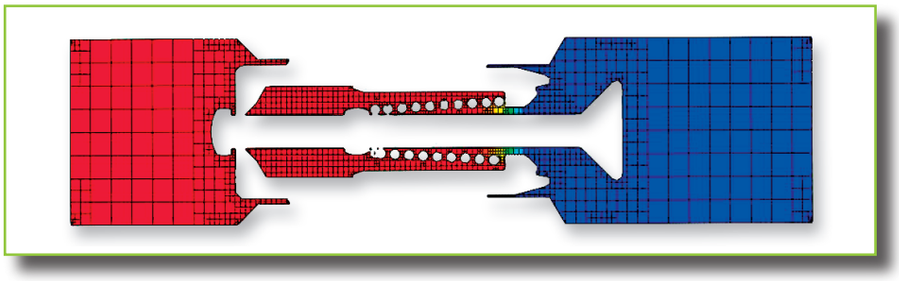
# FloEFD$^{V5}$ for CATIA Helps Ventrex Save Four Months

**MECHANICAL ANALYSIS**
**Engineering Fluid Dynamics**



### Design Challenge

New environmentally friendly CO2 based automotive air conditioning systems operate at pressures 7 to 10 times higher than previous generation systems. This makes it necessary to reduce the pressure drop of the valves used to evacuate and charge the system to enable the required flow rates. But reducing the pressure drop of valves is challenging because of the complexity of internal flow passages caused by the presence of components used to open and close the valve.

The build and test method is time-consuming and expensive and the test results do not provide diagnostic information that help engineers determine whether or not the design change had the intended effect. Computational Fluid Dynamics (CFD) simulation is promising but traditional CFD codes require the user to have a deep understanding of the computational aspects of fluid dynamics in order to be certain of obtaining accurate results.

### Solution and Results

Ventrex Automotive GmbH engineers simulated the performance of their new CO2 valve by taking advantage of FloEFD$^{V5}$ CATIA V5-embedded CFD software. Within a few hours they completed the simulation of the initial concept design and were able to turn their attention to improving it.

The simulation of the existing design showed how the refrigerant was flowing through the valve and helped identify areas where flow was being constricted. The ability to make design changes in CATIA and then have these changes automatically ripple over to the CFD simulation reduced the time from when they developed the design change to when they got the results to an hour or less. As a result, Ventrex engineers were able to quickly optimize the design of the new valve.

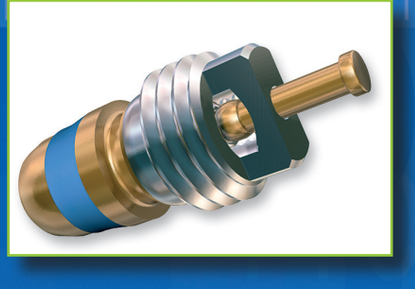
## Customer Testimonial

***" We selected FloEFD$^{V5}$ because it simplifies the process of performing fluid flow analysis to the point where it can be accomplished by any engineer. By using CFD software that is embedded into our CAD software we could evaluate the performance of each new design iteration almost as fast as we could conceive it.***

***This made it possible to quickly improve the performance of the design. We reduced pressure drop to the point that flow rate improved by about 15% in the final design at any given pressure. We reduced the number of prototypes that were required during the design process by about 50, which saved a considerable amount of money but most importantly let us bring the product to market faster.***

***We have already shipped this product to customers and they have verified that it performs nearly exactly as predicted by the simulation. "***

Daniel Gaisbacher, Project Manager,
VENTREX Automotive GmbH



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