Knowledge Transfer Office
香港城市大學
City University of Hong Kong

A Bi-layer Liquid Optical Clear Adhesive to Improve the Strength of Screens in Smartphones

Manufacturing

- Consumer Electronics
- Robotics
- Testing Instruments
- Others

Opportunity

Large screen smart phones and tablets ownership has proliferated in recent years (in 2018, over 2.6 billion smartphones worldwide are sold of which a good numbers are with big screens), yet over 50% to 55% smart phone/tablet repairs are caused by broken screen like cracking and shattering. Current way of strengthening the screen glass is by coating a strengthening chemical layer behind the glass, but the resulting glass needed to be cut to fit the form factor of the phone/tablet, often creating micro cracks. These micro cracks can induce further cracks or shattering later. This invention introduces a bi-layer liquid optical clear adhesive which not only provides better strength, it also alleviates the cutting process to fit various screen sizes, thus avoiding the micro crack problem.

IP Status
Patent granted

Technology Readiness Level (TRL) 3

Inventor(s)
Prof. NIU Xinrui
Mr. XU Bo
Enquiry: kto@cityu.edu.hk

Technology

The invention is a bi-layer liquid optical clear adhesive. Firstly a low modulus adhesive is applied to the phone-body and cured as the first layer of bi-layer adhesive structure. Then the low modulus liquid optical clear adhesive is mixed with ceramic fillers to increase the modulus yet maintaining good optical properties. After degassing, the mixture adhesive with higher modulus is deposited on the top of the first layer of bi-layer adhesive and covered by touch screen glass. The resulting coating can greatly decrease the stress concentration in the subsurface of the touch screen glass and resist the crack growth in it.

Advantages

- The bilayer coating increases the strength of the touch glass by 30% and will resist cracking and shattering. It will not introduce micro crack during the manufacturing process

Applications

- Protect large display screen on smart phones, tablets and similar portable/wearable devices from cracking and shattering easily
- Same protection will apply to flexible devices and soft robotics