

Testing the cutting properties of drill bits

Do you know the cutting properties of your drill bits?

Do you want to compare the wear behavior of different cutting edge geometries?

With the test rig from the RMS, such properties can be measured quantitatively. This will help you to qualify your drill bits on the basis of objective measurement data and statistical evaluations.

In order to be able to simulate the cutting properties under different operating conditions, the test rig from the RMS allows you to freely select the feed force. Depending on the application, the drill bits can be pressed into the material with very small forces or even with more than 100 N. The material is pressed against the tool with the previously defined force by a rope mechanism. The drilling depth can be recorded over time by a displacement transducer. With this data, it is possi-

ble to calculate how fast the tool cuts through the material. If the pressing force is unknown, it can be evaluated in preliminary tests from the determined drilling speeds.

Due to the use of a tooling machine with a stable base, many different materials can be processed with high repeatability. Steel, cast iron and aluminium alloys or model materials for the simulation of selected applications can be used as test specimens. For medical technology, for example, the RMS uses bone models made of polyurethane foam, which can also have a corti-

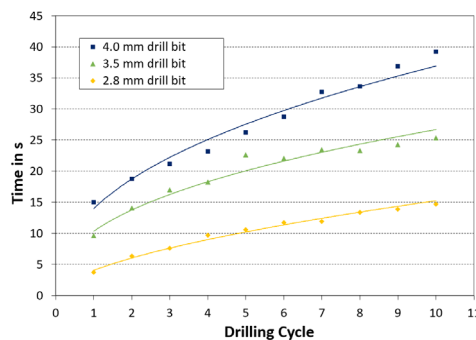


Figure 2: Cutting time of different drill bits over ten drilling cycles for a given drilling depth

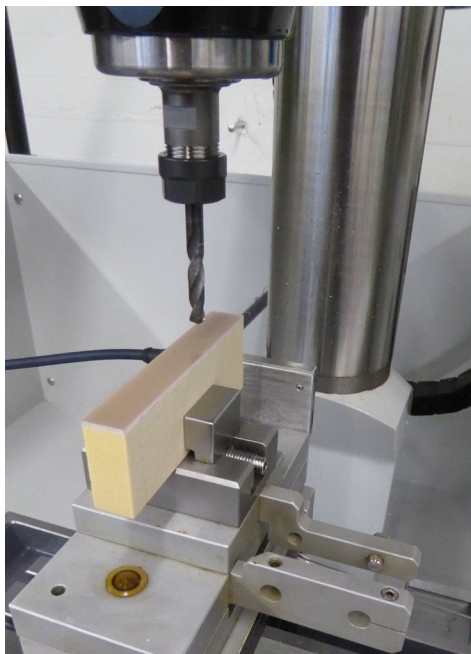


Figure 1: Setup of the RMS test rig on a «Fehlmann Picomax 21-M» tooling machine

cal replica, using an epoxy plate. It is even possible to use a Kirschner wire as a guide. The specimens can have a maximum width of 50 mm. In addition, the test rig offers the possibility of freely moving the specimens in the plane to reduce any possible influence of the clamping.

If the wear of the cutting edges due to mechanical loading is to be documented, light or scanning electron microscope images are a good choice. Such test series can be extended by adding defined cleaning steps between the drilling cycles.

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Info about the machine:

- Tooling machine «Fehlmann Picomax 21-M» with maximum speed of 6300 min⁻¹ (infinitely variable)
- Tool holders via Drill chuck or collet chuck possible (the latter with higher repeat accuracy)
- Maximum width of the Test block: 50 mm

Info about the measurement:

- Laser distance sensor OptoNCDT-ILD 1402 from Micro-Epsilon (max. measuring distance: 45 mm)
- Amplifiers & Software from HBM

Further analysis options:

- Stereo microscope M205A from Leica
- Scanning electron microscope Zeiss Sigma 300 FE with EDX analysis

Discuss your questions with us! We are happy to advise you.

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More information as well as our service catalogue can be found on our website.

RMS Foundation has been certified according to ISO 9001 and is an ISO/IEC 17025 (type C) accredited laboratory.

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