

$$\frac{\partial}{\partial t}(\rho\phi) + \text{div}(\rho\mathbf{V}\phi - \Gamma \text{grad}\phi) = S_\phi$$

CEEMO Engineering Fine-Tunes New Race Car Design in 8 Weeks

CEEMO Engineering develops and manufactures innovative products for the racing industry such as airfoils, body panels and air boxes. Regarded as a market leader, CEEMO Engineering develops and manufactures innovative products for the racing industry such as airfoils, body panels and air boxes. CEEMO has contributed to the success of many racing teams by delivering products for Renault, BMW, Marcos, Lexus and Spyker racing cars.

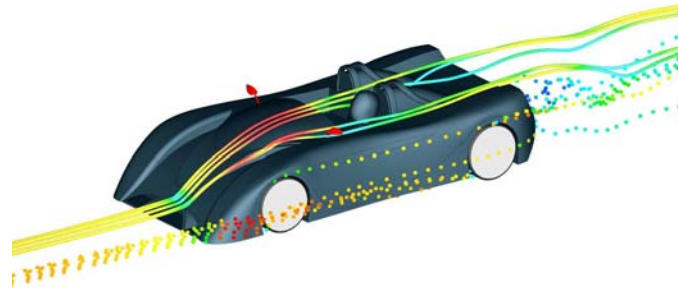


Courtesy of CEEMO Engineering

Fig 1. CAD rendering of new concept car

Since they had an extensive background in designing various aerodynamic parts for racing purposes, they decided to expand their portfolio by designing and testing a new concept car. However, CEEMO did not have any previous experience with using CFD software or virtual prototyping tools.

After an exhaustive search, CEEMO chose EFD.Lab for analysis. "I am an aerospace engineer by background but we had never used CFD software so we did an exhaustive search to find the right tool for the design engineer. EFD.Lab offered the best combination of cost effectiveness and ease-of-use for us" said Evan van Wolfswinkel, engineer.



Courtesy of CEEMO Engineering

Fig 2. Flow trajectories

Their primary goal was to analyze and improve the aerodynamics of the car chassis. Firstly, CEEMO checked the ground clearance. "The results revealed a remarkable amount of down force and explained how the down force was generated" explained van Wolfswinkel. He further modified the design by adding a diffuser and adjusting the ground clearance in the front and the back of the car. He also reduced the drag by making the back rounder. "After seeing the simulation results, I realized that the change in the shape also reduced the down force and resulted in the diffuser losing its effectiveness. EFD.Lab was instrumental in helping me better understand the cumulative effects of my changes and solving the problem."



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The process of testing the body and improving it took about eight weeks. The car is still about two years away from production. "We've optimized the shape of the concept car and will be moving on to studying the suspension shortly" explained Evan van Wolfswinkel.