

Measurement technology for the tool interface solves machining problems

Milling processes often cause problems, but the cause research often goes in the wrong direction. The cutting tool is often held responsible for this, but this often results in expensive on-site service visits for the cutting tool manufacturer at the customer's premises, for which he is not responsible.



Just recently a well-known manufacturer of high-precision cutting tools asked us for help because his customer has used tool holders of poor quality to clamp their high-quality and „not cheap“ miniature tools. He himself cannot provide evidence by measuring the tool holders and has used our **Quality-Check** service to measure the tool holders of his customer.

The result was clear and most of the measured tool holders were outside the DIN / ISO tolerances. Not to mention better than ISO - which would be good for his very small tools. As a result, the end customer had to decide to buy the tool holders again. He ordered it from us with a certificate of the measured accuracy.

The Quality-Check has become an important part of our range of services and is increasingly being used by critical users. The customer's tool holders are measured and digitally documented with little cost. The customer then has a digital report to evaluate the measurement results and to be able to make decisions as to whether or not these tool holders can be used for the desired machining successes.

If runout problems occur, a number of influencing factors must be checked. First, attention is paid to the cutting tool, then to the tool holder and of course to the tool taper, then to the spindle taper, the spindle runout and the clamping force of the tool clamping system. When all of these influencing factors have been checked, the problem area has usually been identified.

For the measurement of HSK tapers, we offer mechanical multi-point measuring devices. With these devices, all functional dimensions of the HSK cone can be measured with accuracy of less than one micron in a matter of seconds. But the investment in such a taper measuring device is high with € 6,000-8,000 depending on the size of the taper. They are more likely to be bought by large companies and then used for regular checking of their stocks or new acquisitions. Machine manufacturers also have these devices on site for testing the cones that customers provide for commissioning the machines.

Some acceptance tests for a great system have already failed because the tool holders supplied by the end user were not in order. Manufacturers of cutting tools have also invested heavily in these measuring devices in order to be sure that tool holders do not destroy their tools at the user's location. And last but not least, the manufacturers of tool holders around the world use our measuring devices. And yet, poor quality comes onto the market. Although incomprehensible to us, it makes the competition a little easier for us.

One advantage of these devices is that they work without any software because only mechanical dial indicators are used.

For the Quality-Check service, we use digital probes instead of mechanical dial gauges. During the quality checks of the customer's tool holders, we found an average deviation from the DIN/ISO standards in over 30% of the existing tool holders. 70% rejects are also not uncommon.

An HSK taper is measured in the taper measuring device in relation to the face or the taper. The patented centering of the large and small cone diameter makes correct measurement child's play. Simultaneously with the taper measurement, the position of the clamping shoulder dimension l5 is measured and the ejection depth l6 is checked. And as a further delicacy, you can check the concentricity and roundness of the taper and the clamping shoulder in the same measuring process. With optional additional measuring devices, the gripper groove dimensions f3 and d11 and the concentricity of the tool side are checked at the same time.



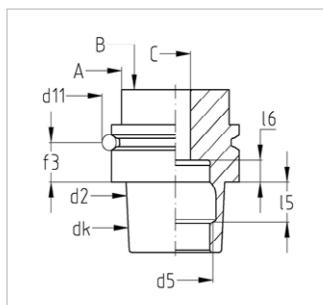
HSK Taper Gauge
HSK Master Taper



Ein HSK Kegel wird im Kegelmessgerät in Bezug zur Planfläche vermessen. Durch die patentierte Zentrierung des großen und des kleinen Kegeldurchmessers wird die korrekte Messung zum Kinderspiel. Gleichzeitig mit der Kegelmessung wird die Lage der Spannschulterschräge l5 vermessen und die Auswerfertiefe l6 geprüft. Und als weiteres Schmankerl kann man im gleichen Messvorgang den Rundlauf und die Rundheit des Kegels und der Spannschulterschräge überprüfen. Mit optionalen Zusatzmessgeräten werden im gleichen Zug das Greiferrillenmaß f3 und d11 und der Rundlauf der Werkzeugaufnahmeseite geprüft.



HSK Master



HSK Measuring Points

Pull Force Check of the Spindle Drawbar

Another critical point for the functioning of a milling process is the machine side. The most important and simplest cause research or preventive maintenance is the regular check of the pull-in force of the spindle.



Spannkraftprüfer

We offer mechanical clamping force testers for this. They are made entirely of steel and are therefore independent of the ambient temperature. A service technician can take the clamping force tester out of his vehicle and start measuring immediately without prior temperature control, regardless of whether it was extremely warm in his vehicle in summer or cold in winter. Simply set the dial indicator to "zero" and read the clamping force in kN. It's that easy. Today it is largely standard that the maintenance set of a machine also includes a clamping force tester.

Electronic clamping force measuring devices, on the other hand, must first be tempered and then calibrated before measurements can be taken. They cost a multiple of our mechanical clamping force testers and have to be serviced regularly. However, maintenance costs almost as much as a new device from us.

Runout Test Arbors

For the radial run-out test of the spindle and the alignment of the spindle or the machine axes, we offer multi-certified test arbors. The test arbors are manufactured with the highest precision using special processes. The face runout of a test bar must be under 0.5 microns, otherwise the runout of the shaft will be too high. The measurement and certification takes place on a professional level in our calibration laboratory.

Our customers often send us mandrels from other manufacturers for annual calibration. Very often, however, they have anything but the accuracy confirmed in the certificate. Most of the time they are given a brand name, although this brand manufacturer did not even produce the test arbor. But they bought it in good faith with a certificate from a supplier. A fatal circumstance that often leads to incorrect measurements and wrong decisions.

Due to many such cases, most of the well-known machine manufacturers buy their test arbors from Diebold today. And so that they may easily be recognized as a Diebold-Goldring quality product, we have given them a gold ring, our trademark for quality. The user will be satisfied when he has a Diebold test arbor in his hand with which he gets an absolutely reliable measurement result.



Runout Test Arbors



Diebold Quality-Check of HSK Tool Holder Tapers

Tool Holders with HSK taper are high precision tools that need to be measured periodically. They may have worn out or have been damaged.

We inspect your tool holders according to the DIN-ISO standards:

- Taper dimensions
- Inner contour
- Runout

Why is precision so important?

- Higher output of your machine
- Better work piece quality
- Less spindle wear and service cost

Things to be avoided:

- Machine down time
- Vibrations during machining
- Quality issues
- Service costs



www.HSK.com

Helmut Diebold GmbH & Co. • Goldring-Werkzeugfabrik • An der Sägmühle 4 • 72417 Jungingen
Tel.: +49 7477 871-0 • E-Mail: info@hsk.com



HSK Tool Holder **PLUS-CHECK**

- Visual inspection
- Cleaning of the tapers
- Measuring with digital gauges in air-conditioned environment
- New packaging

What you get:

- Table of all measurements (electronic)
- Marking of "no-good" tool holders
- Part-ID. No.
- New packaging

HSK Tool Holder **PLUS-CHECK**

- Visual inspection
- Cleaning of the tapers
- Measuring with digital gauges in air-conditioned environment
- New packaging

What you get:

- Table of all measurements (electronic)
- Inspection protocol of all tool holders and dimensions (electronic)
- Laser marked serial no.
- Marking of "no-good" tool holders
- New packaging

***Only the use of tested and certified tool holders that
are according to the standards will make your
machining accurate and profitable.***

Price table *	BASIC-CHECK (€) per piece	PLUS-CHECK (€) per piece
10	21,30	24,60
50	18,40	21,40
100	17,20	19,90
500	15,00	17,50

* Minimum quantity 10 pc., pre cleaned and oiled for shipping

Delivery after receipt (working days)

- | | | |
|---------------|---|---------|
| < 100 Stück | = | 5 days |
| 100–300 Stück | = | 7 days |
| > 300 Stück | = | 10 days |



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Don't hesitate, use our Quality-Check service and get your tool holders inspected.

Details and prices for the quality check can be found at the end of this report.

If you would like to have the condition of your tool holders checked, please contact our sales manager Jan Bidlingmaier by e-mail at j.bidlingmaier@hsk.com or by phone at **07477-871-712**.



Video:

Diebold mechanical Pull Force Gauges

<https://youtu.be/OcX58cOftsY>



Video:

Der Diebold Qualitäts-Check

<https://youtu.be/qX1TyF6t2N0>

Helmut Diebold GmbH & Co.
Goldring Werkzeugfabrik

An der Sägmühle 4
D-72417 Jungingen

Telefon +49 (0) 7477 871 - 0
Telefax +49 (0) 7477 871 - 30

E-Mail info@hsk.com

www.HSK.com