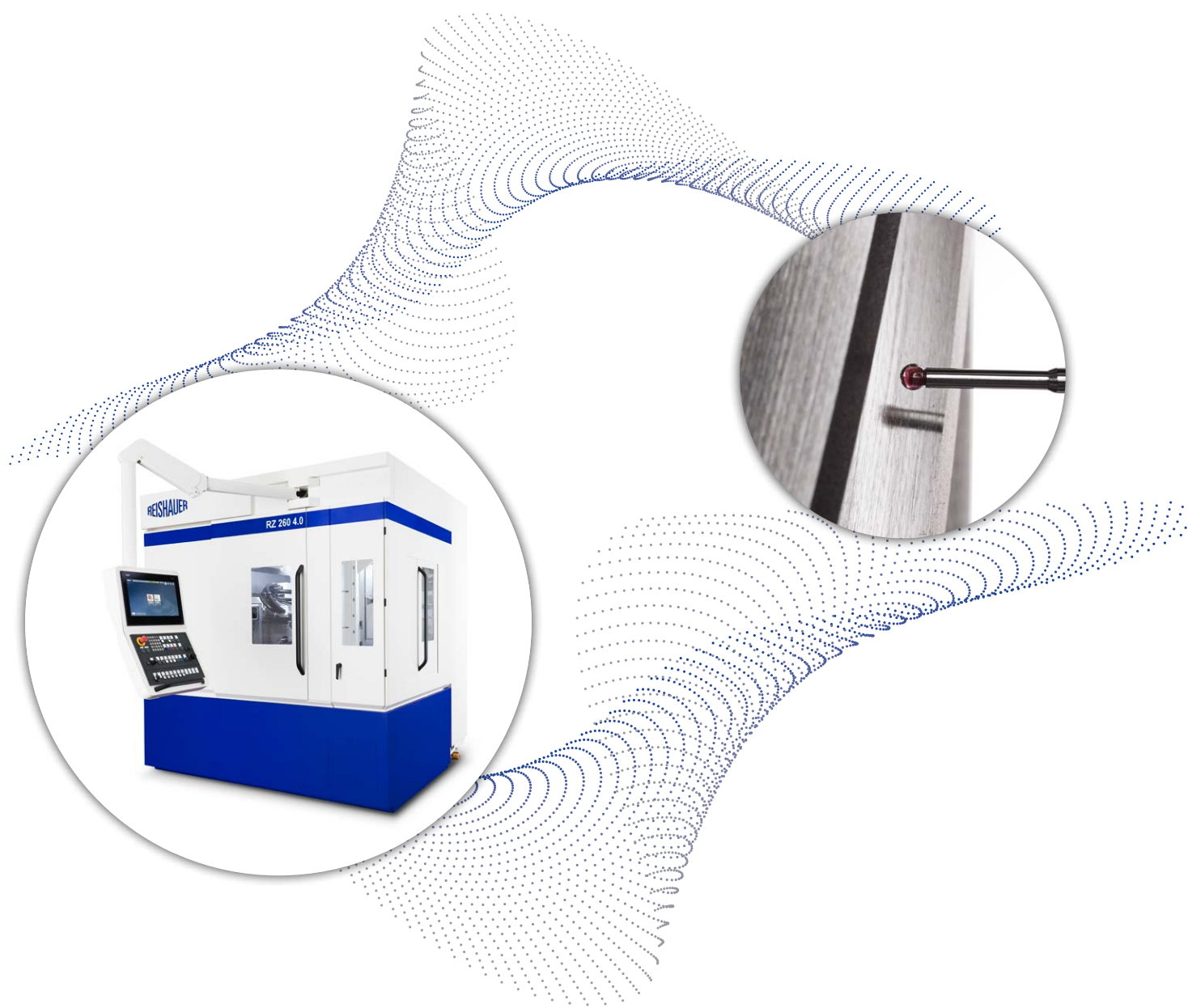


REISHAUER

Gear Grinding Technology

GDE-based Closed Loop



MACHINES

AUTOMATION

TOOLING

TECHNOLOGY

DIGITAL

SERVICES

Grinding and measuring closely geared



Grinding and measuring closely geared

It is essential for grinding and measuring to be closely linked. Every time grinding processes are set-up, they always include a comparison between the desired or target characteristics, and the actual characteristics of the gear being ground. Setting up the grinding process is completed only when the gear has the desired, target characteristics. In the analogue exchange of target and measurement data, every parameter is entered manually on both sides, enabling misinterpretations or incorrect entries to occur, which can lengthen the set-up process, and thus delay the start of production.

Process stabilization through digitization

In the course of digitizing this process, we have defined a format that enables cross-platform communication to take place. The GDE format (Gear Data Exchange Format according to VDI/VDE 2610) is used as the interface between grinding and measuring systems. This not only reduces sources of error, but also eliminates time delays due to the direct and clear comparison of target and measurement data.



One goal of the still young GDE format is the fully automated control loop, which eliminates the need for manual intervention. Reishauer is directly involved in further developing the Gear Data Exchange (GDE) format.

Gear Data Exchange capabilities:

- semi-automated setup of the manufacturing process
- digital process control, increase in overall process capability
- automatic measurement program generation
- digital measurement protocols ensure 100 % traceability
- automatic, digital data collection for QA and AI (KI)

Direct, clear comparison of target and measured data

The GDE file guarantees clear target data transfer between the grinding machine and the measuring device. The subsequent transfer of the measurement data to the grinding machine forms the basis for calculating the automatic correction suggestion.

Automatic Correction Suggestion

From the deviations of the target values transmitted via GDE files, suggestions for correction are automatically generated in the grinding program, and offered to operator staff for confirmation. These can be taken over directly, or only after values have been changed manually.

REISHAUER RZ260

gear m3 - Measurement value input

Dimension correction

Profile and lead corrections

Profile angle correction

	Left flank	Right flank
Measured values f_{Hp}	-5.8	2.2
Nominal value C_{Hp}	0.0	-7.0
Total correction	5.8	-9.2

Lead angle correction

	Left flank	Right flank
Measured values $f_{H\beta}$	-5.7	1.3
Nominal value $C_{H\beta}$	0.0	-10.0
Total correction	5.7	-11.3

Lead crowning correction

	Left flank	Right flank
Measured values C_{β}	7.5	8.5
Nominal value C_{β}	10.0	5.0
Total correction	2.5	-3.5

EXTENDED CORRECTION INPUT EDIT ACTIVATE BACK

To visualize the results of the measurements, they can be accessed at the grinding machine in PDF form. This saves dealing with reports on paper, and also guarantees the correct machine and workpiece assignment. In addition, this visualization serves as a control function, supporting the operator in his decision about whether manual adjustments are required.

Definitions (depending on GDE version)

- reference area
- sign definition
- measurement instruction

Measurement / correction data (partly spindle-specific)

- lengthwise crowning C_{β}
- lead angle $C_{H\beta}$
- profile angle $C_{H\alpha}$
- diametral measurement over two balls M_{dK} or chordal measurement W_k

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