

# Newmix® - Levtech® Application note

## Mixing a Diatomaceous Earth Slurry Using a Pad-Drive™ Mixer

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

Mixing bag: 200L Mixing Bag

Mixing type: Solid-liquid

The Newmix 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

Mixing large quantities of a solid and a liquid, such as during the preparation of high-concentration buffer solution, can be challenging for single-use disposable mixing systems. Often, the force needed to suspend the solid can lead to stalling of the impeller.

In this experiment, a Pad-Drive mixer's ability to suspend a very high powder load was tested. The powder chosen was diatomaceous earth, a fine, inert and insoluble, powdered filter medium that is light and fluffy when it is dry, yet forms a dense mud when mixed with water.



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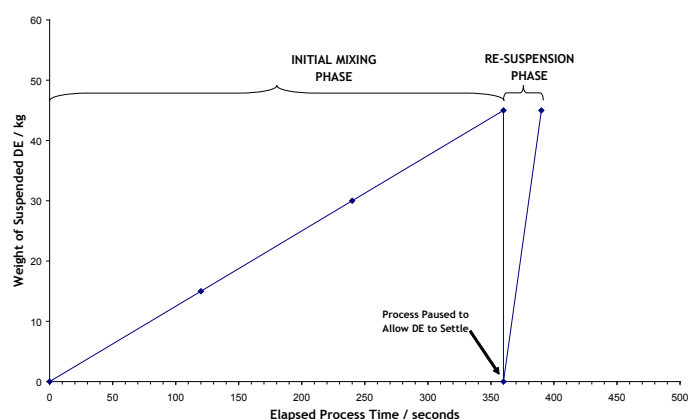
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## Experimental

A 200L mixing bag was filled with ~120L of water, and mixing speed was set to 100rpm with a 9° mix angle, alternating direction every 120 seconds. Diatomaceous earth powder ( $d=0.22\mu\text{m}$ ) was then added until a total weight of 45kg was reached. The mixer was then shut off, and the suspended powder allowed to settle into a dense, compacted mud at the bottom of the mixing bag over several hours. After the powder had settled, mixing was restarted, and the impeller's ability to resume mixing was observed.

Weight of Suspended Diatomaceous Earth vs. Elapsed Time



## Results

The diatomaceous earth powder was consistently dispersed into the water faster than it could be added; the entire 45kg slurry was made in less than 6 minutes, with the limiting factor being the speed of dispensing the dry powder. The Pad-Drive system provided sufficient agitation to maintain all of the powder in suspension.

Once settled, complete re-suspension of the slurry took less than 30 seconds. Video of this experiment is available upon request.

## Conclusions

The paddle mixing action of the Newmix-Levtech Pad-Drive 1000 system is capable of high mixing efficiency without stalling in high-load solid-liquid mixing applications. Preparation of 200L of a 225g/L diatomaceous earth slurry took less than 6 minutes under the tested conditions.

