



## **3D PRINTING SAFETY PROCEDURES**

### **I. PURPOSE**

Northern Kentucky University (NKU or University) is committed to maintaining a safe environment for students, faculty, staff, and visitors. These procedures establish safety requirements for the use of three-dimensional (3D) printing equipment on University property.

### **II. SCOPE**

These procedures apply to:

- All University-owned or University-operated 3D printers
- All faculty, staff, students, contractors, and visitors using 3D printing equipment on University property
- All University facilities, including laboratories, makerspaces, libraries, academic departments, research centers, and residence halls.

### **III. RESPONSIBILITIES**

#### **University Units and Departments Operating 3D Printers**

University Units and Departments that operate or maintain 3D printers must:

- Ensure 3D printers are reviewed and approved by Safety and Emergency Management
- Ensure 3D printers are used in accordance with manufacturer instructions and University safety requirements
- Ensure users of 3D printers complete appropriate safety training
- Ensure 3D printers are located in safe and appropriately ventilated areas
- Maintain safe operating procedures and supervision
- Report safety incidents or hazards to Safety and Emergency Management
- Ensure 3D printer technology is reviewed and approved by Office of Information Technology prior to purchase (see the [IT Procurement Policy](#))

#### **Safety and Emergency Management**

Safety and Emergency Management may:

- Provide guidance regarding ventilation, chemical hazards, and workplace safety
- Review locations where 3D printers are installed or operated
- Assist with enrollment of users in required safety training courses

- Provide recommendations to reduce safety risks associated with 3D printing operations

## **Users**

All individuals operating 3D printers must:

- Complete required safety training prior to use
- Follow posted safety procedures
- Report equipment malfunctions, injuries, or safety concerns

## **IV. PERSONAL 3D PRINTERS AND UNAPPROVED EQUIPMENT**

To ensure compliance with safety, fire, and environmental requirements, personally owned or privately acquired 3D printers may not be brought onto or operated on University property without prior approval.

### **1. Approval Required**

- Faculty, staff, students, and visitors may not install or operate a personally owned 3D printer in University spaces without prior approval from the responsible department and Safety and Emergency Management.

### **2. Safety Review**

- Approved 3D printers will be subject to review by Safety and Emergency Management to ensure compliance with:
  - electrical safety requirements
  - ventilation standards
  - chemical safety requirements
  - fire and life-safety requirements

### **3. Unauthorized Equipment**

- Unauthorized equipment may be prohibited from operation or removed from service until appropriate approvals are obtained.

### **4. Residence Halls**

- Operation of 3D printers in University housing or residence halls is prohibited due to fire safety and air-quality considerations.

## **V. AIR QUALITY AND CHEMICAL SAFETY**

Certain 3D printing processes may emit ultrafine particles and volatile organic compounds (VOCs) depending on the materials used. In addition, certain materials, such as resins, composites, or specialty filaments, can create chemical exposures, dust, and waste disposal concerns.

To reduce exposure risks:

### **1. Ventilation**

- 3D printers must be located in well-ventilated areas.

- University Units and Departments are required to consult with Safety and Emergency Management regarding ventilation needs.
- 2. Approved Materials**
    - Only materials approved by the responsible department or supervising unit may be used.
  - 3. Chemical Handling**
    - Resins, solvents, and other chemicals used in printing or post-processing must be handled in accordance with University chemical safety procedures.
  - 4. Safety Data Sheets, Emergency Contact & Operating Procedures**
    - Safety Data Sheets (SDS) must be available in the 3D printing space for hazardous materials used in the printing process.
    - Emergency contact information and operating procedures must be posted in the 3D printing space.
  - 5. Emission Controls**
    - Where feasible, printers should be operated using enclosures, filtration systems, or other engineering controls to reduce emissions.

## **VI. HAZARD NOTIFICATION FOR 3D PRINTING AREAS**

Areas where 3D printing equipment is operated must provide appropriate hazard notification to inform individuals of potential chemical, air-quality, and equipment hazards associated with 3D printing processes.

### **1. Required Door Signage**

University Units and Departments operating 3D printing equipment must post a clearly visible caution notice on the entry door to rooms or facilities where:

- Resin-based (photopolymer) 3D printers are used, or
- Filament-based printers are operated in a manner that may produce airborne emissions.

### **2. Hazard Information**

Signage must inform individuals entering the area that 3D printing operations may generate chemical vapors, ultrafine particles, or other airborne emissions, and that appropriate safety precautions may be required.

### **3. Applicability**

Door signage should be posted in locations where:

- Resin printing or resin handling occurs
- Multiple printers operate in enclosed areas
- Post-processing of printed materials involves chemicals or solvents

#### **4. Consultation with Safety and Emergency Management**

University Units and Departments should consult Safety and Emergency Management regarding appropriate hazard communication, ventilation practices, and signage requirements.

### **VII. PHYSICAL SAFETY REQUIREMENTS**

3D printers present potential physical hazards, including high temperatures and moving mechanical components. The following safety practices must be followed:

- 1. Hot Surfaces**
  - Printer nozzles and heated beds may exceed 200-400°F.
  - Users must not touch heated components while equipment is operating or cooling.
- 2. Moving Parts**
  - Hands, clothing, and tools must be kept clear of moving mechanical components.
- 3. Electrical Safety**
  - Equipment must not be modified, repaired, or altered by unauthorized individuals.
  - Damaged equipment must be removed from service and reported.
- 4. Supervision**
  - Printers should not be operated unattended unless designed and approved for safe unattended operation.
- 5. Safe Removal of Printed Objects**
  - Users should allow equipment to cool before removing prints and should use appropriate tools when necessary.

### **VIII. PROHIBITED USES**

University 3D printing equipment may not be used to produce items that:

- Violate federal, state, or local law
- Create weapons or weapon components, including firearms or explosive devices
- Pose a safety risk to individuals or property
- Infringe intellectual property rights, including copyrighted or patented designs without authorization
- Violate University policies or codes of conduct

The University reserves the right to deny or terminate printing requests that violate these

restrictions.

## **IX. TRAINING AND AUTHORIZATION**

Individuals must complete required safety training and authorization procedures before operating 3D printing equipment.

University Units and Departments must restrict equipment use to trained personnel or supervised users only.

## **X. INCIDENT REPORTING**

All injuries, equipment malfunctions, or safety concerns must be reported promptly to:

- The supervising department, and
- Safety and Emergency Management

Equipment presenting a safety hazard must be removed from service until inspected or repaired.

## **XI. COMPLIANCE**

These 3D Printing Safety Procedures are governed by the University's policies on [Acceptable Use](#) and [ChemicalSafety.pdf](#). Failure to comply with these procedures may result in:

- Suspension of access to 3D printing equipment
- Disciplinary action under applicable University policies.