

# Vasa Invest Oü

Kivisilla 6-8 Tallinn - Estonia, phone / Phone 003726611800

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## **Design and Projekt specifications , devolpment of enviroiment concept for prefab construction.**

Parties:

Vasa Invest Oü  
Q-house Baltic AS  
Pageron Oü  
Vasa Prefab AB

Objekt of issue.

Designing and testing of soultions for wall elemnts according with norms stated in application EURO CODE 5 and in accordance with BS Exchanged standards from 2012 : BS 5268-2:2002, 5268-3 BS, BS 5268-6-1, BS 5268-6-2, 5268-7-1 BS, BS 5268-7-7

To meat requirements for production of wooden elements reaching the result of maximum energy consumption of **42 kWh/m<sup>2</sup>**

Structure of development project development of passive house for line produktion:

The term passive house (*Passive house* in German) refers to the rigorous, voluntary, *Passive house*. standard for energy efficiency in a building, reducing its ecological footprint. It results in ultra-low energy buildings that require little energy for space heating or cooling. A similar standard, *MINERGIE-P*, is used in Switzerland. The standard is not confined to residential properties; several office buildings, schools, kindergartens and a supermarket have also been constructed to the standard. Passive design is not an attachment or supplement to architectural design, but a design process that is integrated with architectural design. Although it is mostly applied to new buildings, it has also been used for refurbishments.

Requirements for passive house.

The Passive house standard for central Europe requires that the building fulfills the following requirements:<sup>[19][20]</sup>

- The building must be designed to have an annual heating demand as calculated with the Passivhaus Planning Package of not more than 15 kWh/m<sup>2</sup> per year (4746 btu/ft<sup>2</sup> per year) in heating and 15 kWh/m<sup>2</sup> per year cooling energy OR to be designed with a peak heat load of 10W/m<sup>2</sup>
- Total primary energy (source energy for electricity and etc.) consumption (primary energy for heating, hot water and electricity) must not be more than 120 kWh/m<sup>2</sup> per year (3.79 × 10<sup>4</sup> btu/ft<sup>2</sup> per year)

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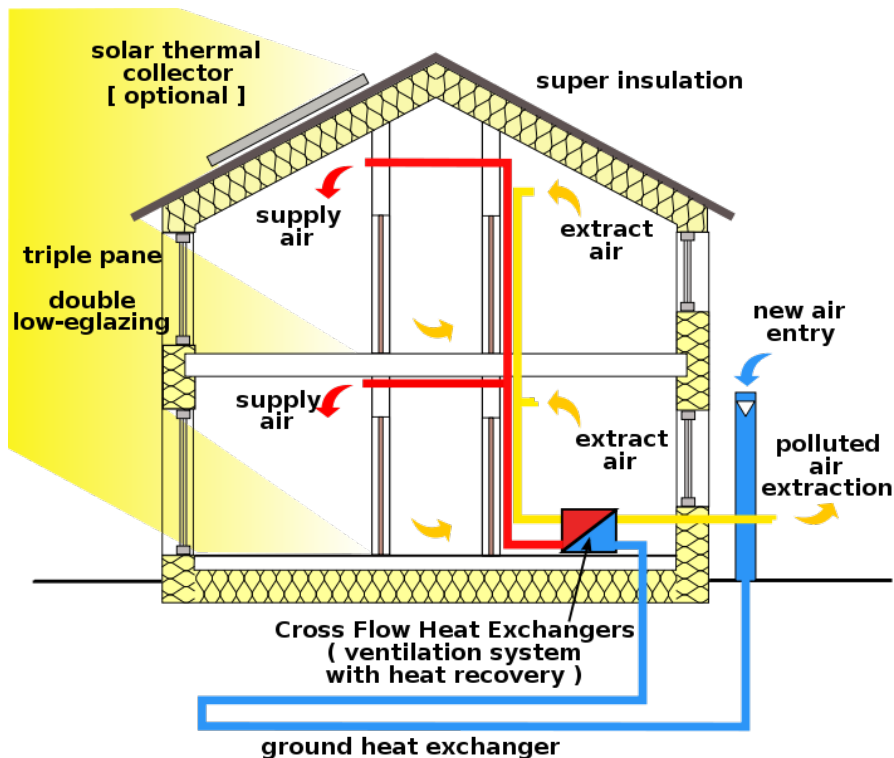
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- The building must not leak more air than 0.6 times the house volume per hour ( $n_{50} \leq 0.6$  / hour) at 50 Pa (N/m<sup>2</sup>) as tested by a blower door,

Purpose of developments in for Vasa house project line.

The purpose is to use the basic elements in all reday know construction metodes and developpe this into a line produced product meating the demands of cost efficiency and maximum energy saving in the absulut most effective way.

Princip following the traditional metods se scheth below



The structual design consits in all Vasa Hus today from above princip with trippel panel, reheating of air and mountinn heating system.

We have chosen to exklude surtain parts as the solar thermal, scence this has small or of non importance to the region where the production take place.

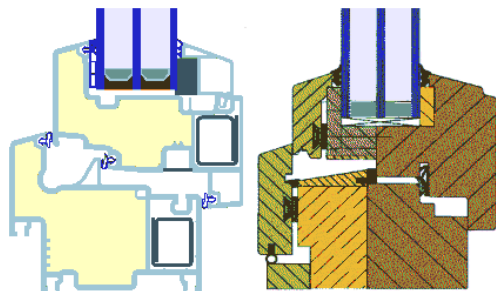
The houses can be constructed from dense or lightweight materials, but some internal thermal mass is normally incorporated to reduce summer peak temperatures, maintain stable winter temperatures, and prevent possible over-heating in spring or autumn before the higher sun angle "shades" mid-day wall exposure and window penetration. Exterior wall color, when the surface allows choice, for reflection or absorption isolation qualities depends on the predominant year-round ambient outdoor temperature. The use of deciduous trees and wall trellised or self attaching vines can assist in climates not at the temperature extremes.

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To meet the requirements of the Vasa Hus almost Passive house standard, windows are manufactured with exceptionally high R-values (low U-values, typically 0.85 to 0.70 W/(m<sup>2</sup>.K) for the entire window including the frame). These normally combine triple-pane insulated glazing (with a good solar heat-gain coefficient,<sup>[2][28]</sup> low-emissivity coatings, sealed argon or krypton gas filled inter-pane voids, and 'warm edge' insulating glass spacers) with air-seals and specially developed thermally broken window frames.

See sketch



The result of the project are under valuation during 2011 and 2012

Tallinn 15.09.2010

Tomas Petersson  
Dir.