



CROSS LAMINATED TIMBER

A Cushman & Wakefield Overview



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Cross Laminated Timber – CLT – is an innovative engineered wood product consisting of at least three single layer panels that are bonded together. As a product it is being used in both new construction and retrofits as an adaptable component of the global construction mix.

CARBON IMPACT

The construction of CLT buildings is less carbon intensive. Every tonne of CLT locks in 1.6 tonnes of CO² while Portland cement generates about 870kg of CO² emissions for every tonne produced. Timber buildings can be designed so material can be reused (scrap wood can be used for example) at end of life. No hazardous chemicals are released during recycling or incineration of CLT.

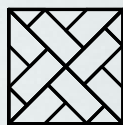


MATERIAL PROPERTIES



WEIGHT

lighter than concrete or brick



STRENGTH

exceptionally strong - panels are glued together in layers of three, CLT doesn't bow or bend and has integral strength in two directions



ACOUSTICS

Superior acoustics compared to stud partitioning, which could also result in additional net internal area being generated or a reduction of the gross internal area



SEISMIC

earthquake proof construction method



Source: Biz Journals, San Francisco, How mass timber is changing options for builders

ADDITIONAL BENEFITS

HEALTH AND WELLBEING

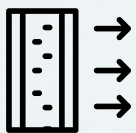
Research has demonstrated that exposed timber interiors have a calming effect, promoting wellbeing and a better learning environment.

COMPLIANCE

Through the transition to a low carbon economy different drivers are being used to reduce carbon emissions associated with construction. Future drivers will include carbon pricing, and carbon mitigation policies.

FUNDING INCENTIVES

Use of CLT could be eligible for tax rebates and grants.



THERMAL PERFORMANCE

good thermal (insulating) performance properties



FIRE SAFETY

designed to withstand heats of up to 270°C but note fundamental fire risks must be explicitly adopted in the design



20%

Timber buildings generally weigh 20% less than a concrete building (70kg/m³ compared to steel at 160kg/m³ and concrete at 300kg/m³)

50%

Less embodied carbon compared to concrete buildings

40%

Less waste compared to steel and concrete buildings



COMMERCIAL VALUE

FASTER CONSTRUCTION TIMES

Timber buildings can be 20% quicker to construct because of their light weight and greater precision

- Less demand for workers on site
- Less sick leave from construction workers reported compared to concrete projects
- Potential for earlier building occupancy/income stream.

PREFABRICATED (MODULAR) CONSTRUCTION

- Quick and easy to assemble
- Ideal for projects with limited on-site storage capacity, for example in dense urban areas
- Less disruptive to the surrounding community
- Used with any building material

STRONG SUPPLY

- 160 billion m³ of standing fibre (trees) in Europe and Russia alone
- Majority of CLT producers are in Central Europe. In 2019, the three biggest cross-laminated timber producers had a total output of over 500,000 m³.

DEMAND

- Since 2015 CLT consumption has increased by around 15% a year, with over 50 installations in Europe alone.
- Investment in CLT manufacturing technology is at an all-time high



Source: Archpaper, 2020, Cross Laminated Timber apartment complex rise in Boston

COMMERCIAL RISK

- Lack of construction skills in the market especially regarding shorter time frames on site
- CLT must be sourced from renewable and sustainably managed forests (i.e. FSC certified) to be identified in green building standards
- Not all individual components are cheaper than concrete

CONCRETE	CLT
235mm RC slab £140/m ²	210mm CLT floor £150/m ²
200mm RC core wall £200/m ²	160mm CLT core wall £115/m ²
350mm stud partition £140/m ²	140mm CLT wall + plasterboard £140/m ²

Taken from Cost model: CLT frame buildings

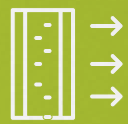
KEY BENEFITS



Rapid assembly and construction on site helps to save time and lower total costs



Exceptionally strong, stiff and stable



Massive structure provides good thermal and sound insulation, plus impressive performance in event of fire



Sustainably sourced wood can help meet carbon reduction requirements and lower environmental footprints

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