# REPORT FROM TEMTIS AUSTRIAN COUNTRY SEMINAR

## Cross-Laminated Timber

## 29. 06. 2007, GRAZ, Austria



### Preamble

The second country seminar organized in the framework of the TEMTIS project took place in Graz, Austria on 29.6.2007. It was organized by the Graz University of Technology.
The seminar focused on massive timber structures using large load bearing elements. In particular, research work concerning the so called “Cross Laminated Timber (CLT)” that has been conducted in the last years at the Institute for Timber Engineering and Wood Technology, and the holz.bau forschungs gmbh at Graz University was presented and discussed.
The speakers at the seminar were the representatives of Graz University of Technology. The seminar participants were the representatives of the project partner institutions.

### The program of the seminar

Seminar concerning the product ‘Cross Laminated Timber (CLT)‘
Meeting place: Lecture room i6, 1st floor / Graz University of Technology, Inffeldgasse 25/D, A-8010 Graz

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| 09:00 | Beginning | |
| 09:00 – 09:20 | CLT-Elements – An Introduction | M. Augustin |
| 09:20 – 09:40 | Grading of the basic material | H. Unterwieser |
| 09:40 – 10:00 | Proof-Loading of Structural Timber | G. Jeitler |
| 10:00 – 10:20 | A contribution to the design and system effects of CLT | R. Jöbstl |
| 10:20 – 11:00 | Coffee Break | |

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| 11:00 – 11:20 | Modeling and Design of CLT-Elements utilized as Plates | T. Moosbrugger |
| 11:20 – 11:40 | Modeling and Design of CLT-Elements utilized as Panels | T. Bogensperger |
| 11:40 – 12:00 | Connection Technique for CLT-Elements | G. Traetta |
| 12:00 – 12:20 | Buildings erected with CLT-Elements | J. Habenbacher |
| 12:20 – 13:00 | Discussion | |
| 13:00 | End of the seminar | |

**Summary of the presentations**

**1. Introduction – Timber Massive Construction View on R&D for an Innovative Design Principle using Cross Laminated Timber**
Speaker: M. Augustin, Institute for Timber Engineering and Wood Technology, TU Graz

This presentation gave an introduction to the R&D areas of the Institute for Timber Engineering and Wood Technology at TUG. Furthermore the production of this elements has been shown and research work in the four modules concerning CLT-Elements has been briefly presented.

**2. Grading of the basic material**
Speaker: H. Unterwieser, holz.bau forschungs gmbh / Graz

For the production of the CLT-Elements the used boards have to be strength graded. Therefore this presentation gave an overview about the regulations of the European standards concerning grading of boards. In addition to this the principles of the two used methods – visual and machine strength grading – and the influencing main parameters have been explained and some devices for the machine grading procedure were presented. As a conclusion results of accomplished projects concerning at the holz.bau forschungs gmbh / Graz concerning that topic have been shown.

**3. A Contribution to the Design and System Effect of Cross Laminated Timber (CLT)**
Speaker: R. Jöbstl, Institute for Timber Engineering and Wood Technology, TU Graz

For the design of CLT-Elements a load bearing model has been developed. This model – very similar to the so called ‚beam model' for glulam – has been presented. Furthermore a suggested procedure for the implementation in standards was presented.

**4. Modeling and Design – CLT-Elements utilized as Plates under Transverse Shear Loading**
Speaker: T. Moosbrugger, Institute for Timber Engineering and Wood Technology, TU Graz

Theoretical basics for the design and modeling in the utilization of CLT-Elements as plates had been presented. In addition an example for design of those elements for a ceiling construction of a family house has been shown and discussed.

**5. Introduction – Timber Massive Construction View on R&D for an Innovative Design Principle using Cross Laminated Timber**
Speaker: T. Bogensberger, Institute for Timber Engineering and Wood Technology, TU Graz

Apart from the utilization as plates (e.g. for ceilings of houses) CLT-Elements can also act as shear wall and load carrying element for loads in their plane, i.e. panels respectively. The mentioned presentation dealt with theoretical aspects for that kind of loading and illustrated the modeling and design based on FEM-calculation for a practical example.

**6. Introduction – Timber Massive Construction View on R&D for an Innovative Design Principle using Cross Laminated Timber**
Speaker: G. Traetta, holz.bau forschungs gmbh / Graz

Since most of the common connection techniques is developed for bar like products specialized connection systems for CLT-Elements has to be created. This presentation mentioned some aspects for the connection technique for the basic design model (e.g. embedment stress) and the most common design situations (e.g. wall-ceiling connection).

**7. Introduction – Timber Massive Construction View on R&D for an Innovative Design Principle using Cross Laminated Timber**
Speaker: H. Habenbacher, KLH, Katsch/Frojach

The company KLH located in Katsch/Frojach was the first producer of CLT-Elements in Austria. Meanwhile they have big experience in the utilization in the erection of building with those elements. In this contribution a couple of erected buildings for different purposed – family houses, multi storey buildings, bridges etc. – were presented. In this context also questions concerning building physics, the erection process and other questions of practical relevance were addressed.

Discussions concerning the given presentations of the seminar finalized the meeting.

Apart from the seminar most of the participants took part in an excursion to company Leitinger in Preding/Styria one day before the seminar. This company produces finger-jointed structural using a tensile proof-loading device. The R&D-work for the

development this device done by holz.bau forschungs gmbh / Graz was presented by Mr. G. Jeitler.
In addition to that the comprehensive test set-up for duration of load tests of self-tapping wood screws in Wernersdorf/Styria was visited by the participants.

**Summarizing evaluation of the seminar**

The Austrian seminar was a follow up to the system of the seminar in Brno. It did not focus only on theoretical problems but also the issue of quality and characteristics testing of timber. The seminar program was well prepared although there was an evident lack of information distribution among students which influenced the number of participants. Despite this fact the quality of the seminar was sufficient. The presentations were very interesting for all the listeners which resulted in a long and exciting discussion.

Next country seminar will take place in Opole in March 2008.

The report was compiled by Jiri Plicka (P4) and Marcela Zahnasova (P1).