OPTIMIZATION OF DIAMOND D-JET VERY LIGHT JET
FACILITATED BY *SCULPTOR* DESIGN RECOMMENDATION

Diamond Aircraft Industries, one of the world's premier producers of single and twin-engine propeller aircraft and single-engine jet aircraft, is currently developing a single-engine Very Light Jet (VLJ), the "D-Jet". During the development phase, a suite of advanced Computational Fluid Dynamics (CFD) technologies is applied in order to speed up the engineering process.

Optimal Solutions, with the use of its unique ***Sculptor*** real-time CFD design deformation technology, teamed up with ANSYS, Inc., a global innovator of simulation software and technologies, and used that Company's FLUENT® software to assist in the CFD optimization of the wing and nacelle of the D-Jet. The study culminated in a proprietary recommendation to Diamond that projects a significant improvement to wing/nacelle interference and stall characteristics.

"Using Sculptor, we rapidly found solutions to problems that had eluded us for some time. The 2nd flying D-Jet prototype incorporates lessons learned from the Sculptor optimization

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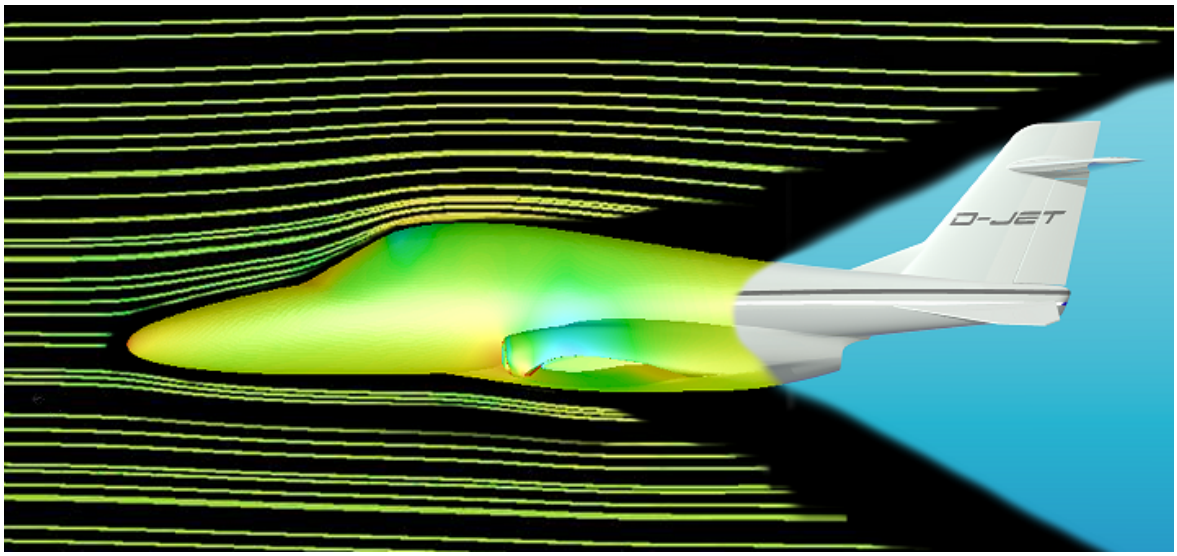

DESIGN PROCESS

Sculptor was used to deform the Baseline meshed geometry into new FLUENT® case files for solving. A brief description of the process follows:

The Baseline mesh was read into ***Sculptor***, after which the engineer created an Arbitrary Shape Deformation (ASD) volume around the geometry that was to be deformed. The control points of the ASD were positioned and aligned to give the desired deformations. The ASD volume was then "frozen". After the volume was frozen, the engineer moved the control points, and the meshed geometry deformed accordingly.

Additionally, optimization algorithms may be employed to automatically move the control points to achieve automatic shape optimization. For this study, a total of five different ASD volumes were created to explore a variety of ways of deforming the Baseline, as shown below.