

What to do if the interface between the spindle and the tool holder is not functioning right? The solution: Take measurements!

The Diebold Quality-Check

As a part of our services, we offer professional inspection of your tool holders. Send your tool holders to us and we will inspect and measure the tapers. You will receive protocols for each tool holder and a list of all documented measurements. This service was developed at the request of customers, because their tool holders and thus their machining processes cause problems, but the user cannot identify the reasons himself. Many customers have asked us to check their stock of tool holders and to evaluate the measurement results so that they can take decisions as to whether or not these tool holders can be used for the desired machining operations.

We are happy to carry out this service for you. If you are interested, please contact our service department by e-mail at service@hsk.com or by phone at +49-7477-871-712.

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

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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

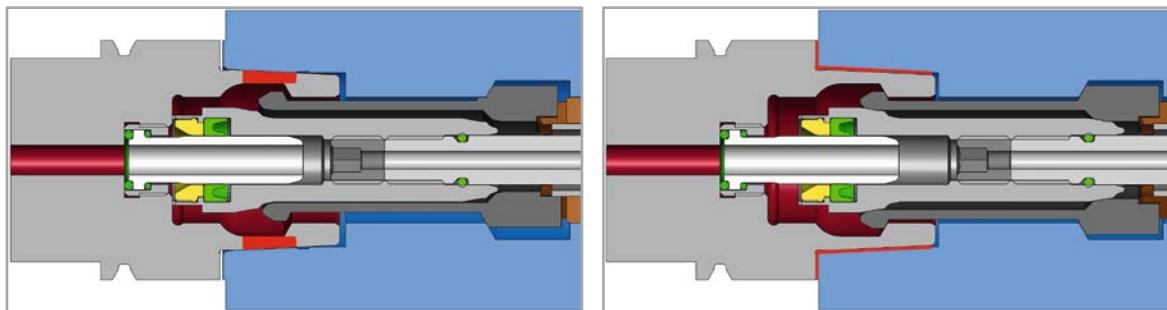
Delivery after receipt (working days)

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



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HSK Taper unclamped and clamped position

Modern High-Performance machine tools are mostly equipped with powerful High Frequency Spindles with HSK tapers. For optimal use of the technical capabilities of HSK tapers, it is necessary that the spindle taper and tool taper are fitted optimally.

There is a very wide range of different HSK tool holders on the market for tool holders, unfortunately also characterized by enormous quality differences. The user can often only recognize these differences when his machining process does not work or no longer works. The requirements for the very precise HSK interface are high and therefore runout problems lead to poor machining results or make it impossible to meet the required tolerances on the workpiece. These problems appear more clearly the more precise and powerful the machines are and depending on the level of accuracy the user wants to achieve with his machines.

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

For the measurement of HSK cones in-house by users, we offer mechanical multi-functional gauges that allow to measure HSK tapers and functional dimensions with micro-precision.





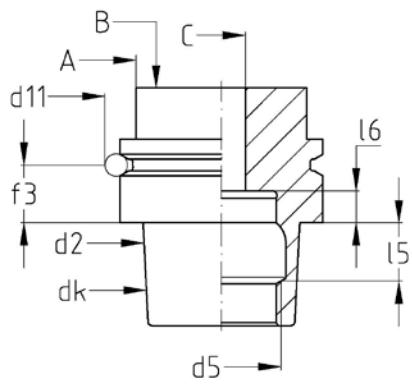
HSK Taper Gauge analog



HSK Master Taper

We have now digitized these mechanical measuring devices for efficient checking of tool tapers, and customers receive a clear documentation of the measurement results.

During the first "quality checks" of customer tool holders, we found out that an average of 30% of the existing tool holders are not to ISO/DIN specification. This is such a serious figure that we have decided to digitize our HSK taper gauges and offer the measurement of tool holders professionally and cost-effectively as a service. An HSK cone is measured in relation to the tool holder face. The patented centering of the large and small cone diameters makes the correct measurement easy. At the same time, the position of the clamping shoulder dimension l5 is measured and the push-out length l6 (ejector depth) 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 additional adaptors, the V-Flange dimensions f3 and d11 and the concentricity of the tool holder side are checked.



HSK Measuring points



HSK Master Taper

The Master Tapers are manufactured with the highest precision at Diebold. The calibration and certification takes place on a professional level. Diebold owns "Master Masters" that

have been calibrated and certified by several internationally recognized measuring institutes. On the basis of these master setting gauges, we produce masters of the highest accuracy level. When checking your tool holders, you have the certainty that the measurements were correct and are professionally documented. With these measurement results, you have the basis for decision-making to ensure that only HSK tools that meet the standards are used on your machines.

The basis for the production of high-precision measuring devices is our fully air-conditioned building, which despite the energy-saving technology is kept at constant 21 Celsius degrees all year round. Inside this building, a precision measuring room of quality class 2 with two PMMC measuring machines from Leitz is installed. The temperature constant in this measuring room is exemplary with +/- 0.2 degrees Celsius per meter. Traceability to reference standards of the DAkks (German Accreditation Board) is installed.



Leitz PMMC in Class 2 Room



Diebold Factory with air conditioned building

The mechanical taper measuring gauges are used almost everywhere in the world where HSK tools are manufactured. But still significant quality differences are of tool holders available on the market are still the rule, not the exception. The problems grow when the user does high-precision manufacturing, micromachining or works in the optical industry. Tool holders at first glance are not so important, but get very important when it comes to

achieving tight tolerances on the workpiece. Many processes do not work at all if the taper angle, the face contact or the inner contour of the tool holders is not at least within the ISO tolerance.

The main strength of these gauges is the simple and methodical operation, so that errors in measurement can be safely avoided. Well-known manufacturers of cutting tools became aware of the possibilities of finer measurement of their tool interfaces via the cone measuring devices. There are various modular systems on the market in which cutting tools are provided with a cone with a face contact and a screw thread. The measuring task is very similar to measuring HSK cones with a face contact, so it was only natural to build a variant of taper gauges based on our patent, that exactly meets the needs of these cutting tool manufacturers.



Taper Gauge for Cutting Tools



Milling Cutter with Face Contact

So far, manufacturers have worked with fairly good measuring equipment, but measuring the relationship between the taper and the face contact was not easy. With the taper gauges from Diebold this problem is solved perfectly.

Other problems arise when machine tool manufacturers work on the acceptance of the new machines. Very often the tool holders are supplied by the machine customer and they are anything but made with the necessary accuracy. You cannot blame it on the user, he has certainly acquired these tool holders from the dealer he is confident with, but dealers usually do not have the equipment to check the tool tapers for accuracy. If faulty tool holders are used here, this often leads to unexpected delays and in many cases to a difficult acceptance process for the machines. We experience this very often when machine manufacturers call us for help and ask for support. Sooner or later, they will be forced to purchase the appropriate inspection gauges in order to be able to check the accuracy of the tool holders that have been provided for the machine acceptance process.

Do not hesitate to use our Quality-Check Service