

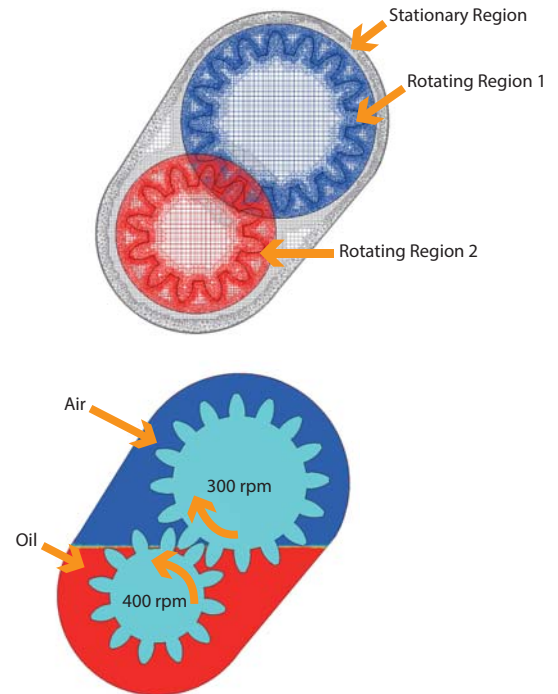
Simulation of Gear Box Using Overset Mesh

SC/Tetra's unique capability, overset mesh, is used to analyze the lubrication behavior of oil in a gear box

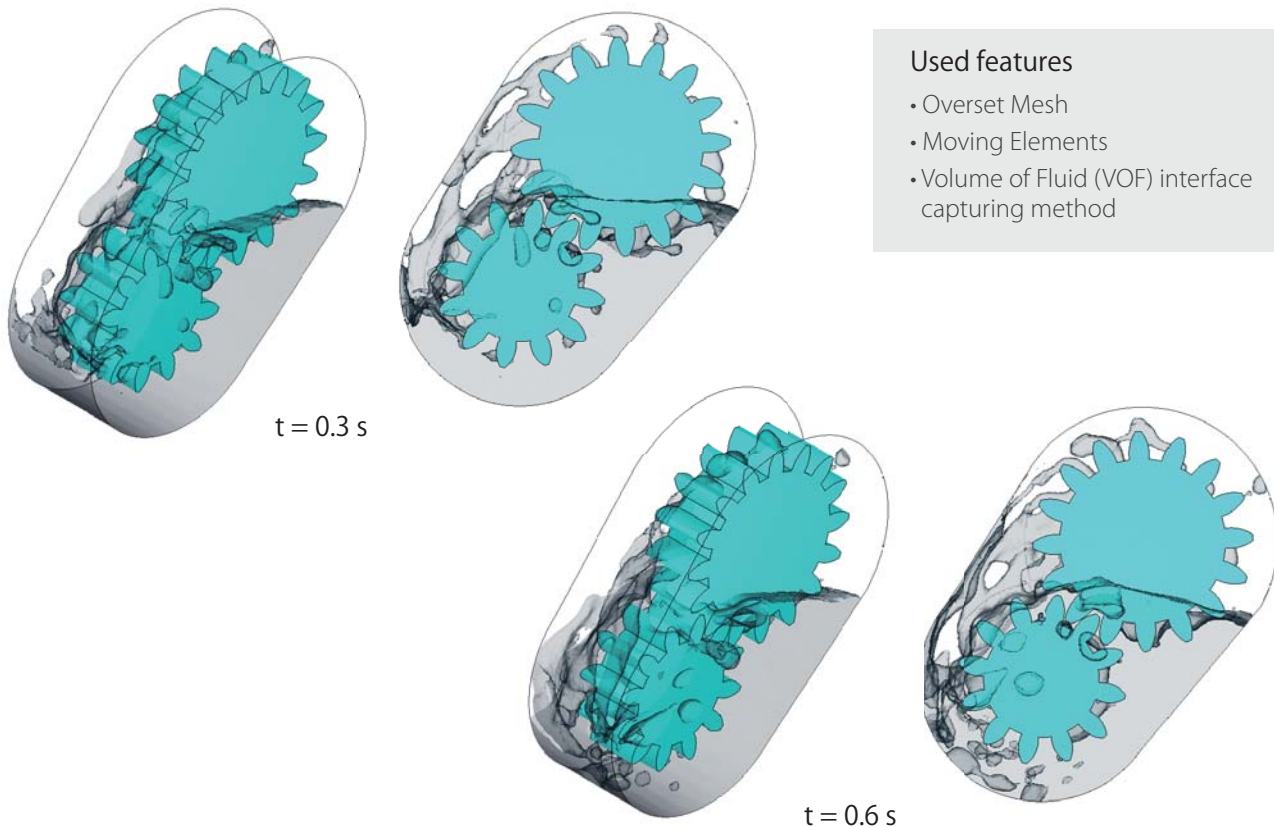
Overview

Gears are used in a number of mechanical devices mainly to transfer motion/power from a rotating power source. These gears transfer torque continuously and most are encased in a closed case that is partially filled with lubricating oil. The rotation of the gears not only transfers the power, but also redistributes the lubricating oil within the case. Having too little oil could result in insufficient lubrication, while excessive lubrication results in excessive heat due to churning loss. It is necessary to be able to predict the behavior of the oil to decide if the lubrication is sufficient or not. Identifying the best location for the ventilation valve is another design parameter an engineer needs to decide by assessing the behavior of oil splash.

Computational Fluid Dynamics (CFD) has been intensively used in various automotive applications. However, handling contact motion, like gears coming together, has been challenging for most CFD software. SC/Tetra is equipped with Overset method, a capability that enables engineers to easily simulate challenging applications involving motion. SC/Tetra can be used to simulate and visualize different types of oil under different operating conditions. This enables the engineer to cost-effectively decide the design variables (such as optimized oil level and the location of a ventilation valve) leading to a better design in a shorter period of development time.



Simulation Results



Used features

- Overset Mesh
- Moving Elements
- Volume of Fluid (VOF) interface capturing method