

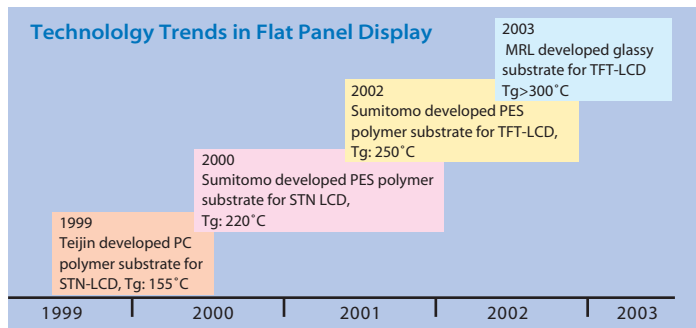
## Nano Glass-like Hybrid Substrates For Active Matrix Displays 主動式平面顯示器用奈米類玻璃基板材料技術開發

Nano organic/inorganic hybrid composites are formed through nano dispersion of high thermal resistance, low coefficient of thermal expansion (CTE) nano organic powders within the polymer matrix, resulting in improved thermal resistance and dimensional stability. High transparency can be achieved through the control of nanoparticle sizes. These nano hybrid composites are crucial substrate materials for next generation active matrix flat panel displays. Year 2003 target is to bring the glass transition temperature of these glass-like substrates to above 300°C (presently over 280°C).

本計畫將奈米級高耐熱、低膨脹性之無機氧化物粉體分散於有機高分子中，以改善材料之耐熱性與尺寸安定性，並藉由奈米粒子尺寸控制達到高透明度，可作為新世代主動式平面顯示器基板之應用，2003年的目標是使上述類玻璃基板的玻璃軟化溫度達300°C以上（目前已達到280°C）。

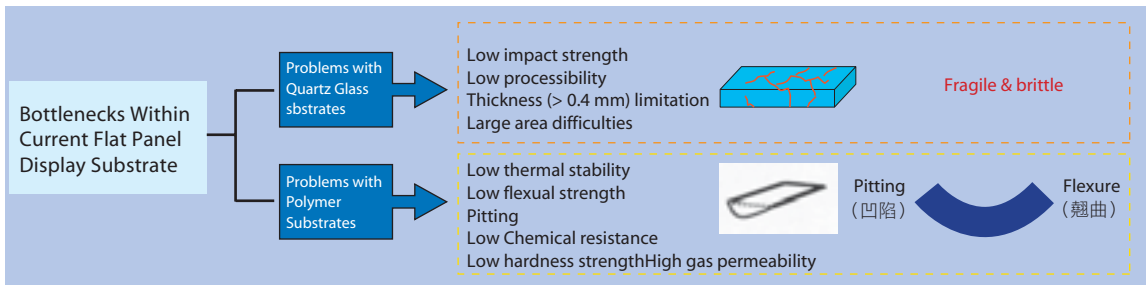
### Performance targets

	Unit	Test Methods	Glass-Like
Thickness	um		<200
Total Light Transmission	%	ASTM D1003	>90
Coefficient of Linear Expansion	ppm/°C (RT-300°C)	by TMA	<20
Glass Transition	°C		>300
Roughness	nm	by AFM	<10



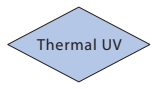
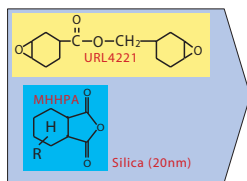
Challenges in TFT Processing Parameters on Plastic Substrate Materials  
(TFT製程對塑膠基材特性需求)

Glass substrates are fragile, difficulties in thickness reduction and in large area fabrication, while polymer substrate is low heat resistance, low dimensional instability, low impact strength and high gas permeability



Organic/Inorganic Nano Hybrid Epoxy  
(奈米類玻璃基板配方開發現況)

The Low Surface Roughness Nano glass-like substrate Coating Process  
(高平坦度之奈米類玻璃基板塗佈製程開發)



### A. Curtain Coating



Nano Hybrid Substrate

### B. Fusion Overflow

