

# OnSet<sup>15</sup>

News, Facts and Professional Solutions for Thermal Analysis

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Events

## NETZSCH GABO Instruments – The DMTA-Expert from Ahlden as a New Member of the NETZSCH-Group

Dr. Herbert Mucha, Application Support, NGI Ahlden



Fig. 1. The NGI team along with some guests from NGB in front of NGI's main building in Ahlden, Germany

On July 9, 2015, Gabo QUALIMETER, the renowned manufacturer of high-load DMA instruments (also called DMTA), has become an independent subsidiary of the NETZSCH Analyzing & Testing Business Unit. Their new name, NETZSCH GABO Instruments – NGI for short – has already become established in the company.

The NGI and NETZSCH Analyzing & Testing business segments are quite complementary to one another and offer significant advantages to both: NGI is now in the position to provide quick local service almost anywhere in the world – which is often a central factor in industrial customers' purchasing decisions – while NETZSCH has become the

Leading Thermal Analysis.



## Editorial

Dear Reader:

Thank you for taking the time to peruse this latest edition of **OnSet** to catch up on the latest news at NETZSCH.

Among other things, this issue will introduce a new member of the NETZSCH Group, feature a research report from the field of ionic liquids and present two innovative instrument systems.

As you already read on the front cover, NETZSCH GABO Instruments GmbH with its headquarters in Ahlden, Germany – approx. 60 km north of Hannover – is one of the leading manufacturers of high-load DMTAs worldwide. Together with our new colleagues, we are on the right path to becoming the world's top supplier in dynamic-mechanical analysis.

In their research report, Dr. Efimova and Professor Schmidt investigate the decomposition mechanisms of 1-ethyl-3-methylimidazolium halogenides as an example for ionic liquids by means of thermogravimetric analysis (TGA) and TGA-QMS coupling.

The objective was to estimate maximum operating temperatures for long-term use.

Our new DIL 402 *Expedis* dilatometer series – featuring the revolutionary *NanoEye* measuring system – and the new high-temperature LFA 467 *HT* now augment the NETZSCH product line.

Interesting reports covering the topics thermorefectance, measurements in humid atmospheres and the unique NETZSCH *AutoEvaluation* and *Identify* features round out this issue of **OnSet**. Don't miss the video which provides a clear illustration of how these two software modules work. The web address for the video can be found in the article.

Curios? Then I'm sure you will enjoy your browse through this 15<sup>th</sup> issue of **OnSet**.

Yann Jeschke  
Head of Marketing

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sole supplier covering the entire product range from laboratory equipment to the high-load DMTA, along with DMTA automation. NGI's strong connection to the tire industry opens up possibilities to NETZSCH for new or improved business contacts in the rubber industry. NETZSCH's strong international sales and distribution system with more than 200 locations all over the world has familiarity with local characteristics across global markets. This more direct communication with customers and short response times for servicing are also often decisive arguments in purchasing considerations.

### History of GABO QUALIMETER Testanlagen GmbH

The development, manufacturing and distribution of state-of-the-art electronic material testing equipment was a long-coveted goal of GABO's founder, physicist Victor Friedbert Gaddum. He began this journey in 1974 with the founding of GABO QUALIMETER Testanlagen GmbH in Ahlden, Germany.

Technological evolution at GABO was driven by the demands of the tire industry. Modern, easy-to-use dynamic-mechanical testing instruments for the investigation of the elastomeric behavior of rubber materials as a function of temperature and the type and strength of load were needed. The "Roelig testing instrument", developed in the 1930s by Dr. Roelig of Bayer AG and completely manually controlled, was not able to meet these challenges. GABO QUALIMETER Testanlagen GmbH subsequently put Roelig's concept into practice with state-of-the-art technology in their

EPLEXOR® dynamic-mechanical analyzer.

### Operating Principle of the EPLEXOR® DMTA

As a DMTA, the EPLEXOR® not only presses together or stretches samples such as rubbers in a targeted manner, but also further deforms them via a superimposed sinusoidal force. Excitation of the sample by a cyclic load (force) is followed by the delayed sample response as a periodic deformation of the test specimen. Under application of the respective test conditions, the material reveals its dynamic properties, such as stiffness (modulus of elasticity) and mechanical damping ( $\tan\delta$ ). The dynamic forces of currently up to  $\pm 8000$  N allow for problem-free excitation of both the linear and non-linear material behavior. The measurement technique records the sample's response as a function of force and temperature ( $-150^\circ\text{C}$  to  $+1500^\circ\text{C}$ ). The results can be presented in either a visual or a tabular format by the evaluation software.

Elimination of the need to reduce the size of the test specimen due to a lack of available force also eliminates the risk of unintentionally analyzing non-representative portions of heterogeneous materials due to the use of excessively small samples.

### Milestones

- Between **1977** and **1988**, the EPLEXOR® series grew stronger and stronger. The initial maximum dynamic force of 1 N (**1977**) expanded to 150 N (**1981**) and ultimately to 1500 N (**1988**).
- In **1994**, the EPLEXOR® series was equipped with high-temperature-resistant sample holders and a furnace for high-temperature applications to  $1500^\circ\text{C}$ .
- Beginning in **1995**, the "Automatic Sample Supply System" (ASSS) allowed for fully automatic 24-h DMTA operation.
- **1997**: The newly developed EPLEXOR® desktop instrument series (25 N, 100 N, 150 N to 500 N) and the standard instruments with dynamic force amplitudes of 2000 N and 4000 N were launched.
- **2002**: Introduction of the GABOMETER, a universal flexometer with an expanded frequency and property range (visco-elastic properties and heat build-up testing).
- **2003**: Ronald Gaddum took over the general management from his father.
- **2007**: The QUALIMETER for fast recording of E-modulus and damping of rubber materials at room temperature became available.
- **2009**: Introduction of GABOTACK. It determines the tackiness of unvulcanized rubber mixtures and other materials with adhesive properties.
- **2010**: Introduction of high-load EPLEXORS with forces of 6000 N and 8000 N and the multi-purpose sample supply system MPAS. Measurements (tension, bending, compression, shearing) could now be carried out on different test geometries in any order without the need for any mechanical change to the setup.
- **2012**: Foundation of the GABO ACADEMY, which offers prospects and customers the ability to acquire knowledge in the field of dynamic-mechanical analysis.
- **2013**: The DiPLEXOR® instrument series allowed for simultaneous recording of the dielectric (up to 10 MHz) and dynamic-mechanical properties (up to 100 Hz).

### Outlook

The currently just under 30 employees – among them physicists, engineers, computer specialists and technicians – develop and manufacture state-of-the-art dynamic mechanical thermal material testing technology and are looking forward to beneficial collaboration and much success in the NETZSCH Group. The path has been paved, as NGB Managing Director Dr. Thomas Denner ensured employees at a meeting at NETZSCH GABO Instruments in Ahlden on October 12, 2015 (figure 1).

The Ahlden location offers valuable conditions for expansion, which – if business development progresses as expected – will surely become necessary very soon.