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Mold'n Seal from Sonderhoff at the Engel Symposium 2012



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▶ Processing Equipments - Production

At this year's Engel Symposium which was held 13-14 June 2012 at the Engel Austria facilities in St. Valentin, under the motto "close to the customer. open to innovation, the Engel system partner – the Sonderhoff group of companies – presented the integrated process solution Mold'n Seal to the symposium participants.

In collaboration with Engel, Sonderhoff presented Mold'n Seal, an integration solution, which in terms of efficiency and product quality combines the two previously separate processes of injection moulding and foam gasketing. Thus pre-produced injection moulded parts and expensive intermediate storage can be dispensed with. On an Engel victory 1350/300 tech series hydraulic injection moulding machine, housings for moisture-proof luminaires from Zumtobel Lighting were injected and then provided with a polyurethane sealing bead immediately thereafter. Very short curing times of two to three minutes for the gasketing material from Sonderhoff Chemicals enable faster further processing of the components and thus greater time savings for the entire manufacturing cycle. In addition, Mold'n Seal also saves costs and space. Investment and personnel costs can be reduced thanks to the high level of integration. Instead of the two robots previously required, with the Mold'n Seal process only one robot is required for the parts handling of both procedures injection moulding and foam gasketing. This results in a significantly reduced space requirement of just 24 m<sup>2</sup>, – much less than the space required for the previous manufacturing concept.

### **Foam gasketing within the injection moulding cycle**

In the injection moulding process, the application of foam gaskets is determined by the injection moulding cycle, the cycle time. Within 55 s per injection moulding cycle, in an eight hour shift, without interruption a total of 523 luminaire housings could be injection moulded, removed from the mould, foamed, and placed on a discharge belt for curing and further processing. In this specific application case the Mold'n Seal process was appropriately adapted to the injection moulded part as follows: The housing of the moisture-proof luminaires is taken out of the injection moulding system by an Engel easix robot and placed in a waiting and cooling position. Then the robot arm grasps an already cooled component, guides it past an ionizing station to the MK 600 mixing head of the Sonderhoff mixing and dosing system, and positions the groove of the luminaire housing directly below the mixing head dosing needle. The multi-axis robot is programmed so that it moves the mixing head, accurately tracking the groove contour of the component; the dosing needle of the MK 600 precisely applies the gasketing material on the base of the groove which is only a few millimetres thick. The output rate of the mixing head is only 0.45 g/s. After placement on the discharge belt the injection moulded part cools and the foam gasket hardens within two to three minutes. Thus, further processing is possible after just a short time. The specially developed fast reacting, two-component PU gasket material from the Fermapor K31 product line of Sonderhoff Chemicals can bridge a mixing head standby time of 25 s. Within this interim the robot arm takes a new part out of the injection mould, places it in the cooling position, removes a part that has already been placed there, guides it past the ionizing station, and when the part is positioned under the mixing head, starts the sealing application again.

For Sonderhoff, the challenge in developing the Mold'n Seal procedure was formulating a gasket material with which the reaction of the two material components can be adapted to each specified injection moulding cycle, and with which the sealed part can be quickly further processed after a short curing time for the applied gasket of two to three minutes. For the Mold'n Seal procedure, Sonderhoff Chemicals developed new formulations for fast-reacting foam gasket systems, the so called Fast-Cure gaskets from the Fermapor K31 product line that enable in-line processing in the injection moulding cycle. Due to the high reactivity of the gasket material, the Fast-Cure gaskets cure very quickly, and thus the foamed injection moulded parts can also be further processed more quickly. This results in significant time savings for the entire manufacturing process.

### **Efficient, cost-saving manufacturing through process integration**

The Sonderhoff group of companies, as a technology leader in the area of FIP(F)G (Formed In-Place (Foam) Gasketing), analyses the development trends in the various customer segments and converts these trend analyses into product innovations. For example, increasing energy costs have resulted in the fact that in all industrial sectors, companies are constantly considering more efficient and sustainable manufacturing methods. These topics are also highly significant for Sonderhoff customers, the plastic processors and injection moulders, as they have a crucial impact on becoming more competitive internationally. Consequently, Sonderhoff developed the Mold'n Seal procedure – the in-line processing of injection moulded components with subsequent direct application of a polyurethane gasket – to offer the customer a cost-saving and time-saving integration solution with minimal space requirements. The machines used in the Mold'n Seal procedure can be flexibly adapted to the respective manufacturing situation of the customer, the design of the component to be sealed, and to the requirement profile of the sealing product system. Due to the combination of the injection moulding system with the mixing and dosing systems, space, time and energy, and thus costs, can be saved. However, the lower automation effort achieved through process integration not only results in reduced space requirements for production, it also results in savings in investment and personnel costs. The overall result enables higher manufacturing output, at lower cost per unit.