REVERIE

Universal 225mm Chord Carbon Rear Wing

The 1700mm data given was produced by Ansys CFD-Flo software, all other widths have been calculated only using the wing width approximation formula found in our FAQ document.

On single element 225mm & 150 mm wings the end plate 'notch' was incorporated to increase the wing's efficiency by beneficially modifying the airflow around the wing tips'.

Specification:

Two universal fit designs are available. A straight design & a curved design with a 1600mm radius (chosen to suit Lotus Elise type models).

The wings feature internal longitudinal stringers and end spars with 2x M6 threaded inserts, for mounting between supports or for affixing end plates.

The wings come ready to mount, either between supports on the end spars, or underside mounted (double or single shear) using the supplied carbon fibre support tabs (to be bonded and riveted in the required position).

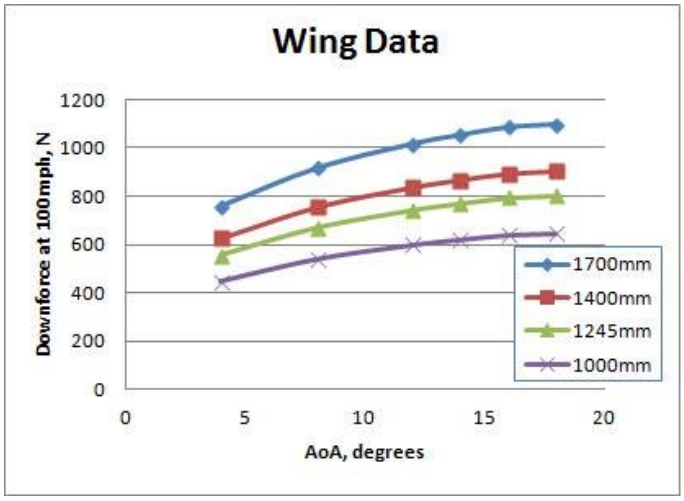
Calculated forces at different spans and angles, taking into account efficiencies at different spans
Air speed 44.7m/s (100mph) freestream.

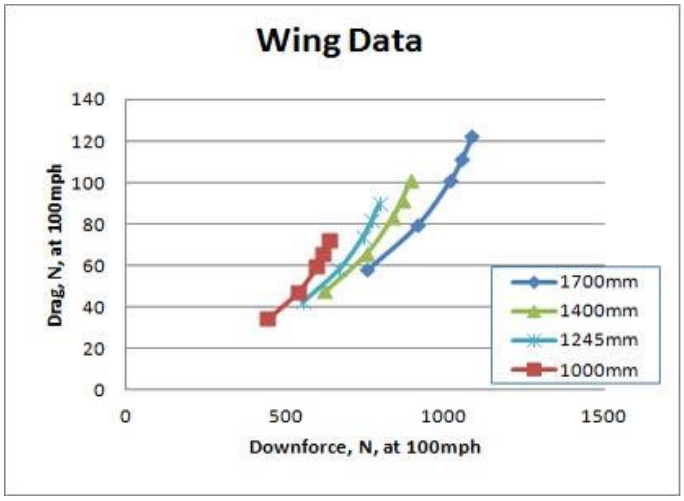
*** Data marked in red show that the wing has either stalled or was close to stalling and has been omitted from the graphs ***

	1000mm Wingspan				1245mm Wingspan			
AoA	**Downforce (N)**	**Drag (N)**	**L/D**	**BHP Absorbed**	**Downforce (N)**	**Drag (N)**	**L/D**	**BHP Absorbed**
4	446	34	13.1	2.0	556	42	13.1	2.5
8	539	47	11.5	2.8	670	58	11.5	3.5
12	598	59	10.1	3.5	744	74	10.1	4.4
14	620	66	9.5	3.9	771	82	9.5	4.9
16	639	72	8.9	4.3	795	90	8.9	5.3
	1400mm Wingspan				**1700mm Wingspan**			
AoA	**Downforce (N)**	**Drag (N)**	**L/D**	**BHP Absorbed**	**Downforce (N)**	**Drag (N)**	**L/D**	**BHP Absorbed**
4	625	48	13.1	2.8	759	58	13.1	3.5
8	754	66	11.5	3.9	915	80	11.5	4.7
12	837	83	10.1	4.9	1016	101	10.1	6.0
14	867	92	9.5	5.5	1053	111	9.5	6.6
16	894	101	8.9	6.0	1086	122	8.9	7.3

Reverie Ltd, Unit 2 Chandlers Row, Colchester,
Essex, CO1 2HG, UK
Email: sales@reverie.ltd.uk
Tel: 0044 (0)1206 866663

www.reverie.ltd.uk





Effect of Endplates on 225mm Single Element Rear Wing Forces

Single Element
Runs at AoA = 16°
Wingspan = 1800mm
Air Speed = 44.7m/s (100mph)

	Downforce (N)	Drag (N)	L/D
Conventional Endplate	1014.6	200.1	5.07
Notched Endplate Design	937.2	161.9	5.79

Tuning Advice

The maximum angle of attack with this wing in free-stream air is 16°, although this may be different when mounted on a car. However, quite substantial downforce at greater efficiency levels (L/D) is given at more modest angles of 4° and 8°. Forces increase with span width, as per tables above. The rises in the forces at speed are in line with the square of the velocity increase. Therefore, to calculate forces at different speeds within the range bracketed here, simply multiply by the square of the ratio of the speeds in question. Below 100mph some caution should be used when applying this square law, but approximations of forces down to around 60mph or 70mph will be valid.

To Scale a Force to a Different Speed:

We will use the Notched end plate design figure at 100MPH from above. Then scale it to 150MPH.

New Force (N) = Original Force (N) x (New Speed^2 (MPH) ÷ Data Speed^2 (MPH))
New Force = 937.2 x ((150 x 150) ÷ (100 x 100))
New Force = 937.2 x 2.25
New Force = 2108.7

A 5mm Gurney appears to add an efficient increment of downforce, as expected. As a guide the 1800mm span wing with a Gurney at 12° produces similar downforce and less drag than it does at 16° without a Gurney. Thus, as a general rule, it may be valid to assume that it is better to use a small Gurney and keep to 12° as a maximum working angle. All the results obtained were from evaluations in free-stream air, with horizontal onset flow to the wing. This is obviously not representative of the onset flow on the back of a car. Nevertheless, the generic findings of this project should be valid.

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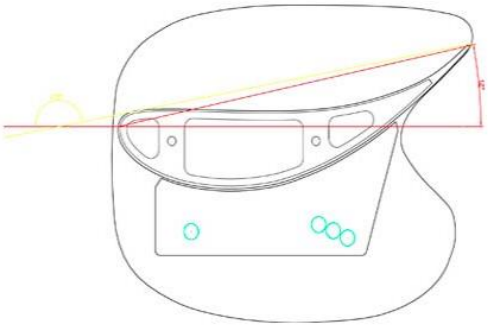
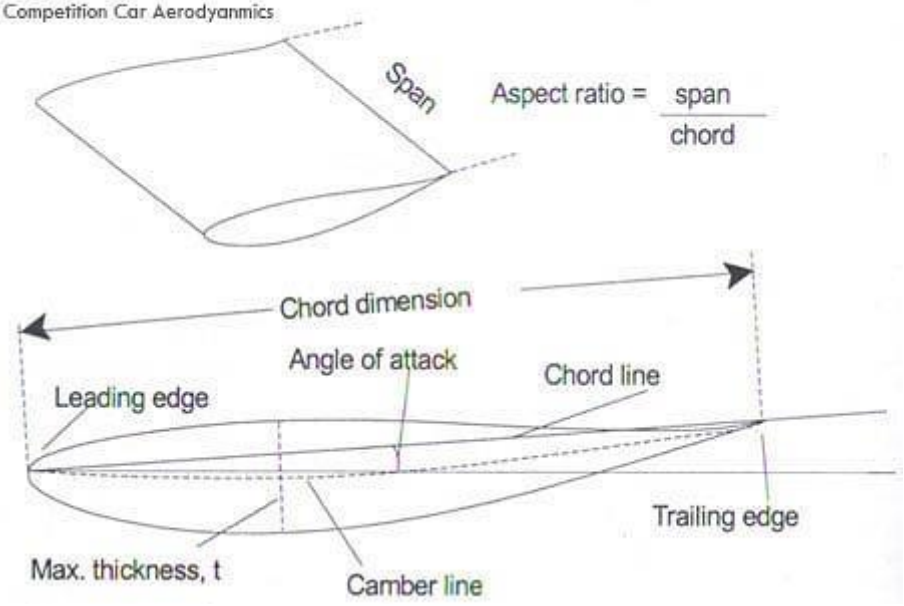
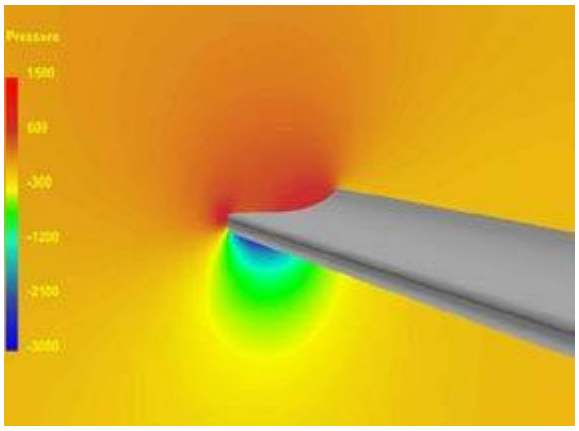


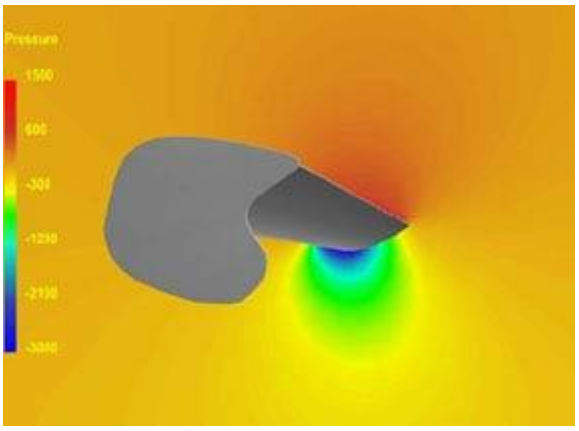
225mm Chord wing cross section showing internal longitudinal supports.

Figure 5-1 *Wing terminology.*

Image courtesy of Simon McBeath
Competition Car Aerodyanmics







ORDERING INFORMATION

Specify straight or curved profile and required span width when ordering. The wing comes supplied with support tabs, rivets and adhesive for post or pillar mounting. Alternatively the end plates can be removed & the wing mounted between wing uprights. Also specify any special end-mount fixing details when ordering.

You may also like to order the optional 5mm or 10mm high gurney flaps. These can improve the lift / drag performance and reduce the onset of stall at higher angles of attack. These can be bonded on with adhesive or in some cases a high strength double-sided tape with suitable surface preparation. These can be purchased at a later date if required. Replacement end plates are also available separately.