

Customer Engagement

Prioritizing measurement needs

Soliciting technical input

The National Institute of Standards and Technology (NIST) promotes U.S. innovation and economic competitiveness by advancing measurements and standards across a wide spectrum of industries. Because measurement challenges continually evolve, NIST works closely with customers to ensure our research programs address the highest priority measurement needs facing industry today and tomorrow. Workshops are one way MSEL examines evolving measurement issues, enabling MSEL scientists to work with leading technical experts to identify and prioritize future research directions.

Recent workshop highlights

Carbon Nanotube Measurements

- September 26-28, 2007
- NASA
- Standard reference materials (SRMs)

This workshop, the 3rd in a series, examined best practices for characterizing single-walled carbon nanotubes. Despite volume production, quality and consistency remain key issues for these materials. Previous workshops (2003, 2005) led to a Recommended Practice Guide, which formed the basis for current ISO documentary standards activities. The 2007 workshop also addressed the demand for reference materials, with industry input expanding the scope of MSEL's SRM development program to include bulk, purified, and separated materials.

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Materials Characterization for Nanoscale Reliability

- August 14-16, 2007
- NSF, Lehigh University, University of Colorado
- Collaborative development of nanometrology

Looking ahead to the challenges of nanodevice mass manufacturing, this workshop considered how to engineer in reliability at this scale. Participants cataloged the range of tools that will be needed in the

future and designed plans for collaborative projects that will build these critical tools as nanotechnology advances. Increased community awareness of new and existing metrology was a common goal, and a series of feature articles are being developed for publication in a high-profile nanotechnology journal.

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Test Procedures for Hydrogen Pipelines

- August 21-22, 2007
- DOE, DOT, ASME
- Testing plan for future pipelines

This workshop addressed codes and standards needs for safe storage and distribution of hydrogen fuels. The future "hydrogen economy" will depend on efficient distribution of these fuels across the U.S., preferably using our existing network of oil and gas pipelines. Unfortunately, these pipelines are made from steel, a material known to degrade in contact with hydrogen. An intra-governmental strategy was developed for gathering critical test data on future pipeline materials (steels, plastics, and composites), including standardization of test techniques in high-pressure gaseous hydrogen environments.

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Reliability of Active Implantable Medical Devices

- October 3-4, 2005
- FDA, ASTM
- Improved life testing of medical components

Manufacturers of implantable medical devices came together to discuss the robustness of accelerated test procedures for medical-grade electronics. Because failure rates are higher than desired, the need for new standards is pervasive. As a result of this workshop, a new iNEMI Technical Integration Group on Medical Electronics was formed, which now has 20⁺ corporate members. New capabilities were also established at NIST for evaluating discrete component reliability, and first-ever documentation was prepared detailing failure modes in ex-planted (failed) devices.

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