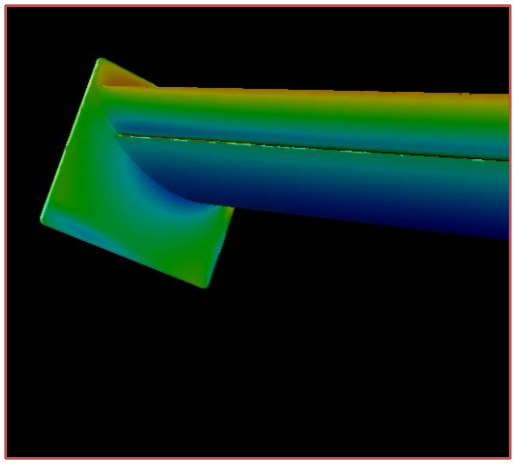
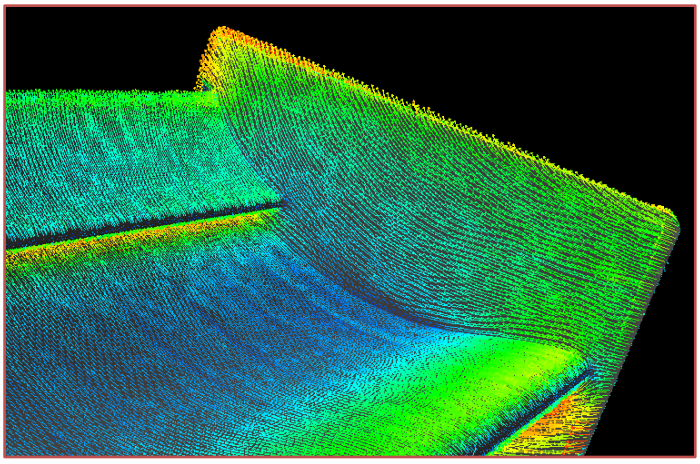
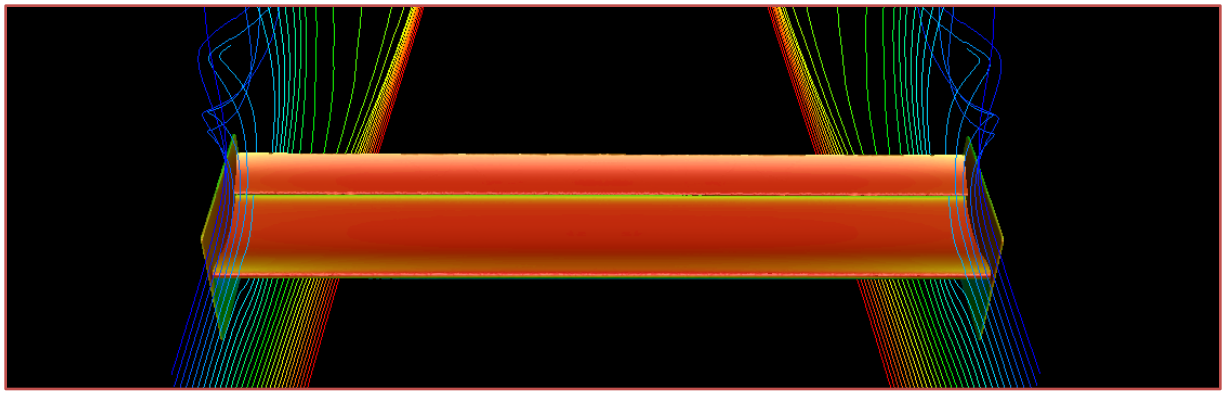
9100/9202 Dual Element Wing

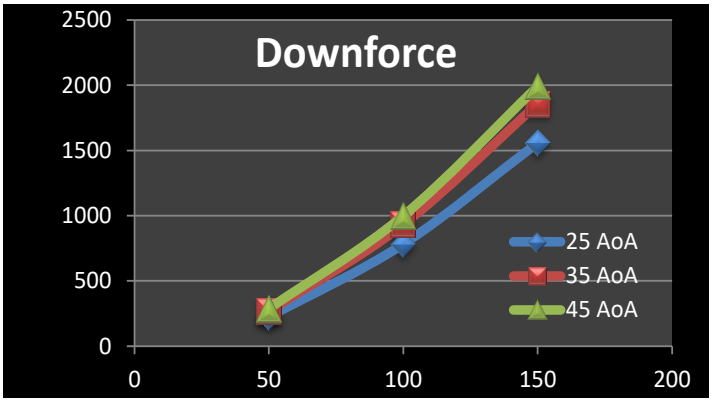
The Zebulon/HRP 9100 wing is a 13” cord designed using a proprietary quantitative process, validated and refined in CFD. Design objectives for this profile were to generate a high Lift to Drag ratio in both clean and turbulent airflows, making it ideal for GT and many other applications. When combined with our 9202 3.5” flap profile, the assembly can produce over 2,000 lbs of downforce at 150 mph in its widest span of 78”. Below data is reported for a 74” span assembly with flat rectangular endplates, with the mainplane installed at zero Angle of Attack (AoA) and flap AoA’s are relative to mainplane angle. A reduction in downforce and drag can be had by reducing the overall assembly’s AoA. The 9100 profile is delivered with CNC machined CFD designed bolt on mounts or can be mounted in a swan neck arrangement. Vortex disbursing endplates can also be added to maximize assembly performance.



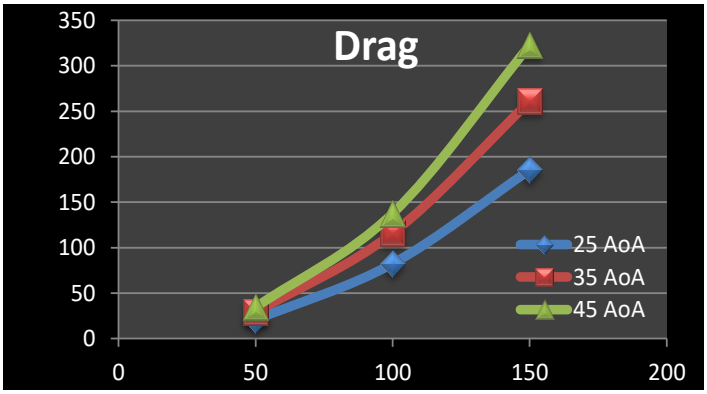




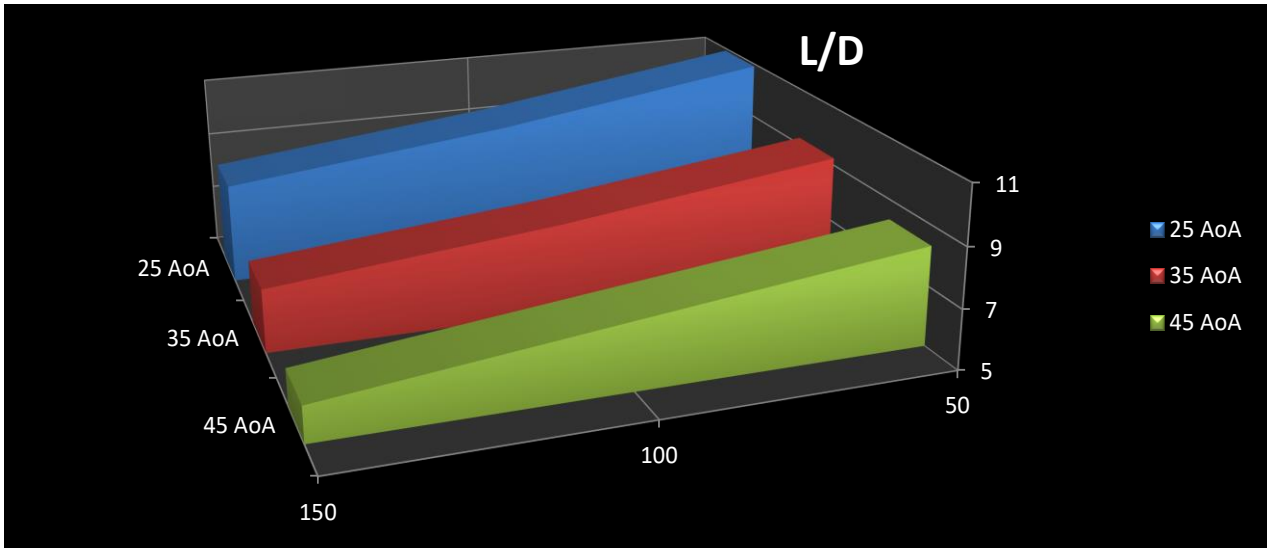
Downforce			
	Speed		
Flap AoA	50	100	150
25 AoA	224.69	782.42	1558.82
35 AoA	267.78	932.46	1857.74
45 AoA	287.08	999.66	1991.62



Drag			
	Speed		
Flap AoA	50	100	150
25 AoA	20.61	82.42	185.45
35 AoA	28.98	115.92	260.82
45 AoA	34.41	137.64	322.50

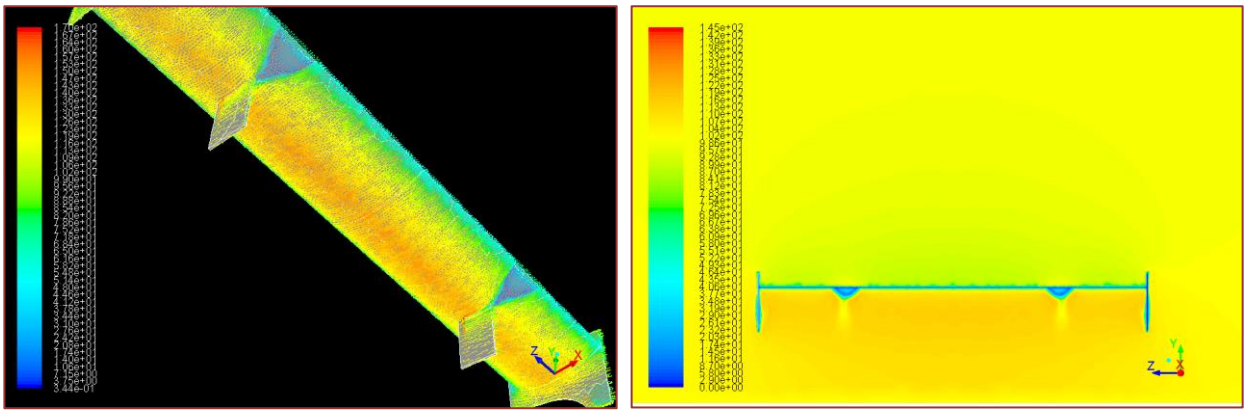


L/D			
	Speed		
Flap AoA	50	100	150
25 AoA	10.90	9.49	8.41
35 AoA	9.24	8.04	7.12
45 AoA	8.34	7.26	6.18

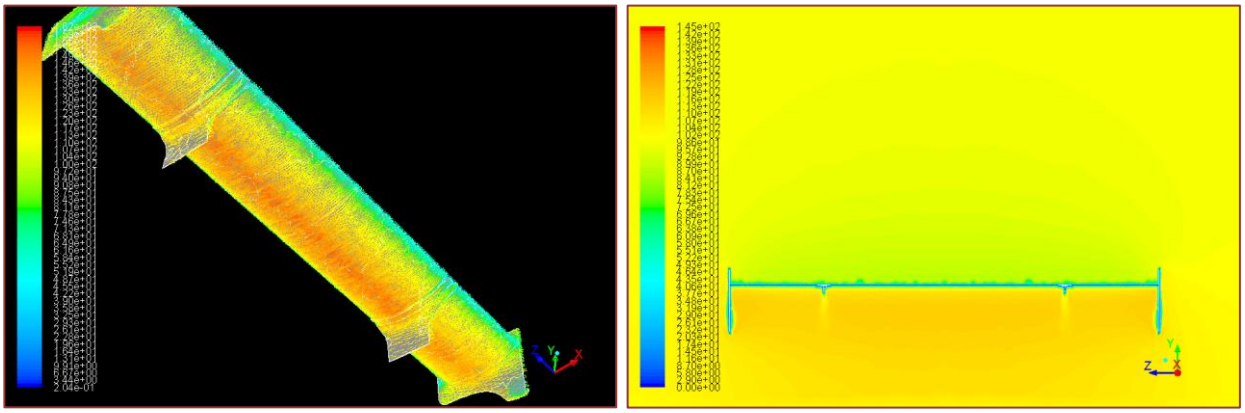


In addition to a high efficiency design, the 9100 mounts are designed to reduce mount-induced airflow separation from the suction surface of the wing profile. This mount style is not designed to replace a swan neck mount in efficiency, but to get much closer to a swan neck style mounts performance. Please see velocity vectors on the left, and flow velocity plots at the trailing edge of the wing on the right.

Traditional Mounts



Zebulon/HRP Mounts



Mount induced flow separation can reduce wing effectiveness by 10% at low angles of attack, and nearly 25% at high angles of attack. By reducing these flow separations, the wing is functioning near its full efficiency.