

With Broad Sword and Data Collector

Walther Faltsysteme Combines Three Mold Technologies from the Haidlmair Group

In plastics processing, efficient production methods are required, especially for articles with high volumes and exacting quality requirements, and these must be constantly optimized. The container specialist Walther Faltsysteme has been working together with the Austrian moldmaker Haidlmair for many years, and now, for the first time, two other companies from the Group have come into play in current projects, helping Walther to achieve higher productivity and production efficiency.



Left: products which are manufactured using the technologies of the Haidlmair Group companies. Right: an application example with folding boxes © Walther Faltsysteme

The development of customized reusable transport containers that are precisely tailored to the special requirements of customers is the art of Walther Faltsysteme GmbH: folding containers that are mechanically folded and unfolded in automated warehouses, foldable mega-packs made of lightweight plastic that make heavy wire mesh boxes redundant, flexfold containers made of conductive plastic for the transport of electronic components, inner packaging adapted to the millimeter that protects sensitive goods – the list could go on and on.

The traditional family business from Kevelaer is one of the few companies in its sector to have its own moldmaking shop, which is mainly used in development projects and in the production of prototype molds. In addition, Walther has been relying on the quality of Haidlmair’s injection molds for several years, especially when it comes to high volume or high-performance molds. In addition to the pure performance data, Dominik Lemken (Fig. 1), project manager and procurement leader at Walther Faltsysteme, appreciates above all the good cooperation with the moldmaker

from Nussbach in Upper Austria, the adherence to the promises made and the commitment to meeting deadlines. For example, the simulations prepared in advance clearly show what results are to be expected. “These are clearly communicated and adhered to,” as Lemken points out, “and that is particularly important because these commitments serve as an important basis for our calculations.”

Since the spring of 2020, Walther has had two new molds in use, which for the first time combine Haidlmair’s know-how with two technologies that »



Fig. 1. Project Management and Procurement Leader Dominik Lemken © Walther Faltsysteme

originally came from the mold maker's development department. These are the hot runner system Flat Die Unit (FDU) and the digitalization solution Mold Monitoring. Behind the two innovations are two companies that now stand on their own two feet: the 100% Haidlmair subsidiary FDU Hotrunner GmbH and Digital Molds GmbH, a 50/50 joint venture between Haidlmair and Siegfried Hofmann GmbH, Lichtenfels, Germany.

Hotrunner with Flat Die for Pallet Runners and Pallet Deck

The two molds in which both Mold Monitoring and the FDU system are installed are used to manufacture a pallet (**Title figure**). The first mold produces the three runners, the second the deck of the pal-

let. The reason for the division is due to the different materials used to produce the pallet. In the case of the runners, glass fiber is added to the plastic in order to achieve a more wear-resistant and bend-resistant design, while some recycled material is used for the deck.

These two factors pose several challenges for producers. In the case of the runners, the glass fiber must be evenly distributed in the product. Some of the advantages of the FDU come into play here. The flow channel in the nozzle is projected onto a flat nozzle (**Fig. 2**). This means that the plastic flows evenly into the cavity through a defined long gap instead of through a small point gate. The FDU promotes this even distribution of the material and thus increases the quality and durability of the runners.

In the past, the recycling material and its performance in the process was a potential drag on the pallet deck and caused problems. The friction in the

mold, especially in the vicinity of the injection points, repeatedly resulted in local temperature peaks, degradation and, as a result, the material sticking. Walther is now solving this problem with the use of the FDU, as the slot nozzle brings the material into the mold more gently. In addition, the ratio of new raw materials to recycled material can be shifted in favor of recycled material, in order to be able to produce the product even more sustainably.

Focus on Performance

The two molds are currently running synchronously next to each other on two machines at Walther. In between, an articulated arm robot assembles the parts to make the finished pallet. Four years ago, Walther ordered the same mold set from Haidlmair. Since then, these molds, equipped with conventional round nozzles, have been running flawlessly and with excellent performance. At the end of 2019, Walther decided to expand its capacity with another production line. The manufacturer's specialists took a very close look at the mold and tried to optimize the performance in terms of mold construction and through minor product changes.

But, after all the analysis, the issue of gating emerged as the bottleneck in the truest sense of the word. Approx. 6.5kg of material per pallet must be injected as quickly as possible. With conventional needle valve nozzles, the users quickly reach the limits. The FDU, with its significantly larger cross-section (in this case a FDU Midi with a blade width of 22mm), enables the user to bring much more material into the mold in a short time and expands on the previous injection capacity limits, pushing the performance envelope further.

In the specific case at Walther, the cycle time could be reduced by approximately 10%. Dominik Lemken is extremely satisfied with the performance so far: "We have already produced over 100,000 units since April without any problems worth mentioning and I would be happy if we could use the FDU for other molds we use, for example applying this to production process for roller plates or various folding boxes would also be ideal, because the im-



Fig. 2. FDU Midi (open version): This nozzle was used in this project with Walther Faltsysteme © FDU Hotrunner

The Author

Peter Peschl, Mag. is Head of Corporate Communications at Haidlmair Group.

Service

Digital Version

➤ A PDF file of the article can be found at www.kunststoffe-international.com/archive

German Version

➤ Read the German version of the article in our magazine **Kunststoffe** or at www.kunststoffe.de

proved performance and the extended process window clearly support doing this.”

The requirements for the second technology used by Walther Faltsysteme from another company in the Haidlmair Group were completely different. The Mould Monitoring delivered by the company Digital Moulds is less about the pure performance of the mold and more about the verifiability of the production processes plus the use of information gained, for example to optimize the material use and to be able to adjust the production plan accordingly at an early stage.

Mould Monitoring enables production and location data to be recorded using hardware that is mounted directly on the injection molding mold (Fig. 3). The data is determined by internal and external sensors, pre-processed in the device and transferred to a cloud-based system via the cellular network. This means that production can be checked in real time, even if the



Fig. 3. The Mould Monitoring Box is mounted on the mold and is the heart of the monitoring system © Digital Moulds

user is not on site. In addition, the data provides more precise information about the condition of the mold, which means that deviations from the specified parameters can be identified quickly, which in turn avoids problems and even loss of production.

Additional Support for Production Reliability

At Walther, the same points were decisive for the decision to use the system. In addition, the specialists there see a special need for information from their customers, especially in the project business. You have to make ad hoc statements about the current status of production and answer questions from the customer, which massively improves the relationship with them, additionally increases the transparency in the process and increases the customer’s trust in the supplier.

At Walther, five molds are now equipped with the system. “With the molds that are equipped with Mould Monitoring, information on the output quantity, completed cycles, fault identification, better planning of short-term maintenance (which can reduce the daily output), and other basic data is important to us. It mainly helps in project management, customer service and purchasing,” says Dominik Lemken as a summary of the system’s main areas of application.

Mould Monitoring as a Digital Helper

Digital Molds was able to fully meet all of Walther’s requirements. In practical use, the positive, preventive examples of Mould Monitoring in production reliability were already evident. In production, there was a gradual increase in the cycle time for a mold, which could be recognized immediately with Mould Monitoring. This increase in cycle time gradually led to a reduction in the output volume. The system immediately sounded the alarm and, when analyzing the Mould Monitoring data, the specialists at Walther were able to recognize relatively quickly that there had to be a problem with the cooling, which in turn extended the cooling time. The quality of the produced part was still delivered, but the actual cycle time values no longer matched the original production planning, which as a result would have led to problems. Thanks to the timely alarm from Mould Monitoring and the data it made available, the Walther specialists were able to identify the problem quickly and clearly. The fix was simply unblocking a cooling hole that could be quickly exposed again without any problems.

The opposite case occurs more frequently at Walther, however: “If problems or malfunctions occur on molds without Mould Monitoring, this can lead to production downtimes of up to several days because the error is not recognized in time or is not recognized for a long time. Our colleagues are already claiming that this would not have happened with Mould Monitoring,” says Lemken describing a rethink in the company. ■

MARIS

**CO-ROTATING
TWIN-SCREW EXTRUDERS**

TECHNOLOGY AND COMPETENCE, TO LEAD COMPOUNDING FORMULATIONS TO NEW STANDARDS IN:

- Organic, Inorganic & Pearlescent pigments Masterbatches
- Additives, White & Black Masterbatches
- High filled Compounds
- Polymeric Alloys
- Technopolymers reinforced with glass fiber and natural fiber
- Thermoplastic Elastomers compounds, TPE (SEBS/SBS base), TR
- TPV, Thermoplastic Vulcanized Elastomers
- Monomers & Solvent content reduction
- Plastic Recycling
- Cable compounds, HFFR, EVA, XLPE, Polyolefin Elastomers
- Hard & Soft PVC compounds
- Rubber compounds EPDM, NBR, NR, SBR
- Rubber recycling
- Rubber Devulcanization process
- Hot melt & Solvent base Adhesives
- WPC (Wood Plastic Composites) compounds
- Reactive Extrusion (TPU synthesis, POM synthesis and stabilization)
- Extruders for bi-oriented film lines (BOPP, BOPS, BOPET, BOPA, BOPE, Lithium Battery film)
- Biopolymers production & compounds
- Expanded & Foam materials
- Special applications & Customized processes