

# Buttisholz, Switzerland







Ground preheating



Solar thermal collectors and weather sensor on the roof



Heat exchanger

## Technical systems

*Ground pipe preheating of ventilation air*  
2 PE-pipes 160mm diameter, length: 43m

### *Mechanical ventilation system*

The supply air from the ground pipe is further tempered by heat recovered from the exhaust air via a counterflow heat exchanger: 260 m<sup>3</sup>/h (100 Pa), 3-step operation.

### *Heating*

Heat is distributed by the fresh air supply, heated with the heat exchanger. There is a wood stove backup heating: 80% efficiency, 11 kW, 6-8 hours burn time.

### *Solar thermal system*

4.5 m<sup>2</sup> collectors with an efficiency of 80% cover the domestic hot water demand with 71%. The remaining coverage of 29% is assured by an electrical back-up.  
The Boiler contains 400l and has a maximal temperature of 97°C.

### *Controls*

The project is prevented from overheating by sensor-controlled sun shading.

### *Extras*

The green roof and a rainwater cistern are two additional ecological elements in the project

## Energy performance

The Buttisholz project fulfills the new Swiss MINERGIE @-P standard. This standard is comparable to the German Passivhaus Standard.

A MINERGIE@-P certified building uses around 10% of the energy of a conventionally built house in Switzerland.

*Space and ventilation heating* 13.3 kWh/m<sup>2</sup>a  
Energy source:  
Electricity, wood stove backup  
- calculated -

*Domestic hot water* 13.7 kWh/m<sup>2</sup>a  
Energy source:  
Solar thermal system 71%, electricity 39%  
- calculated -

*Pressurisation test* 0.3 h<sup>-1</sup>  
- monitored -

*Maximal heating power* 10.0 W/m<sup>2</sup>  
- calculated -



Open working space on the upper floor



Living room



View from the south-east

## Innovative products

### *Building envelope*

Window: Optiwin wooden-metal window (certified "Passivhaus" – window), 1.A Hunkeler, [www.optiwin.ch](http://www.optiwin.ch), <http://www.1a-hunkeler.ch>

### *Ventilation*

Heat recovery unit: Confoair G90, J.E.Storkair, <http://www.jestorkair.nl/>

### *Controls*

Solar and shade control: Tebis components, Hager, <http://www.hager.de/tebis/>

### *DHW*

Solar collectors: Rüesch Minisol, type BR 400, Rüesch, <http://www.rueschsolar.ch>

## Project team

### *Architect*

Norbert Aregger, Buttisholz

### *Timber construction engineer*

P. Jung, Ing für Holzbau GmbH, Rain

### *Heating ventilation sanitary planner*

Grüter AG, Schenkon

### *Controler engineering*

E. Häller, Elektrotechnik, Buttisholz

### *Civil engineer*

Weilenmann u. Blättler AG, Buttisholz

## Contact person

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## Literature and links

[www.aregger-architekt.ch](http://www.aregger-architekt.ch)