

**Session 2D:
Emerging Technologies and Advanced
Materials: Stakeholder Perspectives on
Exposure, Hazard, and Risk Assessment**

***Building trust while navigating risk
management planning for emerging materials***

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NeutralScience L3C and NanoRelease

Overall challenge for risk management of emerging materials?

It's complicated

Measurement methods may differ from standard practice, be expensive, or not even exist

Material properties and data bases for hazard and exposure may be changing fast

Often too little trust to allow us to generalize

It helps a lot to have structured, detailed discussion of the issues and solutions

NanoRelease was started in 2010 to provide such a discussion forum

<http://nanorelease.org/>

- Two independent steering committees (food and non-food)
- Support from government, industry, and private foundations
- 6 workshops and over a dozen task groups to identify challenges and needs
- 16 publications by more 60 independent experts
- Coordinated exploratory methods development in laboratories around the world

<http://nanorelease.org/>

Current draft documents stemming from the dialogue

ERDC TR-XX-DRAFT



US Army Corps
of Engineers®
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Development Center

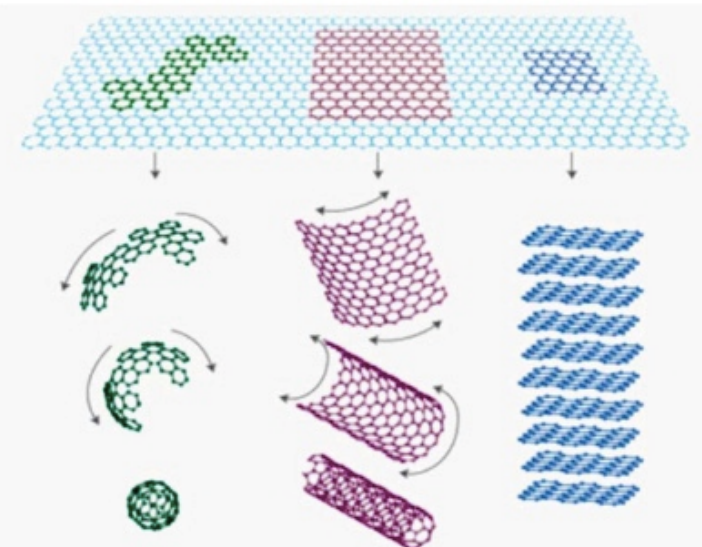


Program Title *Environmental Quality and Installations, Advanced and Additive
Materials: Sustainability for Army Acquisitions*

Methods Evaluation for Assessing Release of Manufactured Nanomaterials from Polymers, Consistent with the NanoGRID Framework

Lynne T Haber, Anthony J Bednar, Alan J Kennedy, Richard A
Canady

January 2018



Pre-peer review report. Do not quote. Image Source: (Lengmartin, 2011)

Engineer Research and
Development Center

And

ISO TC 229

WG 3/PG 29: ISO/TR 22293–

Evaluation of methods for
assessing the release of
nanomaterials from commercial,
nanomaterial containing polymer
composites (N 914)

The ISO TR is more detailed and has novel
content compared to the ERDC TR

The ERDC TR is more problem formulation
driven and links NanoGRID to ISO TR content

The TR's are written in a risk management context for real products

Problem formulation first!

Factors affecting measurement methods needs

Understanding effect of product attributes and use on MN release

Conditions of release throughout life cycle

Material attributes that affect release

Effects of release conditions on the form of MN release

Characterizing MN released from products

Identification of parameters that need to be measured

Framing decision support needs addressed in sample collection

Framing decision support needs addressed in sample preparation

Framing decision support needs addressed in analytic methods

(drawn from the ERDC TR document – copies of the draft available)

Four case studies for use of the ISO TR in the current draft

1. Lightweight parts made of MWCNT-epoxy
2. Cu-based MNM impregnated into woods that are placed outdoors into soil
3. Automotive parts made of MWCNT or Fe_2O_3 in thermoplastics (PP and PA)
4. 3D printing of MNM-containing thermoplastics

Links between NanoGRID decision support framework for product development and use of the detailed ISO TR

Coming soon to a website near you!

Contact the University of Cincinnati Risk Science Center
for details and updates.

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