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Poster: 0185

Potential Application of "Control Banding" for Safe Handling of Engineered Nanoparticles in the Workplace

NIOSH Control Banding Working Group (1) presenting

NIOSH, Cincinnati, OH, Morgantown, WV, Pittsburgh, PA, Spokane, WA, and Washington, DC, United States (1)

Because of their small size and large surface area, engineered nanoparticles may have biological properties distinct from fine particles of similar chemical composition. Such properties may include a high pulmonary deposition, the ability to translocate from the lung to systemic sites, the ability to penetrate dermal barriers, and a high inflammatory potency per mass. As research proceeds in a proactive manner to identify and resolve potential safety and health issues posed by nanotechnology, practical approaches are needed to control engineered nanoparticles in the workplace and to minimize both the likelihood of human exposure and the possible development of adverse health effects. Control banding is a complimentary, risk-based approach to protecting worker health that focuses resources on exposure controls and describes how strictly a risk needs to be managed. NIOSH considers control banding a potentially useful tool for small businesses. Control banding has been validated in various settings, particularly in Great Britain. NIOSH is currently evaluating its utility for the United States. Activities of the NIOSH Control Banding Working Group include communicating through the NIOSH website, publications, and the Workplace Solutions database; fostering national and international collaboration; critically investigating the merits of control banding; partnering with industry, labor, academia and government to develop a national strategy to make the best use of this tool; and emphasizing the need for hypothesis driven validation studies and verification of strategies for small and medium sized businesses to install and maintain controls. Challenges to applying control banding in the U.S. include considerations of a compliance strategy versus the traditional regulatory scheme; the need for risk phrases (R-phrases) as part of the Global Harmonization System; the need for validation and verification of effectiveness; a shift in thinking from "exposure assessment" to "exposure control;" attention to gaps such as how to handle mixtures; and issues related to the role of sampling and analysis. Applying control banding as part of a Nanotechnology Safety Toolbox would provide an integrated approach to assessment of potential risk and effective use of control practices. Applying the hierarchy of exposure controls routinely as part of a toolbox, without expert advice, will require that the controls have been demonstrated to be effective under a wide variety of circumstances.

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Demonstration will require researchers, developers, manufacturers, and users to share and disseminate information. Additional information about control banding and its potential applications can be found at http://www.cdc.gov/niosh/topics/ctrlbanding/.

(The findings and conclusions of this abstract have not been formally disseminated by the National Institute for Occupational Safety and Health and should not be construed to represent any agency determination or policy.)

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