STERILE MEDIA HOLD SCALE-UP USING MOBIUS® SINGLE-USE TECHNOLOGY

Antonio Mayo, MilliporeSigma
Antonio.Mayo@emdmillipore.com
Adam Sokolnicki, MilliporeSigma
Kara Fouhy, MilliporeSigma

Key Words: Single-Use Mixing, Sterile media hold, Scalable process

The benefits of single-use systems (SUS) in biopharmaceutical manufacturing are well understood, and their use is widespread in the manufacture of mAb, rProteins, and related therapies. New frontiers in medicine such as cell and gene therapy present an opportunity for SUS to enable speed to the clinic, however some unique hurdles must be overcome. This poster outlines the collaborative development of a single-use process to address the challenge of supplying sterile media to a bioreactor for inoculation and growth of human tissue cells. To alleviate time constraints, cleaning concerns, and contamination risks, the biopharmaceutical manufacturer chose to employ single-use technology when conducting a 5-fold scale up from a glass bottle process. A significant challenge with this human tissue cell culture process is the 60-day sterile media hold at the cell culture temperature of 36ºC, during which time the bioreactor is intermittently perfused with fresh media. The Mobius® Mix50 single-use mixer (SUM) solves this challenge by first beginning with a sterile, gamma-irradiated mixer bag to eliminate concerns over validation of CIP and SIP cycles. Next, a low-pressure overlay is maintained with a carefully-sized hydrophobic vent filter, to prevent contaminants from entering the sealed mixer container. Process variables requiring assessment for this application include the air overlay pressure and flow rate, the liquid (media) flow rate during filling and draining of the SUM, sizing of the vent filter area, the liquid volume in the SUM, and the sterile condensate collection rate. A series of experiments provided a repeatable and scalable single-use solution for implementation into the manufacturing process. This novel application demonstrates the flexibility of single-use in the rapidly expanding clinical market of products derived from human cells with the unique challenges they present.