

Occupational Risk Assessment and Management

Government Resources

- Air Force Aeronautical Systems Center/Air Force Research Laboratory
 - [Presentations from the 2nd USAF ASC/AFRL ESOH Nanomaterials Workshop, 3-5 November 2009](#)
- Army Public Health Command (Provisional)
 - [Engineered Nanomaterials: ESOH Risk Management Issues for R&D Workers, Session 1C Emerging Contaminants – From Assessment to Action, 1 December 2009, Partners and Environmental Technology Symposium & Workshop](#)
- DoD
 - [DoD Instruction 6050.05, DoD Hazard Communication \(HAZCOM\) Program, 2006, paragraph 6.2.2](#)
 - [DoD Emerging Contaminants Integrated Product Team \(EC-IPT\) Nanomaterials Work Group](#)
 - [Environmental, Safety and Occupational Health \(ESOH\) Risks from Engineered Nanomaterials, DoD Memorandum from Mr. John Young, Jr., Under Secretary of Defense for Acquisition, Technology and Logistics \(AT&L\), 13 May 2008](#)
 - [Framework with NIOSH for Nanomaterial Investigation, DoD Memorandum from Dorothy Robyn, Deputy Under Secretary of Defense, Installation and Environment, 23 Oct 2009](#)
- DOE
 - [DOE N456.1, The Safe Handling of Unbound Engineered Nanoparticles, 1/5/09](#)
 - [DOE Nanoscale Science Research Centers, Approach to Nanomaterial ES&H, Revision 3a – May 08](#)

- NIOSH
 1. [Evaluation of Health Hazard and Recommendations for Occupational Exposure to Titanium Dioxide, DRAFT Current Intelligence Bulletin" November 2005](#)
 2. [Approaches to Safe Nanotechnology – Managing the Health and Safety Concerns Associated with Engineered Nanomaterials, 2009](#)
 3. [Health Hazard Evaluation Report, HETA #2005-0291-3025, \[Carbon Nanofibers\], University of Dayton Research Institute, Dayton, Ohio, October 06](#)
- NNI, Capstone Meeting: [Risk Management Methods & Ethical, Legal, and Societal Implications of Nanotechnology](#), 30-31 March 2010
- [Occupational Safety and Health Administration: Nanotechnology](#)

External Resources

- ACGIH, Ventilation Requirements for Engineered Nanomaterials (Chapter 13, para. 13.67, IN: [Industrial Ventilation, A Manual of Recommended Practice for Design, 27th Edition, ACGIH, 2010](#)).
- [ASTM, E2535-07 Standard Guide for Handling Unbound Engineered Nanoscale Particles in Occupational Settings, November 2007](#)
- [BSI, Nanotechnologies – Part 2: Guide to safe handling and disposal of manufactured nanomaterials, December 2007](#)
- International Council On Nanotechnology: [GoodNanoGuide](#)
- Institut de recherche Robert-Sauvé en santé et en sécurité du travail (IRSST):
 - [Best Practices Guide to Synthetic Nanoparticle Risk Management, January 2009](#)
 - [Engineered Nanoparticles, Current Knowledge about OHS Risks and Prevention Measures, 2nd Edition, July 2010](#)

- ISO TC 229 Nanotechnologies (published standards)
 1. [ISO TC 229 Nanotechnologies: Health and safety practices in occupational settings relevant to nanotechnologies. Document no. ISO/TR 12885, 2008](#)
- [ISO TC 229 Nanotechnologies \(projects under development\)](#)
 1. ISO/AWI TS 12901 Nanotechnologies – Guidance on safe handling and disposal of manufactured nanomaterials
 2. ISO/NP TS 12901-2 Guidelines for occupational risk management applied to engineered nanomaterials based on a “control banding approach”
 3. ISO/NP TR 13329 Nanomaterials – Preparation of Material Safety Data Sheet (MSDS)
 4. ISO/PRF TS 13830 Guidance on the labeling of manufactured nano-objects and products containing manufactured nano-objects
- Massachusetts Office of Technical Assistance (OTA), [OTA Technology Guidance Document: Nanotechnology – Considerations for Safe Development](#), August 2010
- [OECD](#)
 1. No. 8 - [ENV/JM/MONO\(2009\)6](#), Preliminary Analysis of Exposure Measurement and Exposure Mitigation in Occupational Settings: Manufactured Nanomaterials, 17 April 2009
 2. No. 10 - [ENV/JM/MONO\(2009\)15](#), Identification, Compilation and Analysis of Guidance Information for Exposure Measurement and Exposure Mitigation: Manufactured Nanomaterials, 22 June 2009.
 3. No. 11 - [ENV/JM/MONO\(2009\)16](#), Emission Assessment for Identification of Sources and Release of Airborne Manufactured Nanomaterials in the Workplace: Compilation of Existing Guidance, 18 June 2009
 4. No. 12 - [ENV/JM/MONO\(2009\)17](#), Comparison of Guidance on Selection of Skin Protective Equipment and Respirators for Use in the Workplace: Manufactured Nanomaterials

5. No. 13 - [ENV/JM/MONO\(2009\)18](#), Report of an OECD Workshop on Exposure Assessment and Exposure Mitigation: Manufactured Nanomaterials, 27 August 2009
- Literature
 1. Auffan et. al., [Towards a definition of inorganic nanoparticles from an environmental, health, and safety perspective](#), Nature Nanotechnology, Vo.. 4, October 2009
 2. Paik, et. al., Application of a Pilot Banding Tool for Risk Level Assessment and Control of Nanoparticle Exposures, Ann. Occup. Hyg. Vol. 52, No. 6, 2008
 3. Schulte, PA, et. al., NIOSH, Occupational Risk Management of Engineered Nanoparticles, Journal of Occupational and Environmental Hygiene, 2:4, Apr 08
 4. Schulte, PA, et. al., Occupational Exposure Limits for Nanomaterials: state of the art, J. Nanoparticle Research, July 2010
 5. Zalk, D., et. al., Evaluating the Control Banding Nanotool: a qualitative risk assessment method for controlling nanoparticle exposures, Journal of Nanoparticle Research, 11”1685-1704, June 2009

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