Life Sciences

Application Note

USD 3035

Preparing Media Concentrate at the 200 L Scale using a Pall® Magnetic Mixer

Mixing system: Pall Magnetic Mixer

Mixing biocontainer: 200 L Magnetic 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 competing 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 Mixer 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 200 L Magnetic Mixer is supplied with a 16.13 cm diameter, centrally-located impeller.

In this experiment a Magnetic Mixer was used to prepare cell culture media concentrate. 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. The result was a 2x concentrate, suitable for subsequent dilution at the point-of-use.

Figure 1
Pall Magnetic mixer

Figure 2
pH & conductivity measurement probes

Experimental

A 200 L Magnetic Mixer biocontainer was fitted with a pair of calibrated, autoclavable glass pH electrodes via threaded probe ports integral to the biocontainer (Figure 2).

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 (8,484 g) was added through the top of the mixing biocontainer via a 30 L Pall powder bag. No media powder/dust was observed escaping during this addition, and powder delivery to the mix vessel was greater than 99.9 %.

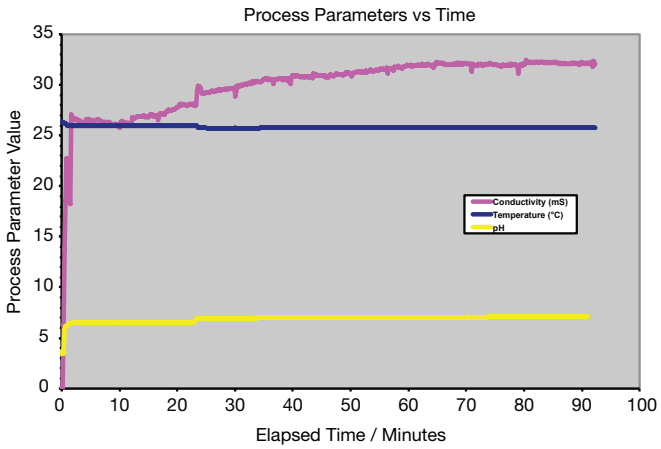
Following the media manufacturer's guidelines, after 23 minutes of mixing, 640 g of sodium bicarbonate powder was added and then the solution was adjusted to pH 7.00 by incremental addition of dilute sodium hydroxide or hydrochloric acid solution. The solution was mixed for another 60 minutes. Homogeneity was monitored via real-time conductivity and pH readings (Figure 2).

Results

Figure 3 shows solution homogeneity in the biocontainer during mixing. Mixing was deemed to be complete within 80 minutes. At no time during the mixing process did the impeller stall or hesitate.

Figure 3

Solution homogeneity in the biocontainer during mixing



Conclusions

The Pall Magnetic Mixer, coupled with a Pall powder bag, is well suited to preparation of 2x cell culture media solution concentrate. Media concentrate preparation times in the <90 minute range appear feasible at the tested volume and medium concentration.

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