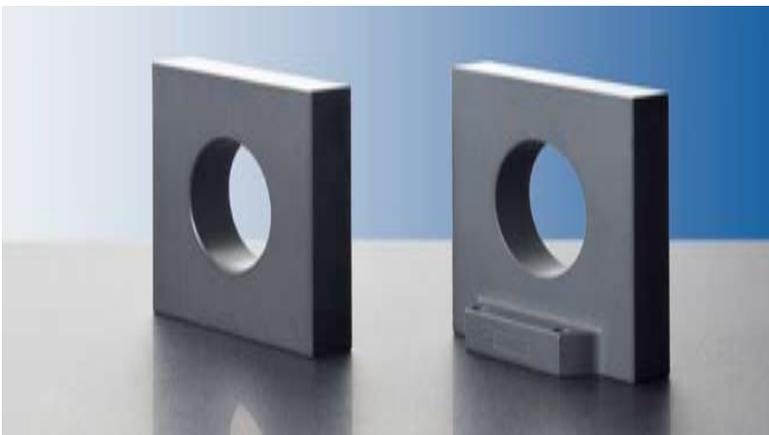


Test squares for machine calibration



Test squares for the calibration of machine tools

■ Machine tools with rotary and tilting axis are today's trend. However, the calibration of these machines is up to now still mainly carried out with common hard stone test squares, which is not ideal due to common reasons. With the new test squares from Kunz precision these calibrations can be carried out considerably faster and with highest accuracy.



Ideal design

New designs serve new purposes. Basically one can differentiate between two models, type A with a wide base and type B without a base. The wide base of type A guarantees a good stability, and with the fixation holes the test square is fastened onto the machine table, so that the table can be tilted towards all sides and also moved at high speed.

Convenient application

Contrary to common hard stone test squares, which offer only limited options due to their design, there are now four, or respectively three highly accurate surfaces available for measuring. The angle error of the axes among each other and the one compared to the surface of the table, as explicated in the DIN standards, can now clearly be separated and demonstrated.

Extraordinary high accuracy

Like all the measuring equipment from Kunz precision also these test squares are manufactured in highest accuracies and are exclusively provided with a certificate SCS (Swiss Calibration Certificate).

The importance of such high precision

Measuring equipment, which is applied for the calibration of machine tools, have to be at least five to ten times more precise than the tolerance, which is to be measured. To meet the ever-rising requirements in accuracy with increasingly small tolerances, it is clearly evident, that also the measuring equipment has to adapt and be improved.

Additionally today electronic measuring probes with high resolutions such as 0.1 μm are taken advantage of when it comes to the measurements for machine acceptances. The measured deviation therefore can be extrapolated with the according test equipment onto a larger measuring length, whereby the measuring equipment is again granted a significant role.

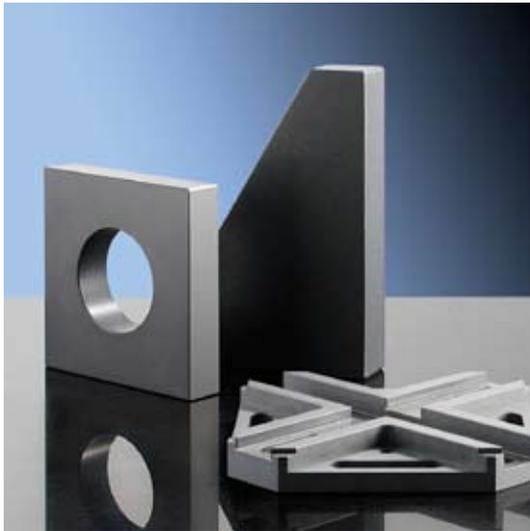
Calibration

The measuring methods, which are applied at Kunz precision for the measuring and calibration of test squares, are especially conceived for this task and belong world wide to the most accurate testing methods of its kind. It comes without saying that this demanding work is carried out exclusively by highly qualified specialists in top-quality air conditioned measuring laboratories. Only like this the incredible high accuracies including the necessary reliabilities can be realised.

Material

The test squares are manufactured in materials, which are most suitable for the each relevant measuring task. There is a choice of the following materials: Fine-grained hard stone, ceramic, special aluminium with a hard surface and hardened steel. Hard stone is still a good choice for standard solutions. The hard stone used by Kunz precision is extremely fine-grained and resistant to abrasion.

Aluminium is best suited for the test squares of type A and B due to its fine structure of the material itself and the even spreading of temperature. By the implementation of a special surface treatment extreme hard surfaces, with depths of layers of less than 0.1 mm can be achieved.



Surfaces

Thanks to unique lapping procedures the measuring surfaces, especially with Aluminium, can be lapped as smooth as mirror glass. This has a positive effect on the accuracy and is suitable for high-precision realisations.

Measuring of rotary axis

These high accuracies allow the implementation of test squares (type B) for the calibration of the four 90-degree angle positions of rotary axis. The lateral bearing surfaces of this realisation are herewith geometrically correct right angled against the measuring surfaces and

thanks to the fixation holes the test square can also be mounted lying onto the machine table.

Nominal dimension with allowance

All the test squares are approx. 10 mm longer and higher than the nominal dimension. With a test square 200 for example the whole measuring length of 200 mm can be fully utilised.

Rounded edges

The edges are rounded so that the measuring surface can be measured smoothly with a probe, which is protuberant for about 1 mm, without having to lift off the probe.

Available qualities

There are three standard qualities available: 2 μm , 1.5 μm und 1 μm . At customers request even higher accuracies up to 0.2 μm can be realised.

The specified accuracies refer to the flatness, parallelism, squareness and straightness of all the measured surfaces. For parallelism, squareness and straightness the one line in the middle of the measuring surface is relevant.

Make use of the profitable advantages of the new generation of test squares from Kunz precision. With the new test squares you calibrate your machine tool significantly faster and more precise.

Advantages compared to conventional test equipment

- Option for fastening directly on the machine table (Type A)
- Big base (Type A)
- 4 measuring surfaces in μm - accuracy
- Calibration SCS
- The test square is bigger than the nominal dimension, so that the nominal dimension can be measured at its full size.
- Geometrically correct lateral surfaces, the test square can also be utilised lying, for example for measuring the angle positioning error (Type B)



■ «Measuring and calibration to the highest precision is our daily challenge. The fascination of measuring technology motivates us to meet the most demanding requirements of our customers both now and in the future.»

Ernst Kunz



Riedtalstrasse 16
CH-4800 Zofingen
Switzerland

Telefon: +41 (0) 62 746 00 20
Telefax: +41 (0) 62 746 00 21
E-mail: mailbox@kunz-precision.ch
<http://www.kunz-precision.ch>