THE OFFICIAL F1 IN SCHOOLS EQUIPMENT

F1™ in Schools

Race System

POWERED BY DENFORD®

Version 11/18

Welcome

DENFORD®

As Proud Founder and Sponsor of F1 in Schools, Denford is delighted to be the official supplier of F1 in Schools Race equipment

"F1 in Schools equipment - designed and manufactured in the UK by Denford Limited."

"Denford continues to work hard to refine the latest F1 in Schools equipment to meet the needs of students taking part in the challenge.

The lightweight, portable Race Track and the Start Gate, with its clear display and data storage, have now both been enhanced and include some exciting new features for 2018/19

The Air Trace Visualisation System is also a valuable asset for aerodynamic capability analysis and for demonstrating this in the classroom.

These products, which were officially launched at the World Finals in 2017, have proved to be a resounding success with students and F1 in Schools Teams worldwide."

Steve Oddy
Managing Director
Denford Limited

Look out for
Official F1 in Schools
Licensed Product
Holograms

"We need high quality equipment to future-proof the F1 in Schools STEM Challenge."

"F1 in Schools has seen exponential growth since its launch in 2000 and in today's technology driven world, it is as important as ever to deliver cutting-edge equipment to future-proof our F1 in Schools STEM Challenge.

The new Denford Race System combines the highest standards of manufacture with the advanced technology required by F1 in Schools teams. The equipment was launched to our international partners at the 13th World Finals in 2017 in Malaysia, and with the teams using the new Race System for the first time, it was a great showcase for these innovative products, following which we have had tremendous interest, as schools strive to meet the technological demands of F1 in Schools students."

Andrew Denford
Founder and Chairman
F1 in Schools

in Schools

F1 in Schools launched in the UK in 2000 as a Design & Technology Project to address the 'Four Key Concepts' of Design & Technology as a Subject: "Creativity, Designing, Making, and Critical Evaluation." F1 in Schools is now acknowledged as the world's most exciting STEM based educational project and engages with learners through the magnetic appeal of Formula 1. The project continues to grow, and engage with millions of learners around the world, offering a truly inspirational STEM based educational experience.

Design

Software

QuickCAM 2D Design

Simple to use and full of advanced features, this wizard-based 2D CAD/CAM package allows you to create 2D designs quickly and accurately, then easily create complex CNC machine toolpaths.

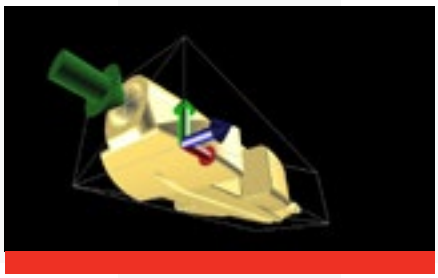
You can also import designs and images from other CAD packages, which can be manufactured on a CNC Router or Laser Cutter.

QuickCAM 2D now includes Advanced V-Carve extension as standard.

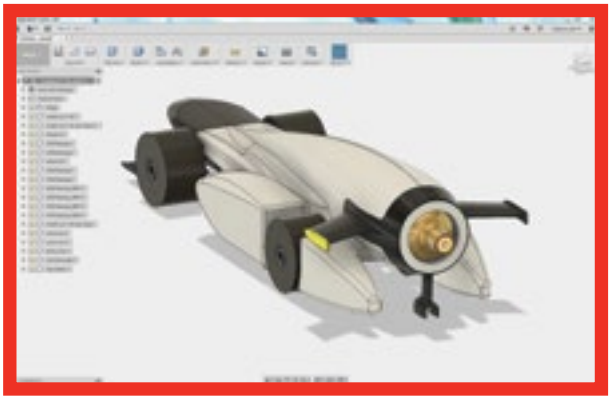
QuickCAM Pro

QuickCAM Pro provides the link between your 3D design software and the Denford range of CNC Routers. It's a simple wizard-based CAM package which creates cutter paths from .STL files and image files for the machining of F1 in Schools cars or any 3D parts on a Denford CNC Router or Milling machine.

The latest release of QuickCAM Pro includes the new F1 Car Wizard, which simplifies the process of creating the CNC file to cut both sides of an F1 car. Simply progressing through the pages of the Wizard allows the program for both the left and right hand side of the car to be created in one easy operation.



Design/Analyse



Autodesk 3D Design Software

As F1 in Schools' Premium Global Software Partner, Autodesk gives teams and schools free* access to software and support through the competition season, including:

- Access to industry software
- Easy-to-follow learning tools
- Videos of other F1 in Schools teams

*Free Autodesk software and/or cloud-based services are subject to acceptance of and compliance with the terms and conditions of the software license agreement or terms of service that accompany such software or cloud-based services. Software and cloud-based services subject to an Educational license may be used solely for Educational Purposes and shall not be used for commercial, professional or any other for-profit purposes.

Autodesk Flow Design

Flow Design is the ideal virtual wind tunnel software for product designers, engineers and F1 in Schools Car designers! It models airflow around your F1 car design concepts to help test ideas early in the design process.

Available only for use by F1 in Schools students and educators, as part of the Free Autodesk software package.

AUTODESK®

Make

Denford CNC Routers

Compact 1000 / PRO

This versatile Router is perfect for cutting F1 in Schools Car designs, as well as a range of resistant materials such as hard and soft wood, plastic, modelling foam, acrylic and prototyping materials. The Compact 1000 Pro can also cut non-ferrous metals.

Router 2600 / PRO

Denford's most popular CNC Routers offer a larger capacity and high-speed, precision cutting for a range of resistant materials, and come complete with an enclosed interlocking guard. Additionally, the Router 2600 Pro has a metal cutting spindle motor for non-ferrous metals.

Also available: Router 2600 ATC fitted with 5 Station Automatic Tool Changer.

Visit **denford.co.uk** for full product specifications

Router 6600 / PRO

Denford's largest Routers – designed exclusively for education and training. Complete with built-in machine bench (table size 1080 x 640mm) and perfect for cutting a range of resistant materials such as hard and soft wood, plastic, modelling foam, acrylic and prototyping material.

The Router 6600 Pro can also cut non-ferrous metals.

Choose from these optional extras to create the Denford Router that's right for you:-

- F1 in Schools Car Manufacturing Fixture
- 4th Axis Programmable Fixture
- 3D Scanning Attachment
- Heavy Duty Machine Bench and PC arm
- Dust Extraction Unit

All Denford CNC Routers are supplied with Denford's VR5 CNC machine operating software.

Make

Lasers

VLS Series Laser Cutters

Available in a variety of sizes and power options. Ideal for cutting, deep engraving, precision scribing, and decorative etching on wood, plastic, fabric, leather, paper and rubber, the VLS Series Lasers will also mark glass, ceramic, metal and stone.

As part of the F1 in Schools Challenge, Laser cutters can be used for a wealth of applications, such as cutting front & rear wings and wheel components, as well as measuring gauges for inspection of F1 Cars. Additionally, teams can use lasers for various aspects of marketing and branded merchandise such as key rings, trophies, signs, business cards and etched glasses. Lasers can also be used in the construction / visual aspects of teams' portfolios and pit displays.

Side panel colour variations

RoHS Compliant and with safety features including Over Temperature Sensor with Audible Alarm, Safety Glass, Automatic Recognition of Accessories and 'Smart Technology' ULR Laser Cartridges which can be easily changed by the user.

3D Printers

3D printers are an essential and affordable choice for any school taking on the F1 in Schools STEM Challenge. Robust, safe and reliable, every printer which Denford supplies is easy to set up and use and comes complete with a full 12-month warranty and the support of a UK-based technical team.

As part of the F1 in Schools Challenge, 3D Printers are ideal for printing front & rear wings, wheels, wheel support systems and nose cones – allowing teams to enhance and fine-tune their car designs.

3D printers can operate using ABS and PLA filament.

Test

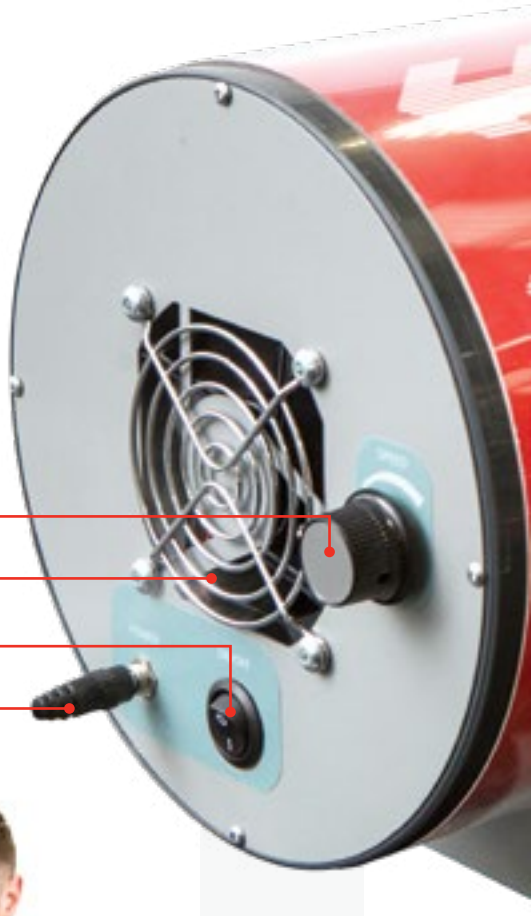
Air Trace Visualisation System

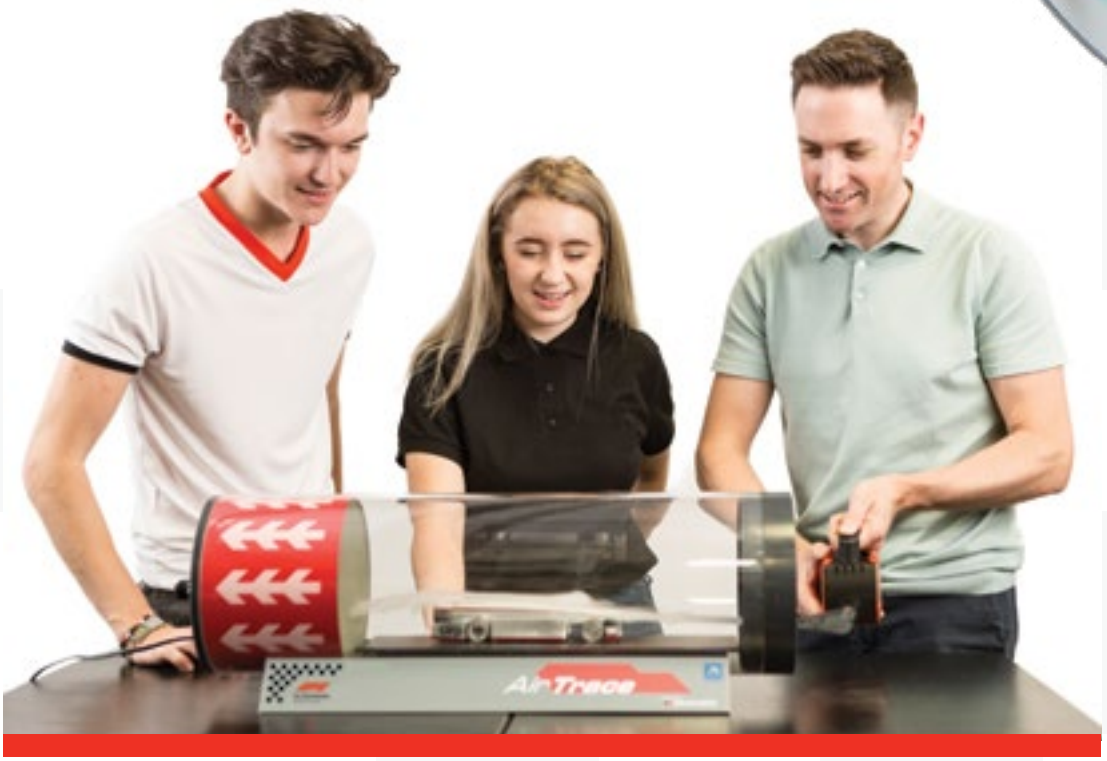
What's included:

- Air Trace Visualisation Tunnel
- Air Trace Smoke Generator complete with Air Trace Fluid

Air Trace Visualisation Tunnel

The Air Trace Visualisation Tunnel is an essential part of the design, test and remake process. Featuring variable wind speeds, it's simple to use, compact in design, and easy to set up. Use it with the Air Trace Smoke Generator to run a steady stream of harmless, smoke-like vapour over your F1 in Schools car to demonstrate its aerodynamic capabilities.





Air Trace Smoke Generator

This will produce a steady stream of smoke-like vapour for up to ten minutes from a fully charged battery, or continuously when connected to a mains adapter. Vapour will disperse quickly, so you can clearly see the air flow pattern without flooding the Air Trace Visualisation Tunnel with thick fog.

Light and practical, the generator comes in its own robust carry case with a battery and charger (mains adapter kit available separately).

Race

F1 Race Track

The NEW F1 Race Track is designed and manufactured in the UK.

Designed to be durable and moisture resistant, its light aluminium construction makes it easy to assemble, break down and store. It measures 23.65 metres in length, comprising 11 track sections and 12 support legs, and incorporating cable management. Timing sensors are built into the finish section of the track for accurate and consistent finishing times.

A flight storage case is available separately.

Car Deceleration System

F1 in Schools cars are growing faster and more sophisticated, so your Car Deceleration System is an important way to slow the cars down safely once they have crossed the finish line. Using a tapered brush system, the unit comes in two pieces designed to stop cars effectively on each side of the track.

Race

F1 Race Control System

The ultimate race package, designed for the F1 Race Track.

What's included:

- Start Gate
- Finish Gate
- 2 Start Boxes
- 2 F1 Start Triggers

Available optional upgrades:

- Optional Sector Gate Timing System
- Race Triggers (see Page 16)
- Flight Storage Case

New Features:

- The Race Control System can now be supplied as a stand-alone system, which can be floor mounted or fitted to the old style F1 Track
- The display screen background can be customised - for example to create an event-specific screensaver
- New reaction time leader board program which updates in real time

The Start Gate is fully programmable, allowing team names to be input and results to be viewed live.

Finish Gate indicators to show that power is applied and that both lanes are clear.

The Start Gate features a high resolution 9" anti-glare screen displaying multiple modes:

- Auto Mode (Race Time)
- Manual Mode (Reaction Time, Race Time and Combined Time)
- Reaction Time Mode (Reaction Time)

Multi voltage power supply and WiFi data transmission as standard.
Rugged start triggers and cables are supplied with 90 degree connectors.
Cable management included.

Finish Gate incorporates a blue spotlight indicator to show when the finish line is crossed.

Reverse view of Start Gate

Reverse view of Finish Gate

Race

Start Boxes

The NEW F1 Start Box is designed for reliability and durability, featuring:

- Silver steel firing pins for extended life
- Torsion Spring which is latched under pressure for consistent release
- Tool steel latch mechanism to provide consistent release and to prevent wear
- The Start Boxes have a latch release lever to allow the spring to be un-cocked, and a substantial base to reduce recoil.

The Start Boxes are designed with safety in mind and are fully guarded.

Standard Start Triggers

Race Triggers

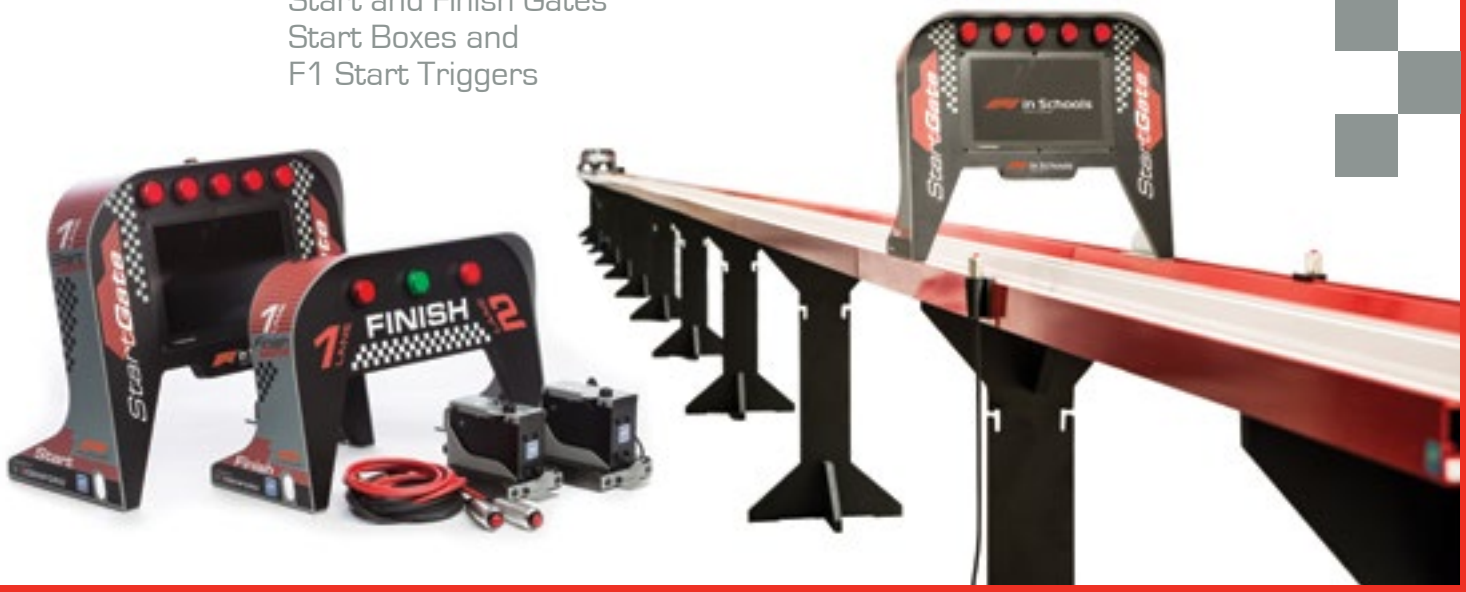
Race Triggers are available on request. The Race Triggers are machined from high grade aluminium alloy, and are larger than standard Start Triggers (shown above left). Race Triggers are used at all of the UK Regional and National Finals, and at the World Finals.

The complete F1 Race System Package

POWERED BY DENFORD®

Includes everything you'll need to get racing

- F1 Race Track
- F1 Race Control System comprising:
  - Start and Finish Gates
  - Start Boxes and
  - F1 Start Triggers



Consumables

Official F1 in Schools Licensed Product Holograms

Consumables

F1 Model Blocks

The F1 Model Block is the only material accepted at the F1 in Schools World Finals. Purpose-designed and tested extensively in the field, the new block is grain-free, machines beautifully, has a **consistent weight and density**, provides a great finish and is easy to paint.

The new F1 Model Block has the same dimensions as the previous Balsa Wood Blank, but is more robust and durable, with no inherent weaknesses.

Every F1 Model Block is wrapped with an official F1 in Schools sleeve and sealed with an **F1 in Schools Holographic Sticker, to confirm that the block is an OFFICIAL F1 in Schools Authorised Product.**

CO_2 Power Packs

Standard

Race

After all your hard work designing, analysing and making your F1 in Schools race car, you deserve the highest quality CO2 Power Packs to power it over the finishing line.

All Denford CO2 Power Packs offer quality and speed. Additionally, the Denford Race CO2 Power Packs are individually weighed to guarantee a race weight range of within 0.5 grams.

F1 in Schools Car Manufacturing Fixture

This specially-designed fixture clamps straight on to the T-Slot Table on your Denford CNC Router to hold your car during manufacture – allowing the highest quality machining for your F1 in Schools car design.

Consumables

F1 Entry/Development Class Starter Kits

F1 Entry / Development Class Starter Kit - SOLO
Consists of:
1 x F1 Model Block Car Kit
1 x IsoSketch 3D Drawing Tool – single blister pack

F1 Entry / Development Class Starter Kit - TEAM
Consists of:
5 x F1 Model Block Car Kit
5 x IsoSketch 3D Drawing Tool – single blister pack

F1 Entry / Development Class Starter Kit - GROUP
Consists of:
10 x F1 Model Block Car Kit
1 x IsoSketch 3D Drawing Tool – class pack of 30

IsoSketch 3D Drawing Tool
– single blister pack
– class pack of 30

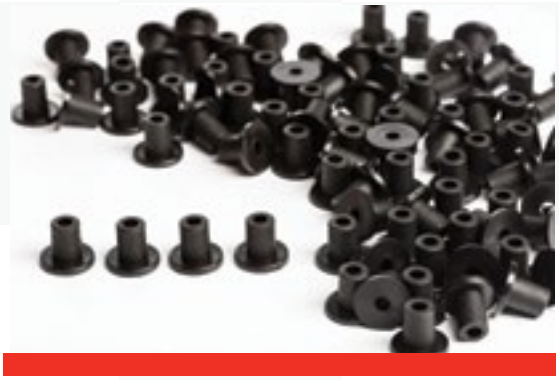
F1 Class Wheels
F1 Class Wheels (pack of 100)

F1 Model Block Car Kit
Includes 4 x F1 Class Wheels, 1 x Sandpaper, 2 x Screw Eyes, 2 x F1 Axles, 4 x Axle Bushes, 1 x F1 Model Block

Paint Stand
The new, improved design holds your car during the painting process. The car is suspended by the cartridge hole and once in the stand, can be rotated to paint all sides.

F1 Axles
Use the strength of steel to mount your model wheels
Axles 66mm (pack of 100)

Screw Eyes
Use these screw eyes to keep your car on track
Screw Eyes (pack of 100)

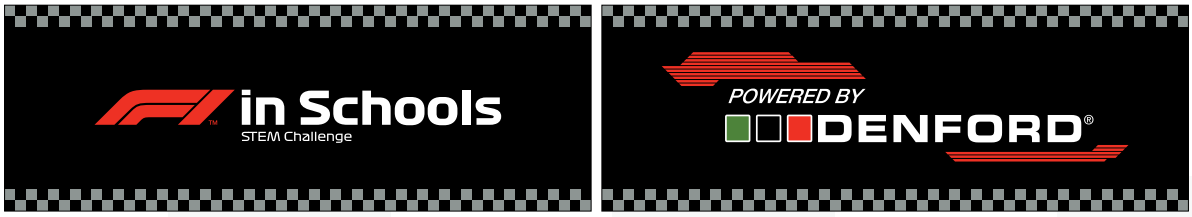


Axle Bushes
(pack of 100)

Consumables

Race Consumables

Decal Stickers
(pack of 25 sheets)



Track Banners
Track Banners for use with the F1 Race Track, featuring chequered flag borders, F1 in Schools STEM Challenge Logo and Denford Logo.

Want to know more?

To register for the F1 in Schools Challenge and for "all things F1 in Schools"
visit www.f1inschools.co.uk

For more information on the new F1 in Schools Race Systems and Denford equipment
visit www.denford.co.uk

F1™ in Schools

Race System

POWERED BY DENFORD®

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