



AFT Mercury 5.5

Intelligent Sizing for Incompressible Flow Piping & Ducting Systems

Achieving cost effective designs for your piping and ducting systems requires an intelligent, systems approach. Human intelligence is powerful yet limited. The myriad design tradeoffs in modern piping systems quickly outstrips the human mind's ability to grasp all possibilities. Crucial opportunities to reduce cost fall through the cracks of your demanding schedule. Now these opportunities can be clearly identified with *AFT Mercury™*, using IntelliFlow® technology. This new technology intelligently sizes piping and ducting systems resulting in significant savings. With comprehensive system modeling capabilities, a flexible graphical interface and an advanced optimisation engine, *AFT Mercury* offers a quantum leap improvement to the traditional pipe and duct design process.



Cost Reduction Through Intelligent System Sizing

What is intelligent system sizing? Traditional engineering methods are limited in their ability to select pipes, ducts and equipment sizes on a system basis. Even simple systems will have billions of potential size combinations to consider for their various components, far too many to evaluate by traditional methods. In contrast, intelligent system sizing selects all components simultaneously as a unit to identify the lowest cost design. This is the essence of IntelliFlow® technology.

With *AFT Mercury*, you specify the design requirements and sizing criteria, which may be to minimize initial or life cycle cost, or parameters such as pipe weight, volume or surface area. *AFT Mercury* then performs a comprehensive analysis of the complex interaction among the various components to intelligently determine their optimal sizes. Extensive database support allows you to easily add your data for fluids, materials, components and cost. Cost data is also available from the optional MeansData™ module with data from RS Means Co. or costs can be generated by linking your model to Aspen Icarus Kbase™.

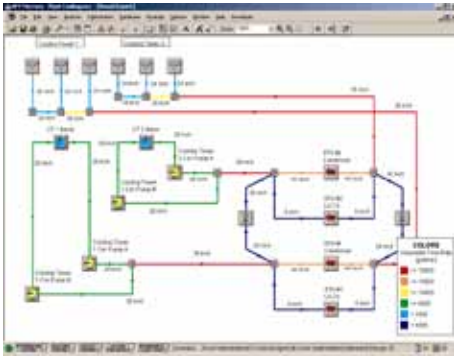
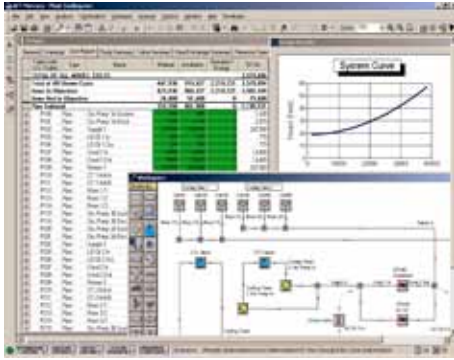
The savings in materials, installation, energy and other costs associated with your piping or ducting system can be dramatic. Traditional methods of system sizing simply can't compare. No matter how good your design methods are, *AFT Mercury* is guaranteed to reduce cost.

Leading Edge Pipe Flow Modeling Technology

Built on the advanced flow analysis and system modeling capabilities of *AFT Fathom™*, *AFT Mercury* can simulate your piping system in complete detail. Employing a robust solver to solve the governing equations of pipe flow, *AFT Mercury* addresses open and closed loop systems, pump and control valve modeling, heat transfer in pipes and heat exchangers and much more. Multiple system configurations are easily managed within a single model using Scenario Manager, with changes in the base model automatically inherited by alternate design cases. In addition to the built-in library of fluids, fittings and valves, the optional Chempak™ add-on, a thermo-physical database of almost 700 fluids, is available to further expand the envelope of your analysis and design.

What is IntelliFlow® and how does it work?

IntelliFlow combines powerful network pipe flow analysis algorithms with state-of-the-art numerical optimization algorithms to intelligently evaluate the complex interaction of system design variables. The system design is repeatedly perturbed and re-analyzed to define the shape of the design space, revealing combinations of design parameters that minimize cost. Design constraints specified by the engineer direct the search in areas that satisfy design requirements such as pressure, velocity and NPSH. Searching continues until an optimum design is found, which is then presented to the user.



Other software in the range includes:

AFT Arrow - Pipe and duct flow modelling for compressible fluids

AFT Fathom - Pipe and duct flow modelling for incompressible fluids

AFT Impulse - Waterhammer modelling

AFT Titan - Cost reduction through intelligent system sizing for compressible fluid systems

AFT Chempak Suite - Thermo-physical fluid properties

Advanced Graphical Interface

The power of *AFT Mercury's* intelligent system sizing capabilities is readily accessible through an advanced drag-and-drop interface tightly integrating equipment characteristics, analysis and output with your system's schematic representation.

New in Version 5.5

- View input and output data for multiple scenarios simultaneously
- Automatically adjust pump reference curve for varying impeller diameters
- Heat transfer between multiple loops
- Three-way valves
- Modify selected input via Excel™ spreadsheet transfer
- Build cost databases using Aspen Icarus Kbase™ link
- Existing pipe replacement cost evaluation

Applications

Minimizing Initial vs. Life Cycle Cost

By sizing to minimize initial cost or life cycle cost over any specified duration, *AFT Mercury* provides the power of informed decision making in developing a low cost system design.

Variable Frequency Drive vs. Control Valve Analysis

The true relative costs of VFD's vs. control valves can only be determined by comparing systems optimally sized for each case, a task quickly done using *AFT Mercury*.

System Balancing through Intelligent Sizing

AFT Mercury can automatically determine line sizes to achieve inherent system flow balance resulting in significant reductions in pumping costs by minimizing throttling losses in flow control devices.

Size for Minimum Cost Over Multiple Design Cases

Imagine the impact of determining piping, ducting and component sizes to minimise cost while insuring performance requirements are met for one or more off design cases. Or perhaps you need to concurrently size for alternate operating scenarios such as two pump operation in the summer and one pump operation in the winter. Only *AFT Mercury* can automatically determine the lowest cost system for these real world conditions.

Understand What Really Drives Your Design

Piping and ducting systems typically have to meet a variety of requirements whose complex interaction makes it difficult to see their relative impact. Comparison of optimized results for differing constraints with *AFT Mercury* will clearly show this impact providing you valuable insight into what's driving your system design.

Optimal Pump Sizing

More than just accurately defining pump head and suction requirements, *AFT Mercury* will automatically determine the most cost effective trade off between pipe size selection and the resulting impact on pump capacity requirements and cost.

System Requirements

- Windows 95 and higher or NT 4.0 and higher
- 64 MB RAM minimum
- 800 x 600 display minimum
- Stand-alone or network



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