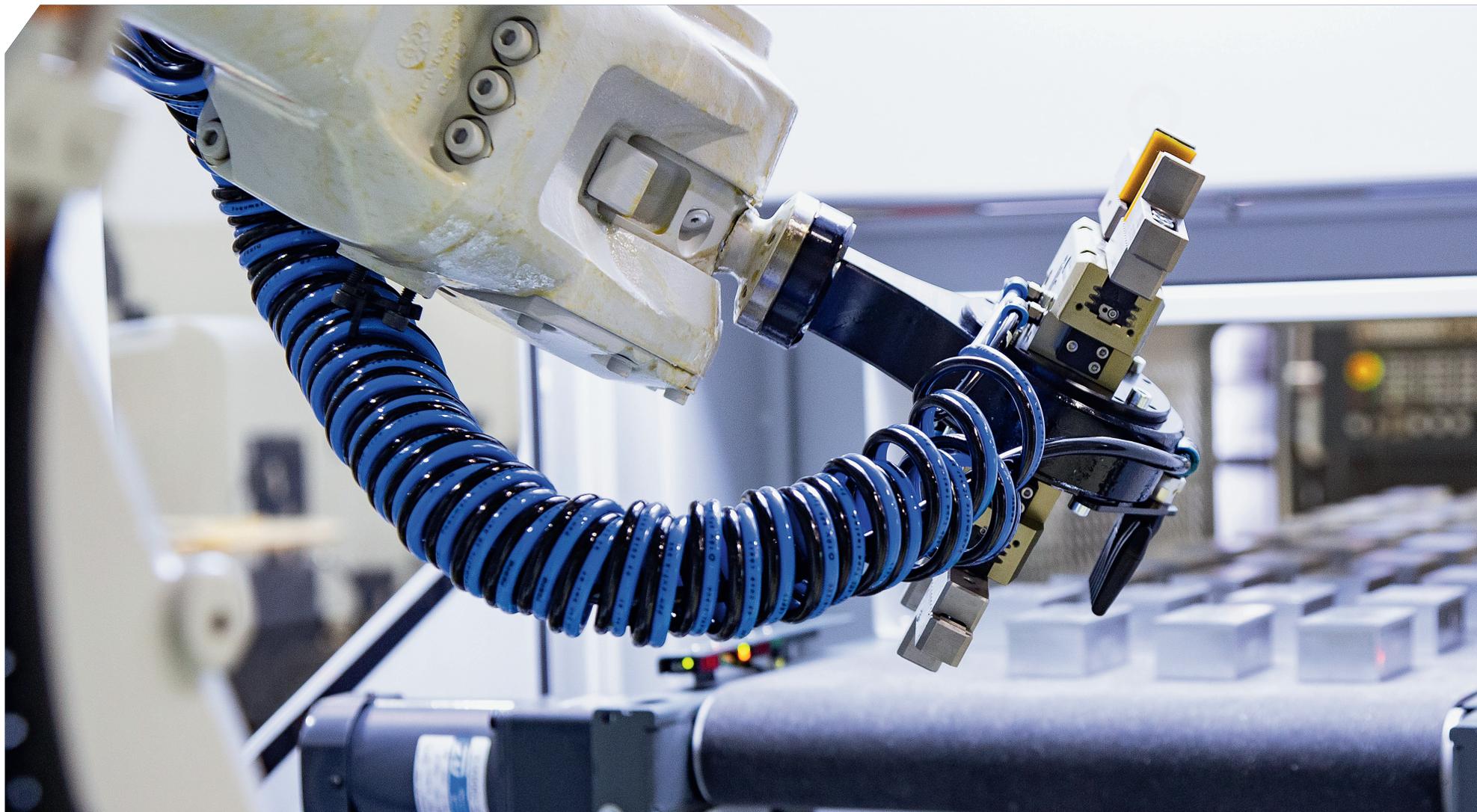




/ A VERSATILE STANDARD AUTOMATION SOLUTION
FOR THE HYPERTURN 45 CONVINCES PRAHER



Shortcut

✓ **Task:** Automated finishing of various injection molded parts.

✓ **Materials:** PVC-U, PVC-C, ABS, PP, PVDF.

✓ **Solution:** Robot cell consisting of a Hyperturn 45 turn-mill center including chip extraction from Emco as well as an ABB Flexloader~ FP600 robot cell with deburring station and blow-off unit.

✓ **Benefits:** Autonomy of four to eight hours; reduction of overall throughput times; high process reliability; high quality of machined plastic parts.



A dynamic duo: at Praher Plastics Austria, an ABB robot ensures high spindle running times for Emco's Hyperturn 45



Praher's automation cell consists of an Emco Hyperturn 45 turning and milling centre, including chip extraction, and an ABB Flexloader™ FP600 robot cell with deburring station and blowing unit.



The conveyor belt discharge is 6,000 mm long.

Smart standard automation

The production of injection molded parts is basically not rocket science. However, the grain is separated from the chaff in the quality of the plastic parts produced or the variety of materials to be processed. An Austrian showcase company in this field is Praher Plastics Austria GmbH, which can now look back on 50 years of experience in the processing of engineering plastics in the high-end sector. In order to cope with the company's growth and the increased variety of parts, a smart automation solution from Emco has been in use in mechanical production for about a year. By Robert Fraunberger, x-technik.

For five decades now, Praher Plastics Austria GmbH (Praher) has specialized in the processing of engineering plastics. „We distribute valves, fittings, pipes, as well as extensive accessories, mainly for the industrial pipeline construction,“ says DI (FH) Hans-Peter Kranewitter, Head of Sales & Marketing at Praher, summarizing the focus of the family-owned company. Praher's headquarters is located in Schwertberg in Upper Austria. Ludwig Praher founded the company in 1971 and started the production of technical plastic parts and the necessary injection molds as a one-man operation. Today, the high-quality products for industrial pipeline construction or pool construction as well as customer-specific plastic parts

and assemblies are produced on fully automatic injection molding machines. „Our customers include almost all of the world's renowned water treatment companies, but also companies from other industries that rely on the highest quality,“ Kranewitter continues. The company is managed in the second generation by Ing. Winfried Fraher together with Dr. Rainer Pühringer.

Modern production as a guarantee for success

A high level of vertical integration, including in-house toolmaking, enables new ideas to be implemented quickly and also secures the production location in Austria due to the high value added. In order for us to be able to hold our own on the world market, modern and largely automated production is essential. In addition, our know-how in processing a wide variety of plastics enables us to deliver the highest and most documented component quality,“ Kranewitter is convinced. Only high-quality pipe material is processed by means of a central material supply system. Automated robot systems enable the Schwertberg-based company to produce economically and flexibly around the clock. Depending on pressure, temperature, and the transported media, Praher customers can choose from a wide variety of materials such as PVC-U, PVC-C, ABS, PP, or PVDF (note: Praher uses more than 200 materials). Connections to other materials such as PE or metallic materials are realized via inserts and

mechanical connections. In total, the company produces around 5,000 different variants per year in typical batch sizes of 1,000 to 5,000 units.

Mechanical processing of injection molded parts

Mechanical finishing of injection molded parts is also an important part of Praher's production philosophy. It is always necessary to weigh up which parts require such further processing. „Sometimes it is different material properties, a large number of variants of the parts, or even smaller quantities that make it more economical to finish the injection molded blanks mechanically than to use several injection molds or highly complex tools with numerous slides,“ adds Markus Hann, head of mechanical production at Praher.

Autonomy for up to eight hours

The machine park, a large part of which comes from the Austrian machine tool manufacturer Emco, has grown over the years and is already partly automated: „Of course, not least due to globalization, we are required to constantly develop further and thus also adapt our machine park to the most modern production possibilities,“ Hann continues, adding: „The implementation of a modern robot cell, which can process, clean or deburr the most diverse parts completely in one

clamping, was therefore a logical development step.“ However, when the automation project was started in spring 2018, the final solution was not yet foreseeable. „Our specifications consisted of some essential criteria: the possibility to machine different parts; an autonomy of at least four to eight hours; no damage to the components due to gripping or insertion as well as further post-processing steps such as cleaning or deburring,“ the production manager recalls the initial situation.

Solution according to customer requirements

Those responsible at Praher were looking for a supplier who could offer both the right machine tool for the complete machining of a wide variety of plastic parts and the associated automation solution. „In the end, we were convinced by the Emco company with its combination of the Hyperturn 45 turn-mill center and an ABB „Flexloader“ FP600 robot line,“ emphasizes Markus Hann. Emco offers standard automation solutions for the complete portfolio of turning and milling machines. „This ranges from bar loaders to swivel loaders to gantry or robot solutions – always best suited to the individual requirements of our customers,“ Peter Koren, Product Sales Manager Automation at Emco, weighs in. Basically, according to Koren, every user can choose from a very practical and proven portfolio: „Our engineering team brings great experience and numerous

implemented solutions. The extensive modular system and the use of flexible standard options enable rapid commissioning of the project-specific automation solution.“ In addition, since standard solutions usually require lower investment costs, the return on investment is shortened. Based on Praher's specifications, Emco's team of experts designed the automation cell and also tested and accepted it before commissioning at ABB in Sweden. „We can fully confirm the good and smooth cooperation between Emco and ABB – there are absolute professionals at work,“ Markus Hann knows from his own experience.

„In order to survive on the world market, automation is a decisive factor for Praher, not only in injection molding, but also in the mechanical production of our more than 5,000 different plastic parts per year. In Emco, we have found the right partner for this.“ DI (FH) Hans-Peter Kranewitter, Head of Sales & Marketing at Praher

Practical robotic cell

The FlexLoader FP 600 is an automatic system in which components are manually placed on a conveyor belt (5,000 x 800 mm). The belt is filled during operation and part removal can thus take place at any time without interruption. This ensures autonomy of at least four to eight hours,“ confirms the production manager.

The parts to be processed, which at Praher are fittings, ball valves, shafts, nuts as well as housing parts, are transported under a camera. The 2D vision system determines the position of the parts and the coordinates are sent to the robot. This ensures reliable loading of the Hyperturn 45,“ explains Peter Koren. In order to cover the widest possible range of parts, two different double gripper systems are used. Deburring and cleaning of the components in a blow-off unit are also integrated into the process. Rejects can also be discharged via a component chute.

Complete machining with Hyperturn 45

The Hyperturn HT 45 SM2Y used is equipped with main and counter spindles, driven tools on both turrets and a Siemens SINUMERIK 840D sl control. Since Praher generally uses dry machining, an exhaust system is mounted directly on the turret. This directs the fine plastic chips or dust directly into a central extraction system. „To increase process reliability, we use an additional frequency-controlled milling spindle with collet chuck to safely remove the often different sprue pins of the injection molding machine before the machining process in the machine,“ Koren revealed an important detail. The clamping cyclers in the Hyperturn 45 are also equipped with a reduced clamping force as well as programmable differential pressure clamping to prevent part deformation. We have had excellent experience with Emco machines in the past. The Hyperturn 45 is an ideal fit for our parts range.



Praher produces around 5,000 different variants per year in typical batch sizes of 1,000 to 5,000 pieces. The MI DN25 ball housing is completely reworked in the Hyperturn 45 in a single clamping operation.



ABB's FlexLoader™ Vision system determines the position of the components. The coordinates are sent to the robot – the components can then be safely picked up from the conveyor belt and returned to the floor.

Both cost-effectiveness and reliability are top-notch," says Markus Hann, seeing his decision in favor of Emco absolutely confirmed after around one year of operation.

Initial difficulties overcome

Praher openly admits that there were classic teething problems at the beginning. The training provided by Emco and ABB was very extensive, but several aspects came together. On the one hand, the Hyperturn 45 is our first turn-mill center, and on the other hand, the IRB 2600 is our first robot with a vision system in mechanical production," Markus Hann explains the factors that must be taken into account in such a project. For example, changes in light influences due to sunlight make it more difficult for the vision system to recognize parts – according to Hann, this requires precise fine-tuning that can only be gathered through experience. After additional user training on site at our company, the system has now been running absolutely smoothly for about a year. It takes less than ten minutes to program new components, and we are constantly expanding the system's range of applications," says the production manager with satisfaction. For Peter Koren, there is no way around solutions like those at Praher in the future.

All in all, the reduction of non-productive times has significantly reduced the overall throughput times of the components: The most important factor is certainly the production autonomy of at least four hours. In addition, the availability of the system is extremely high due to the vision system, the various gripper solutions, and the process-reliable machining in the Hyperturn 45," says the production manager,



By means of a double gripper system, the plastic parts to be processed are safely transferred to the collets with a reduced clamping force.

summarizing the main advantages.

Praher and Emco are already working on the next steps: The possibilities of the system are certainly not yet exhausted, and further optimization is needed. One future goal is unmanned machining, which can be achieved through digitization with EMCONNECT as well as a complete process monitoring," Markus Hann concludes, looking forward to the coming goals.



DI (FH) Hans-Peter Kranewitter Sales and Marketing Manager at Praher

„In order to survive on the world market, the issue of automation is a decisive factor for Praher, not only in injection moulding but also in the mechanical production of our more than 5,000 different plastic parts per year. With Emco, we have found the right partner for this challenge.



Markus Hann Production Manager Mechanics at Praher

„Emco's solution with the Hyperturn 45 and the ABB robot cell was absolutely the right decision. ABB robotic cell was absolutely the right decision. Thanks to the modular design, the system can easily be expanded and is therefore also future-proof. future-proof. „



Peter Koren Product Sales Manager Automation of Emco

„We see a clear trend towards automation. That is why we have positioned ourselves very broadly and offer standard solutions, from bar loaders and swivel loaders to gantry solutions or complete robot cells, as you can clearly see in the Praher example.“



Praher Plastics Austria GmbH has been a specialist in the processing of engineering plastics for 50 years. The core competencies of the family-owned company are contract manufacturing and its own range of industrial valves and accessories. With subsidiaries in several countries and an additional production site in Canada, Praher exports around 80 percent of its products.

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