

Getting Started with OpenVSP-Connect

1. **Download the Zip-File** from <http://OpenVSP.ProfScholz.de> copy into a folder of your choice (e.g. OpenVSP) and unzip the content into that folder. Now almost everything is ready and you do not need to install anything else.
2. **Understand the significance of the files.** These are the files you will see:

The Zip-File you downloaded containing "OpenVSP-Connect" with proper "OpenVSP" version 2.2.4:

OpenVSP-Connect.zip

The unpacked OpenVSP-Installation (Version 2.2.4)

```
vsp.exe
<DIR> airfoil
<DIR> cabin
<DIR> Defaults
<DIR> fonts
<DIR> fuselage
<DIR> models
<DIR> textures
  BWB_Def.vsp
  VspPreferences.xml
  .vsptime
```

The OpenVSP-Installation (Version 2.2.4) in one Folder (e.g. for separate backup):

```
<DIR> OpenVSP-2.2.4-win32
```

OpenVSP-Connect is essentially one file using the Airbus A320 as example data:

```
OpenVSP-Connect.xlsm
```

If you modify OpenVSP-Connect.xlsm for your work,

you want to maintain the original file with the Airbus A320 data:

```
OpenVSP-Connect_A320.xlsm
```

OpenVSP-Connect prepared this OpenVSP file, double click to see plot:

```
AirbusA320.vsp
```

Other examples prepared with OpenVSP-Connect.xlsm and stored in separate files:

```
OpenVSP-Connect_ATR72.xlsm
```

OpenVSP-Connect prepared this OpenVSP file, double click to see plot:

```
ATR72.vsp
```

```
OpenVSP-Connect_A380.xlsm
```

OpenVSP-Connect prepared this OpenVSP file, double click to see plot:

```
AirbusA380.vsp
```

Documentation of OpenVSP-Connect listed from important to less important:

```
GettingStartedWithOpenVSP-Connect.pdf (this file)
OpenVSP_PRE_CEAS_2013_OpenVSP-Connect_2013-09-16.pdf
Veselin_Pavlov_Airplane-3D-Modeling_with_OpenVSP-Connect.pdf
HAHN-2013_OpenVSPModelingStrategies.pdf
DocumentationOfOpenVSP_2014-04-03.pdf
```

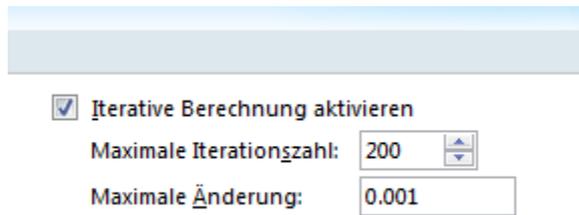
A template file used to hand over input data to OpenVSP-Connect.xlsm

```
MyTool.xlsx
```

3. Set options in Excel

a. Allow iterative calculations in circles

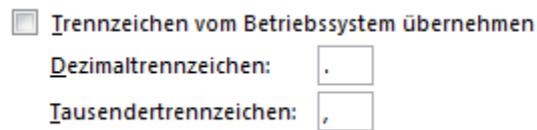
This is required to allow the iterative calculation for double-trapezoidal wings.



The screenshot shows the 'Iterative Berechnung aktivieren' section of the Excel Options dialog box. The checkbox is checked. Below it, 'Maximale Iterationszahl' is set to 200 and 'Maximale Änderung' is set to 0.001.

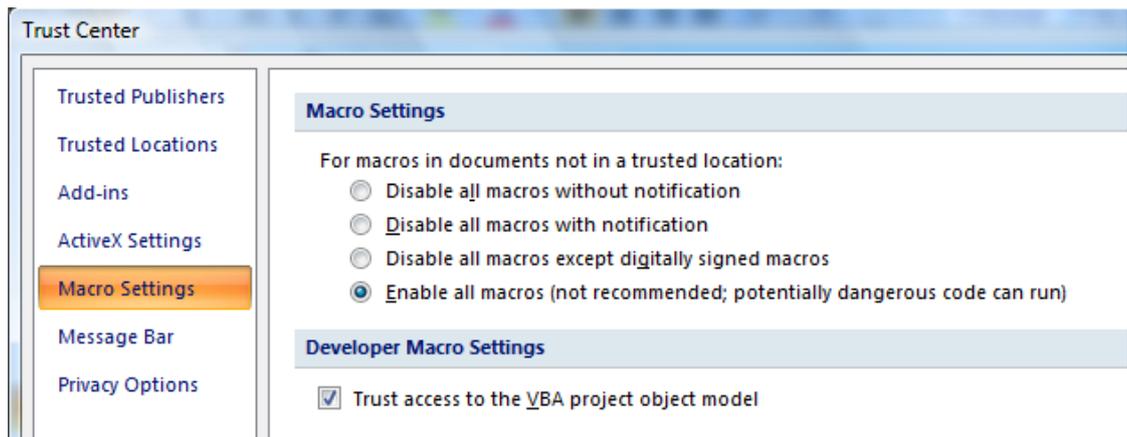
b. Set decimal point (US) instead of decimal comma (German)

This is required to be compatible with OpenVSP



The screenshot shows the 'Trennzeichen vom Betriebssystem übernehmen' section of the Excel Options dialog box. The checkbox is unchecked. Below it, 'Dezimaltrennzeichen' is set to '.' and 'Tausendertrennzeichen' is set to ','.

c. Trust settings: Allow Macros and VBA



The screenshot shows the 'Trust Center' dialog box with the 'Macro Settings' section selected. Under 'For macros in documents not in a trusted location', the 'Enable all macros (not recommended; potentially dangerous code can run)' radio button is selected. Under 'Developer Macro Settings', the 'Trust access to the VBA project object model' checkbox is checked.

4. Check, if OpenVSP works by double clicking on a *.vsp file

An OpenVSP plot window should open. Same view as depicted in 6.

5. Prepare OpenVSP-Connect.xlsm: Enter path to vsp.exe as it appears on your computer!

Input of Aircraft Design Parameters

Enter the results from any aircraft sizing or aircraft conceptual design tool. If data is unknown, use default values as proposed here.

Aircraft Name: AirbusA320

Description: Press "3D-Visualization" to draw the A320. Data was taken from <https://de.wikipedia.org/wiki/Airbus-A320-Familie>. For data unavailable at Wikipedia, default data was used. For other aircraft, "Positions of Aircraft Components" (Part 8) may need to be adapted manually.

1. Action buttons

Automatic Mode	3D Visualization	Tool Chain								
Reset all initial links in the input cells, so that all the necessary parameters can be calculated from Aircraft Design expert knowledge based just on the Number of Passanger, Cruise Mach Number, and the other values boxed in.	Convert your data to an OpenVSP file (*.vsp) and open it in OpenVSP for 3D visualization. --- Ensure that cell marked as OpenVSP_Dir (H10) on the side of this box is Titled correctly.	Load aircraft parameters: 1.) retrieved from literature or 2.) calculated from any Excel-based aircraft sizing tool. --- Ensure that cells marked as MyToolPath (H12) and MyToolName (H13) on the side of								
		<table border="1"> <tr> <td>Path to OpenVSP Executable</td> <td>D:\Homepage\OpenVSP\vsp.exe</td> </tr> <tr> <td>Path to OpenVSP File</td> <td>C:\Users\peter\Documents\AirbusA320.vsp</td> </tr> <tr> <td>Path to your Aircraft Design tool/data</td> <td>D:\Homepage\OpenVSP</td> </tr> <tr> <td>Name of your Aircraft Design tool/data</td> <td>MyTool.xlsx</td> </tr> </table>	Path to OpenVSP Executable	D:\Homepage\OpenVSP\vsp.exe	Path to OpenVSP File	C:\Users\peter\Documents\AirbusA320.vsp	Path to your Aircraft Design tool/data	D:\Homepage\OpenVSP	Name of your Aircraft Design tool/data	MyTool.xlsx
Path to OpenVSP Executable	D:\Homepage\OpenVSP\vsp.exe									
Path to OpenVSP File	C:\Users\peter\Documents\AirbusA320.vsp									
Path to your Aircraft Design tool/data	D:\Homepage\OpenVSP									
Name of your Aircraft Design tool/data	MyTool.xlsx									

2. Requirements

Number of Passangers	n_p	150 [-]
Cruise Mach Number	M_{CR}	0.78 [-]

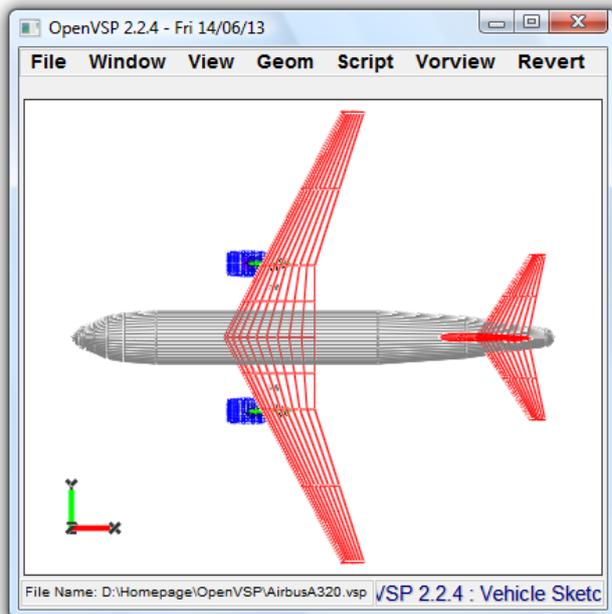
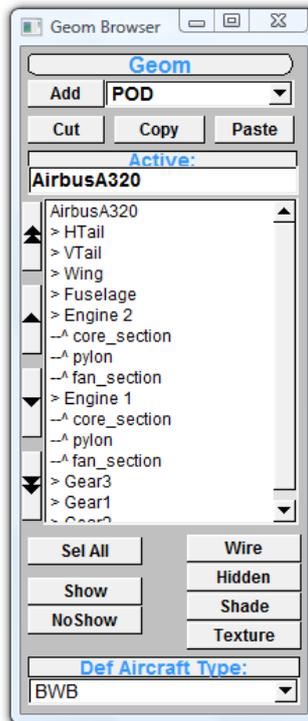
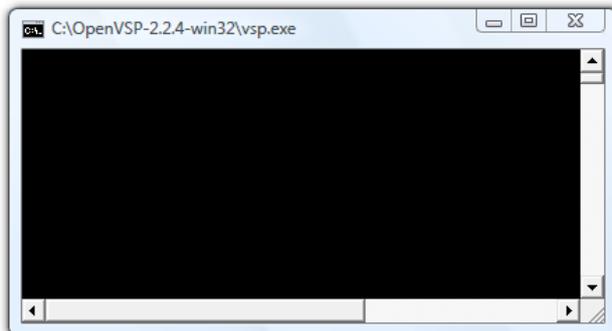
Max. Operating Mach Number M_{MO} 0.820 [-] Mach

6. Check, if OpenVSP-Connect works together with Open: Click on buttonm "3D Visualization" !

OpenVSP Command Window (do not bother)

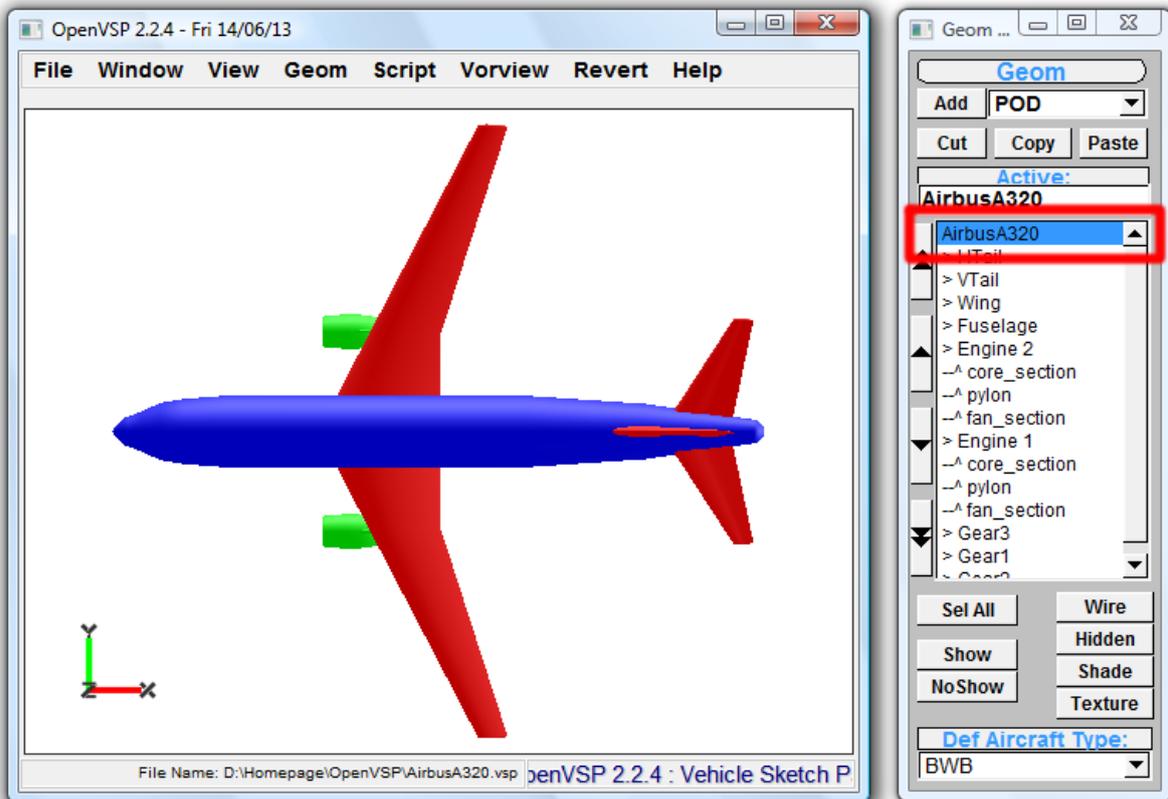
OpenVSP Geometry Editor

You will change the geometry by means of OpenVSP-Connect!

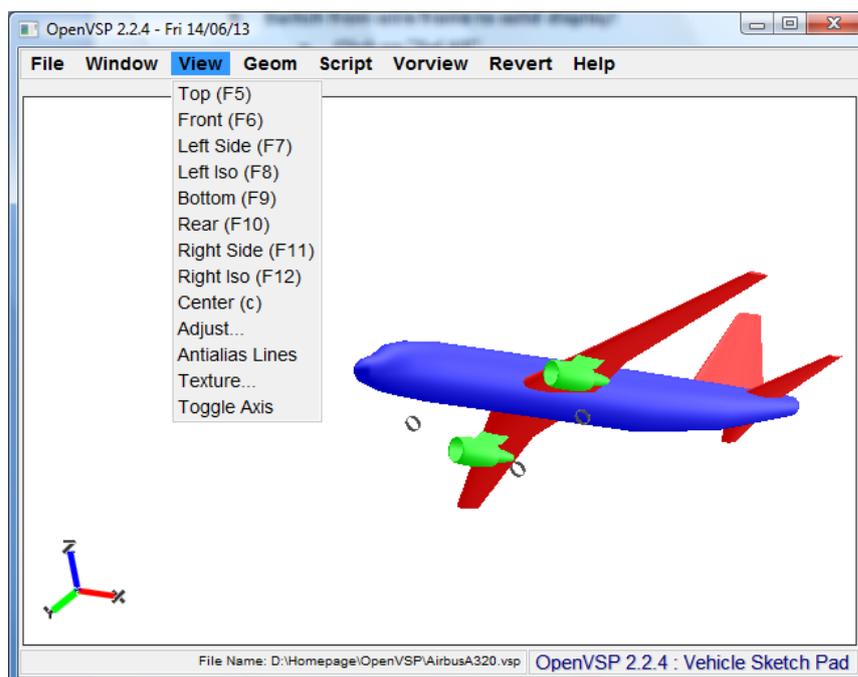


7. Switch from wire frame to solid display!

- a. Click on "Sel All"
- b. Click on "Shade"
- c. Click on the main component (here: Airbus A320) to deselect all components
- d. You see the aircraft as a solid body!

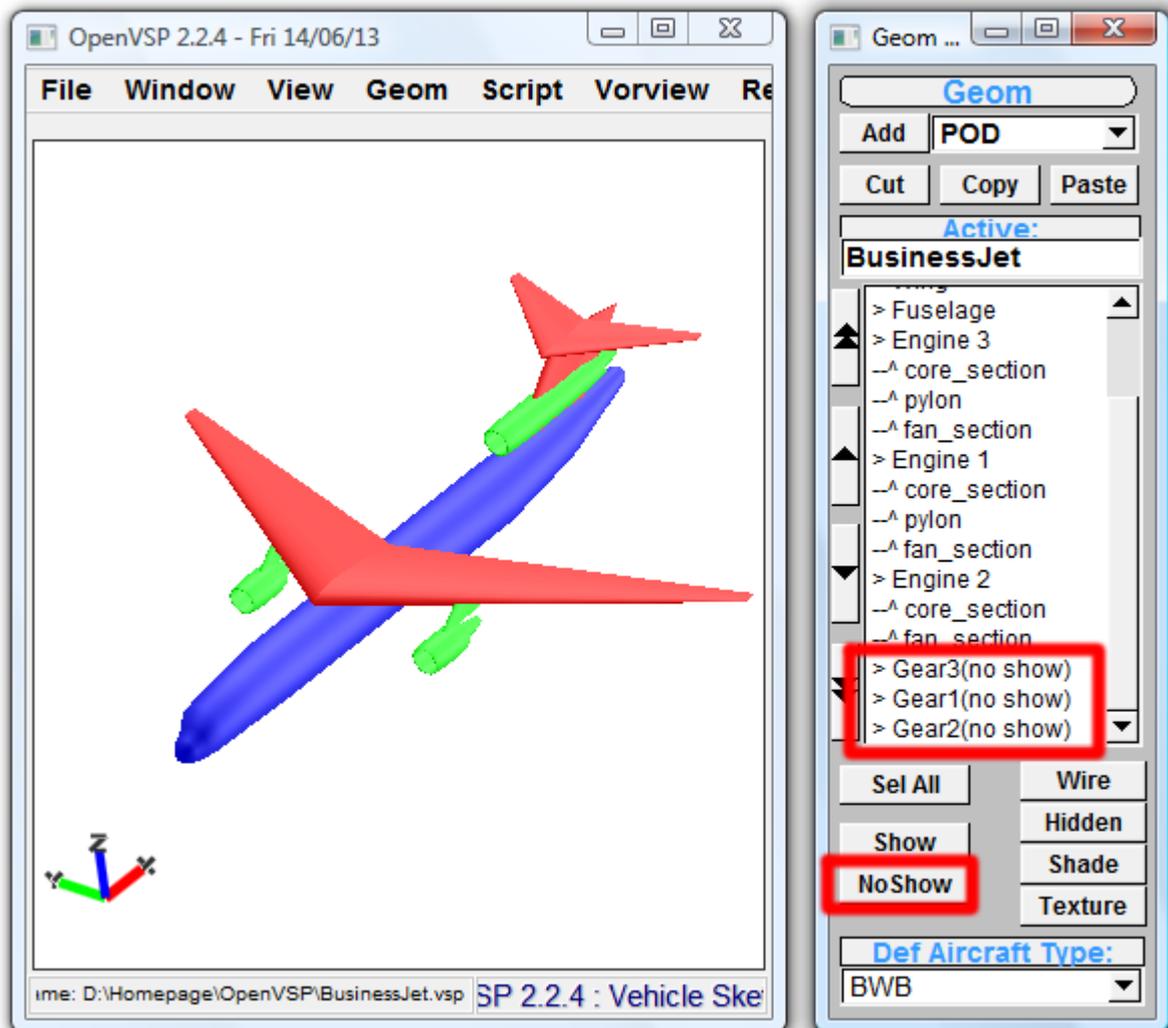


8. Play with different views from menu "View"! Move the aircraft with your cursor!

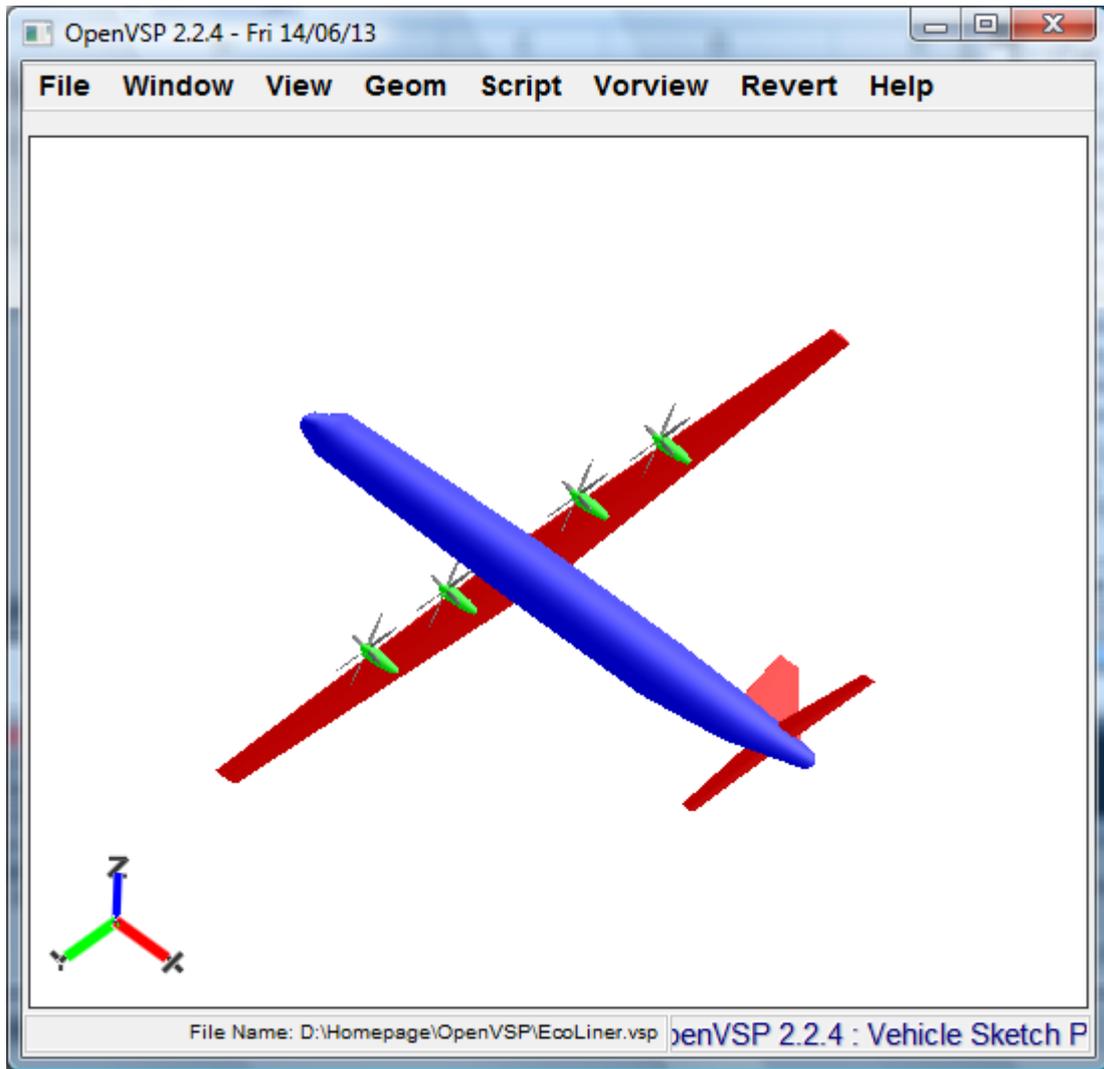


9. Design your own aircraft in "Automatic Mode"!

- a. Click on "Automatic Mode" to initiate all default settings
- b. Enter Number of Passengers (n_p) and Cruise Mach Number (M_{CR})
- c. After each change of parameters click on "3D Visualization" to check out your aircraft



Example of a quick aircraft design: Fast commuter for 90 passengers, cruise Mach number 0.9, high wing, T-tail, 3 engines, landing gear retracted (Now Show). 3D visualization based on free rotation of the aircraft in OpenVSP plot window.



Example of a quick aircraft design: Eco efficient slow medium range aircraft for 200 passengers, cruise Mach number 0.5, high wing, conventional tail, 4 turboprop engines with extra large propellers (for high propeller efficiency), high aspect ratio wing (aspect ratio: 20), landing gear retracted (Now Show). 3D visualization based on free rotation of the aircraft in OpenVSP plot window.

10. Input of data from another Excel file (filled with literature data or with data from aircraft design tool)

Tool Chain	
Load aircraft parameters: 1.) retrieved from literature or 2.) calculated from any Excel-based aircraft sizing tool. --- Ensure that cells marked as MyToolPath (H12) and MyToolName (H13) on the side of	Path to OpenVSP Executable
	Path to OpenVSP File
	Path to your Aircraft Design tool/data
	Name of your Aircraft Design tool/data
	D:\Homepage\OpenVSP\wsp.exe
	D:\Homepage\OpenVSP\EcoLiner.vsp
	D:\Homepage\OpenVSP
	MyTool.xlsx

MyTool.xlsx - Microsoft E

Start Einfügen Seitenlayout Formeln Daten Überprüfen Ansicht Entwicklertools Add-

Einfügen

Calibri 11

Schriftart

Ausrichtung

Standard

Zahl

Bedingte Formatierung

A2

	A	B	C	D	E	F	G
1	Transfer File for Data from ANY Aircraft Design Tool to OpenVSP-Connect						
2							
3		Name_aircraft	AirbusA320				
4	basics	n_p	150				
5		M_CR	0.78				
6							
7		Type_e	jet				
8		n_e	2				
9			Type: propeller		Type: jet		
10	engine	P_TO	7965.665	T_TO	236		
11		n_b.p	6	d_e.j	1.643		
12		d_e.p	1.643	l_e.j	2.999		
13		l_e.p	2.892	cowl_cover	50		
14		d_e.p.r	3.172				
15							
16		Type_W	Double-trapezoidal				
17		S_W	122.6				
18		A_W	9.396				
19		phi_25.W.o	25				

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