



PIPING HYDRAULIC
& THERMAL ANALYSIS

ADVANTAGES

- ✓ Fast start for new employees
- ✓ Extensive analysis capabilities
- ✓ Integration with popular CAD tools
- ✓ Calculation engine for all necessary fluid properties and phase equilibria
- ✓ Flexible licensing
- ✓ Affordable price

FEATURES

- ✓ Real liquid, gas, multiphase and liquid-solid mixtures flow in complex pipelines
- ✓ Steady-state and transient flow (water hammer) with unbalanced forces calculation
- ✓ Flow assurance analysis (severe slugging and gas hydrate prediction)
- ✓ Easy to use on any design stage

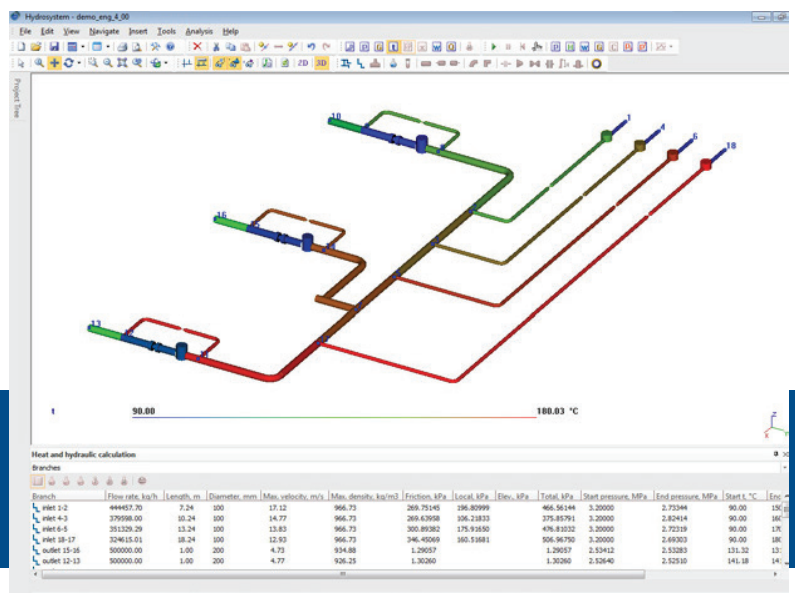
PASS/HYDROSYSTEM provides diameter selection, heat and hydraulic analysis of steady state flow in piping systems of any complexity, including networks with loops. It also covers the most dangerous type of transitional flow related to liquid surge (water hammer).

First introduced in 1977 and blessed by piping hydraulic worldknown guru Idelchik, PASS/HYDROSYSTEM has since then evolved into one of the most powerful piping flow analysis tools.

Process and piping engineers of more than 600 companies now use the software every day.

EMBEDDED INTELLIGENCE

PASS/HYDROSYSTEM combines sophisticated calculation capabilities with ease-of-use to deliver fluid flow and heat transfer simulation and sizing of any piping network for any design stage by even entry-level engineers and designers.



www.enginsoft.com/solutions/truboprovod.html

BROAD APPLICABILITY

PASS/HYDROSYSTEM is widely used for calculation of:

- Process piping systems at plants, storage facilities, pumping and compressor stations
- Plant utility piping systems such as steam, water, compressed air, inert gases, fuel, refrigerants and others
- Piping in mechanical industries such as aerospace, ship building, boiler, turbines and more
- Oil and gas upstream and midstream pipelines • Outdoor piping networks including district heating, water and gas distribution
- Other piping networks

PASS/HYDROSYSTEM provides flow assurance calculations, including severe slugging prediction and gas hydrate formation prediction.

PASS/HYDROSYSTEM simulates most complex types of multiphase flow, including gas-liquid flow and slurry flow.

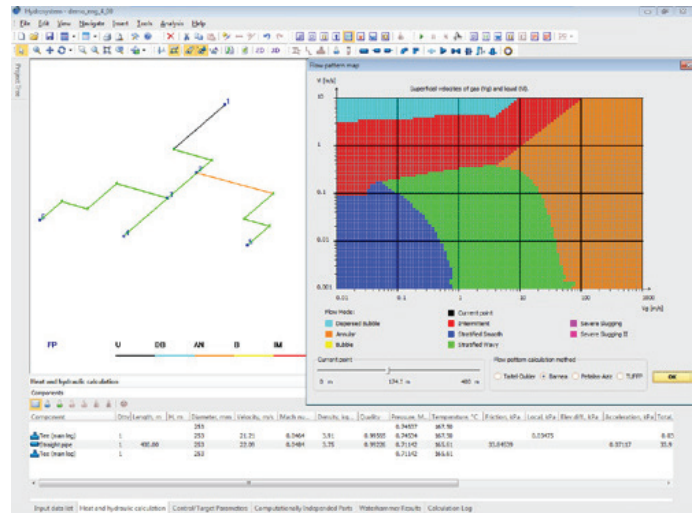
PASS/HYDROSYSTEM provides flow rate calculation and sizing based on the most effective numerical algorithms for network analysis and optimization making it effective for analysis of large scale complex piping networks.

INCREASED PRODUCTIVITY

An easy to use GUI and multi-variant representation of the model with customizable level of detailing and type of graphics (process diagrams, one-line, 3D representation) allows effective use of PASS/HYDROSYSTEM on different design phases, from feasibility study to detailed design. Results representation on the pipeline model and automated customizable report generation help the user to understand piping behavior.

INTEGRATION CAPABILITIES

PASS/HYDROSYSTEM can import piping models ready for analysis from AVEVA PDMS and E3D, PASS/START-PROF and PCF formats, as well as export piping model to PASS/START-PROF. It can also calculate and export unbalanced forces from water hammer to PASS/START-PROF, CAESAR II and other piping stress analysis software.



WIDE RANGE OF LIBRARIES

Thermodynamics libraries used include the advanced proprietary library for refining and petrochemical industry; the library on the base of the International Association of the Properties of Water and Steam formulation; the most accurate modern GERG-2008 library for natural gas; access to the Simulis Thermodynamics calculation server by ProSim SA (for chemical, biochemical and other industries) and PVTsim Hydrate Open Structure Library by Calsep.

PASS/HYDROSYSTEM uses the most advanced models/algorithms and libraries for all level of simulation (both proprietary and from famous researchers/developers from all over the world). This includes minor losses correlations by Idelchik, Miller, and Ito; multiphase flow models by Chisholm, Lockhart-Martinelli, Friedel, Taitel, Barnea and Tulsa University Fluid Flow Project research group; DHLLDV slurry flow model by Delft University of Technology; Todini Global Gradient Algorithm for network solver; Powell derivative-free method for optimization and many others.

FLEXIBLE CONFIGURATIONS

PASS/HYDROSYSTEM Complete provides comprehensive hydraulic and thermal analysis and related sizing calculations for piping systems of any complexity.

PASS/HYDROSYSTEM Pressure&Heat provides hydraulic and thermal simulation and sizing of any piping network for single phase steady state flow.

PASS/HYDROSYSTEM Pressure provides simulation and sizing of any piping network for pressure effects related to single phase steady state flow conditions.