P-31

Evaluation of Mechanical Properties of Barrier ribs for PDP Using Nano-Indentation Techniques

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For the rib materials in PDP(plasma display panel), an effective method to improve the mechanical properties is to form a composite material by reinforcing a glass matrix with a rigid filler, alumina powder. In this study, several types of ribs with different volume percent of fillers were tested for hardness, Young's modulus with the Berkovich indentation and pseudo-compressive strength properties with a flat punch indentation. Optical microscopic analyzer and EDX analysis were used for measuring the filler content on the composite. As a result based on the Berkovich tip, a crack appeared around at the load of 1345mN for the dense type of rib while porous one endured until 2400mN without a crack formation. Young modulus and hardness decreased at the range: 90~65GPa, 9-4GPa, respectively as a function of indent load. The results may suggest that the application of nano-indenter would pave the way for testing mechanical properties of ribs.