

Safety Note 74

Use of Polymer Filament Desktop 3D Printers

1. Purpose

Affordable desktop 3D printers are being widely used in businesses, schools and colleges. Some of these printers use filaments to deposit polymer through a heated nozzle to build three dimensional objects. This type of desktop printer is generally unenclosed, and some published studies have raised concerns that they may release potentially harmful fumes and particles. The scientific evidence base on exposures and potential health endpoints is being developed internationally.

There are various 3D printing technologies. Health and Safety Executive commissioned report RR1146 and CLEAPSS document on managing risks associated with desktop 3D printers focusses on Fused Filament Fabrication, which is the most commonly used technology used in schools, colleges and universities. FFF printing is a process of laying down melted plastic filament in a series of layers. The adjacent layers cool and bond together before the next layer is deposited. Two common filament materials that are used are: polylactic acid (PLA) which is generally used in schools, colleges and universities and acrylonitrile butadiene styrene (ABS).

This safety note will list potential hazards associated with using Polymer Filament Desktop 3D printers and guidance on what needs to be considered for the safe use of these printers

2. Hazards Associated with Polymer Filament 3D Printers

The following hazards need to be considered when conducting a risk assessment:

- Moving components
- Heated components
- Ultrafine particle emission

