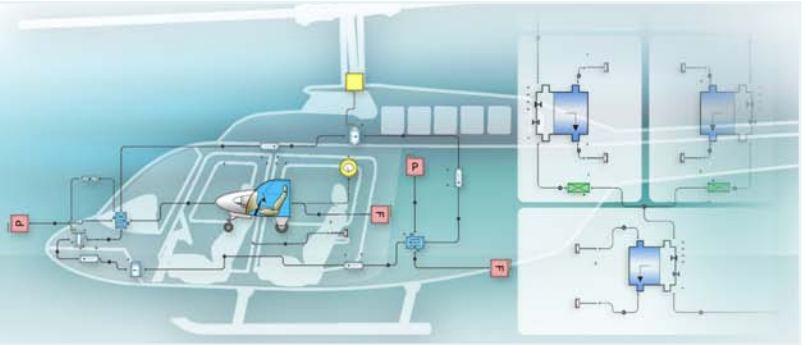


What's New in V7.7 Aerospace



Functionality Overview

New Features

- **New Multi-Arm Tank component** for advanced fuel tank modelling
- **New Cabin component** to simplify the modelling of small aircraft cockpits and cabins
- **New Multi-Fluid Simulation framework** for the miscible liquid-liquid, gas-gas mixing and separation
- **New Altitude Pump component** for measuring changes in performance at changing altitudes
- **Enhanced Turbine component** with new surface map options
- **New Geometric Heat Exchanger Technology** for simulation of air cycle machines and vapour cycle systems
- **Streamlined Catalogue Configuration** to improve workflow

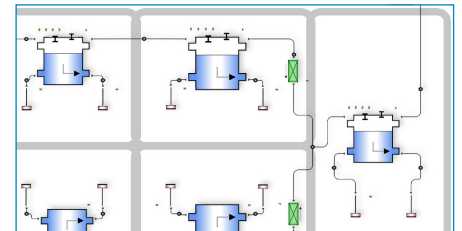
What's New in Flowmaster V7.7 Aerospace

Flowmaster V7.7 Aerospace builds on the existing V7 Aerospace product by streamlining catalogue structures, providing new and enhanced components and expanding simulation functionality to meet the needs of today's aerospace engineers.

Fuel System Tools

Multi-Arm Tank

Modelling the movement of fuel through multi-cell fuel tanks and around the system can be a complex task, creating significant challenges for aerospace engineers, including the correct delivery of fuel to the pump and ensuring that the system conforms to FAA rules on inerting and venting. Flowmaster V7.7 Aerospace includes a **Multi-Arm Tank component** that has been specifically designed to



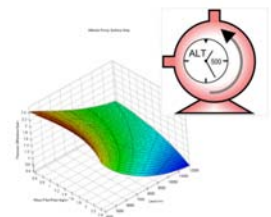
allow engineers to simulate the movement of fuel from one cell to another while also enabling engineers to control the gas mixing within the ullage space of the emptying tank.

Multi-Fluid Simulation

It is critical for fuel systems engineers to be able to simulate and validate performance of both inerting systems that feed the fuel systems with Nitrogen Enriched Air (NEA) and the distribution levels of NEA within the tank ullage in order to reduce fuel flammability to below limits set by FAA regulations. Flowmaster V7.7 Aerospace has a unique **Multi-Fluid Simulation framework** of components and functionality which now gives engineers the ability to model the mixing and modification of multiple liquids or gases.

Altitude pump

It is important for engineers to understand the effect changes in altitude will have on system performance. The new **Altitude pump component** simulates the change in pump performance due to change in altitude. It allows engineers to easily account for the lower suction head pressure available at altitude, compared to sea level.



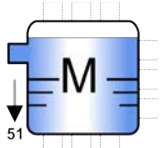
ECS Tools

Cabin Component

The challenges of modelling environmental control systems within smaller aircraft cabins and cockpits differ greatly from those faced by engineers designing systems on board large commercial airliners. Engineers have to understand and factor in a variety of extra internal and external variables that can have a large impact on system parameters.



New Components



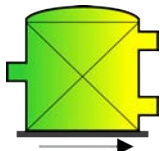
Multi-Arm Tank



Cabin Component



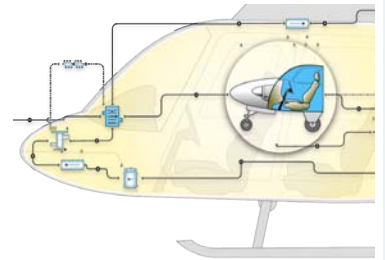
Altitude Pump



Fluid Modifier

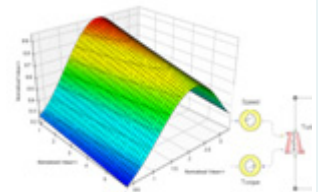
The new Cabin Component within V7.7 Aerospace is designed to enable engineers to simulate cabins of small aircraft, with the ability to predict variables such as the mean temperature of the cabin air space and temperatures of the fuselage, instrument panel and windscreen during and following a transient simulation. The Cabin Component's capability covers:

- Full aircraft definition by modelling glazing, interior trim and passengers
- Radiation, Conduction and Convection Heat Transfer Modelling
- Simulation of Airflow occurring inside and outside of the aircraft, including recirculation within the cabin and airflow travelling over the aircraft
- Mean cabin temperature, relative humidity & specific humidity
- Mean cabin Passenger Comfort model for thermal comfort prediction within the cabin



Turbine Component Enhancement

The current turbine component has been refined further to meet the needs of the aerospace engineer by adding new surface map options specifically tailored to aircraft applications. These include a surface map of Flow Function vs. Pressure Ratio & Corrected Speed and Isentropic Efficiency vs. Velocity Factor & Pressure Ratio.



Geometric Heat Exchanger Technology

For those aerospace engineers who are involved with the simulation of air cycle machines and vapour cycle systems, V7.7 Aerospace now includes a geometric heat exchanger module that allows engineers to model any fluid over heat exchangers.

General Aerospace Systems Enhancements

Streamlined Catalogue Configuration

To improve workflow Flowmaster V7.7 Aerospace has a streamlined catalogue structure to reduce the number of folders that must be navigated to get to each component, making model creation much quicker.

Other enhancements to Flowmaster V7.7

Resizing of components

Flowmaster V7.7 now allows users to resize components in the working model appropriately according to the context of use. This ability is vital for allowing users to connect up multi-arm components such as the new multi-arm tank component.

Enhanced dynamic colourization

Engineers now have enhanced visualization tools for animating system behaviour when running a simulation. The enhancements provide:

- Quicker setup times,
- New 'auto colour' creation for range bands (pressure, flowrate etc)
- Faster repeat times for running multiple simulations
- New pause/time reset/restart ability for animations
- Dynamic value labels for nodes

