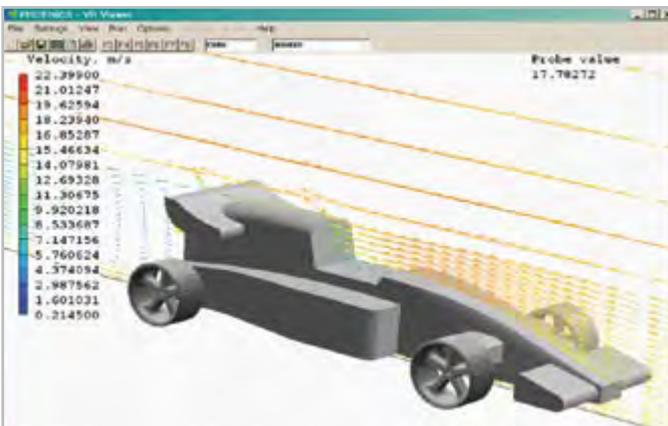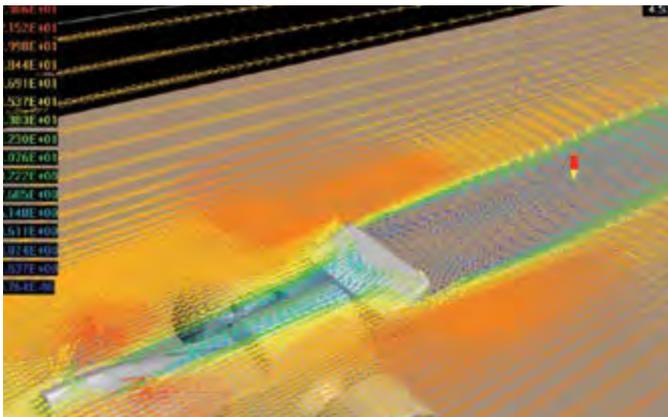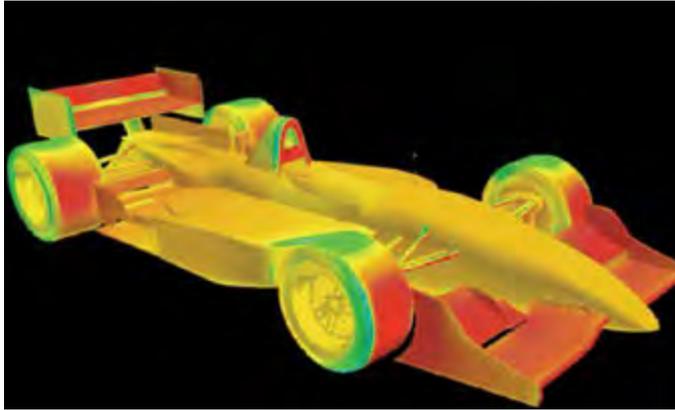# DENFORD®

Virtual Wind Tunnel
F1 VWT ANALYSIS SOFTWARE MK7

New Features:

- Automatic result output
- Simulated wheel spin and CO2 exhaust gas
- Direct CAD import
- Geometry live update – see changes as you update
- Quicker simulation times
- More accurate shape detection

VWT Mk7 is a Virtual Wind Tunnel Software, which allows students to easily analyse the aerodynamic characteristics of their car design, using Computational Fluid Dynamics (CFD), which is an integral part of the design process for racing car manufacturers and teams. It is used to streamline the car's shape by predicting its levels of drag and downforce, which can then be optimised to ensure aerodynamic efficiency and that all 4 wheels remain firmly on the ground!

Ideal for use in conjunction with **F1 in Schools**™

DENFORD®

Virtual Wind Tunnel

For those involved in the F1 in Schools STEM Challenge, the process is simple - students design their F1 car with 3D CAD software such as Autodesk and then export the STL file into the Virtual Wind Tunnel software. The design is then displayed on-screen, allowing students to begin testing the designs for velocities, pressures, areas of turbulence, lift and drag by using vector plots, contour plots, streamlines and isosurfaces.

The Virtual Wind Tunnel Software uses a process called Computational Fluid Dynamics or CFD. This is basically the prediction of processes involving fluid flow, heat and mass transfer, chemical reaction and/or combustion. Anything that involves fluid flow can be simulated using these techniques, with varying degrees of accuracy.

CFD is based upon the laws of physics, of conservation of mass, momentum and energy. The equations are embodied within a mathematical model and solved using a grid superimposed on the region of interest. For the F1 in Schools STEM Challenge, this will be the "Analyse" stage of your team's Design, Analyse, Make, Test and Race process – towards racing success!
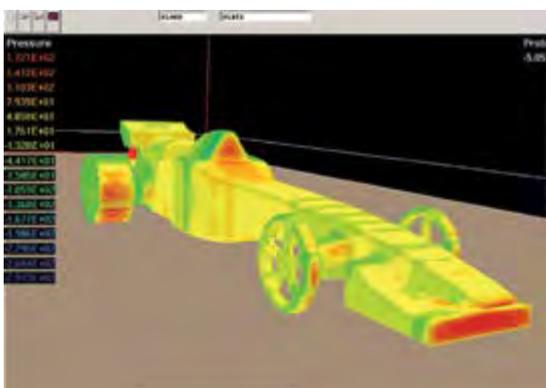
VWT Software Mk7 is designed to fit within your Design and Analyse process. Immediately after finishing a design, easily import the CAD model into VWT, refine geometry locations, enter initial settings and boundary conditions (seeing changes to your simulation model in real time), then run the mathematical solver. Once the simulation is finished, you can analyse your model's performance:

• Downforce and drag on the body of your car
• Data graphs of the whole 3D simulation are ready to export
• Velocity / pressure contour and vector plots, surface contours, iso-surfaces and stream lines

Use these results to improve and optimise your design before race day and ensure that your car is the fastest out there!
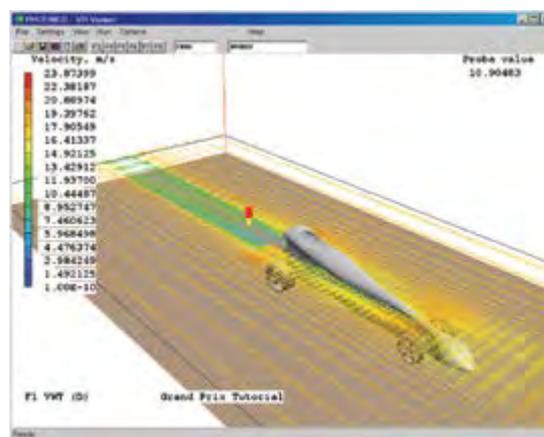
RECOMMENDED SYSTEM REQUIREMENTS

Any standard Windows PC: Vista, 7, 8 & 10

The software is both CPU- and RAM-intensive, but 3GB RAM should suffice [more is better]

3GHz processor speed [minimum]

No special graphics requirements

The software will run on both 32bit and 64bit PCs