

## 3-D Printers – Safe Practices and Precautions

This technology is relatively new and therefore health and safety implications are not fully known at this time. A precautionary approach is recommended as a best practice.

Consider the following:

### CHOOSE A MODEL THAT BEST SUIT YOUR NEEDS

- Choose a manufacturer with customer support and with published safety information, always follow the manufacturer's operating/user manual, ensure proper maintenance
- Larger commercial grade 3-D printers tend to perform better and with consistency, however, these produce fumes and particulate matter, which would require ventilation
- Avoid acrylonitrile butadiene styrene (ABS) as a build material and choose the appropriate material filament; ABS produces toxic acrylonitrile fumes; even with low concentration levels it is better to use other readily available build material
- Polylactic Acid (PLA) is a preferred plastic if using around food because it is food grade safe

### CHOOSE A LOCATION WITH APPROPRIATE VENTILATION

- Choose an area that has adequate ventilation and exhaust capability
- If possible, place the 3-D printer in a room away from workstations or far away from workstations, in a fume hood if available
- Consult with Environmental and Occupational Health Support Services (EOHSS) if you are unsure about a location for your 3-D printer

### 3-D PRINTING TECHNOLOGY SHOULD NOT BE USED TO CREATE OR REPLACE PARTS THAT ARE REQUIRED FOR THE SAFE OPERATION OF EQUIPMENT

- Always buy replacement parts from the manufacturer for safety related equipment
- Manufacturers may not cover the liability or warranty on substitute parts or modified equipment

### USE CAUTION WHEN USING PRODUCTS CREATED BY 3-D PRINTING TECHNOLOGY THAT MAY COME INTO CONTACT WITH FOOD

- Use build material that is food grade safe
- Use a food safe sealant on 3-D printed products that will come in contact with food
- 3-D printed objects can have micro porous structures, this can cause bacteria to grow and are difficult to clean

#### OTHER HAZARD CONSIDERATIONS:

**Mechanical:** Do not place limbs inside the build area while the nozzle is in motion. The printer nozzle moves in order to create the object

**High Temperature:** Do not touch the printer nozzle – it is heated to a high temperature in order to melt the build material

**Fumes & Particulates:** 3-D Printing works by melting synthetic materials, this process can produce odours which can be irritating to some individuals.

Ultrafine particulate can be a by-product of 3-D printing; proper ventilation is needed and printers should never be located close to workers.