Technical Note 1 – Market Survey

One of a series of short briefings on timber technology produced by the towards Adhesive-Free Timber Buildings (AFTB) research project. The project is co-funded by Interreg NWE, 2016-2020. This report has the aim of presenting a short overview of the existing compressed wood and dowel laminated timber markets, as well as the more general construction and timber markets.

Timber Construction Market Overview

Publicly available data allowed the project to conclude the following market for construction in the North-West Europe (NWE) area:

The building sector in NWE countries

✅ Despite recent difficulties, the European economy is expanding overall and this means, from the viewpoint of construction sector, that it is expected to continue to grow in the coming years.

✅ Europe registered an uninterrupted expansion of building activity over the last five years, but the volume of construction is still below the pre-financial crisis record level of 2007.

✅ Great differences can be seen in country-specific outlooks. This results from factors such as local and national political decisions (new public housing, education and health care projects, changes in regulatory policies, etc.) and external factors (price of energy).

✅ Ireland and Luxembourg are the two NWE countries that registered the biggest percentage increase in construction activity. Germany, France and the UK delivered the highest amounts of built volumes.

Review of Engineered Wood Product (EWP) markets in partner countries

✅ Stakeholders of the sector describe a constant increase of EWP markets in Europe over the past two decades in spite of the economic downturn in 2008. The prospects for the future are also positive.

✅ The most important factor which could lead to the further growing usage of EWP is the increase of cost competitiveness, especially for multi-story buildings.

✅ Maintaining future growth will require political willingness to address issues due to the relative youth of the sector. More balanced construction regulation and standardization is needed, as well as better education at all levels.

✅ The production of cross-laminated timber, in the production of which Europe is the world leader, is expected to increase dramatically over the next five years.

Engineered wood products (EWP) can refer to a diverse range of products. The Adhesive Free Timber Buildings (AFTB) project focuses on compressed wood technology for dowel laminated timber beams, panels and connections.

Compressed wood technology

Although compressing wood is not a new concept (a book named Resin-treated, laminated, compressed wood was already published by Stamm in 1941), a lot of new scientific research has been done in the last few years. It is a topic of many current academic research projects.

In the industry, confusion is often made when talking about Compressed Wood or Densified Wood. Indeed, a lot of product referenced as compressed wood on the internet are in fact particle board or firewood aimed for the energy sector. In AFTB project, compressed wood is defined as a product resulting of the compression of whole wood sections that leads to a densification of the timber. Only a few companies are manufacturing such product. Here is a non-exhaustive list of these products.

Laminated Densified Wood

Compressed laminated wood, made of layers of wood veneer, pressed together under high pressure and temperature is used in transformers and other industrial and decorative applications. It has excellent electrical and thermal insulation and high mechanical strength. It is made by compressing thin layers of timber interspersed with petrochemical resins.

Deho Group (including Dehonit (DE) & Permalit Deho(uk)), Segliwa (DE) and Röchling (DE) are three manufacturers. More information can be found on their websites.


Fasteners

Dehonit and Röchling are also producing fasteners (rods and nuts) and Beck is making compressed timber nails. The technology is known under the registered trademark LignoLoc®. More information can be found on their websites.


Other (future) applications

The following video shows research on using compressed wood for flooring. Impact resistance and wear resistance are improved. However, no evidence of marketing of this product was found.

https://www.youtube.com/watch?v=RWTkSjj8v2c

An article from the review Scientific American mentioned various advantages of densified wood. It is more resistant to compression, stiffer, harder, it can be molded in any shape, and with some additional treatment it can be moisture-resistant and swelling can be eliminated. Low-cost armor and lightweight material for vehicle and aviation could be future applications:


Dowel laminated timber

The most known construction element exclusively made of timber is the dowellam or Brettstapel (the name depends on the orientation of the laminae). It is a massive timber construction system that does not use glues or nails. It is generally fabricated from softwood timber planks connected with hardwood timber dowels.

The main strategy to promote dowel laminated timber products is to insist on the fact the panel is made out of 100% natural renewable raw material. It is clearly an environmentally sustainable panel. It is also suitable for reuse at building end of life thus contributing to the circular economy.

Next to the argument of sustainability, manufacturers are also highlighting the fact that dowellam offers profile flexibility and economical attractiveness.

Additional selling points could be the possibility of using local timber, what would add significant value to the local forest resources. Other more practical benefits of adhesive-free massive timber are the good thermal behaviour of the timber panels, the exceptional fire resistance due to the thickness of the panels, the low lifecycle costs and the many advantages that offers the offsite prefabrication.
Currently, there are more than twenty manufacturers of Brettstapel in Europe. Most of them are located in Germany, Switzerland and Austria. They are represented by red pins on the map. It should be noted that there is a huge difference in scale between those manufacturers, ranging from *Thoma Holz GmbH*, a multinational company, to *Williams Homes LTD*, a family business.

### List of Brettstapel/DLT manufacturers

**UK**

- Williams Homes
  - [http://www.williams-homes.co.uk](http://www.williams-homes.co.uk)
- Inwood
  - [http://www.in-wood.co.uk](http://www.in-wood.co.uk)
- MAKAR Construction
  - [http://makar.co.uk/news/dowel-lam](http://makar.co.uk/news/dowel-lam)

**Germany**

- Hecker System Holzbau GmbH
  - [www.hecker-system-holzbau.de](http://www.hecker-system-holzbau.de)
- Römmelt Hallenbau
  - [www.roemmelt-hallenbau.de](http://www.roemmelt-hallenbau.de)
- Rombach (Nur Holz)
  - [http://www.rombach-holzhaus.com](http://www.rombach-holzhaus.com)
- Zwick-Holzbau
  - [www.zwick-holzbau.de](http://www.zwick-holzbau.de)
- Merkle Holzbau GmbH
  - [www.merkle-holzbau.de](http://www.merkle-holzbau.de)
- Kaufmann Massivholz GmbH
  - [http://www.kaufmann-holzbau.de](http://www.kaufmann-holzbau.de)
- Weihele Holzbau GmbH
  - [http://www.weihele-holz.de](http://www.weihele-holz.de)
- Suttner Massivholzelemente GmbH
  - [http://www.holz-suttner.de](http://www.holz-suttner.de)
- Ulrich Zeh GmbH
  - [http://www.ulrichzeh.de](http://www.ulrichzeh.de)

**Austria**

- Holzbau Willibals Longin GmbH
  - [http://www.longin.at](http://www.longin.at)
- Berger Fertigteile & Produktionsges.
  - [http://www.brettstapel.at](http://www.brettstapel.at)
- Thoma Holz
  - [http://www.thoma.at](http://www.thoma.at)
- Sohm Holzbautechnik GesmbH
  - [www.sohm-holzbau.at](http://www.sohm-holzbau.at)

**Switzerland**

- Logus Systembau AG
  - [www.oberholzer-ag.ch](http://www.oberholzer-ag.ch)
- Tschopp Holzbau AG
  - [www.tschopp-holzbau.ch](http://www.tschopp-holzbau.ch)
- Krattiger Holzbau AG
  - [https://krattigerholzbau.ch](https://krattigerholzbau.ch)
- Kueng Holzbau AG
  - [https://www.kueng-holz.ch](https://www.kueng-holz.ch)
- Truber Holz AG
  - [https://www.truberholz.ch](https://www.truberholz.ch)
- Nägeli Holzbau AG
  - [https://www.naegeli-holzbau.ch/](https://www.naegeli-holzbau.ch/)
- Sägerei Sidler AG
  - [www.sidler-holz.ch](http://www.sidler-holz.ch)
  - [www.optiholz.ch](http://www.optiholz.ch)

**Italy**

- Biohabitat Service srl
  - [http://www.biohabitat.it](http://www.biohabitat.it)

**Lithuania**

- Ekobustas
  - [https://www.ecobustas.lt/production/technology/](https://www.ecobustas.lt/production/technology/)

**Canada (not on the map)**

- StructureCraft
  - [https://structurecraft.com/materials](https://structurecraft.com/materials)

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*DLT panel from StructureCraft*
Stakeholders Welcome
A key aim of the project is to engage with businesses, regulators and other interested parties. Adhesive-free timber building technology could be of interest to your business. Please get in touch via the e-mail addresses below:

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For more information please visit the Adhesive Free Timber Buildings (AFTB) project website http://www.nweurope.eu/AFTB or use the contacts.

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