Fraunhofer Institut Angewandte Polymerforschung

Intelligent Materials for Sun Protecting Glazing

Light and heat regulation in glass facades

Transparency and the colour of glazings can be systematically controlled with the help of intelligent synthetic layers. Gels or films from polymer materials we developed can transform from a highly transparent to a milky-white or coloured reflecting state. Switchings between different colours, e.g.from yellow to red, are likewise possible. Over the composition of polymer materials the temperature at which the glazing transforms and the degree of translucency can be controlled. Transparency and/or colour can be controlled in three different ways: in a passive way by solar radiation, in an active way by electrical power as well as in a combination of these two variants (hybride).

This leads to a comfortable reduction of heat radiation through the glass façade and thereby reduces the unwanted heating of rooms. At the same time the light regulation in the rooms can be affected in a positive way.From the outside the glazing on request presents a fascinating play of colours similar to that of the chameleon.

The figures 1 –3 show examples of the temperature controlled colour or respectively translucency conditions when using intelligent synthetic layers.

Figure 1
Transparent yellow-red-violet-switching of a dye containing hydrogel.

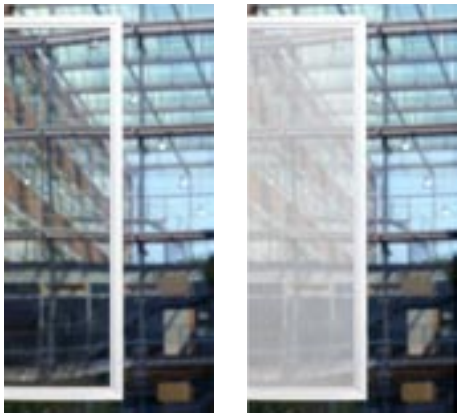

Figure 2
Demonstration window (100 x 50 cm), produced using a translucent gel:at 20 °C (left picture) and at a transformation temperature above 30 °C (right picture).

Figure 3
Two thermotropic windows. The one in the back ground is in the transparent and the one in the front in the translusent state.

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