

## INNOVATION

### **Automatic check of ball-threaded spindles**

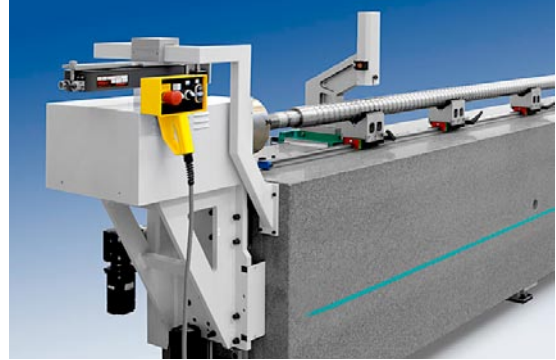
To check precision of lead screws, Kunz precision AG has developed a spindle testing machine with a totally new concept. The innovative machine features a simple construction, an easy handling as well as a very high accuracy. With a measuring length of 8000 mm it belongs to the longest spindle testing machines in the world.



The basis of this machine is a high-precision hard-stone with a length of 8.40 meters. On the one hand, this hard-stone acts as a support for prisms in which the spindle is held. On the other hand, the surface in combination with the side surface forms the guidance for the vacuum air bearing carriage SL200, on which the measuring equipment is installed.

## The measuring procedure

For measurement the spindle is taken up in a three jaw drill chuck and is turned with a constant speed. The drive mechanism has a precision bearing, a DC-motor as well as a high-precision angle measurement system. In order to keep the correct centre height at different spindle diameters, the drive unit is installed on a vertical CNC axis.



The on the carriage installed vertical axis retracts with a probe into the thread of the threaded spindle. The measuring slide – which is very smooth-running due to the special vacuum air bearing – follows the outline exactly. Just over the spindle the laser interferometer is installed, which collects the longitudinal position with a very high accuracy. With this new method measurements can be implemented with an incredibly high precision.

## The measuring software *K-mess*

The control mode of the automatic measurement procedure as well as the evaluation are carried out with the special, newly developed Windows-software *K-mess*. The measurements are carried out dynamically, which means that per rotation several hundred points can be recorded and calculated. At the push of a button the total variance, the irregularity over 300 mm and the variation per rotation are released on a clear measurement report. This interpretation includes tolerances after the different categories of DIN 60051 as well as client-specific standards.

With this new technology lead screws with all different dimensions can be measured very efficiently and with highest precision. Needless to say that also shorter devices can be built up with the described machine concept.

## Primary specifications

Typ	STM 8000
Total length	9000 mm
Machine weight	8500 kg
Measurement range	8000 mm
Diameter	20 - 125 mm
System accuracy	$0.5 \mu\text{m} + 1.5 * 10^{-6} L$ (L in meter)



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