

June 2006

## ■ Welcome

to aixACCT Systems, your partner for future materials.

Our third newsletter focusses on the actuator trade fair in Bremen, the only trade fair in the world dedicated to actuators. So let us present our products for multilayer applications such as the aixCMA, impedance measuring and automated impedance analysis. There are also reports on new products for material characterization for magnetic and resistive materials.



But first of all let me say how pleased I am to welcome SINTEF and PI Ceramic as part of the aixACCT team.

Happy reading!  
Yours sincerely,  
Stephan Tiedke

## ■ SINTEF to establish quality assurance with TF ANALYZER for its foundry service



**SINTEF was acquired as a new customer for aixACCT during the POLECER Conference in Hafjell/Norway in March 2006. The Norwegian research institute is in need of an advanced system for complex measurements and characterisation. The system will be used in SINTEF's new foundry service for piezoelectric MEMS.**

Due to a series of innovations during the recent years aixACCT has built up a unique and complex range of characterisation equipment for piezoelectric thin films. „The modularity of the system, and the flexibility that enables aixACCT to adjust the test system to almost any specific need was especially important for our interest in this system“, said Henrik Raeder, who is in charge of the establishment of the foundry service at SINTEF. „Our foundry service provides a professional and experienced team, and excellent equipment in order to give optimal support to our customers in process and product development.“

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## ■ aixACCT measurement system in operation at PI Ceramic

„The aixPES system from aixACCT is successfully used by PI Ceramic for the investigation and development of new piezoelectric materials“, says E. Hennig, head of development at PI Ceramic. Comprehensive electrical and electromechanical characterization with automated temperature control significantly decreases time for design and optimisation of new, e.g. lead free, materials. In particular the fully integrated system with automatic execution of the required measurements is a great advantage compared to the former use of several different measurement set-ups.

## ■ Actuator technology is boosted by aixACCT characterization systems

**aixACCT products for the characterization of actuators, sensors and multilayer actuators fulfil all measurement requirements in actuator technology. The range of actuator related aixACCT products reaches from evaluation systems to sample holders.**

- The **Resonance ANALYZER** is a software tool for failure inspection of devices by analyzing impedance resonances. It allows high speed analysis of piezoelectric sensors and multilayer actuators.
- The **Piezoelectric Evaluation System (PES)** for piezoelectric and dielectric measurements is built for comprehensive electrical and electro-mechanical characterization of piezoelectric sensors and multilayer actuators. It comes with a customized selection of external hardware components, e.g. high voltage amplifier, laser interferometer, temperature chambers.
- The **aixPlover software tool** provides data evaluation management and advanced analysis for the further application of measurement data.
- **Sample holders** are available for high voltage measurements of bulk ceramics and for simultaneous acquisition of electrical and electro-mechanical data of piezoelectric bulk ceramic. A unique option is to perform these measurements at elevated temperatures.
- The 200/400 V bipolar **High-Voltage Amplifier** is necessary for sample excitation and poling. Applications include AC and DC biasing for piezoelectric material characterization. applications, where our products operate close to theoretical limits in resolution and speed.

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## ■ Ceramic Multilayer Actuator test bench (aixCMA)



A test bench for Ceramic Multilayer Actuator (CMA) characterization has been developed by aixACCT Systems. This fulfills customers' requests for system solutions. The system comes with a unique sample holder for a wide range of different sized actuator devices, necessary amplifiers for excitation voltage and current response measurements. Also included are aixACCT's advanced measurement software and optional software tools for data analysis and statistical evaluation.

The aixCMA system offers comprehensive electrical and electro-mechanical characterization of ceramic multilayer actuators for device qualification and production control. Important actuator characteristics like blocking force diagram and actuator stiffness can be derived. Special user defined excitation waveforms for electrical and mechanical load allow investigations of the CMA's performance under real application conditions.

## ■ New measuring system for magnetic materials and multiferroics

aixACCT has significantly extended its product range in the area of material characterization. Alongside ferroelectric, piezoelectric and polymer material, magnetic materials can now also be characterized with the ANALYZER series.

The ferrous material can also be characterized with the TF ANALYZER. Multiferroics are materials which possess two or more switchable states. These switchable states could be electric polarization and magnetic polarization.

For the magnetic tunnel contacts, which can sometimes be low impedance, the ANALYZER works with a four-point current and voltage measurement in order to reach its usual high resolution. One percent accuracy with a resistance of 10 milli-ohms is reached. The ANALYZER also controls the source in order to generate the magnetic field.

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### ■ High speed analysis of piezoelectric sensors and multilayer actuators

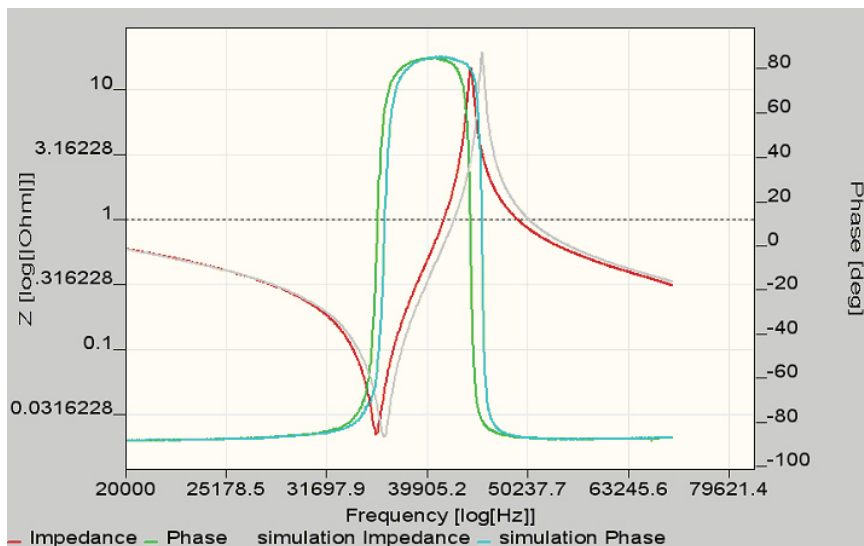
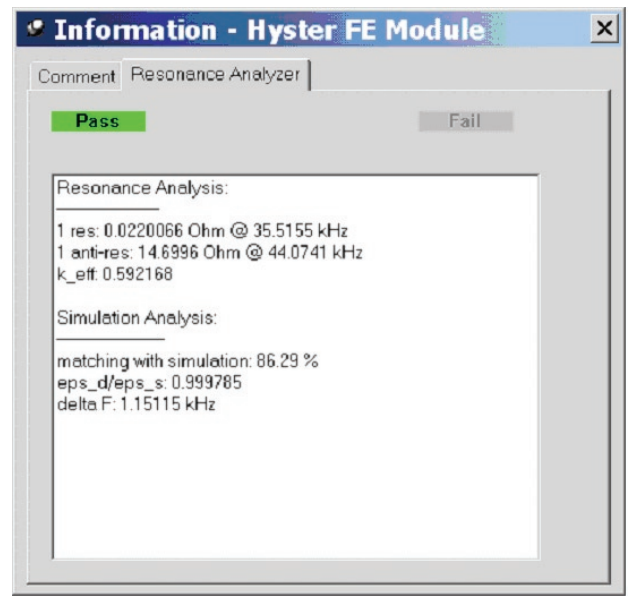
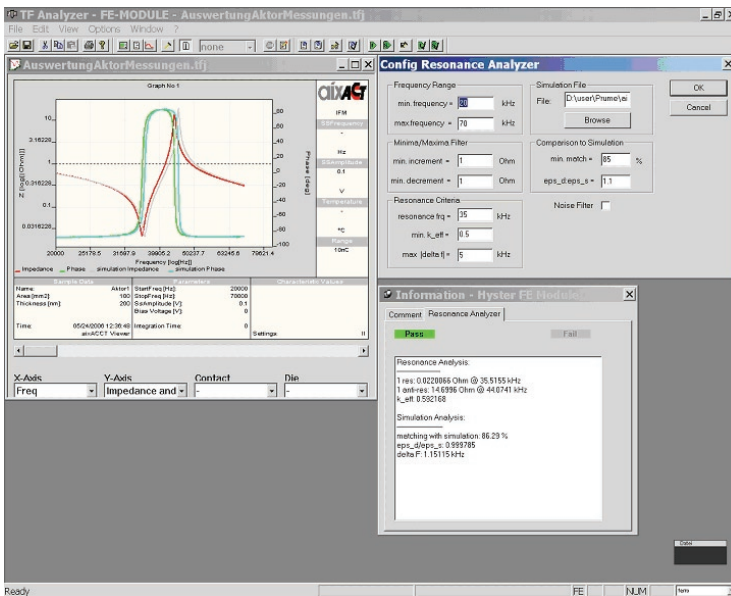


## RESONANCE ANALYZER

Impedance resonance measurements are widely used to investigate material characteristics and piezoelectric devices. The aixACCT Resonance Analyzer software tool significantly reduces the time and effort to analyse specific resonances.

The extracted data analysis allows, in combination with database functionality, improved production quality control.

Hence, special figures of merits can be extracted, so that a single electrical signal measurement helps to check mechanical and electrical properties of the devices. A comparison between the measured curve and an idealized or simulated one enables the individual adaptation of quality criteria to specific device requirements.



**June 2006**

## ■ aixACCT side by side with Canon



**aixACCT Systems and Canon will exhibit alongside each other at the ACTUATOR 2006. aixACCT has given significant support to the leading supplier of printer solutions in order to make its laser**

**system suitable for the piezoelectric market. The TF ANALYZER and Canon are already a successful duo in Japan. This success will now be transferred to Europe.**

The 10th International Conference on New Actuators and the 4th International Exhibition on Smart Actuators and Drive Systems will take place in Bremen, Germany, from June 14 to 16, 2006. With its technological sessions, the 10th International Conference on New Actuators provides the most important meeting place for the exchange of information on new results from the research and development of high-technology actuators and on their implementation into new products.

Please visit us at booth stand no. 9 and enjoy our presentation in the Exhibition Forum at 2 pm on Wednesday, June 14.

[www.actuator.de](http://www.actuator.de)

## ■ aixACCT Calendar of Events

### **June 14 – 16 2006:**

ACTUATOR 2006 - 10th International Conference on New Actuators and 4th International Exhibition on Smart Actuators and Drive Systems, Convention Center Bremen, Germany

Please visit us at booth stand no. 9 and enjoy our presentation in the Exhibition Forum at 2 pm on Wednesday, June 14.

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### **June, 18 – 22, 2006:**

Electroceramics X, International Conference on Electroceramics, Toledo, Spain

<http://www.estyloweb.com/electroceramics-X/>

### **July, 30 – August, 02, 2006:**

ISAF 2006 - International Symposium on the Applications of Ferroelectrics, Sunset Beach, North Carolina

<http://www.mse.ncsu.edu/isaf2006/>