Cross Laminated Timber

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Situation in Western Europe

- What has been the trend in the last years in most western Europe countries?
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Technik
Lignum
Holzwirtschaft Schweiz

‹Hegianwandweg›, Zürich (CH), 2003
Sunken House, London (UK), 2007
Apartment Building, Trondheim (N), 2007
Murray Grove, London (UK), 2009
Hotel Ammerwald, Reutte (A), 2009
LifeCycle Tower, Dornbirn (A), 2012
Sihlbogen, Zürich (CH), 2011 – 2013
### Situation in Western Europe

- **Increase building density**
  - Less single dwellings, more multi-storey buildings (mainly 6-8 floors)
  - Wooden multi-storey buildings in urban areas (London, Zurich et al.)

- **Multi-storey building**
  - In 2003: € 2.35 bn; in 2011: € 4.5 bn
  - Timber market share 2003: 0%; in 2009: 4.9%

- **Single dwellings**
  - In 2003: € 2.25 bn; in 2011: € 2.39 bn
  - Our market share 2003: approx. 18.5%, in 2011: approx. 20%

- **Enhanced requirements in terms of comfort by residents**

- **Tougher standards, e.g. Norm SIA 181 ‘Acoustics in buildings’**

Quelle: Baublatt Nr. 45, 2011
CLT | What is it?

- Innovative wood product
- Produced in the form of large-format planar elements
- Softwood (spruce, fir) plies or laminations form the raw material
CLT | Advantages

Temporary «Chapel St-Loup», St-Loup (CH), 2008
CLT | Advantages

- Flat structure
  - Allows implementation of monolithically conceived architectural concepts which seemed to be reserved to solid materials (such as homogeneous concrete)
  - Designer can think in surfaces instead of a grid Typically necessary for timber frame construction
  - Boards facilitate vast glass surfaces and open, modifiable interiors

High load bearing warehouse «LGH», Zuchwil (CH), 2012
**CLT | Advantages**

- Modular construction system
  - Accurate and ready for erection

- Basically no limits are set to the form of CLT
  - Thanks to CNC-controlled joinery machines

- Elements can be assembled in the factory
  - E.g. to form walls complete with the necessary openings for doors, windows etc.
  - Piping etc. inside elements
CLT | Advantages

- Thin building fabrics can be achieved
  - Wood panels (also) act as insulation
  - Additional thermal insulation is commonly attached to the outside of the elements

- U-Values (e.g.)
  - < 0.2 W/m²K at 240 mm
  - < 0.12 W/m²K at 340 mm
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CLT | Advantages

- Buildings provide excellent environmental values
  - I.e. greenhouse gas emissions of multi-storey buildings are > 10% lower than for similar masonry buildings
  - Panels give the option to left exposed on the inside → further reduces the amount of embodied energy significantly

- More in the Lignatec – take your copy!

Source: Climate-friendly and energy-efficient construction with wood – Basic information and implementation. Lignum, Zürich, 2012
CLT | Advantages

- All advantages come with the well known general advantages of wood and the construction with it
  - Lightweight
  - Dry building material (no drying times → Occupants can move in straight away)
  - Short construction times (prefabricated elements/modules)
  - Carbon sequestration
CLT | Performance

- So what does it deliver to the end user?
- Housing comfort
- Excellent acoustic properties
- Economical performance:
  - Durability
  - Maintenance
  - Stability of value
- Fire safety
Thickest spruce in the world (1.84 m diameter), Calfeisental SG (CH)
The key players:
- Austria, the UK, Switzerland, Germany and Italy

CLT production in Central Europe has grown by 20-30 % per year!
- Over 5 years in a row
- 400 000 m³ of CLT was produced in 2011 (compared to 200 000 m³ in 2008) in Austria, Germany, Italy and the Czech Republic – 70 % of it in Austria
Tendency of new wooden buildings in Italy (left, residential; right, non-residential)

- In 2010 33% of these wooden apartments/buildings were made with CLT
- In the reconstruction of Abruzzo the share of CLT was as high as 41%

CLT | Market review

- 2006: ca. 3 400 m³ of CLT
  - Figure has constantly been climbing over the years...

- 2011: ca. 25 000 m³ of CLT

- Public sector as a driving force
  - Demand in this sector has dropped with the new government’s cut backs in investments

- The future market is seen in multi-storey residential building

- E.g. in London with its housing shortage
  - Products are seen as a competitive building material also with regards to cost
CLT | Prospects
• Construction with CLT delivers robust details and is thus widely appreciated
  • E.g. in Finland publicity and feedback of multi-storey timber apartment buildings has primarily been positive

• It is very likely the CLT market growth will keep being strong
  • Local converters receive a complete building system, which can be used without any difficulties (even in case of a partially lack of knowledge in wood construction)
  • Global warming along with desperately needed CO₂-reduction and sequestration brings further positive discussion and use
CLT | Prospects

«Shopping Resort G3», Gerasdorf (A), 2012
«The future is bright – the future is CLT!»

Many thanks for your attention!
WOOD
tastes good