOAM is the compressive strength and the natural frequency or subsidence that occurs under corresponding load. REGUFOAM is produced in twelve different classes with increasing strength and stiffness. These varying degrees of hardness are identified by colour. The standard thicknesses of 12.5 and 25 mm cover a wide spectrum. It is also possible to request individually adapted sound insulation bearings in terms of thickness and width. A quasi-permanent load combination of dead weight and proportional variable loads is assumed

for the design. The depression should be approx. 1.5 mm and the natural frequency f_0 approx. 20 Hz.



^ REGUFOAM is a moisture resistant, rot-proof and mixed-cell polyurethane foam

Which sound insulation bearing fits?

It is particularly important to select the correct sound insulation bearing. If a too stiff sound insulation bearing is used, the effect can be lost - as if no sound insulation bearing was used at all. If a too soft sound insulation bearing is selected, it will be compressed too much due to the load and would therefore no longer be effective.

The diagram at the bottom of this page offers a practicable solution to determine the suitable REGUFOAM sound insulation bearing for your application as quickly as possible. The specifications apply exclusively to a wall width of 120 mm. Attention - Different load situations prevail in a building depending on its use. It is therefore up to the planner to determine the decisive load for the design of the sound insulation bearings.

EXAMPLE WITH 50 KN/M WALL LOAD

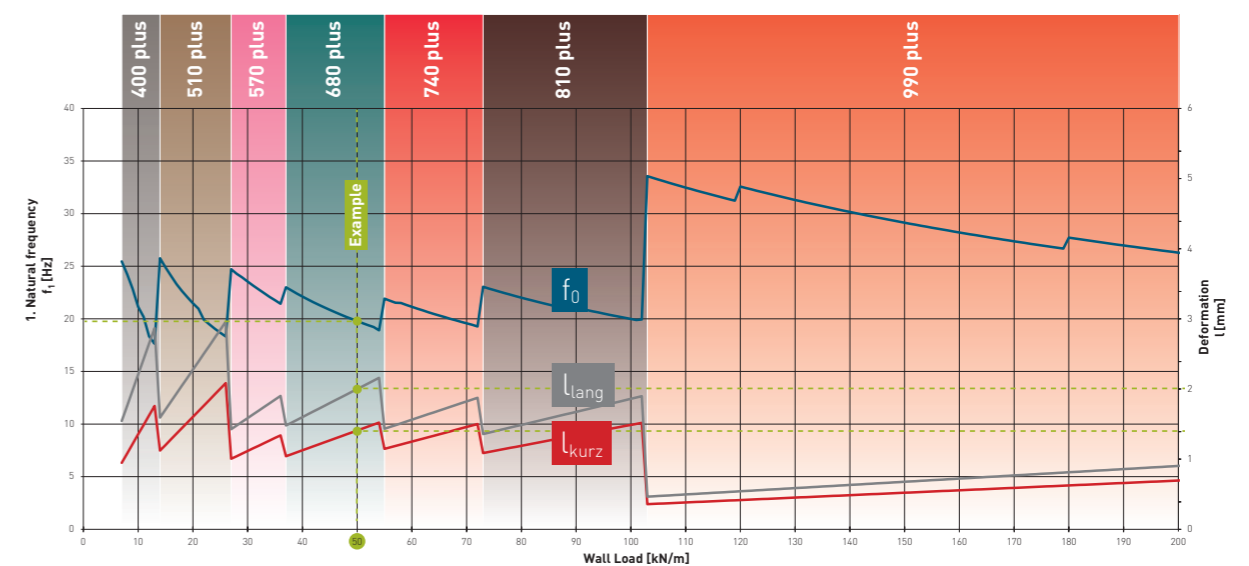
$$q_{d;\text{quasi-permanent}} = g_k + \psi_2 \cdot p_k$$

$$q_d = 34,5 + 0,3 \cdot 51,7 = 50 \text{ [kN/m]}$$

The wall loads decisive for the selection of the sound insulation bearings are to be determined on the basis of the quasi-permanent combination of the actions according to EN 1990, eq. 6.15b. Here, the combination coefficients 2 for the quasi-permanent values of the variable action are to be taken from the national regulations, among others, depending on the use category. With a wall load of 50 kN/m, the "Regufoam 680 plus" sound

insulation bearing would therefore be most suitable for use. Furthermore, the natural frequency (f_0), the subsidence immediately after the load (l_{short}) and the subsidence after 10 years (l_{long}) can be determined. The current example, with a rated wall load of 50 kN/m, would result in a natural frequency of 20 Hz and the immediate reduction in sound insulation would be 1.4 mm. In 10 years the sinking would increase to 2 mm.

For wall width 120 mm



$$f_0 = \frac{1}{2\pi} \cdot \sqrt{\frac{C}{m}} = \frac{1}{T}$$

T... Period in s
 f_0 ... Natural frequency in Hz
 C... Springconstant in N/m
 m... mass in kg

$$c = \frac{E \cdot A}{d}$$

E... dynamic E-Modulus in N/mm²
 A... bearing area in mm²
 d... bearing thickness in mm

$$l_{\text{kurz}} = \frac{\sigma_c \cdot d}{E_{\text{stat}}} \quad l_{\text{lang}} = \text{creep factor} \cdot l_{\text{kurz}}$$

l_{kurz} ... deflection at t=0 in mm
 l_{lang} ... deflection at t=10a in mm
 σ_c ... compression stress in N/mm²
 d... bearing thickness in mm
 E_{stat} ... static E-Modulus in N/mm²

The E-modules (E_{stat} , E_{dyn}) used to create the contents of the diagram are based on a shape coefficient of $q = 2.5$ to 6.0 , depending on the bearing type, according to the manufacturer's specifications, and cover the constructionally relevant area of application of sound insulation bearings as linear bearings of timber construction elements.

GUEST COMMENT

Canada & Austria

Travelling has been a tradition in the crafts since the High Middle Ages at the latest and for centuries was a prerequisite for obtaining the master craftsman's diploma. In the guest commentary Vincent Remer examines the differences and similarities between the two countries Canada and central Europe.



I was able to gain my first experience in the North American, in particular Canadian, construction industry during my years of travel in the mid-2000s. This had the purpose of broadening my own craftsmanship and horizons. During my first job as a carpenter in Canada, I quickly learned that although the metric system was introduced in everyday life, my metric folding rule had little value here (apart from opening beer bottles). Buildings were and are constructed with Anglo-American measurements and tape measures. This is partly explained by the close economic ties between the timber and construction industries and US trading partners. The structural timber produced by countless sawmills at high speed in standard inch-based cross-sections is usually 38.1mm (1.5 inches) thick.

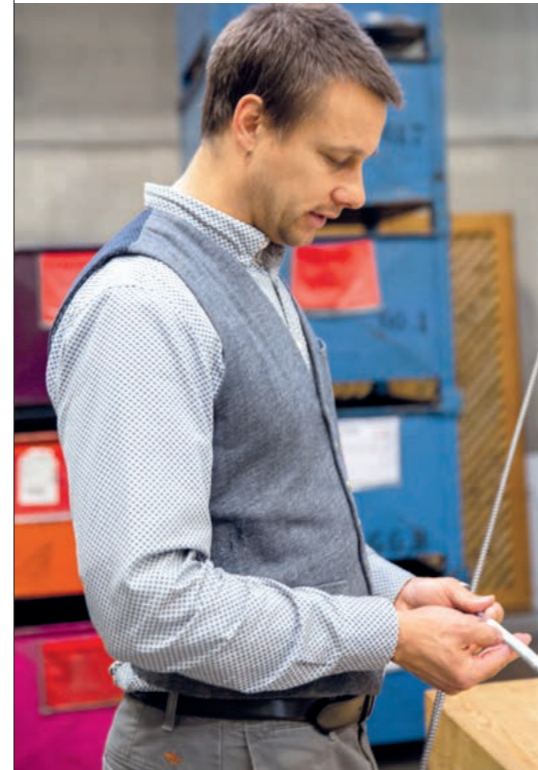
Timber frame constructions and wall construction

Pre-cut at wall height, timber frame buildings are erected on site in no time. The wall construction again differs from the method used and learnt in Europe, for example the stiffening level is placed on the outside.

During my travel time in Central European countries the change from raw sawn timber to the finger-jointed KVH standard had already been largely completed. The lag screw was almost completely replaced by the self-drilling wood screws with Torx drive.

Advantages and disadvantages

However, I was soon able to recognise the advantages of North American timber construction: The working methods are well-rehearsed here and can be easily understood by means of easy-to-understand measurement units. Small timber cross-sections also allow thinner trees to be processed into construction timber and thus the forestry industry can meet a large demand through shorter handling times. My first carpentry work involved truss ele-



< Vincent Remer appreciates working with SHERPA connectors and the know-how from Austria.

INTERVIEW WITH VINCENT REMER IN CANADA

Why do you distribute SHERPA?

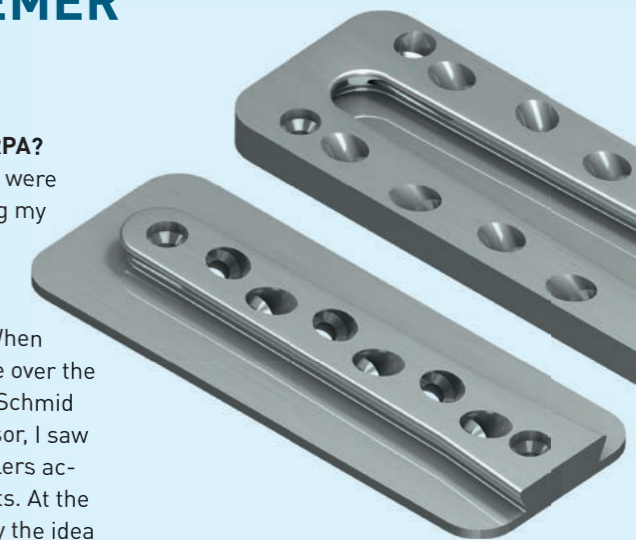
Remer: SHERPA connectors were already familiar to me during my apprenticeship. We used the connectors to install layers of beams and I was very impressed even then. When the opportunity arose to take over the distribution of SHERPA and Schmid products from my predecessor, I saw the chance to give the installers access to these quality products. At the same time I was attracted by the idea of being available as the technical contact person for these products.

What potential do you see at SHERPA?

SHERPA connectors are a well thought-out system. Sophisticated modelling was underpinned by extensive test series. This extensively documented approach provides engineers with a tool for planning effective joints with a high degree of prefabrication. Thanks to the comprehensive documentation, the behaviour in different installation and/or load situations can be understood and used for the design.

What opportunities are there for SHERPA in North America?

Timber construction in North America is experiencing a blossoming with engineering and mass timber con-



struction. This type of timber construction can compete with other solid construction methods, especially if it cleverly plays off the advantage of pre-fabrication and thus minimises the install time. SHERPA offers solutions in which aesthetically sophisticated, statically effective, and constructionally advantageous connections are created. The interest in timber construction also increases the need for solutions like SHERPA can offer. And: The SHERPA team has proven to be a partner who provides support with knowledge and competence. The reliable supply chain helps to have the required connectors available within a short time. SHERPA connectors and the high-quality SHERPA special screws manufactured by Schmid Schrauben are made in Austria. This ensures a uniformly high quality of the products.

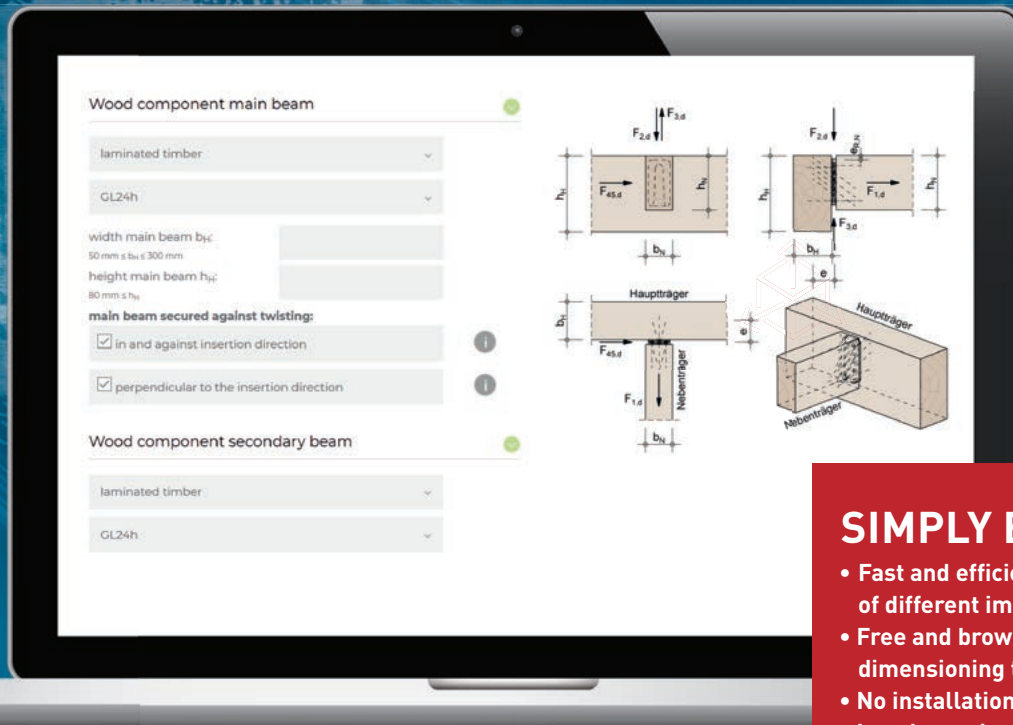
“FOR CENTURIES, TRAVELLING WAS A PREREQUISITE FOR OBTAINING THE MASTER CRAFTSMAN'S DIPLOMA.”

VINCENT REMER,
TIE IN TIMBER

ments for which large, oversized timber cross-sections were used. I could only dream of such cross-sections in Central Europe.

But even in the information age, and perhaps especially then, travelling and thus your own experience is of great importance. There are still differences in crafts, in working life and in everyday life which can only be understood if they are experienced directly and unfiltered.

The perfect tool for professionals



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