

**Florian Westermann**  
Management Assistent

EGIN-HEINISCH GMBH & CO. KG | HENSCHELSTRASSE 8 | 34311 NAUMBURG

*TO WHOM  
IT MAY  
CONCERN*

+49 5625 9210 117 T

+49 151 18052143 M

f.westermann@egin-heinisch.com E

## RENISHAW QC20

# MACHINE GEOMETRY ON THE TEST STAND

DEAR SIR OR MADAM,

As a service provider around the topics of motor spindles and machines we regularly determine whether there are any faults in the bearings, the taper geometry or the tool machine.

The range of possibilities for our Renishaw QC20 ballbar system is broad. After the initial configuration is done, the measurements can be taken out simply in regular intervals. We present you the results in a graphic form and submit proposals for a measurable improvement of your machine output. In combination with the vibration measurement of you spindle you achieve a holistic picture of your machine. Your advantage: you identify weaknesses and problems at an early stage and no longer have to fear machine downtime.

## DIAGNOSIS OF MACHINE GEOMETRY SINCE 2015

From our many years of experience with machines and main spindles, we choose a holistic approach to diagnose defects and failures as well as spindle damage.

Examples of such defects are:

- contouring errors
- stick-slip-effects
- backlash
- repeat accuracy
- measuring errors
- geometrical errors

Damages to the main spindle of a machine tool for example can be the result of abrasion of the machine



guideway or lots in the axis but also of backlash of ball roll spindles.

Due to high position differences and backlashes of ball roll spindles, micro vibrations will appear and take effect on the lifespan of the main spindle bearings.

Geometrical irregularities, a changed mandrel position or a misalignment of the machine guideways are all possible reasons for a poor surface quality after processing. Another consequence lies in short downtimes of the machining tools. This all leads to an increased radial and axis exposure of the main spindle units.

### REPAIR OR EXCHANGE SPINDLE NOT ALWAYS THE BEST SOLUTION

We see machine tools with a holistic approach. Since many years, EH ServiceCompany carries out mandrel- and axis measurements and identifies the mandrel position of a spindle in X/Z and Y/Z.

In the same breath we record the concentricity and obtain a valid assessment of the general condition of your machine.

We have discovered time and again a close relationship between

- machine geometry and spindle damage

as well as between

- maintenance condition and spindle damage

In short, a spindle damage rarely arises from problems with the spindle itself or the lifetime of the bearings, but also in other machine issues.

### WHAT DOES RENISHAW QC20 HAS TO OFFER?

One thing beforehand: with a CNC machine with an error-free positioning

accuracy the actual circle would exactly match the programmed circle.

Once it is found, that the positioning accuracy of the machine is right, a Renishaw ballbar test gives us the possibility to distinguish exactly between the machine and spindle. This is due to the latter will not take part of the test and only holds the measuring system.

Thus, errors of bearings, conical shape or a lack of clamping force can completely fence off other possible issues on the machine.

This insight makes the use of QC 20 to a measurable gain for a holistic view on machine tool geometry and spindle condition.



In practice, there are many factors in the machine geometry or the steering, which can cause effects on the radius of the test circle. More over, abrasion can lead to deviations from the circular shape.

With the Renishaw Quickcheck QC20 ballbar system we are able to measure actual circle tracks and compare them to programmed track to obtain a clear picture of the machine's precision.

### WHERE DO THE MEASUREMENTS TAKE PLACE?

To carry out measurements with our Renishaw QC20 ballbar testing system, we need a free working table and a functional steering. It must be possible to perform an axis interpolation.



The QC20 creates a link between machine and diagnosis unit via Bluetooth which makes cables unnecessary.

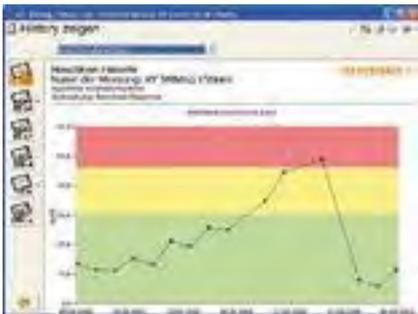
How is the measurement performed?

- for the typical measurement, the machine tool must perform two circles – clockwise and counterclockwise
- in practice before and after the measuring circle an additional bow will be added due to acceleration and slowing down of the machine
- by the use of extensions the measuring radius will be chosen regarding the size and sensitivity and certain characteristics. Big radii can be used to highlight geometrical

errors, small radii react on contouring errors and delays.

- after the configuration is done once, a standard measuring can be taken out

**HOW WILL THE RESULTS APPEAR AND BECOME TRANSPARENT?**



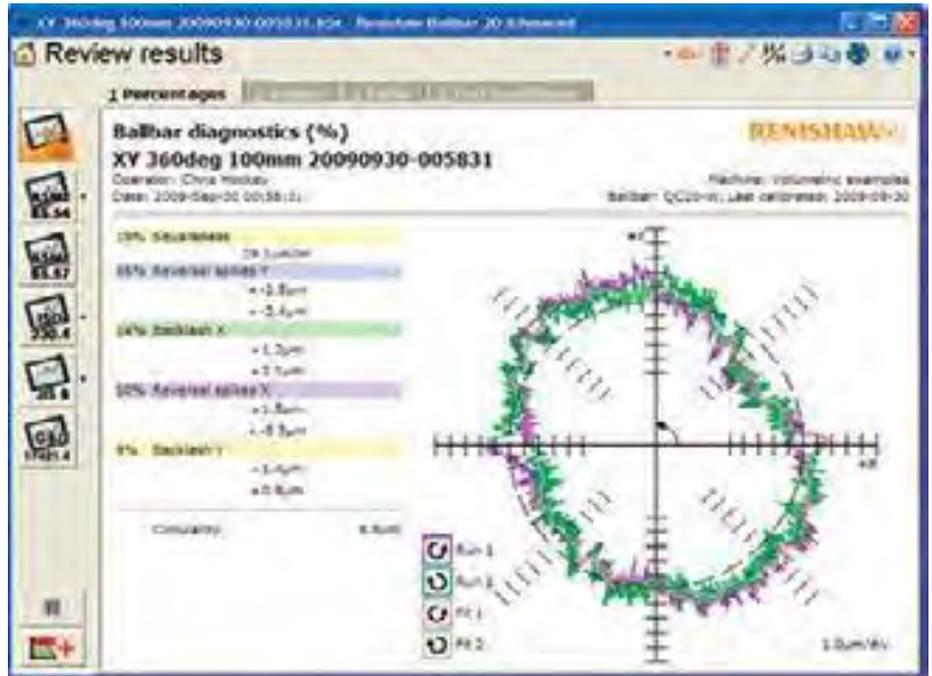
The measuring results of the Renishaw QC20 can be evaluated within a few minutes and can more over be charted out.

**What are the advantages of the Renishaw QC20?**

By using a QC20 the staff of EH ServiceCompany recognizes every form of wear or damage on every type of machine tool.

**How to use the QC20 in the field of interval checks?**

Thanks to the Renishaw QC20 we are able to record a whole history of your machine and recognize damages at an early stage. Changes lead to proposals for an optimization of your system.



Of course all effects of our work will be documented exactly. In combination with an analysis of main spindle's bearings, the QC20 is the perfect addition for maintenance and provides you with reliable findings on the machine's condition.

**A „status report“ for your machine**

By using QC20 we provide you with:

- a complete chart of machine precision over a free definable period
- a simplified planning of maintenance intervals to avoid machine downtime
- the setting of individual markers for warning and intervention according to the individual machine characteristics

- the instant reporting when exceeding the limits, even during the ballbar test
- the basis for quick decisions and approval of the machine
- an exact documentation of the precision improvement after maintenance
- the monitoring and correcting of weaknesses and recurring problems
- scalable charts and focussing on certain details for printing or the use inside a Windows®-framework.

**Affordable QC20 measuring**

Our QC20 measuring will be charged with a hourly rate of 95 €. With that, we provide a highly welcome and affordable addition of our wide scope of services.

Feel free to contact us!

EH ServiceCompany.