Micromirror arrays are a very strong candidate for future energy saving applications. Within this work, the fabrication process for these micro mirror arrays was optimized and some steps for the large area fabrication of micro mirror modules were performed. At first the surface roughness of the insulation layer of SiO2 was investigated. This SiO2 thin layer was deposited on silicon, glass and Polyethylene Naphthalate (PEN) substrates by using PECVD, PVD and IBSD techniques. The surface roughness was measured by Stylus Profilometry and Atomic Force Microscopy (AFM). It was found that the layer which was deposited by IBSD has got the minimum surface roughness value and the layer which was deposited by PECVD process has the highest surface roughness value. During the same investigation, it was found that the surface roughness keeps on increasing as the deposition temperature increases in the PECVD process. A new insulation layer system was proposed to minimize the dielectric breakdown effect in insulation layer for micromirror arrays. The conventional bilayer system was replaced by five-layer system but the total thickness of insulation layer remains the same. It was found that during the actuation of micromirror arrays structure, the dielectric breakdown effect was reduced to approx. 50% as compared to the bilayer system. In a second step the fabrication process of the micromirror arrays were successfully adapted and transferred from glass substrates to the flexible PEN substrates. In the last section, a large module of micromirror arrays was fabricated by electrically interconnecting four 10cm×10cm micromirror modules on a glass pane.