


## HUGE - home and small office

by Valérie-Anne Hugé / 2017-05-29 21:04:00 / Belgique / 9948 / FR

New Construction



Primary energy need :

-1 kWhep/m<sup>2</sup>.an

(Calculation method : )

**ENERGY CONSUMPTION**

Consumption Range (kWh/m <sup>2</sup> .an)	Energy Class
< 50	A
51 à 90	B
91 à 150	C
151 à 230	D
231 à 330	E
331 à 450	F
> 450	G

*Economical building* (Classes A-C) | *Energy-intensive building* (Classes D-G)

Building **A**

**Building Type** : Isolated or semi-detached house  
**Construction Year** : 2014  
**Delivery year** : 2014  
**Address 1 - street** : rue de la Chapelle 21 6780 MESSANCY, Belgique  
**Climate zone** : [Cfb] Marine Mild Winter, warm summer, no dry season.

**Net Floor Area** : 200 m<sup>2</sup>  
**Construction/refurbishment cost** : 350 000 €  
**Cost/m<sup>2</sup>** : 1750 €/m<sup>2</sup>

### General information

The house was first conceived in a bioclimatic way, with large openings on living rooms to the south, small openings on the secondary rooms to the north. The joint ownership was intended because of compactness. We then imagined a simple wooden structure supplemented by good external insulation. To have a thermal flywheel, we needed a large slab in the heated volume, which led us to isolate under the slab with cellular glass. Unlike others that open the spaces and heat up the whole house, we have preferred a large, well-partitioned living space, which will be heated by the sun and the kitchen, so that we can completely switch from heating to heating. We created an entrance airlock to avoid drafts when someone leaves the front door open, because in the area it is customary to chat on the doorstep ... open.

The materials are almost all ecological, renewable. The structure and the insulation are made of wood, some walls are filled with raw earth for the hygrometry and the thermal mass.

### Building users opinion

The inhabitants (we!) are delighted with the thermal qualities of the building. Guests often find it hard to believe there is no heating or cooling. We are less often sick of the respiratory system in winter than before. The brightness of the South is superb, especially in winter when there are few.

### If you had to do it again?

If it were to be remade, we would make it smaller but would add the finishes and the exteriors (lamps, terrace). The passive chassis had evolved very much in 3 years, we would install a large sliding (sliding to the very good performances did not exist at that time). For all the rest, the choices would be the same

## See more details about this project

<https://www.facebook.com/ActivArchitecture-220170004690643/?pnref=lhc>

## Data reliability

Assessor

## Stakeholders

### Stakeholders

Function : Designer

ActivArchitecture

Sébastien Kesteloot, s.kesteloot@activarch.be

<http://www.activarch.be/category/prj/>

Drawing, technical and thermal studies, site monitoring

### Owner approach of sustainability

The project owner, Valérie-Anne Hugé, was interested in sustainable construction when she was still mocked and misunderstood. She built a house in straw and studied bioclimatism. For her home, she wanted "total ecological", ie bioclimatic, passive, concentrated, biological, labeled, and even adaptable PMR and adaptable to family modifications. She has done many finishing herself with so eco-friendly materials that the contractors sometimes did not want to implement them at the time (eg raw earth, TLB toilets)

### Architectural description

All the architectural choices have privileged function and bioclimatism to the formal aspect. From the outside, the house seems banal, no one stops to admire it. The front façade in the north has small windows dedicated solely to the lighting of the technical rooms and an airlock to avoid drafts. The house, built beyond the standards of the passive, goes without heating. Double-flow ventilation allows the incoming air to be warmed up. Solar panels produce all the electricity needed for family life as well as domestic hot water. The materials were selected for their low environmental impact. Wooden structure built by a local craftsman, wood wool insulation, ecological paints, solid wood flooring ... Raw earthen walls have been placed in several places of the house for their thermal, acoustic and hygrometric performances. In fact, they absorb excess moisture from the air to restore it later, when the air is too dry. The rainwater is recovered for laundry and toilets. There are even biomirated litter toilets, an ecological experimental concept designed to produce compost instead of polluting! The ground floor is accessible and adaptable to wheelchairs.

## Energy

### Energy consumption

Primary energy need : -1,00 kWh<sub>ep</sub>/m<sup>2</sup>.an

Primary energy need for standard building : 100,00 kWh<sub>ep</sub>/m<sup>2</sup>.an

Calculation method :

CEEB : 0.0003

Final Energy : -1,00 kWh<sub>ef</sub>/m<sup>2</sup>.an

Breakdown for energy consumption :

Heating: 0%

More information :

The electricity consumed by the sanitary, lighting, machinery and cooking is fully compensated by the solar panels, so we have a negative electricity consumption.

### Real final energy consumption

Real final energy consumption/m<sup>2</sup> : -1,00 kWh<sub>ef</sub>/m<sup>2</sup>.an

Real final energy consumption/functional unit : -1,00 kWh<sub>ef</sub>/m<sup>2</sup>.an

Year of the real energy consumption : 2 010

### Envelope performance

Envelope U-Value : 12,00 W.m<sup>-2</sup>.K<sup>-1</sup>

More information :

K = 12.0

Building Compactness Coefficient : 1,90

Indicator : EN 13829 - q50 » (en m<sup>3</sup>/h.m<sup>3</sup>)

Air Tightness Value : 0,22

Users' control system opinion : Semi-automated system: each light point is connected (and switched off) to the switchboard, the switches are connected to the switchboard with a voltage of 30 volts. On the board, the cables are physically connected without an interface. It is possible to change the assignments of the switches but the inhabitants do not see the interest. They appreciate the "All Off"; switch and the absence of 220 volts in the switches and cables of the extinct lamps (electromagnetic fields).

## Renewables & systems

### Systems

Heating system :

- No heating system

Hot water system :

- Solar Thermal

Cooling system :

- No cooling system

Ventilation system :

- Double flow heat exchanger

Renewable systems :

- Solar photovoltaic
- Solar Thermal

Renewable energy production : 100,00 %

Solutions enhancing nature free gains :

Windows in the South, rooms of life in the South

## Environment

### Urban environment

There are 2 bus stops within 300m of the project, and several within 2km. There is an average of 2 to 3 buses per hour and per direction. Parking: 2 places in front of the house, nothing in the garage. There is room for 4 to 5 bicycles in the garage, and the entry-exit is easy on the ground floor. We are in a rural area very well served: (real distances) 6km from the center of Arlon (where there are many shops), 2300m from a group of shops: garden - restaurants - shoes - baby - stationery - Zeeman - blokker - maxitoys - meuble factory - Aldi - mattress - Go sport - Mc Donald, Castle of Ax, Barter in stock ... at 2500m of the Cora (with ancillary shops) at 4500m of an Outlet Center of which a road "local circulation"; perfect to go shopping by bike. There is a kindergarten and a primary school 300m away from the project (in the village), a secondary school at 3300m which is safe to bike by the local traffic route, and other schools accessible by bus to Arlon.

Land plot area : 467,00 m<sup>2</sup>

Built-up area : 25,70 %

Green space : 347,00

## Products

### Product

Menuiserie Hermine 66

Her-Win SA

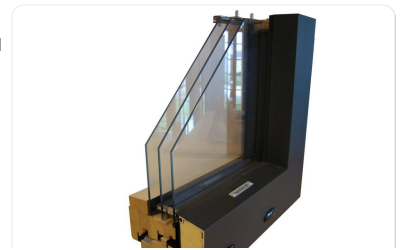
Tél +32 60 34 45 44 - Fax +32 60 34 69 44 - info@hermine66.com

<http://www.hermine66.com/>

Product category : Second œuvre / Menuiseries extérieures

Passive chassis. At the time, Europe's most efficient chassis, at a lower price than the others thanks to specialization: they only manufacture passive chassis. The chassis Hermine 66 becomes the first passive mixed chassis (wood-aluminum) to obtain the approval ATG which adds to the certificate PHI already obtained ( $U_f = 0,60W / m^2K$ )

We were very happy to find chassis so efficient, not too expensive, and aesthetically modern. They are very heavy but it does not feel to use.



## Costs

### Construction and exploitation costs

Total cost of the building : 350 000 €

Subsidies : 10 000 €

## Health and comfort

### Water management

Rainwater supply: washing machine, toilet (except TLB), vidoir.

### Indoor Air quality

No measurements made

### Comfort

**Health & comfort :** The living spaces are oriented to the South, because there is the most natural light. In addition, it is the orientation that brings the highest sun which is less dazzling. The summer - winter comfort is optimal thanks to the thermal mass which keeps the heat - the freshness.

**Measured thermal comfort :** Winter: minimum temperature 18 °, but pleasant feeling because no current of air nor humidity. Summer: maximum temperature 25 ° even during heat waves provided that it can ventilate at night.

**Acoustic comfort :** It is a single-family dwelling which is not calculated for high acoustic insulation. Yet, dry floating screeds upstairs give good comfort, while hearing the children if they scream (it's safer :-)

## Carbon

### Life Cycle Analysis

**Eco-design material :** Wood structure labeled CFC, insulation labeled wood, raw earth, insulation under slab in recycled glass, no PU.

## Contest

### Building candidate in the category



Energie & Climats Tempérés





Santé & Confort



Coup de Cœur des Internautes



Date Export : 20230408084826