

Air-Retaining Grids

A biomimetic air-retaining Salvinia surface

Invention

The present invention "Air-Retaining Grids Technology" describes a new possibility for the architecture and construction of surfaces which are able to keep a layer of gas stable even under changing pressure conditions when immersed in liquid. Structured, non-wettable surfaces are used for various applications, for example as self-cleaning surfaces. The surfaces of the grid structures are liquid-repellent and in particular both hydrophobic and oleophobic. Basic principle of the Air-Retaining Grids Technology: A grid structure (black) is fixed at a defined distance from the surface by spacers (gray). The grid must be intrinsically hydrophobic or chemically hydrophobic. This prevents water from penetrating through the grid and traps a layer of air between the grid and the surface.

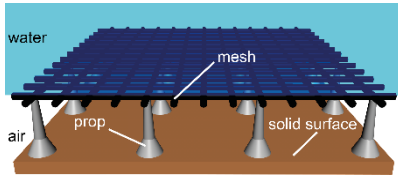


Fig. 1: Basic principle of the Air-Retaining Grids Technology. A grid structure (black) is fixed at a defined distance from the surface



Fig. 2: Salvinia Anchor Cells : Barthlott, Schulte, Roden (2011)

emissions per year, which means a reduction of about 0.5% of global CO₂ emissions. Application in sensor technology as a sensor for flow or pressure is also conceivable.

Current Status

A patent application for the invention has been filed. We would be happy to inform you about the status of the proceedings. The functionality was proven in experiments. On behalf of the University of Bonn, PROvendis offers licenses to interested companies for the invention and the patent application.

Relevant Publications

1) The Salvinia Paradox: Superhydrophobic Surfaces with Hydrophilic Pins for Air Retention Under Water. *Advanced Materials* 22 (21), 2325-2328. W. Barthlott, T. Schimmel, S. Wiersch, K. Koch, M. Brede, M. Barczewski, S. Walheim, A. Weis, A. Kaltenmeier, A. Leder and H. F. Bohn (2010).

An invention of the University of Bonn.

Competitive Advantages

- Environmentally friendly
- Reduction of CO₂ emissions
- Stable against mechanical influences
- Inexpensive and simple production
- Versatile in use

Technology Readiness Level

1 2 3 4 5 6 7 8 9

Experimental proof of concept

Industries

- Environmental technology/ environmental protection
- Industrial supplies (pipelines)
- Boat & marine technology
- Hydraulic systems
- Antifouling

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