

## RESOURCES

A summary of new products and services  
for materials research...

### Machine Control and Data Analysis Program:

Nexygen software from AMETEK Test & Calibration Instruments features advanced machine control capabilities and Windows™ compatibility. The program can be used with any Lloyd Instrument™ materials tester with an RS232 interface. The advanced machine control functions enable users to perform a wide range of analyses on plastics, composites, films, and components. A library of predefined tests is included; additional modules are available. Custom routines may be specified. Website: [www.ametek.com](http://www.ametek.com).

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### Dart Drop Impact Tester:

The DDI/TE from Atlas Electric Devices is a total energy system option for the DDI Dart Drop Impact Tester. The instrument measures the loss of kinetic energy to determine the impact toughness of materials such as polymer and plastic films, packaging, and coated papers. An on-board computer prompts users through the test setup. Users can program all test parameters such as drop height and dart mass. The system allows sample annotation including material type, thickness, and type of failure.

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### Torque Magnetometer:

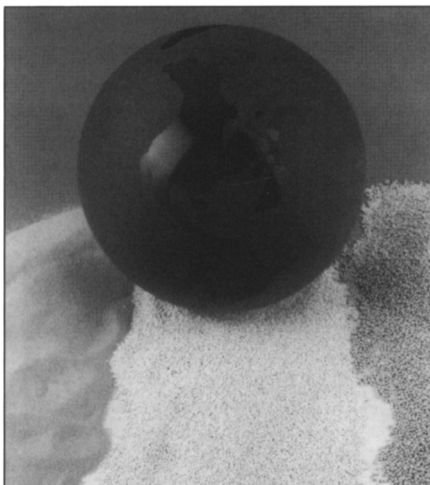
Quantum Design TqMag option expands the measurement capabilities of the physical property measurement system (PPMS). The sensitivity of the TqMag increases at high fields. Designed for measuring small anisotropic samples, the system features a microfabricated, silicon, piezoresistive torque-lever chip mounted on a rotator. The torquemeter performs automated, angular dependent magnetic moment measurements of samples via the magnetic torque at fields up to 14 Tesla and a temperature range of 1.9–400 K on the PPMS. Website: [www.QuanDsn.com](http://www.QuanDsn.com).

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### Thin Film Characterization Software:

FilmSpectrum from Scientific Computing International simultaneously solves for the index of refraction, extinction coefficient, and film thickness from spectrophotometric data. The software obtains a self-consistent solution using a generalized dispersion formula to characterize the dielectric function of measured films. The dispersion formula applies to metallic, amorphous, crystalline, and dielectric materials. With this approach, users can model complex multilayer structures with reflection/transmission data.

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**Rare Earth Powders:** Starmet's custom-produced rare earth powders feature high sphericity and high yields within a specific particle size range. A median particle size distribution is controllable within a specified range from 1000 to 45  $\mu\text{m}$ . The powders include gadolinium, neodymium, yttrium, erbium, dysprosium, and cerium. The powders can be used as alloying agents and for applications such as cryogenic cooling, hydrogen storage alloys, getters, and corrosion-resistant coatings. Website: [www.starmet.com](http://www.starmet.com).

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### Phase Doppler Particle Analysis:

Aerometrics' Phase Doppler Particle Analyzer (PDPA) provides complete analysis of sprays and two-phase flows containing spherical particles, droplets, or bubbles, offering dynamic measurements of particle size, velocity, number density, and volume flux. The system consists of a laser-based optical transmitter, an optical receiver, an electronic signal processor, and computer system with DataView software for data acquisition and analysis.

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**Micro-Thermal Analysis:** TA Instruments'  $\mu\text{TA}$ ™ instrument combines the capabilities of thermal analysis with atomic force microscopy. The AFM head is fitted with an ultraminiature temperature probe that provides the heat source and measures response on a microscopic scale. Modulated temperature technology enhances the signal similarly to Modulated DSC® and provides depth profiling by varying the frequency over a wide range. The instrument images the structure of a sample in terms of its topography, thermal conductivity, and thermal diffusivity. Resolution is approximately 1  $\mu\text{m}$ . Website: [www.tainst.com](http://www.tainst.com).

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**Polyimide Coatings:** Ultradel® coatings are negative-acting, photosensitive polyimides that can be used as stress buffer coatings for large memory and flip chip integrated circuits. For flip chip applications, the coatings also can perform as the mask for the intermetal interconnect process and as a redistribution layer for peripheral pad fan into an array format. The materials provide viscosity stability and are capable of room temperature storage, with no outgassing of photosensitive additives during cure. Latitude in final film thickness is 2–30  $\mu\text{m}$  in a single-spin operation, cure temperatures are as low as 150°C, and 8–10% shrinkage occurs after soft bake.

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### Noncontact Ultrasonic Analyzer:

Ultran's NCA 1000 high-frequency (100 kHz to 5 MHz) system is suitable for analysis of plastics, rubber, fibrous, and cellular products, as well as green, sintered, and crystalline materials. Measurable characteristics include velocity, density, thickness, defects, time-of-flight, and composition. The system unites modular hardware and digital signal processing with high transduction transducers. Dynamic range is >140 dB, and time-of-flight accuracy is +1 ns. Time stability is <0.2 ns, and materials measurement rate is 20/s.

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### Technical Writing Handbook:

ASME International's 290-page guide to technical writing is intended for engineers and scientists. The book covers development of eight types of technical documents. Discussions include scientific reports, training manuals, computer use, and how to distribute work while guarding proprietary information. The book gives tips on research, planning, grammar, layout, and other elements involved in creating concise and readable documents with a professional appearance.

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### Benchtop Accelerated Weathering Instrument:

The SUNTEST XLS+ from Atlas is an accelerated xenon weathering instrument for small-scale lab. testing. The system features a parabolic-shaped test chamber with an exposure area of 1000  $\text{cm}^2$  and provides uniform irradiance exposure and multiple sample testing. An air-cooled xenon arc lamp produces a light spectrum emulating sunlight in spectral distribution. Users can set critical light source test parameters, such as irradiance and black standard temperature.

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