



info

No. 2

ibg-Talk



Despite the difficult conditions in the past year ibg managed to increase its market share and expand. The excellent reputation of our instruments and test systems in the market is an important but not only reason for this situation. Development and manufacturing according to the highest quality standards will also be influential for the future of ibg.

We have manufactured many tailor-made high-performance systems in the past year for our customers and would like to give you some details of these systems in this "ibg info" issue.

I would like to draw the attention of our German customers to the traditional "Workshop", which will take place from 17 to 21 March 2003. The one-day event will give you the opportunity to gather information on eddy current technology in general and of course the latest applications solved by ibg test instruments. Details will follow by separate post.

*Yours
Herbert Baumgartner*

Automatic system to test bearing rings

ibg designed and manufactured an automatic test system for crack detection of bearing rings for one of the largest worldwide bearing manufacturers. The machine is designed to test the bore of inner bearing rings with bore diameters in the range 30 - 40 mm. The rings are fed to the test system OD to OD, via a roller conveyor. Separated they are forwarded to the actual test station. In the test station, the rings are clamped and rotated. The crack detection probe scans the whole borehole surface without contact for surface-open cracks. OK and NOK parts are discharged to the OK and NOK conveyors. The cycle time of the system is only 6 seconds. Changeover for a different part type can be easily achieved using change-parts and is possible

within 10 minutes. The system is also designed so that crack detection on the outer diameter of the rings can be added at a later date.



The system is designed to be very space-saving and by means of rollers can be moved and connected to different production lines.



The rings are transported from a belt to the crack test system.



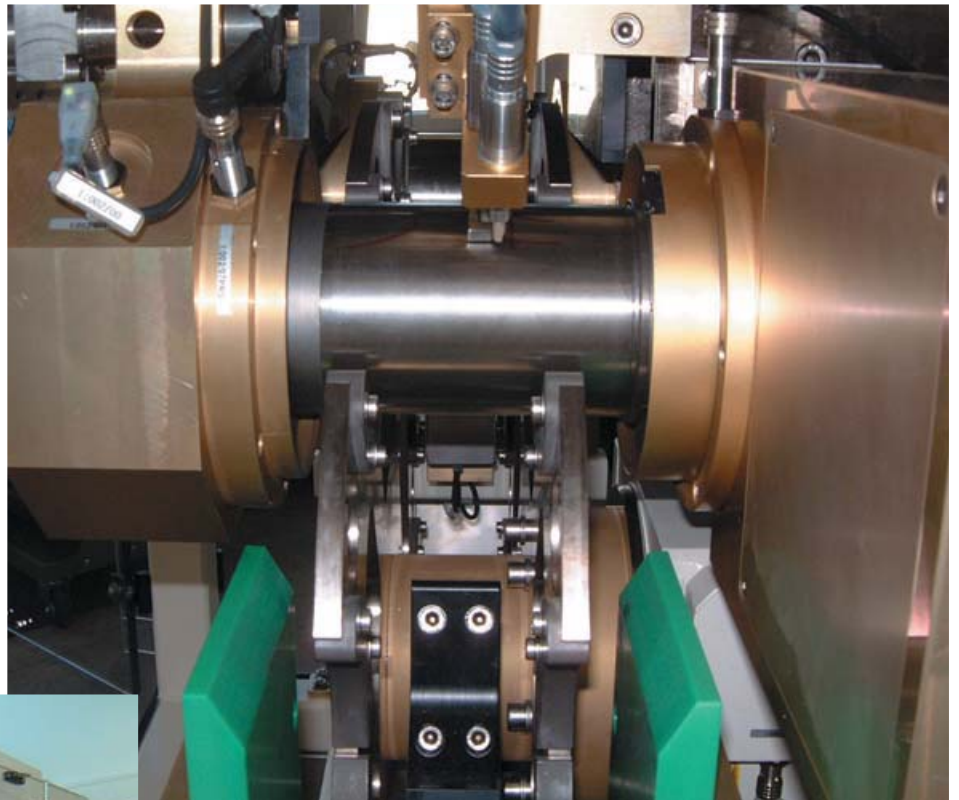
Test parts are moved individually to the actual test station.

Crack detection system for cylinder liners to test entire inner and outer diameter

An ibg system for testing cylinder liners for cracks on the whole ID and OD of the part has been developed using a 3-channel **eddydector**[®] instrument. It scans a 90 mm OD and 86 mm ID (of 132 mm length) in nine seconds, which allows production at 400 parts per hour.

The cylinder liners are clamped and rotated (at 900 rpm), with two probes scanning the OD for surface flaws, while a third probe scans the ID. The cylinder liners are gently separated as they enter the system and are passed singly to the test and discharge stations. OK parts are forwarded to the next processing step on one level while NOK parts are diverted to a lower chute.

This, like many automatic crack test systems replaces magnetic particle visual inspection.



The entire inner and outer surface of a liner is scanned by three crack detection probes.



Once scanned, OK parts are forwarded to the next processing step on the upper chute while NOK parts occupy the lower chute.

eddyliner[®]P
eddyscan[®]
eddydector



Overall view of test system.

100%-Test on ball studs for cracks and correct heat treatment

Within the steering system of an automobile the so-called ball studs (photo below) transfer the steering movements to the wheels and are of course subject to high forces.

Ball studs are a typical safety-critical part and during the production process have to be treated according to certain quality criteria. This means that each ball stud must be checked for cracks and correct heat treatment.

Usually non-destructive test methods based on eddy current techniques are applied because this technology is always reproducible, residue-free and can be automated.

For the crack test, the part is rotated. A crack detection probe scans the area to be tested for surface defects without contact. The crack detection probe generates an eddy current field with a certain carrier frequency. If a crack or pore passes this eddy current field during rotation the change in current resp. voltage is displayed as a typical crack signal on the crack detection instrument **eddydector**®. Such a part will be sorted as NOK by the handling system.

For the structure test, encircling coils are used which have transmitter and receiver windings. A test part is placed in the coil and the transmitter winding is fed with alternating voltage. The resulting voltage vector on the receiver winding, varies according to the structure of the test part and thus can be analysed for the comparison of good and bad parts.

The eddy current test instrument **eddyliner**® P works with the Preventive Multi-Frequency Technology (PMFT) always using eight different frequencies for the test of one part in order to find unexpected failures. The instrument is calibrated with some OK parts, a tolerance field is created and in the test itself each part which does not correspond to the tolerance field is sorted as a NOK part. As well as detecting parts that are too hard or soft, parts with different crystalline structures, hardness depths, varying hardness zones, different alloys etc. can also be

identified. The test itself takes only a fraction of a second.

A test system, as shown in photo on the right-hand side for example, automatically tests up to 6,000 ball studs per hour for surface cracks and correct heat treatment. The ball studs are tested either after the forming process or after the succeeding metal-cutting processing. The parts are fed individually onto the rotary indexing wheel which moves the parts first to the crack test station and then to the structure test station. Further test stations such as e.g. dimension test, thread test etc. are options that can be added to the system. Depending on the sorting decision the test part is sorted to the OK or NOK chute.



Test system with crack test station in twin design. On the left-hand side in the photo: Feeding and separation. On the right-hand side in the photo: The OK parts leave the system via the chute. The NOK parts are sorted out in the middle of the back-side



Different kinds of ball studs

ibg - extra info

ibg UK founded

ibg is still on an expansion course. On 1 September 2002 ibg UK Ltd. started trading from its sales and service office. The foundation of ibg UK is a further important milestone with regard to the strategic market orientation of ibg, which is now represented by 5 ibg-offices and more than 15 sales representatives worldwide. With this network ibg is able to supply all necessary support for the demanding customers in the automobile industry, with local assistance to solve their application problems.

Testing "long material" using eddyliner[®]P

The **eddyliner[®]P** - standard test instrument for the Preventive Multi-Frequency Technology and hundreds used in the automotive industry worldwide - also enters the field of tube, bar and wire manufacturing. As the material is continuously passed through the test coil, measuring is triggered at defined intervals, which serves to find differences in the structure along the test parts. After exiting the coil a PLC decides if the test part is OK or NOK according to pre-selected criteria. Five systems were installed in Europe and Asia in 2002.



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Modular training concept

Over the past years we have recognised that the demand for tailor-made training programmes has increased. Often it concerns operator training in the crack and structure testing field for newly employed staff. Or a general introduction and training to a larger group of participants in order to explain the basics of eddy current testing of components.



ibg reacted and now offers a modular training concept. The training programme is compiled according to each individual case, depending on time limit and previous knowledge of participants. The training can be held in one of our ibg offices

or on customer's site.

Of course we are also prepared to organise half-day or full-day in-house workshops for a large group of people. If you are interested in training, please contact ibg directly or our local representatives.

tailor-made, modular,
individual

ibg training concept



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