

# PNEUMATIC SYSTEMS LIBRARY

Model, design and test Pneumatic Circuits

## SIMPLIFY YOUR DESIGN PROCESSES BY EASILY COMPOSING PNEUMATIC SYSTEMS WITH OTHER DISCIPLINES AND BRINGING A COMMON UNDERSTANDING OF THE SYSTEM BEHAVIOR

The PSL is a library enabling the architecture design, component sizing, modelling and simulation of pneumatic systems. It includes the key components needed to model the use of gas under pressure to generate, distribute and modulate pneumatic power with the finality to transform it into (usually) mechanical power.

### APPLICATION

The models of the Pneumatic Systems Library can be used for the design of pneumatic circuits including the behavior across the disciplines. E.g. the influence of a mechanical translation on the system model induced by a pneumatic system. Among others, it applies to the following systems:

- Pneumatic actuators, motors
- Air cooling
- Brakes or suspensions (train, bus)
- Drills, hammers (industrial systems)
- Bleed air system (aerospace)

### BENEFITS

- Accelerate development convergence by enabling fast simulations within a complex multi-physics system
- Minimize costs through reduced need for physical prototype testing
- Simplification in design processes by easily composing pneumatic systems with other disciplines and bringing a common understanding of the system behavior
- Assess and validate control laws, as well as component dimensioning for pneumatic systems from conceptual design to validation phases

## LIBRARY CONTENT

Different types of Sources define the origin of pneumatic power. Depending on the intended modeling depth, a simple PressureSource can be used or the user can model a complex compression system utilizing the VaneCompressor model, for example.

Valves are used to control the fluid flow direction or imply a logic on the pneumatic system.

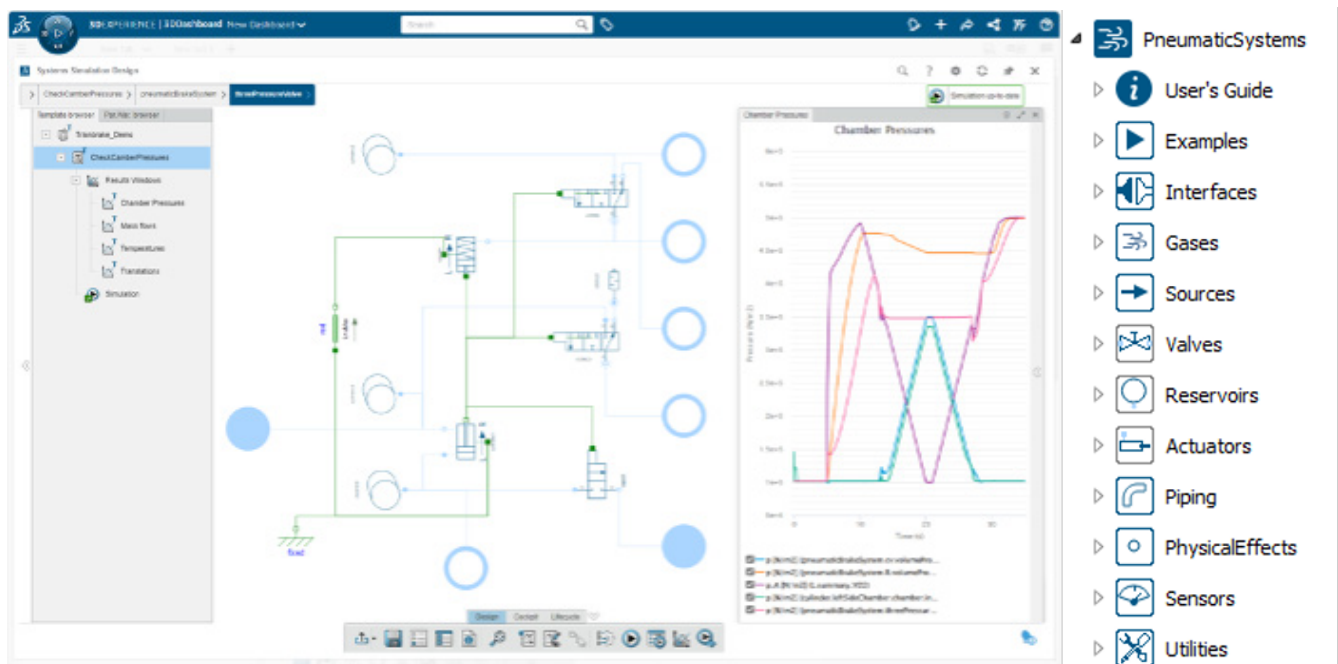
Actuators transform pneumatic power into translational or rotational power. The most common example is a pneumatic Cylinder.

Reservoirs provide the possibility to store pneumatic power and/or apply heat transfer. Piping and Resistance enable modeling the fluid transportation dynamics and losses.

All complex applications are modeled around Physical Effects like an orifice or a capacitance.

## HIGHLIGHTS

- Provide gas models and interface with Modelica Standard Library media
- Comprehensive list of animated components including valves, reservoirs, actuators, piping, sensors and pneumatic sources, using the ISO1219 standardized icons
- Thermal management is available on components
- System and component design in the same applications, with the usage of other libraries
- Modeling level can be adapted to achieve more accuracy or speed the simulation



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