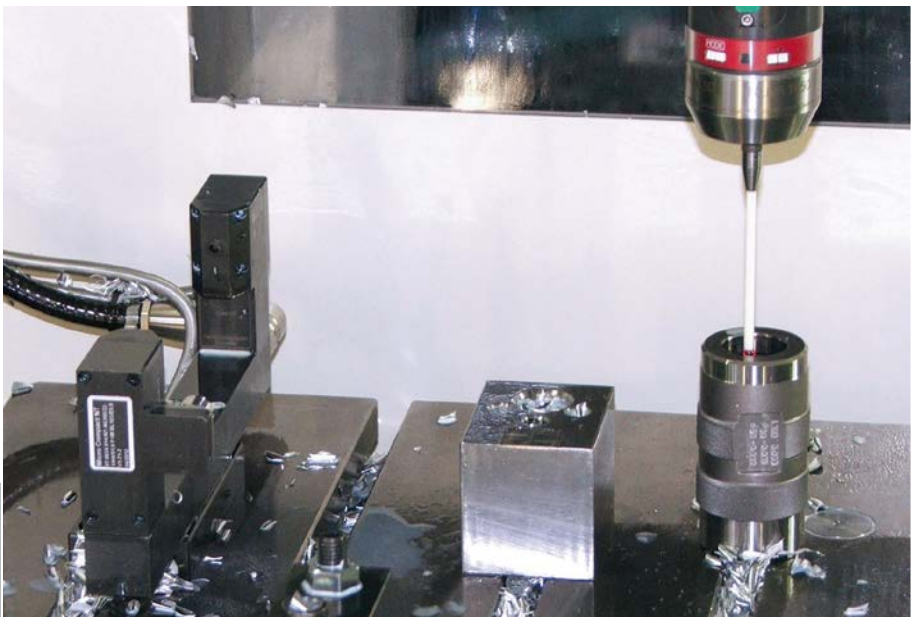


To master the production

Did you know that the worldwide consumption of PET bottle caps is estimated at 4 billion pieces a day? It is obvious from this breathtaking figure that the production of plastic caps for beverage processing, cosmetic industries or for households is a lucrative field which has, however, its relentless rules. The Czech producer of base plates for multiple injection moulds, the Tirad company, has been a part of the production chain, at the end of which the most significant players like Coca Cola or Pepsi have figured for several years and measuring systems of the Blum-Novotest have become the company standard on its road to success.



“There are incredible volumes. For instance, a 96-multiple mould having the frequency of 3.5 seconds is able to produce 26 tonnes (approximately 1 truck) of PET caps a day!” Stanislav Veselý, the executive director of the company, describes. “When you produce such amounts, even a minimum reduction in plastic consumption in the order of 3–5 % poses significant financial savings. And thus, the pressure on the price of the product has created a very specific demand: combining as many cavities as possible in a mould with the closest tolerance. The positional accuracy of cavities affects the wall thickness of the cap and also the financially monitored plastic consumption”.

Within bounds of possibility

While the tolerance of usual accuracy of cavity positioning was formerly ± 0.01 mm/m, recently, the Tirad company has carried out orders having a tolerance of even up to ± 0.005 mm/m. “We had to adapt to the market. Both with regard to precision and also to the size of frames that are made up to dimensions of 1500 x 2500 mm. When you realize that our coordinate measuring machine determines the position and achieves the uncertainty of 0.004 mm/m, we are, in fact, approaching a laboratory tolerance during our production,” Mr Veselý points out.

Absolute technological discipline

The production at the Tirad company really has the character of working under laboratory conditions. Considerable investments were directed especially towards the thermal and technological stability of the manufacturing process, and towards the reduction of human errors. Manufacturing technology in air-conditioned space is actually subject to strict in-house regulations. A minor deviation, in form of a tool set-up to an incorrect length against the verified length, may cause vibrations in the cut thus exceeding the micron tolerance. This is also confirmed by S. Veselý: “In respect of the tool and workpiece set-up, we needed to gain much firmer ground, and that’s why we began thinking about the implementation of measuring probes in our production”.



Blum – a guarantee in quality

The principal role in the choice of laser and touch probes was played by maximum accuracy and long-term process reliability in the machining area. S. Veselý adds: “If you take hundreds of measurements of a micron tolerance a day in a three-shift operation, the circle of potential suppliers is already very narrow. We knew the Blum company as a supplier of first-class laser systems, but also the measuring probes of the TC line persuaded us of their qualities during tests lasting several months. Nowadays, we have 5 machines fitted with the Micro Compact NT laser and with the TC50 touch probe. And we intend – owing to our marvellous experience – to acquire some more.”

TC50 – touch probe for universal applications

The TC50 probe is designed for universal applications in cutting centres, particularly in those with limited accuracy demands at high dynamics and measuring speeds up to 3 m/min. Robust symmetrical design, non-contact signal generation and higher measuring force – these are attributes that guarantee a top measurement repeatability independently of speed, stylus length or pollution of the measured surface. Using the TC50 touch probe, Tirad automatically determines the zero point and monitors the flatness of the base plate in 7 points having a tolerance of 0.005 mm. A demanding application that takes full advantage of the progressive measuring mechanism inside of the probe. In the course of measuring, a text file is generated that stores measured values and can be used for a possible reverse analysis.

Micro Compact NT

Each tool to be cut is measured first by the Micro Compact NT laser system. Measurements, using a focused laser beam of 0.03 mm in diameter, takes place under identical conditions as machining. In this way, it is possible to get results approaching the absolute reality – unlike an external measuring device. The measured length offset compensates inaccuracies resulting from tool change clamping errors or from temperature and dynamic changes in the spindle and the machine. And besides, automatic data transfer into a tool offset table eliminates any human error and the tool data is retrospectively available in the text file. Blum with its 25 years of know-how in laser measuring systems represents the world leader in this industry. The ingenious combination of optics, microelectronics, mechanics and software guarantees excellent repeatability of measurements and almost maintenance-free operation in the long term.

Unproductive time has disappeared

Everyday life of any supplier revolves around these words: price, delivery time, quality. It is then quite logical that companies wanting to get to the top or to remain there are looking for ways to manufacture faster, more precisely or more efficiently. Tirad found the way to master its production and to lay down rules for it. Although it is purely a piece production, the overwhelming majority of the machining process works without any operator intervention just by touching the green button of “cycle start”. “The Blum probes have become a standard for us. They present not only current geometric accuracy to us. They also present retrospective views by storing valuable data for the later analysis of finished machining. However, they are also a glimpse into the future, because lots of unpredictable unproductive time has disappeared thus making price calculations of the demanded work much more specific.” Mr Veselý says in closing.