



HARING.CH

PROJECTREPORT
09/22



GIANT ARCHED HALLS CHENGDU AGRICULTURAL EXPO _CHINA

In September 2020, Häring was invited to a very restrict tender to build an arched exhibition hall for the agricultural expo in the Chinese city of Chengdu. The contract awarded was the recognition of our know-how in timber engineering and high-precision production for heavy timber engineered structures. The Herculean task was accepted and successfully completed despite the pandemic and the tight timeframe that included the full timber engineering design. The timber construction finish on schedule, exactly one year later and the exhibition halls are now open. A total of five exhibition halls with a ground area of 75,000 m² were built in Chengdu. The volume of glulam and building size make this one of the biggest glulam structures world-wide. Häring was the selected company for one of the impressive halls.

CUSTOMER _Eastern Way Engineering Ltd, Wanchai/Hong Kong

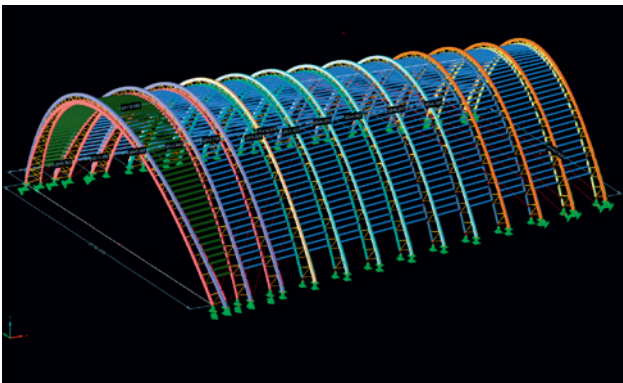
ENGINEERING _Häring AG, Eiken/AG

PRODUCTION _Roth Burgdorf AG, Burgdorf/BE

GIANT ARCHED HALLS CHENGDU AGRICULTURAL EXPO_CHINA

The design benefits from the combine triple arches system and it's ideal for bridging the large spans that were called for in Chengdu. The efficient of the design and details allowed a clever optimization of the transport. A total of 1,300 m³ of larch and spruce glulam was used for the main structure. The height of the building varies along the axes, from 29 m for the first axis down to 22 m for the final one. The build-

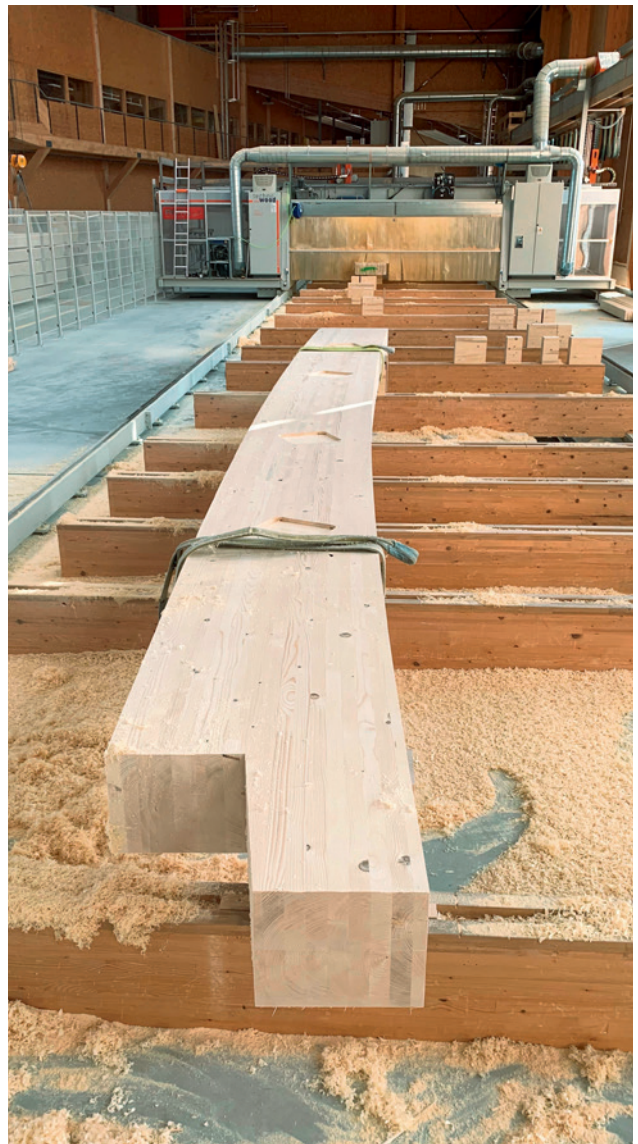
ing's shape means each and every beam is unique in terms of radius, length, curvature and connections. Häring was responsible for the detailed planning of the high-performance beams and the entire production process. To ensure just-in-time delivery to China, up to 245 m³ of glulam per week was manufactured during the three-month production period, including CNC machining of all beams.



01



02



03

120 m_ **ARCH LENGTH**
29 m_ **STRUCTURE HEIGHT**
1,325 m³_ **GLULAM QUANTITY**

Häring's local partner carried out the assembly work under our supervision. The work involved joining together the glulam arches up to 120 m long and securing them to the steel feet of the concrete foundation. The triple timber arches system is connected between using pyramids made of S355 steel, and glulam classes of GL24h/28h (EN 14080:2013). With 13 axes and variable heights along the building, preci-

sion assembly work was a must. This was only possible thanks to millimetre accuracy during the preparatory and production stages at Häring engineering department and factory. One stand-out feature on axis 2 is a huge LED screen weighing 32 tonnes, which is fitted at a height of 20 m above the main entrance – proof of the exceptional load-bearing capacity of heavy timber structures!



04



05



06

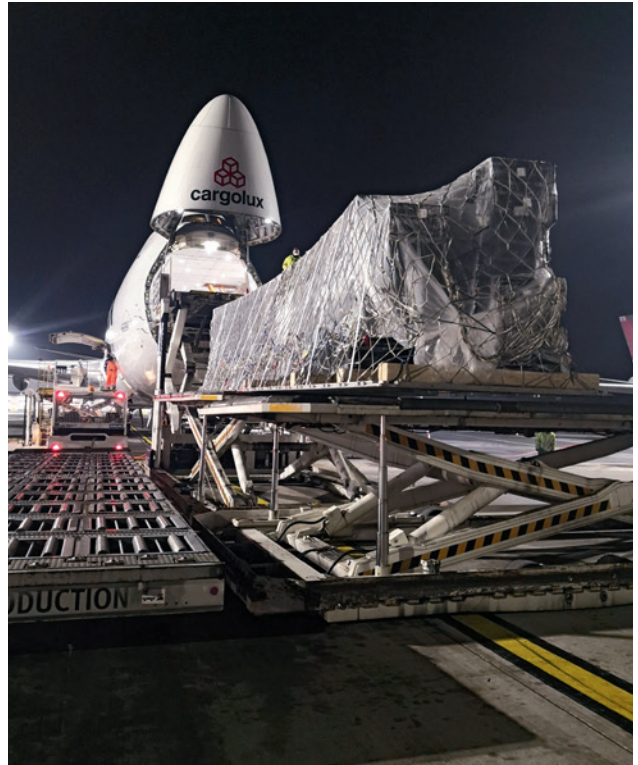
01_Structural model 02_Structural analysis
03_Production – joinery work on the CNC machine
04_Pre-assembly on site
05_Building site with finished structure
06_Assembly
07/08_Protection package for aircargo and train transport
09_Aircargo loading



07



08



09

The extremely tight timeframe – exactly 12 months from placing the order, including engineering design work to the scheduled opening of the agricultural expo in Chengdu – presented Häring with a logistics challenge of Herculean proportions. The coronavirus pandemic led to transport restrictions and the accident in the Suez Canal also caused delays. Despite these unfavourable circumstances, Häring was up to

the challenge and succeeded in delivering the equivalent of 35 containers on time using a combination of sea and rail freight. In addition to this, a total equivalent to seven 45 ft containers with high-precision glulam beams were sent to China by air freight for a number of key express deliveries during assembly. Here, too, the decisive benefits of highly efficient timber design and timber itself as material.

