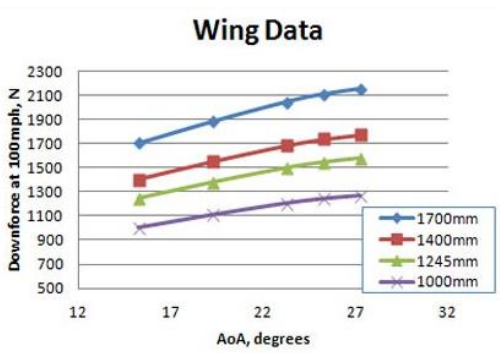
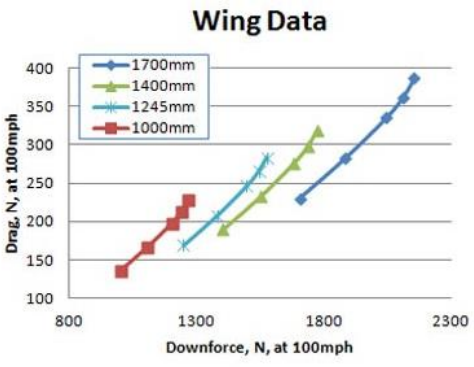
Universal Dual-Element 225mm + 110mm Chord Carbon Rear Wing

Designed by Aerodynamics writer and designer Simon McBeath (author of Competition Car Aerodynamics) for Reverie Ltd and analysed using Ansys CFD-flo software. Data and images generated by the CFD software are displayed below. The wing profile was designed to give a range of downforce levels from moderate to reasonably high, depending on deployed angle of attack and chosen span. 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. The rear wings feature internal longitudinal stringers along the length and end spars with 2 x M6 and 2 x M5 threaded inserts for mounting between supports or for affixing end plates. *** 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				1000mm Wingspan			
AoA	**Downforce (N)**	**Drag (N)**	**L/D**	**BHP Absorbed**	**Downforce (N)**	**Drag (N)**	**L/D**	**BHP Absorbed**
15.24	1003	136	7.4	8.1	1248	169	7.4	10.1
19.24	1108	166	6.7	9.9	1379	207	6.7	12.3
23.24	1203	198	6.1	11.8	1497	246	6.1	14.7
25.24	1240	213	5.8	12.7	1544	265	5.8	15.8
27.24	1266	228	5.6	13.6	1577	284	5.6	16.9
29.24	1265	238	5.3	14.2	1576	296	5.3	17.6
	1400mm Wingspan				**1700mm Wingspan**			
AoA	**Downforce (N)**	**Drag (N)**	**L/D**	**BHP Absorbed**	**Downforce (N)**	**Drag (N)**	**L/D**	**BHP Absorbed**
15.24	1404	190	7.4	11.3	1705	231	7.4	13.7
19.24	1551	233	6.7	13.9	1883	283	6.7	16.9
23.24	1684	277	6.1	16.5	2044	336	6.1	20.0
25.24	1736	298	5.8	17.8	2108	362	5.8	21.6
27.24	1773	319	5.6	19.0	2153	387	5.6	23.1
29.24	1772	333	5.3	19.8	2152	404.3	5.3	24.1





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Tuning Advice:

The recommended maximum angle of attack with this wing in free stream air is 20^{O}, although this may be different when mounted on a car.

Forces increase with span width as per tables above.

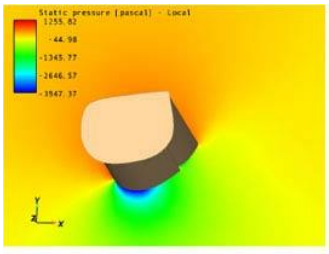
The rise in the forces at speed are in line with the square of the velocity increase. Thus, to calculate forces at different speeds within the range bracketed here simply multiply by the square of the ratio of the speeds in question. Below 100mph some caution should be used when applying this square law, but approximations of forces down to perhaps 60mph or 70mph will be valid.

To Scale a Force to a Different Speed:

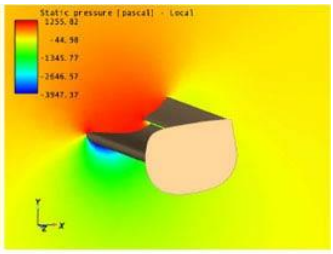
We will use the Notched end plate design figure at 100MPH from above. Then scale it to 150MPH.

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

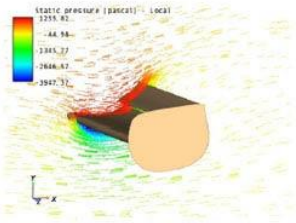
A 5 or 10mm Gurney flap could be added to the rear flap to further add a reasonably efficient increment of down force. All the results obtained were from evaluations in free stream air, with horizontal onset flow to the wing. is obviously not representative of the onset flow on the back of a car. Nevertheless, the generic findings of this project should be valid pressure distribution along the wing centreline Pressure distribution along the wing centreline Velocity vectors, coloured by static pressure, along the wing centreline over upper & lower surfaces of the wing.

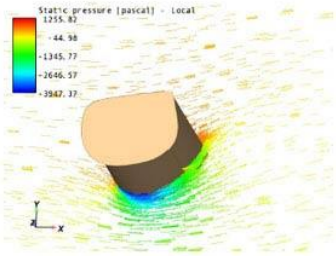


Pressure distribution along the wing centreline

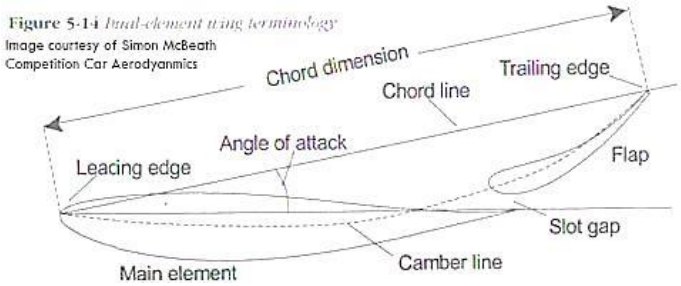


Pressure distribution along the wing centreline





Velocity vectors, coloured by static pressure, along the wing centreline over upper & lower surfaces of the wing.



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.

Tested with flap nose to trailing edge main plane overlap 20mm and slot height 12.5mm. This relationship can be changed upon request for packaging or performance as you require.

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Different style end plates shown, we can make to your design if required

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