

Parametric Tables

Example: Setting up a parametric table to calculate drag force relative to a changing velocity.

1.) Enter all known equations into EES equations window.

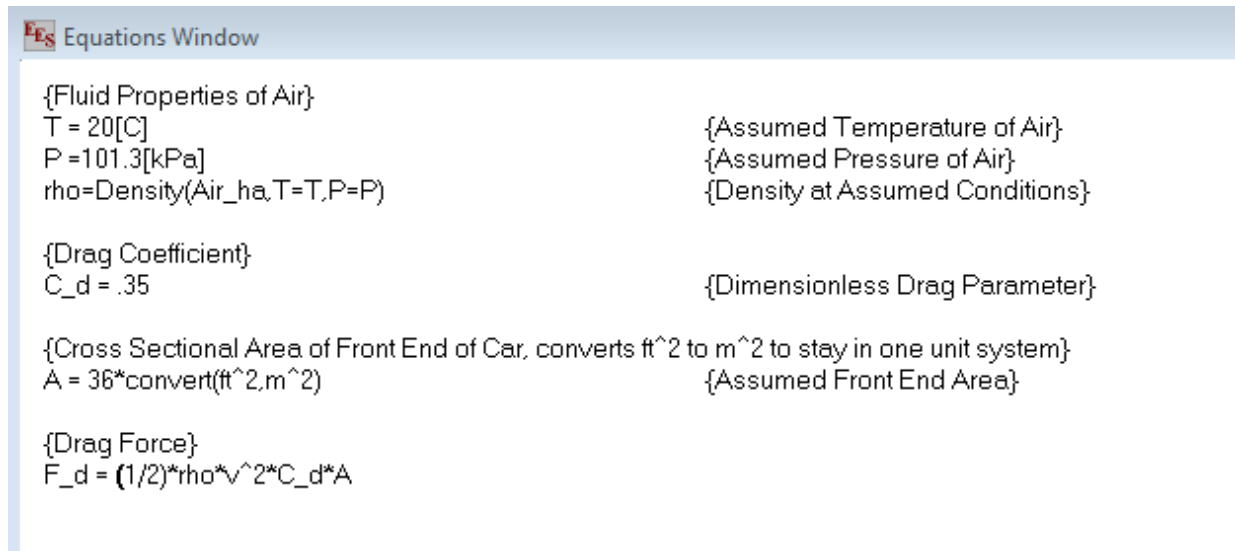


Figure 1: All known equations entered in equations window in EES.

2.) One variable will be fluctuated in order to build a parametric table, so make sure one of the equation variables isn't defined (i.e. in this case we will be changing the velocity and observing the output drag force, so we need to make sure velocity isn't already defined).

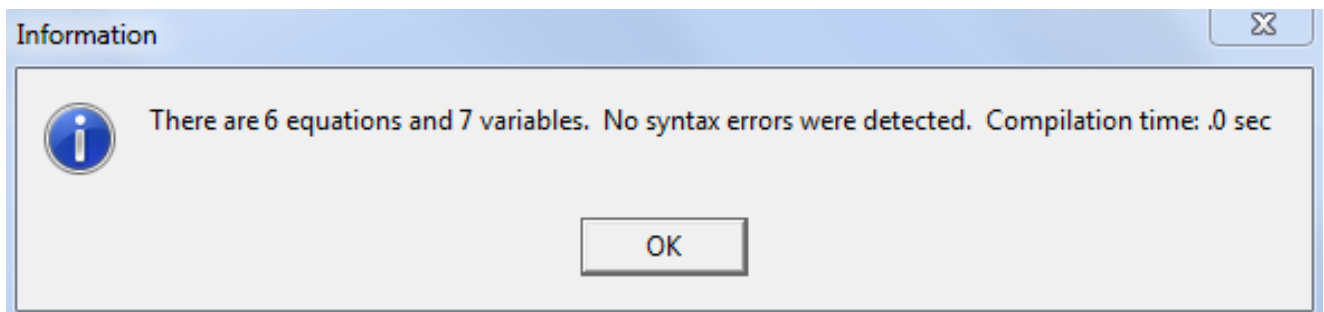


Figure 2: Clicking on the red check mark provides the shown information.

3.) Create a new parametric table (Tables→New Parametric Table) from the EES “tables” menu.

4.) Select the changing variables in the “Variables in table” column (in this case we are observing velocity and drag force). Depending on the experiment, the number of runs may need to be altered. Select “ok” once desired parameters are set.

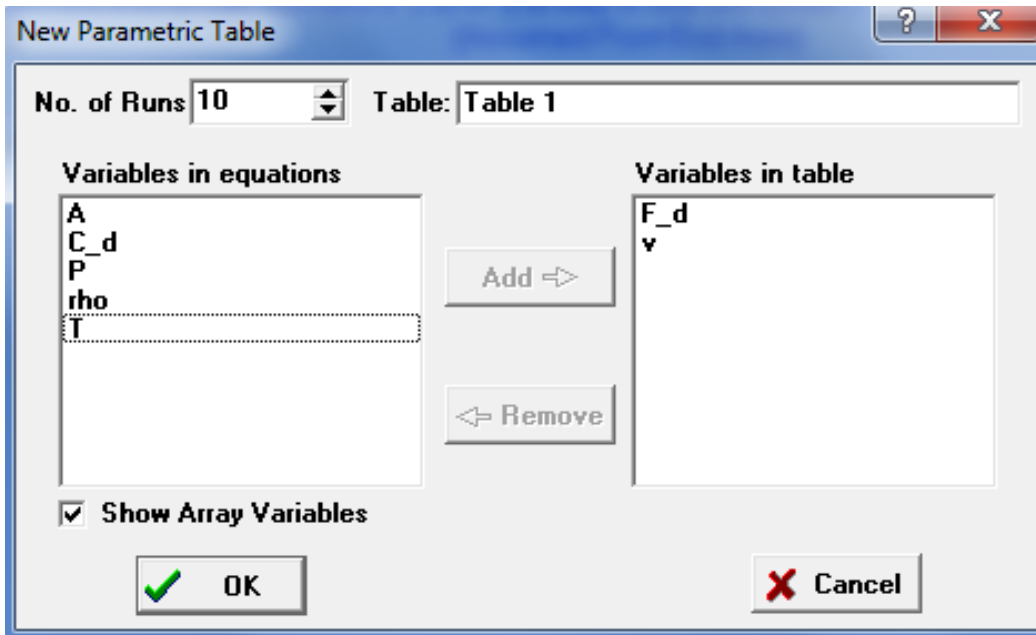


Figure 3: New parametric table variables selection.

5.) At this point, the parametric table will pop up on the screen. To change values of a variable, simply right click on the variable and select “alter values”. The units of the variable can also be set by right clicking on the variable and selecting “properties”. For this example, the velocity was varied 5-25[m/s].

	1	2
	F _d	v [m/s]
1..100		5
Run 1		5
Run 2		5.202
Run 3		5.404
Run 4		5.606
Run 5		5.808
Run 6		6.01
Run 7		6.212
Run 8		6.414
Run 9		6.616
Run 10		6.818
Run 11		7.02
Run 12		7.222
Run 13		7.424
Run 14		7.626
Run 15		7.828
Run 16		8.03
Run 17		8.232
Run 18		8.434
Run 19		8.636
Run 20		8.838
Run 21		9.04

Figure 4: Parametric table with velocity varied from 5 to 25[m/s].

6.) To solve the parametric table, simply click on the green arrow on the top, left corner.

	1	2
	F_d [N]	v [m/s]
Run 1	17.62	5
Run 2	19.07	5.202
Run 3	20.58	5.404
Run 4	22.15	5.606
Run 5	23.77	5.808
Run 6	25.45	6.01
Run 7	27.19	6.212
Run 8	28.99	6.414
Run 9	30.85	6.616
Run 10	32.76	6.818
Run 11	34.73	7.02
Run 12	36.76	7.222
Run 13	38.84	7.424
Run 14	40.99	7.626
Run 15	43.19	7.828
Run 16	45.44	8.03
Run 17	47.76	8.232
Run 18	50.13	8.434
Run 19	52.56	8.636
Run 20	55.05	8.838
Run 21	57.59	9.04

Figure 5: Parametric table with drag force and velocity.

7.) To plot the parametric table results, use the “plots” menu at the top of the EES screen.

Plots→New Plot Window→X-Y Plot

Choose the corresponding variables and set the proper axis ranges.

Tab Name: Plot 1 Print Description with plot

Description:

X-Axis: F_d , v

Y-Axis: F_d , v

Table: Parametric Table, Table 1

First Run: 1, Last Run: 100

Spline fit
 Automatic update
 Add legend item
 Show array indices
 Show error bars

Line: —, Symbol: None, Color: Auto

OK Cancel

Figure 6: Plot setup window

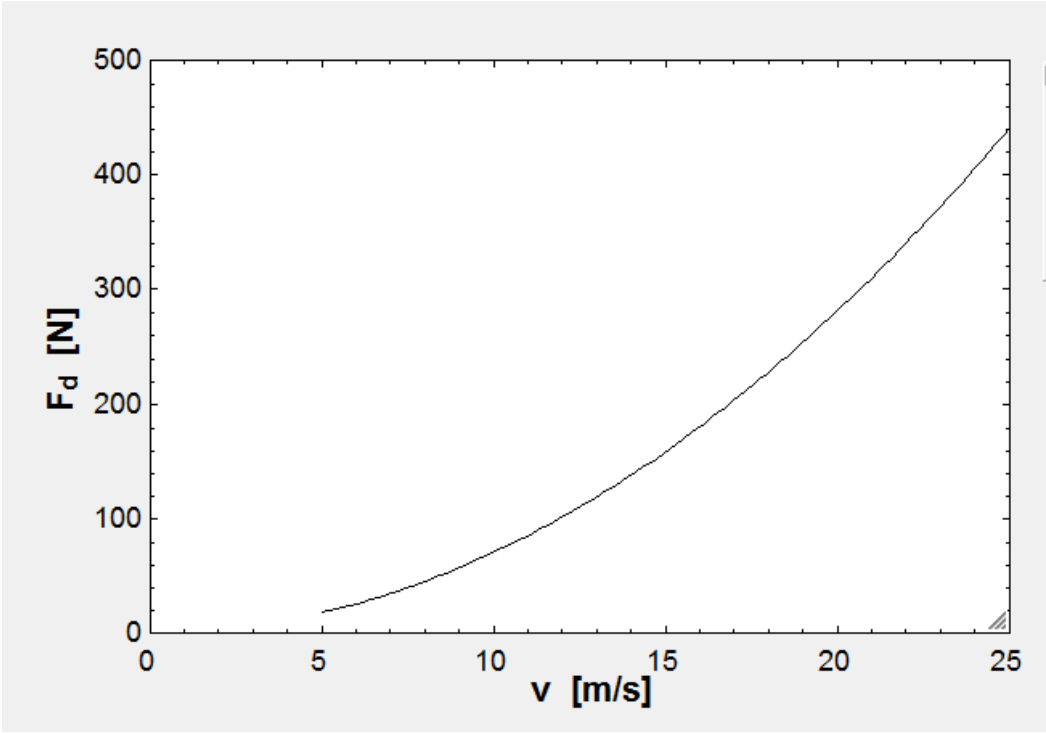


Figure 7: Resulting plot.