



Bio Basics Fact Sheet: Aerosol Production and Exposure Control

Background:

Over the years, there have been many documented cases of lab personnel acquiring diseases due to their work with infectious agents. Approximately 80% of these cases are assumed to be primarily related to the creation of aerosols in the lab. Whenever work with infectious agents is performed, all appropriate measures must be taken to protect workers and the environment. This Fact Sheet describes aerosol-producing activities and safe work practices to protect workers from aerosols.

Definitions:

Aerosols are liquid and solid particles suspended in the air. An aerosol with a diameter of 5 microns or less can remain airborne for a long period of time, spread wide distances, and is easily inhaled. Particles with a diameter larger than 5 microns tend to settle rapidly and can contaminate skin, other surfaces, and ventilation systems.

Examples of Aerosol-Producing Activities in the Lab:

- blowing out pipettes
- cell sorters
- shaking or vortexing tubes, stirring
- opening lyophilized cultures, opening snap top tubes, breakage of culture containers
- flaming loops or slides
- pulling needles out of septums, filling a syringe
- pouring liquids
- centrifugation steps such as filling centrifuge tubes, removing plugs or caps from tubes after centrifugation, removing supernatant, resuspending sedimented pellets, breakage of tubes during centrifugation, and centrifugation itself
- sonicating, homogenizing, blending, grinding, cell disruption with French press
- intranasal inoculation of animals
- cage cleaning, changing animal bedding
- harvesting infected material from animals, eggs, and other virology procedures
- necropsies of infected animals

Safe Work Practices to Minimize the Creation of and Exposure to Aerosols:

Use a combination of the appropriate safety equipment and safe procedures is the primary method to minimize the creation of and exposure to aerosols.

Lab safety equipment to protect personnel from aerosols

- The certified [biological safety cabinet \(class I or II\)](#) is the primary barrier to protect worker from aerosols. Other safety devices include safety centrifuges with automatic locking mechanisms or solid lids, safety centrifuge cups, safety blenders, safety sonicators.
- If aerosol production cannot be prevented or contained, see the [DEHS Respiratory Protection](#)

