

# Flexible Thin Film Encapsulation and Planarization Effect by Low Temperature Flowable Oxide Process

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Flexible Organic Light Emitting Diode (OLED) displays are required for future devices. It is possible that plastic substrates are instead of glass substrates. But the plastic substrates are permeable to moisture and oxygen. This weak point can cause the degradation of fabricated flexible devices; therefore, encapsulation process for flexible substrate is needed to protect organic devices from moisture and oxygen. Y.G. Lee et al.(2009) [1] reported organic and inorganic multilayer structure as an encapsulation barrier for enhanced reliability and life-time. Flowable Oxide process is a low-temperature process which shows the excellent gap-fill characteristics and high deposition rate. Besides, planarization is expected by covering dust smoothly on the substrate surface. So, in this research, Bi-layer structured is used for encapsulation: Flowable Oxide Thin film by PECVD process and Al<sub>2</sub>O<sub>3</sub> thin film by ALD process. The samples were analyzed by water vapor transmission rate (WVTR) using the Calcium test and film cross section images were obtained by FE-SEM.

**Keywords:** Encapsulation, Flowable oxide