Standards for Nanotechnology Material Specifications

This fifth and final article in a series on standards for the nanotechnology community explains the development of specifications that will look at raw nanomaterials in terms of their use in a variety of applications.

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By 2007, the development of international guidelines for nanotechnology was well underway within the International Organization for Standardization (ISO). Each of the projects of ISO Technical Committee (TC) 229, *Nanotechnologies*, had been categorized into one of the TC's working groups: WG 1, *Terminology and Nomenclature*, WG 2, *Measurement and Characterization*, or WG 3, *Health, Safety, and Environment*.

But when the Standardization Administration of China (SAC), China's national standards body, submitted two new work item proposals in October 2007, TC 229 members recognized that the proposed areas of technical activity – addressing specifications for nanomaterials in terms of possible applications – did not fit easily into any of the existing WGs.

Material specifications had already been identified as a priority area in the TC 229 business plan, which was based on the results of a 2006 survey, "*ISO TC 229 Nanotechnologies Survey of Standardization Needs*." Some aspects of the SAC-proposed work items, however, fell under the scope of each of the WGs and yet other parts of the proposals didn't fit into any of the groups.

In response to these newly identified needs, a new working group on *Material Specifications* (WG 4) was formed in early 2008.

Leadership and Work Items for WG 4

Given their important role in the creation of WG 4, China holds the convenorship of the group through SAC and Professor Limin Wang. The scope of the group is still being drafted with the help of several international stakeholders, including many from the United States. This scope, once established, will serve as a roadmap for how to further the efforts of the WG.

TC 229/WG 4 currently has three work items in development to examine raw materials in terms of their purpose in a variety of uses. The first two of these are the original SAC-submitted work items that sparked the formation of WG 4, and are currently being led by SAC:

- *Nano TiO_2 (Titanium Dioxide)* specifies the characteristics and measurement methods for engineered nanoscale titanium dioxide (powder form). The material has numerous industrial applications, including use in sunblock, certain fibers and plastics, paints, printing ink, coatings, ceramics, and catalysts and catalyst carriers.

- *Nano $CaCO_3$ (Calcium Carbonate)* specifies the characteristics and measurement methods for engineered nanoscale calcium carbonate (powder form). Industrial applications for this material include fillers in rubbers, plastics, coatings, paint, and printing ink.

Each of these work items will be divided into two parts: characterization of measurement and methods; and use of the nanoscale material in applications.

The third work item under WG 4 is being led by BSI British Standards, the national standards body for the United Kingdom:

- *Guide to specifying nanomaterials* will provide guidance on the preparation of comprehensive technical specifications for manufactured nanomaterials in order to ensure the delivery of a product that behaves in a reproducible manner.

Impact on Industry

As the standards developed under WG 4 can be used in industrial applications and consumer products from paint and coatings to textiles and sunblock, they will have a tremendous impact on manufacturers in a wide variety of industries, both in the U.S. and abroad. Interested stakeholders are encouraged to provide input that can help to formulate the strategy for WG 4.

U.S. involvement in ISO/TC 229 and its Working Groups begins with the U.S. Technical Advisory Group (TAG) to ISO/TC 229, administered by the American National Standards Institute (ANSI). Led by Clayton Teague, director of the National Nanotechnology Coordination Office, the TAG is organized into Working Groups that mirror their efforts on the scope of each TC 229 WG.

The mirror group for WG 4 is led by Dr. David S. Ensor, of RTI International.

“American industry has a rare opportunity to shape the content of these very early stage working draft standards and influence the strategic direction of WG 4,” said Dr. Ensor.

How to Participate

Participation in the U.S. TAG to ISO/TC 229 WG 4 is open to all nationally interested stakeholders. The TAG actively seeks participants who have expert knowledge in all aspects of nanotechnology material specifications.

“I encourage interested organizations to participate in the U.S. TAG and help develop U.S. positions to guide the deliberations of our experts to WG 4,” Dr. Ensor added. “We expect WG 4 will likely become an important ISO/TC 229 activity with time because it will eventually build on the standards developed by the other working groups.”

To join the ANSI-accredited U.S. TAG for ISO/TC 229 or any of its WGs, contact Heather Benko (hbenko@ansi.org; 212.642.4912).

For more information on the U.S. TAG for ISO/TC 229, visit http://www.ansi.org/isotc229tag.