



Claiming the Passivhaus Standard: The UK context

Technical briefing document

5th July 2011

Satisfying the Passivhaus Standard: the UK context

Technical Briefing Document - July 5th 2011

Introduction

The term “Passivhaus” or “Passive House” is used for an internationally established building standard with very low energy consumption, which has been proven in practice. Quality assured Passivhaus buildings have earned a reputation for excellent comfort, quality and energy efficiency. This has led to a very rapid growth in interest in the standard worldwide. The Passivhaus Institute¹ (PHI) has defined quality assurance requirements for Passivhaus buildings, products, designers and consultants² but this document is only concerned with matters relating to Passivhaus buildings.

Within the UK, there are occasionally claims that buildings meet or exceed the Passivhaus standard simply because they might meet one or more of the Passivhaus requirements. For example they achieve the air-tightness target, or utilise insulation levels that are akin to the minimum backstop U-values, or have been shown to have a space heating energy demand of less than 15kWh/(m².a) using other energy calculation tools such as SAP. It is incorrect to claim that such a building is a Passivhaus building unless it can be shown to be designed and constructed according to all the certification criteria.

Achieving the Passivhaus standard

In order to achieve the Passivhaus standard, a project must clearly demonstrate that it meets the validated quality assurance requirements of the standard. This includes the requirements listed over; reference must also be made to any other requirements or guidelines currently set by the Passivhaus Institute.

The Passivhaus Trust recommends that the best way to achieve quality assurance for a Passivhaus project is through certification by a registered Passivhaus Certifier³. It is reasonable to claim that a building is a non-certified Passivhaus provided that it still meets the requirements of the standard.

If the quality assurance protocols endorsed by the Passivhaus standard have not been observed during the design and construction of a building, then claims that such a building is a Passivhaus are, at the very least, unfounded and at worst, under consumer law, both misleading and fraudulent. Such claims also risk bringing the Passivhaus standard into disrepute.

¹ <http://www.passiv.de/>

² <http://eu.passivehousedesigner.de/>

³ http://www.passiv.de/03_zer/Zertifizierer/Zertif-PHI.htm

Quality Assurance Requirements:

The Passivhaus buildings standard requires all of the following, although this list is not exhaustive⁴:

1. The use of Passivhaus Planning Package (PHPP) – a bundle of both software and guidance notes - and the entry of the correct data⁵
2. That all relevant design assumptions and boundary conditions accord with those established by the PHPP
3. That the conductivities of all materials, products, components and constructions (including thermal bridging) satisfy the relevant EN standards
4. That the internal surface temperature of the windows will not fall below 17°C on the coldest day of the year.⁶
5. That pressure tests have been undertaken in accordance with EN 13829 (with the variant that both pressurisation and depressurisation should be undertaken and that the mean result be used during certification procedures)⁷
6. That where mechanical ventilation heat recovery (MVHR) is utilised it satisfies the PHI's strict performance requirements for those systems.
7. That MVHR systems be commissioned in accordance with the requirements of the Passivhaus standard
8. That the contractor writes a declaration confirming that the building has been built in accordance with the contract documentation
9. Photographic records of the project
10. A comprehensive set of construction drawings and documentation
11. That the above tools and documentation be used to demonstrate that the energy performance standards established by the Passivhaus Institute have been satisfied. For the UK climate, these energy performance standards currently stand at:

⁴ Certification criteria: http://www.passiv.de/07_eng/phpp/Criteria_Residential-Use.pdf
http://www.passiv.de/07_eng/phpp/Certification_Non-Residential.pdf

⁵ PHPP has been especially developed for high performance buildings and is compatible with international norms (such as ISO 13790). Furthermore it has been tested against dynamic simulation tools as well as the measured data. The planning package comprises a wide range of tools specifically developed for the design of high performance buildings.
http://apps1.eere.energy.gov/buildings/tools_directory/software.cfm/ID=549/pagename=alpha_list

⁶ Determined by PHI approved weather data.

⁷ For a Passivhaus building the reference volume used to establish the n50 air leakage is strictly defined by EN 13829, this methodology differs to ATTMA standards which can give a significantly higher volume.

Passivhaus Standard Energy Performance Requirements (UK Climate)	
Specific Heating Demand	$\leq 15 \text{ kWh/m}^2/\text{yr}$
Specific Cooling Demand (non-domestic buildings only)	$\leq 15 \text{ kWh/m}^2/\text{yr}$
or, Specific Heating Load	$\leq 10 \text{ W/m}^2$
Entire Specific Primary Energy Demand	$\leq 120 \text{ kWh/m}^2/\text{yr}$
Airtightness	$n_{50} \leq 0.6 \text{ ach @50pa}$

Certification by an approved certifier is a quality assurance mechanism that ensures that all of the above requirements have been met. This is supported, and recommended, by both the Passivhaus Institute and the Passivhaus Trust.

A building can achieve the Passivhaus standard (and indeed be a Certified Passivhaus building) using products that are not certified by the Passivhaus Institute, provided that the products used meet the necessary performance requirements. It should be noted that the use of Passivhaus Certified, or Passivhaus suitable, products and materials is not evidence of suitability in all cases. However the use of certified components does simplify the audit trail that is utilised by the standard.

The benefits of Passivhaus buildings:

The true value of the performance claims associated with the Passivhaus standard, and any associated claims/marketing by any third party⁸, rests upon the assurance that claims are both credible to consumers, and reflect a genuine benefit to both the consumer and the environment. Benefits include:

1. Minimised energy consumption⁹
2. Avoidance of building defects that can lead to mould growth
3. Excellent standards of thermal comfort (satisfying ASHRAE55 and according with EN7730)¹⁰
4. Minimised energy bills
5. High standard of indoor air quality¹¹

⁸ Including designers, manufacturers, vendors etc.

⁹ http://www.passiv.de/07_eng/PHI/Flyer_quality_assurance.pdf

¹⁰ CEPHEUS results: measurements and occupants' satisfaction provide evidence for Passive Houses being an option for sustainable building, Schnieders J., Hermelink A., <http://www.sciencedirect.com/science/article/B6V2W-4DGD9TX-1/2/0af4c8fb6e974de712202b192ff4395b>

6. Optimised lifecycle costs¹²
7. High levels of satisfaction by the building user/owner¹³

The intensive monitoring of Passivhaus buildings by the Passivhaus Institute over the last twenty years has clearly demonstrated and validated the quality assurance requirements of the standard.¹⁴

What's in a Name? (Consumer Protection and the Passivhaus Standard):

The title Passivhaus (also Passive House) is not trademarked or registered; however, it is clearly defined with its own terms and references. It is understood that in Germany a claim that a building is a Passivhaus has legal status (Horn 2008¹⁵).

The Consumer Protection from Unfair Trading Regulations 2008 (CPRs) offers legal protection to the consumer within the UK.¹⁶ Of particular interest to this review are the topic areas of Banned Practices (Schedule 1), Professional Diligence (Regulation 2) and misleading practices (Regulations 5 and 6).

Defra's Green Claims Guidance appears to draw upon the CPRs by promoting the use of clear, accurate, relevant and substantiated environmental claims and labels on products, services or in marketing and advertising. It also notes that:

1. Legally, any claim or information in advertising and marketing (whether it is environmental or not) must be fair and not misleading. This means that the party making the claim needs to be confident that they have robust¹⁷ and/or scientifically accepted evidence to support the claim¹⁸.
2. The party making the claim should make sure the evidence is clear and robust. Measure claims using the most appropriate standard methods. Consider seeking independent assurance by a third party (e.g. Passivhaus Certification).

¹¹ Measurements of energy performance and indoor environmental quality in 10 Danish Passive Houses – a case study, Larsen T., Jensen R. L., Proceedings of Healthy Buildings 2009
http://vbn.aau.dk/files/18898018/Measurements_of_Energy_Performance_and_Indoor_Environmental_Quality_in_10_Danish_Passive_Houses

¹² http://www.passiv.de/04_pub/Literatur/GDI/WiSt-Daemm.pdf

¹³ Refer to Schnieders, Hermelink (2006) CEPHEUS results: measurements and occupants' satisfaction provide evidence for Passive Houses being an option for sustainable building, Vol 34, pp 151-171, Energy Policy
PEP Project Information No. 1, Climate Neutral Passive House Estate in Hannover - Kronsberg: Construction and

¹⁴ For example refer to Fiest et al (2005) PEP Project Information No. 1, Climate Neutral Passive House Estate in Hannover - Kronsberg: Construction and Measurement Results http://www.passivhaustagung.de/zehnte/englisch/texte/PEP-Info1_Passive_Houses_Kronsberg.pdf

¹⁵ Horn, G. Legal aspects of planning and construction of Passive Houses, International Passive House Conference, Nurnberg 2008

¹⁶ Refer to the document "Guidance on the Consumer Protection from Unfair Trading Regulations 2008" by Office of Fair Trading
http://www.offt.gov.uk/shared_offt/business_leaflets/cpregs/oft1008.pdf.

¹⁷ That the relevant party has adopted all of the quality assurance requirements associated with the Passivhaus standard, and where possible, has undertaken a third party audit (certification audits are considered to be robust as they can reduce the number of errors by 80-90%.)

¹⁸ This is considered to include ongoing scientific research undertaken by PHI and the Passivhaus community.

3. It should be ensured that claims about aspirations of future environmental performance are also supported by evidence and action.
4. Information to substantiate a claim should be retained by the person making the claim, be transparent about the assumptions and approach taken, and be made available to those seeking reasonable justification of it.

Protection of the Consumer and the Passivhaus Standard:

The current UK legal framework, and supplementary government guidance, works to protect the consumer against false claims. As the Passivhaus standard is a distinct and established product it would appear that the consumer is protected against false claims and misrepresentation, furthermore professionals are bound by a duty of care to act in a diligent fashion¹⁹. It is therefore intimated that professional diligence would preclude the distortion or misrepresentation of the Passivhaus Standard. Within this context claims relating to the use of so-called “Passivhaus Principles” could in fact be considered misleading and therefore illegal.

Acknowledgements

This paper was written by Mark Siddall and Nick Grant, with input from the Passivhaus Trust Technical Panel and the Trust’s ‘Passivhaus Claims’ technical working group. Members of the working group include: Jon Broome, Alan Clarke, Paul Smyth and Melissa Taylor. Additional input was also provided by Mark Allen, Justin Bere, Jon Bootland, Bill Butcher, Andrew Goodman, Chris Herring, Jonathan Hines, Sofie Pelsmakers, Paul Tuohy and Peter Warm

¹⁹ Reasonable care and skill is an implied term according to the Sales of Good and Services Act Section 13 of the act <http://www.legislation.gov.uk/ukpga/1982/29/contents>