Chapter 4

Preventing Contamination

4.1 Types of contamination and how to prevent them

Personal protective equipment

Prevention

The specific personal protective equipment recommended depends on your laboratory and can include:

- Wear a lab coat.
- Wear gloves.
- Wear protective glasses.
- Wear a mask.
- Wear protective footwear.

Lab bench

- Wipe work bench before and after with an appropriate cleaner for your application (cell culture, radioactive components, pathogenic samples…).
- Work under a hood.
- Work behind a radioactivity shield.
- Avoid touching used tips.

Pipette to sample

Contaminated tips or a contaminated pipette will contaminate your samples.

Prevention

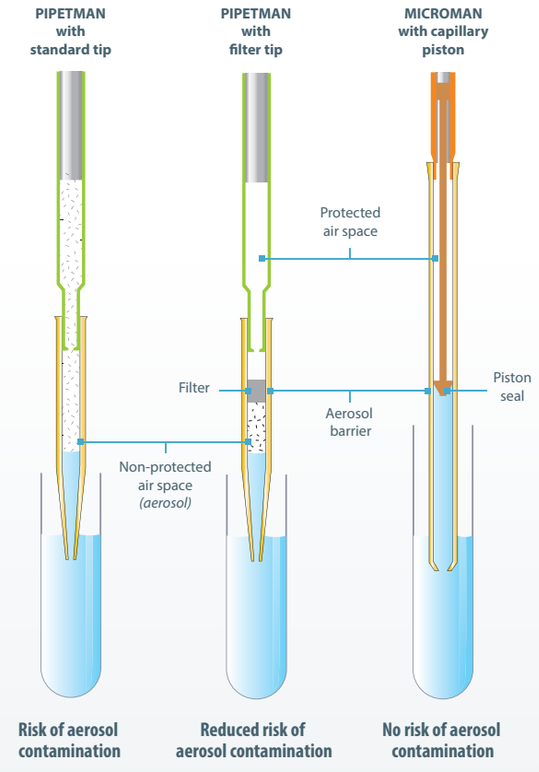
- Store pipettes vertically on a holder.
- Eject tips into a designated container.
- Follow laboratory protocol to clean your pipette.
- Use sterile tips when appropriate.
- Change the tip after each sample to avoid cross contamination.

Sample to pipette

Contamination can occur if the sample or aerosols from the sample are allowed to enter the body of the pipette.

Prevention

- To prevent your sample from contaminating the body of your pipette, do not turn the pipette upside down when there is sample in the tip. Always store your pipettes vertically.
- Release the push-button slowly.
- Use filter tips to reduce contamination risk.
- Use the corrosion protection kit available for PIPETMAN P1000 (Neo, G and L).
- For complete protection of the pipette, choose MICROMAN E for problem liquids.

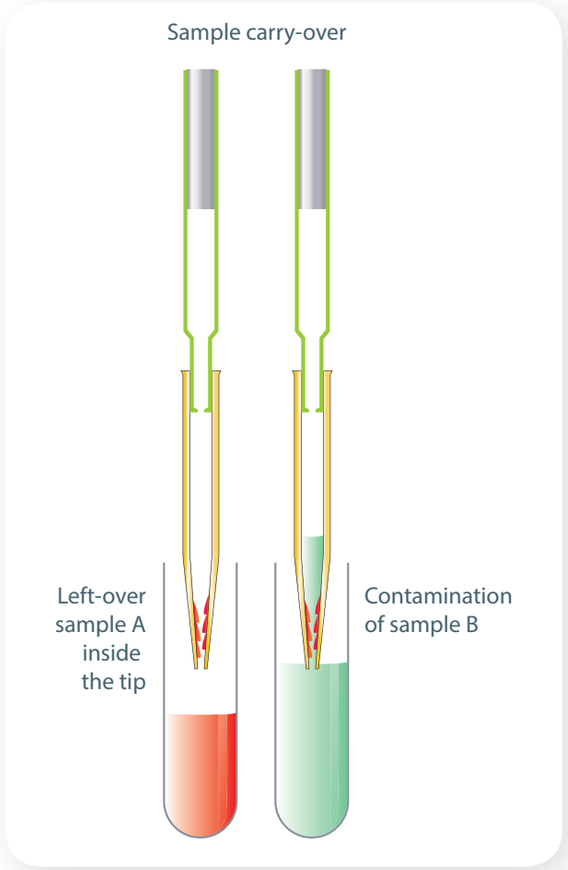


Sample to sample (carry-over)

Change the tip after each sample.

A portion of sample "A" can adhere to the inside wall of the tip after sample delivery.

The leftover portion of sample "A" can mix with the next sample "B" and may cause a false test result.



How to prevent aerosol contamination?

It is essential to prevent aerosol contamination when using PCR and other amplification methods, or when pipetting DNA/RNA solutions, infectious materials, radioactive samples, etc.

Gilson offers two solutions:

1. **Use a PIPETMAN pipette with PIPETMAN DIAMOND sterilized filter tips when faced with the following situation:**
   - Working under sterile conditions.
   - Pipetting aqueous samples.
   - Avoiding cross-contamination.

2. **Use a MICROMAN pipette with sterilized capillary pistons when faced with the following situation:**
   - Working under sterile conditions.
   - Pipetting viscous samples.
   - Avoiding cross-contamination.

4.2 Decontaminating your pipette

The solutions mentioned below are options and other solutions may be used. Make sure your decontamination technique is compatible with your pipette material and refer to your laboratory decontamination procedure.

Contamination causes	Decontamination techniques	Cleaning guidelines
Radioactive compounds	**Detergent - cleaning solution**	Disassemble the lower part of your pipette. Fully immerse the contaminated parts* into an ultrasonic bath with a detergent or cleaning solution recommended for laboratory instruments. It is strongly recommended to rinse the pipette several times with water and dry it thoroughly. Always make sure that radioactivity has decreased to an acceptable level.
Viruses, bacteria, mycoplasma, fungi	**UV radiation**	Work surfaces may be decontaminated by exposure to 300 nm UV light for 15 minutes. UV will not damage Gilson PIPETMAN materials. Note that the UV rays cannot penetrate inside the pipette and cannot be considered as a decontamination protocol for the internal components of the pipette.
DNA, RNA, biological samples	**10 % bleach solution or UV radiation**	Disassemble the lower part of your pipette. Fully immerse the contaminated parts* into at least 3 % sodium hypochlorite for at least 15 minutes. Rinse thoroughly with distilled water and dry. Exposure to UV light for 30-60 minutes will further reduce DNA contamination, but not fully eliminate it from the pipette surface.
Aqueous solutions and buffers	**Water cleaning**	Disassemble the lower part of your pipette. Rinse the contaminated parts thoroughly with distilled water and dry.
Acids/alkalis		
Organic solvents	**Detergent - cleaning solution**	Disassemble the lower part of your pipette. Fully immerse the contaminated parts* into an ultrasonic bath with a detergent or cleaning solution recommended for laboratory instruments. Rinse the pipette several times with water and dry it thoroughly.
Proteins		

If pipette brands other than Gilson are used, please make sure the material is compatible with the appropriate cleaning solutions.
* Check the User's Guide for specific parts to clean by immersion.

Autoclaving

This is a common method of sterilization. PIPETMAN DIAMOND Tips and parts of PIPETMAN pipettes* may be sterilized in the laboratory under the following conditions: moist heat/121°C/20 minutes/1 bar.

Note: autoclaving has a limited spectrum of action and will not destroy RNase for example.

** PIPETMAN parts can be autoclaved according to the User's Guide for the pipettes. Refer to your model User's Guide for the defined parts and the recommended conditions.*