

# Certified Passive House Designer / Consultant course

## Module 1: Building envelope

In lectures, workshops and discussions, you will gain indispensable knowledge about the opaque and transparent areas of an energy-efficient building envelope for residential and non-residential buildings.

Physical basics such as thermal conduction, moisture protection and thermal comfort in different climate zones will be addressed, as well as calculations of U-values, psi-values or fRsi-values and the topic of thermal bridges and their effects. Products, materials, constructions and connection details suitable for passive houses are explained using numerous examples.

An important topic is the air tightness of a building. This module deals with the effects of a lack of airtightness and planning principles and example details for airtight constructions in solid and lightweight construction. A practical exercise on airtightness measurement and the area of thermography are discussed as well.

Furthermore, construction principles, physical requirements in different climates and installation situations of windows suitable for passive houses are dealt with in detail. A wide range of highly energy-efficient glazing, windows and glass façades is shown in different examples.

## Module 2: Building Service, Retrofit, Economics

The focus of this second module is on the one hand the heating and cooling of highly energy-efficient buildings. Physical principles and calculations of primary energy, heating heat, heating load and heat gains are taught in connection with the calculation procedures of the Passive House Project Planning Package (PHPP).

Concepts for the use of various heat generators and system set-ups in Passive Houses are covered, as are the various components and the planning of heating and hot water generation. In addition, planning principles for heating and hot water distribution and drinking water supply suitable for passive houses are taught, and measures for avoiding distribution and storage losses are explained using many examples.

You will also gain knowledge and planning aids for summer thermal insulation, passive and active cooling and moisture recovery, both for the Central European climate and for planning tasks in other climates.

Another focus of this module is on the topic of ventilation. Knowledge of physical principles, system concepts and components of a mechanical ventilation system with heat recovery, preventive fire protection and economic efficiency are taught as well as the installation and adjustment, as well as dimensioning of system components and design of volume flows and air exchange rates. Skills relating to the planning of ventilation systems and duct networks are taught in lectures and exercises.

Furthermore, the second module highlights the topics of highly energy-efficient retrofits and the economic efficiency of energy-efficient measures. In many examples of successful energy-efficient

refurbishments with Passive House components, special physical and constructional problems in retrofit projects and their solutions are presented - both for the building envelope and for the building services. In the area of economic efficiency, knowledge of life cycle assessments and dynamic methods of investment calculations is conveyed in addition to examples of cost reduction in highly energy-efficient buildings. Exemplary comparisons of the economic efficiency of passive houses and low-energy buildings conclude this module.

### **Module 3: PHPP Basics**

Learn how easily and reliably energy-efficient buildings and renovations can be individually planned - with the Passive House Project Planning Package (PHPP), the energy balancing and planning tool for efficient buildings and modernisations. In this module, in addition to an overview of the PHPP and its structure, all the knowledge required to enter a residential building into the PHPP is imparted - both for the area of the building envelope and for the building services. PHPP calculations are explained and linked to the calculation of characteristic values taught in the previous modules. In addition to the representation of renewable energies in the PHPP, primary energy and the use of the pioneering PER factors developed by the Passive House Institute are also discussed. Many exercises and input aids facilitate the start with the PHPP.

### **Revision Session**

This workshop prepares you optimally for the examination to become a "certified passive house designer/consultant". In addition to many repetitions and exercises, there is sufficient time to answer your questions. Typical calculations will be carried out and practised as examples and comprehensive information will be provided on how to prepare and work on the exam.