

ADS V4

User's Manual

Part X

Toolbox

Rev A
May 29, 2020

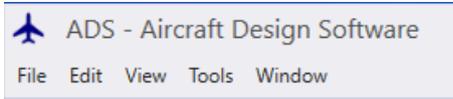


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1. Introduction

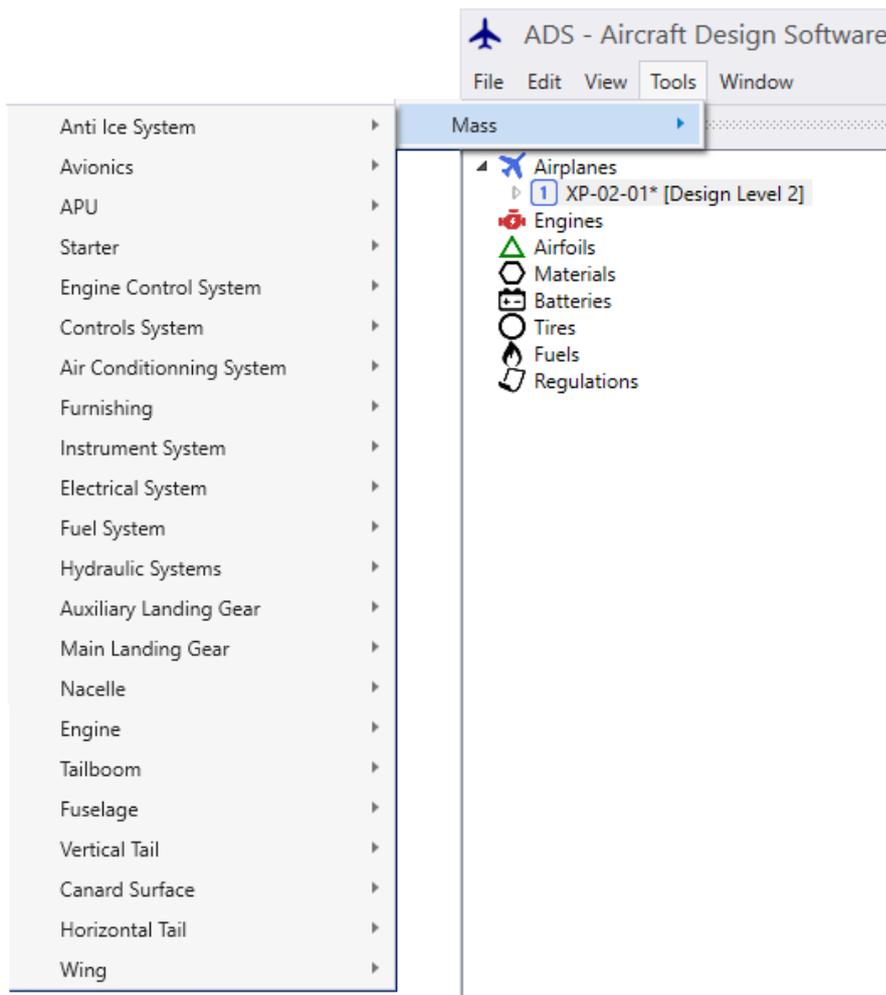
The Toolbox is accessible from the Top Menu by clicking on Tools



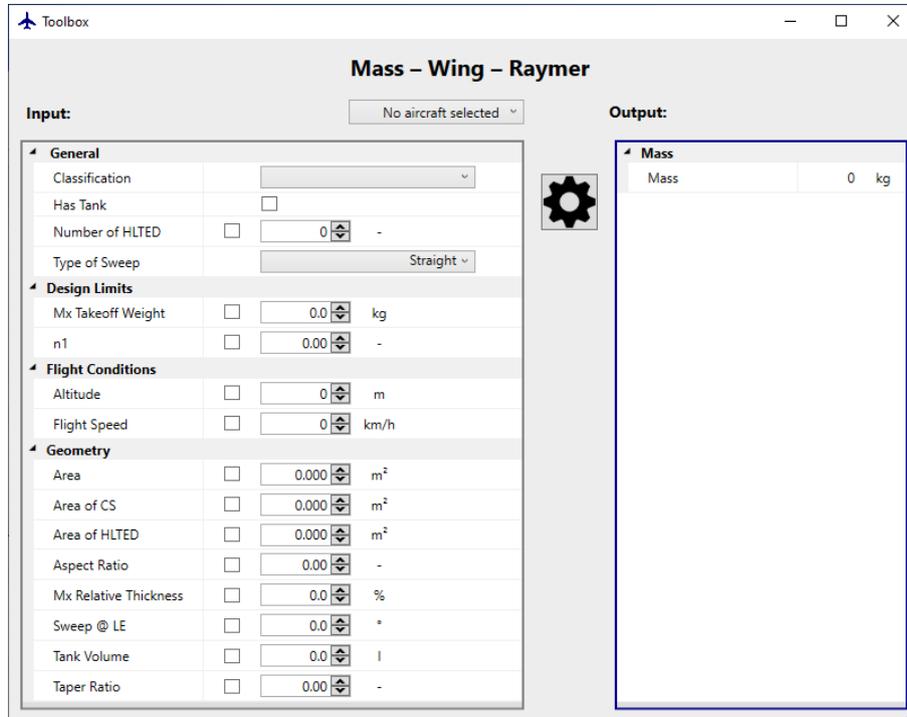
2. Mass

The Tool Mass will be used to compute the mass of a given item according to a given method.

1. Select one item in the list
2. Then select one method



Once the element and method have been selected, the form is displayed. You can either fill in all the fields or select an aircraft from the list. The list contains all the planes that have been loaded in the current session.



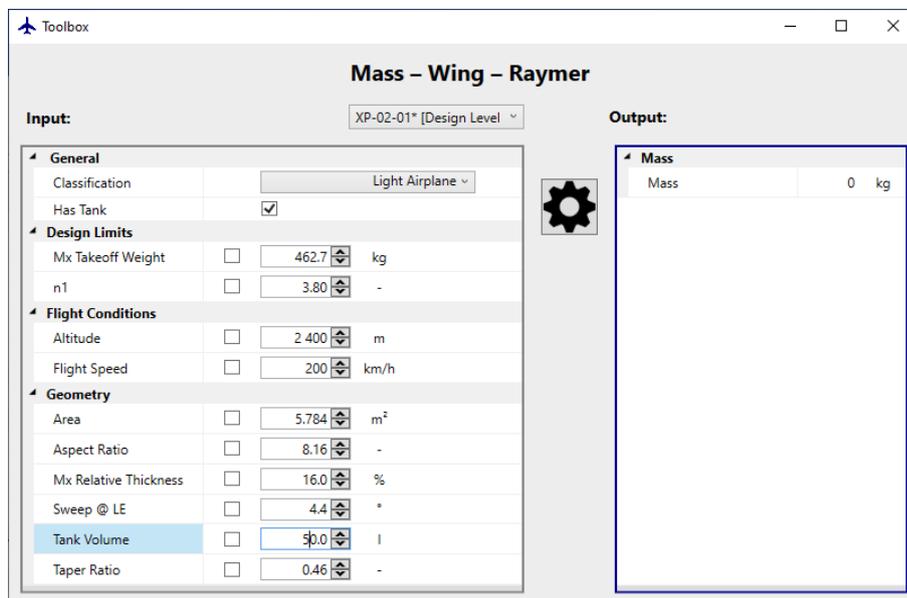
Toolbox - □ ×

Mass – Wing – Raymer

Input: No aircraft selected **Output:**

General		
Classification	<input type="text"/>	
Has Tank	<input type="checkbox"/>	
Number of HLTED	<input type="text" value="0"/>	-
Type of Sweep	<input type="text" value="Straight"/>	
Design Limits		
Mx Takeoff Weight	<input type="text" value="0.0"/>	kg
n1	<input type="text" value="0.00"/>	-
Flight Conditions		
Altitude	<input type="text" value="0"/>	m
Flight Speed	<input type="text" value="0"/>	km/h
Geometry		
Area	<input type="text" value="0.000"/>	m ²
Area of CS	<input type="text" value="0.000"/>	m ²
Area of HLTED	<input type="text" value="0.000"/>	m ²
Aspect Ratio	<input type="text" value="0.00"/>	-
Mx Relative Thickness	<input type="text" value="0.0"/>	%
Sweep @ LE	<input type="text" value="0.0"/>	°
Tank Volume	<input type="text" value="0.0"/>	l
Taper Ratio	<input type="text" value="0.00"/>	-

Mass	
Mass	0 kg



Toolbox - □ ×

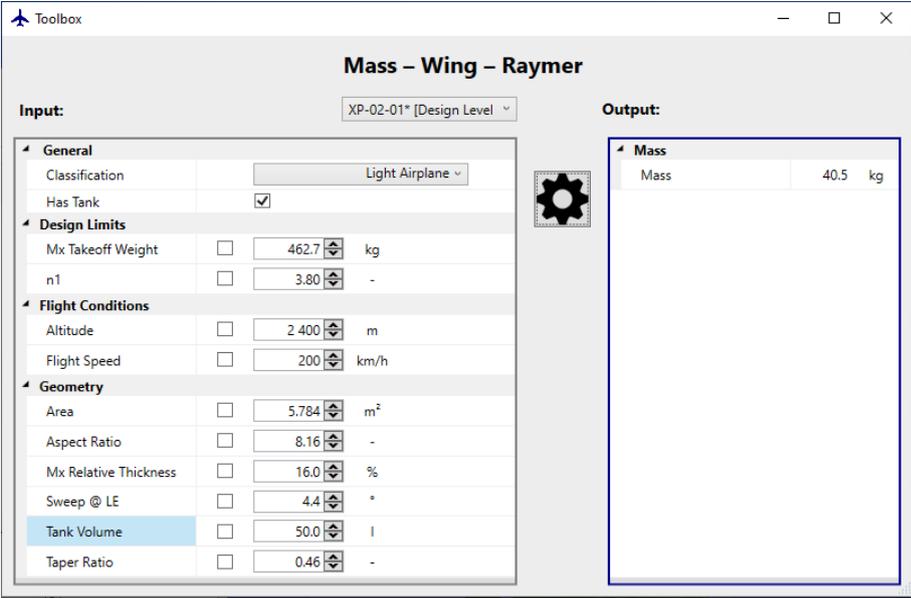
Mass – Wing – Raymer

Input: XP-02-01* [Design Level] **Output:**

General		
Classification	<input type="text" value="Light Airplane"/>	
Has Tank	<input checked="" type="checkbox"/>	
Design Limits		
Mx Takeoff Weight	<input type="text" value="462.7"/>	kg
n1	<input type="text" value="3.80"/>	-
Flight Conditions		
Altitude	<input type="text" value="2 400"/>	m
Flight Speed	<input type="text" value="200"/>	km/h
Geometry		
Area	<input type="text" value="5.784"/>	m ²
Aspect Ratio	<input type="text" value="8.16"/>	-
Mx Relative Thickness	<input type="text" value="16.0"/>	%
Sweep @ LE	<input type="text" value="4.4"/>	°
Tank Volume	<input type="text" value="50.0"/>	l
Taper Ratio	<input type="text" value="0.46"/>	-

Mass	
Mass	0 kg

Once all the fields have been completed, click on  to perform the calculation.



The screenshot shows a software window titled "Mass - Wing - Raymer" with a "Toolbox" icon in the top left and standard window controls in the top right. The window is divided into "Input" and "Output" sections. A gear icon is located between the two sections.

Input: XP-02-01* [Design Level]

Category	Parameter	Value	Unit
General	Classification	Light Airplane	
	Has Tank	<input checked="" type="checkbox"/>	
Design Limits	Mx Takeoff Weight	462.7	kg
	n1	3.80	-
Flight Conditions	Altitude	2 400	m
	Flight Speed	200	km/h
Geometry	Area	5.784	m ²
	Aspect Ratio	8.16	-
	Mx Relative Thickness	16.0	%
	Sweep @ LE	4.4	°
	Tank Volume	50.0	l
	Taper Ratio	0.46	-

Output:

Parameter	Value	Unit
Mass	40.5	kg

By checking the check boxes located on the left side of the form, you can do several calculations in a line and thus perform a sensitivity analysis. You can select just one check box or all the check boxes. The range of variation may be defined. It's advised to limit the range to a few percent.

After having clicked on click on , the results are presented in a table and displayed in a graph

	0 Mass Wing (kg)	1 Mx Relative Thickness (%)	2 Mass Wing (kg)	3 Area (m ²)
1	44.2	12	32.6	4.338
2	43.3	12.8	34.2	4.627
3	42.5	13.6	35.8	4.916
4	41.8	14.4	37.4	5.206
5	41.1	15.2	39	5.495
6	40.5	16	40.5	5.784
7	39.9	16.8	42	6.073
8	39.4	17.6	43.5	6.363
9	38.8	18.4	45	6.652
10	38.3	19.2	46.5	6.941
11	37.9	20	48	7.23

