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75 years of polyurethane

Interview: M. Lannèr, CEO, Vencorex

CPI Polyurethanes Technical Conference preview

PU flexible foams

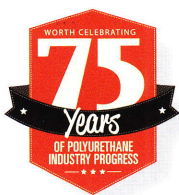
Light stabilisers

POLYURETHANES MAGAZINE INTERNATIONAL



Every Step of the Way

It was 75 years ago that scientists took the first step in polyurethane chemistry and, from that moment on, the industry has moved the world forward with innovations that have made our lives more comfortable, more energy efficient and more fun. Dow Polyurethanes is proud to have been a part of that history and continues to develop innovative solutions that help keep our customers a step ahead of ever-changing industry requirements. Solutions like our VORANOL™ polyols for viscoelastic and high-resilience foam solutions, which help our customers tailor formulations to a desired comfort level... and get a jump on improved product performance.



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Polyurethane at the Engel Symposium

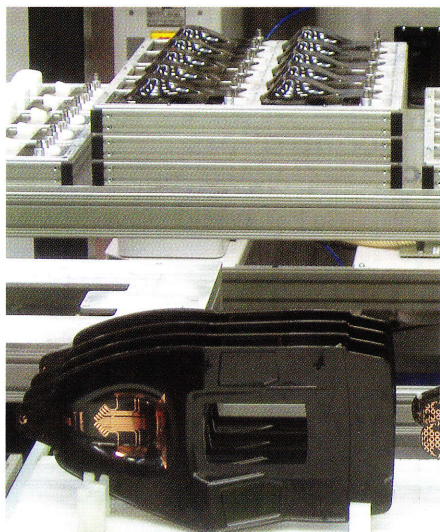
Injection moulding machine producer Engel held its 2012 Symposium in June, with 2,700 visitors attending the two-day event. Aside from presentations in the Design Centre in Linz, there were 18 live machine demonstrations at the company's large machine plant in Sankt Valentin, of which two involved use of polyurethane technology.

One of these demonstrations was moulding of a high gloss piano black surface, an example demonstrated by Engel at Fakuma 2011. It involved back-moulding in a **Clearmelt** production cell of a capacitive foil from **Plastic Electronic** onto a ABS-PC carrier in one half of a two-component rotating index platen mould from **Schöfer** to form a three-dimension moulded interconnection device (3D-MID). The outer surface was then flooded with **Hennecke's ClearRIM** equipment of the carrier's outer surface with **Bayer MaterialScience** transparent polyurethane in the second mould half to provide a high gloss surface with a deep 3D impression on Plastic Electronics' finished "Touchskin" technology part.

As at Fakuma 2011, a **Duo 2050/350 pico** was used in Sankt Valentin for the demonstration, equipped with **Engel Viper 20** and **40** linear robots. Overall cycle time was 110 s.

Automotive supplier **Magna Exterior & Interior Systems** supported design of the Touchskin black central console (stack) dem-

High gloss PU-flooded centre stack mouldings (background), with a view of integrated back-moulded capacitive circuitry (foreground)



onstration part. Engel stated at both Fakuma 2011 and again at its 2012 Symposium that it illustrates how "a cockpit of the future without buttons and switches will be just as elegant as smartphone controls."

Having first shown its **Mold'n Seal** process at the **Arburg** Technology Days open house in March 2011 with a PP housing, **Sonderhoff** showed the same type of FIPFG (Formed In-Place Foam Gasketing) process again at the 2012 Engel Symposium, this time with a different example – a polycarbonate industrial lighting housing from Austrian lighting equipment specialist **Zumtobel Lighting**, for use in wet and humid environments on account of sealing to the IP65 industrial protection level.

The polycarbonate housing was first moulded using a **Victory 1350/300 Tech Eco-drive** tiebarless machine in a single cavity Zumtobel mould. It was then removed from the mould with an **Stäubli-based Engel easix** multi-axial handling robot, which laid down the part for partial cooling and also picked it up later, passing it through an ionisation station and placing it under the mixing head of the **Sonderhoff** low pressure **DM 402** mixing and dosing equipment. The robot moved the part under the **MK 600** mixing head for it to apply the two-component polyurethane to the 4 cm deep and 4 mm narrow sealing groove, with operation of the robot equipment integrated with the moulding machine's control system.

Overall cycle time was 55 s, within which 25 s was used for application of the **Fermapor K31** two-component polyurethane bead at a rate of 0.45 g/s to the still warm (around 50 °C) moulding, an approach also used in the 2011 demonstration to accelerate sealant cure. A partial cooling phase beforehand was not needed in the 2011

demonstration, as it involved a PP compound coming out of the mould at a lower temperature than applied with polycarbonate at the 2012 Engel Symposium demonstration.

Sonderhoff Holding Marketing Director **Peter Fischer** told PU Magazine "We could have naturally applied the bead faster, but then the waiting time in the mixing head would have been much longer. As we had to adapt to the overall cycle time and the time needed for both moulding and handling were fixed, we decided to take time in application of the seal material. The highlight and trick of the process lies however in the ability of the mixing head to wait 30 seconds with reactive material and despite that, to have ready seals in the part that have cured so much after a further 120 seconds that they can then be already touched."

Based on the 55 s cycle time, the production cell can make 523 of the lighting housings complete with the polyurethane seal in an 8 h shift and Fischer stated that there is no need to stop the line during this period for rinsing the mixing head. The production cell achieved its high productivity within the small 24 m² footprint of the injection moulding machine, due to use of just one multi-axial robot to assist both moulding and sealing operations.

Very small footprint with Sonderhoff Mold'n Seal: In-line processing of injection moulded light fixture housings with direct application of a PU foam gasket

