



Infectious Aerosol Management During Centrifugation with Various Swinging-Bucket Rotor Assemblies

The purpose of this drawing is to show the containment of infectious aerosols by 5 kinds of swinging-bucket rotor assemblies. The top and bottom rows of assemblies A, C, D and E represent the buckets of the 4 assemblies spinning and just after the spin respectively. Assembly B is shown only just after the spin. This assembly (B) provides essentially the same containment as assembly A, only assembly B is useable only at much slower speeds due to the strength of the tubes (50 ml conical screw-cap tube containing a smaller capped tube is shown [Thanks to Dr. D. Dorsky]). The big black spot indicates the swing structure of the removable bucket. The small blue specks represent the generated infectious aerosols.

Assemblies A and D are buckets with fitted covers. After the spin, the bucket is removed from the rotor and moved inside the Biological Safety Cabinet (BSC, biohood) to be opened. Both assemblies protect the researcher from an inhalation exposure when the centrifuge is opened. Assembly A both potentially keeps the interior of the bucket uncontaminated (if tube exteriors are uncontaminated) and provides a layer of protection in case a tube breaks. Assembly C provides protection against an inhalation exposure if the tubes are opened in the BSC, and if no tube breakage occurs, which is hard to know until after the centrifuge is opened. Assembly E should not be used with infectious biological materials. Assembly A is the safest with assembly B being a cheaper alternative for slow spins (do a non-infectious test run). Any infectious aerosols produced should be expected to persist for a significant time (there is no good rule for this).