Membrane Filters: Choosing the Correct Filter for Cell Culture Media Purification

Introduction

Cell culture media provides vital nutrients and proper environmental conditions to support growth, viability, and productivity of cells used in biopharmaceutical manufacturing. Optimized media formulations help to ensure batch-tobatch consistency in biologic production, and the properties of media will directly impact the yield and cost efficiency of the manufacturing process. Due to the importance of cell culture media, it is crucial that it is properly sterilized to prevent potential contaminants from competing with cultured cells for nutrients and compromising cell growth, product quality, or overall batch yield.

Optimizing Bioprocess Operations

Sterilizing filtration of media can often come with its own stream of challenges, however: premature clogging, scalability difficulties, and proper material selection, to name a few. These difficulties can reduce filtration efficiency, increase batch time, and even affect cell growth and viability. Thus, it is of paramount importance that an efficient and scalable filter that is compatible with the media is chosen. This paper seeks to provide initial guidance for the scalability of Meissner SteriLUX[®] (single-layer PVDF) and EverLUX[®] (dual-layer PES) filters with CHO cell media. Data was gathered using Meissner 47 mm disc filters. The same filter membrane is available in various configurations from 25 mm syringe filters up to 50 inch capsules, ensuring consistent performance across development, pilot, and manufacturing stages.



Figure 1: CHO media filtration through PVDF membranes



Figure 2: CHO media filtration through PES membranes.



Tailoring Membrane Selection: PVDF and PES

The choice between PVDF and PES media can come down to a variety of factors including filtration performance, chemical compatibility, extractable and leachable profiles, particulate load and size distribution, and more. PVDF often has lower non-specific protein binding, while PES often has more favorable flow rates. However, it should be emphasized that these factors are application specific and can change depending on the process. Ultimately, initial screening and testing is the best way to determine which media will be most efficient in a specific process. While the results of this study demonstrate EverLUX[®] – Meissner's dual-layer highly asymmetric PES – to have the highest throughput and flowrates, filtration performance is dependent on several factors and is very process specific.

It is recommended that initial testing is done to find the ideal filter for an application. Meissner Technical Services can perform filterability studies to help determine the best filter and filter size for each application, ensuring your process is optimized and efficient. Contact us at <u>sales@meissner.com</u> to learn more about how Meissner can optimize your process.



Figure 3: Quantity of 10" filters required to process 10,000 L of CHO media.



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