Air-Shade
Responsive sustainable shading system, Vienna, Austria

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Summary by the jury
Cooling as a process is one of the biggest energy consumers in the building sector around the globe. The project Air-shade from Vienna, Austria, addresses this problem by proposing a shading system that is sensitive to solar exposure and powered by air – with no need of any external energy source. Insofar as that it can vary in scale, size, material, and form, the proposed device is applicable to a broad variety of buildings, constructions, façades, roofs, windows, etc. Exposed to solar radiation, the air inside the umbrella-like units heats up and expands, allowing the armature to open. Conversely, when solar radiation diminishes the air cools down and the shutters close.

Appraisal by the jury
The jury commends the exploratory nature of the project and its ingenious approach to problem solving. Particularly appreciated is the simple transfer of a low-technology artifact – in this case, an umbrella – to create a high-technology apparatus to shade buildings. Architectural design is here deployed as a method to investigate new sustainable construction techniques. Most successful in this exercise are the doubly-curved façades that constantly transform according to the intensity of solar exposure.

Project data

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Further authors
Image 3: Shading as a response: by opening itself, the system enhances cooling of buildings.

Image 4: Solar gain over time: the opening of the shading system and heat elimination.

Image 5: Shading system responds to the immediate local environment: e.g., clouds, vegetation, etc.

Image 6: Initial shading unit construction in open and closed position.

Image 7: The functioning prototype with 1m² shading area and one of the possible shading textiles.

Image 8: Air container with a thermomanometer tracks the changes in temperature and pressure.

Image 9: Detail of the functioning prototype in an open position, without the shading textile.

Image 10: Prototype detail in closed position without the shading textile and air container in front.