New conductive coatings for flexible touchscreens

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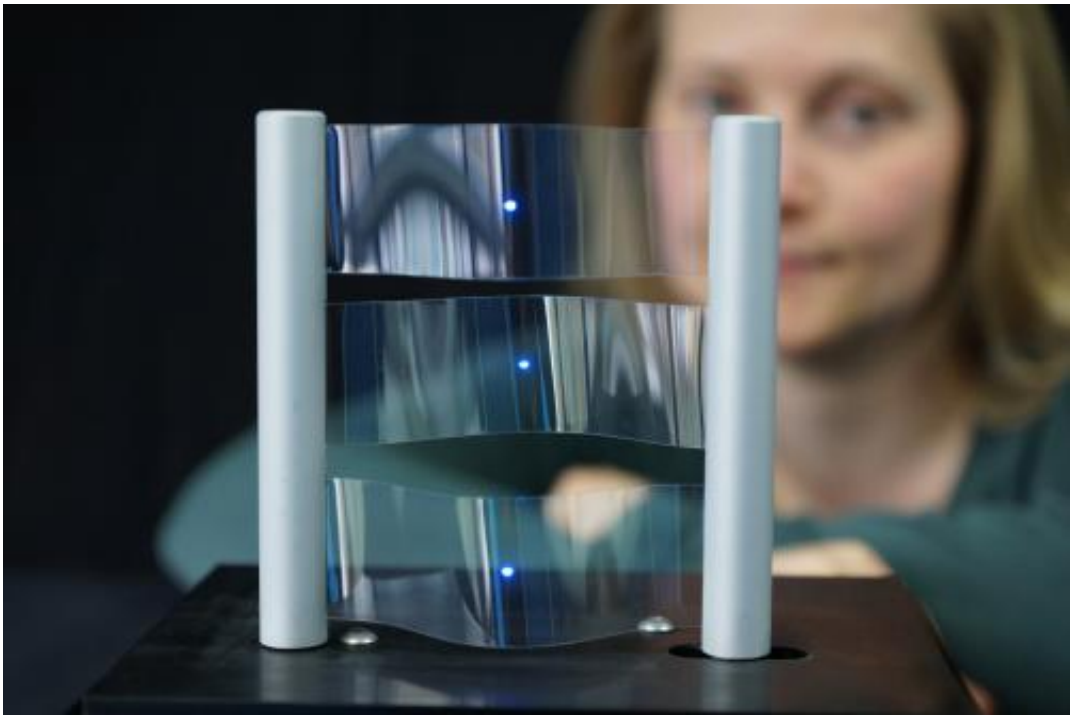

Transparent conductive coatings; Credit: INM

Mobile phones and smart phones still haven't been adapted to the carrying habits of their users. That much is clear to anyone who has tried sitting down with a mobile phone in their back pocket: the displays of the innumerable phones and pods are rigid and do not yield to the anatomical forms adopted by the people carrying them. By now it is no longer any secret that the big players in the industry are working on

flexible displays. Properties that suitable coatings offer in this respect will be demonstrated by the developments of the INM – Leibniz-Institute for New Materials on show nano tech 2015, Tokio, Japan.

For the nanoparticle inks, the researchers are using what are known as TCOs, or transparent conducting oxides. "We use the TCOs to produce nanoparticles with special properties", says Peter William de Oliveira, Head of the Optical Materials Program Division, "the TCO ink is then created by adding a solvent and a special binder to these TCO particles". The binder performs several tasks here: it not only makes the TCO nanoparticles adhere well on the film; it also increases the flexibility of the TCO coating: in this way, the conductivity is maintained even when the films are bent. The ink can then be applied to the film directly by gravure printing using a printing plate. After curing under UV light at 150°C, the coating is ready.

The transparent electronic inks allow conductor tracks to be produced unproblematically even on a large-scale by means of the classic reel-to-reel process. Initial trials at INM have been promising. The researchers all agree that the use of structured rollers will in the future allow even large, structured conductive surfaces to be printed with a high throughput at low cost. Conductive coatings with TCOs are usually applied by means of high vacuum techniques. The method known as sputtering, however, is very expensive.

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