

Superhydrophobic Coatings

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Technology Summary

New coatings exhibiting superhydrophobic properties have been developed by ORNL researchers. The portfolio of inventions uses a variety of materials to produce a coating which creates a liquid contact angle very close to the theoretical limit of 180 degrees. The result is a coating which causes liquids to “bead up” on the surface of a material. This action prevents fouling and facilitates the removal of any dirt or other surface contaminants.

The inventions offer three main kinds of superhydrophobic coatings. The application of each coating system results in a surface with superhydrophobic properties, but each one may be better suited to different types of applications.

Advantages

- Low cost
- Ease of manufacture
- Anti-fouling characteristics

Potential Applications

- Marine anti-fouling
- Water piping
- Self-cleaning solar panels
- Waterproofing fabrics

Patents

Brian R. D'Urson and John T. Simpson, *Composite, Ordered Material Having Sharp Surface Features*, U.S. Patent 7,150,904, issued December 19, 2006.

Brian R. D'Urso and John T. Simpson, *Composite Nanostructured Super-Hydrophobic Material*, U.S. Patent 7,258,731, issued August 21, 2007.

Brian R. D'Urso and John T. Simpson, *Method for Producing Microchannels in Drawn Material*, U.S. Patent 7,638,182, issued December 29, 2009

Brian R. D'Urso and John T. Simpson, *Multi-Tipped Optical Component*, U.S. Patent 7,697,807, issued April 13, 2010; U.S. Patent 7,697,808 issued April 13, 2010.

John T. Simpson, Craig A. Blue, and James O. Kiggans, *Article Coated with Flash Bonded Superhydrophobic Particles*, U.S. Patent 7,754,279, issued July 13, 2010.

Other patents in preparation.

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