



INNOVATIVE TECHNOLOGY FOR MANUFACTURING OF A PANE OF PLASTIC WITH FUNCTIONAL INTEGRATION

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Goal of this research project is the development of a technology for manufacturing a 3-dimensional pane of plastic with an electrochromic system. This electrochromic system can control optical transmission and consists of the following layers. A plastic plate or film (i.e. PET or PC) with an ITO (Indium-Tin-Oxide) -coating is used as conducting film. A polymer electrolyte is placed between the ion-storage layer and the electrochromic layer (PEDT/PSS). If you apply a potential (+/- 3V) on the conducting layer, you can control the transmitting light through this film.

There are two important challenges for the manufacturing process. The first one is to ensure that all layers in this system are coated with a small tolerance in layer thickness. In this case single layers have a thickness of 100 nm (ion storage layer) to 800 nm (conducting layers). The second point is the forming under thermal influence, like thermoforming or back injection moulding. The conducting layer and the ion-storage layer consist of metal oxides, so a process control to deform these oxides, without changing their characteristics (e.g. electric conductivity) has to be found. Furthermore a possible change of layer thickness during the form process has to be constant. Results of both important challenges will be discussed.