
3D Printer Procedure

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TY OF UNIVERSITY



3D Printer Procedure

Table of Contents

- I. Purpose
- II. What is 3D Printing
 - A. ABS vs. PLA Feedstock
 - B. 3D Printing Emissions: Nanoparticles and Vapors
- III. Responsibilities
 - A. Environmental Health and Safety
 - B. Deans, Directors and Principal Investigators (PI) with 3D Printer Oversight
 - C. Facilities Management
 - D. Purchasing Department
- IV. 3D Printer Guidelines
 - A. Approval Process
 - B. Ventilation
 - C. General Safety Information
 - D. Engineering Controls
- V. Personal Protective Equipment (PPE)
- VI. Training and Recordkeeping

3D Printer Procedure

I. Purpose

The 3D Printer Procedure establishes the minimum requirements necessary to allow for the safe use of 3D printers located in the University of Northern Colorado (UNC) facilities. The procedure is presented in recognition of the continued expansion of 3D printer use by faculty, staff and

B. 3D Printing Emissions: Nanoparticles and Vapors

Nanoparticles

To reduce the potential for nanoparticles to aerosolize or be inhaled by users, it is best to purchase 3D printers with an enclosure, from the manufacturer. Even with an enclosure, a review will need to be performed regarding ventilation systems (see Section IV.A).

Exposures to nanoparticles at high concentrations have been associated with adverse health effects, including total and cardio-respiratory mortality, strokes and asthma symptoms. While PLA feedstock is designed to be biocompatible, the thermal decomposition products of ABS feedstock have been shown to have toxic effects on lab rodents.

Chemical Vapors

3D printers may best be used in a location that has additional ventilation.

Heating of certain thermoplastic filament can generate toxic vapors and vapors with high

D. Purchasing Department

- Review all 3D Printer purchase requests with EHS.
- Ensure printers are not ordered until approval, from EHS, is received.

IV. 3D Printer Guidelines

A. Approval Process

All 3D printers purchased for use on campus shall have to go through an approval process. EHS shall be notified by the interested purchaser/requester

- Turn off the printer if the printer nozzle jams, and allow the printer to ventilate before removing the cover.
- Maintain a safe distance from the printer to minimize the inhalation of emitted particles.

D. Engineering Controls

Particle emissions are the focus, especially when multiple printers are running simultaneously. Another consideration is toxic vapors that can be generated by heating plastics. Engineering controls should be considered first to assist with minimizing hazards. These may include the following:

- Use 3D printers ONLY in properly ventilated areas.
- Choose low-emitting printers and feed materials/filament when possible.
- Purchase and use the manufacturers supplied controls, such as an interlocked enclosure. (Enclosures appear to be more effective at controlling emissions than just a machine cover.)

V. Personal Protective Equipment (PPE)