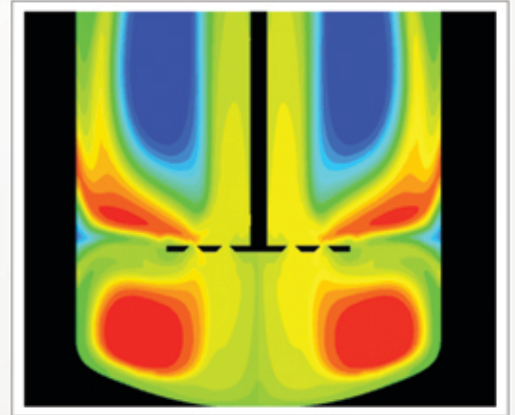
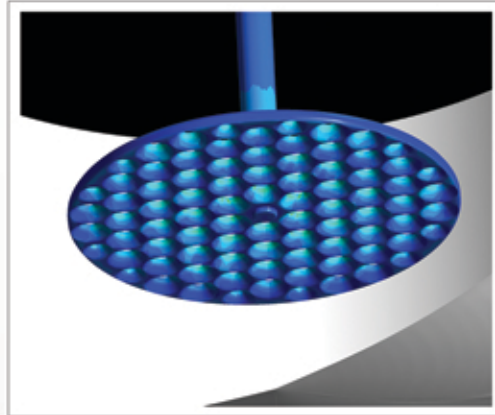
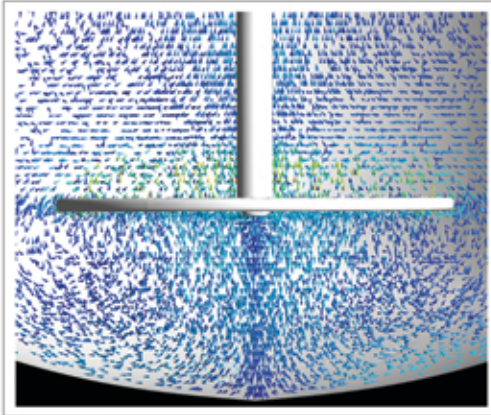


CFD Analysis Report

Saltus® M200 Mixing System



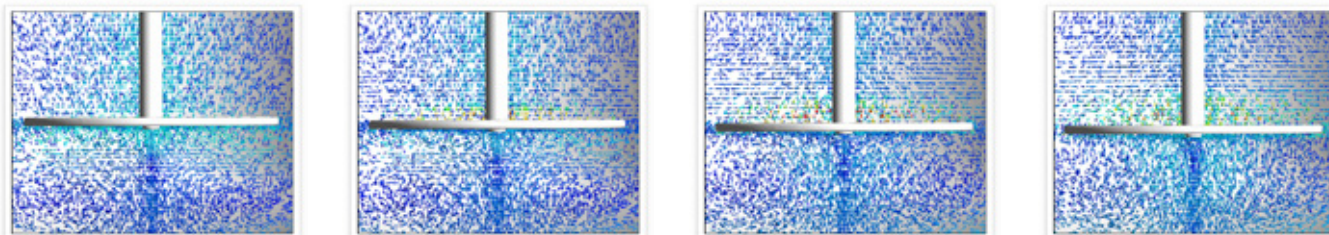
Analysis Summary for the Saltus® M200 Mixing System

Meissner Filtration Products completed a thorough Computational Fluid Dynamics (CFD) study on the Saltus® M200 Single-Use Mixing System. The report data gathered - over 40 pages of information - demonstrates the Saltus® mixer's low shear, highly effective mixing capabilities.

Meissner's CFD analysis was performed on the Saltus® M200 mixing system to evaluate single and dual disc agitator configurations, fluid fill volumes ranging from 50 L to 200 L, and multiple agitation frequencies spanning the range of typical operation. The full report can be requested through Meissner for review.

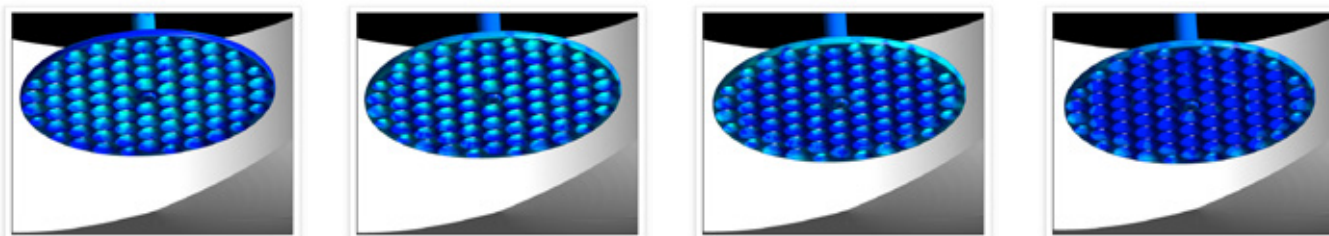
Velocity Vector

To evaluate fluid flow, models were generated to develop velocity vector diagrams that display both direction and magnitude of fluid velocities. Shown here are velocity vector diagrams of 12 Hz operation at various positions throughout the agitator stroke. As the colored arrows shift from one side of the agitator to the other, this indicates a change of agitator direction. Brighter colored arrows represent higher fluid velocity.



Shear

Models were created and interrogated to determine shear stress imparted on the fluid near the agitator surface. The images below depict a downward stroke of the mixing agitator being operated at 6 Hz. Brighter colors represent areas of higher shear. It's important to note that shear levels are minimal even when the agitator is at the middle of its stroke, when shear stress and agitator velocities are at the maximum.



Homogenization

Homogenization performance was analyzed using mass fraction method homogenization scenarios which show real time mixing characteristics of the Saltus® M200 mixer. The sequence of images below shows how 200 L of fluid (100 L of red fluid A and 100 L of blue fluid B), are mixed using a single-disc agitator being operated at a frequency of 12 Hz and combine to form a fully homogenized green mixture. These scenarios were performed for an array of agitator speeds, fluid fill volumes and agitator types.

