



# CommunicationsDirect

A free news and information service sponsored by PricewaterhouseCoopers for global communications professionals.

Search

<a href="#">Channels</a>	<a href="#">Newsletter</a>	<a href="#">Industry links</a>	<a href="#">Site map</a>	<a href="#">About us</a>	<a href="#">PwC Global</a>	<a href="#">RSS</a>
--------------------------	----------------------------	--------------------------------	--------------------------	--------------------------	----------------------------	---------------------

- [Mobile](#)
- [Wireline](#)
- [Internet & Data](#)
- [Business & Management](#)
- [Policy & Regulations](#)
- [Networks & Operation](#)
- [Hardware, Software & Technology](#)

## Hardware, Software & Technology



### Moth Eyes Inspire Non-Reflective Phone Displays

May 24, 2010

A newnanocoating technique aims to create a perfectly non-reflecting view on phonedisplays. The material is applied to the phone's polymer parts duringmanufacture, eliminating the need for a costly separate process step andresulting in non-reflective components that are also scratch resistant and easyto clean.

Moths arethe new technology's prototype. As moths search for food at dusk, they hidefrom predators by muting reflections on their faceted eyes. While eyes shimmeron many other kinds of insects, moth's eyes are perfectly non-reflecting. Tinyprotuberances smaller than a wavelength of light form a periodic structure onthe eye's surface. This nanostructure creates a gentle transition between therefractive indices of the air and the cornea. As a result, light reflection isreduced and the moth remains undetected.

Researchscientists at the Fraunhofer Institute for Mechanics of Materials (IMM) in Freiburg, Germany,have adapted the moth's clever eye disguise use on display coatings. On mobilephone displays, transparent surfaces are only useful if they allow viewingwithout reflecting light back. While conventional methods apply theanti-reflective coating in a separate step after production, the Fraunhoferscientists have found a way of reducing light reflection during the actualmanufacturing of the part or component: "We have modified conventionalinjection molding in such a way that the desired nanostructure is imparted tothe surface during the process," says Frank Burmeister, an IMM projectmanager.

To achievedisplay non-reflectivity, the researchers developed a hard material coatingthat reproduces the moths' optically effective surface structure. "We usesthis [material] to coat the molding tools," Burmeister says. "Whenthe viscous polymer melt is injected into the mold, the nanostructures are transferredirectly to the component." Because no second process step is required,manufacturers that adopt the process are likely to achieve a significant costsaving along with enhanced production efficiency.

Whileplexiglas and most standard anti-reflective coatings are particularly sensitiveto smudges and marks, the IMM scientists are producing wipe-resistant andscratch-proof surfaces. To achieve these properties, an injection mold isflooded with an ultra-thin organic substance composed of polyurethane."The substance runs into every crevice and hardens, like a two-componentadhesive," Burmeister says. The result is an extremely thin nanocoating ofpolyurethane on which the optically effective surface structures, which arejust one ten-thousandth of a millimeter thick, are also reproduced.

Working incooperation with several industrial partners, the research scientists now aimto develop components for the auto industry, such as windshields and instrumentdisplay covers that are hardwearing and easy to clean.

Copyright 2010 PricewaterhouseCoopers. PricewaterhouseCoopers refers to the network of member firms of PricewaterhouseCoopers International Limited, each of which is a separate and independent legal entity. All rights reserved. The preceding article was written by John Edwards, a freelance technology writer based in Gilbert, Arizona. He can be reached by phone at +1-480-854-0011.

[Print](#)

Including articles on:

**IFRIC 13:**  
Customer loyalty programmes

[Free registration](#)

[Free personalized newsletter subscription](#)

[Edit your profile](#)

- [LinkedIn](#)
- [Facebook](#)
- [Mixx](#)
- [Digg](#)
- [Yahoo Buzz](#)

© 2010 PricewaterhouseCoopers. All rights reserved. PricewaterhouseCoopers refers to the network of member firms of PricewaterhouseCoopers International Limited, each of which is a separate and independent legal entity. Web site developed by ICF International.

[Legal and Privacy Notices](#)    [About Site Provider](#)