

Mixing system: Newmix® - Levtech® Jet-Drive™ system

Mixing bag: 200L A-Mix™ bag

Mixing type: Liquid-liquid

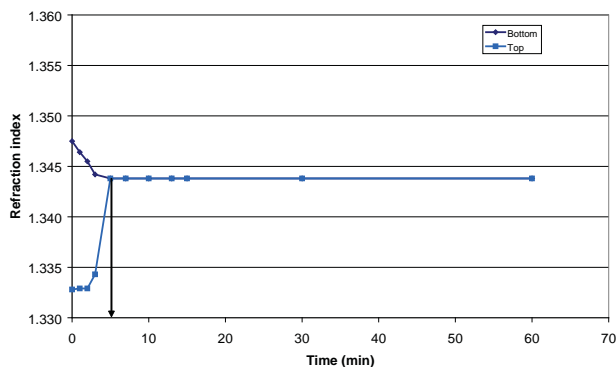
The Newmix-Levtech Jet-Drive system is one of the lightest and most compact disposable mixing systems. It consists of a cubical shaped disposable bag with a magnetically impelled turbine, secured to the bottom of the bag, working as a centrifugal pump.

The established 3D recirculation loop eliminates dead zones and ensures efficient and fast mixing.

Introduction

Liquid-liquid homogenization is a common requirement in biopharma processing, including after storage. Furthermore, a cubical bag shape is generally considered to be preferable from a storage efficiency (footprint) viewpoint. However, performing mixing in a cubical bag can be difficult; some mixing technologies can be prone to uneven distribution within the mixing bag, or can even introduce unwanted particulate contamination. The Jet-Drive impeller was developed to overcome these challenges.

In this experiment, a Jet-Drive system was used to prepare a 10% glycerol solution. The objective was to compare the mixing efficiency when the dense solute was added to a mixed solvent versus a quiescent solvent.

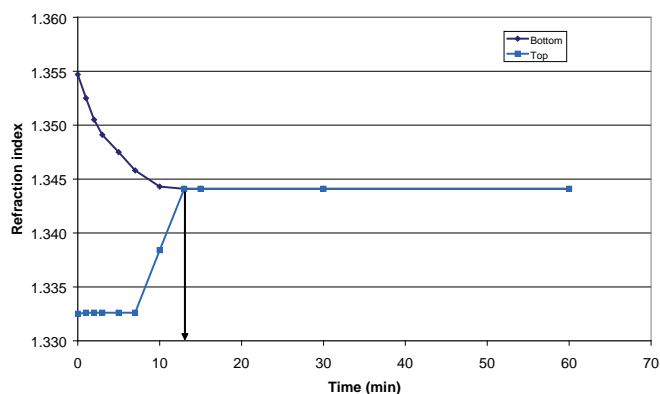


Mixing of 20kg glycerol in 180L water FROM REGIME

Experimental

A 200L A-Mix bag was filled with 180L of DI water, and the Jet-Drive impeller mixing speed set to 1000rpm. After 5 minutes, 20kg of glycerol was added to the mixing bag in one of the top corners. Solution homogeneity was monitored via refractive index readings on samples taken from the top and the bottom of the mixing bag.

The experiment was repeated with the Jet-Drive impeller set to a speed of 0rpm during the glycerol addition, which was done with a pipette to deposit the denser glycerol on the bottom of the mixing bag. Once the glycerol had been added, the impeller speed was ramped up to 1000rpm over 60 seconds. This was intended to represent a worse case scenario.



Mixing of 20kg glycerol in 180L water FROM REST

Results

The accompanying chart shows the solution homogeneity in the bag during mixing. Even under the most unfavorable conditions, a very high degree of homogeneity was attained within 13 minutes.

Conclusions

The Newmix-Levtech Jet-Drive system is well suited for liquid-liquid applications where a high degree of final homogeneity is important.

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