

Welcome to aixACCT Systems,

the world leader in metrology of piezoelectrics is expanding production!

aixACCT has doubled its production space in spring this year in order to satisfy customer requests faster. This continuous growth is definitely based on the continuous improvements in testing capabilities for piezoelectrics that aixACCT has introduced in the last ten years.

Latest announcement for characterization tools of piezoelectrics is testing at high as well as cryogenic temperatures. Rising demand from industry made aixACCT decide to serve customers to test down to -100°C . The development of high temperature piezoelectrics has led to the development of a Piezoelectric Evaluation System up to 600°C .



For piezoelectric MEMS we have introduced the e31,f versus bias voltage test, which allows to correlate e31,f and d33,f coefficients.

Finally, I should mention the big success of our tool for multiferroic materials, where we combine the ferroelectric tester with a magnet system or where we can do magnetoresistive tests using a current source.

Happy reading!
Yours sincerely,
Stephan Tiedke

■ 3rd Workshop on piezo-MEMS was a great success!

Prof. Susan Trolier McKinstry did a great job in organizing the 3rd Workshop on Piezoelectric MEMS. The event took place in Washington DC on April 8th and 9th this year. More than 100 participants most of them from industry showed steady improvements in piezoelectric properties of thin films, which makes the whole community optimistic for further growth of this market. A pilot line at ST Microelectronics in Italy and EPCOS activities to build a RF switch based on PZT underline the market potential of this platform technology

▪ Doubling the space at aixACCT complies with market growth

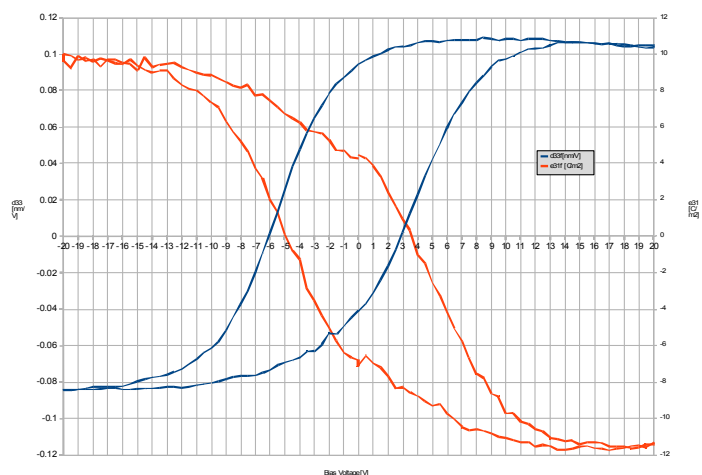
aixACCT System, world leading supplier of test equipment for piezoelectrics is growing due to the increasing demand of piezoelectric industry. The modular concept and at the same time customized design offer the flexibility required by research and industry. The combination of high flexibility and at the same time high reliability makes the system unique and very attractive for industry.

aixACCT Systems usually starts to supply standard test equipment to R&D divisions and while a customer's project is moving into prototyping and finally mass production, aixACCT's products are accompanying these different stages. That is the great benefit of aixACCT products, they grow with the product development by offering more testing complexity or testing automation according to the product phase.

▪ Extending testing capabilities: e31,f versus bias

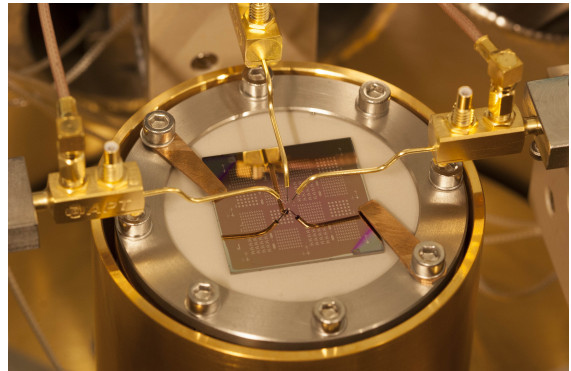
aixACCT Systems has introduced a highly valuable extension to its aix4PB test bench. While this system has been able to test precisely e31,f at 0V bias voltage due to the well defined boundary conditions aixACCT has now introduced an extension to this system, which is called e31,f vs. bias voltage. Especially for actuator solutions it's worth to know the piezoelectric coefficient at higher voltages.

Moreover, this enables the user to test e31,f using the aix4PB and d33,f coefficient using aixDBLI of the same sample versus bias voltage. Correlations can be found by plotting e31,f versus d33,f. An example is shown in the graph on the right for a PZT sample from EU project piezoVolume.



▪ **Cryo and high temperature piezoelectric testing by aixACCT**

Satisfying customer requests for low temperature measurements aixACCT offers tests of piezoelectric properties down to -100°C . For the field of high temperature piezoelectric ceramics 600°C for measuring piezoelectric properties are available also. The picture below shows a sample holder for thin films covering -150°C to 150°C .



▪ **HP and aixACCT working together on characterization of piezoelectric thin films**

aixACCT and HP had been working on the investigation of pad size and substrate clamping effect, earlier reported by aixACCT. Based on the simulations of S. Subramanian of HP the effect can be explained and a recommendation can be given how to circumvent the effect, especially when moving from 6'' to 8'' wafer. The key is the aspect ratio between lateral dimension of the squared or circular top electrode and the wafer substrate thickness. This one of the aspects that makes it more easy to compare results.

▪ **Meet aixACCT at the ...**

- UFFC/ISAF meeting exhibition Prague/ Czech Republic, July 21 – 24, 2013

▪ **Recent publications and presentations:**

"Electrode Size Dependence of Piezoelectric Response of Lead Zirconate Titanate Thin Films Measured by Double Beam Laser Interferometer", S. Subramanian, P. Mardilovich, A. Mason, A. Roelofs, T. Schmitz-Kempen and S. Tiedke, submitted to APL

"Comparability of the characterization of piezoelectric thin films for MEMS applications" T. Schmitz-Kempen, S. Tiedke, P. Murali, S. Troiler-McKinstry, P. Mardilovich, S. Subramanian, F. Stoppel, T. Lisec, 3rd International Workshop on Piezoelectric MEMS, Washington DC, 9th April 2013