

# **Claiming the Passivhaus Standard:** Technical briefing document

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## **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, Peter Warm, Kym Mead and Tad Everhart.



# Introduction

The Passivhaus Standard is arguably the world's most rigorous quality assurance standard for energy efficient buildings.

Passivhaus buildings have a reputation for not only energy efficiency, but also comfort and quality. This has led to a rapid growth in the adoption of the Standard and global interest in the buildings that result.

The Passivhaus Institut (PHI) in Darmstadt, Germany developed the Passivhaus Standard based upon rigorous scientific research and testing.

The term "Passivhaus" or "Passive House" is often used when referencing a building that has been designed to this internationally recognised standard.

In order to support the quality assurance that is offered by the standard the Passivhaus Institute<sup>1</sup> (PHI) has defined requirements for Passivhaus buildings, products, designers and consultants.<sup>2</sup> This document is primarily 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 requirements of the Passivhaus Standard. On other occasions claims have been that buildings are designed using "Passivhaus Principles."

For example they achieve the air-tightness target, incorporate insulation to levels that are akin to the recommended U-values, or have been shown to have a space heating energy demand of less than 15kWh/m<sup>2</sup>.yr using National Calculation Methods (NCM) such as the UK's regulatory compliance tools SAP and SBEM.

It is incorrect to claim that such a building satisfies the Passivhaus Standard or that it adheres to the principles that underpin the quality assurance standard.

A building may not be described as a Passivhaus unless it has been modeled in the Passivhaus Planning Package (PHPP) and meets all of the requirements of the Passivhaus Standard. PHI established a process to certify buildings meet the Passivhaus Standard, and PHI publishes quality assurance criteria.<sup>3</sup>

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<sup>1</sup> <http://www.passiv.de/>

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

<sup>3</sup> PHI established quality assurance requirements for Passivhaus buildings, products, designers and consultants but this document is concerned only with quality assurance requirements for Passivhaus buildings.



## Achieving the Passivhaus standard

In order to achieve the Passivhaus Standard, a project must clearly demonstrate that it meets the validated quality assurance requirements. 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 demonstrate that the quality assurance requirements have been met is through certification by an accredited Passivhaus Certifier<sup>4</sup>.

It is reasonable to claim, or declare, that a building is a non-certified Passivhaus, or satisfies “Passivhaus Principles”, provided that it meets all of the quality assurance requirements established by the Passivhaus 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 satisfies the Passivhaus Standard 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.

### **Certified Passivhaus Designers and Consultants**

When designing a Passivhaus persons with Certified Passivhaus Designer and Consultant qualifications have a duty of care to ensure that their work adheres to and respects the principles of quality assurance that are established by the Passivhaus Standard.

It is considered reasonable to expect that Certified Passivhaus Designers and Consultants will carry a higher duty of care because of their training, qualifications and standing within the building industry.

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<sup>4</sup> <http://www.passiv.de/en/index.php>



## Quality Assurance Requirements:

**Certifying that a building is a Passivhaus/meets the Passivhaus Standard** requires all of the following,<sup>5</sup>:

1. The use of Passivhaus Planning Package (PHPP) – a bundle of both software and guidance notes - and the entry of the correct data<sup>6</sup>
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.<sup>7</sup>
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)<sup>8</sup>
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:

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<sup>5</sup> Certification criteria: [http://www.passiv.de/07\\_eng/phpp/Criteria\\_Residential-Use.pdf](http://www.passiv.de/07_eng/phpp/Criteria_Residential-Use.pdf)  
[http://www.passiv.de/07\\_eng/phpp/Certification\\_Non-Residential.pdf](http://www.passiv.de/07_eng/phpp/Certification_Non-Residential.pdf). Note that this list is necessary but may not be sufficient. PHI retains the right to add quality assurance requirements for certification.

<sup>6</sup> 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](http://apps1.eere.energy.gov/buildings/tools_directory/software.cfm/ID=549/pagename=alpha_list)

<sup>7</sup> Determined by PHI approved weather data.

<sup>8</sup> 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.



## Claiming the Passivhaus Standard

<b>Passivhaus Standard Energy Performance Requirements (UK Climate)</b>	
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 accredited building 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 PHI and the Passivhaus Trust.<sup>9</sup>

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<sup>9</sup> 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 party<sup>10</sup>, rest 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 consumption<sup>11</sup>
2. Avoidance of building defects that can lead to mould growth
3. Excellent standards of thermal comfort (satisfying ASHRAE55 and according with EN7730)<sup>12</sup>
4. Minimised energy bills
5. High standard of indoor air quality<sup>13</sup>
6. Optimised lifecycle costs<sup>14</sup>
7. High levels of satisfaction by the building user/owner<sup>15</sup>

The intensive monitoring of Certified Passivhaus buildings by the Passivhaus Institute over the last twenty years has clearly demonstrated and validated the quality assurance requirements of the standard.<sup>16</sup>

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<sup>10</sup> Including designers, manufacturers, vendors etc.

<sup>11</sup> [http://www.passiv.de/07\\_eng/PHI/Flyer\\_quality\\_assurance.pdf](http://www.passiv.de/07_eng/PHI/Flyer_quality_assurance.pdf)

<sup>12</sup> 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>

<sup>13</sup> 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](http://vbn.aau.dk/files/18898018/Measurements_of_Energy_Performance_and_Indoor_Environmental_Quality_in_10_Danish_Passive_Houses)

<sup>14</sup> [http://www.passiv.de/04\\_pub/Literatur/GDI/WiSt-Daemm.pdf](http://www.passiv.de/04_pub/Literatur/GDI/WiSt-Daemm.pdf)

<sup>15</sup> 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

<sup>16</sup> 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](http://www.passivhaustagung.de/zehnte/englisch/texte/PEP-Info1_Passive_Houses_Kronsberg.pdf)



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

The term 'Passivhaus' is not trademarked or registered; however, it is clearly defined with its own terms and references.<sup>17</sup> In Germany a claim that a building is a Passivhaus has legal status (Horn 2008<sup>18</sup>).

The Consumer Protection from Unfair Trading Regulations 2008 (CPRs) protect consumers from false and misleading claims.<sup>19</sup> For example, Banned Practices (Schedule 1), Professional Diligence (Regulation 2) and misleading practices (Regulations 5 and 6).

Defra's Green Claims Guidance promote clear, accurate, relevant and substantiated environmental claims and labels on products, services or in marketing and advertising:

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 robust<sup>20</sup> and/or scientifically accepted evidence to support the claim<sup>21</sup>.
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.
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.

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<sup>17</sup>The title Passivhaus (also Passive House) is not trademarked or registered; however, phrases including Passivhaus and Passive House are.

<sup>18</sup> Horn, G. Legal aspects of planning and construction of Passive Houses, International Passive House Conference, Nurnberg 2008

<sup>19</sup> 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](http://www.offt.gov.uk/shared_offt/business_leaflets/cpregs/oft1008.pdf).

<sup>20</sup> 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%.)

<sup>21</sup> This is considered to include ongoing scientific research undertaken by PHI and the Passivhaus community.





# The Passivhaus Standard and Consumer Protection

A building meeting the Passivhaus Standard is a distinct and established product that may be advertised, marketed, and sold to consumers.

Buildings meeting the Passivhaus Standard have a number of benefits for the consumer.<sup>22</sup>

A building which does not meet the Passivhaus Standard will not have the advertised benefits. The purchaser will be injured by the false claims and misrepresentations that the building met the Passivhaus Standard.

CPRs and Defra protect the consumer against false claims and misrepresentations that a building meets the Passivhaus Standard. Persons making false claims and misrepresentations that a building meets the Passivhaus Standard, or satisfies the principles of Passivhaus quality assurance, are subject to legal claims, sanctions, and damages for violating the CPRs.<sup>23</sup>

Consumers injured by these false claims may sue the persons making false claims which injured them. Defra may instruct action against the false claimants or prosecute claims against them. The Passivhaus Trust may also join or initiate enforcement actions against parties making false claims that buildings meet the Passivhaus Standard in order to protect its members.<sup>24</sup> Within this context claims relating to the use of so-called “Passivhaus Principles” could in fact be considered misleading and therefore illegal.

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<sup>22</sup> Refer to The benefits of Passivhaus buildings

<sup>23</sup> Civil actions under the CPRs are not exclusive remedies. The professional making false claims is likely a defendant in claims for damages based on common law tortious conduct as well as disciplinary action by professional accreditation organizations since professionals are always bound by a duty of care to act in a diligent fashion. Professional diligence would preclude the distortion or misrepresentation of the Passivhaus Standard.

NOTE: 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>

<sup>24</sup> The true value of the performance claims of the Passivhaus Standard rests upon the assurance that the claims are credible to consumers. False claims not only injure consumers but also the professionals and tradespeople creating buildings which do meet the Passivhaus Standard.



