




The National Institute for Occupational Safety and Health (NIOSH)

Promoting productive workplaces through safety and health research 

3D Printing with Metal Powders: Health and Safety Questions to Ask

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This poster from the NIOSH Nanotechnology Research Center cites health and safety questions with different control options and information to reduce exposure to potential hazards.



Characterization of Potential Hazards: What potential hazards are associated with metal powder 3D printing? What metals are in the powder? Are there known health effects from the metals (see safety data sheets) or can they be reactive with the air? What is the work environment like (for example, an open or isolated area)?

Work Activities: Could the work activities cause exposure? How are you handling the metal powders? What is the likelihood of exposure? Can you change the way you do the activity to reduce the likelihood of exposure (high potential to low)? Be aware of the other printing activities occurring nearby.

Engineering Controls: Based on the work activity or step in the printing process, what engineering controls will reduce the likelihood of exposure? What are the key design and operational requirements for the control? Consider fire and explosion hazard of metal powder when selecting controls.

Administrative Controls: Have you considered your workplace practices and policies? Have you set up a plan for waste management? Have you considered what to do in case of a spill?

Personal Protective Equipment (PPE): If the measures above do not effectively control the hazard, what PPE can be used? Have you considered PPE for other safety hazards (such as static, fire, explosion, and laser)?

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