

CATIA SYSTEMS HYDROGEN LIBRARY

Develop hydrogen systems and dimension components, dedicated to propulsion, generation and storage of hydrogen



MODELING AND SIMULATION OF HYDROGEN SYSTEMS

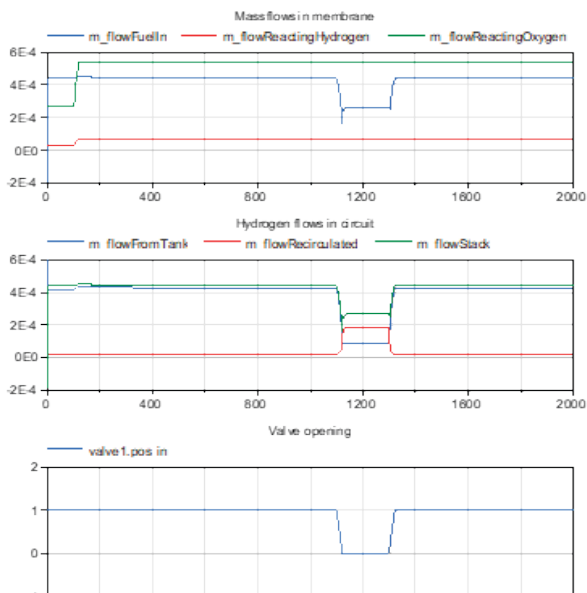
The Modelica based Systems Hydrogen Library supports the development of hydrogen systems, from production with electrolysis or reformation to storage up to fuel cell stacks. The ease of component parameterization as well as the use of standard connectors helps to build up circuit models fast and fully compatible to the Modelica Standard Library.

APPLICATION

The library has been designed to support the integration of fuel cells in drive trains completing the Battery and the Electrified Powertrain libraries for mobile and stationary applications. In addition it provides the key components for hydrogen production and storage to study complete hydrogen based energy systems. The library includes different types of media models: liquid hydrogen, real gas and moist air with variable constitution.

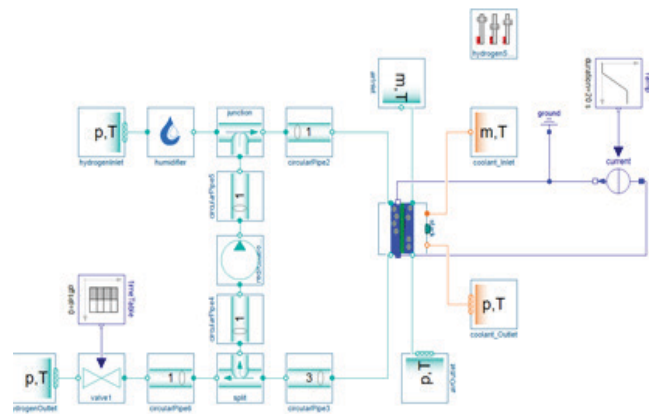
BENEFITS

- Significantly reduced costs through the efficient modeling and simulation of hydrogen systems.
- Quickly size hydrogen components to assess sub-systems lifetime and performances.
- Reduce membrane aging by ensuring sufficient air or hydrogen flow at abrupt load changes.
- Easy to implement with compatible connectors and simple component parameterization for fuel cells
- Generic volume and pressure loss models for easy addition of user specific components



HIGHLIGHTS

- Delivers a large set of components: boundary conditions, pumps, pipes, valves, reservoirs, heat exchangers, fuel cell stacks, methane reformation, electrolyzers, humidifiers, membrane models.
- Covers liquid and gaseous media with thermal dynamics properties for high and low pressures
- Supports 1D temperature analysis along the flow channel in the stacks
- Full compatibility to Battery and Electrified Powertrain library for hybrid energy systems



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