

Solar systems of Schweizer:

Factsheet – Application limits of Solrif® with regard to rain tightness.

Summary

This document outlines the range of application in which Solrif® can be deployed at various roof pitches and minimum-level requirements for roof sub-structures and underlays. In many countries it has become common practice to install an underlay below the roof covering as a secondary barrier to drain condensation moisture but also against wind driven rain and snow. However, standards vary considerably. The “reference roof pitch” according to Germany’s roofers association ZVDH has been defined at the technical University of Berlin to 22° (prEN 15601).

Performance parameters and requirements have been established based on:

- Driving rain tests at French scientific and technical construction institute (CSTB, Centre technique et scientifique du bâtiment, France).
- Driving rain tests according to prEN 15601 at Technical University Berlin, Germany, certificate no. 130208.
- Requirements by German Roofers Association (ZVDH).
- Requirements by Swiss Society of Engineers and Architects (SIA).

Requirements based on application

For Solrif®, the following requirements have been determined regarding water-tightness:

Roof pitch	Description
10°	General lower limit for the use of Solrif®.
10° - < 22°	Waterproof subroof recommended for exceptional requirements (back pressure > 50 mm dynamic pressure height).
22°	Corresponds to standard roof pitch (RDN) according to ZVDH
22° - 32°	Subroof recommended for increased requirements (dynamic pressure up to 50 mm back pressure height)
> 32°	Subroof for normal requirements.
70°	General upper limit roof pitch for the use of Solrif®.

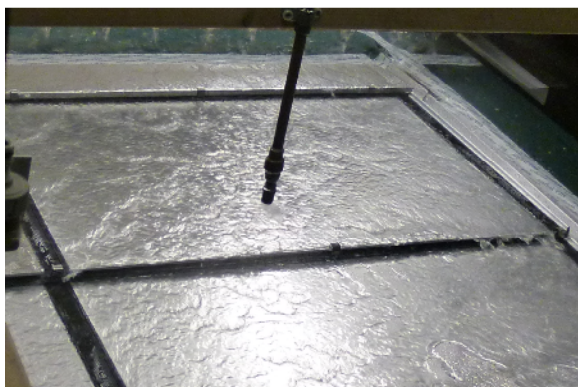


Figure1: Tests according to prEN 15601 at TU Berlin

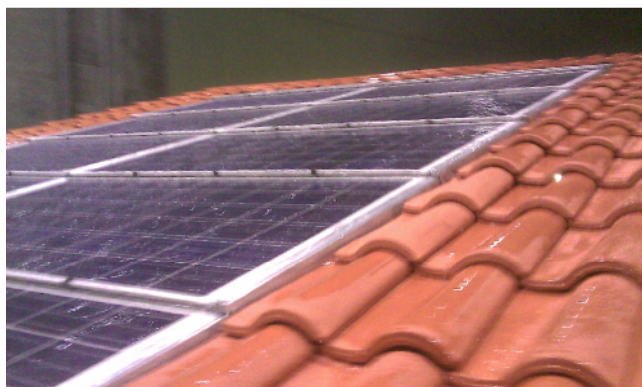


Figure 2: Tests at CSTB facility Jules Verne in Nantes

Guidelines:

- Subroof with increased requirements
A rain-proof sub-roof requires an impermeable underlay. The underlay is fixed to the sub-roof in the upper third of the horizontal overlaps and all overlaps are sealed watertight. Counter-battens, however, do not need to be covered. Any penetrations such as for connections must be implemented in a rain-proof way. In ventilated constructions, ingress of drifting snow and rain through ventilation openings cannot be avoided. Additionally, a rain-proof subroof functions as a barrier against the drip of condensation moisture.

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– Subroof with extraordinary requirements

A water-tight roof substructure requires the same impermeable underlay as the rain-proof sub-roof (see above), but in addition requires the impermeable underlay to also cover the counter-battens to ensure that the slate battens penetrate the underlay at relatively elevated points. Thicker counter battens should be used at sites where a lot of driven rain and drifting snow should be expected. Wood should not be fully sealed behind impermeable sheeting, as any moisture inside may lead to rot. Alternatively, rot-resistant materials may be used for the counter-battens. Any penetrations such as ducts must be implemented in a water-tight way. Additionally, a water-tight sub-roof is appropriate as a barrier against dripping condensation moisture.



Figure 3: Subroof with increased requirements (rain tight according to ZVDH)

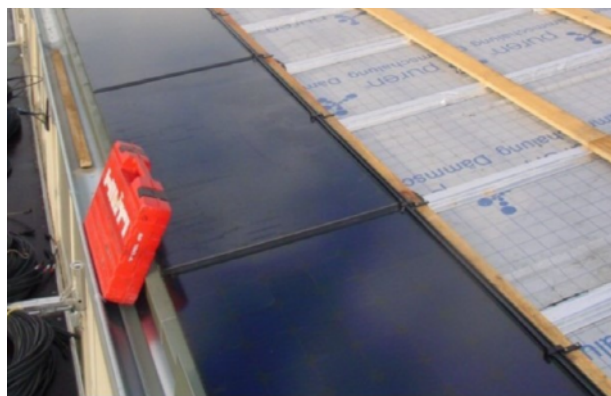


Figure 4: Water-tight roof substructure for extraordinary requirements (according to ZVDH)

French Market

Since the different requirements for subroofs are not common in France and the fixing in the ATEC (Avis Technique: 21/12-22) refers to tests without a subroof, limit of 15 ° was determined by the CSTB.

Increased structural requirements

Special climatic conditions, exposed location of the building, constructive features and large distances between ridge and eaves (> 8 m) require additional rain protection measures, such as the use of a counter batten made of moisture-resistant materials or raising the counter batten.

Increased demands on roofing membranes

In contrast to tiled roofs, in BIPV roofs significantly higher temperatures can occur behind the modules in the roof area. Therefore, foils with increased temperature resistance (80°C) should be used for the rainproof or waterproof design of the subroof.

Technical support

For technical support, please contact: pv@ernstschweizer.ch