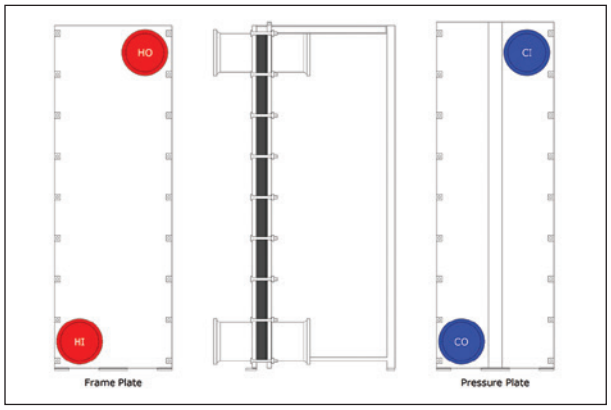
Rate, simulate, and design plate-and-frame heat exchangers

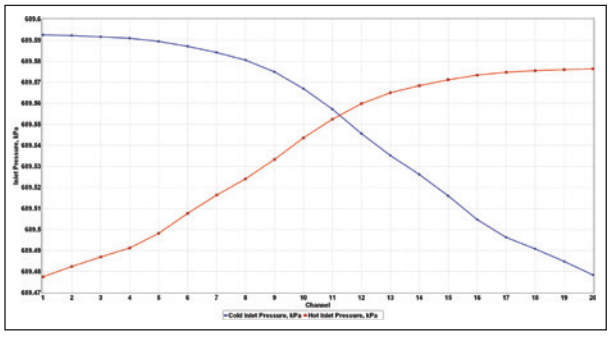
***X**phe* is an incremental program that contains HTRI's latest pointwise methods based on literature and proprietary experimental data. The heat transfer and pressure drop correlations are continually improved as a result of our ongoing research.

As a module in ***X**changer Suite*®, ***X**phe* lets you quickly transfer applicable case data to other components like ***X**ist*® or ***X**ace*®.

FEATURES



Scaled drawing of plate pack indicating nozzle configuration.



Plot of hot and cold pressure profiles for inlet ports.

- Handles virtually any plate-pack arrangement.
- 2D incrementation calculates localized profiles for heat transfer and pressure drop.
- Detailed output reports provide overall and localized results.
- Extensive visualization tools show exactly how the exchanger is performing.
- Integrated physical property system eliminates requirement for additional property generation software. ***X**changer Suite* includes VMGThermo®, an extensive and rigorous fluid physical property generator from Virtual Materials Group, Inc.
- Includes built-in interface to most process simulators.
- Supports embedding as a unit operation in any CAPE-OPEN compatible process simulator.
- Displays both input and output in multiple unit sets, including user-defined sets. Dynamic display of values in all unit sets.
- Session view allows tracking and retrieval of all runs made during a session.
- Includes live configuration drawing for easy specification of complex flow arrangements.

GEOMETRY SPECIFICATIONS

- Herringbone plates with chevron angles from 0 to 90 degrees
- Built-in databank of plate geometries from multiple vendors
- Custom plate geometries defined and saved for future use
- One to six passes for each fluid
- Cocurrent or countercurrent flow in channels
- Up to five different plate types per plate pack

CALCULATION FEATURES

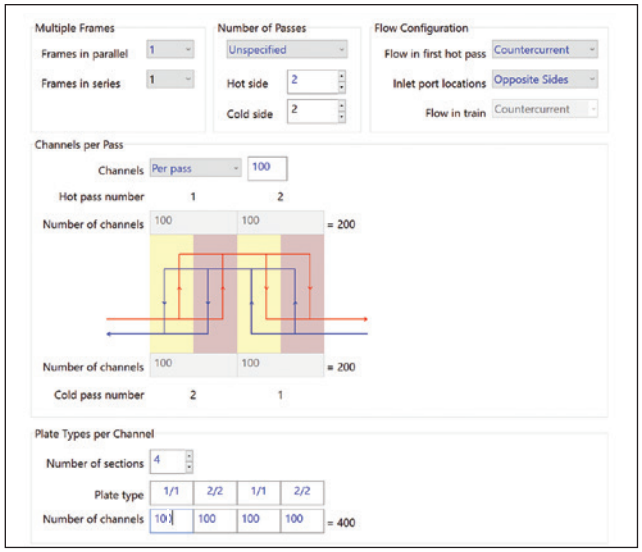
- Rigorous heat transfer and pressure drop calculations using a 2D incrementation scheme that divides the exchanger into a large number of zones
- Flexible process input allowing specification of known process information (temperature, weight fraction vapor, and/or flow rates) with the program calculating missing information based on energy balance
- Three modes: rating (known duty and geometry), simulation (unknown duty and known geometry), and design (known duty and unknown geometry)
- Built-in port maldistribution model for calculating flow in each channel
- Optional specification of heat transfer coefficients and safety factors
- Support for non-Newtonian process fluids

DESIGN TOOLS

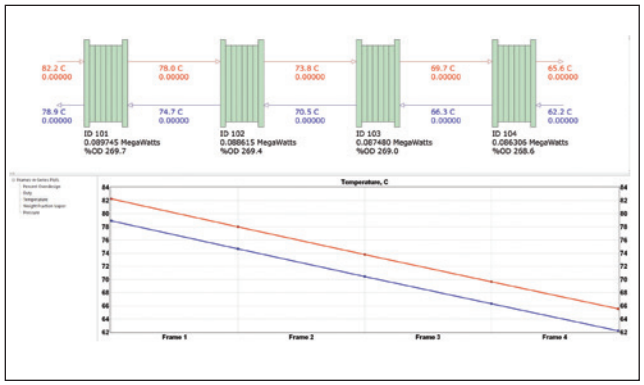
- Classic design mode to automatically determine pack configuration, including number of hot and cold passes and required number of plates
- Grid design option to vary geometry over user-specified ranges and step sizes
- Design constraints to prevent selection of undesirable designs

OUTPUTS

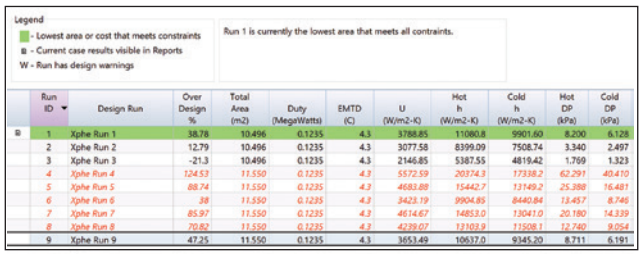
- Extensive set of spreadsheet-style output reports for printing or exporting to Microsoft® Excel®
- Summary reports with overall results in one or two pages
- Detailed reports for local profiles of all important parameters (temperature, pressure, heat transfer coefficients, heat flux, etc.)
- Standard API 662/ISO 15547 style specification sheet
- 2D scaled drawing provides visual confirmation of exchanger geometry
- Design and Series views allow plotting of variables across alternative designs and between frames in series
- User-defined graphs for easy accessibility



Input panel for specifying flow configuration of hot and cold streams.



The Frames-in-Series view displays unit process conditions and calculated temperature profiles.



	Run ID	Design Run	Over Design %	Total Area (m2)	Duty (MegaWatts)	EMTD (C)	U (W/m2-K)	Hot h (W/m2-K)	Cold h (W/m2-K)	Hot DP (kPa)	Cold DP (kPa)
	1	Xphe Run 1	38.78	10.496	0.1235	4.3	3788.85	11080.8	9901.60	8.200	6.128
	2	Xphe Run 2	12.79	10.496	0.1235	4.3	3077.58	8399.09	7508.74	3.340	2.497
	3	Xphe Run 3	-21.3	10.496	0.1235	4.3	2146.85	5387.55	4819.42	1.769	1.323
	4	Xphe Run 4	124.53	11.550	0.1235	4.3	5572.59	20374.3	17338.2	62.291	40.410
	5	Xphe Run 5	88.74	11.550	0.1235	4.3	4683.88	15442.7	13149.2	25.388	16.481
	6	Xphe Run 6	38	11.550	0.1235	4.3	3423.19	9904.85	8440.84	13.457	8.746
	7	Xphe Run 7	85.97	11.550	0.1235	4.3	4614.67	14853.0	13041.0	20.180	14.339
	8	Xphe Run 8	70.82	11.550	0.1235	4.3	4239.07	12103.9	11508.1	12.740	9.054
	9	Xphe Run 9	47.25	11.550	0.1235	4.3	3653.49	10637.0	9345.20	8.711	6.191

Display of alternate geometries for design of plate-frame exchanger.

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