

# Evaluating Standards Needs for Nanoplastics

## **A Preliminary Survey Assessment**

Sponsored by  
ASTM International Committee E56 (Nanotechnology)

Developed by  
AC530-Nanoplastics Task Group

Analyzed and presented by Vince Hackley and Justin Gorham, NIST



# Survey purpose

The purpose of this survey was simple and two-fold...

1. assess current needs for developing documentary standards and RMs for nanoplastics
2. identify opportunities for future standards development that will support progress in the field

# Some definitions (specific to survey)

## **Nanoplastics**

- polymeric particles with physical dimensions between roughly 1 nm and 1000 nm.
- intentionally produced or incidental products resulting from use, disposal/recycling or degradation of bulk plastics.

## **Documentary Standards**

- include methods, practices, specifications, classifications, terminologies and guides.
- written documents produced by a consensus process at the national or international level.

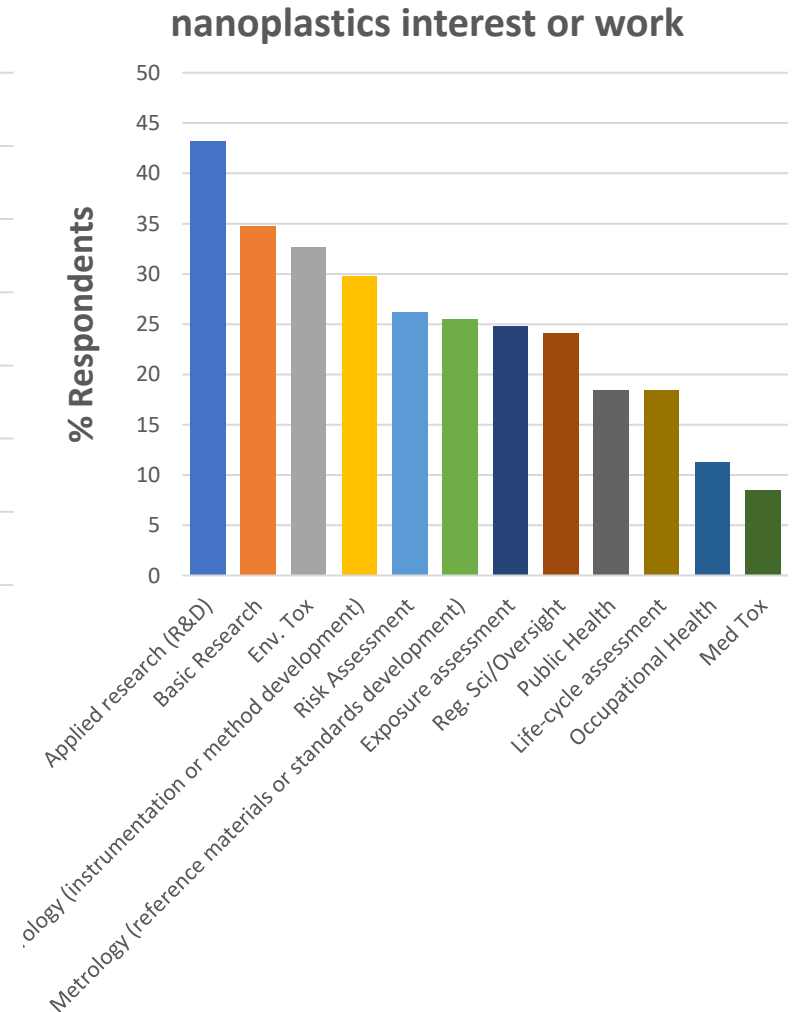
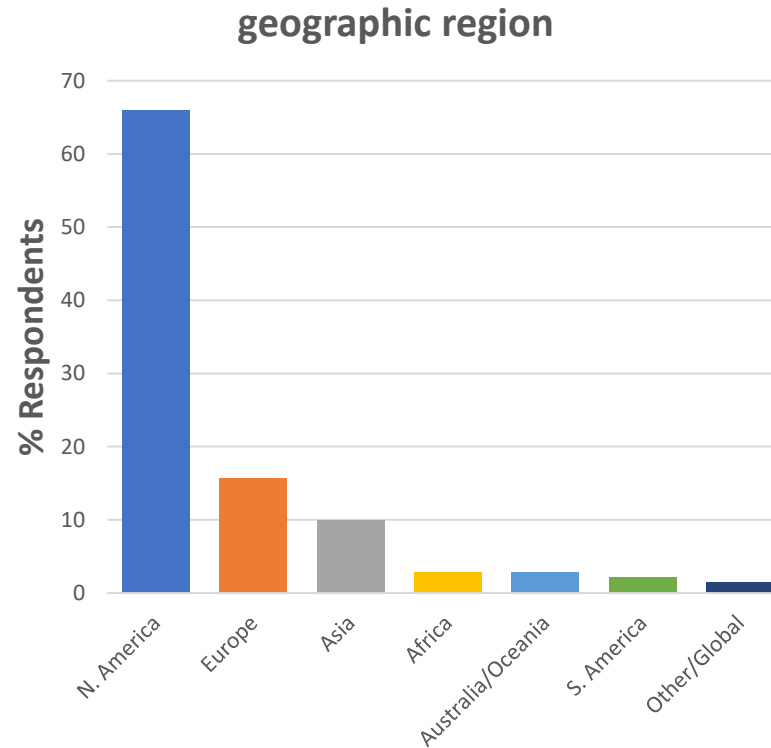
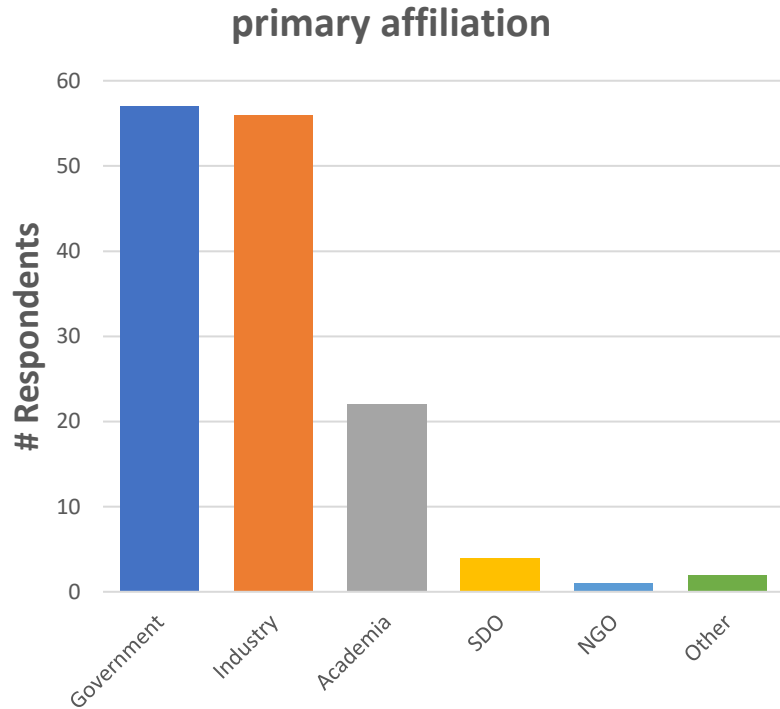
## **Reference material (RM)**

- artifact that contains plastic material in one or more forms and which is homogeneous, stable and fit for its intended use.
- RMs generally have assigned property values with uncertainties and might be traceable to the International System of Units (SI).
- RMs lacking assigned values are referred to as a research grade or representative test materials.

# Survey details

- 142 individual respondents completed this survey
- Responses anonymous (no names, email, specific affiliations)
- Reached out to plastics committee ASTM D20, ASTM E56-F42-D35-E50-F15, ISO TC 229, US TAG to ISO TC 229, EC Joint Research Center, CUSP Consortium, NPL (UK), BIPM/CCQM, APEC
- Questions developed by *Nanoplastics Task Group* in E56
- Survey open for 8 weeks
- Roughly 10 min to complete
- Almost all multiple-choice questions; most with “select all that apply”

# Who were the respondents?



$$Response\ Rate = 100 \times \frac{R}{I_{tot}}$$

$R$  – number of times a specific response was selected  
 $I_{tot}$  – total # individuals responding to question

## **Takeaways from preliminary analysis of survey?**

- Properties of primary interest are size, shape, composition & concentration
- Significant interest in a broad range of properties and issues is consistent with nanoplastics as an emerging field
- Stakeholders already utilize standards and will likely adopt nanoplastics standards
- Inconsistent terminology is still significant if not primary issue (>30% response rate)
  - Terminology especially important to industry (liability/legal/trade issues?)
- Biggest challenges are detection/identification/quantification (DIQ), sample preparation/handling and complex media/mixtures
- Majority of respondents say relevant RMs are not available or they make their own test materials in-house (major gap)

## **What next?**

- Complete parsing of survey results and provide more detailed analysis with priorities clearly defined
- Correlate needs with technical state of readiness for standards development
- Report out to E56 and make results public



# Nanoplastics Task Group Members

<b>Name</b>	<b>Organization</b>
<a href="#">Farber, Julia</a>	ASTM Committee D20
<a href="#">Gilliland, Douglas</a>	European Commission Joint Research Center, Italy
<a href="#">Gorham, Justin</a>	US NIST
<a href="#">Hackley, Vincent</a>	US NIST
<a href="#">Hagelskjær, Oskar</a>	CNRS, University of Toulouse, France
<a href="#">Jämting, Åsa</a>	NMI-Australia
<a href="#">Kaiser, Debbie</a>	US NIST
<a href="#">Khan, Sadia</a>	US FDA
<a href="#">Klaessig, Frederick</a>	Pennsylvania Bio Nano Systems LLC
<a href="#">Lerner, Jeremy</a>	LightForm, Inc.
<a href="#">Majumdar, Sanghamitra</a>	US FDA
<a href="#">Matheson, Joanna</a>	US Consumer Product Safety Commission
<a href="#">McConnell, Frank</a>	ASTM International
<a href="#">Nelson, Bryant</a>	US NIST
<a href="#">Palui, Goutam</a>	US FDA
<a href="#">Patri, Anil</a>	US FDA
<a href="#">Petersen, Elijah</a>	US NIST
<a href="#">Pleus, Richard</a>	Intertox Inc.
<a href="#">Shaw, Katherine</a>	US NIST
<a href="#">Stefaniak, Aleksandr</a>	US National Institute for Occupational Safety and Health
<a href="#">Thornton, Tony</a>	Micromeritics Inc.
<a href="#">Van Der Maten, Taco</a>	Malvern Panalytical Inc.
<a href="#">Varner, Katrina</a>	US Environmental Protection Agency
<a href="#">Yu, Shaofang</a>	BASF
<a href="#">Zarate-Bermudez, Max</a>	US Centers for Disease Control
<a href="#">Zou, Shan</a>	National Research Council - Canada