

How to use Program FOILFIT 2.01

1. Copy the program in a directory of your choice.
2. Start the program via Windows Explorer.
3. A window opens which provides all program controls. It shows the drive and the open directory from where FOILFIT was started. The files field shows all files in that directory with a .dat extension. Search in the respective windows for the drive, directory, and file name of your .dat file containing the foil and camber offsets. To open drives and directory it needs a double click, to choose the .dat file it needs a single click.
4. In the input file name field the complete filename appears and the same name appears in the output file field except with the name extension .FOI . There are different options to change the output directory and/or the output filename:
 - you may enter 3 digits (101 255) into the digits field. Then the output filename will change to the standard MultiSurf name "Typexxx.FOI" (xxx being the entered digits) while maintaining the input directory.
 - you define a different output directory for the .FOI file by choosing it from the directory window by a double click and then keying 3 digits into the digits field (see above). Then the new output directory with the standard MultiSurf foil .FOI output filename will appear in the output file name field.
 - you may edit the output directory and file name in the output file name field should it be necessary.
5. The number of control points is set to 8. You may change this number if you need in the range from 4 to 20.
6. To start the calculation click the <Start> button. The large screen shows the program and basic I/O information. Clicking on the <Next Screen> button allows to display fitting statistics for foil and camber, the graphic display of the normalized input data and their spline approximation, as well as the list of control point coordinates of foil and camber.
7. Close the program by clicking the <Terminate> button.
8. It is recommended to ensure that in the region settings of your computer the decimal separator is set to decimal point. If it is set to decimal comma, the numbers on the screen as well as in the foil-file appear with decimal comma and the foil file has to be edited with a text editor to change commas to points to make it compatible with the required MultiSurf input format.

Input file (file extension .dat)

The input file is an ASCII text file in three sections:

- (1) The first line is an identifying message for the file.

- (2) The second line is an integer telling how many lines follow.
- (3) The balance of file is data lines.

Each data line needs four numbers, separated by spaces, free format; all four values expressed as % of chord (see example below):

X-position
thickness function ordinate
thickness function delta
camber function

The thickness function delta is an optional correction to the thickness; if there is no correction to make, use zero in this column. In the following example, the .100 trailing edge thickness is removed by using deltas of $.100 (x/c)^4$.

When fitting a symmetric section (no camber), the camber column can be all zeroes. However, the resulting section will have no camber when used as a 5-point foil in MultiSurf, even if its 2nd and 4th control points are unsymmetrically located.

Example input file (0010-65.dat)

data for 0010-65 foil p. 319 w/ 64 mean line p. 385

```
17
0.000 0.000 0.000 0.
1.250 1.467 0.000 0.369
2.500 1.967 0.000 0.726
5.000 2.589 0.000 1.406
7.500 2.989 0.000 2.039
10.000 3.300 0.000 2.625
15.000 3.756 0.000 3.656
20.000 4.089 0.000 4.500
30.000 4.578 -0.001 5.625
40.000 4.889 -0.003 6.000
50.000 5.000 -0.006 5.833
60.000 4.867 -0.013 5.333
70.000 4.389 -0.024 4.500
80.000 3.500 -0.041 3.333
90.000 2.100 -0.066 1.833
95.000 1.178 -0.081 0.958
100.000 0.100 -0.100 0.000
```