

DEMOSITE & DEMOSITE FLAT ROOFS in IEA Task VII(PVPS)

C. Roecker, P. Affolter, J. Bonvin, A. Muller
Ecole Polytechnique Fédérale de Lausanne (EPFL)
Laboratoire d'Energie Solaire et de Physique du Bâtiment
Bâtiment LESO - CH - 1015 LAUSANNE
Phone: + 41 (0)21 693 45 39
Fax: + 41 (0)21 693 27 22
Email: christian.roecker@epfl.ch
<http://lesowww.epfl.ch>

ABSTRACT:

DEMOSITE is an international demonstration center for photovoltaic building elements, which was part of the demonstration effort of the group 'PV in Buildings' of Task 16, in the IEA Solar Heating and Cooling Program.

Incorporated in the new Task VII of the IEA PVPS program (Photovoltaic Power Systems), the center, still unique of its kind, has received a new impulse and now offers new features :

- **new flat roof area** to display specific systems
- **new row of pavilions** for either tilted roof or facade mounting
- **WWW pages** with details on existing and previous pavilions
- **new graphic concept** for information panels, data sheets, web pages
- **CD-ROM** available for a virtual visit of DEMOSITE and DEMOSITE FLAT ROOFS, which allows people to share the experience without paying for travel.

This center is operated by the PV team of the LESO-PB, EPFL, in Lausanne, and guided tours are regularly organized, including a visit of several pilot installations on the site of the EPFL.

New pavilions have been set up and equipped during the first year of operation within Task VII, and visitors from various countries and of different backgrounds continue to make use of the opportunity to see the innovative solutions proposed. Among the new systems displayed:

- ◆ BRAAS TILES: PV large tiles system for tilted roofs
- ◆ SUNSLATES: fiber-cement based tiling system for tilted roofs
- ◆ SOFREL: concrete based system for flat roofs
- ◆ CONSOLE: plastic based system for flat roofs
- ◆ SOLBAC: fiber-cement based system for flat roofs

With these new pavilions and more to come, DEMOSITE is the only place where people can see several of the latest PV integration techniques, displayed outdoor, in real size.

Keywords: Building Integration – 1: R&D Demonstration Programs – 2: Supporting structures– 3

1. INTRODUCTION

After six years of successful operation, the international demonstration center Demosite is now running within the framework of the new Task VII "PV in the Built Environment" of the IEA PVPS Program. Still unique of its kind, it now includes a second exhibition site especially for flat roof systems, since such systems are now gaining importance.

In order to better promote the displayed products, a new graphical concept was applied to all communication tools of the site, which include:

- ◆ an information sheet for every stand
- ◆ an information panel on-site for every stand
- ◆ a conference panel for promotion at conferences, exhibitions, ...
- ◆ an information pamphlet for international distribution
- ◆ a CD-ROM which will be available soon
- ◆ a new home-page www.demosite.ch which will be available soon, too.

2. NEW STANDS AT DEMOSITE PART I

As soon as constructed, the new row of Demosite Part I displayed two interesting new roofing systems:



Fig. 1. : The new roofing system Sunslates (by Atlantis) displayed at the Demosite.

Sunny Tile (already described in [1]) and Sunslates. This new photovoltaic integration system was developed by Atlantis Solar Systems Ltd. Sunslates™ are totally integrated photovoltaic construction elements and correspond in size, appearance and mounting system to the fiber-cement tiles of the company Eternit. The slates are also available on a natural slate base plate (other format).

As these elements are directly integrated into the building envelope and replace other façade or roof protection systems, mounting costs are drastically reduced.

Sunslates™ also convince from an aesthetic point of view. Their color is very close to that of standard fiber-cement and natural stone colors and the fact that they respect the geometric pattern of standard slates gives an impression of uniformity.

The visible part of integrated photovoltaic slates (like the visible part of the fiber-cement slate) has an area of 40 cm x 30 cm. The electric connection is on the covered part of the slate where it is protected against weather damage and still easily accessible.

All system components as well as the entire Sunslates™ roof and façade system have successfully passed rigid lifecycle and performance tests. The roofing system is certified according to IEC 1215. At the end of their lifecycle, the tiles can be treated as ordinary, harmless building rubble.

The interest of displayed stands depends on several aspects: success on the market place, architectural quality, aesthetics, quality of the constructive system. As the demand exceeds the number of free places, the Demosite team had to renew some of the older stands. The Elektrowatt stand, constructed in 1992, was dismantled this year in order to welcome an interesting new product: the roofing system Braas.



Fig. 2. The roofing system from Braas: an interesting combination of standard concrete based tiles and glass-glass customized modules.

Braas Dachsysteme GmbH (headquarters in Germany, subsidiary in Switzerland, among others) are specialized in roofing materials. They are present mainly on the European market and known for their extremely weather resistant concrete tiles. The developed photovoltaic tile is totally integrated into the roof plane. Its size corresponds to that of a row of four standard concrete tiles.

Braas photovoltaic systems are ready-to-use and available in different dimensions. Between 20 (8m²) and 120 (48m²) modules can produce an electrical power of between 700 Wp and 4200 Wp.

Planning expenditures are minimal thanks to the total integration of the system into the roof; all that is needed by the roofer is a simple sketch on the basis of which he can mount the modules. The electrician is only needed to connect the system to the grid.

The Braas system is composed of :

- ◆ a glass-glass module of 18 cells and a power of 35 W S.T.C.
- ◆ a plastic back case that guarantees water tightness and panel ventilation thanks to a pipe coil
- ◆ two stainless steel sections used to fasten the module to the wooden roof battens.

The electric socket connectors supplied with the system allow quick and easy connection. The designers of the system made sure that mounting time was kept at a minimum, which considerably reduces installation costs.

3. NEW STANDS AT DEMOSITE PART II (FLAT ROOF SYSTEMS)

As soon as implemented, the new site for flat roof systems hosted three products: Sofrel, Solbac and the flat roof system Amax. These pavilions are now connected to the grid and measurements are made in order to verify the long term performance. It is also possible measure particular parameters such as for example the module temperature of frameless and framed modules.

The latest stand to arrive at this site is the Console product. Developed by the dutch company Ecofys, it includes a light base made of 100% recycled chlorine free polyethylene that is directly ballasted on the roof, in the same way as Solbac.



Fig. 3. The Console system combines quality with a low price and is widely applicable as a support structure for solar panels on flat roofs.

4. PROMOTION

As mentioned above, the promotion tools of the Demosite are continuously maintained so that the diffusion effect can be maximized. After the complete make-up of the whole graphical system, the last feature to be implemented is the

CD-ROM, that will allow people who can not invest time and money to come in Lausanne, to visit Demosite virtually. After the CD-ROM, the WWW home-page will be remolded.



Fig. 4. The information sheets are the first of the promotion tools upgraded to the new graphical system. All displayed systems are described with technical details and project examples.

5. ACKNOWLEDGEMENTS

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