



**Chalet La Pedevilla**



## Introduction

The building is a mountain chalet surrounded by the impressive scenery of the South Tyrol dolomite mountain ridges. It can be considered a modern interpretation of the old 'Paarhof', the traditional kind of farm building typical for South Tyrol, built with a local natural material such as pine wood and white Dolomite concrete (Leitner Electro Srl). A BIPV system is integrated on the wooden roof of the chalet.

## Aesthetic integration

The BIPV system is made of black modules replacing the conventional roof boards, in a way that the plant blends in very well with the dark roof.

## Energy integration

The chalet is certified 'CasaClima A' and achieved the nZEB (nearly Zero-Energy Building) target, due to the exploitation of solar and geothermal energy and the employment of energy-efficient building solutions. The photovoltaic system was calculated to produce around 6,592 kWh per year. It is able to cover the building's electric consumption for the ventilation system and the heat recovery. Around an 80% of the produced photovoltaic electricity is self-consumed. The system has access to the net metering scheme (Scambio sul Posto) (Leitner Electro Srl).

## Technology integration

The 25 photovoltaic modules (Aleo Solar S\_79 SOL) are mounted with special aluminium Solrif profile frames and fixed to the substructure with special mounting clamps, used to brace two modules to their frames in the overlapping area. This system ensures weather tightness thanks to the special horizontal interlock of the modules' profile frames and the additional rubber lip placed between the overlapping module edges. The modules are naturally back ventilated, due to the distance between the modules and the roof. For safety reasons, the wiring and the connectors are placed in a grid gutter, fixed on fire-resistant plasterboard that separates the modules from the wooden parts of the roof.

## Decision making

From the beginning, the client, Arch. Armin Pedevilla, included the PV plant into the building project, driven by the purpose of creating a high-energy efficiency building, able to produce the energy required using most of the on-site available renewable energy sources. Once the economic feasibility was verified through simplified calculations, he confirmed the installation of the plant. The PV panels were architecturally integrated into the roof with the main goal of reaching a high level of aesthetic quality, matching the building's dark painted oak exterior (Leitner Electro Srl).

## Lessons learnt

The photovoltaic technology is integrated combining contemporary with traditional design. Simple standard PV modules are placed on the roof as if they were conventional roofing components blended into the dark wood boards, making the building a great example of photovoltaic integration with high replication potential. This example shows that reaching an overall high quality of a BIPV system requires a careful design, with care for details and sensitivity to the surrounding, but it does not always require specific custom-made products.

## PROJECT DATA

Project type	new construction
Building use	residential
Heritage constraint	conservation area
Building address	Strada Pliscia 13, Marebbe (BZ), Italy

## BIPV systems

### BIPV SYSTEM DATA

Architectural system	Opaque roof
Integration year	2013
Active material	monocrystalline silicon
Module transparency	opaque
Module technology	glass-glass, recognizable PV, standard modules
System power [kWp]	6
System area [m²]	43.3
Module dimensions [mm]	1,016 x 1,704
Modules orientation	South-East
Modules tilt [°]	30
Annual FV production [kWh]	6592

### BIPV SYSTEM COSTS

Total cost [€]	15616
€/m²	361
€/kWp	2603

## Stakeholders

### Main building designer

PEDEVILLA ARCHITECTS

### BIPV system designer

Leitner Electro Srl

### BIPV system installer

Leitner Electro Srl

Via Ahraue 6, Brunico (BZ), Italy

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<https://www.leitnerelectro.com/index.php?lang=it>

### BIPV components producer

Aleo Solar GmbH

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<https://www.aleo-solar.com/>

### Collaborators

Bergmeister GmbH





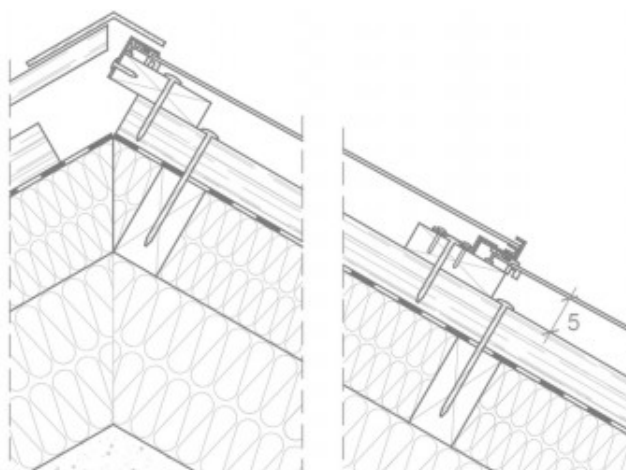
Building embedded in the natural surroundings of Pliscia © Arch. Armin Pedevilla



Dark BIPV modules © Leitner Electro Srl



Detailed view of the 'Solrif' mounting system © Leitner Electro Srl



Technical detail of the roof bearing structure by Leitner Electro Srl, re-drawn by Eurac Research



Wood modules substructure: the cables and the fire-resistant plasterboard are visible © Leitner Electro Srl



The buildings evoke the old 'Paarhof' structure © Arch. Armin Pedevilla

Case study author:

Eurac Research