

Release Notes

INSTED Ver. 8.2.1



TTC TECHNOLOGIES, INC.

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Release Features

INSTED Ver. 8.2.1

The latest version of INSTED (Ver. 8.2.1) includes the enhancements, changes, and bug fixes to INSTED 8.2.

Improved Plate-Fin Solver

- The plate-fin solver is optimized so that the calculations involving REFPROP fluids become much faster. The boost of the calculation speed is especially significant for the plate-fin rating when using the predefined mixture (such as air) in REFPROP.
- For multiple rating module, the following new parameters are added to allow to be varied during the calculation:
 - Number of passages for hot flow
 - Number of passages for cold flow

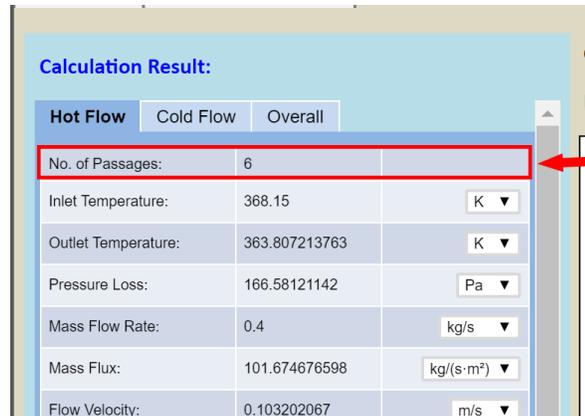
The screenshot displays the 'Plate-Fin: Multiple Rating' module in the INSTED software. The interface is divided into three main sections:

- I. Project Name:** A text input field for entering the project name.
- II. Choose a Rating Project:** A dropdown menu with the text 'Please choose' and a 'View Details' button.
- III. Choose an Input Variable to Vary:** A dropdown menu with a list of variables. The variables listed are:
 - Hot Flow Flowrate
 - Plate Length
 - Plate Width
 - Plate Thickness
 - Hot Flow Fin Height
 - Cold Flow Fin Height
 - Hot Flow Fin Pitch
 - Cold Flow Fin Pitch
 - Hot Flow Fin Thickness
 - Cold Flow Fin Thickness
 - Hot Flow Fin Offset Pitch
 - Cold Flow Fin Offset Pitch
 - Hot Flow Fin Wavelength
 - Cold Flow Fin Wavelength
 - Hot Flow Fin Wave Amplitude
 - Cold Flow Fin Wave Amplitude
 - Plate Conductivity
 - Hot Flow Fin Conductivity
 - Cold Flow Fin Conductivity
 - Hot Flow Passages
 - Cold Flow Passages
 The 'Hot Flow Passages' and 'Cold Flow Passages' options are highlighted with a red box and a red arrow.

On the right side of the interface, there is a 3D diagram of a plate-fin heat exchanger. The diagram shows a stack of plates with fins. Red arrows indicate the flow of 'Fluid A' through the channels, and blue arrows indicate the flow of 'Fluid B' through the channels. The width of the exchanger is labeled 'W' and the length is labeled 'L'. Below the diagram, there are 'Load' and 'Close' buttons. At the bottom right, there is a 'Compute' button.

Improvements on user interface

- New outputs of “No. of Passages” are added for both hot and cold streams for the rating result of plate-fin.



Calculation Result:		
Hot Flow	Cold Flow	Overall
No. of Passages:	6	
Inlet Temperature:	368.15	K ▼
Outlet Temperature:	363.807213763	K ▼
Pressure Loss:	166.58121142	Pa ▼
Mass Flow Rate:	0.4	kg/s ▼
Mass Flux:	101.674676598	kg/(s·m ²) ▼
Flow Velocity:	0.103202067	m/s ▼

- “Bulk” calculation method is disabled when rating a plate-fin heat exchanger with multi-passes or multi-partitions.

Issues Fixed in the Plate-Fin Module

- In INSTED Ver. 8.2 there was a bug when using Manglik and Bergles Correlations to calculate the Colburn and friction factors of offset-strip fins. This issue has been fixed in INSTED Ver. 8.2.1.
- In INSTED Ver. 8.2 there was a bug when generating a downloadable Excel file for multiple rating calculations. The file was generated even before all the calculations were completed so that the calculation results of several rating points may be missing in the Excel file. This issue has been fixed in INSTED Ver. 8.2.1.
- In INSTED Ver. 8.2 there was a bug when generating a downloadable Excel file, the fin geometry data is not added to the file when Kays & London fins were used. This issue has been fixed in INSTED Ver. 8.2.1.
- In INSTED Ver. 8.2 there was a bug when generating a downloadable Excel file, the side/end bar width and height were not outputted to the correct column in the Excel sheet. This issue has been fixed in INSTED Ver. 8.2.1.
- In INSTED Ver. 8.2 there was a bug when generating a downloadable Excel file, when the Kays & London fins with multiple layers of fins were used (such as 1/2-11.94 (D)), the overall plate spacing was outputted as fin height in the Excel sheet. This issue has been fixed in INSTED Ver. 8.2.1.