

Selective Laser Sintering (SLS) 3D Printing Safety Tips

SLS printing uses high-power lasers to fuse powdered thermoplastic (often Nylon or polyamide) into solid layers. Surrounding unused powder acts as the support material and is recovered for future use.



Key hazards

- **Inhalation:** Airborne powder can irritate lungs or cause an allergic reaction.
- **Combustibility:** Fine thermoplastic powders are flammable and can ignite or explode when dispersed in air near an ignition source. **Keep powders away from ignition sources.**
- **Laser exposure:** High-powered lasers can cause burns or eye injuries if interlocks or shields are bypassed.



General safety tips

- Supervise prints at all times to prevent accidents.
- Never eat, drink, or store food near work areas.
- Do not open the print chamber until the printer has cooled and the laser is disabled and do not bypass interlocks or shields.
- Review the manufacturer's guidelines for printer-specific hazards.



Laser safety

- **Do not interfere with interlocks or sensors;** ensure the laser is only able to operate when fully enclosed and unable to escape the unit.



PPE and safe handling

- **Safety glasses or face shield** to shield eyes from airborne dust.
- **N95 mask or half-face P100 respirator (depending on exposure)** to protect the respiratory system from fine powder particles. For more details, see the Respiratory Protection and Fit-Testing web page at torontomu.ca/respiratory-protection.
- **Nitrile gloves and lab coat** to provide a barrier from skin contact with fine powders.



Ventilation and air quality

- Always operate in well-ventilated areas.
- Ensure air filters are well maintained and free from blockages.



Electrical safety

- Use grounded outlets to reduce risk of electrical shock.
- Do not overload power strips to avoid electrical fires.
- Follow lock out/tag out procedures to ensure safe maintenance.



Chemical and storage safety

- **Uncured resins are toxic.** Avoid contact with skin and eyes.
- Store powders in sealed, clearly labelled containers (see Chemical Safety website at torontomu.ca/chemical-safety) away from ignition sources to avoid cross contamination and dispersal in the air.
- Ensure objects are fully cleaned before handling without gloves.



Waste disposal

- Dispose of resins and solvents as per hazardous waste guidelines on the Chemical Safety website: torontomu.ca/chemical-safety.

Emergency situations, exposure and spills

In the case of an emergency, dial 911.

Contact TMU Toronto Campus Security at 416-979-5040 (ext. 555040 from an internal phone); or TMU Brampton Campus Security at 416-598-5950 (ext. 555950 from an internal phone).

Report injuries, near misses and hazards to the TMU Emergencies and Reporting website at torontomu.ca/emergencies-reporting.

Skin contact: Thoroughly wash the area with soap and water. Launder clothing before reuse.

Inhalation: Move to fresh air. If respiratory issues develop or persist, seek medical attention.

Eye contact: Rinse eye(s) for several minutes with water. Remove contact lenses if present and easy to do. Protect the unexposed eye. If symptoms develop or persist, seek medical attention.

Spills: Follow emergency response procedures in TMU's Chemical Safety Manual available online at torontomu.ca/chemical-safety.

