Adoption of direct bonding on the rise in tablet or larger applications

Filling air gap via direct bonding can help enhance the overall performance of a display significantly. Direct bonding not only improves the general optical performance with lower reflectivity, but also boosts durability and reduces the thickness. However, while the industry is well aware of such advantages, it would be challenging to persuade consumers to understand them. In other words, the marketing effect is relatively weak against the money and efforts invested.

Direct bonding costs more than the air gap solution. Bonding the cover glass to a touch panel and a liquid crystal display (LCD) or organic light-emitting diode (OLED) display requires additional material and process costs for adhesives. With the widespread use of direct bonding over the past two to three years, its yield rate has improved, but overall, it remains in the 90% range, still requiring additional process, material, and labor costs associated with rework.

Meanwhile, the application of direct bonding is no longer limited to high-end products. Direct bonding is now applied to mid- to-low cost smartphones, and the yield rate for smartphones has reached a relatively high level, resulting in a drop in extra costs. In addition, direct bonding helps make smartphones slimmer. Following suit of smartphones, the use of direct bonding is expected to increase across tablet and notebook PCs. Apple Inc. already applied direct bonding to the newly launched 9.7-inch iPad Air 2.

The adhesive market for touch panels including optically clear adhesive (OCA) and optically clear resin (OCR) is on the rise. However, a decline in the number of touch panel layers is negative to OCA. An increase in demand for touch panels with many laminated layers such as the GFF type would be welcome news for the OCA market, but the GFF is losing its ground to the GF1 type. Furthermore, GF2, LCD in-cell, LCD on-cell, and AMOLED on-cell touch types are expanding their market share. These touch panel structures with a lesser number of layers than GFF have advantages in making a thinner and cheaper product, and therefore are promising to consumers or brands. In contrast, demand for OCR and the market are expected to grow steadily.
Lead Analyst

Duke Yi - Director, Display Material & Components

With more than 10 years of industry experience, Duke Yi is leading a display parts and materials research team at IHS Technology. His team researches on display parts, chemical materials, and the touch panel industry, and has published more than 30 different kinds of reports.

Duke joined IHS in 2000 and has conducted researches on the touch industry and backlight unit industry. He has also conducted various projects with display leading companies and government agencies. He was invited to a number of conferences as a speaker.

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