Development of general purpose simulation tools for positive displacement compressors
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Project Description

• Development of a comprehensive compressor simulation platform to predict the performance of hermetic positive displacement machines.

• Applied to both crank-motion driven positive displacement machines as well as dynamic linear compressors with variable stroke

Approach

• The general structure of a compressor or expander simulation model in the platform. Different modules have been added to the entire structure, which is based on the complexity according to the machine type.

Discussion

The software platform considers the main aspects of compressor modeling:

• Geometry
• Thermodynamic governing equations
• Leakage paths
• Valve dynamics
• Internal heat transfer
• Friction and mechanical losses
• Electric motor losses

Results

1. Dynamic piston displacement variation
2. Compressor dynamic performance prediction
3. Simulation Platform graphical user interface

Predict the performance of positive displacement machines