

Fact Sheet: Microtome and Cryostat Safety

Introduction

Microtomes and cryostats are used for cutting thin sections of fixed and unfixed tissue. The use of these instruments in the laboratory presents a laceration hazard, which can result in an exposure to bloodborne pathogens or other infectious materials. Additional risks include pinching and crushing by moving mechanical parts, and repetitive motion strain. Personal Protective Equipment (PPE) is required to operate this instrument.

Learning how to use the instrument:

- Training on instrument use and safety must be provided by a knowledgeable, responsible person within the laboratory.
- A written procedure specific to the individual piece of equipment should be available to laboratory personnel.
- Refer to the manual or contact the manufacturer for additional information.

Safety check before working with the instrument:

- Acknowledge understanding of how to operate a microtome / cryostat.
- Wear appropriate PPE such as gloves, lab coat or gown, safety glasses or goggles, and respiratory protection (if necessary).
- Secure hair, jewelry and loose clothing to prevent them from being caught by the knife.
- Inform beginning of work to another laboratory member in case of an emergency.
- Clean and organize work area.
- Lock hand wheel (AKA rotary wheel).
- Clear off non-working sharps or blades left out on bench tops or work areas.
- Verify Knife holder. It should have no blade installed and the knife guard should be secured in place.
- Follow any other safety requirements specific to your work.

Working safely with microtome and cryostat blades:

- Do not operate this instrument without proper training.
- Consider the use of surgical grade Kevlar gloves when using a cryostat to provide additional protection from cuts and scrapes.
- Always lock the hand wheel to immobilize the block when not actively cutting tissue and before insertion or removal of blade.
- Always keep hands away from working blades.
- Use protectors/guards for knife-edges that may extend beyond microtome knife holder.
- Position the sample first and then put in the blade with the blade edge positioned away from hands.
- Use engineering controls like forceps, tweezers, dissecting probes, and small brushes to retrieve samples, change blades, dislodge blocks, or clean equipment.
- Discard and handle trimmings and sections of tissue as biohazardous waste.
- Never walk away from an exposed blade.
- At the end of each session with the instrument, dispose of the blade immediately in a sharps waste container. Alternatively, reusable blades can be secured in a container when not in use.
- Properly decontaminate equipment, including reusable blades, after each use with an appropriate disinfectant.
- Before the instrument is cleaned or maintained, the hand wheel must be locked and the blade removed from the blade holder. Use caution as other components of the instrument may also have sharp edges.
- Do not move or transport a microtome with knife in position.
- Do not leave motorized microtomes running unattended.

Emergency response to instrument related injury:

- Lock the movement of the instrument immediately.
- Inform a laboratory member about the emergency.
- Gently wash injured area with soap and water for 15 minutes.
- Assess severity of the injury.
- Determine if there was exposure to biohazardous materials.

- Seek medical attention through the [Occupational Health Clinical Services](#).
- For severe and lethal injuries, call 911

Additional Information:

Visit the Res [Respiratory Protection Program website](#) and contact HSRM to evaluate if your work requires respiratory protection.