

Overcoming Liquid Challenges with Bottletop Dispensers

Dispensing many different liquids is daily routine in laboratories. Some are challenging and need special consideration for safe and accurate liquid dispensing. Here we show four types of challenging liquid applications and how to overcome these by using the right accessories.

Highly aggressive liquids

Problem:

- > Highly concentrated acids or bases can attack plastic materials such as PP*¹.
- > Bottle thread adapters are often made of PP and are in close contact to the liquid.
- > Tightness of the adapter is essential for accurate liquid aspiration and dispensing.
- > The PP adapters can get destroyed which leads to leakage.

Solution:

- > Adapters made of more chemical stable material such as ETFE*² or PTFE*³ should be used.



Fig. 1: A wide range of ETFE adapters exist to fit most laboratory bottle types.

*1 polypropylene
*2 ethylene/ tetrafluor-ethylene-copolymer
*3 poly(tetrafluoroethylene)

Titration with fuming acids

Problem:

- > Fuming acids are maximum concentrated chemical gases dissolved in water such as in 37% HCl*⁴ or 65% HNO₃*⁵.
- > Exclusion of surrounding humidity is needed to protect the acid from dilution.

Solution:

- > A drying tube must be filled with a moisture absorber (e.g., silica gel) and attached to the bottletop dispenser to absorb humidity.
- > Also useful when working with alkaline solutions tending to form carbonates. Should be filled with e.g., sodium hydroxide pills preventing this reaction.



Fig. 2: Bottletop dispensers with attached drying tube protect fuming acids from dilution.

*4 hydrochloric acid
*5 nitric acid

HPLC and small vessels

Problem:

- > HPLC vessels have a small opening.
- > Tightly racked reaction tubes are often used in microbiology.
- > It can be difficult to reach into these tubes without tilting the dispenser.
- > It can be time consuming and dangerous.

Solution:

- > A flexible discharge tube extends the dispensing tube length up to 80 cm.
- > The flexible discharge tube has a thin opening to reach into narrow vessels.



Fig. 3: A flexible discharge tube enables reaching into small glass vessels and close-standing tubes.

Sterile liquids

Problem:

- > Sterility is essential for all cell culture applications and most microbiological assays.

Solution:

- > Sterility can be achieved by autoclaving the bottletop dispenser directly attached to the bottle with medium.
- > Use a sterile filter attached to the back of the bottletop dispenser to filter surrounding air entering the system.
- > Medium is protected and can be stored in the biosafety cabinet.



Fig. 4: A sterile filter attached to the back of the bottletop dispenser secures sterility.

Video "Eppendorf Service - Spa and Wellness for Dispensers"

