







SCOPE	
This document defines the Safe Work Procedure for Ultimaker 2+ Connect 3D Printer	
Application	
Single-extrusion 3D printing using PLA only	
SAFETY HAZARDS AND RISK CONTROLS	
Hazard	Control Strategy
Electrical Hazards	Inspect all leads for damage before plugging machine into electrical socket. If damage is evident do not attempt to use the machine and report the condition to technical staff Check current tagging and testing of machine before operating.
Mechanical Hazards Pinching, crushing, and entanglement hazards. 3D printers contain moving parts. Build plate, axles and drive belts may be points of entrapment.	Do not reach into top area of the printer during operation. Do not lean over the printer during operation. Keep hands clear of internal build area during operation.
Risk of Burns Hot surface hazard. The print heads of Ultimaker 3D printers can reach temperatures above 200 °C, while the heated bed can reach temperatures above 100 °C.	Do not touch print head or build plate with bare hands when they may be hot. If unknown, treat print head and build plate as if they are hot. Allow machine to cool down completely before reaching inside, removing prints, or performing maintenance or modifications, unless explicitly stated otherwise for certain maintenance operations. Wait until the display indicates that the build plate has cooled to a safe temperature. When performing maintenance, always use tweezers, pliers, and thermal gloves where appropriate.
Emission Hazard 3D printing processes can release ultrafine particles (UFPs), volatile organic compounds (VOCs) and other chemical substances. Above threshold limit values (TLVs) emissions can pose risks to health. Concentration depends on filament, adhesive, print conditions, and air exchange rate.	Use PLA material only. Ensure adequate ventilation. Do not use in classrooms or areas without exhaust ventilation. Ensure machine settings are appropriate for PLA; do not overheat material.
Static Magnetic Field Hazard Ultimaker 3D printers contain magnets.	Maintain at least 4cm of distance between any implanted electronic medical devices or implants containing ferromagnetic material and the 3D printer.
Personal Protective Equipment (PPE)	
Appropriate personnel protective equipment must be provided and used	
 Safety Glasses Safety glasses, goggles or face visor must be worn at all times.	 Rings and Jewellery Rings and jewellery must not be worn.
 Protective Clothing Close fitting clothing must be worn	 Hair Long and loose hair must be contained.
 Footwear Enclosed footwear must be worn at all times.	 Protective gloves Thermal gloves must be worn while cleaning or replacing the nozzle. Cut resistant gloves must be worn when removing prints from build plate with a razor, and may be needed for post-processing.
ROLES AND RESPONSIBILITIES	
Title	Role
Technician	Technical staff must ensure that operation of the 3D Printer is undertaken by suitably trained individuals.
Students and non-technical staff	Must be inducted and trained to use this equipment before use. Consult with a technician if uncertain about any process.

PROCEDURE

Pre-operational Safety Check

Ensure no slip/trip hazards are present in workspaces and walkways.
Locate and ensure you are familiar with the operation of the ON/OFF switch.
Check that the print bed is clean, dry, and free of any detergent or grease.

Operational Safety Check

Keep clear of moving machine parts.
Observe print in the first 30 minutes of operation to ensure good adhesion of print.
Check print intermittently to ensure no warping or other failure issues.
Abort print if failure occurs.

Startup and Operating Instructions

Level the print bed using a calibration card. Keep hands clear of all moving parts during levelling and only place hands inside the enclosure when prompted to do so by the display.
Load PLA material (Ultimaker or Generic) and ensure that the printer's settings match the material loaded.
Ensure that Ultimaker Cura is configured for Ultimaker 2+ Connect printer and correct material.
Slice print at appropriate resolution, using support and adhesion where necessary.
Preview sliced print to confirm that settings are appropriate.
Export sliced print to USB.
Apply a thin, even layer of glue to build plate.
Insert USB into printer and print from USB.
Observe print for first 30 minutes to ensure good adhesion and check intermittently.

Housekeeping

Wait for machine to cool down fully. Check display to confirm.
Remove build plate from machine.
Remove work from build plate, using a razor scraper and cut resistant gloves if necessary.
Wash the plate using detergent and lukewarm water and dry fully before returning to printer.
Confirm print removal on display.
Leave the machine and work area in a safe, clean and tidy state.