

TALKING TIMBER



A WIN-WIN FOR SUSTAINABILITY

Combining a timber-rich building with the certified Passivhaus Standard results in both embodied carbon and in-use energy savings. Additionally, it locks carbon into the fabric and structure of the building for decades, offering the closest approach to net-zero buildings



The Passivhaus Standard is a third party-certified, quality-assured method for designing and constructing buildings of any typology.

With over 30 years of refinement, the Passivhaus Planning Package (PHPP) – a sophisticated Excel-based modelling tool – accounts for all aspects of a building, including site conditions, shading, microclimate, current and future weather data, form factor and

fabrication. Three key principles ensure quality performance:

1. Accurate site-specific modelling in PHPP
2. An integrated approach – balancing energy losses/gains, comfort, and cost
3. Third party quality assurance – ensuring proper construction and commissioning

Additionally, five essential physical characteristics define a Passivhaus building:

- A continuous, high-performance thermal envelope and airtight layer
- Consideration of thermal bridging within energy modelling
- Solar gains and shading considerations, paired with high-performance glazing and doors
- Quiet and efficient mechanical ventilation with heat recovery (MVHR)

Certified Passivhaus buildings include:

- Residential: detached, semi-detached, terraces, and multi-occupancy housing (mid/high-rise)
- Educational: schools, university buildings, and student accommodations
- Commercial and institutional: offices, factories, hospitals, leisure centres, and more

Embodied carbon considerations are taken seriously. PHribbon, a software plug-in for PHPP, allows designers to evaluate multiple designs by adjusting materials and quantities. Software developer Tim Martel has incorporated all timber products with certified Environmental Product Declarations.

Timber and moisture management are critical concerns. Softwood timber must remain below 20% moisture content to prevent rot. To mitigate moisture risks, PH Homes – owners of the PH15 I-joist and LVL system – utilise rain covers during construction, providing a dry assembly environment.

Certified Passivhaus buildings are designed with airtight construction, often featuring proprietary airtight timber boards behind interior plasterboard finishes. These boards prevent moisture from interior activities (breathing, cooking, washing,

Tabitha Binding FIMMM, currently works with the Passivhaus Trust and Coaction Training CIC, and is a member of the IOM3 Wood Technology Leadership Team. She has previously worked with TDUK, TTF, BM TRADA, TRADA, Woodknowledge Wales, Coed Cymru, Tir Coed and Woodland Heritage

drying) from penetrating the timber structure. Instead, moisture is managed through MVHR, which extracts warm, damp air from kitchens and bathrooms, transferring heat to incoming fresh, filtered air supplied to living and sleeping areas. This maintains an indoor relative humidity of around 50% at a comfortable temperature of 21°C, benefiting both occupants and the timber structure.

Certified Passivhaus timber-rich homes can incorporate timber materials such as:

- CLT, glulam, LVL and I-joists
- Solid stud, twin wall, Larson truss systems
- OSB, plywood, MDF, particleboards, wood wool boards
- Wood fibre insulation (solid, flexible batts, loose fill)
- Cellulose insulation
- Timber-based interior and exterior joinery, cladding, fixtures, and fittings

Scotland is moving toward implementing the Scottish Passivhaus Equivalent, while Wales is advancing the 'Tai ar y Cyd' project, uniting 23 social housing providers in a timber-framed Passivhaus and AECB-standard pattern book.

The Passivhaus Trust offers guidance and a free 4.5-hour online introductory course: How to Build a Passivhaus. <https://passivhaus.uk/>. For more in-depth training, Coaction Training CIC provides courses with funding options from CITB and the Welsh government. Learn more at <https://coaction.org.uk/blog> ■



Above: Passivhaus PH15 System IMAGE CREDIT: PASSIVHAUS HOMES

**Wood
Technology
Group**
IOM3