

BARKHAUSEN NOISE ANALYZER INTEGRATED IN GEAR MEASURING MACHINE (GMM) BY WENZEL

The detection of grinding burn continues to be a major issue in the production of wind energy gears. Wenzel GearTec has formed an exclusive partnership with Stresstech Group to offer fully integrated and automatic detection of grinding burn. As a result of this co-operation a Barkhausen Noise sensor is integrated in the Gear Measuring Machine (GMM) for detecting grinding burn thereby eliminating the need for detection using the subjective Nital Etch process.

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Photos Dominik Dapprich and
Wenzel GearTec GmbH*



Gear failure caused by grinding burn.



Gear sensor measuring Barkhausen Noise in a gear.



Gear Measuring Machine (GMM) by Wenzel with a gear sensor.

The tool changing system in the Wenzel GMM automatically removes the Renishaw probe from the machine and picks the Barkhausen sensor for grinding quality testing. Both straight and helical gears can be tested. A system for testing of inside geared rings is under preparation.

Already two systems of this kind have been delivered to customers in Germany. In addition three machines, which are prepared for Barkhausen option and can be fitted with Rollscan system in a matter of minutes, have been sold to USA. "The Barkhausen testing feature was one of the key issues for GearTec customers to decide for our product", tells Technical director Chris Pumm from Wenzel GearTec in Wiesthal.



More information about Wenzel GearTec at
www.wenzel-geartec.de

More stories

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- Editorial
- PCS Ltd. works for Barkhausenization of industry in Bohemia, Moravia and Slovakia
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EDITORIAL



Are you safely navigating the rough waters of the current economic climate? Just like you and me, our materials break down without an inherent ability to withstand the stresses and strains of everyday life. The heat treatment of steel is a well known method to build in compressive stresses and deliver a material with better properties. Stresstech is strong and we continue to expand our offerings at the intersection of these two concepts.

Our **Rollscan**[™] technology is an ideal method to include in the production stream. BNA exhibits excellent sensitivity when compared to encircling coils or eddy current and ultrasonic probes. In the high volume production of automotive transmission gears we capture green (soft) parts by simple, fast, automated testing all product. Off line gauges are used to test hardness and locate heat treat patterns in crankshafts, output shafts and axles.

We are measuring residual stresses, retained austenite and peak widths with our **Xstress** diffractometers. Our **Prism**[™] technology has been reported to be a fast, simple and quantitative test for heat treat quality on axle shafts. We continue investment in fundamental studies of nondestructive methods for case depth measurements.

Look for more innovations from Stresstech Group. And if we have the chance to work together, maybe we'll have a little fun along the way. After all, too much stress is never a good thing!

Robert M. Fix, President, American Stress Technologies, Inc.

PCS LTD. WORKS FOR BARKHAUSENIZATION OF INDUSTRY IN BOHEMIA, MORAVIA AND SLOVAKIA



Text and photos Jiri Malec (j.malec@pcs.cz)

PCS is a private Czech company (www.pcs.cz/en/about-us.ep/), in which the division of analytics has dealt with special testing instruments since 1990. After some changes of the European map in early 90', we hold our business activities on the territory of former Czechoslovakia.

Extensive cooperation with Stresstech group has been going on for more than ten years. As the result of a program called friendly "Barkhausenization of the industry" we have installed almost twenty systems for analysis of Barkhausen noise mainly in automotive segment. The key applications are coupled to grinding burn (thermal damage) detection and more generally to grinding or machining optimizing.

Very nice evidence that material fatigue properties are significantly influenced by grinding damage can be observed on accidental cracks on cutting hob.

Material used for hob production is very hard. Using slim gear type sensor, Wikov's quality engineers can check the root of the hob, where the probability of defect is the highest. Thermal damage can be observed mainly after careless resharping by user. Barkhausen method can successfully be used even for testing of coated tool.

We regularly organize special seminars for our customers and potential users of our instruments. Participants can hear there brief review mainly about Barkhausen noise analysis, spectrometry and diffractometry. Important part of our meetings is an opportunity for customers to see practically all devices alive and to make their own tests. Very pleasant way to discuss different topics of instrumental applications are our social evenings with Moravian music during seminars.



Hob after fatigue crack due to grinding damage.



Seminar discussion and sample testing in Valtice, 2009.

STRESS MEASUREMENTS ON COMPLICATED PARTS MADE EASY WITH XSTRESS ROBOT

Positioning the X-ray goniometer is often challenging, when residual stresses on large or complicated parts need to be measured. Stresstech's Xstress Robot solves this problem.

Traditionally the goniometer is positioned on the measurement spot of the part by moving the part with some kind of a manipulator. With portable diffractometers positioning is typically done by moving the diffractometer around the part, e.g. using Stresstech's Floor stand.

Xstress Robot can move the goniometer in all directions easily and accurately. It gives more freedom and automation than other manipulators. It takes the role of manipulator, X-Y unit and rotating table of the diffractometer at the same

time. Thus automating all movements, e.g. for mapping purpose, is easy with Xstress Robot.

The robot working as a goniometer instead of carrying it is already being tested at Stresstech. This kind of configuration will add even more freedom to the accessibility of the goniometer. If combined with camera control, it makes the X-ray measurement easier than with any other previous arrangements. This type of system will become available during 2010.



A bearing being measured with Xstress Robot with G2.



Xstress Robot taking the role of a goniometer.



Xstress Robot with G2 head.

ICBM8 AT IGCAR, KALPAKKAM, INDIA ON FEBRUARY 11-12, 2010

For the first time in its over 10-year history, the ICBM Conference will be held outside Europe in India. The 8th International Conference on Barkhausen Noise and Micromagnetic Testing will be held on February 11-12, 2010 in Kalpakkam, India. It is hosted by the Indira Gandhi Centre for Atomic Research (IGCAR).



ICBM8 will be held in Indira Gandhi Centre for Atomic Research (IGCAR, www.igcar.gov.in), Kalpakkam, India.

IGCAR is an establishment of the Department of Atomic Energy set up in 1971 with the main objective of conducting broad based multidisciplinary research, directed towards the development of sodium cooled Fast Breeder Reactor (FBR) technology in India.



IGCAR carries out frontline research in different aspects of materials science and engineering with special emphasis to manufacturing technology, materials characterization, non-destructive evaluation (NDE), sensor development and inspection of components. IGCAR has an active research programme in micro magnetic and magnetic Barkhausen emission NDE techniques for detection and quantitative evaluation of microstructural variation and stresses. It has established collaborations with educational and R&D institutes, and industry. The Centre is being steered by Dr Baldev Raj (www.igcar.gov.in/director), an internationally renowned metallurgist and a specialist in NDE.

IGCAR Kalpakkam is located about 70 km South of Chennai City, and is about 10 km South of Mamallapuram, a heritage town, famous for monolithic sculptures. Chennai is well connected nationally and internationally through a well established air network. Mamallapuram, Kancheepuram and Pondicherry are the three important destinations of cultural heritage near Kalpakkam (www.tamilnadutourism.org).

For more information about registering to the conference, see www.icbmconference.org.

ICBM7 Conference Proceedings

The 7th International Conference on Barkhausen Noise and Micromagnetic Testing was held in Aachen, Germany in 2009. Conference Proceedings of the event is now available.

Order the Conference Proceedings of the ICBM7 or the previous six conferences with a form available at www.icbmconference.org.



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Stresstech Group Customer Newsletter
published by

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