



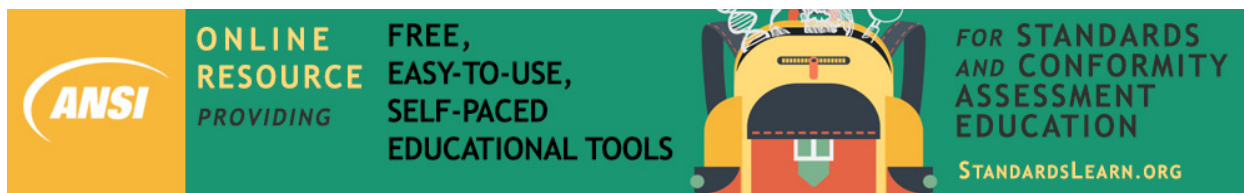
## ANSI-NSP Newsletter

Volume II, Issue 4 • 2016

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](mailto:hbenko@ansi.org).

For further information and updates on the Panel, please visit the [ANSI-NSP Website](#).



## WELCOME

Happy New Year! 2017 promises to be a productive year, with the publication and development of more standards that relate to nanotechnology and nanomaterial research and commercialization. With this increased activity amount comes greater opportunities for stakeholder engagement.

Attracting and maintaining participation in standards efforts is always a high priority, especially for those organizations that rely on the technical experts to volunteer their time and expertise to help develop relevant, concise, and science-based documents that will be beneficial to the community. It is also important for those organizations whose products will be impacted by the development and implementation of these standards. Participation in standards activities provides organizations with both a seat at the table as well as a voice in the development of standards that will impact international commerce.

For more information regarding the various organizations currently developing standards relative to nanotechnology processes and nanomaterials, be sure to visit [nanostandards.ansi.org](http://nanostandards.ansi.org), which not only provides information about standards and associated documents (standards, best practices, guidelines) that directly relate to nanomaterials and nanotechnology-related processes applications and products, but also directly links users to those organizations currently developing standards in this technology space.

## **SAVE THE DATE: ANSI NANOTECHNOLOGY STANDARDS PANEL – FEBRUARY 28, 2017**

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ANSI's Nanotechnology Standards Panel (ANSI-NSP) is holding a meeting on Graphene Commercialization and Standardization needs. This meeting is scheduled for **Tuesday, February 28, 2017**, and will take place at Consumer Technology Association in Arlington, Virginia. For more information or updates on how to register, please contact Heather Benko ([hbenko@ansi.org](mailto:hbenko@ansi.org)).

## **NEWS & INFORMATION**

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### **ASTM E56 Committee on Nanotechnology**

ASTM Committee E56 discussed several new work items at their meeting on November 14-15, 2016 in Orlando, FL. One of these proposed new work items is WK56764, *New Guide for Characterization of Graphene Flakes Produced by Exfoliation*. This proposed new standard will cover the measurement approaches for assessment of lateral flake size, average flake thickness, Raman intensity ratio of the D to G bands, and carbon/oxygen ratio for graphene and related products made of exfoliation. The techniques used are atomic force microscopy, Raman spectroscopy and X-ray photoelectron spectroscopy methods. Within the standard, examples will be provided for each measurement. This proposed new standard was requested by National Research Council (NRC) Canada, due to a need to standardize materials and manufacturers in the graphene area. If you are interested in participating in the work of this proposed new standard, please contact Kate Chalfin at [kchalfin@astm.org](mailto:kchalfin@astm.org).

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

The following IEC TC 113 documents were published in 2016, or are awaiting publication:

#### **[IEC TS 62607-4-2:2016, Edition 1](#)**

#### **Nanomanufacturing - Key control characteristics - Part 4-2: Nano-enabled electrical energy storage - Physical characterization of cathode nanomaterials, density measurement**

Provides a standardized method for the determination of the density of cathode nanomaterials in powder form used for electrical energy storage devices. This method provides users with a key control characteristic to decide whether or not a cathode nanomaterial is usable, or suitable for their application.

#### **[IEC TS 62607-4-4:2016, Edition 1](#)**

#### **Nanomanufacturing - Key control characteristics - Part 4-4: Nano-enabled electrical energy storage - Thermal characterization of nanomaterials, nail penetration method**

Provides a measurement method for thermal runaway testing for nano-enabled energy storage devices, using a comparative measurement to enable a manufacturer to decide whether or not the nanomaterial additives used in energy storage devices are resilient against the thermal runaway caused by a faulty or accidental low resistance connection between two or several internal points.

[\*\*IEC TS 62607-6-4:2016, Edition 1\*\*](#)

**Nanomanufacturing - Key control characteristics - Part 6-4: Graphene - Surface conductance measurement using resonant cavity**

Establishes a method for determining the surface conductance of two-dimensional (2D) single-layer or multi-layer atomically thin nano-carbon graphene structures, synthesized by chemical vapour deposition (CVD), epitaxial growth on silicon carbide (SiC), obtained from reduced graphene oxide (rGO) or mechanically exfoliated from graphite.

IEC TS 62604-6-4, was a US-led project headed by Jan Obrzut, NIST

**IEC/TS 62607-3-2: Nanomanufacturing - Key control characteristics - Part 3-2: Luminescent nanoparticles - Determination of mass of quantum dot dispersion**

This TS, a USNC-led project, specifies a method for determining the mass of a sample of QD dispersion after the removal of impurities and surfactant ligands through heating at high temperatures.

**IEC/TS 62844: Guidelines for quality and risk assessment for nano-enabled electrotechnical products**

This TS provides a recommended methodology for identifying relevant parameters of nanomaterials and generic guidelines on implementation of quality assessment and environment/health/safety assessment for nano-enabled/nano-enhanced electrotechnical products.

**IEC/TS 80004-9: Nanotechnologies - Vocabulary - Part 9: Nano-enabled electrotechnical products and systems**

This TS provides terms and definitions for electrotechnical products and systems that are reliant on nanomaterials for their essential functionalities. It is intended to facilitate communications between organizations and individuals in industry and those who interact with them.

In development:

**IEC 62565-3-1: Nanomanufacturing - Material specifications - Part 3-1: Graphene - Blank detail specification**

This standard, a USNC-led project, will establish a blank detail specification and format for listing essential electrical and certain other characteristics including optical, dimensional, and mechanical properties of single and few layer and functionalized graphene for use in electrotechnical applications. The third Committee Draft is will be circulated soon.

**IEC/TS 62565-4-2: Nanomanufacturing - Material specifications - Part 4-2: Luminescent nanomaterials - Detail specification for general lighting and display applications**

This TS, a USNC-led project, specifies the essential general and optical requirements of monodisperse luminescent nanomaterials used in general lighting and display products to enable their reliable mass production and quality control during the manufacturing process. The first Committee Draft has been circulated and comments were resolved. A Draft Technical Specification will be circulated shortly.

**IEC TS 62607-5-2: Nanomanufacturing - Key control characteristics - Part 5-2: Thin-film organic/nano electronic devices - Measuring Alternating Current characteristics**

Specifies a standard procedure for measuring AC characteristics as a stability test based on the measurement of frequency-dependent hysteresis in current-voltage characteristics of OTFTs. Circulation of a first working draft is expected around the end of January, 2017.

**IEC TS 62607-6-1: Nanomanufacturing - Key control characteristics - Part 6-1: Graphene - Measurement of Sheet Resistance of Commercial Graphene Powders by the Four Probe Method**

Established a method for conductivity measurements of graphene powders. Circulation of the first working draft is expected around year-end 2016.

**IEC/TS 62607-6-3: Nanomanufacturing - Key control characteristics - Part 6-3: Graphene - Characterization of graphene domains**

This TS will provides the evaluation method of determining graphene domains in order to understand the effect of graphene domain size and distribution of defects on properties of graphene, and enhancing the performance of high speed, flexible, and transparent devices using CVD graphene. It is a joint project with ISO TC 229. The first Committee Draft was recently circulated and is out for comment until February 10, 2017.

Proposed new work:

**IEC 62876-3-1: Nanomanufacturing – Reliability Assessment – Part 3-1: Graphene – Stability test: Temperature and humidity**

Establishes a general reliability qualification methodology for graphene layers on a substrate to demonstrate that these layers fulfil a minimum level of reliability. The described methodology will not provide full reliability data which allow the estimation of product lifetimes. Balloting for this New Work Item Proposal closed November 6, 2016.

**IEC TS 62607-4-6 Ed.1.0: Nanomanufacturing-Key control characteristics - Part 4-6: Nano-enabled electrical energy storage devices - Determination of carbon content for nano electrode materials, infrared absorption method**

Describes a method for determining the carbon content in nano electrode materials with carbon concentrations ranging from 0,001 % (m/m) to 100 % (m/m) by combusting the materials in an induction furnace and performing infrared absorption spectroscopy measurement on the combustion by-products. Balloting for this New Work Item Proposal closed October 7, 2016.

**IEC TS 62607-4-7 Ed.1.0: Nanomanufacturing - Key control characteristics - Part 4-7: Anode nanomaterials for nano-enabled electrical energy storage- Determination of magnetic materials, ICP-OES method**

Provides a method for the determination of magnetic impurities in anode nanomaterials for lithium-ion batteries using Inductively Coupled Plasma Optical Emission Spectrometer (ICP-OES), including test principle, reagents, instruments, test procedures, test results and test report. Balloting for this New Work Item Proposal closed October 7, 2016.

**IEC TS 62607-6-2: Nanomanufacturing - Key Control Characteristics - Part 6-2: Graphene - Evaluation of the number of layers of graphene**

Describes methods for counting the number of layers of graphene such as atomic force microscope (AFM), transmission electron microscope (TEM), light transmittance, and Raman scattering. Balloting for this New Work Item Proposal closed October 28, 2016.

**IEC TS 62607-8-1: Nanomanufacturing - Key Control Characteristics - Part 8-1: Nano-enabled metal-oxide interfacial devices - Test method for defect states by thermally stimulated current**

Specifies the measurement method for determining defect states of nano-enabled material and devices as generated by the de-trapping of charges. Balloting for this New Work Item Proposal closes January 20, 2017.

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

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

- **ISO/TR 18196:2016 - *Nanotechnologies -- Measurement technique matrix for the characterization of nano-objects***, provides a matrix that guides users to commercially available techniques relevant to the measurements of common physiochemical parameters for nano-objects.
- **ISO/TR 18637:2016 *Nanotechnologies – Overview of available frameworks for the development of occupational exposure limits and bands for nano-objects and their aggregates and agglomerates (NOAA)***, provides an overview of available methods and procedures for the development of occupational exposure limits (OELs) and occupational exposure bands (OEBs) for manufactured nano-objects and their aggregates and agglomerates (NOAAs) for use in occupational health risk management decision-making.

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](#).

ISO/TC 229 has recently added the following projects to their work programme:

- **ISO/AWI 19749 -- *Nanotechnologies --Determination of size and size distribution of nano-objects by scanning electron microscopy*** (under development by JWG 2, Measurement and characterization)
- **ISO/AWI 21363 -- *Nanotechnologies -- Protocol for particle size distribution by transmission electron microscopy*** (under development by JWG 2, Measurement and characterization)
- **ISO/AWI TS 21362 – *Nanotechnologies -- Application of field flow fractionation for characterization of nanomaterial contents*** (under development by JWG 2, Measurement and characterization)
- **ISO/AWI TS 21975– *Nanotechnologies -- Polymeric nanocomposite films for food packaging -- Barrier properties: characteristics and measurement methods*** (under development by WG 4, Materials specifications)
- **ISO/AWI TR 22019 – *Nanotechnologies -- Considerations in performing toxicokinetic studies of nanomaterials*** (under development by WG 3, Health, safety and environment)

- **ISO/AWI TS 22082 – Nanotechnologies -- In vivo toxicity assessment of nanomaterials using dechorionated zebrafish embryo** (under development by WG 3, Health, safety and environment)

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](#)..

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](mailto:hbenko@ansi.org)