Evaluation of New Batch Mixing Tank Design

Fillworth approached Wilde Analysis to evaluate a new batch mixing tank design in order to establish the levels of mixing efficiency and to determine the input power requirement and pressure loading on the vessel structure.

Company

Fillworth (UK) Ltd is a medium-sized, privately-owned specialist manufacturer of industrial mixing equipment.

The range of equipment covers a huge spectrum of liquid mixing applications – from heavy-filled mastics to cold-set inks and paints. Typical other applications are adhesives, sealants, bitumens, and general dispersion products, such as plastisols and varnishes.

Challenge

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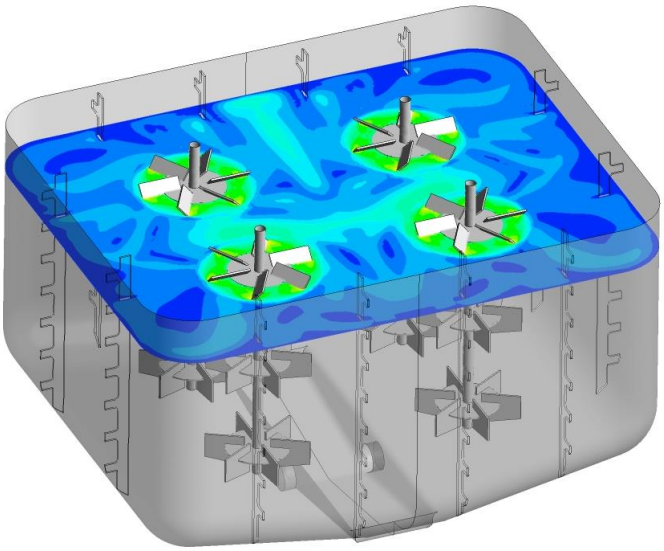

Fig. 2: CFD model showing internal tank flow patterns and levels of fluid loading (Courtesy: Fillworth)

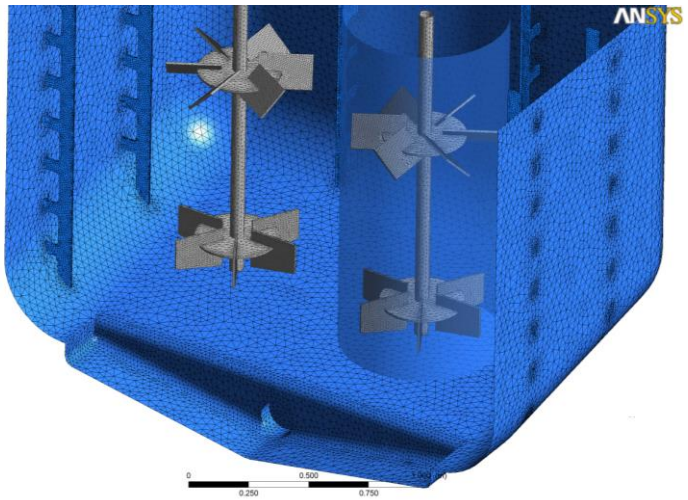

Fig. 1: CFX model of rotating agitators. (Courtesy: Fillworth)

Solution

The supplied CAD model was de-featured and meshed within **ANSYS Workbench v12.0**, and a computational model quickly set up in **ANSYS CFX** using a multiple frame of reference approach to model the rotating agitators (Fig. 1).

The CFD model provided a detailed picture of the internal tank flow patterns and levels of fluid loading (Fig. 2), as well as providing details on the expected power draw.

The initial analysis helped to identify potential improvements, and Wilde CFD subsequently worked with Fillworth in guiding design modifications through further simulation work, with the resulting design delivering improved performance.

Business Benefits

- Tangible design improvements through simulation.
- Confidence in design.