

Release Notes

INSTED Ver. 8.1.1



TTC TECHNOLOGIES, INC.

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Release Features

INSTED Ver. 8.1.1

The latest version of INSTED (Ver. 8.1.1) includes the enhancements, changes, and bug fixes to INSTED 8.1.

Improved Plate-Fin Solver

- New Colburn factor j and friction factor f correlations were implemented for fins with herringbone/wavy profile along the stream direction. The new j/f correlations replaced the old equations so that more accurate results can be obtained.
- Additional inputs of wavelength and wave amplitude to define the geometry of herringbone/wavy fins were added.

The screenshot displays the 'Plate-Fin: Fin A' configuration window. It is divided into three main sections:

- I. Fin Shape (Frontal):** A dropdown menu is set to 'Rectangular'.
- II. Fin Profile (Flow Direction):** A dropdown menu is set to 'Herringbone/Wavy'. A red arrow points to this menu with the text 'Choose "Herringbone/Wavy" for "Fin Profile"'. To the right, a 2D diagram shows a herringbone fin profile with parameters: p (pitch), h (fin height), h' (total height), s (wave width), t (fin thickness), and a (fin angle).
- III. Fin Properties:**
 - Fin Height (h): [] m
 - Fin Thickness (t): [] m
 - Fin Pitch (p): [] m
 - Wavelength (λ):** 0.0 m
 - Wave Amplitude (A):** 0.0 m
 - Fin Conductivity: [] W/(m·K)
 - Fin Density: [] kg/m³

A red box highlights the 'Wavelength (λ)' and 'Wave Amplitude (A)' fields, with a red arrow pointing to them and the text 'New inputs for wavelength and wave amplitude.' To the right, a 3D perspective view of the herringbone fin structure is shown.

At the bottom, there are two checkboxes:

- Use user-defined j/f data?
- Use fin data from Kays & London?

- In the multiple-rating mode, the new parameters “Fin Wavelength” and “Fin Wave Amplitude” have been added to allow the parametric calculation of their effects.

Start Page x Plate-Fin: Multiple Rating x

I. Project Name:

II. Choose a Rating Project:

Boeing Test2 View Details ?

III. Choose an Input Variable to Vary:

- Hot Flow Flowrate
- Cold Flow Flowrate
- Hot Flow Inlet Temperature
- Cold Flow Inlet Temperature
- Hot Flow Inlet Quality
- Cold Flow Inlet Quality
- 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

Get Value ?

kg/s

data?

Load Close Compute

Fluid A Fluid B

W L

"Fin Wavelength" and "Fin Wave Amplitude" are added to the control parameters in "Multiple Rating" module if "herringbone/wavy" fins are used.

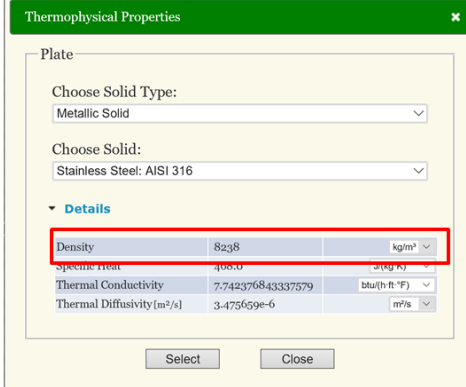
Issues Fixed in the Plate-Fin Module

- In INSTED Ver. 8.1 there was a bug related to the incorrect unit conversion between the solid material database and plate-fin plate/fin density inputs. The issue can be reproduced as follows using INSTED Ver. 8.1:

1. Try to get density from solid material database



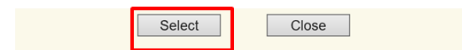
2. Density for Stainless Steel 316 is 8238 kg/m³



3. If change the density unit to lb/ft³, density value is changed to 514.28 lb/ft³



4. Click "Select" button to transfer density value back to Plate-Fin module



5. The value of 514.28 is set for plate density while the unit is still kg/m³, which is wrong.



Wrong!

Value should be 8238 for kg/m³

This issue has been fixed in INSTED Ver. 8.1.1.

- A re-evaluation of the other conversion processes from the Database was also completed for all the native database properties in INSTED to ensure that a similar issue did not exist for any other data.