

Admixtus

Accelerating mixing simulation processes

Benefits

- Enable users with no experience to perform CFD analysis
- Quickly create geometry
- Accurately set up detailed physics
- Support parametric design
- Streamline postprocessing

Features

- Built-in design parameters
- Extensive multiphase flow modeling options
- Simple plug-in installation
- Complete flexibility with STAR-CCM+ file access

Summary

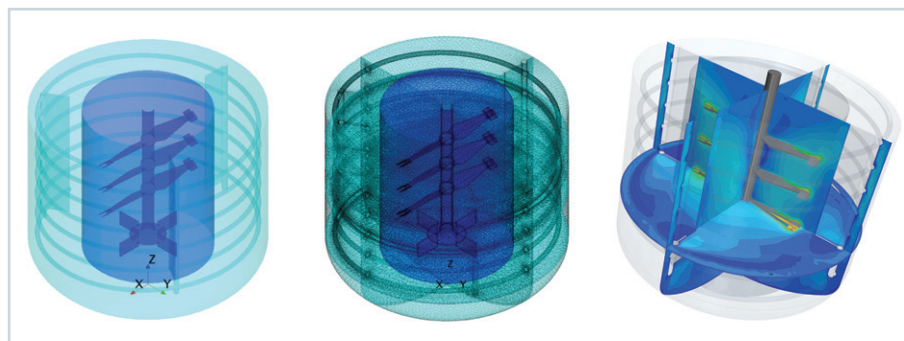
Companies in industrial process engineering – particularly in the chemical, pharmaceutical and food industries – face challenges with multiphase-flow analysis, especially when the suspension of solids, flow of slurries or highly viscous/viscoelastic materials are involved. Companies have traditionally used computational fluid dynamics (CFD) simulation to support many mixing challenges that cannot be solved by standard analytical or experimental methods. However, performing

simulation mixing can require a significant amount of time to create geometry, generate a suitable mesh and define detailed physics.

Admixtus is a virtual product development mixing-simulation tool that seamlessly works with STAR-CCM+® software from Siemens PLM Software. The tool helps you easily create geometries, generate CFD simulations and carry out analysis of stirred vessels by efficiently automating the entire workflow.

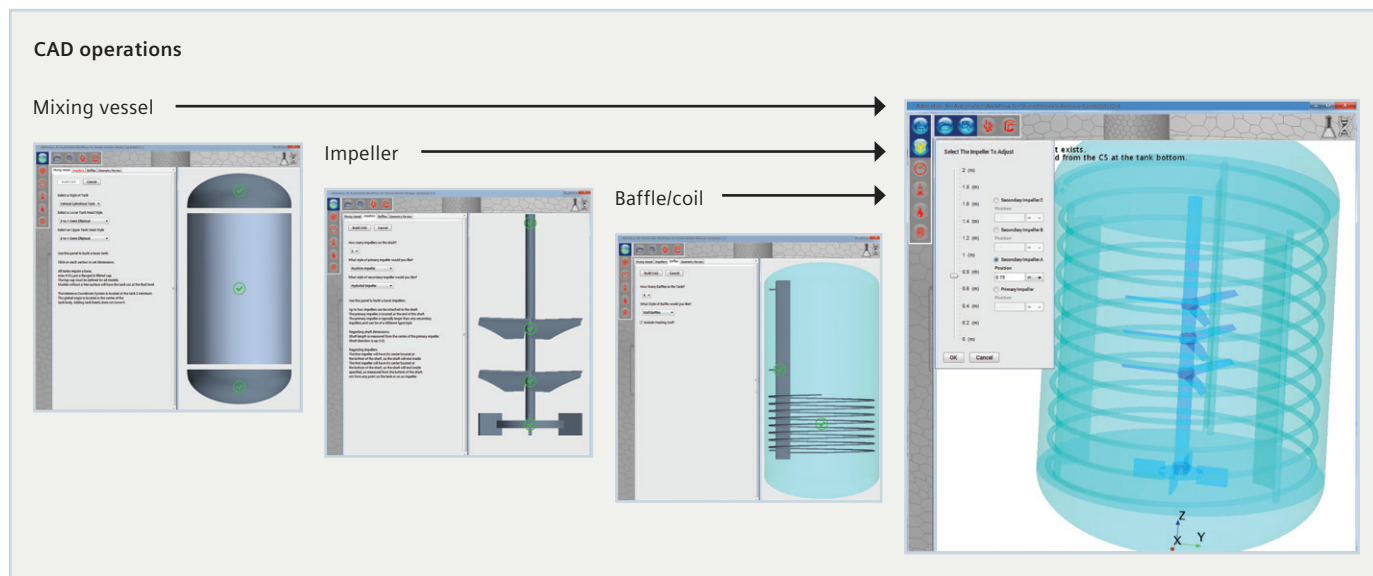
Installation

Admixtus is delivered as a NetBeans (.nbm) file installed in STAR-CCM+ via the plug-in manager, making installation straightforward. The Admixtus interface then guides you through each stage of your workflow: from computer-aided design (CAD) operations through postprocessing.



Going from CAD geometry to analysis in easy, guided steps.

Accelerating mixing simulation processes



Choose from a library of predefined features to rapidly build your CAD geometry.

CAD operations

Admixtus contains a library of standard mixer features, including mixing vessels, impellers, baffles and coils. The interface guides you through the basic steps to define the geometry, giving you control over the components and their dimensions. You can also import your own CAD file if required.

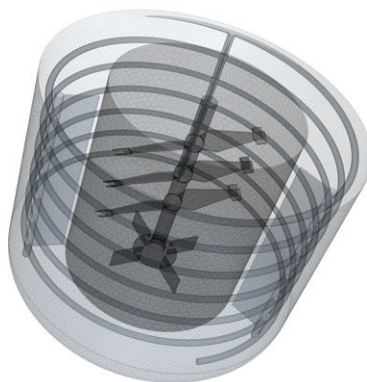
Mesh settings

Using Admixtus enables you to automatically generate a detailed, highly-efficient mesh suitable for mixing simulations. You can choose either polyhedral or trimmed meshes. The meshing setup consists of three steps:

- Choose the mesh type
- Change the base size using the slide bar
- Change the mesh density using the slide bar

Material and analysis setting

By using Admixtus, powered by the robust solver in STAR-CCM+, you can model multiphase flows using an extensive range of submodels, including: drag, virtual mass, lift and

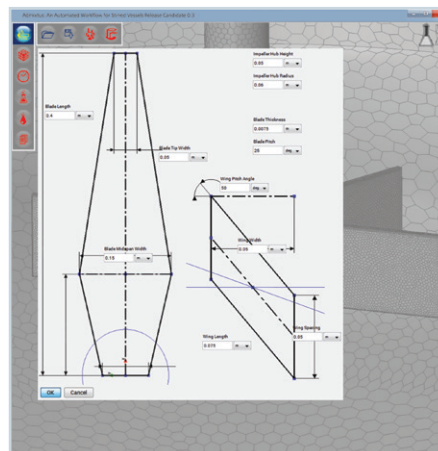


Example of a mesh.

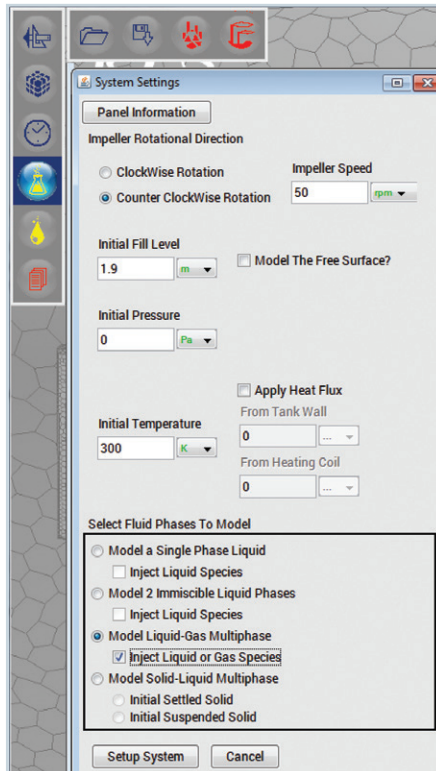
turbulent-drag forces, break-up and coalescence models for bubbles, and a granular-flow model. By using these models you can:

- Perform gas-liquid and solid-liquid simulations
- Establish mixing time calculations using tracer studies
- Perform Reynolds Number (Re), torque and power-based calculations
- Study mixing vortex depth and free surface distribution

- Calculate mixing intensity index based on simulation
- Investigate gas holdup distribution in gas-sparged vessels
- Study effects of revolutions per minute (RPM) on solid suspension
- Output results to Excel® spreadsheet software for data sharing
- Perform parametric studies (Optimate and/or Optimate+ plug-in required)



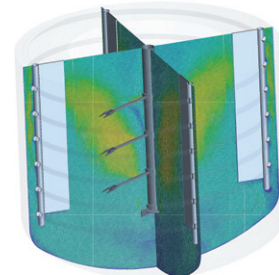
Automatic generation of design parameters in STAR-CCM+ for use with Optimate+.



Example of model setup in Admixtus.

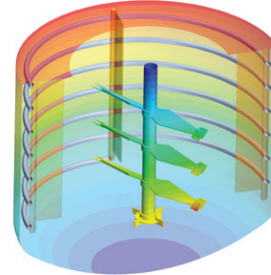
Fluid setting

The Admixtus interface guides you through the setup for the fluid and solid phases, using a database of standard materials. This information is automatically transferred to STAR-CCM+.



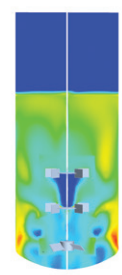
Flow field

Pumping and circulation time
Bulk velocity
Stagnation regions
Mixing time
Mixing intensity



Pressure field

Impeller torque and power draw
Other forces such as baffles



Additional physics/chemistry

Residence time distribution
Temperature field
Shear and forces
Mixing intensity

Default scenes show different flow parameters.

Basic analysis

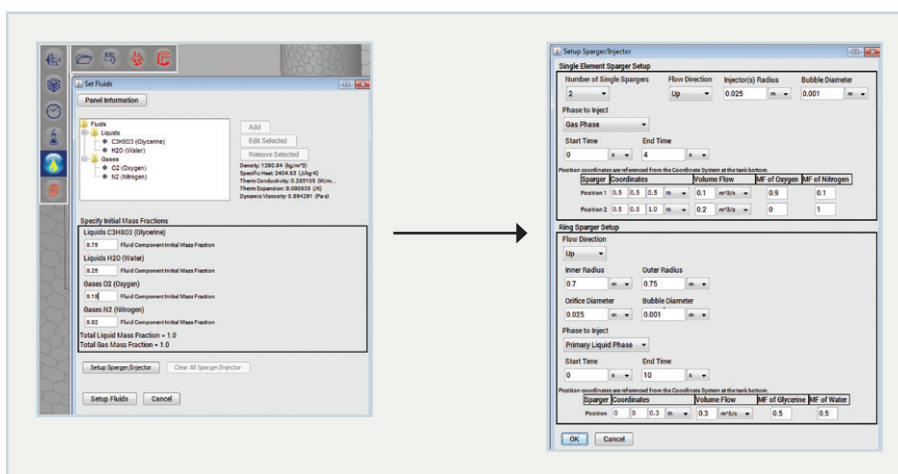
Using Admixtus enables you to calculate key analysis values using industry-standard correlations to provide a quick 1D results estimate prior to submitting the 3D analysis for simulation. These preliminary calculations can be used to verify user inputs prior to running the simulation.

Postprocessing

Admixtus comes with a built-in selection of commonly-used reports, plots and scenes for the analysis of stirred vessels.

Advantages

By using Admixtus you can be quickly and interactively guided through the mixing simulation workflow, from setup to solution, including postprocessing. You can use Admixtus even if you have no CFD experience. Using Admixtus can help you facilitate significant productivity gains through workflow automation, allowing you to explore design alternatives earlier in the product development cycle.



Define your fluid and solid phases, then include sparger/injection points.

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