Expert series: Top Security and Full-Screen Display Without the High Price Tag? New Technology Makes It Possible

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Today, a phone provides more than just connection. It's a digital device that helps you run your entire life. Perhaps this has never been more evident than during the current COVID-19 crisis, which has closed countless businesses and kept millions of people at home. A phone is now a lifeline for work and personal use.

Chances are it's the first thing you look at when you wake. From texts to emails, it's how you communicate. How you stay connected to your loved ones. You use it to bank, make appointments and manage your calendars. One minute you might capture the perfect image of your children and the next you're checking your investments after market fluctuation alerts, all from the palm of your hand.

All this use also means there has never been more private personal information linked to our phones. Security becomes just as important as functionality, because a mobile device is a big target for criminals.

OLED vs. LCD displays

Historically, the smartphones with the best security and the highest screen quality have come at a premium price. OLED (organic light emitting diode) displays provide crystal-clear images in full screens that go edge to edge. As for safety, biometric sensor security allows for fingerprint recognition or facial recognition from the front screen, personalized to the individual. This makes it incredibly difficult to break into a phone should it be lost or stolen.

These phones cost upwards of — and sometimes over — $1,000.

Alternatively, phones with LCD displays are easier to manufacture and cost less to produce. Therefore, they are much more affordable and much more common — both in the United States and definitely around the world.

LCD smartphones are good but have historically been limited. There typically isn't an edge-to-edge full screen. Security measures usually involve typing in a password or number. And if included, biometric fingerprint sensors must be housed in a home button, on the side or the back of the phone.

New technology to change LCD possibilities

What if you could get the high-quality of an OLED display, including an under-screen front-screen biometric fingerprint sensor, with an LCD display and without sacrificing price or energy efficiency?

That's exactly what 3M is doing with the new 3M™ Near Infrared Transmission System (NITS). Thanks to specially developed films, LCD screens are being enhanced in ways that were previously impossible. What's more, these enhancements are affordable both for the manufacturer and the consumer.

How does it work? 3M’s new backlight optical film system allows infrared optical sensors in the back of the phone to image fingerprints through the backlight and LCD panel. This technology is new to the world and has numerous noteworthy benefits:

Screen quality

The visual quality of the display will match what people are accustomed to with OLEDs. With this new technology, LCDs can be edge-to-edge for a full-screen display with a brightness and vivid color typically associated with more expensive phones.

Security

According to third-party verified global data collected by 3M, the main activities completed with fingerprint sensors include: locking and unlocking phones (69%), logging into apps (39%), using payment apps (37%), and authorizing online purchases (29%).

The 3M NITS film stack works within the phone to allow for enhanced biometric security. That means eliminating the pain of having to remember a password and the risk of someone hacking into your key pattern. Instead, individualized fingerprint reading can be found inside of the phone's beautiful display, which offers convenience in addition to security.

Convenience

Globally, in-screen is the preferred fingerprint sensor location, according to the research. With the new 3M NITS technology, this is now available without compromising the LCD display. Preference of fingerprint sensor location is typically driven by ease of use, or familiarity based on the system of their current phone. Those who prefer in-screen sensors see them as innovative, trendy, convenient and out of the way of phone cases and other buttons.

Sustainability

Implementing this system into LCD phones doesn't require any additional charging by the user. That means you get the same battery life as before, so you can set energy consumption worries aside.

The future is bright

3M materials have been inside displays since thin, LCD computers and TVs first came on the market. We know a lot about optics and we keep learning. It's exciting to see the new 3M NITS sensing technology come to life, allowing for front-enabled biometric security and a bigger screen on LCD smartphones, all at a lower cost compared to OLEDs.

Keep in mind, in some countries around the world, OLED displays aren't even available. In others, they may be available but are out of reach for the majority of people due to the price tag . Doesn't everyone deserve a great phone with top-of-the-line security? We believe they do.

What's more, this is only the start of the potential positive impact this technology could have. Biometric security on LCDs for fingerprint, facial or gesture recognition could transform daily life, allowing us to get rid of keys, wallets, garage door openers and more, so we have less waste with more convenience and efficiency. The future is full of possibilities. Visit engage.3M.com/nits to learn more.