Product		Fathom (Incompressible)	Fluid Flow - Liquid Module (Incompressible)	
Current Version		**11**	**3.47**	
Release Month / Year		**Jan-20**	**May-20**	
Latest Maintenance Release		**Jul-21**	**May-20**	
Developer		Applied Flow Technology	Flite Software NI Ltd	
License Module		Perpetual /Lease (Qty/Yearly)	Perpetual / Lease	
License Type		Standalone / Network	Standalone / Network	
License Mapped by		USB / eLicense (cloud)	Soft License	
License Manager		HASP-lm (for USB}, AFT eLicense Manager (for eLicense)	N/A	
Competetive Analysis				
Functional Comparisons		**Fathom**	**Pipe Flow Expert**	**Feature Advantages**
Input, Calculation, Modeling and Editing				
	Incompressible Fluid Flow Analysis	Yes	Yes	
	Isometric	Yes	Yes	
	2D Freedom	Yes	No	
	2D - Othogonal	Yes	Yes	
	Easy, Input for Pipes and Components	Yes	Yes	
	Graphical User Interface with Pictures for Data Input	Yes	No	
	Tabular Input data check for all Pipes & Inputs	Yes	No	
	Import Excel Change Data / Input change from Excel	Yes	No	
	Load Background Picture	Yes	No	
	Merging 2 Model Files in 1	Yes	No	
Import Piping Layout From	Piping Component File (.pcf)	Yes	No	• Reduces time to create the model
	CAESAR-II Neutral File (.cII) supported by AutoPIPE®, ROHR2, TRIFLEX®, and others			
	GIS Shape Files (.shp)			
	EPANET Files (.inp)			
	Export Piping Layout to EPANET	Yes	No	
	Groups and Group Manager	Yes	No	
	Select Special for Editing	Yes	No	
	Special Condition for Pipes and Junctions (Nodes)	Yes	Yes (Limited)	
	Select Flowpath in Model	Yes	No	
Scenario Manager	Scenario Manager for Design Variants	Yes	No	• Reduces modeling time • Allows to check different operating conditions in one model
	Scenario Comparison Tool	Yes	No	
	Output Comparison of Multiple Scenarios in Single Window	Yes	No	

	Multi-Scenario Pump vs. System Curves	Yes	No	• Allows to compare graph system variables under different operating conditions
	Multi-Scenario Profile Graphs	Yes	No	
	Renumbering Pipes/ Nodes / Junctions	Yes	No	
	Combine/Split Pipes	Yes	No	
	Global Pipe Edit	Yes	Yes (Limited)	
	Global Junction / Nodes Edit	Yes	Yes (Limited)	
	Multilevel Undo/Redo on Workspace	Yes	No	
	Checklist Feature for remaining inputs	Yes	No	
	List Undefined Pipes / Nodes / Junctions	Yes	No	
	Solution Control (Tolerance & Relaxation)	Yes	Yes	
	Analysis for Ducts	Yes	Yes	
	Analysis for Helical Tube,	Yes	No	
	Pipe Friction Model - Absoulte Roughness	Yes	Yes	
	Pipe Friction Model - Relative Roughness	Yes	Yes	
	Pipe Friction Model - Hazen Williams	Yes	Yes	
	Pipe Friction Model - Explicit Friction Factor	Yes	Yes	
	Pipe Friction Model - Resistance	Yes	No	
	Pipe Friction Model - Frictionless	Yes	No	
	Pipe Friction Model - MIT Equation	Yes	No	
	Pipe Friction Model - Miller Turbulent Equation	Yes	No	
	Loss Model (3-K, Darby)	Yes	No	
	Loss Model (Equivalent Length)	Yes	No	
	Non Newtonian Fluid Modeling (Power Law, Bingham Plastic)	Yes	No	
	Adjusted Turbulent K Factor (Correction)	Yes	No	
	Design Factor for Pipe Friction, Pipe Fittings and Losses	Yes	No	
	Design Alert Feature (Limits: Pressure, Velocity, Temp, and all parameters)	Yes	Yes (Limited)	• Important to detect undesired conditions in the network: minimum flow, minimum fluid velocity, max. Pressure, min. Pressure, etc.
	Initial Guesses for Flow and Pressure	Yes	No	
	Transfer Results to Initial Guesses	Yes	No	
	Venturi	Yes	Yes	
	Orifice	Yes	Yes	
	Screen / Filters	Yes	No	
	Spray Discharge / Sprinkler / Nozzles	Yes	Yes	
	General Component / Resistance (with K Factor & Resistance Curve)	Yes	Yes	
	Closed / Block pipes	Yes	Yes	
	Choice of calculation modes – Inlet pressure/flowrate	Yes	Yes	

Pumps	Centrifugal Pump (Input Pump curves)	Yes	Yes	
	Positive Displacement Pumps	Yes	Yes	
	Off Pump with No Flow / Flow through	Yes	No	
	Variable Speed Pump	Yes	Yes	
	Pump Impeller Trimming	Yes	Yes	
	Optional Efficiency / Power and NPSHR Data for Pump Curves	Yes	Yes	
	BEP calculation and % BEP of Operating	Yes	No	
	Submerged Pump	Yes	No	
	Parallel Pumps	Yes	Yes	
	Series Pumps	Yes	Yes	
	Pump End of Curve Flow Rate	Yes	No	
	Reference Density Correction with Pressure vs. Mass flow curve	Yes	No	
	Pump Configuration (Speed and Impeller Dia Combination)	Yes	No	
	Suggest Pump (Local Database from Developer)	No	Yes	
	Suggest Pump using Online Database (Intelliquip)	Yes	No	
Valves				
Valves	Valves Loss Model - Cv	Yes	Yes	
	Valves Loss Model - Kv	Yes	Yes	
	Valves Loss Model - K Factor	Yes	No	
	Valves Loss Model - Resistance Curve	Yes	No	
	Valve Data Source - Crane, Idelchik, Miller	Yes	Yes	
	Valve Cv. vs. % Open	Yes	Yes	
	Check Valves / NRV's	Yes	Yes	
Relief Valves	Relief Valve (Inline, Exit, Inline- Exit)	Yes	Yes (Limited)	
	Relief Valve Loss Model - CdA	Yes	Yes	
	Relief Valve CdA data from API 526	Yes	No	
	Relief Valve Profiles (Opening: Instant, Pressure; Closing Instant, Pressure, Never)	Yes	No	
	Relief Valve Constant Back Pressure	Yes	No	
	Relief Valve Remote Sensing	Yes	No	
	Relief Valve Manufacturers Database	No	Yes	
Control Valve & 3Way Valve	3 Way Valve	Yes	Yes	
	Flow Control Valve	Yes	Yes	
	Pressure Sustaining Control Valve	Yes	Yes	
	Pressure Reducing Control Valve	Yes	Yes	
	Constant Pressure Drop Control Valve	Yes	No	
	Control Valve Loss (Fully Open) : Cv	Yes	Yes	
	Control Valve Loss (Fully Open) : Kv	Yes	Yes	

	Control Valve Loss (Fully Open) : K Factor	Yes	No	
	Control Valve Action if Setpoint Not Achievable	Yes	No	
	Control Valve Cv. Vs. % Open	Yes	Yes	
	Closed Valve, Exit Valves	Yes	No	
Heat Transfer through Pipes				
	Adiabatic (Perfectly Insulated)	Yes	No	• Allows to accurately model almost all possible form of heat trnasfer through Pipes.
	Heat Transfer with Insulation Thickness	Yes	Yes	
	Isothermal Heat Transfer	Yes	No	
	Convective Heat Transfer	Yes	Yes	
	Convective Heat Transfer with Heat Flux	Yes	No	
	Convective Heat Transfer with Heat Tracing	Yes	No	
	Constant Heat Flux	Yes	Yes	
	Constant Heat Rate	Yes	No	
	Buried Pipe	Yes	Yes (Limited)	
	Pipe Heat Transfer Results Diagram	Yes	No	
Heat Exchanger Models				
Pressure Loss Model	K Factor	Yes	Yes	• All thermal models available for heat exchangers allows engineers to model a variety of configurations. When the output conditions of the heat exchanger are not known, AFT Fathom can use the NTU-Effectiveness method to calculate the heat transfer.
	Tube Configuration	Yes	No	
	Resistance Curve (Flow vs. Pressure Drop)	Yes	Yes	
Thermal Model	Controlled Downstream Temperature	Yes	No	
	Parallel Flow (NTU-effectiveness method)	Yes	No	
	Counter-Flow (NTU-effectiveness method)	Yes	No	
	Cross-Flow, Both Fluids Unmixed	Yes	No	
	Cross-Flow, Secondary Fluid Mixed	Yes	No	
	Cross-Flow, System Fluid Mixed	Yes	No	
	Enthalpy Stagnation Rise	Yes	No	
	Shell & Tube, 1 Shell Pass, Multiple of 2 Tube Passes	Yes	Yes	
	Specified Heat Rate In Constant	Yes	Yes	
	Specified Heat Rate vs. Flow	Yes	No	
	Temperature Stagnation Rise	Yes	No	
Other Features				
	Cost Analysis (Energy and Total Cost)	Yes	No	
	Checking for Cavitation / Vapour Formation	Yes	Yes	
	Variable properties and temperatures	Yes	Yes	
	Automatic Pipe Elevation form Nodes	Yes	Yes	
	Control Systems Logic Implement	Yes	No	
	Correction for ambient pressure decrease with height	Yes	No	
	ANSI / HI 9.6.3-2017 for Pump POR/AOR	Yes	No	
	ANSI/API 610 (2010) for Pump POR / AOR	Yes	No	
	ANSI / HI 9.6.7-2015 for Pump Viscosity Correction	Yes	Yes	• Allows to include standard

	Submergence (ANSI/HI Standard 9.8.7 -1998)	Yes	No	compliance in your modeling
	User Notes in Output	Yes	No	
	Cautions / Warnings and Critical Warnings for Users	Yes	Yes	
Database and Library				
	Fittings and Losses data using Crane handbook	Yes	Yes	
	Using Miller Handbook	Yes	Yes	
	Using Idelchik Handbook	Yes	Yes	
	User-defined fittings using K value	Yes	Yes	
	User-defined fittings using Resistance Curve	Yes	No	
	Database Manager (Local & Network Database)	Yes	No	
	Fluid Database: Standard (By Software Developer)	Yes	Yes	
	Fluid Database: ASME	Yes	No	• More Reliable and accurate modeling
	Fluid Database: NIST REFPROP	Yes	No	
	Fluid Database: CHEMPAK Database Optional	Yes	No	
	User Defined Component Database	Yes	No	
	Insulation Database	Yes	Yes	
	Pipe Material Database - ANSI	Yes	No	
	Pipe Material Database - DIN	Yes	No	
	Pipe Material Database - EN	Yes	No	
	User Defined Pipe Material Database	Yes	Yes	
	Pipe Size and Colour, Junction Icon Customization	Yes	Yes	
	User Defined Cost Database	Yes	No	
Output & Reporting				
	Easy, readable Output of Pipes and Junctions	Yes	Yes	
	Output as tables in 1 window /Output Window	Yes	No	
	Display of data and results on the Schematic / Visual Report	Yes	Yes (Limited)	• Improves result interpretation and analysis capabilities
	Color Maping Output Parameters	Yes	No	
	Sort Output Parameters in table	Yes	No	
	Custom Sticky Notes in Output	Yes	No	
Graphs				
	Profile Graphs (Velocity, Pressure, Volumetric Flow rate, Elevation other)	Yes	No	
	Energy & Hydraulic Gradeline (Incompressible)	Yes	Yes	
	Multi-Scenario Pump vs. System Curves	Yes	No	
	Multi-Scenario Profile Graphs	Yes	No	
	Pump Vs. System Curves	Yes	Yes	
	Composite Curves (Series & Parallel)	Yes	Yes	
	Stacked Graphs and Dual Y-axis Graphs	Yes	No	