

Probing quality solutions

From helicopters to watch movement parts, on-machine probing is key to accuracy and productivity, as *Machinery* discovered

Based in Ankara, Turkey, Alp Aviation is using Renishaw's Productivity+ software to program its on-machine probing routines offline, enabling it to create and test routines in a CAM environment for the Renishaw part-setting probes fitted to all 50 of its machining centres.

The company, which is 50 per cent owned by helicopter manufacturer Sikorsky, produces body and rear-wing parts for helicopters. It also makes rear hub parts for the F135 Joint Strike Fighter engine for Pratt & Whitney and Goodrich landing gear parts.

Alp bought Productivity+ in July 2007 to reduce process development time. Alp's working environment is virtually paperless and highly automated, so it couldn't afford to be programming the probing routines manually.

The NC part program that the company's Unigraphics CAD/CAM system produces is then loaded into the Renishaw Productivity+ package, where the engineer adds probing cycles.

Productivity+ uses a graphical user interface (GUI) to provide a user-friendly programming environment. Alp engineers simply pick features from the part model, or choose parameters from dialogue boxes, to define the program. The probing cycle is run as a simulation on the PC, picking up on any errors, before it reaches the machine tool. When it is complete, the required post-processor is selected and the output is automatically generated, ready for

loading directly into the appropriate machine via the DNC system. One part is produced to test the machining and probing program before full production commences.

Cenk Akin, engineering team leader, explains the key benefits: "Productivity+ makes it much easier to prove out the process before going on the machine. If the machine is being used to test processes rather than producing saleable

parts, we are losing money."

While Productivity+ is a recent purchase, Alp has used Renishaw part-setting spindle-mounted probes for years – all new machines are delivered with probe systems fitted. The company uses simple clamping, programming the machine to use the probe to establish part position, which is entered into the machines' CNCs. The probe is also used later in the process; for example, every

Getting the measure of large workpieces

When Stoke-on-Trent based engineering company Unilathe was faced with the need to measure the length of large shafts, the company struggled to find an instrument with the required accuracy and capacity. But an answer was forthcoming from Bowers, which was able to supply a 10 ft capacity Ultra-Light Sylvac Calliper.

"As we were previously using one of our CMMs to measure our large shafts, transporting the parts and CMM time became a major problem," explains quality manager

Jeff Bratt.

"Before we discovered the Sylvac calliper, we despaired of ever finding a gauge with the capacity to measure our shafts. Since using the gauge, valuable CMM time has been released and measuring times have been slashed.

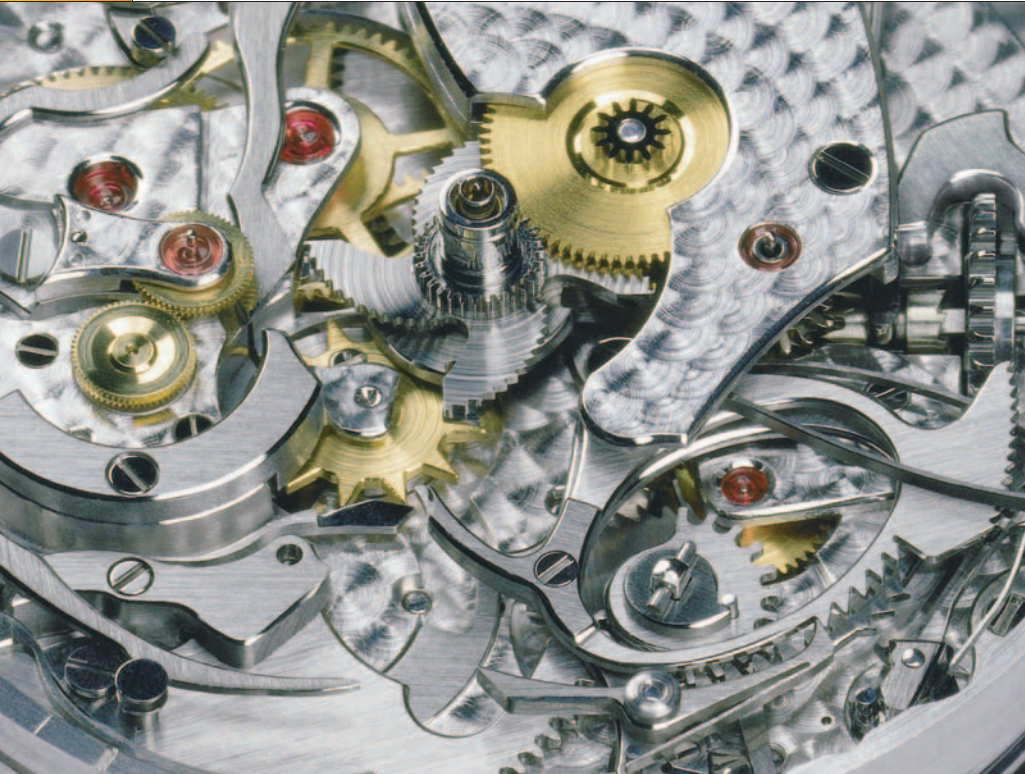
To further speed-up our

shaft measuring process we have constructed 2 V-block saddles, containing alignment slots to accept the new gauge, and allow us to check the required lengths. Our new lightweight calliper will help to ensure that our valued customers continue to receive the highest quality components from Unilathe."

The digital gauge's accuracy, strength and lack of weight are supported by its advanced composites main

beam and contact faces coated with titanium (giving excellent wear resistance), while operator repeatability is helped by a constant measuring force facility with an easy-to read large digital display.





Blum LaserControl NT-H supports the manufacture of Swiss precision watch movements

part is checked before finishing cuts, and inspected on the machine once finished. Production cycle time has improved by up to 50 per cent in some cases.

Mr Akin says: "Productivity+ software and Renishaw part setting probes have made this possible. The benefits not only include time and cost savings; we can also totally trust the process, since any chance of machine operator error has been removed. Process repeatability has improved – we've achieved a higher level of gauge R&R results by using probes with less than 1 micron repeatability."

METICULOUS MANUFACTURING

Probing is, in fact, the link between Swiss precision watch movements and helicopters. Since 1987, Christophe Claret has supplied exclusive movements to prestigious watchmakers such as Guy Ellia and Jean Dunand, in the process creating several world firsts.

His company, La Chaux-de-Fonds, based in the Swiss Jura, boasts clean rooms and temperature controlled environments with noise absorbers installed throughout the workshops. In this controlled atmosphere watch components are manufactured and every watch movement is meticulously assembled by experts.

From 17 employees in 2001, the factory now employs over a hundred staff with a technical research department that has grown five-fold in three years. Precision to a hundredth of a millimetre is standard; however, the workshop often works to the scale of a micron or even a nanometre. The workshop includes 18 CNC machining centres (the oldest only four years old), with the company aiming to complete each part in one-hit working to within a five micron tolerance band.

Blum LaserControl NT-H contact/non-contact measurement is used for thousands of tools, drills, bits, taps and

milling cutters that have to be examined and measured daily before use. The Laser NT-H conducts tool pre-setting, measurement with or without contact, eccentricity management and notes runner or taper defects without risk of collision. The control also examines standard or special tools with the precise noting of the number of teeth when milling.

Production manager Christophe Bouveret explains: "We have chosen the most effective system for measuring and controlling tool breakages in a highly lubricated environment. Above all we look for reliability. The Blum system meets all of our criteria and expectations as it is capable of coping with very small tool diameters, down to the scale of a tenth of a millimetre.

"The LaserControl has become indispensable for measuring all tools before machining. Data is entered methodically into a table with co-ordinates of high precision that anticipate any tool breakage. Productivity gains are really substantial. Previously, we wasted a considerable amount of time pre-setting by conventional means. And, very importantly, it's the automatic input of data and measurements into the machines' digital controls that was until then a manual task with risk of error. To summarise, it's a system that allows us to guarantee quality while simultaneously achieving much higher productivity." □

Honing surface measurement support

Sunnen's latest CNC honing systems can produce holes to 0.25 micron, with minimal variation and no operator intervention. The gauge room next to the machining area in the firm's 1,200 m² premises in Hemel Hempstead, Hertfordshire, is equipped with a Mahr MarForm MMQ44 Formtester and a Mahr MarSurf S2 surface measuring system.

The MarForm MMQ44's high precision X, C and Z measuring axes make it possible to perform any form measuring function; monitoring

deviations in geometry or position for parameters such as roundness, cylindricity, straightness and parallelism.

The MarSurf S2, which incorporates a dedicated processor, uses the tactile stylus method of roughness and waviness measurement that allows a two-dimensional profile to be calculated and documented to international standards.

Pressing two keys plus 'start' on the keyboard equates to 'measurement finished, documented and saved'.