

priedemann
facade lab

ArKol: Development of architecturally well integrated
façade collectors with heat pipes | arkol.de

 Borderstep Institute for
Innovation and Sustainability

IBK2

Institut für
Baukonstruktion
Lehrstuhl 2

FACHVERBAND
DER STÜCKATEURE
FÜR AUSBAU UND FASSADE



DEUTSCHE
AMPHIBOLIN-WERKE
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ARKOL–Thermal Use of Solar Energy

Flexible Façade Collector for Solar Architecture

Supported by:

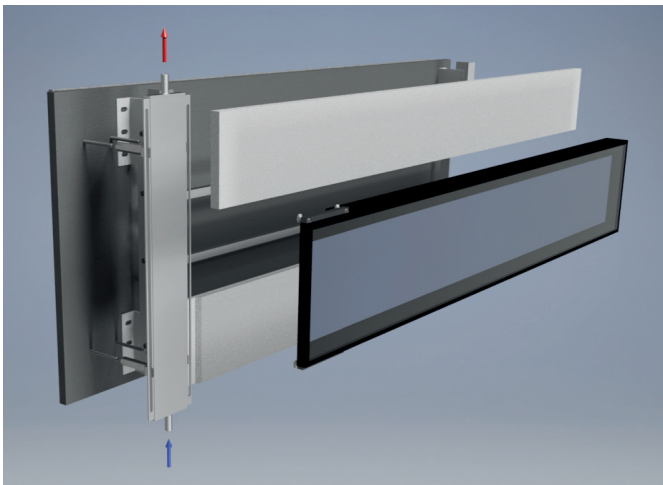


on the basis of a decision
by the German Bundestag

Concept

Partners from research, industry and trade are developing two new concepts for architectural design of solar thermal facades within the "ArKol"¹ project, which is supported by the German Federal Ministry for Economic Affairs and Energy (BMWi). Compared to classic configurations for solar collectors, the "strip collector" concept provides a high degree of flexibility, already in the early design phase, and thus offers an aesthetically attractive and energy-relevant element for sustainable building. This is achieved by a slim collector configuration in the form of a strip, which can be constructed in different lengths as required by the design and can be positioned at the desired height on the sub-structure, so that the zones between individual collector strips can be filled with conventional façade cladding materials of any height.

This is technically feasible because the heat, which the collector generates from solar radiation incident on the solar absorber, is transported laterally by heat pipes and transferred to the main collecting channel via a "dry connection". This means that solar fluid flows only through the collecting channel, whereas the individual collectors do not need any hydraulic connection to the collector channel, but only a purely mechanical one, e.g. by bolts or screws.



Exploded-view drawing of the construction of an individual collector strip

¹ "ArKol – Entwicklung von architektonisch hoch integrierten Fassadenkollektoren mit Heat-Pipes" (FKZ: 0325857A) (ArKol – Development of architecturally well integrated façade collectors with heat pipes)

Demonstration unit

A demonstration unit with five collector strips was developed and produced by the project partners, which allows the new concept to be experienced and the solar-thermal gains to be measured. It serves as the basis for communication with potential users as well as further development and optimisation. During the development process, expertise was contributed by the interdisciplinary consortium ranging from the fundamentals of heat pipes, through collector design, to façade construction. Different application scenarios illustrate design options and energy-relevant features.



Strip collector demonstration unit

Application examples



Residential building scenario



Office scenario



Industrial building scenario