stresstech news
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ROBOSCAN FOR GEARS MAKES GEAR QUALITY MONITORING AT FORD PLANTS IN SHARONVILLE, USA, LIKE CHILD'S PLAY

Four robot driven gear inspection systems, RoboScan for Gears, have been checking gears at Ford plants in Sharonville, USA, for several years, now. In addition to them, Ford is committed to Barkhausen noise having been using it for several applications for long.

Text Robert M Fix
American Stress Technologies, Inc.

Stresstech's semiautomatic gear inspection system, RoboScan for Gears, uses environmentally friendly and nondestructive method based on Barkhausen Noise to confirm the perfect quality of grinding in gears, or to spot the defected parts and gears from the production. Soft spots, tensile stresses and other grinding damages reducing the gear´s lifetime are detected with the system.

Fast feedback to gear grinders

RoboScan for Gears is a non-destructive test instrument that replaces the time consuming, traditionally used acid etch method thus reducing the amount of hazardous waste and manpower needed for the quality control. As a result considerable savings in quality control costs and an improvement in quality assessment are achieved. The BNA technique makes testing easy and fast so that actions to adjust the manufacturing parameters can be taken immediately.

Rollscan does the work

The system RoboScan for Gears involves a well-known Barkhausen Noise instrument, the Rollscan 200, which is used widely for grinding quality inspection among the motor component manufacturers, also other than gear manufacturers. The Barkhausen Noise signal from the gear is picked up with a special gear sensor, which is used together with a 6-axis robot and a turntable with a sample holder for easy loading and unloading of the gear. The turntable will automatically rotate the gear to the correct starting position. For analyzing, displaying and documenting the measured data a Windows based ViewScan software is implemented in the system. This makes saving and printing the inspection data easy for possible future use or statistical analysis.

RoboScan takes care of the gear inspection after the gear has been manually placed on the stand.

Checking the quality of grinding with the system is easy demanding human interference only for loading the gear on the rotating chuck. Using the simple control panel the system operator chooses the measurement program created for the gear type and starts the automated testing procedure. Programming the system for new gears is also simple and easy by "teaching". Within a few minutes the operator can review the results and approve or reject the gear.

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EDITORIAL

2007 will be described in Stresstech Group's history as the busiest and best so far. Investing boom in our customer industry has produced us orders of large and automated quality control systems involving robots, as well as numerous smaller systems. That proves that Barkhausen method is in good use among our customers. Interest in our X-ray products has also been growing, and we have received record amount of Xstress 3000 orders, including also orders of our latest model G3.

Of applications inspection solutions for different size and type of gears have been very sought-after this year. Robotized RoboScan systems will be in production also in the future based on received orders and inquiries. Inspection needs of our customers have top priority in our functions, and we are constantly developing our products to answer this need better. The new Rollscan 250 is the latest example of this work.

Good news seldom come without any drawbacks. Growing activity also among our subcontractors and component providers has caused increase in delivery times of components and raw material making it harder for us to keep our delivery times. Orders also have a tendency to come in bunches, which has caused rush and extra stress in our designing and manufacturing phases. Keeping our delivery times reasonable from the customer's and our point of view will be a challenge and target of our attention in the future.

Lasse Suominen, President of Stresstech Oy

STRESSTECH GROUP PRESENT IN BRAZIL THROUGH ZAF SISTEMAS ANALÍTICOS LTDA

"*We are proud to help the development of our country with the high-tech, reliable and proven technology*", says Hélio Nagano from ZAF SISTEMAS ANALÍTICOS LTDA, Stresstech Group's representative in Brazil.

ZAF SISTEMAS ANALÍTICOS LTDA was founded in Brazil 20 years ago. In addition to Brazil, ZAF serves also other Southern Common Market (Mercosur) countries in South America, in where all the time growing interest in nondestructive quality control equipment can be seen. Many companies are getting ISO14000 and they are discovering the headache to discharge the acid used in etching technic, so they are thinking to change safer analysing system, like Rollscan.

ZAF has engineers and salesmen that work with practically "on line" support from Stresstech and AST.

Mahle Metal Leve is one of the many satisfied Barkhausen Noise users in Brazil, whom ZAF has been able to help with Stresstech Group products during its 10 year partnership with Stresstech Oy and American Stress Technologies. "*The Rollscan system based on Barkhausen Noise helps us so much because it improves the quality control, becomes shorter the time expended and reduces the rejected number of pieces. Before the Rollscan system, we used nital etching to detect grinding burns, which caused us many problems associated to chemical residues, waste time, operator safety, etc.*", says a customer of ZAF, Mr. Emerson Paredes from Mahle Metal Leve, in Mogi Guaçu, Sao Paulo, Brazil, who uses one Rollscan 200 system in the quality control of piston pins.

Mr. Emerson Paredes from Mahle Metal Leve inspecting piston pins with Rollscan 200 system.

NEW GENERATION ROLLSCAN 250 FOR ROUTINE MEASUREMENTS

If you need a simple-to-use instrument to measure Barkhausen noise without the need to vary and view the effect of versatile parameters, Rollscan 250 is our latest answer.

Text Juha Siiriäinen
Stresstech Oy

Until now the Rollscan 200 has been the heart of the Barkhausen noise quality inspection systems. It is an ideal instrument for detecting grinding burns and other hardness and stress related surface properties. Its limitation has been that the magnetizing parameters are fixed. However, the parameters of Rollscan 200 are determined so that in most cases they are optimal.

For optimizing measurement speed and depth

New generation Rollscan 250 is designed following our traditional, well established philosophy; easy to use at the shop floor, easy to set up, and self explanatory user interface. Now the new Rollscan 250 broadens the inspector's possibilities to get more comprehensive, and more focused measurement data. This is due to adjustable magnetizing frequency, which can be adjusted continuously from 1 to 500 Hz.

Adjustable magnetizing frequency makes it possible to optimize the speed of the measurement. A Barkhausen noise measurement can be either static or dynamic. For detecting a defect of certain size, there must be sufficient amount of magnetizing cycles on the defected area. This limits the relative speed between the sample and the sensor with dynamic measurements, and the required detection time with static measurements. If the relative speed is too high, or the measurement time too short, there is not enough time for the domain walls to make enough many back and forth movements, and the detected Barkhausen noise signal remains too low, and the resolution becomes low.

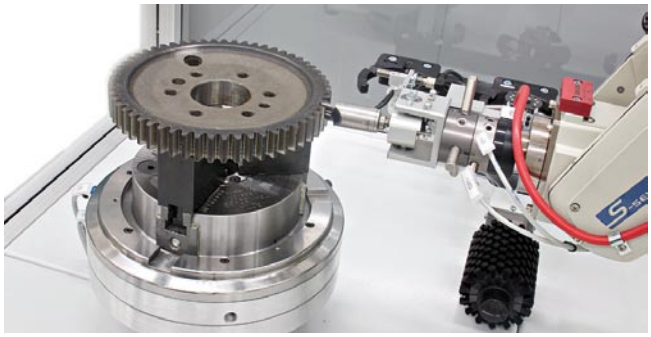
Not only the measurement speed but also the effective penetration depth can be optimized. This is the case when surface properties are uniform with all samples, and some subsurface property such as case depth, must be measured.

Tolerant sensor technology

The sensors for the Rollscan 250 are the same as for the Rollscan 300 and the MicroScan 600. These sensors are with differential amplifier. This sensor technology is very tolerant against electromagnetic interference. As the amplitude of the detected Barkhausen noise signal is always low, external interferences might become harmful for reliable data analysis. This is especially the case with the robot and servo motor driven systems. Signal detection by using sensors with differential amplifier followed by digital signal processing has proven to be excellent combination at electromagnetically harsh environment. In the case of replacing existing Rollscan 200 with the new Rollscan 250, old Rollscan 200 sensors can be used with an adapter.

Flexibility with two channels

Rollscan 250 is either one or two channel instrument. If there is a need to have more than two cannels, then it is possible to install several Rollscan 250 instruments parallelly. The decision to limit the number of channels was based on more simple construction, and on the fact that most robot operated systems are with one channel only. For better versatility and flexibility the decision was to implement one addtional channel. Communication with the computer is through USB or Ethernet ports, and also the old RS-232 port is available, as well as connectors for oscilloscope. The operation and data acquisition can be done also over the LAN network.



Rollscan 250 sensor installed in the RoboScan and measuring a gear.

ICBM6 IN FRANCE IN 2007

The 6th International Conference on Barkhausen Noise and Micromagnetic Testing took place in Valenciennes, France

Text Andrzej Wojtas
Chairman of the ICBM

On the 9th and 10th of July 2007, for the 6th time the researchers, the developers and the industrial users of the Magnetic Barkhausen Noise Analysis inspection met for the ICBM conference. The conference was hosted by the University of Valenciennes, France and co-organized by the University and Stresstech Oy.

Participants from 12 countries came to hear to and to present their own achievements in the R&D and in industrial applications of the MBNA methods. The conference program included 16 oral and poster presentations. The visitors were also invited for a guided tour of the University laboratories.

This year, for the first time, the conference was combined with a workshop. It included three dedicated sessions: 1. Introduction to Barkhausen Noise Analysis, 2. Gear grinding – "From wristwatches to wind mills" and 3. Aerospace components – "Landing gear and more".

The conference dinner had an exciting artistic program and the meetings in the hotel lobby had once again shown that the BNA community can find a healthy balance between work and leisure.

Conference Proceeding as printed book or CD are available. They can be ordered with a form on the www.icbmconference.org.

Preparations to arrange the next ICBM conference are already going on. The exact dates as well as the call for papers, registration details and the conference program will be placed on the ICBM website: www.icbmconference.org as soon as they become available.

ICBM6 participants enjoying a sunny break in front of the University of Valenciennes.

ICBM conferences have attracted Barkhausen noise users and scientists already six times since 1998.

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