

CLEARING THE FOG



A lotus flower seen through nano-coated glass

If only someone could find a way to keep that annoying fog off mirrors in the bathroom on a more permanent basis. Michael Rabner, a materials scientist at MIT, just might have figured out how to clear the fog from glass surfaces. He found his inspiration in the beautiful lotus plant. It turns out that lotus leaves repel water so well that when raindrops hit the leaf, the drops remain spherical. He began exploring the possibility of trying to make a coating that did the same thing. Fogging occurs when water drops from the air condense on a cool surface. The drops scatter light, creating the fogging.

The majority of antifogging sprays are polymers that flatten the drops so they do not scatter light. Unfortunately, they wear off the surface quickly. Rubner and his colleagues found a nanocoating (a very thin coating) that had the opposite effect of the lotus leaf. Their coating is extremely water loving, or superhydrophilic. It is composed of tiny, hydrophilic glass particles that are packed together very irregularly. This leaves tiny pockets between the particles that can fill with water, spreading the droplets into a film that doesn't scatter light.

An additional bonus of the glass and air coating is that it prevents glare. Nearly 100% of light travels through this nanocoat, compared

to 92% on untreated glass. The coating is made from 7-nanometer layers of polymer alternating with layers of glass particles. The layers are constructed so that the glass particles don't pack together well, producing a Swiss cheese structure.

To increase the durability of the coating, it is heated to 500 °C to fuse the glass particles and disintegrate the polymer. This makes the coating scratch-resistant and also makes the anti-fog property last for more than a year.

Leggi attentamente il testo e rispondi alle domande che seguono.

- A** Which plant inspired Michael Rabner's discovery? Why?
- B** How is this discovery an example of applied scientific method?