

# Häring Timber Technology: Leader in Innovative Timber Construction Systems



Chris H. Häring, Structural MSc Eng, Federal Institute of Technology ETHZ, President of Häring Group

**H**äring Timber Technology is a leader in innovative timber construction systems based in Switzerland. As timber specialists, Häring Timber is not only recognised as a European market leader with factories in Europe, but also the largest producer of glulam timber in Asia. The company specializes in timber element construction and modular systems, and all according to European standards, with the recognised quality from Switzerland.

**Asian Timber:** Lately, there has been increasing use of timber in construction. What are the benefits of timber as compared to concrete?

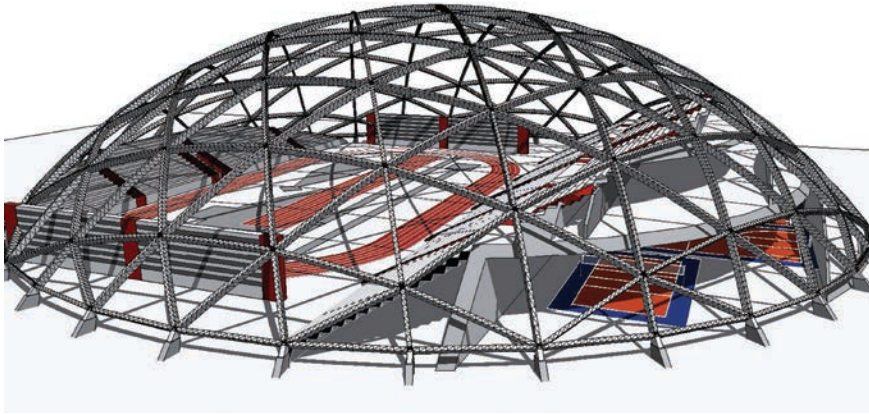
**Chris H. Häring:** "Welcome to the timber age!" The increase of timber construction is expected to allow the countries to

achieve the target for "Low carbon" or "Zero carbon" in the building industry. Materials such as concrete are the main source of emissions in construction. However, timber construction has the capability to balance the emissions, not only during construction but also during the entire life cycle of the building. With timber structures, it's feasible to reach the Zero carbon footprint per building.

It's clear that timber construction increases the overall efficiency of the construction by providing or implementing a dry construction system that includes structural elements. For the developers, this means significant gains on the project schedule with a faster return of their investments. Looking on the technical side, our strategy and service is to



Saldome, Rheinfelden (Switzerland)



*Project Sportsdome (Switzerland)*

support architects, engineers, construction companies and project developers in demanding project design, and to support the use of regionally sourced timber, which, for example, can be sourced from sustainably managed fast-growing plantations in Southeast Asia.

**Asian Timber:** As one of the most promising materials that can reduce emissions and increase productivity, is there anything that is holding the construction industry from adopting timber?

**Chris H. Häring:** Only the know-how may limit the use of timber structures. To develop groundbreaking ideas and implement innovative designs, you need support from structure specialists with experience and foresight. We have learned the potential of glulam structures through years of experience, and persistently strive to expand the fields in which it is used, both in curved structures or mass-timber buildings.

Established 140 years ago, the Häring Group is a fifth generation private-owned leader in innovative timber construction systems based in Switzerland. As one of the pioneers in glulam manufacturing, Häring Timber Technology has developed a complete system with all its know-how in the production of glulam structures – from engineering to construction.



*Eden Project, Cornwall (England)*

**Asian Timber:** How does Häring Timber stay on top of the ever-advancing technology in timber construction? How has the technology helped improve how architects and designers use timber in buildings and infrastructure?

**Chris H. Häring:** Mostly through our translational R&D and collaborations with several Universities. Häring Timber specialises in ENSPHERE® dome structures, bionic freeform structures, curved structures and mass timber structures with earthquake proof system Flex-Frame®.

This timber engineering achievement fits the needs of mid rise tower structures for offices or apartments, and can be combined as timber element construction and modular systems. All according to European standards, with the recognised quality from Switzerland.

**Asian Timber:** What are the timber construction projects that Häring Timber has been involved in? How has the construction industry accepted the use of timber in constructions?

**Chris H. Häring:** Over 140 years, our list of projects is enormous and we are

proud of our historic references. Any mentioning is unfair to so many projects. However, we have some projects of which we are especially proud of such as the sports arena “Postfinance Arena” in Bern (Switzerland), which is mainly used for Ice Hockey and has an arch structure of 90 metres that still impresses up to date. Important to mention is that even after 50 years, the glulam arches are still in perfect conditions and the timber beams do not require any service/maintenance.

Other projects we would like to mention

are the “Swiss Light Source Research Centre” at Paul Scherrer Institute with a span of 138 metres, and the Sports Ice Arena in Davos, Switzerland. Our Ensphere® domes enable a unique design by following a geodesic geometry. Our original Ensphere® system was created in the 80’s with continuous R&D and several domes were built since then. In 2004, we built the Saldome 1, which has a 90 metres clear span and is being used for salt storage and no maintenance service was necessary since it was built. In 2011, we pushed our Ensphere® connections a few steps forward and built the Saldome 2, which has a 120 meters clear span and acclaimed the title of biggest dome



*Railway Station, Berne (Switzerland)*



*Sales Centre, Ulsan (South Korea)*

in Europe.

Besides our projects in Europe, we are also want to mention our projects in Asia. Our first project was the swimming training

center for the Olympics in China that lead to the successful Chinese Swiss joint venture in 2003. Other projects followed in China, including large temples in the Zhejiang province, the Hotel Astor in Tianjin, Shijiazhuang, the Shijixhuang Science centre, and strategic defense structures for the Chinese army in Suzhou and also in South Korea and specially designed timber structures in the Kingdom of Bhutan

We will present some examples at Innobuild Asia that demonstrate the potential and recognition by the construction industry. These examples are included in the 4 segments that we are specialised ENSPHERE® dome structures, bionic

freeform structures, curved structures and mass timber structures. We will also highlight three projects that were awarded with internationally awards such

as the “Quality in Construction Award” from UK, the “Global 100 – Eco-tech Award” for sustainable construction from Japan and the “Schweighofer Prize Award” for innovation from Switzerland.

**Asian Timber:** How has the use of timber in constructions developed over the last 10/20 years? In your opinion, will the use of timber in constructions increase in the next 10/20 years?

**Chris H. Häring:** Wood has proven its worth for thousands of years as a robust, stable and yet lightweight construction material. It is now becoming clear that this traditional choice is also a state-of-the art material that can be used to make high-precision components directly from digital models and using industrial processes – turning wood into an elite 21st-century construction material.

Rapid urbanisation, growing environmental awareness and the digital revolution are transforming the way we built. The construction sector is a major contributor to the global carbon emissions and world leaders pledged to move towards zero net greenhouse-gas emissions. One of the most exciting building materials that can reduce emissions and increase productivity is wood.



Häring factory, Tianjin (China)

Technology: The machinery and software developments have pushed the glulam production and structural analysis to a digital interface that links office and production. The large CNC machines are common in our factories, but the overall production line have undergone continuous

updates in order to increase production efficiency, flexibility and capacity to produce larger and even more complex structures.

Since the 90's, we have realised several bionic/freeform glulam structures. Our factories are equipped with front-line technology to allow efficient production of

even complex structures, which can be combined with our in-house engineered connectors such as the Ensphere® connector.

The basics of the Ensphere® dome go back to the 80s. Through continuous developments, we are now able to build



Häring headquarter in Eiken (Switzerland)



Xiangji Temple (China)

bigger and wider. The design and structural concept of our Ensphere® system is inspired by nature. The efficiency of the solution is demonstrated by the versatility that allows it to be used to cover a football stadium; indoor sports arena or music arena, gardens and other events. Also in industrial facilities, compared to traditional warehouses, where due to the higher proportion of storage capacity per square meter as a clear advantage.

With a free span that can exceed 200m in diameter, logistics and assembly are also elements that can differentiate this solution and ensure cost-effectiveness. The timber structure of a 120m dome is assembled in just 6 weeks with a team of only 6 people. We expect that in Asia there are many opportunities for implementing these economic large diameter structures.

**Asian Timber:** What are the species that are suitable for use in timber constructions?

**Chris H. Häring:** In Europe, the glulam structures are mainly produced with Spruce/Fir, Larch but also Ash and Beech can be used. However, wood is a renewable resource on any continent and the western world does not need to export natural based products with exported western production cost. Southeast Asia

has sustainable managed forests with promising resources. For us, it is fair enough to contribute with technology transfer.

**Asian Timber:** Häring Timber is also the largest producer of glulam timber in Asia. How has the region accepted the use of glulam timber? What is your largest project in Asia that uses glulam timber?

**Chris H. Häring:** Asia is a growing market. China is definitely the biggest market at the moment, but operations in other countries in Asia have been realised as well. From our Chinese Swiss joint venture, Häring Swiss Wood Structures in Tianjin was created, and it is one of the largest production lines in Asia. The factory's set-up is mostly meant for the production of structural demanding glulam elements.

Production capacity and layout allow sections of 26 x 220cm at a length of over 35 metres. The limit is rather given by road conditions, jobsite access or transport regulations. The project Xiangji temple may be one of the largest due to the mass timber design based on the traditional temples. Besides its gigantic ground area, the project expands over 6 storeys. Bigger projects for the winter Olympics China 2022 and others

are in the pipeline and will break ground to even bigger projects.

**Asian Timber:** Certification is a very important element in timber. Are timbers used by Häring Timber certified?

**Chris H. Häring:** Yes, Häring Timber only uses certified wood. All timber used in our glulam factories; timber elements or modular construction factories are coming from sustainable and control forest. FSC certificate from the timber supplier is requested and our glulam production is also CE, Swiss, Chinese and South Korean certified.

**Asian Timber:** What are your thoughts on participating in International Built Environment Week 2019?

**Chris H. Häring:** We recognise and welcome the strategy and the efforts of Singapore, as Southeast Asia's leading innovation hub, to implement sustainable structures with the renewable resource wood.

Our strategy and service are to support architects, engineers, construction companies and project developers to realise their project with a timber structure or timber construction. If we can be involved since the concept stage, these early meetings will allow a full understanding of the project concept and eventual limit or restrictions. This will give us a better understanding of the architectural requirement and the possible developments in each project that we can support, advice and provide the structural pre-design/design.

Our services will help the overall package of the project by bringing in cost-effective suggestion and estimation that will allow the solution to be optimised. After this feasibility, pre-design and design stage, we can bring to the project the detail development and execution development to reach a full accurate cost that can be used later for permits, tender/contracts and construction.