Specialist Article

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polishing compounds

Using Scattered-Light Measurement Technology to Analyze Surfaces

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Scattered-light measurement technology offers precision analysis and evaluation of surface quality.
In turn, this enables a more reliable assessment of the cost-effectiveness of polishing methods.

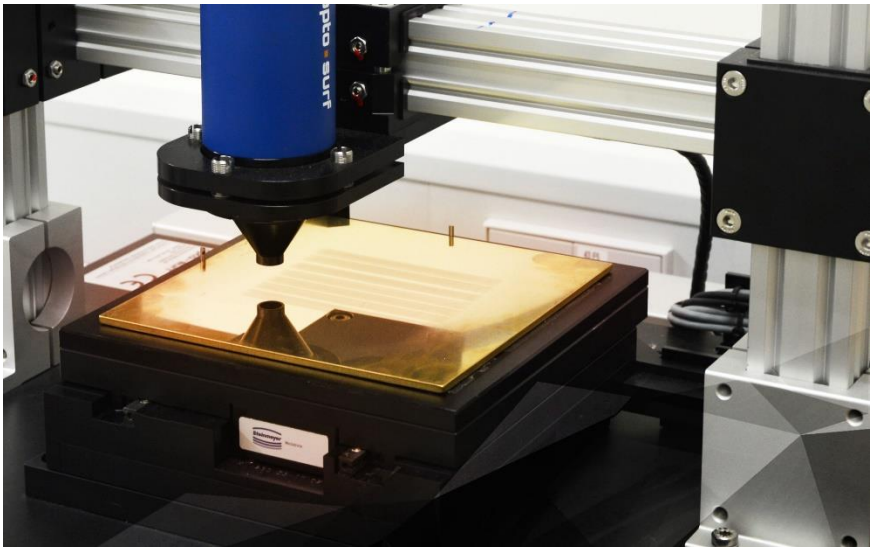

Figure 1: a scattered-light measuring device in action

Key Insights at a Glance:

- Scattered-light measurement technology enables highly accurate evaluations of surface quality
- Outstanding reproducibility of measurement results
- Measurement results available much faster than with conventional processes
- Vibrations and temperature fluctuations have no impact on measurement results
- Disruptive factors can be identified and considered individually
- Measurement results can be visualized in 3-D

Inline Measurement as Informed Decision-Making Support during the Polishing Process

An innovative process enables the measurement of all relevant polishing parameters and thus accurate identification of differences in the performance of various sanding and polishing compounds. The same applies to different process settings. This data allows industrial companies to optimize parameters, providing them with informed decision-making support for the development of polishing process designs.

Several factors have an impact on the polishing result: number of polishing cycles, type and volume of polishing compound, polishing time, downforce, and type of polishing tool. Scattered-light measurement technology makes it possible to consider and analyze each of these parameters in isolation.

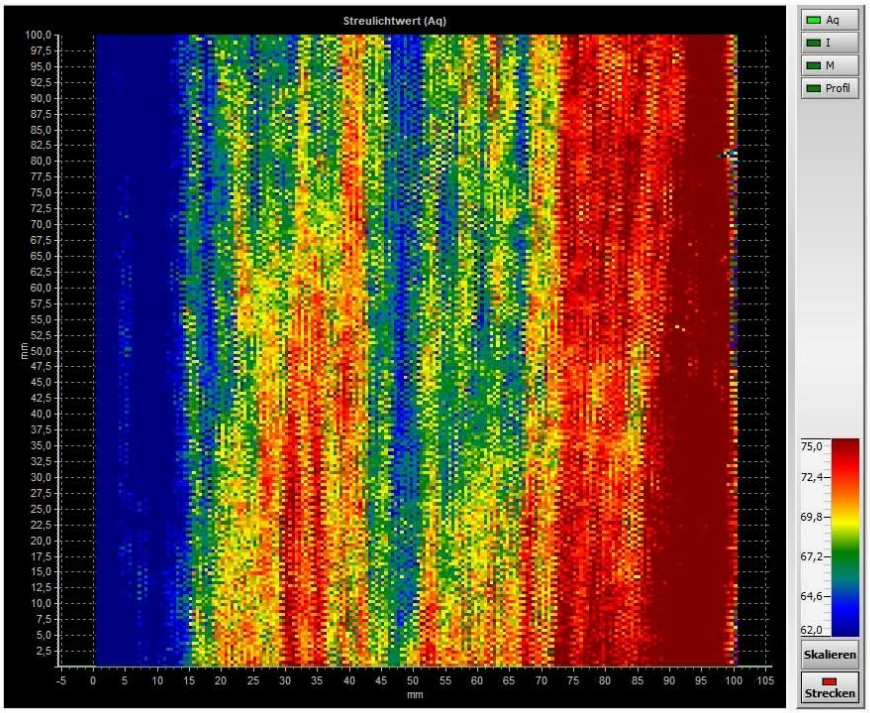

Figure 2: a measurement image of a poor-quality surface

Systematic Optimization of Polishing Processes

The data collected serves as a basis for improving polishing processes. The aim is to achieve the best polishing results possible in the most cost-effective way possible. With this in mind, it is important to verify the properties of the polished surface in relation to wear and tear of the sanding belt, the number of polishing strokes, the number of polishing cycles, and the effect of oxidation.

Standardized Smoothing of Sample Plates with a Sanding Shoe

An innovative arm can prepare sample plates in a standardized way using belt sanding, thus ensuring that each sample plate has the exact same initial surface. After varying the parameter combinations on the individual sample plates, the polishing results can be compared more effectively.

Automated Measurement Technology for Standardized Surface Measurement

Scattered-light measurement technology facilitates precision measurement of sample plates. Because the shorter measurement times allow for a much higher sample throughput, a multitude of tests can be carried out to determine the best surface results possible. The more accurate measurement technology reveals parameter changes in the polishing process immediately and, as a result, analysis enables better statistical substantiation of the results. What's more, vibrations and temperature fluctuations now have no impact on the measurement results, meaning that process recommendations can be made more reliably.

Cutting-edge scattered-light measurement technology uses a fine beam of light to measure the roughness and reflectivity of a surface. The emitted light is reflected at a variety of angles by the surface before being captured and analyzed by a lens. The unit of measurement for surface quality is the Aq score. The findings can be presented in both quantitative and graphic form, facilitating a discussion of the results.

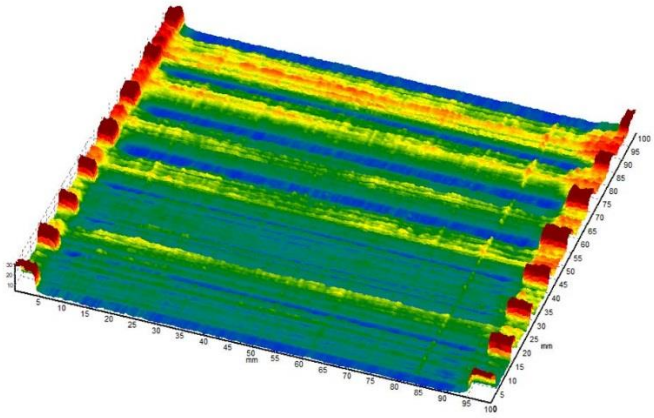

Figure 2: a measurement image of various samples

Reliable Measurement Data for Developing New Polishing Processes

The measurement process described plays a key role in supporting the development of cost-effective polishing processes and compounds. Therefore, subjective assessments and trial-and-error tests are a thing of the past. Reliable and reproducible measurement data form the basis for informed decision-making.

Customer-Specific Polishing Processes for More Cost-Effective Polishing

Application engineers can develop customer-specific polishing processes, enabling optimization of the polishing results, cycle time, consumption values, and polishing tool. This new process creates data-based decision-making support for more cost-effective polishing.

Conclusion

Customer-specific polishing processes can only be developed on the basis of reliable data – and scattered-light measurement technology provides this data. The isolated observation of individual parameters makes it possible to accurately determine their impact on the polishing result.

About the Author

There is often uncertainty about whether polishing processes are optimal and whether they can be compared with each other, particularly when it comes to quality and productivity.
That's why Menzerna uses scattered-light measurement technology, which makes it possible to identify and classify surface defects. Surface measurement values are recorded in controlled conditions, allowing the identification of potential optimizations to industrial polishing processes.

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