

## WHAT IS A PASSIVE HOUSE?

The purpose of this post is to give a little more information to anyone interested in having their own passive house.

First of all it's important to differentiate the difference between a Passive House and a certified Passiv Haus; The Passivhaus Standard is a construction standard developed by the Passivhaus Institut in Germany. The Passivhaus Standard is a specific construction standard and if your house meets that standard can be certified as an 'official' and 'certified' 'Passive House'.

### So what is a Passive House ?:

A Passive House is so well insulated, the annual space heat demand is so low that a conventional heating system can be omitted. The threshold for this to happen therefore is a space heating energy demand of up to 15 kWh/(m<sup>2</sup>a).

### How is a Passive House Measured ?

A house meets the Passive House standards (incidentally any building, not just houses can also be certified by the Passive Haus Institute) by a thorough analysis using the PHPP software. The PHPP software takes the following into account:

- Building dimensions & orientation
- U-values for all elements including windows, doors etc...
- Thermal bridges
- Shading
- Window orientation
- Ventilation
- Climate
- Domestic hot water heat demand
- Solar domestic hot water
- Electricity
- Boilers

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Mark Stephens Architects (Passive House Architects)  
Rooskey  
Foxford  
County Mayo  
Tel: 094 92 57621  
Mob: 085 159 4084  
Email: [info@markstephensarchitects.com](mailto:info@markstephensarchitects.com)  
Web: <http://markstephensarchitects.com>

# MARK D. STEPHENS

## *Architects*

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### PASSIVE HOUSE RECOMMENDATIONS FOR CENTRAL EUROPEAN CLIMATE:

The performance requirements for Passive Houses are detailed below. It is important to note that it is not any individual value as it is the total house that is calculated as a whole and you are allowed to use components with less strict values, as long as you meet the overall performance requirements:

1. Total heating and cooling demand smaller than 15 kWh/(m<sup>2</sup>a)
2. Total primary energy demand smaller than 120 kWh/(m<sup>2</sup>a) including ALL energy consumed (incl. household electricity e.g.)
3. U value of exterior building elements below 0.15 W/(m<sup>2</sup>K)
4. Constructed without thermal bridges
5. Air tightness of 0.6ac or better (N50 not Q50) at 50 Pascal
6. U value of all glazing below 0.8 W/(m<sup>2</sup>K)
7. Very high energy recovery efficiency ventilation system (>/ 75% complying with PHI certification) and minimal electricity consumption (</ 0.45 Wh/m<sup>3</sup>)
8. Minimal heat losses to hot water generation and distribution
9. Highly efficient use of electricity

### PASSIVE HOUSE REQUIREMENTS

As well as fulfilling the above (and proved through the PHPP software) you will also need to provide:

- Full drawings that include any shadow casting objects (trees etc...); this would involve site plans, construction drawings, detail drawings, window locations (to ascertain thermal bridges), M/E drawings...
- Technical Specifications for:
  - Window/door frames
  - Glazing
  - Services
  - Components
  - Electrical components (household appliances etc...)
  - Declaration of construction supervisor
  - Photographs throughout entire construction process showing every element

I've condensed this down to be readable but if you think there's something unbelievably important – let me know and I'll include it.

You are then ready for your house to be inspected and verified by a Passiv Haus certified inspector (fee paid)