

New continuous R2R production method of large area electroluminescence systems

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InovisCoat GmbH has developed with Glow-Tec® a completely new large area lighting technology with very uncommon properties for a light source. The unique coating process, evolved by InovisCoat, makes it possible to coat all functional layers at the same time.

The technology is based on an electroluminescence multi-layer-system. Electroluminescence is an optical and electrical phenomenon. A solid emits light connected to an alternate current or electrical field. The voltage input (energy) moves electrons to higher orbitals. On returning to their original state, the electrons emit the previously absorbed energy in the form of light energy. The Fig. 1 illustrates the physical process of luminescence.

Usually electroluminescent devices are produced by screen printing, layer after layer. One functional layer is deposited from the liquid phase after the other using a crosslinking or hardening (curing) step. The size of the printing screen determines the electroluminescent area. Further disadvantages are characteristic graininess and the use of organic solvents.

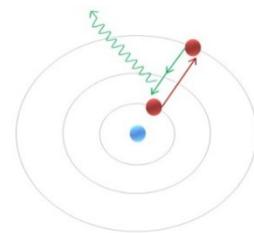


Fig. 1: Luminescence process

InovisCoat has revolutionized this process through its decades of experience in coating and chemistry, thus the creation of Glow-Tec® was a combination of new unique manufacturing processes and new material technology. Contrary to screen printing InovisCoat is using a high precision cascade coater to transfer continuously up to nine different functionalized layers onto a substrate. Plastic films, textiles or papers can act as possible substrates. Water-based solvents are used instead of organic ones. The result is an electroluminescent multi-layer-system with a total thickness of approximately 175 µm. The multilayer coating process by InovisCoat allows the production of large areas (roll-to-roll) in an economical and environmentally sustainable way using flexible substrates.

The Glow-Tec® multi-layer-system is illustrated by the Fig. 2. This system's structure corresponds to a capacitor. The alternate current excites the active luminous layer flowing from the front to the back electrode, thus entire area illuminates in homogenous gentle light. The system is characterized by a low operating voltage of only 30-150 V.

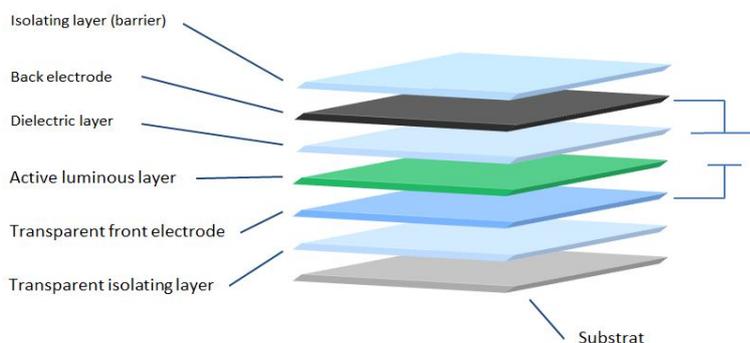


Fig. 2: Glow-Tec® multi-layer system

Glow-Tec® is manufactured in various colours and can be tailored and combined to any product. Flexibility, well compressive capacity and very low weight enable it's integration into many possible markets. Through its flexibility Glow-Tec® is suitable to illuminate flat or shaped surfaces.