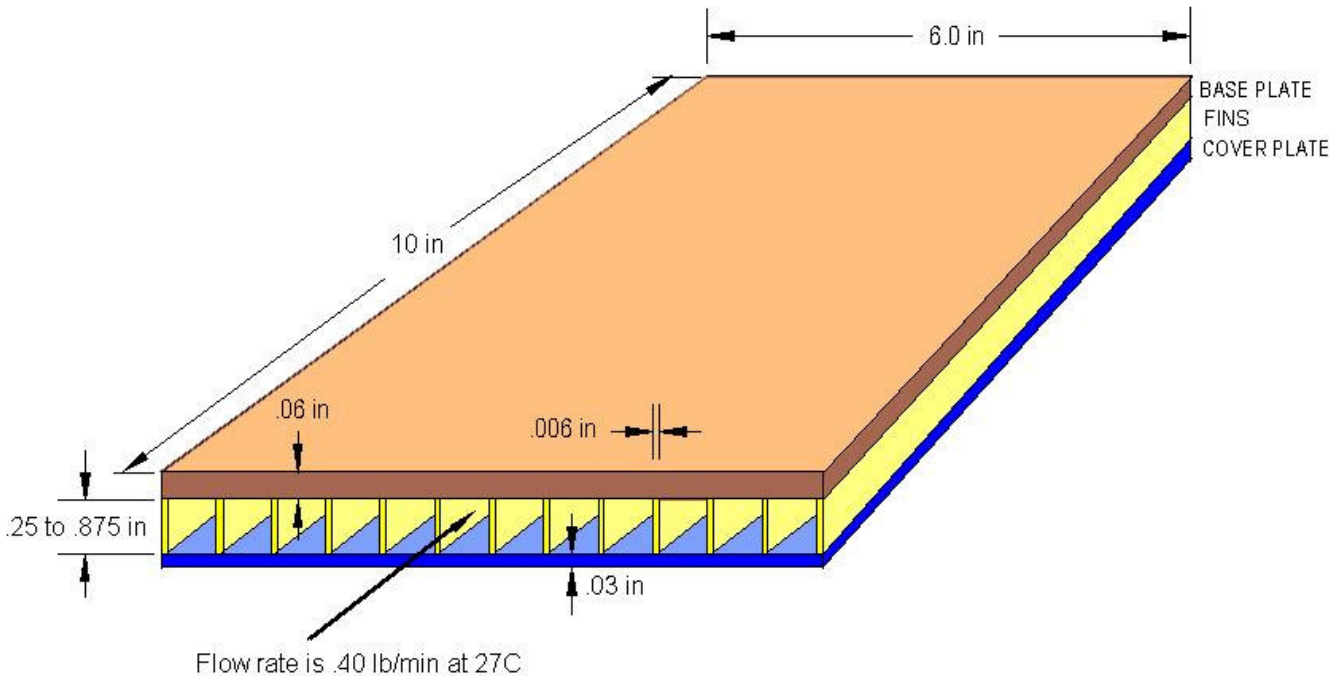


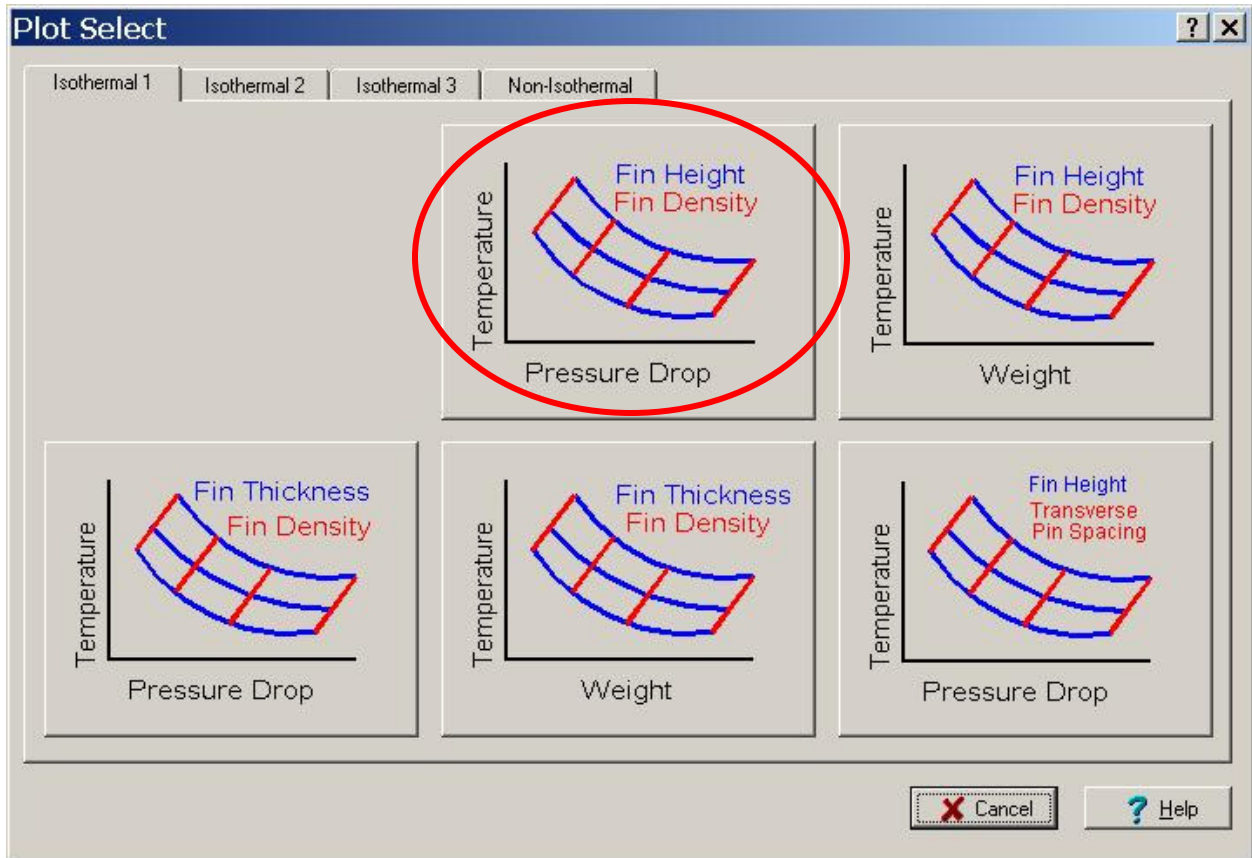
**Plot Model Wizard**

This example generates a plot of varying fin height and density demonstrating COLDPLATE’s ability aid in the design and analysis of cold plates. Assume that it is desired to determine the thermal characteristics of a cold plate with the following input parameters. The model will be generated using COLDPLATE’s Plot Wizard.

- Length L is 10 inches
- Width W is 6 inches
- Fins are to be .006 inches thick
- The fin type is rectangular
- Cover plate is .03
- Base plate is .06 inches thick
- The inlet air temperature is 27C
- The inlet air pressure is 14.7 psi
- Cooling fluid is air
- Mass flow rate is .40 lb/min
- The base, fins and cover are aluminum
- 70 Watts is uniformly distributed across the cold plate.
- Vary the fin height from .25 to .875 inches
- Vary the fin density from 4 to 12 fns/inch



Select the Plot Button circled in red to start the Plot Wizard of varying Fin Density and Fin Height.



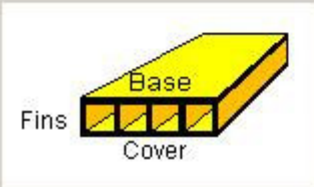
Input the geometry on this tab.

**Plot Wizard - Geometry - Step 1 of 4**

		Minimum	Maximum	No. of Values
<b>Geometry</b>				
	Length (in.)	10		
	Width (in.)	6		
	Fin Height (in.)	0.25	0.875	4
	Base Thickness (in.)	0.06		
	Cover Thickness (in.)	0.03		
	<b>Plate Fins</b>			
	Fin Density (fins/in.)	4	12	5
	Fin Thickness (in.)	0.006		
<b>Fin Type</b>				
<input type="checkbox"/> 3/32-12.22 <input type="checkbox"/> PF4 <input type="checkbox"/> PF9 <input type="checkbox"/> PLANE FIN 11.1 <input checked="" type="checkbox"/> <b>RECTANGULAR</b> <input type="checkbox"/> TEST		1 Fin type(s) selected		<input type="button" value="View fin description"/>
<b>For Bypass Flow Only</b>				
	Duct Width (in.)			
	Cover Clearance (in.)			

Select Default Aluminum Properties on this tab.

Plot Wizard - Material Properties - Step 2 of 4



The diagram shows a 3D perspective view of a coldplate assembly. It consists of a central rectangular block labeled 'Base', which is flanked by two rows of rectangular fins labeled 'Fins'. Below the base and fins is a thin layer labeled 'Cover'.

**Base**

Select type of material: Default Aluminum Properties

Thermal Conductivity (W/in.-C): 3.92

Specific Heat (W-min./lb-C): 7.07

Density (lb/in.^3): 0.098

**Fins**

Select type of material: Default Aluminum Properties

Thermal Conductivity (W/in.-C): 3.92

Specific Heat (W-min./lb-C): 7.07

Density (lb/in.^3): 0.098

**Cover**

Select type of material: Default Aluminum Properties

Thermal Conductivity (W/in.-C): 3.92

Specific Heat (W-min./lb-C): 7.07

Density (lb/in.^3): 0.098

<Back   Next>   X Cancel   ? Help

Input temperature, pressure, flow rate and air as the fluid on this tab.

Plot Wizard - Fluid Properties - Step 3 of 4

Inlet Fluid Temperature and Pressure

Inlet Fluid Temperature (C)

Inlet Fluid Pressure (lb/in<sup>2</sup>)

Type of Cooling Fluid

- AIR
- COOLANOL20
- COOLANOL25
- EG\_H2O\_30/70
- EG\_H2O\_40/60
- EG\_H2O\_50/50
- EG\_H2O\_60/40
- ENGINE OIL

Fluid Flow Rate

Mass Flow Rate (lb/min)

Volume Flow Rate (ft<sup>3</sup>/min)

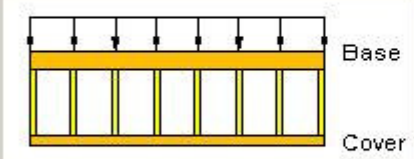
*Predict Flow Rate That Results In*

Fluid Exit Temperature (C) of

<Back    Next>    X Cancel    ? Help

Input the power dissipation on this tab.

Plot Wizard - Power - Step 4 of 4



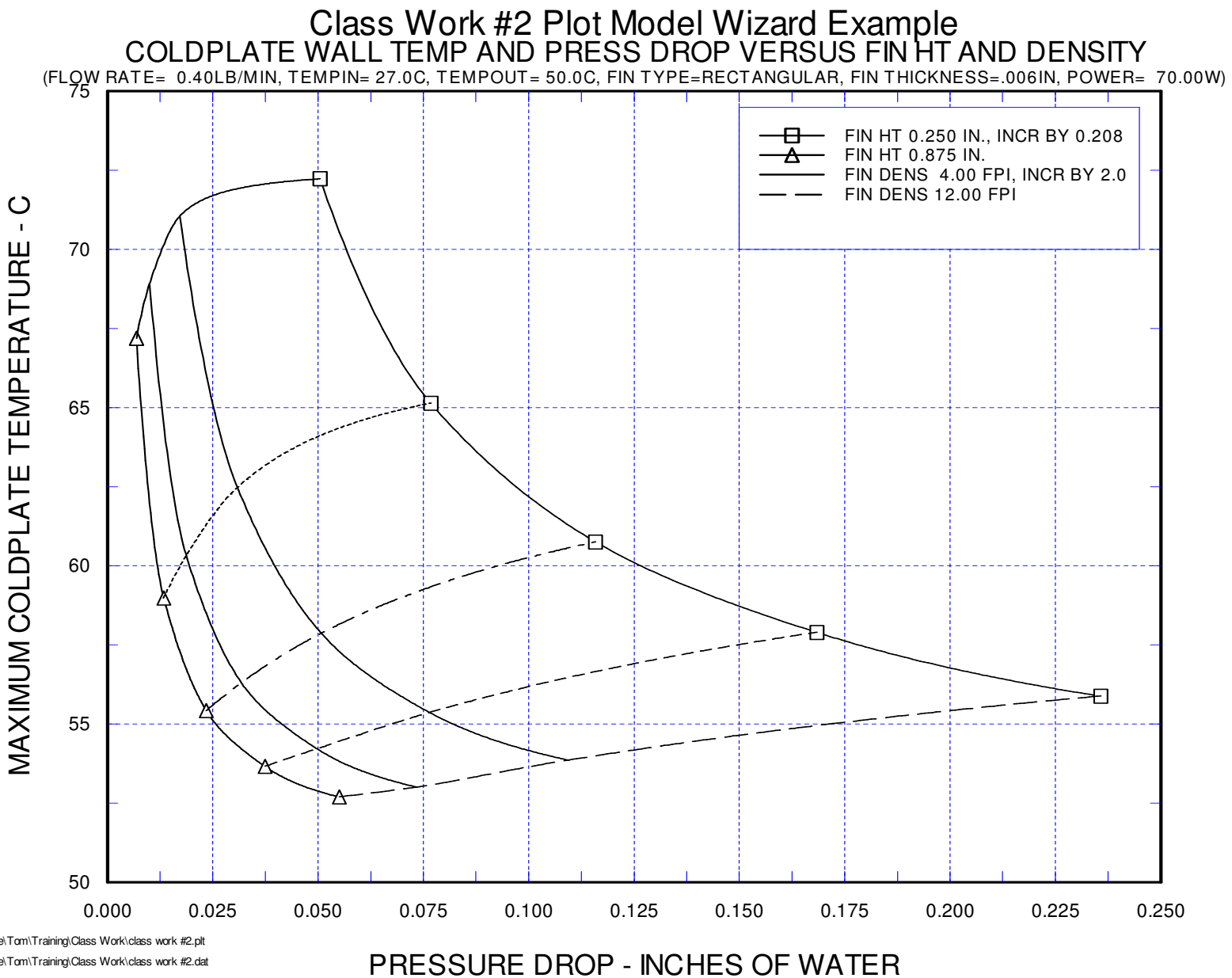
Base Plate Power (Watts)

Base  
Cover

After filling in the power value a complete model will be built and ready to run. Click on "Finish" and the Flow Thru Cooling form will appear. The model can be saved and run or edited to add more model information.

<Back Finished X Cancel ? Help

These parameters were input into COLDPLATE and run, the resulting plot is shown below. From this the optimum temperature versus pressure drop can be selected.



C:\Userfile\Tom\Training\Class Work\class work #2.plt  
 C:\Userfile\Tom\Training\Class Work\class work #2.dat  
 2010-Nov-29 COLDPLATE by EPAC