

MOSEN

Capability in Computational Fluid Dynamics (CFD)

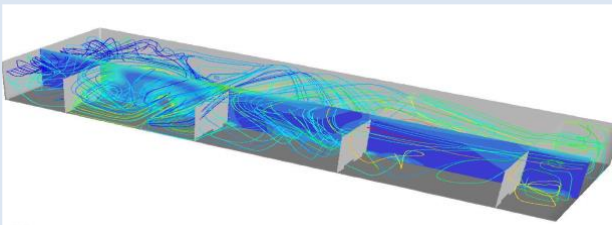
Introduction

Computational Fluid Dynamics (CFD) is a powerful numerical modelling technique used to simulate the flow of a gas or liquid through a physical geometry. The technique is highly versatile and can be used to study a wide variety of complex fluid flow phenomena, such as the spread of fire and smoke through a building, the wind loadings on a structure or the flow of air through a tunnel. CFD can also be used to study processes such as mixing systems and chemical reactions, including combustion.

Typically, CFD may be used in conjunction with other methods for the following tasks:

- Verification and optimisation of design performance
- Investigations following accidents
- Development of understanding of particular flow processes

Flow pathlines in a water treatment works aeration tank:



Mosen's experience in CFD

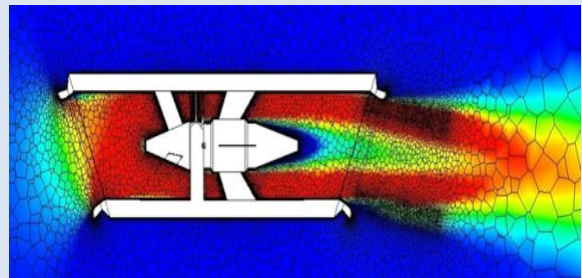
- Tunnel ventilation
- Fire and smoke movement
- Building heating, ventilation and cooling
- Process plant performance
- Multiphase flows
- Free-surface flows
- Turbomachinery
- Dispersion in air and water
- Wave loading
- Floating structures in waves
- Vortex induced vibration in currents
- Heat transfer
- Explosions

CFD codes

Mosen has access to a variety of CFD codes, including OpenFoam, FDS, CFX and Fluent. Through these codes, we can model a wide range of flow physics, including chemical reaction and combustion; heat transfer; turbulence; and multi-phase physics. Using our powerful mesh generators, complex geometries can be created or imported from CAD data.

In order to model complex flow physics, Mosen's staff members have developed their own subroutines that can be interfaced to the standard CFD codes, thus providing unique capabilities.

Simulation of MoJet® flow turning within a tunnel:



Our MoJet® technology is underpinned through extensive 3D Computational Fluid Dynamics (CFD) simulations, which are capable of predicting the thrust to within 1% of the measured value. MoJet Ventilation relies on ANSYS CFD and decades of experience to achieve exceptional confidence in our calculated results, typically using up to 100 million cells for a full tunnel simulation.

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