Leveraging Mathematical Models for Optimizing Filter Utility at Manufacturing Scale

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Abstract

In the production of biopharmaceuticals depth filters followed by sterile filters are often employed to remove residual cell debris present in the feed stream. In the back drop of a global pandemic, supply chains associated with the production of biopharmaceuticals have been constrained. These constraints have limited the available amount of depth filters for the manufacture of biologics. This has placed manufacturing facilities in a difficult position having to choose between running processes with reduced number of depth filters and risking a failed batch or the prospect of plants going into temporary shutdown until the depth filter resources are replenished. This communication describes a modeling based method that leverages manufacturing scale filtration data to predict the depth filter performance with a reduced number of filters and an increased operational flux. This method can be used to quantify the acceptable level of area reduction before which the filtration process performance is affected. This enables facilities to manage their filter inventory avoiding potential plant shutdowns and reduces the risks of negative depth filter performance.

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