

Smart Notes



Does your choice in filtration device matter for overall performance?

Yes. You can increase efficiency in the time it takes to filter, enhance your speed with faster flow rates, and improve the stability of your media to save time in the lab by choosing the right filtration device.

Background

There is always interest in saving time in the lab, especially during routine or daily activities such as filtering cell culture media. Decreasing the time it takes to filter from start to finish and increasing the flow rate of media during filtration can improve efficiency. Knowing that the media can maintain pH stability in the receiver bottle over days and weeks can also prevent the need to prepare fresh media. We performed a study to determine the efficiency of filtration, the speed of filtering media, and the stability of the media after filtration using Thermo Scientific™ Nalgene™ Rapid-Flow™ filtration units.

Increased efficiency in total filtration time

Nalgene Rapid-Flow Filtration Units were tested against units from Supplier M. Rapid-Flow Sterile Single-Use Filter Units with PES membrane were filled with 1,000 mL of Gibco™ BenchStable™ DMEM Basal Media containing 10% Gibco™ Fetal Bovine Serum (FBS) and 1% Gibco™ Penicillin/Streptomycin antibiotic mix. Vacuum pressure (at 25 in Hg) was applied to the filter units in triplicate and the total time from the start of filtration to finish was recorded. Devices from Supplier M were subjected to the same conditions using the same media for comparison.

Our results show that Nalgene Rapid-Flow Filtration Units averaged a total filtration time of 49.2 seconds compared to 76.9 seconds for Supplier M filtration units (Figure 1). Nalgene Rapid-Flow Filter Units are up to 36% faster in total filtration time compared to competitive filtration units.

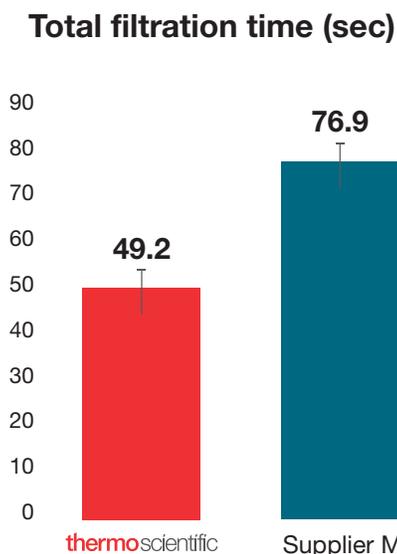


Figure 1: Rapid-Flow Sterile Single-Use Filter Units have up to 36% faster total time from start of filtration to finish than Supplier M.

Enhanced speed with faster flow rates

Nalgene Rapid-Flow Sterile Single-Use Filter Units with PES membrane and competitive filtration units were tested in a similar manner as the total time for filtration (above) but the flow rate (mL/min) was recorded using a calibrated receiver bottle.

Our results show that Nalgene Rapid-Flow Filtration Units average flow rate was 842.3 mL/min compared to 520.0 mL/min for competitive filtration units yielding up to a 38% faster average flow rate. (Figure 2).

Average flow rate (mL/min)

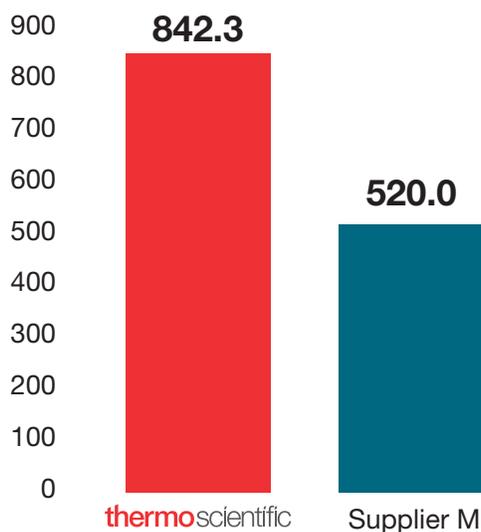


Figure 2: Rapid-Flow Sterile Single-Use Filter Units have up to 38% faster flow rate than Supplier M.

Improved pH stability of media

At 0, 24, 48, and 72 hours and 1, 2, and 4 weeks, pH measurements were taken to evaluate the stability of filtered media. Triplicates of 1,000 mL of BenchStable DMEM Basal Media containing 10% FBS and 1% Penicillin/Streptomycin antibiotic mix were filtered using Nalgene Rapid-Flow Sterile Single-Use Filter Units with PES membrane and kept in the receiver bottle at 4°C. The receiver bottle was repeatedly opened for each pH measurement.

Our results show a range of pH between 7.4 to 7.6 over a 4-week incubation time for Nalgene Rapid-Flow filtration units (Figure 3). The fluctuation is less than 3% pH which ensures that the receiver bottle can maintain the stability of filtered media over time.

pH stability of media filtered with Nalgene Rapid-Flow filtration units

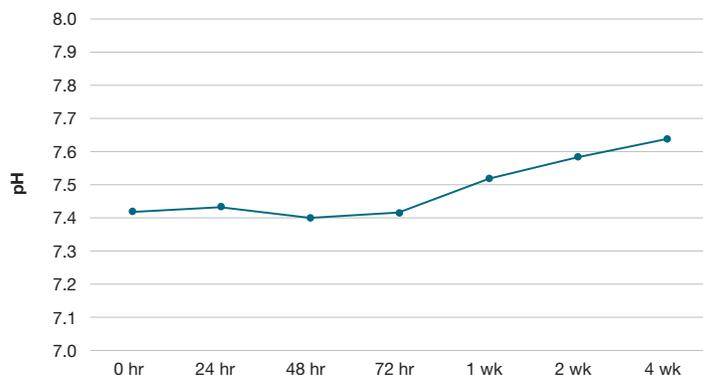


Figure 3: Media that has been filtered using Rapid-Flow Sterile Single-Use Filter Units and left in the receiver bottle at 4°C have a stable pH with less than 3% fluctuation over a 4-week period.

Summary

Nalgene Rapid-Flow Sterile Single-Use Filter Units with PES membrane are 36% faster in total filtration time and 38% faster in average flow rate compared to competitive filtration units. Nalgene Rapid-Flow Filtration Units maintain pH of media stored in the receiver bottle with less than 3% fluctuation in pH measurements over time.

Find out more at thermofisher.com/filtration