

**Attachment 8**  
**NIOSH Engineered Nanomaterials Survey**

Thank you in advance for participating in this survey.

The National Institute for Occupational Safety and Health (NIOSH) is sponsoring the survey. The purpose is to learn about how companies in engineered nanomaterials industries are using research findings, guidance documents, and other information developed by NIOSH and how that information is influencing occupational safety and health. NIOSH is part of the Centers for Disease Control and Prevention (CDC), and is not a regulatory agency. Our mission is to eliminate work-related illnesses and injuries through a focused program of research and prevention. RTI International is conducting the survey on behalf of NIOSH. RTI is a private, not-for-profit research organization based in North Carolina.

The information gathered from this survey will be used by NIOSH to enhance our understanding of how our efforts are influencing occupational safety and health across a range of engineered nanomaterial-related businesses.

The survey is voluntary and should take no longer than 20 minutes to complete. The information we collect will be summarized in an internal document. We will not identify you or your [INSERT BASED ON CATEGORY: company/organization] in any documents or reports without your prior approval.

If you have questions about this survey, please do not hesitate to contact the RTI survey manager, Ryan Weber, at [insert toll free number] or our Help Desk at [insert Help Desk email].

**This survey should be completed by the person in your [company/organization] who is the most knowledgeable about the safety and health programs at this location. This may be the environmental safety and health manager, for example, or a senior manager at this location.**

**LOCATION: ADD LOCATION**

**If there is someone else in your [company/organization] who would be a more knowledgeable respondent for this survey, please forward this survey to that individual. If more than one individual is needed to complete the survey, we ask that you work together to provide as much information as possible.**

comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to - CDC/ATSDR Reports Clearance Officer; 1600 Clifton Road NE, MS D-74, Atlanta, Georgia 30333 ATTN: PRA (0920-1202).

**1. Does your [company/organization] develop, manufacture, use, handle, distribute, analyze, or provide services related to engineered nanomaterials?**

*For the purpose of this survey, the term “engineered nanomaterials” refers to a variety of purposefully engineered materials and structures that have at least one dimension that is in the order of 100 nanometers or less.*

*If you are not sure if the material is an engineered nanomaterial, you may need to consult with others (e.g., product manager, process engineer, purchasing agent, supplier or review product information (e.g., Safety Data Sheets)).*

*(Check one.)*

- Yes
- No → **GO TO QUESTION 32, PAGE 11**
- Don't Know → **GO TO QUESTION 32, PAGE 11**

**2. Please indicate the commercial sector(s) where the engineered nanomaterials or the engineered nanomaterials-enabled products or services that your [company/organization] provides are intended to be used.**

*(Check all that apply.)*

- Manufacturing the following products, specifically:
  - Textiles or Apparel
  - Wood, Paper, and/or Printing Products
  - Petroleum or Coal Products (e.g., asphalt, petroleum refineries, lubricants, grease)
  - Chemicals (e.g., petrochemical, dye and pigment, resin, paints, coatings, pesticides, fertilizer)
  - Pharmaceuticals or Medicine (e.g., nanomaterial enabled medicines or therapeutics)
  - Toiletry, Soap, or Cleaning Compounds (e.g., lotions, cosmetics, sunscreen, polishing)
  - Plastics or Rubber Products (e.g., plastic containers, pipes, polymers)
  - Nonmetallic Mineral Products (e.g., cement, concrete, clays, including carbon nanotubes and graphene)
  - Metal or Fabricated Metal Products (e.g., nanoscale metals, forging, stamping, metal tools, metal parts)
  - Manufacturing Machinery (e.g., for agriculture, construction, semiconductors, chemicals, metalworking)
  - Electronic Products, Electrical, Electro-optical or Electromedical Equipment, and Components (e.g., batteries, semiconductors, integrated circuits, electronic sensors)
  - Transportation Equipment (e.g., cars, trucks, boats, planes)
  - Medical Equipment or Supplies (e.g., non-electrical equipment, such as surgical equipment)
- Agriculture, Forestry, Fishing, or Hunting (e.g., farming, crop production, animal production)
- Mining, Quarrying, or Oil and Gas Extraction
- Utilities (e.g., electric power [including solar], natural gas, water and sewage systems)
- Professional, Scientific, or Technical Services (e.g., R&D physical, engineering, life sciences, biotechnology)
- Waste Management and Remediation Services (e.g., land, site or building remediation)
- Other, please specify:

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3. **Your organization or [company/organization] may have multiple locations (i.e. worksite, building, facility, plant, etc.).**

**Please respond only about the location or locations for which you have knowledge of safety and health programs. Throughout the survey we refer to these sites as “your location(s).”**

**What is the total number of individuals (employees and contractors) who work at your location(s)?**

*(Check one.)*

- 1-10
- 11-50
- 51-250
- 251-500
- 501-1,000
- 1,001-5,000
- More than 5,000

4. **How many individuals have any contact with engineered nanomaterials at your location(s)? Include both employees and contractors with either regular or occasional contact with engineered nanomaterials.**

*Regular Contact – Include employees that regularly handle or use engineered nanomaterials as a matter of routine during the course of their average work day.*

*Occasional Contact – Include employees that may have infrequent, short contact with engineered nanomaterials over the course of an average work day (i.e., an employee that moves through a space where engineered nanomaterials are being handled or used such as maintenance or janitorial staff).*

*(Check one.)*

- None
- 1-10
- 11-50
- 51-250
- 251-500
- 501-1,000
- 1,001-5,000
- More than 5,000

5. **Which of the following describes how your [company/organization] handles or relates to engineered nanomaterials at this location(s)?**

*(Check all that apply.)*

- Develop engineered nanomaterials
- Manufacture engineered nanomaterials
- Incorporate engineered nanomaterials into our products
- Develop applications or products that use engineered nanomaterials
- Repackage/distribute engineered nanomaterials
- Conduct laboratory scale-up of engineered nanomaterials
- Perform nanomaterials characterization
- Provide services using products containing engineered nanomaterials
- Conduct site visits to determine exposure to engineered nanomaterials
- Produce instruments for manufacturing, characterizing, and detection of engineered nanomaterials
- Dispose engineered nanomaterials
- Other, please specify:  
\_\_\_\_\_  
\_\_\_\_\_

6. **In what physical forms are engineered nanomaterials handled at your location(s)?**

*(Check all that apply.)*

- Solid, freely mobile (e.g., dry powder)
- Contained in an aerosol
- Suspended in a liquid (e.g. water, solvent)
- Suspended in a matrix (e.g. polymer, paste)
- Solid, embedded, bound, or fixed in a material or product
- Other, please specify:  
\_\_\_\_\_  
\_\_\_\_\_

7. **On a typical day, what is the approximate quantity of engineered nanomaterials handled at your location(s)?**

*(Check one.)*

- Less than a kilogram (2.2 pounds)
- More than a kilogram (2.2 pounds)

**8. What are the different types of engineered nanomaterials at your location(s)?**

*(Check all that apply.)*

- Nanoparticles, specifically:
- Silver nanoparticle
  - Gold nanoparticle
  - Other metallic nanoparticles, please specify:

\_\_\_\_\_

\_\_\_\_\_

- Titanium dioxide nanoparticle
- Zinc oxide nanoparticles
- Other metal-oxide nanoparticles, please specify:

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\_\_\_\_\_

- Ceramic nanoparticles, please specify:

\_\_\_\_\_

\_\_\_\_\_

- Quantum dots (i.e., semiconductor nanoparticles)

- Nanotubes, nanofibers, nanorods, or nanowires, specifically:

- Single-walled carbon nanotubes
- Multi-walled carbon nanotubes
- Carbon nanofibers
- Boron nitride nanofibers
- Semiconductor nanotubes or nanofibers
- Semiconductor nanorods or nanowires
- Other metallic nanorods or nanowires, please specify:

\_\_\_\_\_

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- Nanosheets, specifically:

- Graphene
- Boron-nitride nanosheets
- Other nanosheets, please specify:

\_\_\_\_\_

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- Nanofibrils cellulosic
- Nanocrystalline cellulosic
- Nanoclays
- Dendrimer
- Polymers
- Other, please specify:

\_\_\_\_\_

\_\_\_\_\_

- Don't know

**9. Some government, non-profit, or for-profit organizations offer site visits or site consultations consisting of teams of experts that evaluate and provide recommendations regarding occupational safety and health practices.**

**Since 2005 have any of your location(s) hosted such a site visit or site consultation?**

*(Check one.)*

- Yes
- No → GO TO QUESTION 13, PAGE 5
- Don't Know → GO TO QUESTION 13, PAGE 5

**10. Who conducted the site visit(s) or site consultation(s) at your location(s)?**

*(Check all that apply.)*

- CDC/NIOSH
- Other government organization
- Private company/consultant
- Academic institution(s)
- Other, please specify:

\_\_\_\_\_

\_\_\_\_\_

**11. Did the site visit(s) or site consultation(s) include feedback or recommendations for handling engineered nanomaterials?**

*(Check one.)*

- Yes
- No → GO TO QUESTION 13, PAGE 5
- Don't Know → GO TO QUESTION 13, PAGE 5

**12. Was any of the feedback or recommendations for handling of engineered nanomaterials from the site visit(s) or site consultation(s) implemented?**

*(Check one.)*

- Yes, all of them
- Yes, some of them
- No

**13. Which of the following resources have you used to acquire information about how to safely handle engineered nanomaterials?**

*(Check all that apply.)*

- Government publications/materials *(Check all that apply.)*
  - NIOSH “Approaches to Safe Nanotechnology”
  - NIOSH “General Safe Practices for Working with Engineered Nanomaterials in Research Laboratories”
  - NIOSH “Current Strategies for Engineering Controls in Nanomaterial Production and Downstream Handling Processes”
  - NIOSH “Occupational Exposure to Carbon Nanotubes and Nanofibers”
  - NIOSH “Occupational Exposure to Titanium Dioxide”
  - A professional development course or webinar taught by NIOSH instructors
  - EPA “Control of Nanoscale Materials under the Toxic Substances Control Act”
  - EPA disposal regulations
  - OSHA Fact Sheet “Working Safely with Nanomaterials”
  - NIST “New NIST Reference Material Provides a Silver Lining for NanoEHS Research“, 2015
  - Federal, state, or local government publications, please specify:  

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- Industry, scientific, or professional meetings, conferences, or tradeshow. Please specify:  

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- Scientific articles, professional or industry publications. Please specify:  

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- International publications (e.g. Safe Work Australia). Please specify:  

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- Websites, blogs, and Internet search engines (e.g. Google, Bing)
- Informal discussions with professional contacts or peers
- Materials or publications developed by your company
- Product manufacturer information (e.g.: Safety Data Sheets (SDS) or Pre-manufacturing Notices (PMN))
- Other, please specify:  

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**14. How has the information you acquired from any source about engineered nanomaterials been used?**

*(Check all that apply.)*

- Informed safety and health practices
- Informed [company/organization] policies for handling of engineered nanomaterials
- Incorporated into training materials
- Incorporate into product information (e.g., SDS)
- Modifications to products
- Modifications to processes
- Other. Please specify:  

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**15. Does your location(s) implement a safety and health program for your employees?**

*Safety and health programs may have a variety of names, including Accident Prevention Program, Injury and Illness Prevention Program, Comprehensive Safety and Health Program and, for laboratories, Chemical Hygiene Plan (CHP).*

(Check one.)

- Yes
- No

**16. Which of the following safety and health practices are used at your location(s)? For each practice that you identify, is there separate or specific guidance for its application to engineered nanomaterials?**

*If the safety and health programs vary by location, please report the most typical for the locations for which you are knowledgeable, for example programs at your largest location or the most common programs across locations.*

	Safety and health practices used at your location(s)? (Check one.)	IF YES IN COLUMN 1: Separate or specific guidance for engineered nanomaterials? (Check one.)
<b>HAZARD IDENTIFICATION AND EVALUATION:</b>		
Determination of routes of exposure	<input type="checkbox"/> Yes → <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Identification of processes or job tasks where workers may be exposed	<input type="checkbox"/> Yes → <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Evaluation of new processes/procedures for hazards	<input type="checkbox"/> Yes → <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Review of purchase orders for possible hazardous materials	<input type="checkbox"/> Yes → <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
<b>PROTECTION:</b>		
Use of exposure controls (elimination, substitution, engineering, administrative, Personal Protective Equipment [PPE])	<input type="checkbox"/> Yes → <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Assessment of effectiveness of exposure controls	<input type="checkbox"/> Yes → <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Assessment of need for PPE	<input type="checkbox"/> Yes → <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Maintenance of engineering controls (e.g., dust collection systems)	<input type="checkbox"/> Yes → <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Spill cleanup procedures	<input type="checkbox"/> Yes → <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Waste management/disposal procedures	<input type="checkbox"/> Yes → <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
<b>SCREENING OR MONITORING:</b>		
Medical screening and surveillance	<input type="checkbox"/> Yes → <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Exposure monitoring	<input type="checkbox"/> Yes → <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
<b>ADMINISTRATIVE OR PROCEDURAL:</b>		
Systematic review and update of safe use procedures	<input type="checkbox"/> Yes → <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Method for reporting hazards, illnesses, and injuries	<input type="checkbox"/> Yes → <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Development of internal [company/organization] exposure guidelines	<input type="checkbox"/> Yes → <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
<b>OTHER:</b>		
	<input type="checkbox"/> Yes →	<input type="checkbox"/> Yes

Other. Please specify: _____	<input type="checkbox"/> No	<input type="checkbox"/> No
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**17. In cases where you do not have specific safety and health practices or guidelines for engineered nano-materials, what surrogate hazards or substances do you use to inform your safety and health practices or guidelines?**

(Check all that apply.)

- Nuclear hazards
- Asbestos
- Biohazards
- General chemical hazard. Please specify: \_\_\_\_\_
- Other. Please specify: \_\_\_\_\_
- None. We do not use other hazards or substance as a model for engineered nanomaterials

**18. Which of the following engineering controls are used to reduce or prevent worker exposure to any potential chemical or material hazards at your location(s)? For each engineering control you identify, is that control required when working with engineered nanomaterials?**

	Used to reduce any potential chemical or material hazard? (Check one.)	IF YES IN COLUMN 1: Required when working with engineered nanomaterials? (Check one.)
Separate HVAC system	<input type="checkbox"/> Yes → <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Pressure differentials	<input type="checkbox"/> Yes → <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Designed or separate work areas (e.g., control room)	<input type="checkbox"/> Yes → <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Closed system piping	<input type="checkbox"/> Yes → <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Cleanroom	<input type="checkbox"/> Yes → <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Laboratory fume hood	<input type="checkbox"/> Yes → <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Laminar low flow ventilated enclosure	<input type="checkbox"/> Yes → <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Biosafety cabinet (BSC)	<input type="checkbox"/> Yes → <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Glove box	<input type="checkbox"/> Yes → <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Local exhaust ventilation (other than fume hood, BSC or glovebox)	<input type="checkbox"/> Yes → <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
High-efficiency particulate air (HEPA) filtration	<input type="checkbox"/> Yes → <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Ultra-low particulate air (ULPA) filtration	<input type="checkbox"/> Yes → <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Working with nanomaterial in a slurry or suspension	<input type="checkbox"/> Yes → <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Other, please specify): _____	<input type="checkbox"/> Yes → <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No

**19. Which of the following personal protective equipment (PPE) is used by individuals working with engineered nanomaterials at your location(s)?**

(Check all that apply.)

- No PPE is used
- Coveralls or lab coats. Please specify. (Check all that apply)
  - Woven
  - Nonwoven
- Gloves
- Eye/face protection
- Shoe covers
- Hair bonnets
- Respirators. Please specify. (Check all that apply)
  - Disposable filtering facepiece
  - Elastomeric half-facepiece respirator
  - Elastomeric full-facepiece respirator
  - Powered loose fitting facepiece
  - Powered tight fitting facepiece
  - Other type of respirator, please specify: \_\_\_\_\_

Other type of PPE. Please specify: \_\_\_\_\_

**20. Does your workforce receive any informal or formal training on the safe use or handling of engineered nanomaterials?**

(Check one.)

- Yes
- No → GO TO QUESTION 23, PAGE 10
- Don't Know → GO TO QUESTION 23, PAGE 10

**21. How is this training provided?**

(Check all that apply.)

- Formal training from internal training staff and resources
- Informal training from colleagues and peers
- External or consultant training resources
- Other. Please specify: \_\_\_\_\_

**22. For this question, employees are categorized by their level of possible contact with engineered nanomaterials.**

*Regular Contact* – Employees regularly handle or use engineered nanomaterials as a matter of routine during the course of their average work day.

*Occasional Contact* – Employees may have infrequent, short contact with engineered nanomaterials over the course of an average work day (i.e., an employee that moves through a space where engineered nanomaterials are being handled or used such as maintenance or janitorial staff).

*No contact* – Employees do not have any type of contact with engineered nanomaterials

**For each level of employee at your location(s), indicate if they receive training on the following practices regarding the safe use or handling of engineered nanomaterials. Include full-time staff, part-time staff, contractors working onsite, and/or temporary staff.**

	Employees with....			Training not provided
	Regular Contact	Occasional Contact	No Contact	
Types of engineered nanomaterials and general engineered nanomaterial awareness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Where to locate information about the safety and health practices regarding engineered nanomaterials	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Routes of exposure to engineered nanomaterials	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use or maintenance of exposure controls (elimination, substitution, engineering, administrative, PPE) for engineered nanomaterials	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use or maintenance of respirators for engineered nanomaterials	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Procedures for spill cleanup, waste management, or disposal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

procedures of engineered nanomaterials				
Method for reporting hazards, illnesses and injuries related to engineered nanomaterials	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**23. Is worker awareness or knowledge of engineered nanomaterials assessed at your location(s)?**

*(Check one.)*

- Yes
- No → **GO TO QUESTION 25**
- Don't Know → **GO TO QUESTION 25**

**24. How is it assessed?**

*(Check all that apply.)*

- Periodic surveys
- Random inspections
- Regular inspections
- Other, please specify:

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**25. What type of process emission or exposure monitoring is conducted at your location(s)?**

*(Check all that apply.)*

- None. Monitoring is not conducted → **GO TO QUESTION 27**
- Filter-based air sampling for mass
- Filter-based air sampling for electron microscopy
- Direct reading particle counters
- Wipe sampling
- Dermal sampling
- Other, please specify:

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**26. When is process emission or exposure monitoring conducted?**

*(Check all that apply.)*

- Initial process start-up
- Changes in process or control(s)
- During upset conditions (i.e., response conditions, in response to a spill or similar unanticipated event)
- Periodically (e.g., annually)
- Other, please specify:

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**27. Does your [company/organization] produce documents related to engineered nanomaterials?**

*(Check one.)*

- Yes
- No → **GO TO QUESTION 29**
- Don't Know → **GO TO QUESTION 29**

**28. What types of documents related to engineered nanomaterials are produced?**

*(Check all that apply.)*

- Journal articles
- Scientific publications
- Articles for trade magazines
- Comments on public policies that are intended to be disseminated (either within or outside of your [company/organization])
- Comments or input on NIOSH documents
- Comments or input to industry or materials standards
- Comments or input to professional, scientific or trade associations
- Blogs
- Safety Data Sheets
- Instructions for how to use your products or guidance for measuring engineered nanomaterials
- Information provided to your customers along with your products or services
- Information from your [company's/organization's] standard operating procedures or practices for the handling or use of engineered nanomaterials
- Other, please specify:

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**29. Does your [company/organization] have an occupational safety and health office, department, or individual?**

*(Check one.)*

- Yes
- No → **GO TO QUESTION 31, PAGE 11**
- Don't Know → **GO TO QUESTION 31, PAGE 11**

**30. How many occupational safety and health (OS&H) professionals are employed at your location(s)?**

*An OS&H professional is someone who has a degree in OS&H or certification from a nationally recognized accrediting body and who devotes a significant portion of their work time to OS&H responsibilities. Be sure to count yourself if applicable.*

(Write in the number of OS&H professionals.)

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Don't Know

**31. Altogether, how long have you worked with engineered nanomaterials?**

(Enter number of years.)

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 Years

**32. What is your current position at your [company/organization]?**

Please specify:

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**33. Do you have any certification in occupational safety and health (OS&H)? For example, Certified Industrial Hygienist (CIH), Certified Safety Professional (CSP), or Chemical Hazardous Material Manager (CHHM).**

(Check one.)

Yes, please specify:

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No

**34. Are your responsibilities regarding occupational safety and health your:**

(Check one.)

Full-time responsibility

Part-time responsibility

Other duty as assigned (i.e., responsibilities are done with other responsibilities)

None of the above

Other, please specify:

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**35. Is there any other information on occupational safety and health regarding engineered nanomaterials you wish you add?**

(Check one.)

No

Yes, please specify:

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**Please return the completed survey in the enclosed pre-paid envelope to:**

**Fulfillment Department**

**Attn: \_\_\_\_\_**

**THANK YOU!**