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Zimmer&Kreim GmbH & Co. KG
ZK EDM | ZK Automation | ZK Software
Beineäcker 10, 64395 Brensbach, Germany

Michael Huth, Leiter Vertrieb und Marketing
T + 49 (0) 6161 - 93 07 - 44
F + 49 (0) 6161 - 93 07 - 73
m.huth@zk-system.com
www.zk-system.com

News about Moulding Expo, 21.5 – 24.5.2019, Stuttgart

genius 900 NOVA is the winner in die erosion benchmark

During the comparison competition of Werkzeugbau Akademie Aachen (as part of RWTH Aachen) the *genius* 900 emerges as the clear winner:
In terms of processing time, accuracy and surface quality (Ra 1,1 / VDI 21)

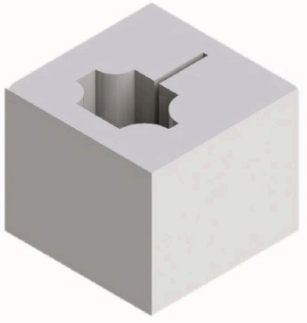
Exactly half a year ago at AMB in Stuttgart Zimmer&Kreim presented a new generation of eroding machines – *genius* 900 NOVA. The goal of the developers was to bring a machine on the market which would be the best in its class. And that was about speed, precision and availability.

The evidence is now provided. Parallel to the market launch, ZK took part in a comprehensive benchmark of WBA (Werkzeugbau Akademie Aachen). „We did not shy away from the challenge at this early stage“, explains Armand Bayer „because we knew from tests what these eroding machines could do.“

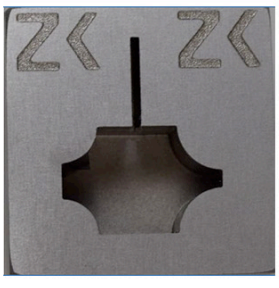
Benchmark with three OEMs and seven well-known tool manufacturers
The goal of this test was to make the comparison of industrially implemented programming strategies and machine parameters in order to identify the best practices for the entire eroding process. The following parameters were evaluated: production time, idle time, surface quality as well as precision of slot and edges.

Geometry is the key to everything!
The test processors simply did not have it: the benchmark geometry was determined by a neutral body. Decisive for the choice of geometry was that erosion poses a great challenge similarly for users and machines. At the same time, the processing should be completed within a day. The complete process chain (milling, determining offset data, machine setup, quality control etc.) was also taken into account.

Fig: Description of test geometry © WBA, Aachen



- Geometriegenauigkeit: +/- 0,01 mm
- Zielrauheit: VDI21 (Ra = 1,12 µm)
- Solltiefe: 10 mm
- Werkstoff: 1.2343 (zentrale Bereitstellung)



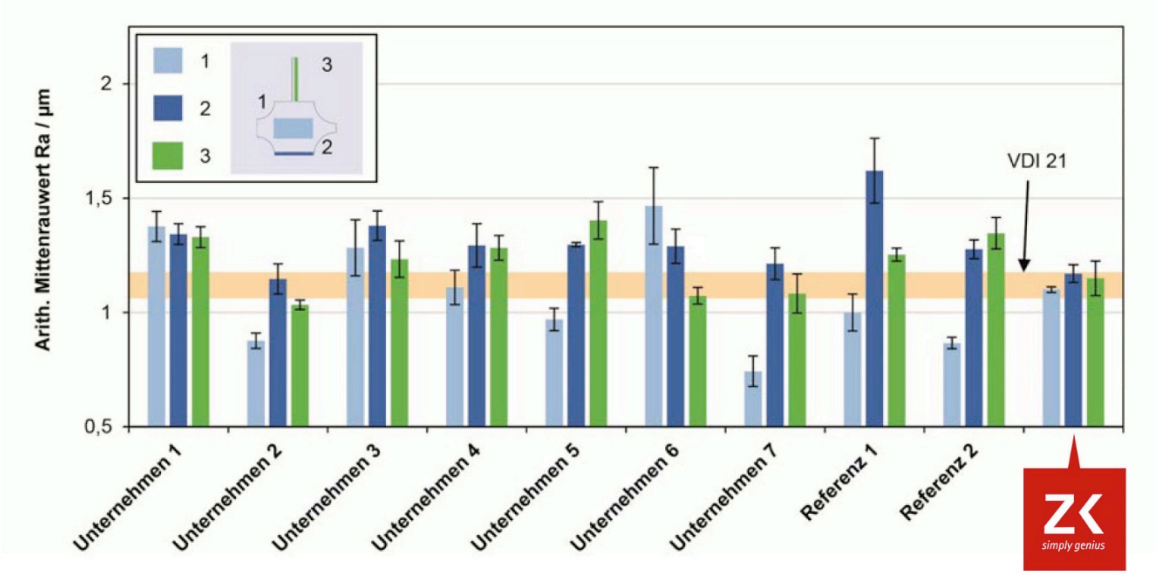
„Difficult geometries or different materials are not a problem for our eroding machines at all“, says Michael Huth, Head of Marketing and Sales. „All our machines in *genius* series have the same level of performance – with different table sizes and different designs, of course,“ underlines Michael Huth this distinct competitive advantage.

The *genius* generator and machine control make the difference

Among all evaluated results, the *genius* 900 NOVA was the only machine to reach the specified target corridor for the required roughness:
Ra 1,1µm – VDI 21 (the values for wall, floor and slot were used).

Since we were the only ones to achieve the required targets during the test, this was a confirmation for our developers. Of course, in addition to our outstanding precision landing, the researchers also define signs of the great scattering of other participants. Thus, large differences in measured roughness at various points in the electrode indicate a poorly adjusted deflection strategy at the finishing stages.

Fig: Evaluation of target corridor VDI 21 © WBA Aachen



Time and quality - the best production time with the best surface quality ever

The electrode eroded on the ZK-*genius* 900 NOVA was the only one to achieve the OK-test for further transfer to the process, while for other participants the electrodes would have had to be done again. The electrode was eroded to the required quality on the *genius* machine exactly in 1 hour and 35 minutes.

„If this value is also considered together with the qualitative result when achieving roughness and eroding slots and edges, every company knows that using one *genius* series machine allows to manufacture and produce four equally difficult electrodes in one day without loss of material and with transfer of those electrodes further to the process.“, adds Armand Bayer. In the light of high pressure of economic efficiency which the companies are facing nowadays, the investment in a high-precision machine pays off quite fast.

Fig: Evaluation of processing time © WBA Aachen

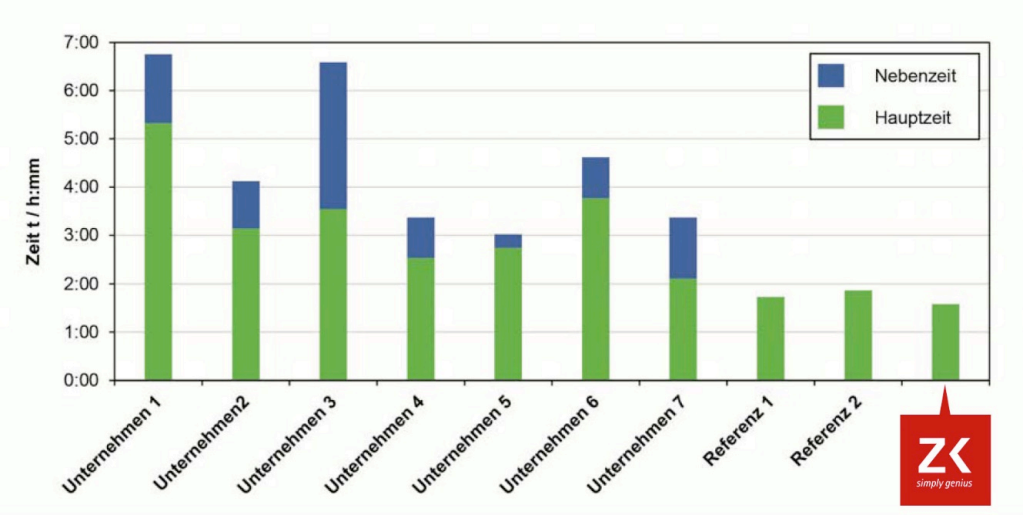
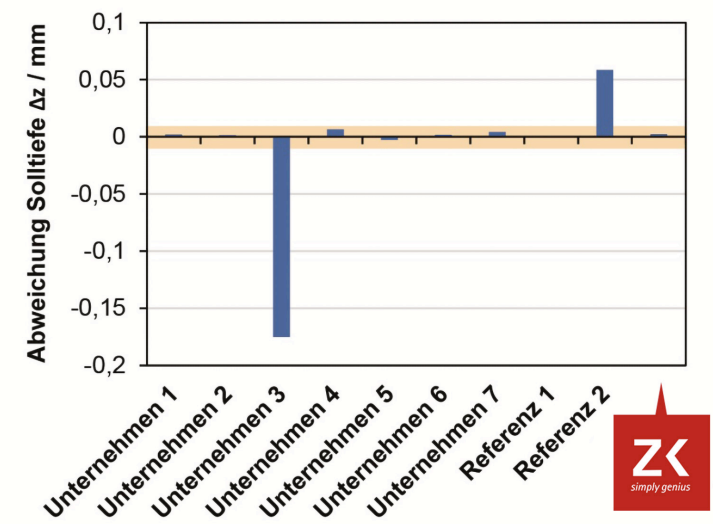


Fig: Deviation of target depth Δz / mm © WBA Aachen



Also for the target depth there were two significant deviations for different processing companies. According to the experts, this is caused by defective control measurement of the electrode which, on the one hand, leads to time-consuming reworking or, on the other hand, to non-compensatable electrode wear. Thermal influences may also be the cause in such a case. (thermal growth of the machine)

To avoid this, ZK has taken constructive measures in *genius* 900 NOVA. The thermosymmetric design and its high stiffness prevents dimensional deviations. Even in case of extreme temperature differences, the *genius* series ensures the maximum process accuracy.

Furthermore, ZK machine control enables the processing strategy and position data to be transferred directly from the CAD data. This creates a „digital twin“ of the 3D model which helps to avoid programming errors that lead to deviations.

There actually still seems to be a need to catch up. It is not without reason that the researchers suggest specific action recommendations to companies. Especially the difference in results between companies and OEMs – with the same machine technology – suggests that the transfer of knowledge has to be deepened here and the training courses have to be extended.

ZK Academy and training courses

The operators and users of ZK eroding machines already know it. Zimmer&Kreim attaches great importance to passing on its own expert knowledge to the customers. „We demonstrate how every user can get the most out of our machines and thus to achieve the optimal process flow and competitive advantages for its company“, explains Arman Bayer. „Because we want the processes of our customers to be extremely cost-effective.“ Additionally to qualified training personnel, ZK also makes the demo center in Brensbach available to every customer for conducting the tests**.**

A worthwhile check-up

For those who would like to get to know their machine or the entire process, Zimmer&Kreim organizes the visits the office in Brensbach where you can see the *genius* winning machine in action on site. This visit can be combined with a free check-up of your own machine constellation or with asking the questions about the entire process flow.

You can register quite simple by visiting the following website: https://www.zk-system.com/checkup/
Or by using the following phone number: 06161 9307 – 0
The detailed benchmark report can be found at: https://www.zk-system.com/wp-content/uploads/2019/03/Langfassung-Forschungsbericht-Senkerosion-RWTH-Aachen-2018-web.pdf