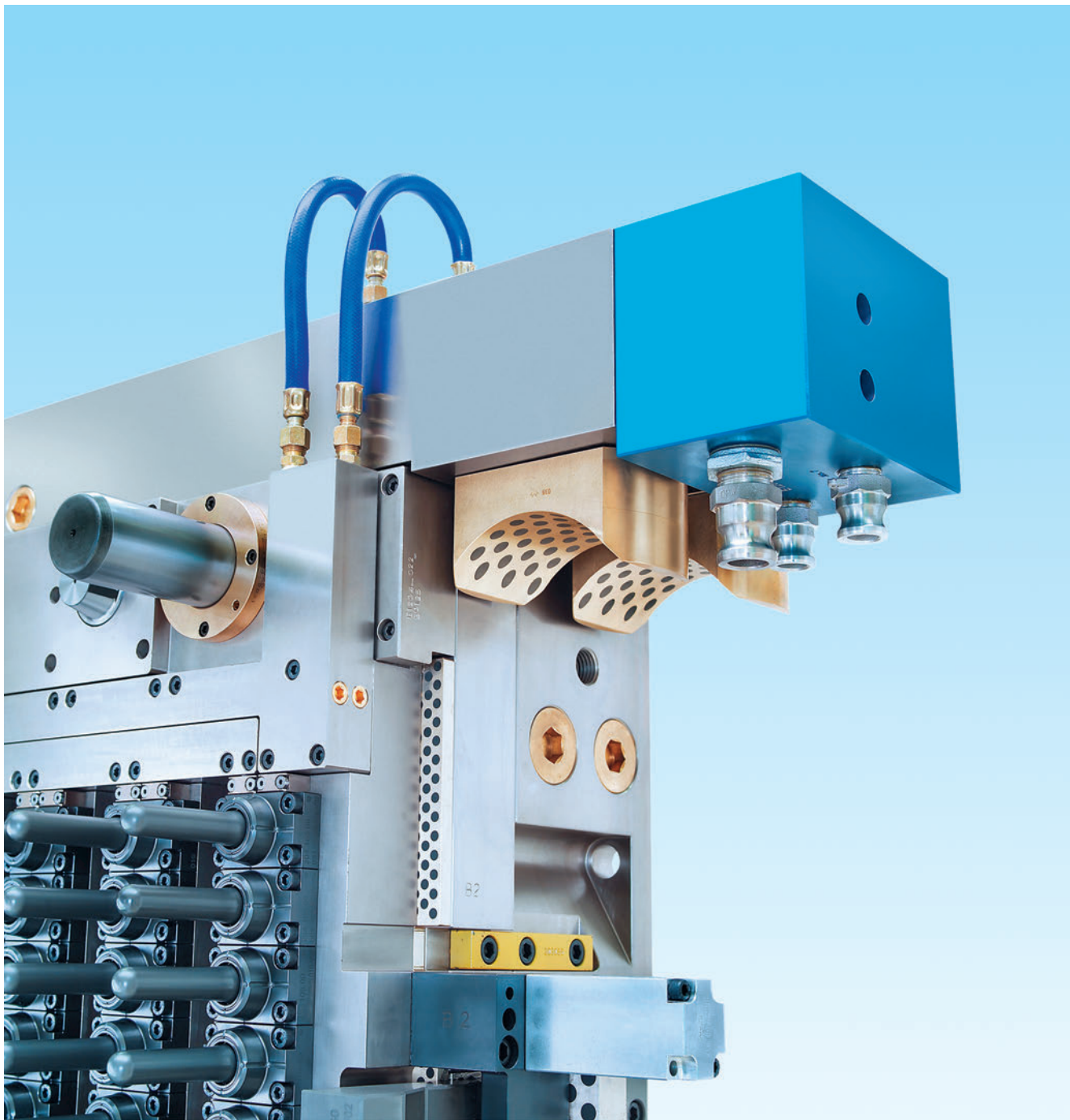




Otto Hofstetter AG

Precision: a valuable product
with real customer benefits.





Precision machining and very close tolerances are signs of quality. Precision machining and very close tolerances also drive up component manufacturing costs. But you get what you pay for. It all starts at the design stage. Designer engineers demand maximum precision, and as a result the manufacturing operation has to invest in the most up-to-date machine tools, and costs generally move in an upward direction. The competitiveness and financial health of a company depend on how they answer the question: “Precision before costs, or costs before precision?”

A manufacturer in the Far East, who successfully produces large numbers of tools and supplies the lower end of the market, told me that “quality costs money”. Many European toolmakers tell me that they are not in a position to manufacture to lower standards of quality. The Swiss toolmakers, Otto Hofstetter, who have just celebrated their 60th anniversary, say they have no option but to make quality products. Having looked at the tug-of-war between quality and costs, the company have positioned themselves uncompromisingly in the quality sector – and they have to accept the cost structure that this entails.

Concrete questions about quality

We asked Otto Hofstetter a few pertinent questions on the subject of quality and costs. Questions such as,

- Is quality a luxury with which one pampers oneself, or is it a calculable economic factor?
- Can quality be quantified?
- What benefits does precision engineering offer to the customer?
- What does it bring to the manufacturer and to the user?

At Otto Hofstetter they manufacture PET injection moulding tools and hot runners, all of which are assembled from precision-machined parts. The components are machined

to tolerances in the micron range. The aim of the manufacturing strategy is to produce tools with a long working life and optimum maintenance intervals, which also run at minimum cycle times. High-quality preforms with minimum material usage is also a basic objective. The views of Otto Hofstetter are unequivocal, as can be seen from the reaction we received.

Hot runner blocks

High precision means a problem-free startup. Right from the first shot the preform weight will normally be within the required tolerances, and maintained in production. For material flow within the block the hot runner channels are “naturally” balanced by having channels of equal length and equal diameters. Machining tolerances are to within ± 0.001 mm, which is particularly important for co-injection, where two materials come together in the nozzle.

Precision also saves on material, which in the fast-moving packaging world accounts for up to 90 per cent of the cost. Using the example of the latest type of 96-cavity tool a 20.4 gram preform is constantly moulded at 0.1 gram below the nominal weight. Over a 12-month period this can add up to a saving of about 36 tonnes of PET (8 seconds cycle/97 per cent efficiency).



Stack parts.

Core, cavity, gate pad and neck split are the main parts of a stack.

Nozzle systems

Machined to within microns: nozzle housings, needles and nozzle tips are all carefully matched to within 2 microns. With a minimum amount of play in the needle the nozzle system is maintained in a leak-free condition for a longer period of time. Stretching the maintenance intervals saves annual costs. Maintenance costs for a precision mould are, on average, only 2 per cent of the tool cost per annum, whilst a normal tool would call for about 4 per cent – although it is well over half the price!

Replacement assembly programmes

To ensure continuous production availability Hofstetter keeps an overhauled hot runner system in stock for each tool type, making it available to the customer on site in a very short time. The overhaul of a 72-cavity hot runner tool means 20 lost production days. A “Quick Exchange” part based on precision-machined components reduces the downtime to 2 days. The benefits of this can be easily quantified.

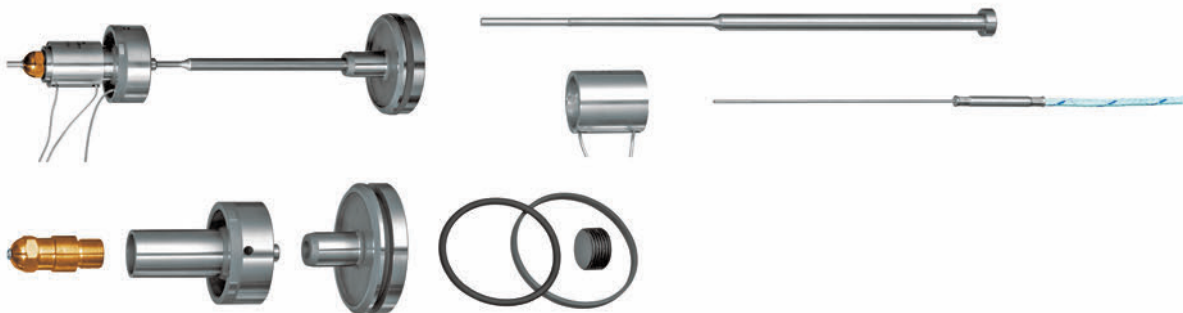
Example: based on 350 working days per annum efficiency is 96 per cent.

- When losing 20 days for maintenance, resulting in only 330 days production, efficiency falls to 90.4 per cent.
- With a 2-day downtime thanks to “Quick Exchange” annual production is still 348 days, or 95.3 per cent efficiency.

The degree of savings varies depending on the location of the production site, but a 5 per cent difference is a good indication of what can be done.

“Cold half”

Bolster, centring systems and guide plates are all part of the cold half of the tool. The distance between the guide bores in a 144-cavity tool stripper plate are controlled to within 0.007 mm. The roundness of a preform is very much dependent on the roundness of the core pin and how it is centred. A high degree of precision in the tensioning and centring cones has a direct influence on the life of the tool. If the recommended maintenance and cleaning programme is followed the cold half can work for many years without loss of quality.



Nozzle parts.

A cross section in the area of the precision-engineered nozzle parts.

Maintenance/surface protection

The surfaces of the major assemblies are coated with a new material, OH-Xtreme®, specially developed for Hofstetter. A coating only nanometres thick ensures that there is minimal abrasion on the wear surfaces. The required opening and closing forces are reduced by up to 30 per cent. The mould tool, as an integral part of the preform system, contributes to the careful treatment of the highly stressed injection moulding machine components and so helping the mould and the press to a longer service life. At the same time the mould tool contributes to the growing trend towards higher numbers of cavities in machines with lower clamping forces – also helping keep investment costs down.

Hard to quantify, but real

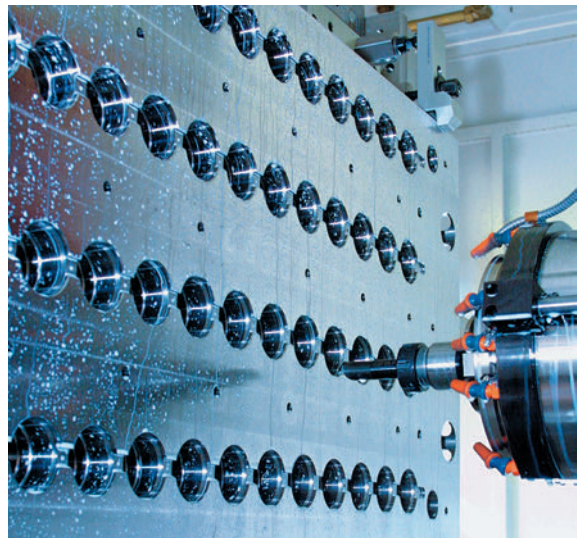
Hofstetter also pointed out to us several other arguments in favour of precision moulds – arguments that are perhaps hard to quantify in money terms, but are nevertheless real.

- Individual zone adjustments: the temperature of each individual nozzle is precisely and independently controlled. Hence the quality of the melt at each cavity is maintained equal. If one heater fails, the cavity is temporarily by-passed and linked to its neighbour, thus maintaining uninterrupted production.
- Energy savings: especially by minimising water consumption. The new Hofstetter tools use about 40 per cent less water, depending on their size.
- Average annual service availability of a precision-engineered tool is around 97 per cent.
- Longer life means an extended amortisation period, offering either reduced fixed costs, or alternatively a short or normal amortisation period resulting higher cash flow. Resale value of a precision tool is up to 20 per cent higher.

High quality standards have become the trademark of Swiss manufacturers. They have, as other manufacturers in the PET business, converted the unavoidable high cost structure into a marketing advantage and are offering added value to the customer – value that can be calculated and quantified. At Otto Hofstetter this has meant commercial success for 60 years.

Wolfgang von Schroeter

for PETplanet Insider



Automatic machining of a cavity plate.

It will be passed to the subassembly section in just a few hours.