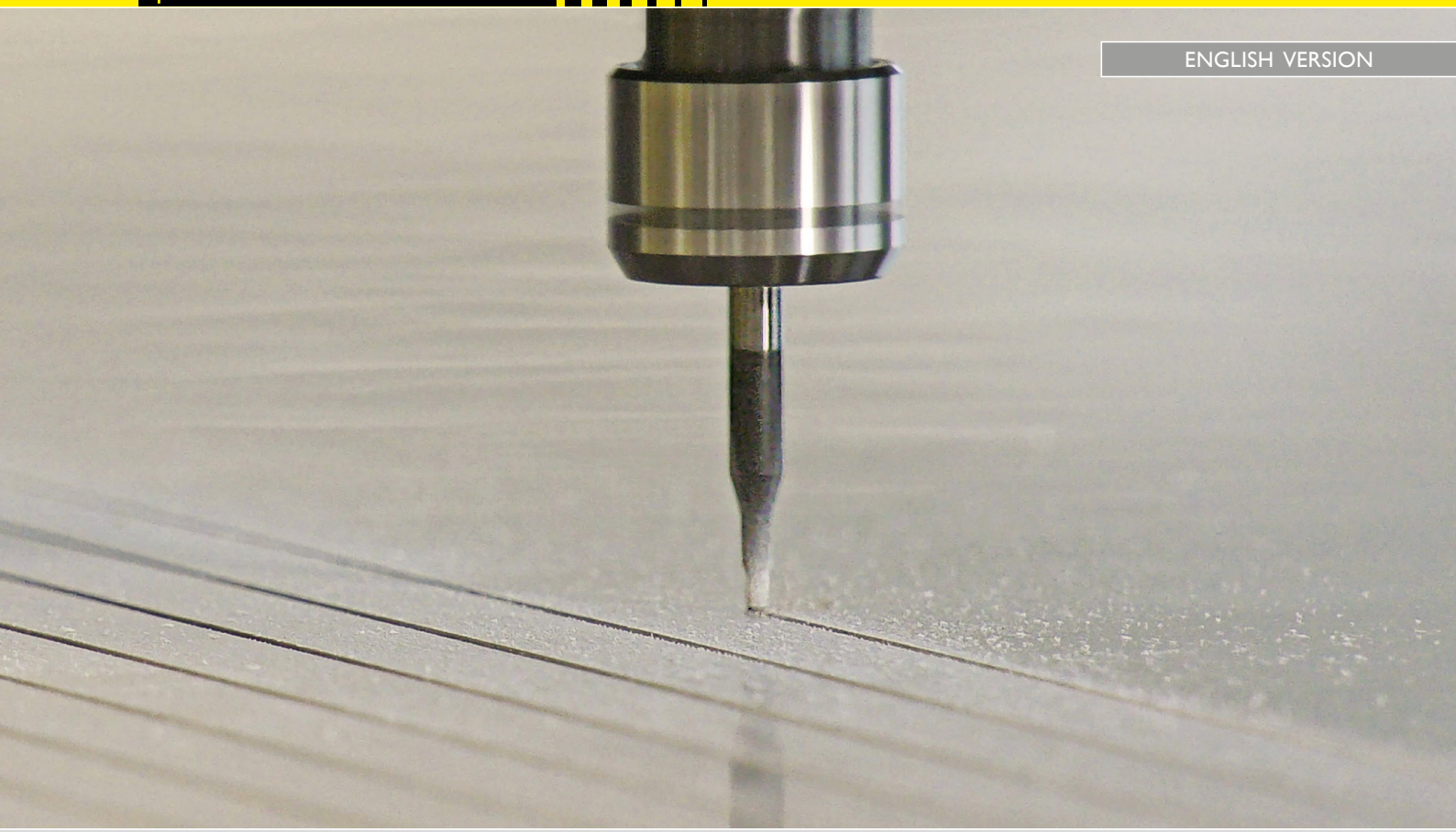
partner for success

ENGLISH VERSION



Higher quality and lower costs do not have to be contradictory.

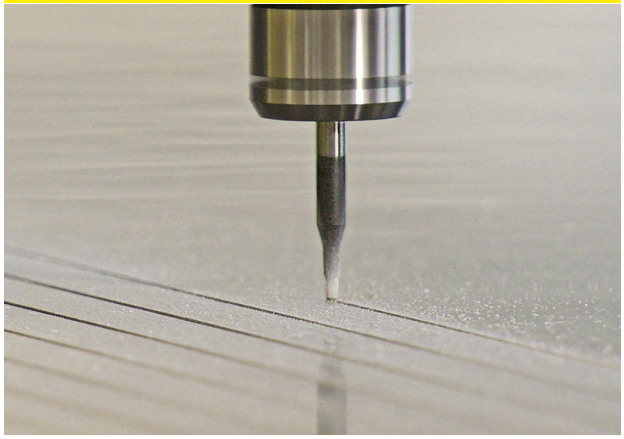
Milling cutter wear accounts for a high share of production costs during the production of Pertinax creasing matrices. In addition, tool wear in the production process always means a gradual decrease of the product quality. Fluctuating parameters in the creasing channels means a lack of process reliability for the diecutting industry and thus faults when filling vending machine packs. What is needed is cost effective production in a constant quality, and there is a matching solution for this requirement. Because tool wear and machine set-up time are the biggest cost drivers during the production of Pertinax creasing matrices.

CITO from Schwaig near Nuremberg carried out a study on this in its in-house DFG (Die Future Group) CENTER. This tested the service life of engravers that are commonly used in the industry compared to specially developed, high-speed channel milling cutters. The test was performed under identical manufacturing parameters. Channels were milled with a width of 1.3 mm and a depth of 0.5 mm. CITO BROWN Standard (simple glass reinforcement) was used as test material. The cutter plunged into the material horizontally. After a milling section of only 100 m, the engraver already displayed signs of wear and thus an associated loss of quality in the channel width and fraying of the channel edges.

More than 1,100 metres could be milled without any significant change in the quality of the channel using the CITO high-speed milling cutter. With a constantly high quality, the tool's service life could be improved by over 1,000 %. The fast wear of conventional engravers leads to higher costs. Longer service lives for quality tools reduce not only the costs for tool wear but also increases the efficiency thanks to shorter down times of the milling cutter due to the necessary tool swap. This better cost effectiveness makes itself noticed not just in the production of creasing matrices. The consequence of the constantly high quality of the creasing channel is ultimately reflected by the performance of the folding carton gluing machine and the packing system. Constant restoring forces or the uniform and symmet-

Engraver

CITO high-speed milling cutter



rical form of the creasing increases the smooth output of the packaging and carton auto-erecting machines, thus bringing a genuine benefit at the end of the production chain.

So what does this mean in the performance-oriented production of cutting dies? Up to now it has been difficult to determine the right time to change the milling cutter. There was no correspondingly accurate measuring equipment. The CITO CounterControl measuring device was used to constantly ensure the quality of the milling so as to identify deviations in the creasing channels and take appropriate counter-measures. Transferred to production, this means that not only can deviations be identified in the final inspection, the quality can also be improved by determining the correct time to change the milling cutter. This leads to some additional great savings on the cost side.

The following parameters were used in the study:

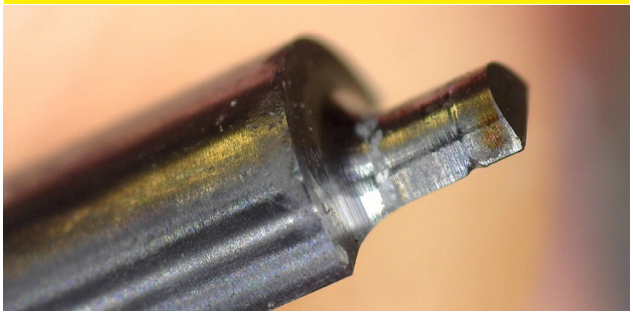
Feed:	66 mm / second
Plunge speed:	1 mm / second
Speed:	50,000 rpm
Processing depth:	0.5 mm
Milling strategy:	synchronous
Milled metres / plate:	100.16 metres
Miller ingresses / plate:	200
Milled plates / total:	11
Milled metres / total:	1,101.76 metres
Miller ingresses / total:	2,200

The conventional engraver was already so badly worn after 100 m output that the generally applicable tolerance in the crease width of 0.05 mm was undershot. The creasing channel with a nominal width of 1.30 mm was only 1.25 mm. After milling a further section of 100 m, the engraver was so worn that a channel width of only 1.18 mm could be achieved. After running for a further 100 m, in other words a total of 300 m, a channel width of only 1.14 mm could be measured. At the end of the test, after 1,100 m had been milled, the creasing channels milled with the CITO high-speed milling cutter displayed a deviation in the width of 0.02 mm, meaning that they were still within the tolerance range.

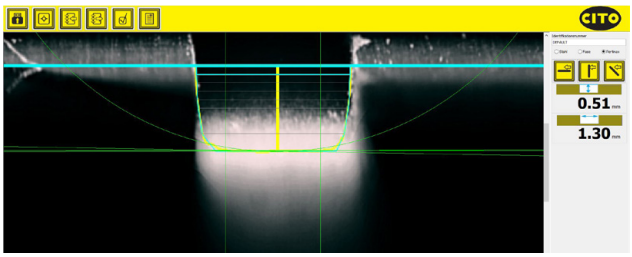
The outcome of the test is that constant quality and process reliability can be achieved whilst simultaneously reducing the costs. A win-win situation for cutting die production, the diecutting industry and packing businesses.

Jürgen Mariën

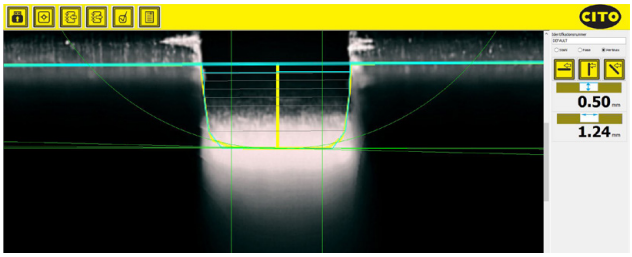
Engraver



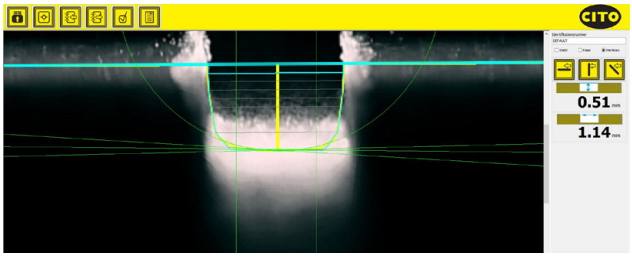
The photo shows the engraver with wear after 300 running metres. The result of this is a creasing channel whose width is reduced by 0.16 mm.



Milling result after 1 metre

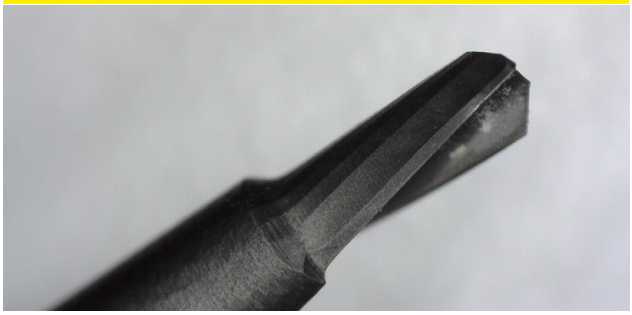


Milling result after 100 metres

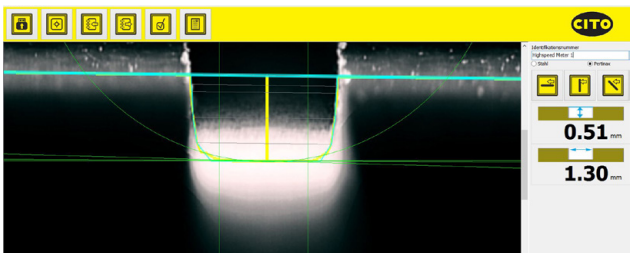


Milling result after 300 metres

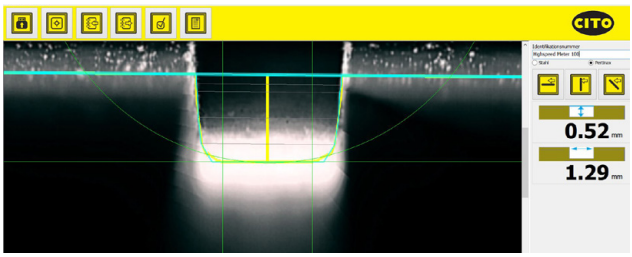
CITO high-speed milling cutter



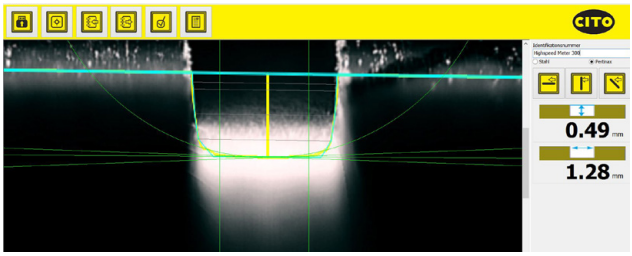
The photo shows the CITO high-speed milling cutter with wear after 1100 running metres. This only affects the width of the creasing channel by 0.02 mm.



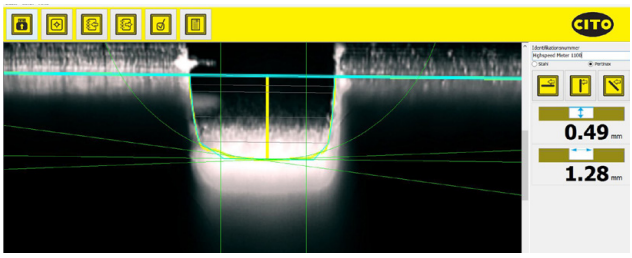
Milling result after 1 metre



Milling result after 100 metres



Milling result after 300 metres



Milling result after 1,100 metres