SUPERCRITICAL CO2

Bringing nuclear quality and standards to system simulation.





Flownex[®] SE simultaneously solves mass, momentum and energy in conjunction with two-phase fluid properties for system models. This makes it ideal for modeling super critical CO2 cycles.

TYPICAL USES

ANALYSIS

- Performance assessment
- Modification assessment
- Root cause failure analysis

DESIGN

- System sizing
- Component sizing
- Determining operating ranges
- Calculate flow, temperature, pressure, power consumption, etc. at different operating conditions
- Evaluate different control philosophies

OPTIMIZATION

- Heat exchanger length optimization
- Efficiency optimization at different design points

SOFTWARE CAPABILITIES & FEATURES

- Comprehensive component library
- Powerful and intuitive user interface
- Well defined two-phase CO2 fluid properties
- Detailed fluid dynamic models (choking, real gas behavior, etc.)
- Incremental heat transfer with framework for custom correlations
- Full transient capabilities, including:
 - · Stable implicit flow solver
 - Adaptive time-step functionality
 - Thermal and rotational inertia
 - Analogue and digital control library
- Built in design and analysis features allowing automated parametric studies

Flownex[®] is developed within an ISO 9001:2015 quality management system that is ASME NQA-1 compliant.



SOME OF OUR CLIENTS



www.padtinc.com/flownex productinfo@padtinc.com

Find us on:





sCO2



DESIGN sCO2 CYCLE

- Evaluate different sCO2 cycle configurations
- Optimize cycle efficiency with changes in cycle parameters
- Develop detailed component specifications

INTEGRATE BALANCE OF PLANT

- Lubrication systems
- Cooling water systems
- Turbine cooling systems
- Safety auxiliary systems

GAS TECHNOLOGY

DESIGN CONTROL SYSTEM

- Build a virtual DCS using the extensive control
- component library
- Integrate the control system with the fluid system model in the same software environment
- Determine the optimal transducer locations for fast and stable control of the plant
- Tune PID controllers in a virtual plant environment and save time during commissioning of the plant



GTI utilizes Flownex[®] to simulate and optimize the transient operation of their \$119M, 10 MWe, sCO2 pilot plant's main process loop. Allowing them to better understand the transient operational ranges of their components and evaluate control philosophies.





TESTIMONIA

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INSTITUTEFlownex® has been great to use! It has a very friendly user interfaceMegan Herreraand quick to learn for simple modeling tasks. For moreSenior Engineeradvanced modeling tasks, the support team has been great.