

ELOTEST PL600 with SuperFinisher Mode

Flaw inspection on cylindrical and conical rolling elements

Grinding and super finishing for the production of high precision surfaces provides ideal conditions for non-destructive testing.

For defect inspection on cylindrical, barrel, and tapered rolling elements, we use the extremely precise parts handling of these systems to inspect during the manufacturing process, without any further processing time.

Description Super Finisher Mode

The final manufacturing step of rollers, bolts, bars, and rings of all types is very often grinding and honing. It has become standard in the industry to integrate eddy current testing of the running surfaces directly into these grinding, superfinishing, or honing machines.

This saves time and money because the non-destructive testing is done directly in and during production without the need for a separate testing machine.

To inspect surfaces, the last grinding, or honing stone in the super finisher is usually replaced by a sensor holder, which then places the eddy current sensor directly on the surface of the rotating parts. In grinding machines, eddy current probes are integrated into guide tools.

There is a wide range of sensor types, depending on the desired surface coverage and mounting options within the machine.

The sensor element with differential circuit is designed in such a way that an overlapping test track is created, and a 100 % test is guaranteed. The test release is affected via a distance signal, which is generated by a second sensor element in absolute circuit in the same housing. The beginning and end of the part generate a threshold overrun and thus control the test release.

This sensor technology requires only a single-channel ELOTEST PL600. The multiplexer integrated there allows fast testing without loss of time. The „Superfinish“ mode in the ELOTEST PL600 is a task-specific optimized device variant that offers noise and sensor wear monitoring in addition to testing for cracks and grinding burns. Since the Superfinish configurations very often operate without a connection to a higher-level control system, this device variant has a shift register for part tracking. With each test part end, the test result is clocked into a shift register.



Application example

Just like a Superfinish stone, the sensor is fed by contact. Unlike the stones, the sensors only slide on the surface. The contact surface of the sensors therefore consists either of a wear-resistant ceramic or of plastics with very good sliding properties.



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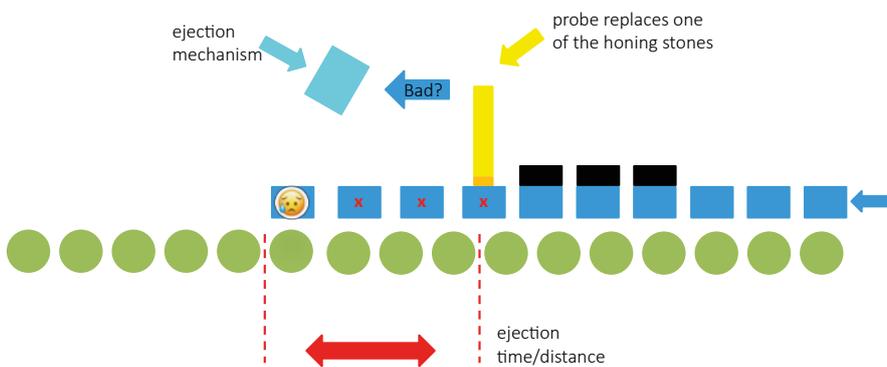
The defects that can be found with these sensors are longitudinal cracks and local grinding burn. In some cases, transverse and circumferential cracks can also be found with sensors such as our KDA-129 sensor.

The big advantage of testing in the Superfinisher systems is that the parts are very stable in the machine and the surface is in optimal condition, with no dents or other damage from handling.

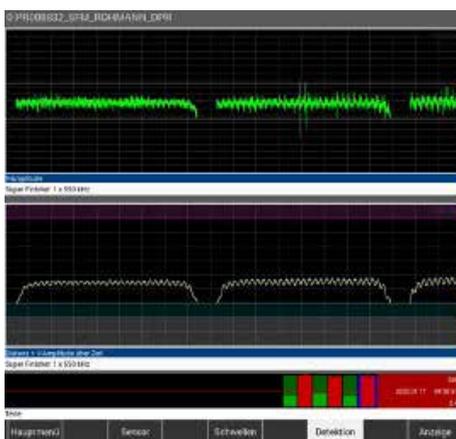
Wherever possible, parts are demagnetized before grinding, which also helps to suppress additional noise and contributes

to a better signal-to-noise ratio.

In the Superfinisher configuration, as mentioned, combined differential/absolute („KDA“) sensors are used.



Description of the inspection:



IO logic to count the inspected parts and feed a shift register for later sorting.

In the upper area, the eddy current signal image of the differential sensor is shown. A tolerance band can be seen here. If the test signals are within this tolerance band, the tested part is evaluated as good. If the threshold of the tolerance band is exceeded, the tested part is evaluated as bad.

The eddy current signal image of the absolute sensor is shown in the lower area. As soon as an edge of the part to be inspected reaches the sensor, the absolute signal rises and the inspection release is issued. The falling absolute signal ends the test

release. The absolute signal from the sensor is used to detect the „gap“ between parts. This signal controls the internally generated inspection enable signal so that the often noisy edges can be masked out. In addition, the „gap“ signal is used by the

release.

According to the test result of the difference signal in the upper range, the test results Good/Bad are taken over into the shift register.

Probes for SuperFinisher Mode

Probe data KDA-129

Application:

Dynamic crack and grinding burn detection, superficial cracks, dependent on the direction of the inspection, with distance compensation to suppress variations of the distance

Coil system:

Differential ferrite core, transformer, with distance compensation, magnetically shielded

Frequency range: 50 kHz - 1 MHz

Active area: approx. 1,5 mm

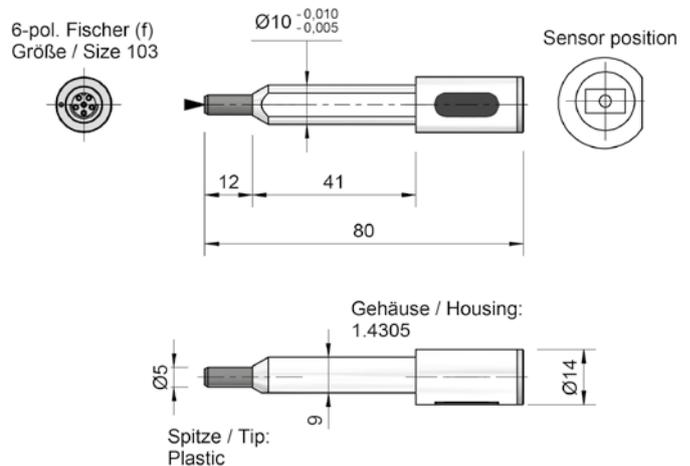
Penetration depth: low

Technical data:

- Housing:** metal (stainless steel)
- Design:** customized
- Connection:** customized



KDA-129 H-1956.02.1



Art.No.: A0M9951956001021

Probe data KDA-46

Application:

Dynamic crack detection, superficial cracks, dependent on the direction of the inspection, with distance compensation to suppress variations of the distance

Coil system:

Differential ferrite core, transformer, with distance compensation, magnetically shielded

Frequency range: 50 kHz - 1 MHz

Active area: approx. 1,5 mm

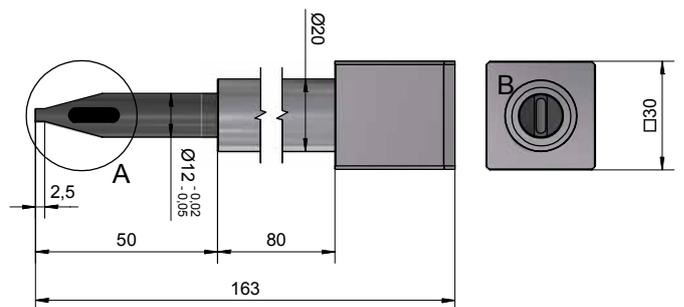
Penetration depth: low

Technical data:

- Housing:** metal (stainless steel)
- Design:** customized
- Connection:** customized



KDA-46 H-1101.14.1



Art.No.: A0M9951101001141