

// AIR-RETAINING-GRIDS

Ref-Nr: TA-4541

HINTERGRUND

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.

LÖSUNG

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.



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ENTWICKLUNGSSTAND

Funktionsnachweis

PATENTSITUATION

CN anhängig
EP anhängig
US anhängig
JP anhängig
KR anhängig

CATEGORIES

//Chemie //Material- und
Werkstofftechnik //Smart Materials

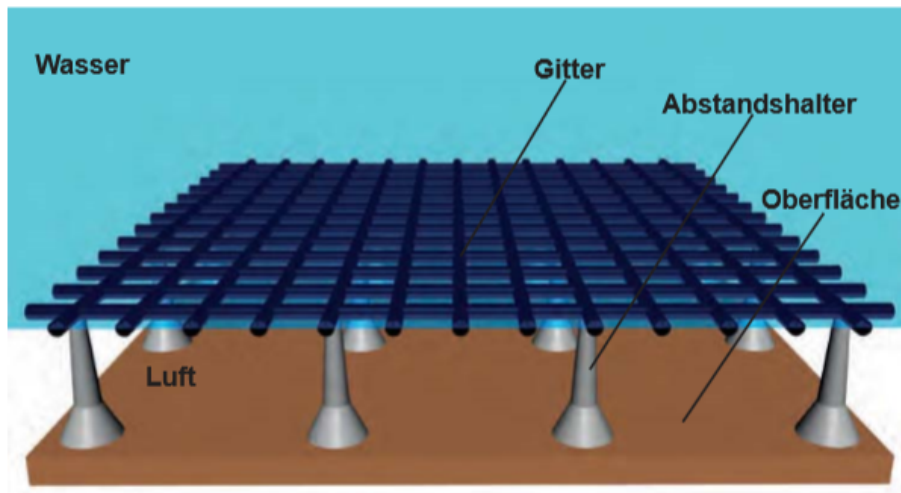


Fig.1: Basic principle of the Air-Retaining Grids Technology. A grid structure (black) is fixed at a defined distance from the surface by spacers (gray).

VORTEILE

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

ANWENDUNGSBEREICHE

The Air-Retaining Grids Technology is ideally suited for a large-scale implementation of bionic air-retaining surfaces. There is great potential in the production of low-friction ship coatings, where structures are permanently submerged in liquids or water. The grids can be used to achieve stable air retention. A reduction of air resistance in ships would save up to 32.5 million metric tons of fuel and 130 million metric tons of CO₂ 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.

SERVICE

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.

PUBLIKATIONEN & VERWEISE

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).
