

USER REPORT

April 2024

Reproducibility and flexibility on a large scale

MacroPower injection molding machines from WITTMANN achieve high competitiveness for AKROH in the Netherlands

Not far from the IJsselmeer in the north of the Netherlands, AKROH Industries B.V. manufactures a wide range of plastics products for many different branches, including agriculture, the automotive industry and healthcare. The MacroPower from WITTMANN is one of the most popular machine models on its production floor and plays a key role in the company's growth strategy.

AKROH is celebrating. On the day of our visit, three cream cakes were delivered to the production plant in the Dutch city of Zwolle, each decorated with a photo of a WITTMANN injection molding machine. The occasion is the commissioning of a new MacroPower 2000 from WITTMANN – with 2000 t clamping force by far the largest injection molding machine ever installed at AKROH. With this investment, the family-owned company is opening a new chapter in its history. Following the massive expansion of its machinery, further growth is now planned for the business segment of contract injection molding, which currently generates about 20 per cent of the company's sales. "We are continuously stepping up the product portfolio for our customers", states Arend-Jan Horst, owner and CEO of AKROH Industries B.V.

With 27 injection molding machines in a wide range of clamping forces, the company's machinery and equipment has almost doubled since it moved into its new building three years ago. "We are now a modern factory", says Horst not without pride, since his whole family is contributing to the company's success. His wife Olga and his son Jorn, for instance, are in charge of the accounts department. Jorn's brother Robert is responsible as operator for the injection molding machines of the plant.

Ultimate reproducibility for extremely tough products

Since the company's foundation in 1956, its product range has been changed and diversified several times. Among AKROH's own product lines, one main focus lies on agricultural applications. Equipment for livestock and dairy farming as well as tractor components have made the AKROH brand famous especially in Europe. Via the agricultural trade, the company currently delivers more than 7,000 different products

and product variants into 60 countries worldwide. More than 600 molds are in active use.

During our visit in Zwolle, large black shovel blades are running off the production line from a MacroPower 850 injection molding machine. Mounted on a wooden rod with a handle also injection molded from plastic, they will be sold as feeding shovels later on.

These large parts with a 1,000 g shot weight are produced in a single-cavity mold within a cycle time of 30 seconds. They are made of high-impact polypropylene, for they must be able to withstand some tough treatment during rough daily use in the stables and on the fields. Between summer and winter, the environmental temperatures may vary from -10 to +40° Celsius, which must not have any adverse effect on the stability of the shovels.

“With the MacroPower we can rely on producing consistent high quality”, Arend-Jan Horst emphasizes, leading us to another MacroPower machine, which molds large plant containers to a customer’s order. “Here, the requirements are even more stringent”, he explains. “The wall thickness is no more than 1.5 mm, yet we still achieve very high dimensional accuracy.” This was not the case with an injection molding machine of a Chinese brand, which AKROH purchased some years ago on trial. Especially with thin-walled parts, which require high injection pressures, the Chinese machine’s sensor system quickly reached its limits.

Another advantage of the MacroPower in direct comparison between the machines is its modest floor space requirement. Thanks to two-platen technology, the MacroPower’s footprint is noticeably shorter.

Generally, the footprint of the production cells is a major issue. Even when it comes to automation, AKROH ensures a compact layout. A conscious decision was made to equip the new large 2000-ton machine with a linear robot. In contrast to a six-axis robot, which would take up additional floor space next to the machine, the WX173 linear robot from WITTMANN is mounted directly on the machine above the clamping unit. For maximum flexibility during parts removal, WITTMANN integrated two additional servo rotary axes for its customer. Thanks to the servo C-axis, it is possible to switch flexibly between removal on the moving and on the stationary mold mounting platen, depending on the mold.

MeltPro screw and HiQ Flow – a successful duo

Another contribution to the consistent high quality of the injection-molded parts is made by the plasticizing units in the WITTMANN machines. “All of our most recently delivered machines are equipped with MeltPro barrier screws, and we have now also retrofitted the existing machines”, reports Michel van der Motten, Managing Director of WITTMANN BATTENFELD Benelux NV. By this move, AKROH has prepared itself

well for the future, since the proportion of regrind in the materials being processed is rising. When using a machine with a standard 3-zone screw to process materials with a high proportion of regrind, AKROH had to lengthen the plasticizing time in order to achieve sufficiently high melt homogeneity. "This means that for a number of products we would no longer have been cost-efficient", Horst explains.

The intelligent assistance systems from the HiQ product series from WITTMANN provide additional support in processing recycled material. The HiQ Flow software measures the viscosity of the plastic melt during the injection phase of each cycle. In the case of deviation from the pre-defined set value, the machine automatically compensates the injection volume within the same shot. The result is 100 per cent good parts.

Especially in recycled plastic materials, the MFI sometimes fluctuates strongly from one batch to the next. "With our WITTMANN machines, we can still process high percentages of recycled material streak-free", says Horst. "Since our introduction of MeltPro screws and HiQ Flow, we are not getting any more production-related scrap." Some plant containers are already being produced entirely from recycled materials. For making the feeding shovels, 10 per cent regrind are currently blended in. This regrind is entirely derived in-house from sprue and start-up scrap.

"Keeping production scrap in the cycle is now an essential strategy for us to remain competitive with our prices", Arend-Jan Horst emphasizes. "For the agricultural products, we have strong competitors in China, India and Pakistan. Here, the unit costs are invariably an important issue."

Digitalization secures maximum uptime

"Our customers buy from us, because we deliver excellent quality, respond flexibly to customers' wishes and are nevertheless not more expensive than the Asians", the manager explains. "The price we are paying for this is a continuous flow of process optimization." Consistently high reliability and stability of the machines are not enough. The availability and flexibility of the production systems are also closely examined by the AKROH management for every investment decision.

"When we receive an order today, we can deliver it tomorrow", this is how Arend-Jan Horst describes the extreme case, which actually happens quite often. Molds are changed twice or three times per day, and this must be done quickly to keep the machines' uptime on a top level. The long-stroke system for releasing the tie-bars supports easy installation of large molds from one side, and what is more, the progressing digitalization of the production processes is already showing a positive effect here as well. "The machine recognizes the mold by reading out the mold data set and then automatically sets the correct parameters", explains Horst. "Digitalization already offers many opportunities today for working even more efficiently. We intend to exploit these opportunities even more effectively in future".

In family-owned companies, long-term planning is normal

A basic prerequisite for continuous optimization of processes is transparency. The AKROH team is just starting a relevant project to examine energy efficiency. “We have set ourselves the task of measuring more. We look at all sources of energy consumption, not only those of the machines. Maybe it is possible after all to turn the temperature of the cooling water up by two degrees in one process or another. The energy prices have risen so sharply in the course of last year that even changes seemingly small at the first glance have a large effect. The important point for me is that we can continue production here in our homeland in spite of the high labor and energy costs – to this end we exploit all opportunities open to us.”

As CEO of a family-owned company, Arend-Jan Horst thinks ahead on a long-term basis. “I was eleven years old when my grandpa bought his first injection molding machine”, he remembers. “That was a Battenfeld machine, and I learned injection molding on it.” Strong ties between AKROH and the WITTMANN Group, of which Battenfeld today is a part, have been in existence ever since. “The excellent contacts are important to me”, Horst emphasizes. “WITTMANN is a family-owned company like us, and family-owned companies work in a different way. People there talk openly with each other, which also makes it possible to plan the future together.”



Fig.1: The feeding shovels with injection-molded parts made of high-impact PP are ready for rough handling in stables and on fields. The AKROH CEO Arend-Jan Horst (left) presents the shovels jointly with Michel van der Motten, Managing Director of WITTMANN BATTENFELD Benelux, in the showroom of the new, modern production plant in Zwolle, The Netherlands.



Fig. 2: The MacroPower is one of the favorite machine models on the AKROH production floor.

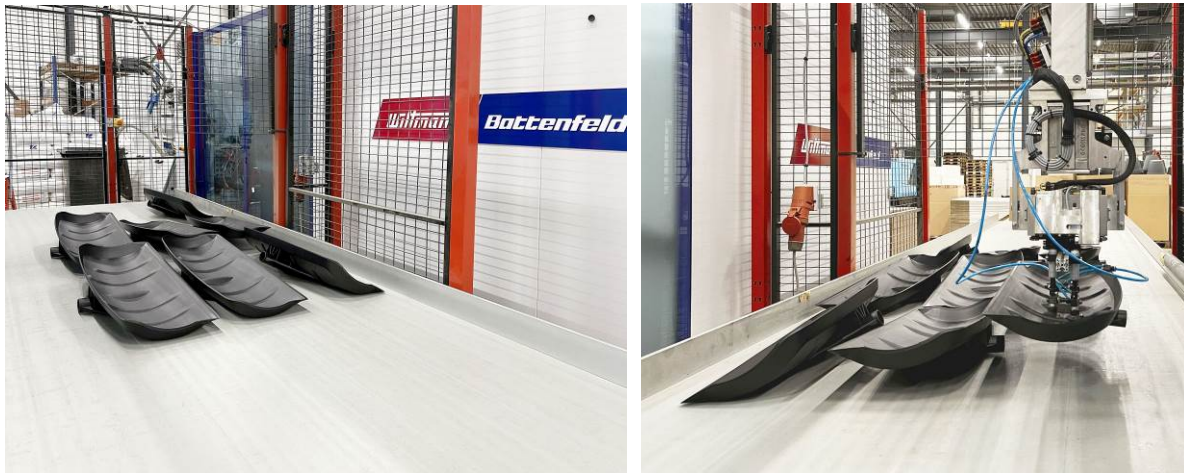


Fig. 3a+b: The blades of the feeding shovels are manufactured on a MacroPower 850 injection molding machine.



Fig. 4: Happy about the MacroPower 2000 injection molding machine which has just arrived: Arend-Jan Horst, Michel van der Motten and Robbert Horst (from left to right).



Fig. 5: The arrival of the new MacroPower 2000 injection molding machine is celebrated with cream cake. From left to right: Michel van der Motten from WITTMANN BATTENFELD Benelux, Robbert Horst, Jorn Horst und Ar-end-Jan Horst, jointly representing two generations of owners.



Fig. 6: The new MacroPower 2000 is the largest injection molding machine so far in AKROH's equipment. It is intended primarily for generating further growth in the business segment of contract injection molding.

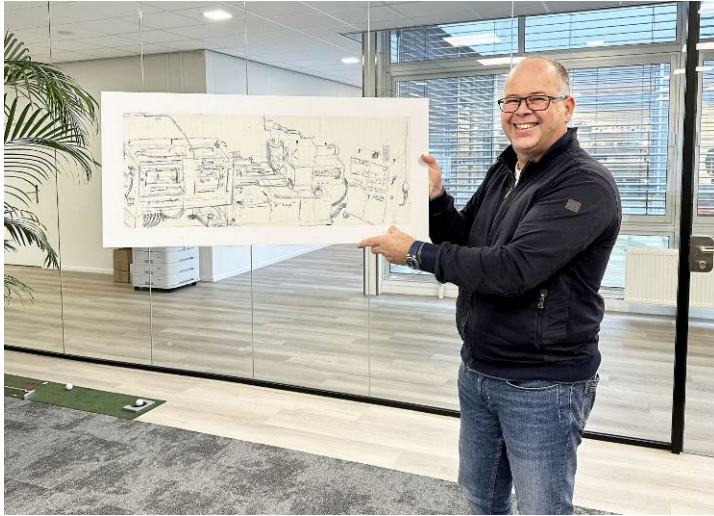


Fig. 7: Arend-Jan Horst was eleven years old when his grandfather purchased his first Battenfeld injection molding machine. Horst then made a drawing of this machine, which is now hanging in his office.

Photos: WITTMANN

The WITTMANN Group

The WITTMANN Group is a globally leading manufacturer of injection molding machines, robots and auxiliary equipment for processing a great variety of plasticizable materials – both plastic and non-plastic. The group of companies has its headquarters in Vienna, Austria and consists of two main divisions: WITTMANN BATTENFELD and WITTMANN. Following the principles of environmental protection, conservation of resources and circular economy, the WITTMANN Group engages in state-of-the-art process technology for maximum energy efficiency in injection molding, and in processing standard materials and materials with a high content of recycled and renewable raw materials. The products of the WITTMANN Group are designed for horizontal and vertical integration into a Smart Factory and can be interlinked to form an intelligent production cell.

The companies of the group jointly operate ten production plants in six countries, and the additional sales companies at their 37 different locations are present in all major industrial markets around the world.

WITTMANN BATTENFELD pursues the continued strengthening of its market position as a manufacturer of injection molding machines and supplier of comprehensive modern machine technology in modular design. The product range of WITTMANN includes robots and automation systems, material handling systems, dryers, gravimetric and volumetric blenders, granulators, temperature controllers and chillers. The combination of the individual areas under the umbrella of the WITTMANN Group enables perfect integration – to the advantage of injection molding processors with an increasing demand for seamless interlocking of processing machines, automation and auxiliaries.

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