M.A. Ford Europe – on a Roll!

Over the years, the Rollomatic name has become a byword for Swiss precision engineering, accuracy and performance in the grinding and surface finishing industries, as well as countless OEM businesses globally. While reputation is an important part in any commercial environment, it’s the ability to deliver results and meet customer expectations that really matter in the fiercely competitive machine tool sector.

We take a detailed look at the recent installation of a Rollomatic NP3+ machine by Advanced Grinding Solutions at the Custom Tools Division of leading grinding and surface finishing manufacturer, M.A. Ford Europe, to explore the background and the outcomes.

M.A. Ford Europe has been trading in the UK for just over 20 years and, like Rollomatic, has acquired a reputation for quality, precision and performance in high technology sectors. These include automotive, aerospace, medical and Formula 1 alongside general engineering and subcontract manufacturing, where the objectives are usually centred on improving productivity through high performance machining.

At the heart of the company is its extensive range of coated solid carbide tooling, including end mills, drills and special tools, which achieve exceptional cutting performance on tough metals, such as Inconel, titanium and other super alloys, as well as less exotic materials.

While the majority of the tooling range is manufactured at the expansive facilities at its US parent company in Davenport Iowa, which already operates around 20 Rollomatic machines, during the last five years there has been more than £5 million investment in the company’s Custom Tools Division in Leeds, Yorkshire.

The Custom Tools Division was created when tool manufacturer and remanufacturer, Ashton Tools, was acquired by M.A. Ford Europe in 2012 with the intention of expanding the custom tooling operation as well as designing and manufacturing ‘standard’ tools in the UK for the home and European market.

The challenge

“To understand why we purchased the Rollomatic NP3+, it’s necessary to have some insight into our manufacturing process,” explains M.A. Ford Europe’s manufacturing director, Chris Wagstaff.

“By early 2018, our manufacturing facility in Leeds had undergone a massive transformation and expansion with the number of tool grinding machines more than doubled from three years earlier, giving us increased capacity and greater flexibility in the manufacturer of standard and special tools.

“However, in some respects we became a victim of our own success. We found that as our manufacturing volume and tool range expanded, our high-performance tool cutter grinders were being used increasingly to prepare the tool blank diameters, as part of each tool cutting programme. This was limiting our production capacity and efficiency. We were already running a blank grinding cell with a pre-owned machine to help alleviate some of the issues and although it proved that the principle was worthwhile, the machine didn’t have the accuracy or performance that we needed.”

The company had also achieved ISO 9001:2015 by this time and with its increased focus on processing, procedures and planning; one of the company’s risk assessments identified some important issues. The volume of different pre-formed tooling blanks they stocked had reached more than 300 different diameters and lengths, which tied up financial resources in stock. Even with this level of stock holding, they found that bars often needed cutting to length or required the diameters to be ground to meet special orders, which increased wastage and production time. They also identified that if their ageing blank grinder was to fail, the impact would be considerable, as there was no ‘back-up’.

The solution

As M.A. Ford in the US was already relying on a range Rollomatic blank and tool grinding machines as a core part of its production, the UK management team included Rollomatic alongside two other manufacturers as part of the selection process.

Rollomatic’s sole UK agent, Advanced Grinding Solutions (AGS), evaluated M.A. Ford Europe’s specifications and recommended the Rollomatic NP3+ multi-axis CNC grinding machine.

AGS’s managing director, Chris Boraston, explains: “The initial contact from M.A. Ford was made on our stand at MACH 2018, as we were both exhibiting at the show. As Chris Wagstaff and MD David Ward outlined the issues they were facing and their future production targets, the longer we talked, the more confident I was that the Rollomatic NP3+ would be the best solution for them.”

After extensive detailed competitive trials and proofing tests in the UK and at Rollomatic’s Switzerland HQ, M.A. Ford Europe agreed with Chris Boraston and ordered the machine, which was delivered and installed in February 2019.

A special ‘pinch/peel’ grinding process, pioneered by Rollomatic, is used by the NP3+, which allows blanks with lengths up to 400 times the diameter to be ground without deflection issues. It also has a working range from 0.025 mm to 25 mm diameter with the ability to grind stepped diameters, angles, radii and chamfers. An integrated 3-axis robot loader provides auto-loading from pallets.

A number of other factors that influenced the decision including its performance and exceptional accuracy. Chief among these is the Rollomatic’s ability to produce tool blanks in a single automatic operation using...
both roughing and finishing grinding wheels simultaneously within very close tolerances. Cylindrical blanks are finished with length, diameter and concentricity tolerances of 0.002 mm and even on the longest tools a run out concentricity of under 0.001 mm is achieved.

The immediate advantages of this ability, apart from the high precision, is that it removes the need to replace grinding wheels and re-load tool blanks for finishing, which is the case on most other machines, which saves time and money. It also removes the need to undertake cylindrical grinding operations on 5- or 6-axis tool grinding machines, which are usually less accurate than the Rollomatic NP3+ and take longer. As a direct result, M.A. Ford cutter grinding machines focus on manufacturing cutting tools rather than occupying valuable production time with cylindrical grinding operations.

The daily grind
As the Rollomatic is performing a specific set of functions, its programming is also considerably simpler than that used on most cutter grinders, which also has time and cost benefits. Rollomatic’s software is designed to work offline or directly on the machine and allows the most complex of tools to be typically programmed in 10-15 minutes. The software, in conjunction with the rough and finish grinding wheels set up, allows users to specify multi-pass grinding operations for roughing and/or finishing to achieve the highest possible level of accuracy whilst creating superior surface finishes on tapers and radii.

Chris Boraston added: “Accuracy is a key feature of Rollomatic machines and the integral Movomatic and Marposs gauges used at M.A. Ford Europe provide constant automatic positioning and post-process gauging of ground diameters with automatic feedback to the machine’s FANUC control. This maintains the high levels of accuracy and quality demanded by their production team.”

The results
After installing and commissioning was completed, the Rollomatic very quickly began making a significant contribution to tool production at M.A. Ford’s Custom Tool Division, which delighted manufacturing director, Chris Wagstaff: “We run an incredibly efficient manufacturing operation with ‘lights-out’ production, so it’s important that we have reliable and robust machining plant, such as the Rollomatic, which reduces the risk of interruptions in production,” he says. “Throughout the selection and testing procedure, we had a clear specification of what we wanted to achieve and even though the machine has been operational for just a few months, it has exceeded our expectations and made a significant impact on our manufacturing process.”

For one of its customers, M.A. Ford Europe manufactures a special multiple diameter end mill in batches of 1,500 and has already seen a 30 percent reduction in the cycle time for that tool. It’s a similar story for the other special products, as well as standard tools, as the tool cutters have been freed up to concentrate on flute grinding and final production while the NP3+ deals with the production of precision blanks.

The flexibility of the machine has also had a dramatic impact on M.A. Ford Europe’s blank stock. From stocking more than 300 individual blanks, the company now only needs 12 different stock items, which has simplified inventory and stock ordering, as well as reducing the financial commitment to stock.

Chris Wagstaff concludes: “It’s probably fair to say that, although we were expecting production and manufacturing improvements, our investment in the Rollomatic has also delivered tangible business benefits in areas that hadn’t been identified. Clearly, this is a significant achievement and we can understand why our colleagues at M.A. Ford in the US rate them so highly.”

Further information on M.A. Ford Europe and its manufacturing solutions can be found at www.mafordeurope.com or by calling 01332 267960.

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Pictured left to right: Damien Wunderlin, sales director- Rollomatic, David Ward, managing director – M.A. Ford Europe, Chris Boraston, managing director - Advanced Grinding Solutions

Simple programming of the Rollomatic NP3+