Student Races

The Formula Student project is the European spin-off of the Formula SAE competition in the USA where over 100 universities compete in this exciting project. The Formula Student Race in Birmingham is very similar to the one in America, and many universities try to compete at both races.

In the Formula Student Project engineering students have to design, build and race a formula style race car. A team of judges not only assess the designs and technical specifications of each car but also look into the individual team presentations, design philosophy and cost predictions.

Besides the static inspections the students have to demonstrate the potential of their car in several dynamic events. The dynamic events include a brake test, a figure eight, an acceleration test, an auto-cross and as the grand finale the endurance event in which students drive their cars for 20 laps on a demanding circuit.

An essential part of any car is its engine. For the combustion of fuel air is supplied by an air intake. To limit the total air flow to the engine and thus its power a ring of a certain maximum diameter, prescribed by the rules of the competition, has to be set in the air intake. This ring is called the restrictor. As the cross-section of the connection to the air filter and the inlet manifold of the engine is much larger than the restrictor, the air intake has an axis-symmetrical converging and diverging part.

In particular in the diverging part of the air intake a variety of aerodynamic phenomena like flow separation and shock waves may occur, which can reduce the engine performance significantly. To prevent any of these detrimental effects FlowMotion has been consulted on the design of the air intake. Since it is very difficult to perform accurate velocity measurements inside a 40 mm tube, FlowMotion has resorted to flow simulations to optimize the shape of the air intake.

The overall simple geometry of the intake has allowed for the assessment of a large variety of shapes in a short time, which has finally resulted in a minimization of the aerodynamic drag and therefore in a maximization of the mass flow rate for the entire range of driving situations during the race.

In the final standings of the European competition on 3 July 2002 the Delft Formula Student team has reached an impressive 16th place in a field of 40 cars.