
**ANSI-NSP Newsletter** Volume III, Issue II ● September 2017

The ANSI-NSP Newsletter provides information on nanotechnology standards and related topics of interest. Stakeholders are encouraged to submit information to the ANSI-NSP that they feel would be of interest to the larger ANSI-NSP Community.

While ANSI will be providing some of the content to be included in this newsletter, this is a community-driven project, with developers and organizations providing updates on any documents published or upcoming meetings that may be of interest to the ANSI-NSP. If you do have any information you would like to share, please feel free to forward it to hbenko@ansi.org.

For further information and updates on the Panel, please visit the ANSI-NSP Website.


## WELCOME

While Standards are intended to facilitate commerce, in the case of nanotechnology standardization, they can also be utilized to support and enable the responsible development of nanotechnology. Whether it's in metrology or terminology, the development of standards to describe things precisely or measure them accurately makes it easier to communicate and implement practices that support understanding what nanomaterials are, and the important physical properties that may correlate to their potential impacts on human health and the environment. Such standards can be used by developers, users and the EHS community to aid in material and application design.

Our guest columnist, Dr. Eric Grulke of the University of Kentucky, is helping in these efforts by leading the development of an ISO Standard to determine particle size distribution of nano-objects using transmission electron micrscopy (TEM). This Standard will hopefully be utilized by not only industry, but also regulators, to better understand nanoparticle size distribution and how it impacts a product's

performance, as well as if there are any potential environmental health and safety concerns that need to be considered.

While participation in standardization may not always be recognized as an important facet of an academic career, engagement in such activities can provide both university faculty and students the opportunity to interact and collaborate with companies, organizations and government agencies that could in turn provide opportunities and funding for their respective academic institution.

## Guest Columnist – Dr. Eric Grulke

**A 'value proposition' for academics in standards development**

Academics develop future innovations through research and train undergraduate and graduate students for their careers in innovative, professional practice. A broader question for the academic might be: how do standards influence innovations? Innovation pathways are often visualized as linear and sequential, but actual innovation 'pathways' are non-linear, interconnected and complex.

When you think about it, metrics and measurements provide integral elements of an innovation pathway. Our technology community creates new properties through research and development and translates customer needs into specifications. Intellectual property rights are linked to novel, measurable properties. Regulators require metrics to do their work. Customers select products, processes, or services on their measured performance in applications.

The standards team benefits from university involvement by incorporating impartial viewpoints, direct experience with state-of-the-art testing, and broader perspective to the process. The faculty member benefits from discussions with industry, regulatory, and non-governmental stakeholders, using standards in design instruction, and including standards as important elements in the research products and process.

There are significant, long-term benefits to academics that participate in the standards development process. -Working with standards committees can be considered important service work. However, you will be building national and international collaborations that can impact your research for years to come. Committee work often leads to publications in growing research areas. If you are developing novel instrumentation techniques, research funding from traditional federal agencies is also possible.

Developing standards is a 'contact sport'. Academics can help improve the standards development process, which, in turn, can lead to improved research approaches and new case studies to bring to the classroom.

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Dr. Eric Grulke spent four years in new process development with the polymer industry and over thirty years in academics at two universities. His research themes revolve around innovation at the interfaces of engineering with the life or physical sciences, specifically with food engineering, polymers and polymer processing, nanocomposites, and toxicology of nanoparticles. He is currently teaching the

chemical engineering capstone design sequence. Prof. Grulke is leading a standards project on size and shape distributions of nanoparticles using transmission electron microscopy (TEM).

## NEWS & INFORMATION

### Canadian Standards Association (CSA) Technical Committee on Cellulose Nanomaterials

CSA Group has recently published two new standards on cellulose nanomaterials:

**CSA Z5100-17 - *Cellulose nanomaterials – Test methods for characterization***

This is a second edition standard documenting test methods to characterize base cellulose nanomaterials, for use in commercially-viable products. The standard includes twenty-six test methods for purity, morphology, chemical and physical properties for base material characterization, with applicability to cellulose nanocrystals (CNC), cellulose nanofibrils (CNF), and cellulose microfibrils (CMF).

**CSA Z5200-17 - *Cellulose nanomaterials – Blank detail specification***

This first edition standard provides a blank detail specification, with guidance and templates for listing material properties and characteristics that may be critical to end product quality. A companion standard with CSA Z5100, this standard indicates how to report measurable properties and characteristics of cellulose nanomaterials for commercial applications, for use between the cellulose nanomaterial supplier and customer.

The Z5100/Z5200 STANDARDS PACKAGE (both standards) is available at this link:
http://shop.csa.ca/en/canada/sustainable-forest-management/z5100-14/invt/Z5100-Z5200pkg

The CSA Technical Committee on Cellulose Nanomaterials that developed the above two standards has stakeholder representation by research, government, industry, and users from Canada and the United States. Experts on this committee also provide input for standards development for cellulose nanomaterials at both ISO/TC229 *Nanotechnologies* and ISO/TC6 *Paper, board and pulps*. With several international standards projects underway, recent publications at ISO in this subject area include:

**ISO/TR 19716:2016 - *Nanotechnologies -- Characterization of cellulose nanocrystals*** is a technical report on commonly used methods for the characterization of cellulose nanocrystals (CNCs), including sample preparation, measurement methods and data analysis. Selected measurands for characterization of CNCs for commercial production and applications are covered. These include CNC composition, morphology and surface characteristics.

**ISO/TS 20477:2017 - *Nanotechnologies -- Standard terms and their definition for cellulose nanomaterial***
(see more information below)

## IEC TC 113 *Nanotechnology for electrotechnical products and systems*

IEC TC 113 will hold its next face to face meeting November 6-10, 2017 in Shenzhen, China. For more information regarding the United States National Committee TAG to IEC TC 113, please contact Mr. Mike Leibowitz: Mike.Leibowitz@Nema.org.

## ISO/TC 229 *Nanotechnologies* Recent Publications and approved work items

ISO has recently published the following deliverables developed under ISO/TC 229 *Nanotechnologies*:

- **ISO/TS 11888:2017 - *Nanotechnologies -- Characterization of multiwall carbon nanotubes -- Mesoscopic shape factors (Revision of 2011 edition),*** provides guidelines for the characterization of compounds containing single-wall carbon nanotubes (SWCNTs) by using optical absorption spectroscopy.

- **ISO/TR 18401:2017 - *Nanotechnologies -- Plain language explanation of selected terms from the ISO/IEC 80004 series***, is intended to assist stakeholders who are making decisions about the direction, management and application of nanotechnologies to better understand selected key terms and definitions in the ISO/IEC 80004 vocabulary series for nanotechnologies.

- **ISO/TS 20477:2017 - *Nanotechnologies -- Standard terms and their definition for cellulose nanomaterial,*** defines terms and definitions for different types of cellulose nanomaterials including secondary components found in cellulose nanomaterials due to their manufacturing processes. The document also gives information on cellulose micromaterials in Annex A.

  Terms in this document are applicable to all types of cellulose nanomaterials regardless of production methods and their origin (plants, animals, algae or bacteria)

- **ISO/TS 80004-13 – *Nanotechnologies – Vocabulary – Part 13: Graphene and 2D Materials***, lists terms and definitions for graphene and related two-dimensional (2D) materials, and includes related terms naming production methods, properties and their characterization.

  It is intended to facilitate communication between organizations and individuals in research, industry and other interested parties and those who interact with them.

More information regarding the documents above, or any published ISO Standards or other deliverables, can be reviewed after publication using the ISO Online Browsing Platform (https://www.iso.org/obp/ui/). All ISO published documents are available for purchase via ANSI's Webstore.

More information regarding the work items above, or any other work items included in ISO/TC 229's work programme is available via your country's ISO Member Body. In the U.S., please contact ANSI: hbenko@ansi.org

**The American National Standards Institute's Nanotechnology Standards Panel (ANSI-NSP) serves as the cross-sector coordinating body for the purposes of facilitating the development of standards in the area of nanotechnology, including, but not limited to: nomenclature/terminology; health, safety and environmental aspects; materials properties; and testing, measurement, and characterization procedures.**

**For more information about the NSP, please contact hbenko@ansi.org**