

AMLCD Substrates - P. Bocko (Corning Incorporated)

The display industry is poised for a dramatic technology displacement as the availability of HDTV and digital programming drive new display technologies into the TV application dominated from its inception by the CRT. An analogous trend, stimulated by the accelerating need for display of increasingly complex information in computer applications is now in the advanced stages as the active matrix liquid crystal display (AMLCD) has become the leading monitor technology. At the same time, the availability of ubiquitous bandwidth via wireless technologies will stimulate the emergence of a variety of high-performance portable display devices. AMLCD substrates, highly engineered non-alkali aluminosilicate compositions, have evolved to meet demanding extrinsic and intrinsic requirements that deliver improvements in display manufacturing cost (via larger substrates and high yield processes) as well as performance. Increasing substrate size has been the most dramatic trend; it is expected that the dimension may eventually exceed 3 meters on a side, that is, over three orders of magnitude greater than the substrate thickness. Other substrate process and application performance factors arise from the glass elastic, viscoelastic and chemical properties. Viscoelastic properties are especially key for polysilicon applications, the technology of choice for portable applications. The role of the AMLCD substrate as an enabler for the display revolution is discussed from the perspective of fundamental glass properties and manufacturing innovation.