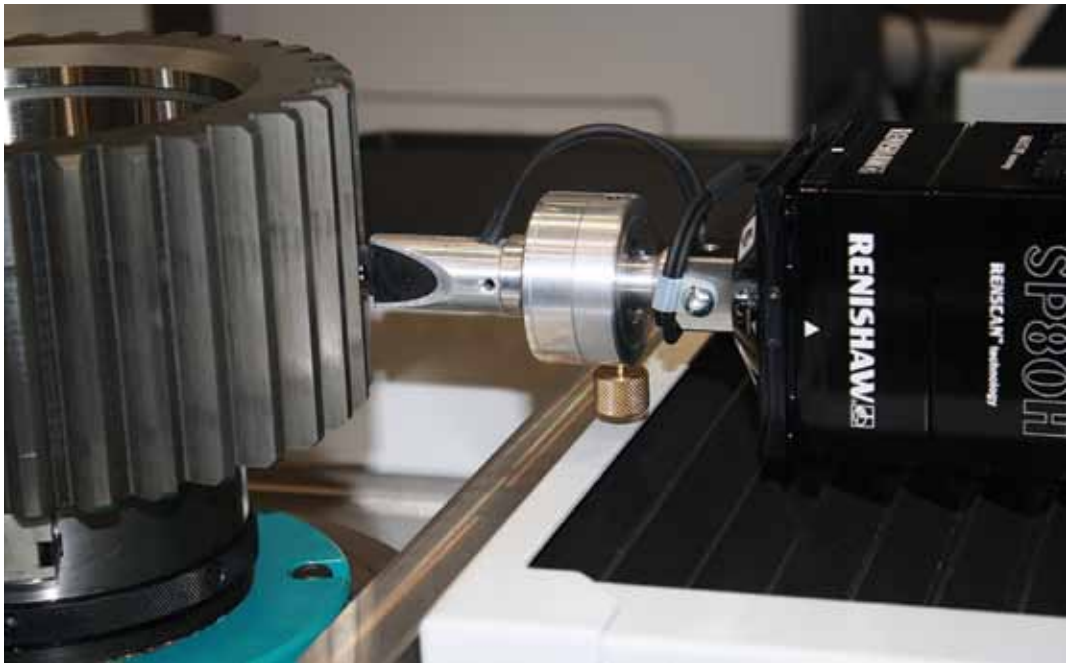


This Wenzel WGT 500 gear measuring machine uses a Barkhausen Noise Analysis system integrated into a horizontally-mounted Renishaw SP80 probe to detect pitting and grinding burn on the ground surfaces of gears.

be used to identify grinding burn and pitting that can occur on the flanks of gear teeth. The company's new BNA method saves time by enabling users to analyze potential grinding burn on flanks at the same time workpiece measurement occurs. This eliminates the need for an additional inspection process.

The digital BNA system Wenzel offers on its GearTec InovaGear, WGT and LH measuring machines is Stresstech's Rollscan R300. This system includes the BNA analyzing unit and sensor as well as software that integrates into the host measuring machine's controller. The BNA sensor is incorporated into a Renishaw SP80 probe that can be conveniently stored in a probe change rack. According to the company, inspection routines with the Rollscan are fast enough to match the production rates of most manufacturing lines, enabling accurate process control in real-time. This offers shops the potential to realize significant quality improvements in addition to reduced material and labor costs.

For more information from Wenzel America, enter the company name at **mmsonline.com/suppliers** or call 248-295-4300.

Sizing up the Digital Optical Comparator

BY MARK ALBERT

By magnifying the image of a workpiece and projecting that image against a template that magnifies a profile of the part's design, the traditional optical comparator magnifies the ability of the human eye to detect critical deviations. Mismatches between the projected work-

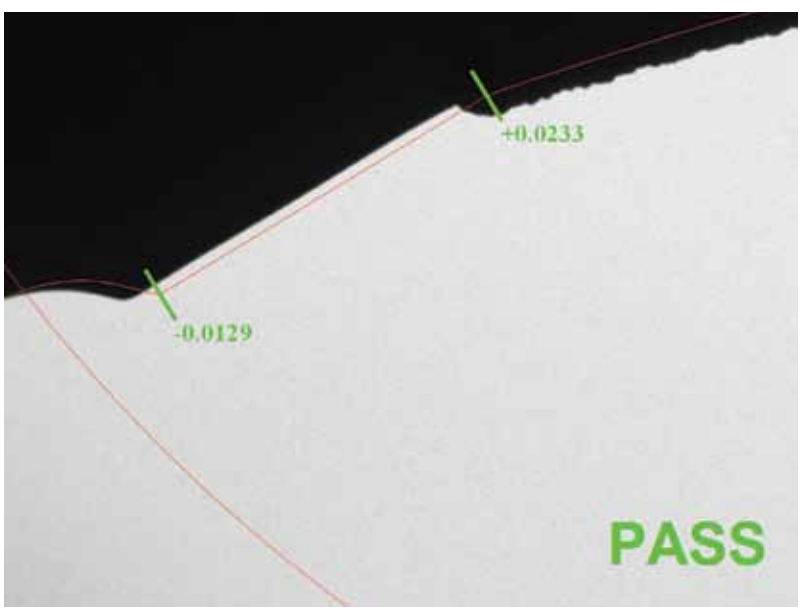
The VisionGauge can be configured either horizontally or vertically, as dictated by fixturing and mounting considerations.

piece image and the template make these deviations more obvious, enabling the user to judge whether the workpiece is acceptable.

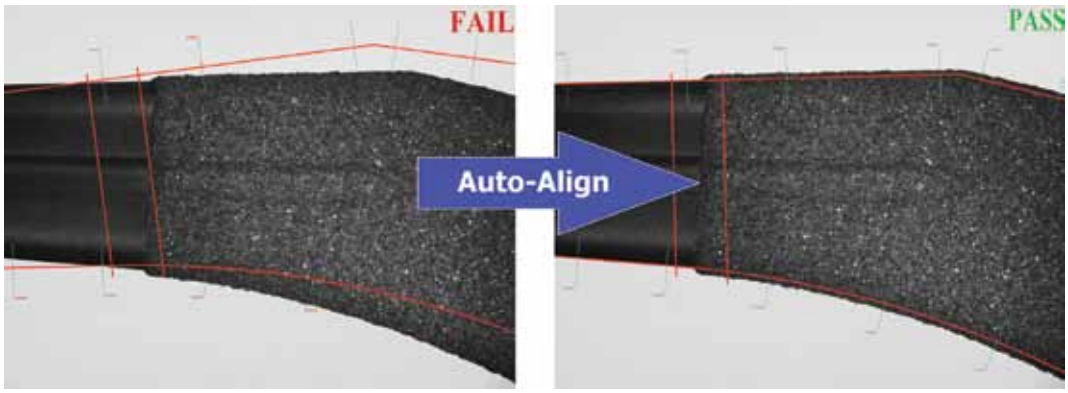
The digital optical comparator has essentially the same function, but the comparison is done electronically, thus taking this inspection process to a higher level of precision, automation and convenience. The Visionx VisionGauge digital optical comparator (distributed in North America by Methods Machine Tools, Sudbury, Massachusetts) provides an example of how digital operation contributes to this "magnification" in capability.

Perhaps the greatest advantage of digital comparison is the ability to work directly with the CAD data so that no template or overlay is needed. This eliminates the need for VisionGauge users to prepare, handle and store templates, which are usually line drawings inked on Mylar film, based on the designer's original blueprint. Using CAD data also precludes discrepancies between the blueprint and its enlargement on the template.

The value of the comparison conducted by the digital comparator, however, goes beyond this convenience. For example, the VisionGauge can compute and display the part's deviation from nominal dimensions captured in the CAD file. This happens automatically and without the operator's judgment or interpretation. The results of this comparison can be collected; saved in a database as a record of the inspection and measurement operations; and forwarded to third-party software applications. The system has the ability to capture



Bidirectional tolerances at various control points can be specified by the user. The system automatically computes and displays the part's deviation from nominal at every control point. This display includes a pass/fail result at every control point as well as for the entire part.



The Auto-Align feature finds the best match between the CAD data and the part image without operator intervention. This feature speeds inspection and makes it more effective.

electronic documentation (including high-resolution graphics) directly from the shop floor. According to Visionx, this process happens seamlessly during inspection.

The system can determine pass/fail status automatically and immediately send messages across a network for responses such as corrective action at the machine tool. Depending on magnification, digital comparison can detect deviations as small as 0.0001 inch.

Digital operation also enables the system to perform functions beyond the capabilities of the traditional comparator. For example, the system aligns the CAD data to the image of the workpiece without user prompting. This is a faster, more accurate process than manually shifting a physical template. In addition, a laser module available for the VisionGauge provides 3D inspection capability by enabling it to measure depth and height (Z-axis measurements). The traditional comparator is limited to 2D comparisons.

Likewise, the "hardware" of a digital optical gauging system differs from the traditional comparator. The "projection screen" of the VisionGauge, for example, is an array of flat-screen computer monitors. The system can be configured horizontally (the lens views the upright part from the side) or vertically (the lens looks down from above on the part lying flat). The Illumination can be positioned in front of or behind the part (above or below the part on a vertical unit). A wheeled base enables the user to move the system about for shopfloor use.

Finally, it should be noted that the comparison function of the system sets it apart from other noncontact or vision-based measurement systems. The digital comparator not only measures dimensions, but it also actively compares the measurements to nominal values, thus making it truly a gage for accepting or rejecting a part.

For more information from Methods Machine Tools, enter the company name at **mmsonline.com/suppliers** or call 978-443-5388.

See High Speed Spindle Versatility

Air-driven, high speed spindle technology is effective in machining a variety of workpiece materials. These constant-speed spindles also offer the flexibility to be mounted on machine tools, robots and similar equipment or used by hand to enable operators to comfortably deburr workpieces or remove casting flash. A series of videos from Air Turbine Tools (Boca Raton, Florida) shows this technology's versatility in machining aluminum castings, tool steel tire molds and wooden guitar components. Find these videos at short.mmsonline.com/airturbine.