



Application Note

USD 3031

Hydrating Media Powder at the 200 L Scale using a Pall® Magnetic Mixer

Mixing system: Pall Magnetic Mixer

Mixing biocontainer: 200 L Mixer biocontainer

Application mixing type: Powder-liquid

Pall Life Sciences offers several different single-use mixing technologies that provide varied cost, operational and performance advantages over conventional stainless steel mixing vessels and other single-use mixers. The criteria for selecting the best Pall mixing technology include scale, particle and sheer sensitivity, mixing power, physical fit and economic considerations. This application note illustrates how the Pall Magnetic Mixing system performs in a demanding, real-world application.

Introduction

The Pall Magnetic Mixer is a compact single-use mixing system. The mixing biocontainer incorporates a bottom-mounted magnetically-driven impeller that provides high-torque mixing for powder-liquid and liquid-liquid applications. The impeller rides on a low-friction, inert bearing assembly designed to ensure low particle shedding while allowing mixing of high powder loads in large liquid volumes. All product-contacting surfaces are USP Class VI and Animal Derived Component Free (ADCF).

Powder-liquid mixing is a common requirement in biopharmaceutical processing. In order to maximize mixing efficiency for powder-liquid applications, the Magnetic Mixer is available with a 16.13 cm (6.35 inch) impeller.

In this experiment a Magnetic Mixer was used to prepare cell culture media. The procedure entailed the dissolution of SAFC Ex-Cell™ 302 Serum-Free CHO Dry Powder Medium and then adjustment of the solution pH using readings from sensors installed in the mixing biocontainer.



Experimental

A 200 L Magnetic Mixer biocontainer was fitted with a pair of calibrated, autoclavable glass pH electrodes via threaded probe ports (see accompanying photograph). The mixing biocontainer was then filled with ~180 L of water at room temperature, and the impeller mixing speed was set to 300 rpm. The recommended amount of dry media powder (4,242 g) was added through the top of the mixing biocontainer via a 30 L Pall powder bag.

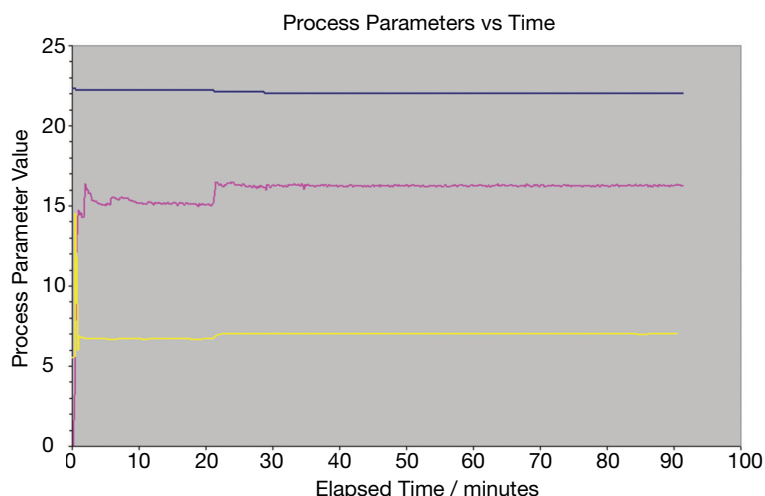
Following the media manufacturer's guidelines, after 20 minutes of mixing, 320 g of sodium bicarbonate powder was added and the solution was adjusted to pH 7.00 with sodium hydroxide or hydrochloric acid. The solution was then mixed for 60 minutes as recommended. Homogeneity was monitored via real-time conductivity and pH readings.

Results

Figure 1 shows solution homogeneity in the biocontainer during mixing. After the media powder addition, mixing was deemed (from the conductivity data and visual observation) to be complete within approximately 12 minutes. After the bicarbonate addition and pH adjustment, mixing was deemed complete within a further 8 minutes.

Figure 1

Solution homogeneity in the biocontainer during mixing



Conclusions

The Pall Magnetic Mixer system, coupled with a Pall powder bag, is well suited to preparation of cell culture media solution. Media preparation times in the 20-30 minute range appear feasible at the tested volume and medium concentration.



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