

Q: What is CLT?

A: Cross Laminated Timber (CLT) is a solid structural wood product made from a minimum of three bonded layers of timber laminated at right angles and is intended for roof, floor and wall applications. CLT is prefabricated and digitally designed with minimal waste from production, which improves efficiencies, safety and speed in construction.

Q: What is the history of CLT?

A: The initial development of CLT occurred in the early 1990s in Switzerland. In 1996 Austria conducted a joint research effort that resulted in the CLT product known today. In the early 2000s the use of CLT in construction significantly increased and it is now a common method of construction in Austria, Germany, Switzerland, Sweden, Norway and UK. North America is also starting to use CLT as a form of construction.

Q: What are the benefits of CLT?

A: CLT is a more efficient and safer form of construction that is environmentally sustainable. The key benefits of CLT include:

- **Safety:** High risk site activities are eliminated through offsite manufacturing.
- **Reduce Labour Costs:** Less labour is required to construct the CLT system.
- **Lightweight Material:** 20% the weight of concrete. Reduces foundation loads and distribution requirements.
- **Faster Construction:** 30% faster than traditional construction methods.
- **High Quality:** Durable building material that is equivalent to concrete. High precision manufacturing results in quality finishing.
- **Easily Modified:** CLT can be easily modified both during and after construction.
- **Environmentally Sustainable:** Reduced carbon omissions, reduced carbon footprint through production, and high thermal performance.

PRODUCT PERFORMANCE

Q: What happens when CLT gets wet?

A: There isn't an issue with timber getting wet for short periods of time as is the case during the construction process. The CLT construction process is very quick and therefore the time in which the timber is exposed to wet conditions is negligible. However, any timber that does get wet during the construction process will dry out and return to suitable moisture content levels. The dimensional stability generated by CLT also significantly reduces the movement caused by moisture in comparison to traditional timber frame structures.

Q: Will a CLT building rot?

A: Timber has the potential to rot when exposed to high levels of moisture over extended periods of time. CLT buildings are designed to effectively manage moisture exposure and therefore mitigate the risk of rot. This is done by designing a CLT with a rain screen façade associated with appropriate moisture controls.

Q: Is deformation and shrinkage of timber a problem in CLT buildings?

A: No. The perpendicular cross lamination of CLT provides a very dimensionally stable product, which negates any significant deformation or shrinkage in the panel. This is the major difference between mass timber panels and traditional timber framed systems.

Q: Does a CLT building creak and move like a timber framed house?

A: No. The performance of a CLT building is more reflective of a conventional concrete building rather than a timber framed house. All buildings experience movements caused by many long and short term factors all of which can be controlled through design.

Q: How are termites treated in a CLT building?

A: CLT can be chemically treated for termite resistance, however incorporating a physical separation from the ground using a concrete structure in conjunction with a physical termite barrier is considered to be a more viable approach in dealing with termites. However, chemical treatments can be utilised if necessary.

Q: Are airborne termites an issue for a CLT building?

A: No. Termites need a moist and dark environment to both colonise and migrate in large numbers, which is generally when they do the most damage. Airborne termites therefore need to find a consistently moist environment to land and in turn colonise, which is generally not available on the façade of a building. However, it is good practice to ensure that the external plumbing works of a CLT building are maintained to eliminate any moisture points.

Q: What is the fire risk of a CLT building?

A: Timber has good thermal insulation properties and when it burns, a layer of char is created that helps to protect and maintain the strength and structural integrity of the wood inside. This is why timber in large sections such as CLT can often be used in unprotected situations where non-combustible materials such as steel would require special fire protection. CLT when completely exposed has excellent fire resistance, however installing fire resistant lining materials such as plasterboard to either flooring or walling CLT systems can provide further fire protection. Alternatively the installation of fire resistant lining materials can provide the entire fire protection requirements of the system without any further reliance on the CLT.

Q: How does CLT perform in relation to Acoustics?

A: The acoustic performance of CLT is excellent and is equivalent to other construction methods. The solid cross section of CLT makes it possible to achieve very good acoustic performance for both ceilings and walls. As with other forms of construction, CLT is not entirely reliant on the base material to deliver the required acoustic performance.

Q: Does a CLT building perform better thermally than a steel or concrete building?

A: Yes. Wood is a poor conductor which means that it is a good insulator of heat. Steel and concrete on the other hand are good conductors which mean that they more transmit heat. CLT buildings offer an additional thermal benefit in that the precise nature of the manufacturing process means that there is very little air leakage within the building envelope. Therefore air at the preferred temperature is kept within the building and not lost to the outside environment, which is equally relevant to cooling as it is to heating.

CONSTRUCTION

Q: Can CLT be used for buildings other than residential?

A: Yes. CLT has been used to construct a number of different types of buildings including schools, offices, shopping centres, health and government facilities.

Q: Can CLT be used to build houses?

A: Yes. The construction of single dwelling houses using CLT is extremely popular in Europe and is considered the premium product in the market.

FAQs

Cross Laminated Timber



Q: How does using CLT improve the quality of your building?

A: The highly precise nature of the CLT manufacturing process allows for a tighter sealing of the building envelope which results in a better overall thermal performance. Higher quality fit-out is also achieved as the base structure is easy to connect to and very precise. CLT construction also generates an increased building density compared to framed construction, which provides a degree of thermal mass and can be associated with heating and cooling energy reductions.

Q: Does designing a CLT building before construction slow down the process?

A: Completing the design of a building prior to construction allows for a more efficient construction process as it enables the effective management of delays and coordination problems.

Q: How are the CLT panels connected?

A: The CLT panels are connected using half-lapped, single or double splines made with engineered wood products. Metal brackets and plates in conjunction with fasteners are used to transfer the loads.

Q: Can CLT panels be repaired on site if required?

A: As the CLT manufacturing process is extremely precise the need to repair a CLT panel on site should be a rare occurrence. However if an error does occur then the CLT panel can be repaired or altered very easily on site due to the workable nature of timber.

Q: Is CLT cheaper than concrete?

A: CLT projects are currently cost comparable to conventional concrete construction methods with the majority of the cost savings being

achieved through reduced construction time. However, as the design and engineering of the CLT system develops the overall cost of the system will reduce further.

Q: Can CLT be used in bushfire prone areas?

A: Yes. The Construction in Bushfire Prone Areas Standard places restrictions on exterior building elements only with no limitations on the interior structure. As CLT is predominately used in interior applications there will be no limitation on its use.

Q: What happens if a CLT building catches on fire during construction?

A: A site specific fire safety plan has to be prepared to address the potential issue of fire during construction.

DESIGN

Q: How far can CLT panels span?

A: CLT is a flexible and light-weight building system that allows for long spans in either floor, wall or roof construction. CLT systems can generally achieve the spans typically found in apartment and commercial buildings.

Q: Can CLT be exposed for architectural reasons?

A: Yes. CLT can be designed as an exposed component of a building either internally or externally.

Q: How is condensation managed in a CLT Building?

A: The same way as a conventional building by incorporating appropriate moisture barriers and insulation.

FAQs

Cross Laminated Timber



Q: If a section of a CLT building is damaged by fire, does it mean that the entire building will need to be demolished?

A: No. CLT buildings need to be designed taking disproportionate collapse into account so that the structural capacities of adjoining panels are capable of taking the load should another panel be damaged. Individual panels can then be repaired and/or replaced on site as required.

Q: How does a CLT building perform under earthquake loads?

A: A well-engineered timber building should perform much better than a concrete building under earthquake loads. CLT buildings are very ductile and have good energy dissipation characteristics, which is highly dependent on the mechanical connections used during construction. Recent testing of a full-scale CLT building conducted by the Trees and Timber Research Institute of Italy in Japan saw the structure perform remarkably well under severe earthquake loads. The building used in the test was later dismantled and reconstructed in Italy for permanent use.

SUSTAINABILITY

Q: Where does the timber used to manufacture CLT come from? Is it sustainable?

A: The timber is sourced from sustainably managed forests in Europe, North America or New Zealand. Timber is the only sustainable construction material as it stores carbon for its entire life cycle. Sustainable forests are managed in such a way that ensures that trees are planted to replace the trees that are harvested.

Q: Does the carbon generated by the shipping of CLT from Europe or North America to Australia still make the process sustainable?

A: Even when you factor in the impact of shipping the building still only generates half the carbon of an equivalent concrete building.

Q: What is the life span of CLT building?

A: The Building Research Establishment in the UK has certified the CLT product for a life span of 60 years and there are occupied timber buildings in Europe that are over 700 years old. The key factor in the longevity of a timber structure is the management of moisture during the design stage.



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