

Newmix® - Levtech® Application note

Demonstrating Pad-Drive™ Scalability from 25L to 1000L

Mixing system: Newmix®- Levtech® Pad-Drive™ 1000 system

Mixing bag: 25L, 50L, 200L, 500L and 1000L Q-Mix™ bags
(US Pat.No. 7,249,880)

Mixing type: Solid-liquid

The Newmix-Levtech Pad-Drive system is a scalable and non-invasive single-use mixing system. The heart of this mixer is an innovative top-mounted mixing paddle that allows effective and uniform mixing in demanding applications, such as preparation of contained high-solids solutions or mixing of high-viscosity liquids.

Introduction

Scalability - the ability to perform mixing consistently over a useful range of working volumes - is an important consideration when selecting a mixing system. Ideally, a single mixing system will be equally suitable for use in a small scale-preclinical environment as in a large-scale production situation. It is also desirable that the same mixing settings (impeller speed etc.) yield the same mixing results so as to reduce the validation burden on the user during process scale-up.

In this experiment, a Pad-Drive 1000 Premium was used to prepare a concentrated salt solution in mixing bags ranging from 25L to 1000L. The objective was to demonstrate how the system can perform consistent mixing, independent of working volume.



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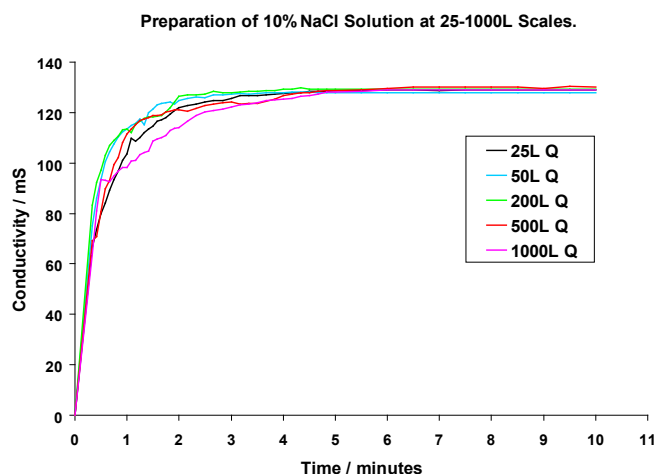
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Experimental

A 25L Q-Mix cubical mixing bag was filled with 25L of DI water and 2.5kg of solid sodium chloride (NaCl). Immediately after the solid was added, mixing was started (70rpm, 15° mixing angle). Solution homogeneity was determined via conductivity readings taken inside the mixing bag during the mixing process.

The experiment was repeated with 50L of water and 5kg of NaCl in a 50L Q-Mix bag, 200L of water and 20kg of NaCl in a 200L Q-Mix bag, 500L of water and 50kg of NaCl in a 500L Q-Mix bag, and 1000L of water and 100kg of NaCl in a 1000L Q-Mix bag.



Results

The accompanying chart illustrates the solution homogeneity in each bag during mixing.

In every case mixing was complete within 5 minutes. At no time during the mixing cycle did the paddle impeller stall or hesitate.

The mixing curve at each scale is virtually identical, confirming that mixing is highly consistent and predictable across the full range of working volumes.

Conclusions

The Newmix-Levtech Pad-Drive mixing system is capable of efficient and consistent mixing throughout the range 25L to 1000L while using the same mixing parameters.