

# DENFORD On-Line Technical Forum

TECHNICAL SUPPORT AVAILABLE 24 HOURS A DAY, 7 DAYS A WEEK

Denford's Technical Forum is a free of charge on-line technical support service that is available to Denford customers 24 hours a day, 7 days a week. [www.denfordata.com/bb/](http://www.denfordata.com/bb/)

**"The technical forum has provided a wealth of information and support for our 20-year-old Denford CNC machine, in fact just as good as the support we receive for our brand new CNC Router!"**



Denford's On-Line Technical Forum is a free of charge service that can be accessed 24 hours a day, 7 days a week.

The On-Line Technical Forum is available to Denford customers, old and new, and it couldn't be easier to use. Just visit <http://www.denfordata.com/bb/> and register on line.....it's that simple.

Denford's On-Line Technical Forum opens up the traditional communication channels that can restrict customer and technical support, due to availability of staff, teaching commitments or different time zones.

A multitude of topics relating to Denford machines and software (both new and old) are covered within the forum, which is simple to search, and easy to use.

Denford's Technical Team and Denford customers from around the world regularly log on to the forum to offer support and advice and, most importantly, post a solution for all to see.

As well as offering comprehensive technical support, Denford's On-Line Technical Forum enables customers to share ideas and projects with other users. Media such as teaching material, project work, PDF's, images, drawings and text documents are easily attached to messages for all users to view and comment on.

You can also read the latest Denford news before anyone else, and keep track of machine and software upgrades, some of which can be downloaded direct from the Technical Forum web site.

The On-Line Technical Forum has proved to be hugely popular with customers. One recent user posted a note to inform us that the Technical Forum has "provided a wealth of information and support for our 20-year-old Denford CNC machine, in fact just as good as the support we receive for our brand new CNC Router!"

Of course the traditional methods of phone and email are still available, but try out this new service by simply logging on to [www.denfordata.com/bb/](http://www.denfordata.com/bb/) and register.



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**DENFORD**

## CAD/CAM Solutions & Projects for Education



## Product Catalogue International Edition

Denford are the proud sponsors of:



September 2009

ISO9001 Compliant

Dear Reader,

Welcome to the latest edition of the Denford Product Catalogue

This new edition of the Denford catalogue brings you a range of 'traditional' CAD/CAM software and hardware solutions, and also provides us with the opportunity to showcase a number of exciting new products.

Rapid Prototyping technology is a major focus for schools, and with this in mind, Denford are delighted to announce the launch of the Dimension uPrint 3D printer, which provides highly-affordable, hassle-free 3D printing of durable ABS models direct from .stl design files, generated using any 3D CAD design software such as SolidWorks and Pro/DESKTOP.

Also new for this edition of the catalogue are Denford's New Turn 270 CNC Lathe and QuickTURN 2D Design software. The New Turn 270 (and its sister product, the VMC 1300 CNC milling machine) are proving to be popular with those who are delivering the 14-19 Engineering Diplomas.

To complement the New Turn 270 CNC Lathe, we have launched QuickTURN 2D Design. This advanced, yet simple to use, wizard based software allows 2D turned designs to be created quickly and accurately for output to Denford's New Turn 270 Lathe.

Denford CNC Mills, Lathes and Routers are available with our Universal Machine Benches, which allow full portability – enabling the machines to be pushed from room to room through a standard doorway. The benches also provide plenty of storage space for tooling and materials.

Denford's new PCB Engraver has made a real name for itself since its official launch late last year. This machine is now a firm favourite with schools wishing to move away from the traditional methods of chemical etching of PCB boards. It is simple to use and comes complete with everything you need to cut and engrave a range of resistant materials, such as copper board, plastic and acrylic.

Package Solutions are also featured in the catalogue. These include an F1 in Schools package, incorporating Design, Analyse, Make, Test and Race hardware and software. There is also a 3D Scanning and Manufacturing package for reverse engineering applications; a stand-alone, affordable and easy to operate 3D Scanning package; several Dye Sublimation packages; and a primary project for Design & Technology at Key Stages 2 & 3.

Denford are busy planning for the future. We currently have a number of new products on the drawing board, and our new building project is moving ahead at a pace. In the meantime, we are clearly focussed on providing a comprehensive range of CAD/CAM solutions – backed up by a Customer Support Service, which sets the standards for others to follow.

We, at Denford Limited, greatly appreciate your continued support, and we hope that the products and educational projects we are involved in – such as F1 in Schools – continue to enthuse and engage your students in the process of design and manufacture.

Yours sincerely

Simon Moorhouse  
Managing Director



The F1 in Schools and 4x4 In Schools Challenge

F1 in Schools Ltd is a Not for Profit Company established to provide an exciting, yet challenging educational experience, through the magnetic appeal of Formula One.

Formula 1 is the most glamorous, high tech sport in the world. It has a television audience of hundreds of millions for each race and is a truly global sporting phenomenon. The F1 in Schools Challenge brings the excitement and motivation of F1 into your school, whilst enabling you to cover the required curriculum in a real and meaningful way for students. Developed by experienced Education Leaders in the UK, the Challenge provides a fully resourced and supported opportunity to make learning truly inspirational for your school. With the F1 in Schools World Championship operating in 31 countries and currently with over 10 million active students, the F1 in Schools Challenge provides a real opportunity for a learning experience of a lifetime and the chance to become a World Champion.

The aim is to encourage students to consider engineering as a career, highlighting the positive nature of all that embraces engineering in an exciting and positive way. The Challenge is for school children aged 9 to 19 to use CAD/CAM software to design, analyse, manufacture, test and race a model F1 car from balsa wood, powered by compressed gas cylinders.

The Challenge enables students to experience many areas of education and learning, and to develop an informed view about careers in engineering, science, marketing, technology and Formula One, as well as gaining qualifications along the way.

Denford are also proud Founders and Sponsors of the "4x4 in Schools Technology Challenge" in partnership with the IET, Landrover & JCB and the "GT in Schools - The Sports Car Challenge" with our long standing partners Jaguar Cars.

For more information visit the sites:  
www.f1inschools.co.uk  
www.4x4inschools.co.uk  
www.gtinschools.co.uk

Andrew Denford  
Founder and Chairman,  
F1 in Schools Ltd



NEW PRODUCTS

NEW

LaserCAM  
2D Design  
see pages 08-09



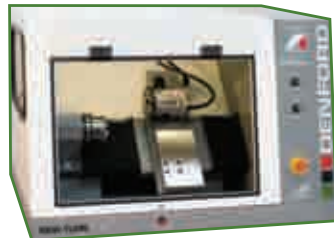
NEW

QuickTURN  
2D Design  
see pages 16-17



NEW

New Turn 270  
see pages 36-37



NEW

NextEngine -  
3D HD Scanning  
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NEW

Comprehensive  
F1 & Denford  
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**PROUD FOUNDERS & SPONSORS OF...**

Using 3D CAD (Computer Aided Design) software, the team **designs** a Formula One™ car of the future.

**DESIGN**



Aerodynamics are **analysed** for drag coefficient in a virtual reality wind tunnel using Computational Fluid Dynamics Software (CFD)

**ANALYSE**



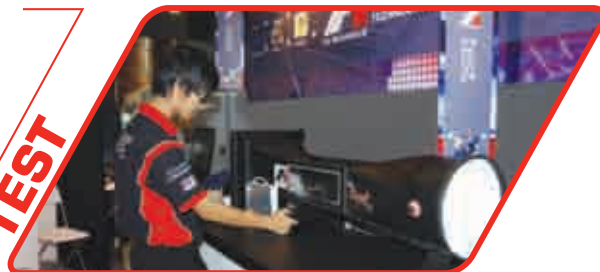
Using 3D CAM (Computer Aided Manufacture) software, the team evaluates the most efficient machining strategy to **make** the car.

**MAKE**



Aerodynamics are **tested** in wind and smoke tunnels.

**TEST**



[www.f1inschools.co.uk](http://www.f1inschools.co.uk)

**RACE**

Teams are judged on car speed, as well as supporting evidence of their design, verbal presentation and marketing display stand in "the pits".



# DENFORD

## INNOVATIVE EDUCATIONAL PROJECTS

The F1 in Schools Technology Challenge encourages students to explore a variety of engineering and manufacturing processes by using CAD/CAM and CNC technology to produce their own model F1 Car of the Future. As founding partners of the F1 in Schools Technology Challenge, Denford supply a wide range of equipment and training to get you to the starting line. In addition, Denford also support the 4x4 in Schools Technology Challenge & GT in Schools - The Sports Car Challenge.



This National Challenge offers an exciting opportunity to encourage the development of our engineers of tomorrow, to engage young people in the complexities and challenges of design engineering, and to demonstrate the rewards of choosing engineering as a career.

Sponsored by:  
The IET, JCB, Denford, SSAT, DATA, SEMTA, and Yorkshire Forward.

[www.4x4inschools.co.uk](http://www.4x4inschools.co.uk)



GT in Schools - The Sports Car Challenge is a competition, open to all UK based Secondary Schools, Colleges and (organised) Youth Groups, to design and manufacture CO2 powered model GT sports cars.

The process will follow closely the real life process that Engineers in automotive companies such as Jaguar follow, i.e. sketching, modelling, scanning/digitising, analysing, making, testing and racing.

Sponsored by:  
Jaguar Cars



[www.gtinschools.co.uk](http://www.gtinschools.co.uk)

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# SolidWorks™ Education Edition\*

3D DESIGN, DRAFTING AND SIMULATION SOFTWARE

## SolidWorks™ 3D Design

3D DESIGN, DRAFTING AND SIMULATION SOFTWARE

SolidWorks is the same software that engineering professionals worldwide use to design innovative, real-world products. SolidWorks Education Edition\* includes curriculum materials, making it easy for you to teach at every level of education, and is ideal for those involved in delivering the new Engineering Diplomas. SolidWorks is simple for your students to learn and use. Without leaving the SolidWorks application, students will be able to fully simulate their designs, enabling them to truly learn about engineering processes.

### DESIGN ANY PROJECT IN 3D

with ease using SolidWorks' powerful, yet easy-to-learn tools, then create professional-quality drawings, photo-quality renderings and animation.

SolidWorks was the first parametric 3D CAD tool ever developed for Windows™, and since its initial release in 1995, it has continued to define the standard for usability in 3D CAD.

### TEACHER RESOURCES & CURRICULUM

are included with every license of SolidWorks Education Edition\* to help educators learn and teach the software. Materials include Teacher and Student Guides, F1 in Schools Project, Bridge Design Project, PowerPoint™ presentations and tests, as well as more than 50 tutorials built into the product. All of this material is designed to help educators focus on teaching design rather than simply on CAD commands.

### SOLIDWORKS SUBSCRIPTION SERVICE

is included the first year with every purchase, and may be renewed each year for continued peace of mind. Subscription Service provides:

- Technical support through SolidWorks' Customer Portal
- Product upgrades and updates
- Free home-use licenses for your students

### SIMULATE YOUR DESIGNS

Simulate your designs in SolidWorks. Without even leaving the SolidWorks application, your students will be able to fully simulate their designs, enabling them to truly learn about engineering processes.

Here you see an aerodynamic simulation of an F1 in Schools race car. SolidWorks also provides tools for stress, thermal, vibration analysis and much more, all with extensive documentation and tutorials.

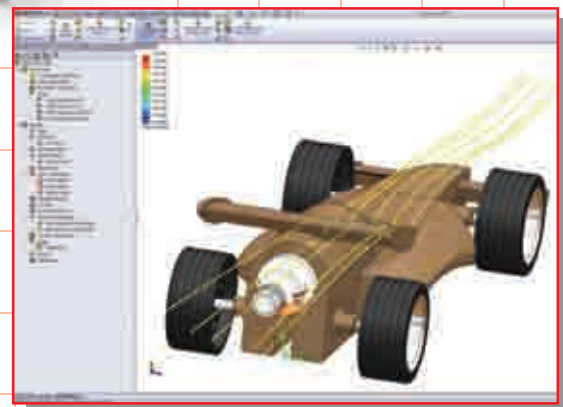
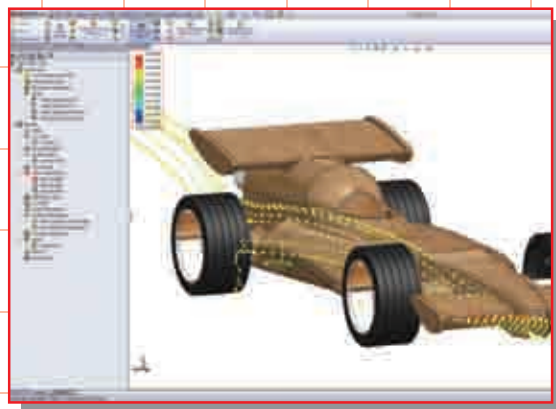
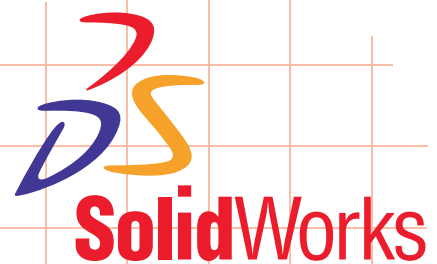
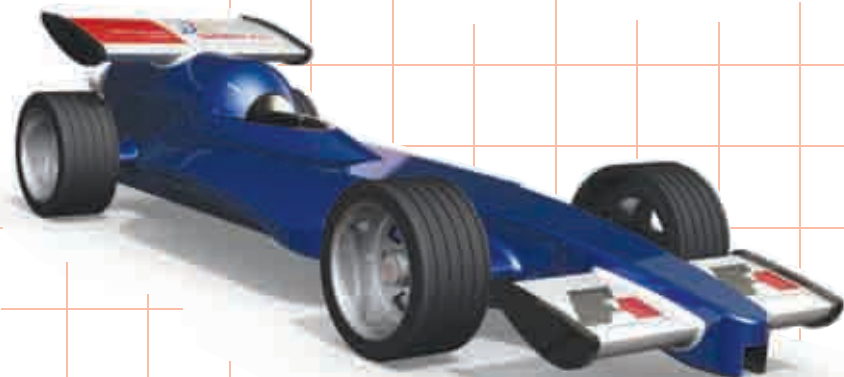
### SYSTEM REQUIREMENTS

Windows XP Professional/Vista Ultimate or Business editions (32 and 64-bit versions are supported)  
Intel Pentium, Xeon or Core, AMD Athlon, Opteron or Turion  
1GB minimum RAM  
Tested OpenGL workstation graphics card and driver combination (see [www.solidworks.com/graphicscards](http://www.solidworks.com/graphicscards))  
DVD Drive and pointing device  
Internet Explorer 6  
Microsoft Excel 2002, 2003 or 2007

To get you up and running, Denford also offer a range of CNC Routers, Lasers, Milling Machines and Lathes, together with tooling packages, workholding kits and courseware.

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Teacher resources & curriculum materials, including an F1 in Schools Project, are supplied with every license of SolidWorks Education Edition\*.

\*Classroom Licence Package for Secondary Schools (any school below college/university level)

CAD/CAM Software : VR CNC Software : CNC Routers : Mills : Lathes : PCB/Engraving Machines : Benches & Accessories : Laser Cutters/Engravers  
Rapid Prototyping : Concept Modelling : 3D Scanning Solutions : Cutter / Plotters



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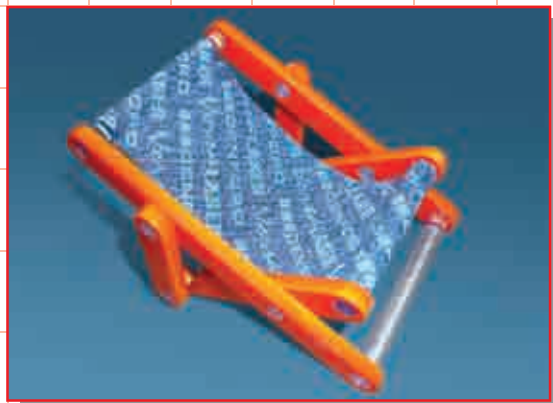
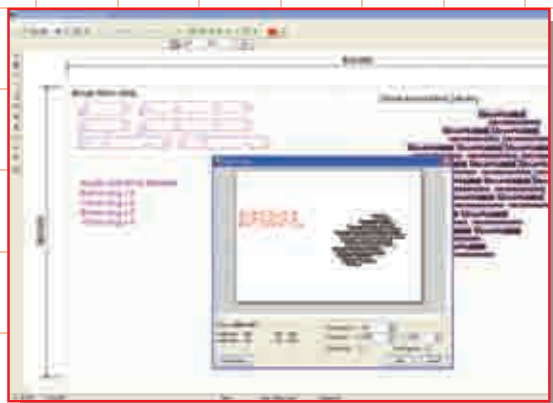
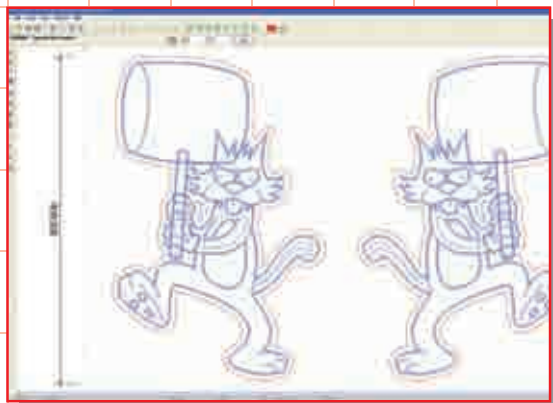
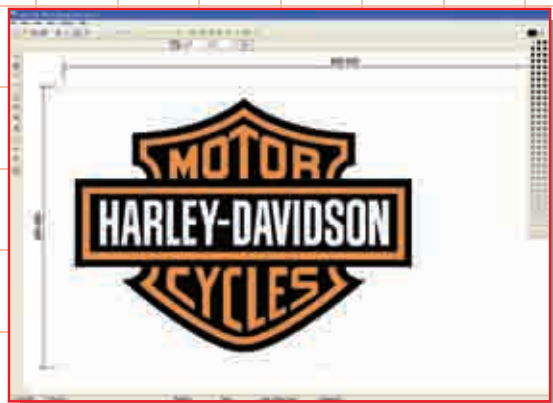




# LaserCAM 2D Design

2D DESIGN SOFTWARE FOR LASER CUTTERS

**NEW**



## LaserCAM 2D Design

2D DESIGN SOFTWARE FOR LASER CUTTERS

LaserCAM 2D is a 2D CAD solution for use with Laser cutting machines. Simple designs can be created quickly and accurately and output to a laser with minimum effort. A host of import options make it the ideal way to manufacture logos, designs and projects on most types of Laser cutter & engraver.

### POWERFUL TOOLS TO MAKE LASER MANUFACTURING EASY

LaserCAM 2D Design has all the features you need for laser cutting / engraving - all in one place. For example, the image importer includes image editing features to adjust brightness, contrast and gamma. The interactive preview and tools to create greyscale, black and white or halftone images will ensure you get the best results every time.

Custom colour palettes make it easy to pick the right colours for the laser driver [e.g. solid blue for vector engraving, solid red for vector cutting, black for raster engraving].

Grid size setup is easy - just click 'Match to Printer' and select the laser driver you're going to use.

Before printing your design, the handy preview window allows you to offset its position and scale, without altering the original. It also gives you the option to only output selected objects.

With a wealth of designs available in postscript (.EPS) and metafile (.WMF, .EMF) formats, you will never be stuck for logos or cool designs!

### CAD DRAWING FEATURES

The following objects can be created to exact sizes: Lines, Arcs, Polylines, Curves, Polygons, Ellipses, Text\*, Multi-line Text with justification\*, Hatched areas, Offset paths, Bitmap Image Contours.

\*Any TrueType font available to Windows™ can be installed and used by LaserCAM

Drawing features allow easy creation and manipulation of objects:

Customisable grid size for snapping to fixed distances, Editable object nudge, Angular [polar] snap, Absolute and relative co-ordinate entry, Object property editor allows sizes, angles and positions to be entered exactly, Quick drawing navigation (pan & zoom) is realised by mouse wheel operation, Object grips can be grabbed and moved, Various object snap modes can be activated at any time: End point; Mid point; Nearest; Intersection; Tangent; Perpendicular.



Object modifiers allow objects to be altered quickly and accurately:

Move, Scale, Rotate, Mirror, Copy, Paste, Join, Explode, Group and Ungroup, Customisable colour palettes for easy configuration to match the Laser driver, Rectangular array, Circular array, Boolean shape operators: Union; Intersect; Split; Subtract.

### IMPORT/EXPORT FEATURES

#### Import:

Raster Images: .JPG; .BMP; .ICO; .EMF; .WMF

Clipboard paste from other drawing packages such as CorelDraw.

PCB Gerber file (RS274X).

AutoCAD: .DWG and .DXF (versions up to 2000).

Vector image clipart metafiles: .WMF and .EMF

Fonts: True type .TTF font files.

Encapsulated PostScript: .EPS vector files.

#### Export:

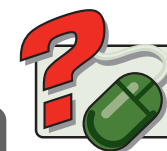
AutoCAD: .DXF files can be saved.

QuickCAM 2D Design: .MCM files saved in LaserCAM can also be opened in QuickCAM 2D for CNC machining.

### SYSTEM REQUIREMENTS

IBM or 100% Compatible PC, Pentium III, 1Ghz, 512MB RAM, 200MB Free Hard Disk Space, Microsoft Windows XP/NT/2000 and later, CD-ROM Drive, Floppy Drive, OpenGL 3D Accelerator Graphics Card with 128MB RAM supporting at least 1024 x 768 screen resolution. CNC Machines require USB Connection.\*

\*N.B. Machines cannot be run from 64-Bit Operating Systems



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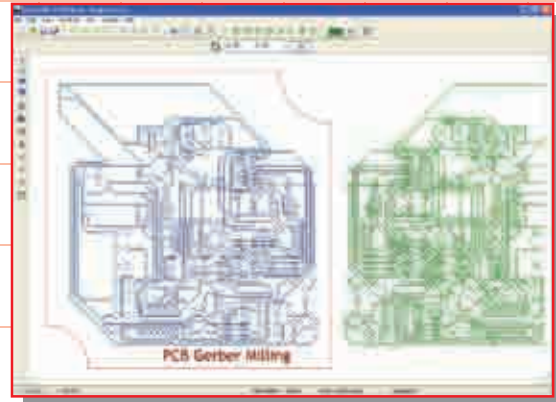
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# QuickCAM 2D Design

2D DESIGN & MANUFACTURE SOFTWARE



## QuickCAM 2D Design

2D DESIGN & MANUFACTURE SOFTWARE

QuickCAM 2D Design is an advanced, yet simple to use, wizard based 2D CAD/CAM package. You can create designs quickly and accurately, then run the CAM wizard to create CNC machine toolpaths. It features various import options to allow images, PCB's and designs from other CAD packages to be manufactured. The customisable post processor and advanced printing facilities provide outputs to most desktop CNC and laser machines.

### CAD DRAWING FEATURES

#### Shape Creation:

Line, Polyline, Rectangle, Curve/Spline, Circle, Arc, Point, Polygon, Ellipse, Text, Multiple Line Text with Justification, Hatch, Offset Path, Image Outline (Contrast Edge Detection).

#### Drawing Help:

Customisable Grid Size, Grid Snap, Object Nudge, Polar Snap, Absolute and Relative Co-ordinate Entry, Shape Property Editors, Fast Drawing Navigation.  
Snap Modes: End, Middle, Nearest, Intersection, Tangent.

#### Shape Modification:

Unlimited Undo and Redo, Move, Scale, Rotate, Mirror, Copy, Paste, Join, Explode, Group and Ungroup multiple shapes, Apply colour to any shape, Modify shape using grips or by property editor, Boolean shape operations: Union, Intersect, Split, Subtract, Rectangular Repeat, Circular Repeat.

### IMPORT/EXPORT FEATURES

#### Import

Raster Image - JPG,BMP,ICO,EMF,WMF.  
Clipboard Vector paste (eg from CorelDraw)  
Gerber (RS274X) - PCB designs are imported and converted into polylines.  
Autocad drawings (DWG,DXF) - drawings can be imported (Autocad versions 2.5 through to 2000).  
Vector Image Clipart - WMF, EMF.  
Font - any Truetype Font (TTF) can be imported then used by the software.

#### Export

Autocad DXF versions 10 through to 2000.

Custom file format for loading and saving design, machining plans and images.



### CAM WIZARD FEATURES

Material selector - customisable materials define cutting feeds, speeds and cutting depth.

Machining plan - easily create and rearrange any number of machining plans from the following types:

**Follow** - follow the shapes path ideal for Engraving and Laser Cutting.

**Inside Offset** - offset cutter path inside shape(s) with automatic island recognition.

**Outside Offset** - offset cutter path outside shape(s).

**Area Clearance** - multiple offset cutter paths inside the shape(s).

**Raster Clearance** - create a raster path at any angle to clear the inside of shape(s).

**Drill** - select point, circle or arc centres for drilling operations.

Automatic island recognition selects whether shapes within shapes are machined on the inside or the outside. Each island's level (ie, inside or outside) can be altered manually.

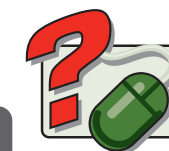
**Post Process** - final tool path can be simulated quickly in 2D then posted (G code) to a variety of machines via the customisable post processor.

Powerful printing features allow printed output to be previewed, moved and scaled accurately - making it ideal for use with plotting, engraving and laser cutting devices.

### SYSTEM REQUIREMENTS

IBM or 100% Compatible PC, Pentium III, 1Ghz, 512MB RAM, 200MB Free Hard Disk Space, Microsoft Windows XP/NT/2000 and later, CD-ROM Drive, Floppy Drive, OpenGL 3D Accelerator Graphics Card with 128MB RAM supporting at least 1024 x 768 screen resolution.  
CNC Machines require USB Connection.\*

\*N.B. Machines cannot be run from 64-Bit Operating Systems



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# QuickCAM PRO

ADVANCED MILLING CAM SOFTWARE

## QuickCAM PRO

ADVANCED MILLING CAM SOFTWARE

QuickCAM Pro is an advanced, yet simple to use, wizard based CAM package, which is used to create cutter paths for machining 3D parts on a milling machine or router. Both STL files and image files can be imported into QuickCAM Pro, and a comprehensive set of machining plans can be used individually or in combination to produce complex 3D surfaces and lithophanes.

### FEATURES

12 machining plans – use individually or in combinations:

- **3 Roughing Plans.**
- **6 Finishing Plans.**
- **3 Fine Finishing Plans.**

Each plan can be customised or used with default values.

Any number of plans can be used to produce the final part.

Different cutters can be used with each plan.

Simulation mode can be toggled on or off for easy viewing.

Custom boundary feature allows selected area to be machined.

Viewer and simulation colours can be selected and changed.

Finished models can be rendered in custom materials.

Intelligent scaling fits model into billet or billet around model.

Comprehensive “show me” files to provide Help options.

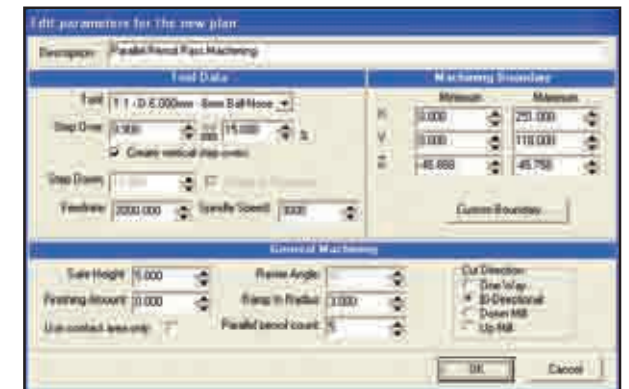


### SUPPORTED INPUT FORMATS

3D Stereo Lithography\*(STL) files.

\*Used by Pro/DESKTOP, ArtCAM, Autodesk Inventor and Solid Edge.

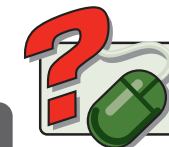
AutoDesk 3D Studio Files (3DS).



### SYSTEM REQUIREMENTS

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# VR CNC Milling 5

CNC MACHINE CONTROL SOFTWARE

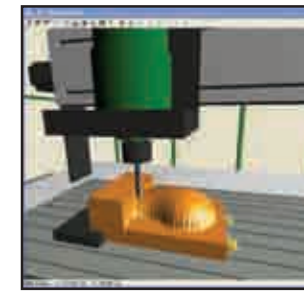
## VR CNC Milling 5

CNC MACHINE CONTROL SOFTWARE

Virtual Reality (VR) CNC Milling 5 is an improved and updated version of our CNC machine control software incorporating Denford PCB Manufacturing Software and 2D DXF import facilities, together with USB connectivity, delivering machining times up to 40% faster than before. Enhanced features provide the user with new machining capabilities, simplified options in datum setting, improved tool and work offset features and a new, powerful, virtual reality 3D simulation engine.

### PROGRAMMING FEATURES

Program information screen provides fast interactive 3D depiction of tool path.  
Powerful NC code editing options.  
Program pre-scan checks for syntax errors and invalid codes prior to machining.  
Utilities toolbar provides seamless integration with other Denford applications.  
Simplified tool editing with multiple tool types.



### VR SIMULATION FEATURES

Simulate real machining with highly detailed Virtual Reality.  
Actual cutting of the virtual material in jog mode or program cycle.  
Tables, bases and workholding fixtures are simulated.  
Collision detection: objects change colour when cutter comes into contact with billet, workholding or tables.  
Virtual feed & speed overrides can control the virtual machine.  
Auto datum facility: Program can run without having to set the VR offsets.

### MACHINE CONTROL FEATURES

USB connectivity – Faster Data Transfer.  
Continuous Path Manufacturing system pre-examines CNC moves to determine optimum change of direction.  
One click datum positioning.  
Material override mode – Automatically adjusts program feeds & speeds from a pre-set menu.  
Intelligent program restart window allows restart of program from any line.  
Denford Post Processor allows translation of NC programs between different controllers.

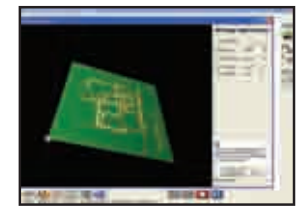
### SYSTEM REQUIREMENTS

Please refer to page 13.



### VR MILLING PCB IMPORT

Simple "Wizard" program with 3D Graphics.  
Imports Gerber files from all major PCB design packages.  
Imports Drill files from all major PCB design packages.  
Multi pass machining strategy increases clearance around tracks.  
Option to create drilling plan from pad hole diameters.  
Option to centre pads, pilot holes or drill all holes.  
Handles double sided boards.  
Toolpath simulation.



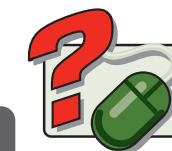
### VR MILLING 2D DXF IMPORT

Simple "Wizard" program with 2D Graphics.  
Integrated Material and Tool Library.  
Imports DXF and DWG files from all major CAD packages:- TechSoft, Pro/DESKTOP, ArtCAM, AutoCAD, CorelDraw etc.  
Multiple cutter path strategies including:  
Follow Path.  
Inside Offset [cutter path offset by radius].  
Outside Offset [cutter path offset by radius].  
Area Clearance [Offset by outline] with programmable step-over.  
Area Clearance [Raster] with programmable step over and angle.  
Drilling cycles.  
Intelligent selection of Islands.  
Toolpath simulation.

### IMPORTING TECHSOFT 2D DESIGN FILES

A key feature of VR Milling Version 5 is a DXF / DWG file import facility which is far more advanced than the Techsoft post supplied with Techsoft Version 1, and is far simpler to use.  
This import routine works with all major CAD packages and applies to both Techsoft Versions 1 and 2.

As a result, all Denford machines supplied within the last 3 years are able to import designs drawn in Techsoft Version 1 or 2 without any additional software or post processor being required.  
DXF import allows 6 cutting strategies to be selected, and it uses the tooling and material library from within VR Milling 5 whilst selecting the correct feeds speeds and depths of cut. As a result it does not require the user to use colour, fill or line width to define tool paths.



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 **DENFORD**

# QuickTURN 2D DESIGN

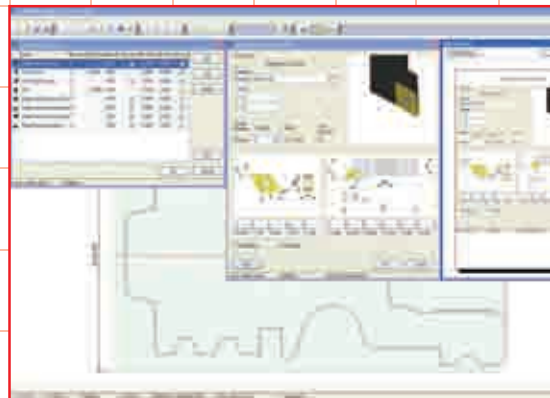
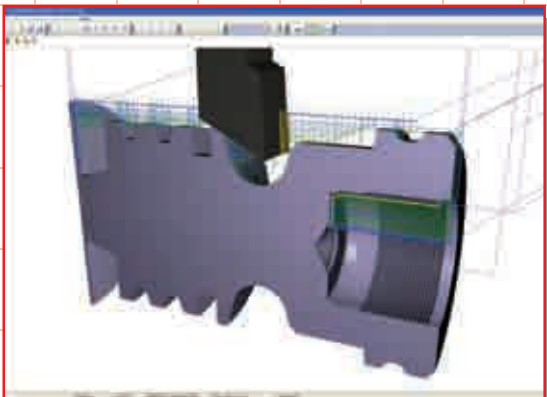
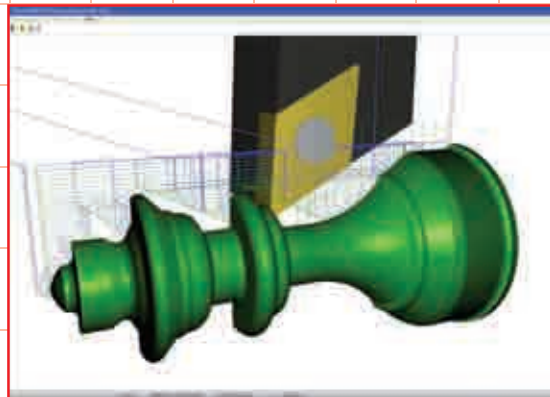
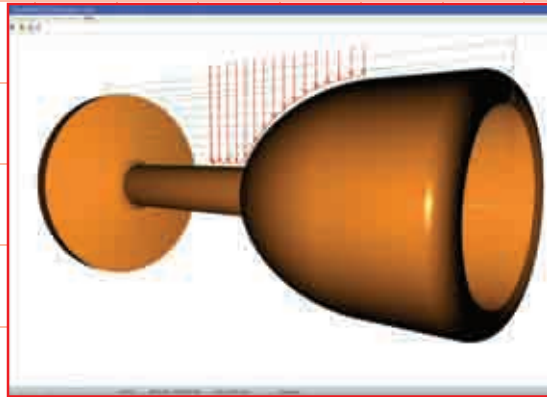
CAD/CAM DESIGN AND MANUFACTURE SOFTWARE FOR LATHES

 **DENFORD**

## QuickTURN 2D DESIGN

CAD/CAM DESIGN AND MANUFACTURE SOFTWARE FOR LATHES

QuickTURN is an advanced yet simple to use, wizard based CAD/CAM package for Lathes. You can create or import 2D profiles, configure your tooling and material settings, then run the CAM wizard to create and simulate CNC Lathe toolpaths. The software features fully automatic toolpath generation, picking the most suitable tool from those available.

**NEW**


### PROFILE DRAWING FEATURES

Create lines, arcs and threads on external and internal profiles.  
Geometry is limited to the billet size and interacts with the rest of the profile to inhibit the creation of profiles that would be impossible to machine (eg, overhangs or breaking through from the internal profile).  
DXF file import wizard allows designs from other CAD software to be turned into a profile ready for the CAM wizard.  
Profile items can be edited interactively on screen, or by the property editor.  
Profile dimensions update constantly.

### TOOLING AND MATERIAL OPTIONS

The tooling editor allows a wide range of tool types to be edited or created and features a live 3D preview of the tool. The shape and size of tool tips and holders can be defined exactly as they are in the real world for a more realistic simulation.  
Tools can be quickly deactivated so the CAM wizard will not pick them.  
Material types can be configured quickly and easily to include feed, speed and cut depth settings for each of the tools available.  
Default feed and speed settings for all tool types can be edited quickly by a unique override slide bar.  
Tooling and material details can be printed out in summary or full detail.

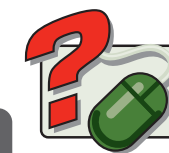
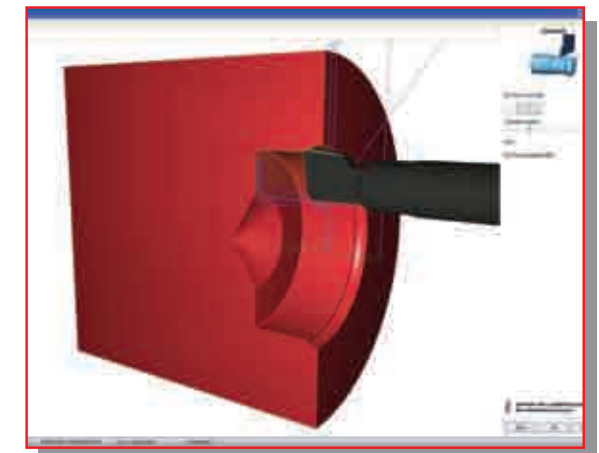
### SYSTEM REQUIREMENTS

IBM or 100% Compatible PC, Pentium III, 1Ghz, 512MB RAM, 200MB Free Hard Disk Space, Microsoft Windows XP/NT/2000 and later, CD-ROM Drive, Floppy Drive, OpenGL 3D Accelerator Graphics Card with 128MB RAM supporting at least 1024 x 768 screen resolution.  
CNC Machines require USB Connection.\*

\*N.B. Machines cannot be run from 64-Bit Operating Systems

### CAM WIZARD FEATURES

Material selector to alter feed, speed and cut depths.  
Billet Material size editor in case the actual material is larger than the design.  
Tooling selector quickly allows certain tools to be deactivated.  
Toolpath generator automatically picks the tools and creates all internal/external cutting and threading operations.  
Tool nose radius compensation is automatically applied to the generated toolpath for any turning, boring and grooving tools.  
A 3D preview of the design also shows the generated toolpaths.  
Each set of toolpaths can be deactivated if not required by the rearrange profile editor.  
Toolpaths are post-processed to a CNC file suitable for a Denford Lathe.  
A fully animated 3D cutting simulation of the tool paths lets you verify that the CNC program is ok.



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# VR CNC Turning

CNC MACHINE CONTROL SOFTWARE

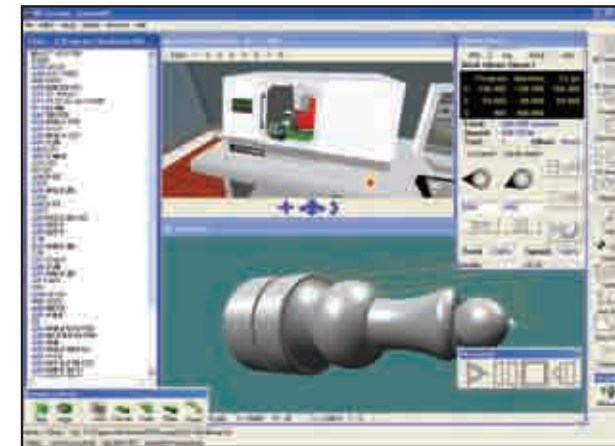
## VR CNC Turning

CNC MACHINE CONTROL SOFTWARE

VR CNC Turning is a Virtual Reality based CNC programming software package offering full machine control and Virtual Reality simulation of CNC Lathes. Features include customisable docking toolbars, comprehensive tooling management, colour formatting of NC code, powerful NC code modification options, context sensitive G&M code help.

### PROGRAMMING FEATURES

Customisable docking toolbars.  
Comprehensive tooling management.  
Colour formatting of NC code.  
Powerful NC Code modification options.  
Context sensitive G&M code help.



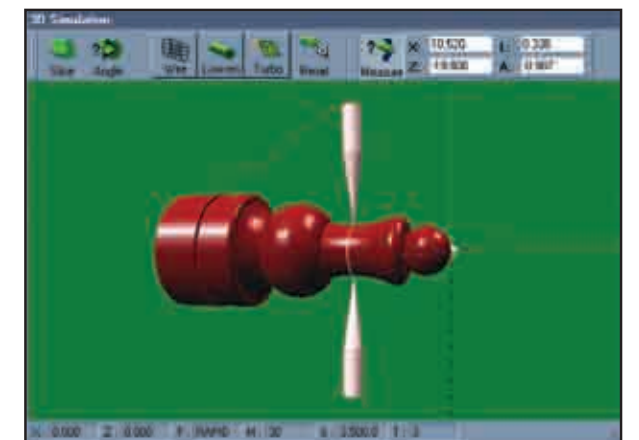
### VR SIMULATION FEATURES

Dynamic rotation/zooming.  
Colour coded move types and tooling.  
Built in Virtual Micrometer to measure the simulated workpiece.  
Unique "SourceTrack" technology for interaction between graphical data and NC Code.



### MACHINE CONTROL FEATURES

VR CNC Turning is recommended for physical control of the full range of Denford CNC Lathes. Password protected machine parameters allows tailoring to suit individual machines.  
The Denford Post Processor allows translation of NC programs between different controller types.



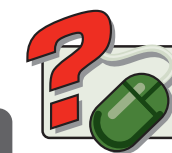
### VIRTUAL REALITY FEATURES

Virtual Reality control encourages students to familiarise themselves with machining processes before physical manufacture. Includes a fully working Automatic Turret and library of machine options.

### SYSTEM REQUIREMENTS

IBM or 100% Compatible PC, Pentium III, 1Ghz, 512MB RAM, 200MB Free Hard Disk Space, Microsoft Windows XP/NT/2000 and later, CD-ROM Drive, Floppy Drive, OpenGL 3D Accelerator Graphics Card with 128MB RAM supporting at least 1024 x 768 screen resolution. CNC Machines require USB Connection.\*

\*N.B. Machines cannot be run from 64-Bit Operating Systems



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# Virtual Wind Tunnel

F1 VWT ANALYSIS SOFTWARE

## Virtual Wind Tunnel

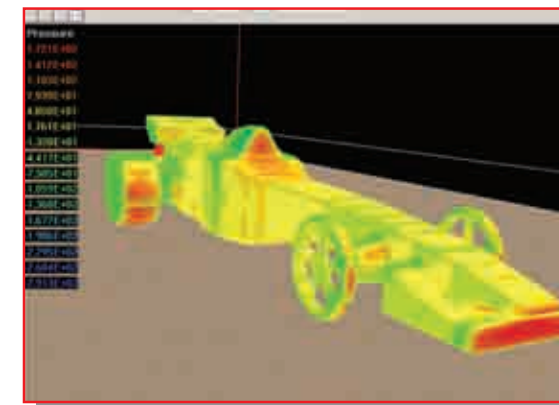
F1 VWT ANALYSIS SOFTWARE

The Virtual Wind Tunnel provides an innovative and cost-effective way for schools and colleges to analyse and test their F1 cars. The results will provide you with information relating to the potential performance of your design, and provide guidance towards the areas for improvement.

For those involved in the F1 Challenge, the process is simple - students design their F1 car with 3D CAD software such as SolidWorks, 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.

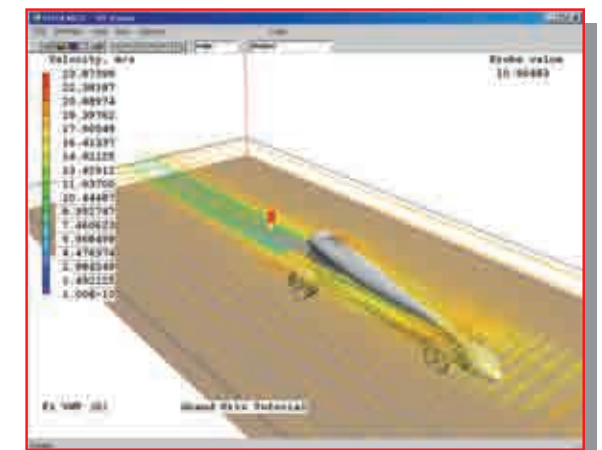
CFD is based upon the laws of physics, of conservation of mass, momentum and energy. The equations are embodied within a mathematical model and solved using a grid superimposed on the region of interest. For the F1 in Schools Challenge, this will be your "analyse process" - i.e. Step 2 of your team's progress towards racing success.




Your design will be imported from CAD software and displayed in our Formula 1 Virtual Wind Tunnel (F1VWT) software which is already set up to receive it. You will alter initial settings, boundary conditions and other factors in the F1 VWT pre-processor, before starting the mathematical 'solver'. Once the solution has been reached, you will visualise the results interactively in graphical form, using the F1 VWT post-processor.

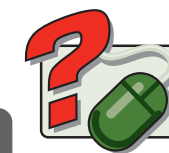
You will see velocities, pressures, areas of turbulence, lift and drag, using vector plots, contour plots, streamlines and iso-surfaces. The forces on the car body will be calculated and plotted to provide lift and drag data.

Industrial design companies use CFD techniques to assist with their prototype designs. What you do with the information is up to you ...



### SYSTEM REQUIREMENTS

Any standard Windows PC (XP or VISTA) system. The software is both CPU- and RAM-intensive but 1GB RAM should suffice (& 2GB is better), and a 1GHz processor speed (as a minimum). No special graphics requirement. Both 32-bit and 64-bit systems are supported but, if required, 64-bit must be specified at time of order.



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# PCB Engraver

3 AXIS CNC PCB AND ENGRAVING MACHINE



The PCB Engraver is ideal for manufacture of PCB boards.

# PCB Engraver

3 AXIS CNC PCB AND ENGRAVING MACHINE

A 3 axis CNC PCB and Engraving Machine with totally-enclosed guarding, suitable for all levels of education and training. The PCB Engraver is supplied with operating software incorporating Gerber and DXF import facilities. The PCB Engraver is ideal for cutting and engraving a range of resistant materials, including copper board, plastic and acrylic.

Denford's PCB Engraver is ideal for schools wishing to move away from traditional methods of chemical etching of PCB boards.

Denford's PCB Engraving machine features the latest 'Floating Head' technology. The Floating Head allows manufacture of PCB's, and engraving of uneven surfaces. The PCB Engraver is also ideal for batch manufacture of PCB boards.

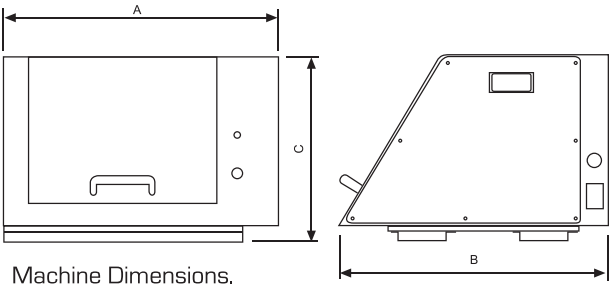
Tool changes are a simple process and allow drilling of larger holes, and the adjustable spindle speed and feedrate make the PCB Engraver ideal for cutting or engraving a range of resistant materials such as plastic, acrylic and copper board. The floating head combined with powerful new software, makes manufacture a quick and easy process.

## THE PCB ENGRAVER COMES AS STANDARD WITH:

Powerful operating software that is simple to use and allows multiple designs to be made at once.  
High speed spindle motor and floating head technology.  
Basic tools and depth-setting device.  
Installation and Instruction guides.  
Outlet for dust extraction.  
Sacrificial Table.  
USB Connection.

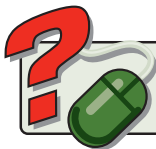
CAD, CAM and/or PCB design software, such as Denford's QuickCAM 2D Design, will be required in order to make the files required for machining (CNC G-Code or Gerber).

N.B. To allow optimum performance of the Floating Head dust extraction is essential.



- **Precision Leadscrews**  
For high-accuracy positioning
  - **100 Watt, 20,000 RPM Motor**  
Ideal for small diameter tooling
  - **Floating Head**  
Allows machining over uneven surfaces
  - **5,000mm/min Fast Traverse**  
For speed of manufacture
  - **Localised Dust Extraction**  
Essential for accurate cutting with Floating Head
  - **Spare Spindle Motor is Available**  
For quick and easy toolchange
- Please note, diagram for illustration purposes only.

MECHANICAL DETAILS	PCB Engraver
Machine Length (A)	570mm - 22.44in
Machine Depth (B)	585mm - 23.03in
Machine Height Bench Mounting (C)	385mm - 15.16in
Machine Weight	43kg - 94.80lb
Table Size	360 x 210mm - 14.17 x 8.27in
Travel X Axis	330mm - 13in
Travel Y Axis	210mm - 8.27in
Travel Z Axis	40mm - 1.57in
Float Z Axis	5mm - 0.20in
Beam Clearance	50mm - 1.97in
Max. Spindle Speed	20,000 RPM
Spindle Speed Control	Manual
Max. Feed Rate	5000mm/min - 196.85in/min
Max. Contouring Feed Rate	1000mm/min - 39.37in/min
Mains Supply Requirements* (* Alternative supplies available on request)	Single Phase
Spindle Motor	100 Watts
Axes Motors	Stepper
Volts	230 Volts - 110/120VAC
Current	5 Amps



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# Compact 1000/1000 PRO

COMPACT 3 AXIS CNC ROUTER



# Compact 1000/1000 PRO

COMPACT 3 AXIS CNC ROUTER

A compact 3 axis CNC Router with totally enclosed interlocking guard, suitable for all levels of education and training. The Compact 1000 is ideal for cutting a range of resistant materials such as hard and soft wood, plastic, modelling foam, acrylic and prototyping materials. In addition, the Compact 1000 Pro can cut non-ferrous metals.



Shown with optional universal bench and integral dust extraction.

### THE COMPACT 1000/1000 PRO COME AS STANDARD WITH:

- VR CNC Milling Operating Software (PC not included).
- Aluminium T Slot Table.
- Outlet for Dust Extraction System.
- Workholding Clamps.
- Installation and Instruction Manuals.
- USB Connection.

### OPTIONAL EQUIPMENT INCLUDES:

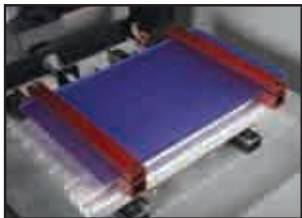
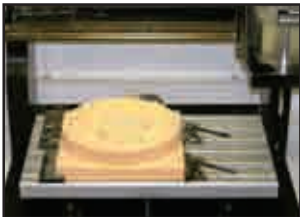
- Vacuum Pads, F1 in Schools Car Manufacturing Fixture,
- Industrial Keypad, 4th Axis Programmable Rotary Fixture,
- 3D Scanning Attachment, Universal Machine Bench and
- Dust Extraction Unit.

### SYSTEM REQUIREMENTS

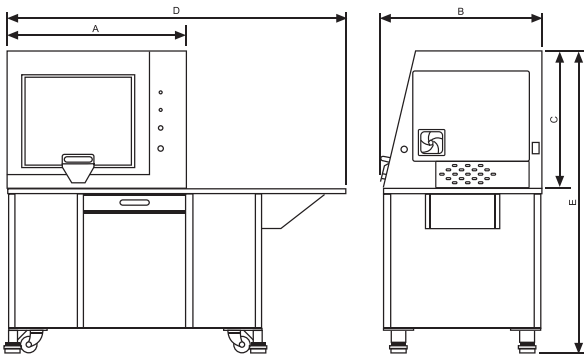
Please refer to page 13.

### RECOMMENDED SOFTWARE PROGRAMS

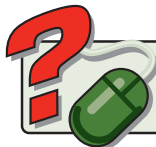
- All software necessary to control the Compact 1000 / Compact 1000 Pro is included. Also included is a seat of QuickCAM 2D Design - an easy to use 2D CAD package.
- For 2D Designs - will link to packages able to export 2D dxf files such as QuickCAM 2D Design, TechSoft Design Tools - 2D Design, CorelDraw etc.
  - For 3D Designs - will link to packages able to export STL files such as Pro/DESKTOP, ArtCAM and Autodesk Inventor SolidWorks etc. when used in conjunction with QuickCAM Pro.



MECHANICAL DETAILS	COMPACT 1000	COMPACT 1000 PRO
Machine Length (A)	875mm - 34.45in	
Machine Depth (B)	750mm - 29.53in	
Machine Height (C)	675mm - 26.58in	
Length with Optional Base (D)	1600mm - 62.99in	
Height with Optional Base (E)	1440mm - 56.69in	
Machine Weight	116kg - 255.74lb	
Machine Weight, with Opt. Base	230kg - 506.06lb	
Table Size	400 x 240mm - 15.75 x 9.45in	
Travel X Axis	400mm - 15.75in	
Travel Y Axis	240mm - 9.45in	
Travel Z Axis	110mm - 4.33in	
Beam Clearance	140mm - 5.51in	
Max. Spindle Speed	23000RPM	24000rpm
Non-Ferrous Metal Cutting	No	Yes
Spindle Speed Control	No	Yes
Spindle Speed Override	No	Yes
Max. Feed Rate	5000mm/min - 196.85in/min	
Max. 3D Profiling	4500mm/min - 177.17in/min	
Mains Supply Requirements *	Single Phase	
(* Alternative supplies available on request)		
Spindle Motor	1.1kW - 1.48HP	1.0kW - 1.34HP
Axes Motors	Stepper	
Volts	230 Volts - 110/120VAC	
Amps	8 Amps	
Hz	50/60 Hz	
Electric Connection	13A Socket	



Machine Dimensions.



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# Router 2600/2600 PRO

3 AXIS CNC ROUTER



## Router 2600/2600 PRO

3 AXIS CNC ROUTER

A 3 axis CNC Router with totally enclosed interlocking guard, suitable for all levels of education and training. With its large capacity the Router 2600 is ideal for cutting a range of resistant materials such as hard and soft wood, plastic, modelling foam, acrylic and prototyping material. In addition, the Router 2600 Pro can cut non-ferrous metals.

### THE ROUTER 2600/2600 PRO COME AS STANDARD WITH:

- VR CNC Milling Operating Software (PC not included).
- Aluminium T Slot Table.
- Installation and Instruction Manuals.
- Outlet for Dust Extraction System.
- Workholding Clamps.
- USB Connection.

### OPTIONAL EQUIPMENT INCLUDES:

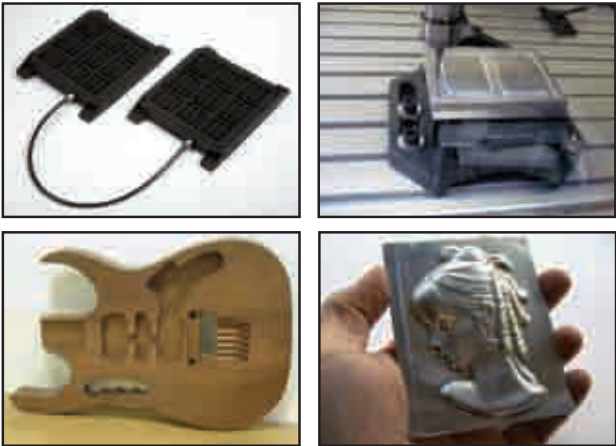
- Vacuum Bed, F1 in Schools Car Manufacturing Fixture,
- Industrial Keypad, 4th Axis Programmable Rotary Fixture,
- 3D Scanning Attachment, Dust Extraction Unit and Universal Machine Bench.

### SYSTEM REQUIREMENTS

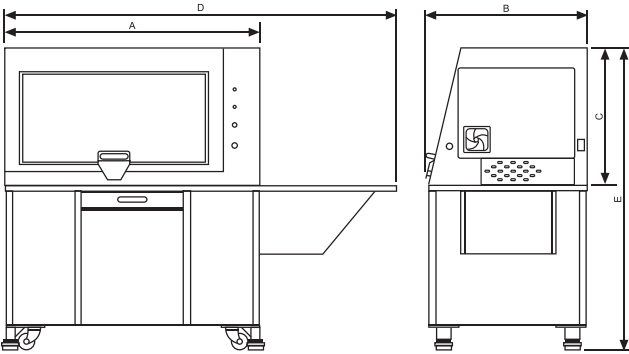
Please refer to page 13.

### RECOMMENDED SOFTWARE PROGRAMS

- All software necessary to control the Router 2600/ Router 2600 Pro is included. Also included is a seat of QuickCAM 2D Design - an easy to use 2D CAD package.
- For 2D Designs - will link to packages able to export 2D dxf files such as QuickCAM 2D Design, TechSoft Design Tools - 2D Design, CorelDraw etc.
  - For 3D Designs - will link to packages able to export STL files such as Pro/DESKTOP, ArtCAM and Autodesk Inventor SolidWorks etc. when used in conjunction with QuickCAM Pro.



MECHANICAL DETAILS	ROUTER 2600	ROUTER 2600 PRO
Machine Length (A)	1200mm - 47.24in	
Machine Depth (B)	750mm - 29.53in	
Machine Height (C)	675mm - 26.58in	
Length with Optional PC Arm (D)	1850mm - 72.83in	
Height with Optional Base (E)	1440mm - 56.69in	
Machine Weight	150kg - 330.69lb	
Machine Weight with Opt. Base	255kg - 562.18lb	
Table Size	700 x 430mm - 27.56 x 16.93in	
Travel X Axis	600mm - 23.62in	
Travel Y Axis	400mm - 15.75in	
Travel Z Axis	110mm 4.33in	
Beam Clearance	150mm - 5.91in	
Max. Spindle Speed	23000RPM	24000rpm
Non-Ferrous Metal Cutting	No	Yes
Spindle Speed Control	No	Yes
Spindle Speed Override	No	Yes
Max. Feed Rate	5000mm/min - 196.85in/min	
Max. 3D Profiling	4500mm/min - 177.17in/min	
Mains Supply Requirements* (* Alternative supplies available on request)	Single Phase	
Spindle Motor	1.1kW - 1.48HP	1.0kW - 1.34HP
Axes Motors	Stepper	
Volts	230 Volts - 110/120VAC	
Amps	8 Amps	
Hz	50/60 Hz	
Electric Connection	13A Socket	



Machine Dimensions.



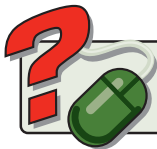
Shown with optional universal bench and optional computer support extension. (PC not included)



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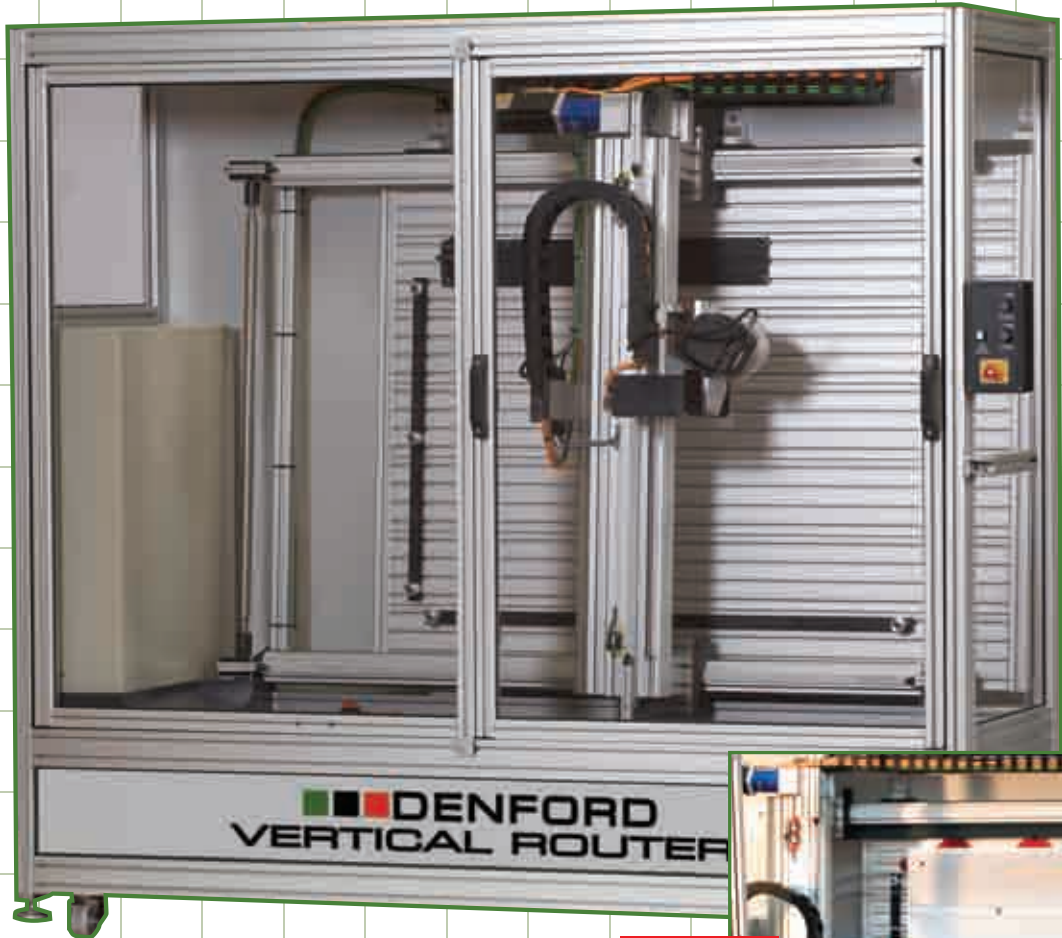
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# Vertical Router

LARGE FORMAT 3 AXIS CNC ROUTER



NEW

New Large Format Vacuum Bed  
See Router Accessories page 32

## Vertical Router

LARGE FORMAT 3 AXIS CNC ROUTER

The Denford Vertical Router is a large format CNC Router, combining high speed machining over a large working area with space saving engineering. The 1200 x 800 mm working envelope makes it ideal for the manufacture of large-scale items such as furniture parts and door panels. The machine is well equipped with a high power 21,000 rpm spindle motor and AC Servo Motors allowing contouring and rapid feeds of 20 metres per minute in all axes. Inspired design provides excellent production capabilities and ease of installation, as the Vertical Router will fit through a standard door frame.

### THE VERTICAL ROUTER COMES AS STANDARD WITH:

- VR CNC Milling Operating Software (PC not included).
- Aluminium T Slot Table.
- Outlet for Dust Extraction System.
- Maintenance and Instruction Manuals.
- Workholding Clamps.
- USB Connection.

### OPTIONAL EQUIPMENT INCLUDES:

- Hinged Arm Computer Shelf, Dust Extraction Unit, F1 in Schools Car Manufacturing Fixture, 4th Axis Programmable Rotary Fixture, and Workholding Clamps.

### KEY FEATURES INCLUDE:

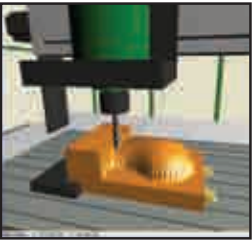
- Incredible 1200 x 800 x 150 mm working area.
- 21,000 rpm spindle motor.
- Fully closed loop servo system for increased machining accuracy.
- 20 metres per minute Feed/Rapid rate.
- Will fit through a standard door frame.

### SYSTEM REQUIREMENTS

Please refer to page 13.

### RECOMMENDED SOFTWARE PROGRAMS

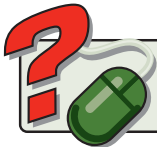
- All software necessary to control the Vertical Router is included. Also included is a seat of QuickCAM 2D Design - an easy to use 2D CAD package.
- For 2D Designs - will link to packages able to export 2D dxf files such as QuickCAM 2D Design, Techsoft Design Tools - 2D Design, CorelDraw etc.
  - For 3D Designs - will link to packages able to export STL files such as Pro/DESKTOP, ArtCAM and Autodesk Inventor SolidWorks etc. when used in conjunction with QuickCAM Pro.



Will fit through a standard door



MECHANICAL DETAILS	VERTICAL ROUTER
Machine Width	2200mm - 86.61in
Machine Depth	750mm - 29.53in
Machine Height	1920mm - 75.59in
Machine Weight	450kg - 992lb
Table Size	1300 x 900mm - 51.18 x 35.43in
Travel X Axis	1200mm - 47.24in
Travel Y Axis	800mm - 31.50in
Travel Z Axis	150mm - 5.91in
Max. Spindle Speed	21,000rpm
Feed Rate (all axes)	20 metres/min - 65.62ft/min
Mains Supply Requirements* (* Alternative supplies available on request)	Single Phase
Spindle Motor	1.7kW - 2.28HP
Axes Motors	Servo
Volts	230 Volts
Amps	13 Amps
Hz	50/60Hz
Electrical Connection	16A Hard Wired



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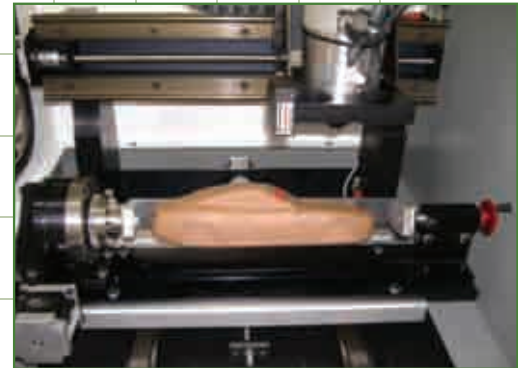


# Router Accessories

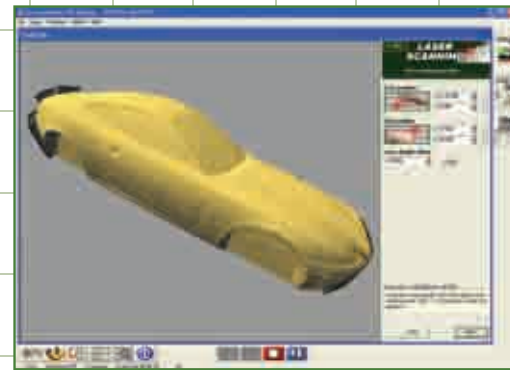
EasySCAN 3D  
3D SCANNING ATTACHMENT & SOFTWARE FOR DENFORD ROUTERS



1. Select a model



2. Scan the model



3. Manipulate scan data



4. Manufacture on a Denford CNC Router



5. Completed model

Denford's EasySCAN 3D Scanner attachment has full 360 degree scanning capability when used in conjunction with Denford's Rotary Fixture, and is suitable for use with the entire range of Denford CNC Routers.

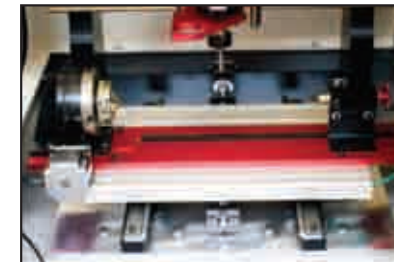
The EasySCAN 3D package incorporates user friendly, wizard based software for scanning, editing and saving 3D models, prior to manufacture on a Denford CNC Router. EasySCAN 3D is ideal for Reverse Engineering applications.

**3D Scanning & Manufacturing Package**  
see page 44 - 45

## Router Accessories

4TH AXIS PROGRAMMABLE ROTARY FIXTURE/CAR MANUFACTURING FIXTURE  
VAC PADS & BEDS

The Denford 4th axis programmable rotary fixture is designed for use with the Denford range of CNC Routers. It allows 360 degree rotation of material and comes complete with its own software - QuickCAM 4D Milling.



### 4th Axis Programmable Rotary Fixture

for use with Compact 1000,  
Router 2600 & Vertical Router.

### QUICKCAM 4D MILLING SOFTWARE

(Supplied **FREE** with the Denford 4th Axis Programmable Rotary Fixture.)

An easy to use, wizard based CAM package specifically designed for use with the Denford 4th axis programmable rotary fixture. QuickCAM 4D Milling imports 3D files from most 3D CAD packages and converts these into 4th axis CNC program data for output to the range of Denford CNC Routers. Users are guided through a series of simple steps, defining billet size, model orientation, machining strategy and axis of rotation before generating the appropriate CNC output file.

### QUICKCAM 4D MILLING FEATURES

True 3Dimensional model-making capabilities. Seamless integration with VR CNC Milling software. Circular, spiral and linear machining strategies. User definable limits allow for workholding avoidance. Supports both roughing and finishing paths. Resize, orientate and centre the model. Autoscale of model to fit the workpiece.

### SUPPORTED OUTPUT FORMATS

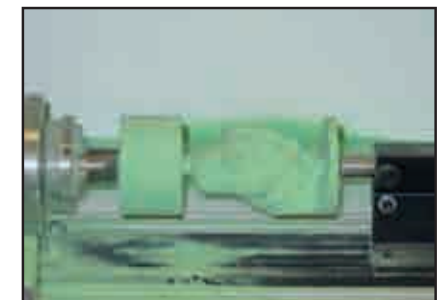
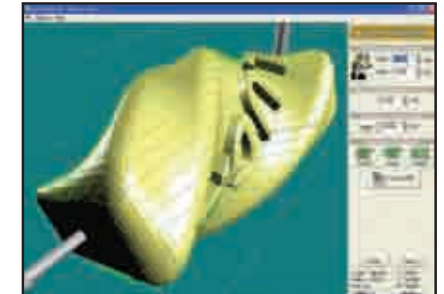
CNC controllers for Denford CNC Routers.

### SUPPORTED INPUT FORMATS

3D Stereo Lithography \*.STL files  
\*Used by Pro/DESKTOP, ArtCAM, Autodesk Inventor and Solid Edge, Autodesk 3D Studio Files (3DS), SolidWorks.

### SYSTEM REQUIREMENTS

IBM or 100% Compatible PC, Pentium III, 1Ghz, 512MB RAM, 200MB Free Hard Disk Space, Microsoft Windows XP/NT/2000 and later, CD-ROM Drive, Floppy Drive, OpenGL 3D Accelerator Graphics Card with 128MB RAM supporting at least 1024 x 768 screen resolution. CNC Machines require USB Connection.\*  
\*N.B. Machines cannot be run from 64-Bit Operating Systems



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# Router Accessories

FLOATING HEAD PCB MANUFACTURE AND ENGRAVING



## PCB Production with a Floating Head

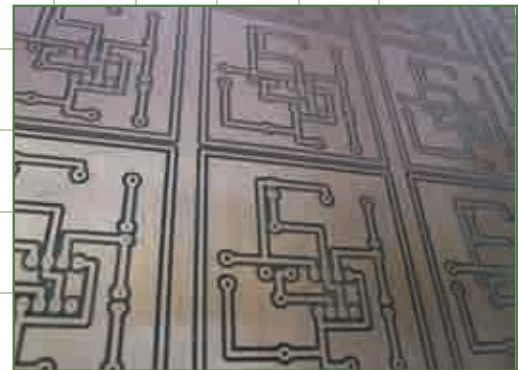
Denford's 'Floating Head' option permits manufacture of PCB's and engraving of uneven surfaces, and is ideal for batch manufacture of PCB boards.

The floating head comes complete with a quick change facility for a swift interchange with the standard issue router motor.

The cutting tool profiles around the outside of the tracks creating an isolation gap. The weight of the spindle motor plunges the cutter into the PCB board, and depth is set by a plastic disc that floats on the material surface. A float up to 5mm is possible using this technology.

Tool changes are a simple process and allow drilling of larger holes.

The floating head is designed for use on Denford's Compact 1000 / Pro and Router 2600 / Pro.



## DUST PRO 100 EXTRACTION UNIT

Denford's Large Capacity Dust Extraction system is a purpose-designed dust control system for use with the Compact 1000/Pro and Router 2600/Pro. It can be used as a stand-alone unit, or incorporated within Denford's Universal Machine Bench, as shown above. The unit is highly effective in removing airborne dust and light particles produced during machining, and is recommended for schools where MDF is regularly used. The unit comes ready to use including a removable / re-usable dust collection bag and separate HEPA filter.



## LARGE FORMAT VACUUM BED

Suitable for use with the Router 2600/Pro, and the Vertical Router, the large format (600 x 400mm) bed is supplied with an external vacuum pump. Suitable for 'blind' machining and 'through' machining when used with sacrificial mat.

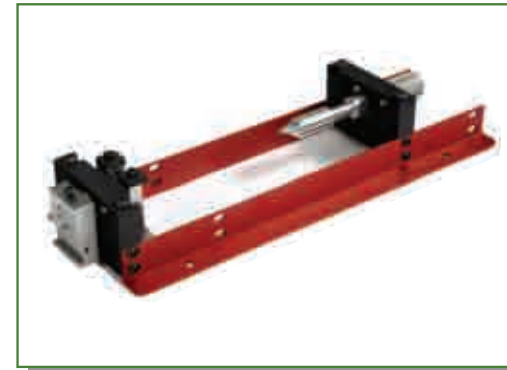
Dual-bed option with manifold is available for use with the Vertical Router, details on application.

# Routing Accessories

VAC PADS, VAC BEDS, CAR MANUFACTURING FIXTURE AND CLAMPING KITS

A range of vacuum bed options for clamp-free machining operations.

All these accessories are suitable for use with Denford's range of CNC Routers. The accessories enhance the capabilities of the machines, and enable 2D and 3D designs to be manufactured easily and effectively.



## F1 IN SCHOOLS CAR FIXTURE

The F1 in Schools car manufacturing fixture comes as standard with 2 clamping systems to enable the manufacture of D Type and R Type cars. The fixture clamps directly to the T-slotted table on the Compact 1000 / Pro or Router 2600/Pro and is also suitable for use on the VMC 1300.

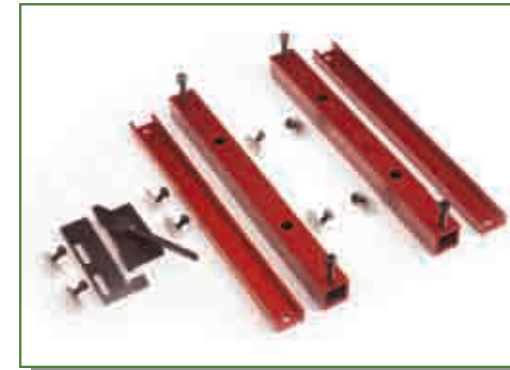


## DUST PRO 50 EXTRACTION UNIT

Particle and dust extraction unit suitable for use with the Compact 1000/Pro and the Router 2600/Pro.

This purpose designed unit is ideal for extraction of airborne dust created during the manufacturing process, and also to vacuum the machine after the cutting process is complete.

The unit comes complete with castors, flexible hose and fittings.



## ADDITIONAL CLAMPING KIT

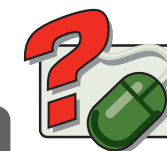
Additional Clamping Kit includes 2 Parallel Clamping Rails with T-Nuts, (allowing the workpiece to be raised from the bed, to permit 'through' machining), 1 additional L Bracket and Lever Clamp with T-Nuts.



## VAC PADS

Vac Pads are suitable for the Compact 1000/Pro and Router 2600 / Pro. The package includes 2 vacuum pads and an integral vacuum pump.

Suitable for 'blind' machining only.



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# VMC 1300

CNC MILLING MACHINE

# VMC 1300

CNC MILLING MACHINE

A 3 axis CNC milling machine available either floor standing or for bench mounting, with totally enclosed high visibility interlocking guard, suitable for all levels of education and training. Programmable spindle speeds and feedrates make the VMC 1300 ideal for cutting a range of resistant materials such as wax, plastic, acrylic, free cutting alloys, aluminium and steel. Also available for integration into FMS/CIM systems (additional equipment must be fitted at time of manufacture).

### THE VMC 1300 COMES AS STANDARD WITH:

- VR CNC Milling Operating Software (PC not included).
- Installation and Instruction Manuals.
- Power Drawbar with Manual Actuation.
- Workholding Clamps
- USB Connection.

### OPTIONAL EQUIPMENT INCLUDES:

Table mounted 6 station automatic tool changer (which can be removed to enable full 375mm X axis travel), pneumatic vice and guard, spray mist coolant, and Universal Machine Bench. 4th Axis Programmable Rotary Fixture is also available.

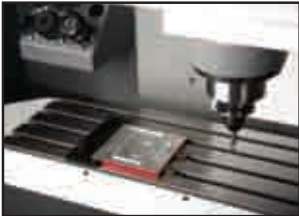
### SYSTEM REQUIREMENTS

Please refer to page 13.

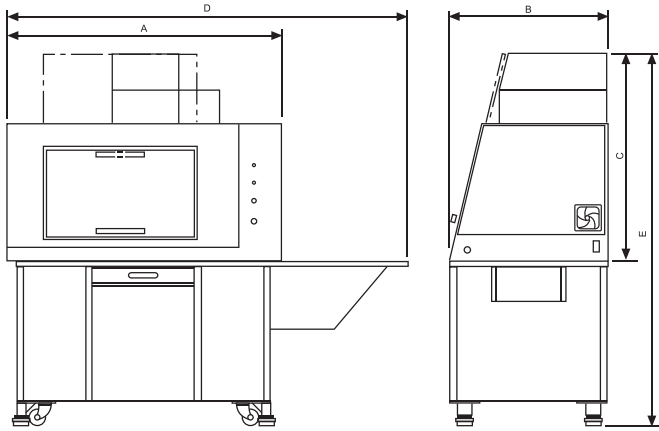
### RECOMMENDED SOFTWARE PROGRAMS

All software necessary to control the VMC 1300 is included. Also included is a seat of QuickCAM 2D Design - an easy to use 2D CAD package.

- For 2D Designs - will link to packages able to export 2D dxf files such as QuickCAM 2D Design, TechSoft Design Tools - 2D Design, CorelDraw etc.
- For 3D Designs - will link to packages able to export STL files such as Pro/DESKTOP, ArtCAM and Autodesk Inventor SolidWorks etc. when used in conjunction with QuickCAM Pro.



MECHANICAL DETAILS	VMC1300	VMC1300 PRO
Machine Length (A)	1300mm - 51.18in	
Machine Depth (B)	750mm - 29.53in	
Machine Height (C)	1000mm - 39.37in	
Length with Optional PC Arm (D)	1900mm - 74.80lb	
Height with Optional Base (E)	1765mm - 69.49in	
Machine Weight	353kg - 778.23lb	
Machine Weight with Opt. Base	456kg - 1005.31lb	
Table Size	600 x 180mm - 23.62 x 7.09in	
Travel X Axis Without ATC	375mm - 14.76in	
Travel X Axis With ATC Fitted	250mm - 9.84in	
Travel Y Axis	150mm - 5.91in	
Travel Z Axis	235mm - 9.25in	
Table to Spindle	305mm - 12.01in	
Max. Spindle Speed	4000rpm	6000rpm
Max. Feed Rate	5000mm/min - 196.85in/min	
Max. 3D Profiling	4500mm/min - 177.17in/min	
Mains Supply Requirements* (* Alternative supplies available on request)	Single Phase	
Spindle Motor	1.1kW - 1.48HP	1.6kW - 2.15HP
Axes Motors	Stepper	
Volts	230Volts - 110/120VAC	
Amps	8Amps	10Amps
Hz	50/60Hz	
Electrical Connection	13A Socket	



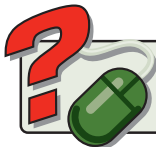
Machine Dimensions.

Shown with optional universal bench and optional computer support extension. (PC not included)

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# New Turn 270

CNC LATHE

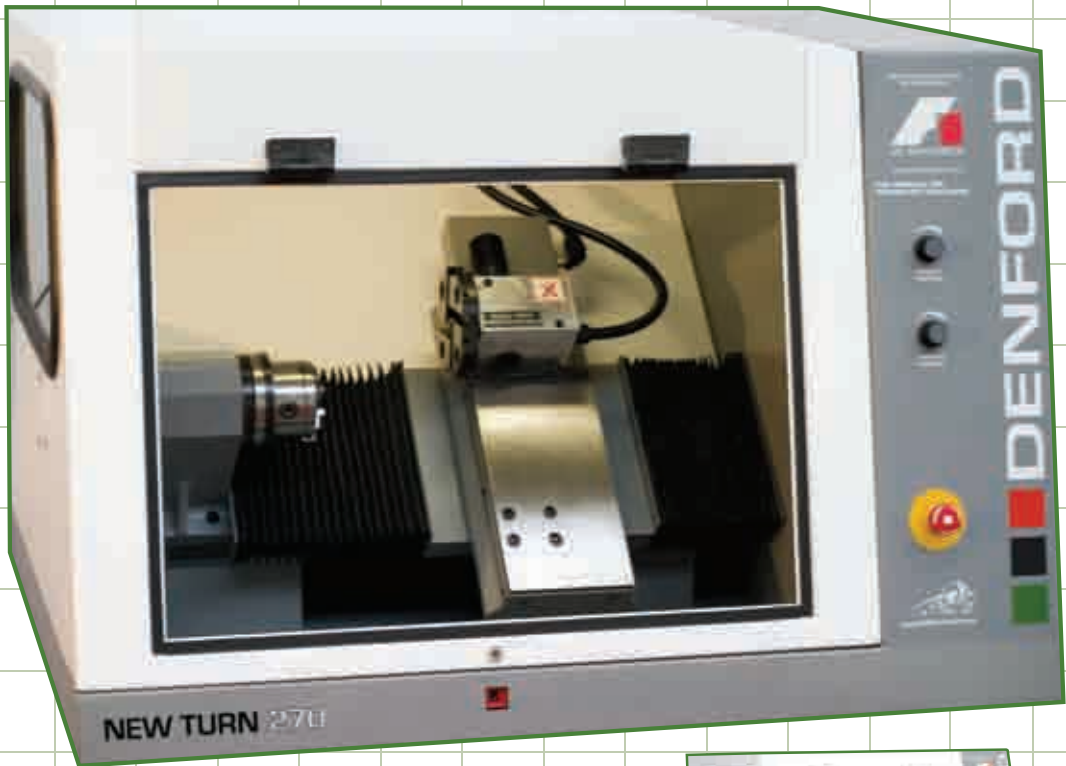


## New Turn 270

CNC LATHE

A compact 2 axis CNC Lathe with totally enclosed high-visibility interlocking guard, suitable for all levels of education and training. Programmable spindle speeds and feedrates make the New Turn 270 ideal for cutting a range of resistant materials such as wax, plastic, acrylic, free cutting alloys, aluminum and steel. Also suitable for integration into FMS/CIM systems [additional equipment must be fitted at time of manufacture].

NEW



Shown with optional universal bench.

### THE NEW TURN 270 COMES AS STANDARD WITH:

- VR CNC Turning Operating Software (PC not included).
- Installation and Instruction Manuals.
- Quick Change Toolpost and Holder.
- Manual Self Centring 3 Jaw Chuck.

### OPTIONAL EQUIPMENT INCLUDES:

- 8 station programmable turret, pneumatic chuck and guard,
- spray mist coolant, tail stock, and Universal Machine Bench.

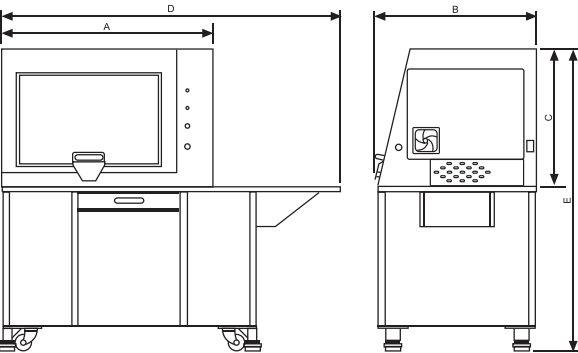
### SYSTEM REQUIREMENTS

IBM or 100% Compatible PC, Pentium III, 1Ghz, 512MB RAM, 200MB Free Hard Disk Space, Microsoft Windows XP/NT/2000 and later,CD-ROM Drive, Floppy Drive, OpenGL 3D Accelerator Graphics Card with 128MB RAM supporting at least 1024 x 768 screen resolution. CNC Machines require USB Connection.\*

\*N.B. Machines cannot be run from 64-Bit Operating Systems

### RECOMMENDED SOFTWARE PROGRAMS

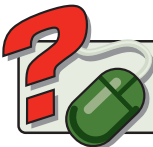
All software necessary to control the New Turn 270 is included. Also included is a seat of QuickTURN 2D Design - an easy to use CAD package.



Machine Dimensions.



MECHANICAL DETAILS	NEW TURN 270
Machine Length (A)	1000mm - 39.37in
Machine Depth (B)	750mm - 29.53in
Machine Height Bench Mounting (C)	675mm - 26.57in
Length with Optional Base (D)	1600mm - 62.99in
Height with Optional Base (E)	1440mm - 56.69in
Machine Weight	140kg - 308.65lb
Machine Weight with Optional Base	255kg - 562.18lb
Swing Over Bed	190mm - 7.48in
Swing Over Cross Slide	100mm - 3.94in
Distance Between Centres	270mm - 10.63in
Travel X Axis	150mm - 5.91in
Travel Z Axis	225mm - 8.86in
Max. Spindle Speed	4000rpm
Max. Feed Rate	2500mm/min - 98.43in/min
Spindle Bore	26mm - 1.02in
Mains Supply Requirements* (* Alternative supplies available on request)	Single Phase
Spindle Motor	1.5kW - 2.01HP
Axes Motors	Stepper
Volts	230 Volts - 110/120VAC
Amps	8 Amps
Hz	50/60 Hz
Electrical Socket	13A Socket



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# Micromill

CNC MILLING MACHINE

# Microturn

CNC LATHE



## Micromill and Microturn

CNC MILLING MACHINE AND CNC LATHE

A compact 3 axis CNC milling machine and 2 axis CNC lathe, both with totally enclosed interlocking guards - the ideal introduction to small part CNC manufacture. Variable spindle speeds and feedrates make the MicroMill and MicroTurn ideal for cutting resistant materials such as wax, plastic, acrylic, aluminum and free cutting alloys.

### THE MICROMILL COMES AS STANDARD WITH:

- VR CNC Milling Operating Software (PC not included).
- Installation and Instruction Manuals.
- Maintenance Tools.
- Clamping Kit.
- 1/4" Dia Milling Collet.
- 5/16" Dia Drawbar.
- 3/16" Slot Drill 1/4" Shank.
- Set of Metric Allen Keys.

### THE MICROTURN COMES AS STANDARD WITH:

- VR CNC Turning Operating Software (PC not included).
- Installation and Instruction Manuals.
- Maintenance Tools.
- 1 1/2" Standard Toolpost.
- Tailstock.
- 3" Dia Spindle Faceplate.
- No. 1 Morse Taper, Spindle Centre.
- No. 0 Morse Taper, Tailstock Centre.
- 2 1/2" Dia 3 Jaw Chuck & 2 Tommy Bars.
- 1/4" Braised Carbide Tip Cutting Tool, Right Handed.

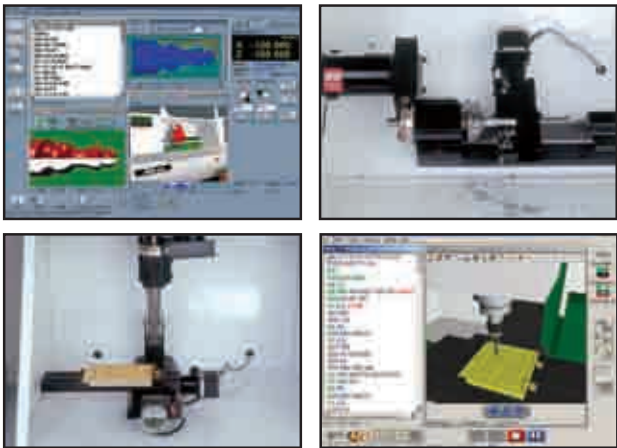
### OPTIONAL EXTRAS INCLUDE:

Quickchange toolpost and thread cutting package.

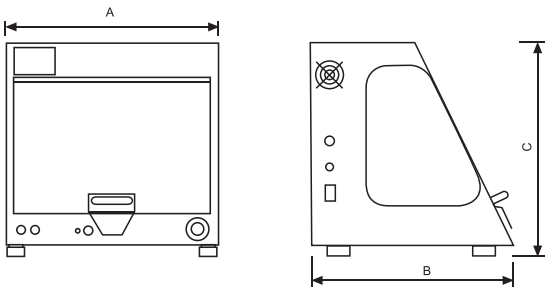
### SYSTEM REQUIREMENTS

For MicroMill please refer to page 13.

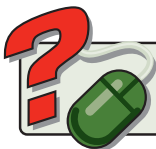
For MicroTurn please refer to page 19.



MECHANICAL DETAILS	MICROMILL	MICROTURN
Machine Length (A)	685mm - 26.97in	685mm - 26.97in
Machine Depth (B)	654mm - 25.75in	654mm - 25.75in
Machine Height (C)	688mm - 27.09in	688mm - 27.09in
Machine Weight	50kg - 110lbs	57kg - 125lbs
Table Size	70x330mm - 2.76x12.99in	n/a
Swing Over Bed	n/a	90mm (150mm opt) - 3.5in
Travel X Axis	228mm - 8.98in	50mm - 1.97in
Travel Y Axis	130mm - 5.12in	n/a
Travel Z Axis	160mm - 6.30in	126mm - 4.96in
Table to Spindle	182mm - 7.17in	n/a
Max. Spindle Speed	2800rpm	2800rpm
Max. Feed Rate	750mm/min - 29.53in/min	600mm/min - 23.62in/min
Max. 3D Profiling	600mm/min - 23.62in/min	n/a
Mains Supply Requirements* (* Alternative supplies available on request)	Single Phase	Single Phase
Spindle Motor	0.37kW - 0.50HP	0.37kW - 0.50HP
Axes Motors	Stepper	Stepper
Volts	230V - 110/120 VAC	230V - 110/120 VAC
Amps	8 Amp	8 Amp
Hz	50/60 Hz	50/60 Hz
Electrical Connection	13A Socket	13A Socket



Machine Dimensions.



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# Universal Machine Benches

## Universal Machine Benches

Denford's Universal Machine Benches are suitable for use with our entire range of CNC Routers, Mills and Lathes. The benches are designed to accommodate varying requirements, and to integrate with existing furniture in a traditional workshop environment, or an IT suite.



Universal Machine Bench VMC/0600B

Shown with optional computer support extension.  
(Machine & PC not included)



Universal Machine Bench VMC/0600WB

### UNIVERSAL MACHINE BENCH

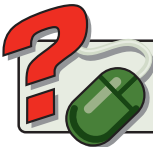
The Universal Machine Bench comes with wheels, anti-vibration pads, storage cupboard, tooling drawer and is suitable for a range of bench top machines including:-

<b>VMC 1300, Router 2600/Pro</b>	Product Code:	VMC/0600B
Optional - Computer Support Extension	Product Code:	VMC/0602
Optional - Integrated Dust Pro 100	Product Code:	ADVXU
<b>Compact 1000</b>	Product Code:	MRCWB
Includes - Computer Support Extension	Product Code:	ADVXU
Optional - Integrated Dust Pro 100		
<b>Turn 270</b>	Product Code:	TRNWB
Includes - Computer Support Extension		
<b>Stand-Alone Workbench</b>	Product Code:	VMC/0600WB
Optional - Computer Support Extension	Product Code:	VMC/0602
Optional - Integrated Dust Pro 100	Product Code:	ADVXU

**Bench Size:** 1200mm x 750mm x 790mm (WxDxH) 47.24in x 29.53in x 31.10in  
**Colour:** Grey  
**Weight:** 103kg - 227.08lbs (with integrated dust extraction unit 163kg - 359.35lbs)



Universal Machine Bench VMC/0600WB  
Shown with integrated Dust Pro 100.



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# F1 in Schools Package

A COMPLETE PACKAGE INCORPORATING DESIGN, ANALYSE, MAKE, TEST & RACE

**Design**

**Analyse**

**Make**

**Test**

**Race**


[www.f1inschools.co.uk](http://www.f1inschools.co.uk)

CAD/CAM Software : VR CNC Software : CNC Routers : Mills : Lathes : PCB/Engraving Machines : Benches & Accessories : Laser Cutters/Engravers  
Rapid Prototyping : Concept Modelling : 3D Scanning Solutions : Cutter / Plotters

## F1 in Schools Package

A COMPLETE PACKAGE INCORPORATING DESIGN, ANALYSE, MAKE, TEST & RACE.

The F1 in Schools Technology Challenge stimulates a student's interest in, and understanding of, the entire process of design and manufacture. Through involvement in the F1 in Schools project, students will gain first hand experience of teamwork, and communication, whilst encouraging individual flair and confidence. The F1 in Schools project provides students with the opportunity to reflect industrial working practice of developing a product from concept, to prototype to production.

In support of the F1 in Schools Technology Challenge, Denford offer an F1 Package, which includes all of the equipment required to get you up and running for this innovative educational project - covering Design, Analyse, Make, Test & Race.

### A brief overview:

- Design:** Design the car body using SolidWorks 3D CAD software. SolidWorks is available as a multiple user licence.
- Analyse:** Use Virtual Reality Wind Tunnel Software and SolidWorks to analyse car designs for velocities, pressures, vibration analysis, lift & drag and much more.

- 3. Make:** After the 3D model is complete, import the design into Denford's QuickCAM Pro software to generate the CNC file. Graphically verify the CNC file by using Denford's Virtual Reality CNC routing software and then manufacture the car using Denford's F1 Car Manufacturing Fixture on either the Compact 1000 or Router 2600 CNC Router.
- 4. Test:** The manufactured car can be tested for drag efficiency and air flow around the vehicle with the Scout Wind Tunnel & Fog Maestro Smoke Generator.
- 5. Race:** Put the cars to their ultimate test and judge their speed over a measured distance with the F1 in Schools 24m Elevated Race Track and F1 Race System.

### The F1 in Schools Package:\*

#### DESIGN:

SolidWorks Education Edition - 3D Design, Drafting & Simulation Software (available separately - see page 6 & 7).  
QuickCAM Pro Advanced Milling/Routing CAM software (site licence).

#### ANALYSE:

Virtual Reality Wind Tunnel (VRWT) Software (single licence).

#### MAKE:

##### CNC Machine Options

- Router 2600/Router 2600 Pro (Metal Cutting).
- Compact 1000/Compact 1000 Pro (Metal Cutting).

##### Car Manufacture Fixture

F1 in Schools Car Manufacturing Fixture for both D & R Type Cars.

##### Consumables - R Type/D Type Cars

R Type Balsa Wood Blanks - Pack of 20.  
Fusion Wheels - Black - Pack of 100.  
Screw Eyes 1" - Pack of 100.  
Long Axles - 65mm - Pack of 100.  
Straw Wheel Spacers - Pack of 500.  
Washers - 4mm - Pack of 100.  
Decal Stickers - Pack of 25 sheets.  
Paint Stand.

D Type Balsa Wood Blanks - Pack of 20.  
PX Wheels - Rear - Black - Pack of 100.  
LX Wheels - Front - Black - Pack of 100.  
Screw Eyes 1/4" - Pack of 100.  
Short Axles - 43mm - Pack of 100.

#### TEST:

Scout Wind Tunnel.  
Fog Maestro Smoke Generator including 1Ltr. Fog Fluid.

#### RACE:

Elevated Race Track - 24m track.  
F1 Race System - x1 Start & Finish Gate, x2 Launch Triggers, x2 Launchers,  
x1 Power Supply, x1 Control Box, Race Time Management System.  
8 Gram Competition Cartridges (pack of 120).



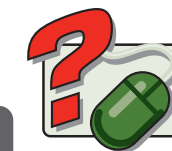
Compact 1000 Router



Router 2600 Pro

For the full range of F1 consumables & race equipment see pages 48 - 53

\* Outside the UK, package contents may vary.  
Please refer to your dealer/agent.



Get help, advice and share designs online  
[www.denfordata.com/bb](http://www.denfordata.com/bb)

To get you up and running, Denford also offer a range of CNC Routers, Lasers, Milling Machines and Lathes, together with tooling packages, workholding kits and courseware.

Total Commitment to Manufacturing Technology in Education and Training Worldwide. ISO9001 compliant.

Denford reserves the right to alter machines and software specifications without prior notice. All Denford products are subject to copyright. All brands and products are trademarks or registered trademarks of their respective companies.



 **DENFORD**

# 3D Scanning & Manufacturing

COMPLETE 3D LASER SCANNING AND MANUFACTURING PACKAGE

 **DENFORD**

## 3D Scanning & Manufacturing Package

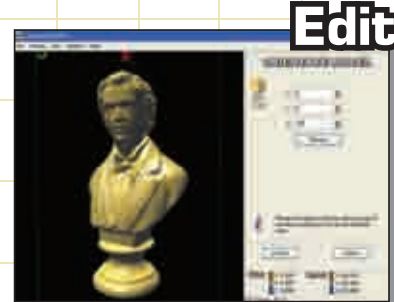
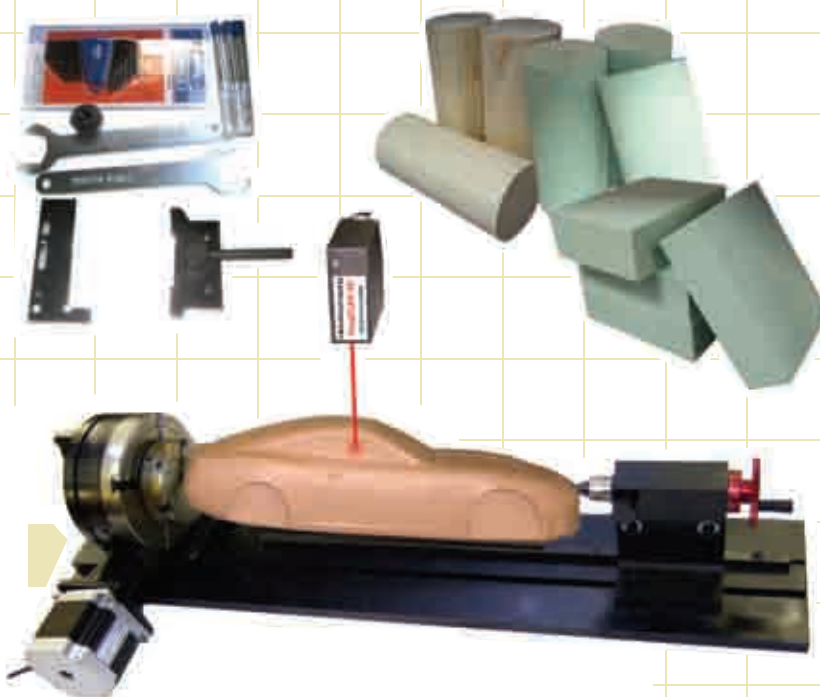
COMPLETE 3D LASER SCANNING AND MANUFACTURING PACKAGE

A complete 3D Scanning and Manufacturing package which includes hardware and user friendly wizard based software for scanning, editing and saving of 3D models, prior to manufacture on a Denford CNC Router.

Ideal for Reverse Engineering Applications.



Router 2600 Pro shown.  
Example only.

**Scan****Edit****Make**

Denford's EasySCAN - 3D Laser Scanning and Manufacturing Package comes with everything you need to laser scan and digitise objects in 3 dimensions, directly into your PC and then manufacture on one of Denford's CNC Routers.

It is an easy to use, cost effective solution for reverse engineering applications, that gives fantastic results every time....

The EasySCAN 3D Laser Scanning and Manufacturing Package incorporates user-friendly wizard based software for scanning, editing and saving of 3D models, prior to manufacture on a Denford CNC Router. The EasySCAN 3D Laser Scanner attachment has full 360-degree scanning capability when used in conjunction with the supplied 4th Axis Programmable Rotary Fixture.

### Denford's EasySCAN 3D Laser Scanning and Manufacturing Package includes:

Wizard Based Software for scanning, editing and saving 3D models before manufacture.

#### CNC Machine Options

- Router 2600 Pro (Metal Cutting)
- Router 2600
- Compact 1000 Pro (Metal Cutting)
- Compact 1000

4th Axis Programmable Rotary Fixture including QuickCAM 4D Milling CAM Software.

Tooling for use with a range of resistant materials including hardwood, softwood, plastic, modelling foam, acrylic and prototyping materials.

A set of work holding clamps.

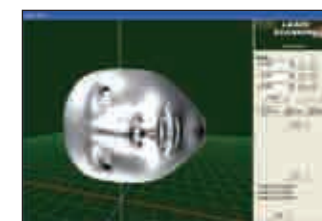
#### Consumables package including:

- 50 Round Pine Billets (65mm dia x 150mm long)
- 50 High Density Foam Billets (70mm dia x 150mm long)
- 50 High Density Foam Billets (150 x 110 x 45mm)



Scan in your  
chosen model  
(or create your own)

View results with  
the EasySCAN  
software



Manipulate the  
scanned data

Manufacture on  
the CNC Router



The completed  
model



Get help, advice and share designs online  
[www.denfordata.com/bb](http://www.denfordata.com/bb)

# 3D HD Scanning

AFFORDABLE, EASY TO OPERATE , 3D SCANNING

## NEXTENGINE™

IN ONE PACKAGE, EVERYTHING YOU NEED TO QUICKLY SCAN AND DIGITIZE PHYSICAL OBJECTS

NextEngine uses 4 lasers for high scanning speeds and cleaner scan data. The scanner measures 50,000 points per second to create highly detailed digital models that can be exported on .stl, .obj and .vrmf amongst other file formats. There are no scan limits, as larger scans can easily be meshed together. Optional software allows scanned models to be saved in CAD format for editing in 3D CAD packages such as SolidWorks.

**NEW**

## NEXTENGINE™



Scan Object



Mesh File



Machined Part



## NEXTENGINE 3D SCAN SOLUTIONS

Schools have discovered the hands-on learning power of classroom Rapid Prototyping, with 3D input and output linked to CAD and computer generated imaging (CGI) systems. 3D Printing lets students quickly create physical models, and 3D Scanning lets them digitize reference samples and revisions to their 3D prints. Get full scanning and modelling with a low-cost NextEngine HD Scanner.

### NEXT ENGINE 3D HD SCANNER INCLUDES:

### Product Code:



#### Desktop 3D Scanner

Multi-laser precision provides 127-micron measuring accuracy and texture capture for creation of highly detailed, full-colour 3D models.



#### Automated Positioner

Enables one-button alignment of multiple scans to speed 3D model creation.



#### SCANSTUDIO HD™

Scan Control Software  
Points to MESH. Essential tools to scan, align, fuse and polish scan data for creation of fully healed mesh models ready for 3D printing or for output to CGI or CAD modelling software.

NXHDS

### OPTIONAL:

### Product Code:



#### SCANSTUDIO CAD TOOLS™

Transforms scans into surfaces for CAD modelling. Convert scan data meshes into NURBS and transfer to CAD. Automatically section scans and output NURBS splines to CAD. Specify part top, bottom, sides, and origin before surfacing. One-button automatic surface creation through fishnet drape.

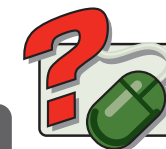
NXSCAD



#### RAPID Works™

Brings smart physical modelling power to CAD platforms. Full-featured solution to make CAD parts from scan points. Outputs IGES, STEP, and SLDPRF for transfer to CAD systems. Full RapidformXOR2 features. The most advanced in the world. Automated feature extractor reduces drafting labour up to 90%. Fully parametric model with true SolidWorks Feature Tree output.

NXRPW



Get help, advice and share designs online  
[www.denfordata.com/bb](http://www.denfordata.com/bb)





## DESIGN

### SolidWorks Education Edition

Classroom Licence Package for Secondary Schools  
(any school below college/university level)

60 user network licence +1 standalone licence  
Special 10% 'F1 in Schools Participant' DISCOUNT

SWL61

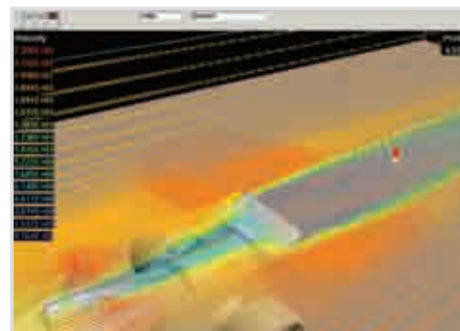


### QuickCAM Pro

An advanced, yet simple to use, wizard-based CAM package,  
which is used to create cutter paths for machining 3D  
parts on a milling machine or router.

Site Licence

BI01806P



## ANALYSE

### Virtual Wind Tunnel

F1 VWT Analysis Software  
Single Seat  
5 User Licence  
Site Licence

BI01841

BI01841A

BI01841C



## MAKE

### Compact 1000/Pro

#### Compact 1000

A compact 3 axis CNC Router with totally enclosed interlocking guard.  
Ideal for cutting a range of resistant materials such as hard and soft  
wood, plastic, modelling foam, acrylic and prototyping materials.

MRC002000A

#### Compact 1000 Pro

Ideal for cutting non-ferrous metals

MRC003000



### Router 2600/Pro

#### Router 2600

A 3 axis CNC Router with totally enclosed interlocking guard. Ideal for  
cutting a range of resistant materials such as hard and soft wood, plastic,  
modelling foam, acrylic and prototyping materials.

MRP002000

#### Router 2600 Pro

Ideal for cutting non-ferrous metals

MRP003000



### F1 in Schools Car Fixture

Comes as standard with two clamping systems to enable  
the manufacture of D-Type and R-Type cars. The fixture  
clamps directly to the T-Slotted table on the Compact  
1000/ Pro or Router 2600/Pro and is suitable for use  
on the VMC 1300.

NR1/0400UA



### D Type Car Kit: PX & LX Wheels

Includes 2 x PX rear wheels and 2 x LX front wheels, 1 x  
sandpaper, 2 x screw eyes, 2 x axles, straw wheel spacers,  
4 x washers, 1 x D type balsa wood blank.

N13226DE1



### R Type Car Kit: Fusion Wheels

Includes set of 4 x black Fusion wheels, 1 x sandpaper,  
2 x screw eyes, 2 x axles, straw wheel spacers, 4 x washers,  
1 x R type balsa wood blank.

N13226F1R01



### D Type Wheels

Set of PX and LX Wheels - 2 Front, 2 Rear - Black  
PX Wheels - Rear - Black (pack of 100)  
LX Wheels - Front - Black (pack of 100)

N21899/OSET

N30848

N30846



### R Type Wheels

Set of Fusion Wheels - Black (pack of 4)  
Set of Fusion Aluminium Effect Hubs (pack of 4)  
Fusion Wheels - Black (pack of 100)  
Fusion Aluminium Effect Hubs (pack of 100)

N54531/OSET



N54608/OSET

N54531

N54608








	MAKE	
	<b>R Type Wheel Kit</b>	
	includes: 4x wheels, 2x Tether Line Guides, 4x Axle Inserts/Grommets (6mm) 2x Axles	N14759
	<b>D Type Balsa Wood Blank (pack of 10)</b>	
	Blank measures 304mm x 41mm x 70mm and contains a pre-drilled hole for the CO2 cartridge.	N53347
	<b>R Type Balsa Wood Blank (pack of 10)</b>	
	This official R Type balsa wood blank measures 223mm x 65mm x 50mm and contains a pre-drilled hole for the CO2 cartridge.	N28886/10
	<b>D Type Kit Bag (for one car, excluding balsa blank)</b>	
	Includes 2 x PX rear wheels and 2 x LX front wheels, 1 x sandpaper, 2 x screw eyes, 2 x axles, straw wheel spacers, 4 x washers.	N14634:04
	<b>R Type Kit Bag (for one car, excluding balsa blank)</b>	
	Includes set of 4 x black Fusion wheels, 1 x sandpaper, 2 x screw eyes, 2 x axles, straw wheel spacers, 4 x washers.	N14758:04
		

	<b>Paint Stand (for use with D and R Type cars).</b>	
	This new, improved design holds your car during the painting process. The car is suspended by the cartridge hole and once on the stand, can be rotated to paint all sides.	N54528
	<b>Axles</b>	
	<b>Use the strength of steel to mount your model wheels</b> Long Axles(65mm) (pack of 100). Short Axles (43mm) (pack of 100).	N53341 N53728
		
	<b>Screw Eyes</b>	
	<b>Use these screw eyes to keep your car on the track</b>  1/4" Screw Eyes (6.34mm) for use with D Type Cars (pack of 100). 1" Screw Eyes (25.4mm) for use with R Type Cars (pack of 100).	N15109 N53693
	<b>Washers</b>	
	<b>Reduce friction between the wheel and the car body.</b>  Washers for use with D and R Type Cars (4mm) (pack of 100).	N15194
	<b>Straw Wheel Spacers</b>	
	<b>For use as axle bushings</b> Straw Wheel Spacers for use with D and R Type Cars (pack of 500).	N33890



	Decal Stickers	
	Decal Stickers (pack of 25 sheets)	NF1009
	TEST	
	Smoke Tunnel Including Fog Maestro Smoke Generator	
	A harmless smoke-like vapour passes through the Smoke Tunnel demonstrating airflow around the object.	N13277
	Fog Maestro Smoke Generator	
	Fog Maestro Smoke Generator inc. 1 litre of Fog Fluid (Generator can be used with the Smoke Tunnel or Scout Wind Tunnel).	N25100
	1 Litre of Fog Fluid	N56805
	Scout Wind Tunnel	
	A wind tunnel specifically designed to measure frontal drag on F1 cars. It is 1240mm in length and features a powerful motor that draws air through at approx 40mph. Includes 1 Bottle of Manometer Oil.	N24761
	Replacement Bottle of Manometer Oil.	N59108
	RACE	
	Elevated Racetrack	
	24 Metre - Long Track (includes 10 x 2.4m sections and 11 legs only).	N22049

	F1 Race System	
	Designed for use with the Elevated Racetrack, the F1 Race System includes: 1 x start gate, 1 x finish gate, 2 x launch triggers, 2 x launchers, 1 x power supply, 1 x control box and Race Time Management Software.	N32483
	Test Cartridges	
	8 Gram Test Cartridges for Long Track (pack of 360). (for test only. NOT suitable for competition).	B103002A
	Competition Cartridges	
	8 Gram Competition Cartridges for Long Track (pack of 120).	N53337
	4 Gram Competition Cartridges for Short Track (pack of 120).	N53338
	Deceleration Towels	
	Set of 2 deceleration towels. (Used to stop the cars at the end of the track.)	N18060
	F1 Baseball Caps	
	1 size baseball cap, sold individually.	NBCAP



**WOOD** A range of hardwoods, suitable for machining on Denford routers.

**JELUTONG WOOD BLOCK**

A light coloured hardwood which allows high definition detailed machining of 3D models. Easy and quick to machine with minimal tool wear.

BI03509F

Billet size: 160mm x 100mm x 16mm (pack of 50).



**AMERICAN MAPLE WOOD BLOCK**

A creamy white hardwood with a close grain and fine, even texture. Easy to work and finish, without the need for sanding.

BI03509G

Billet size: 160mm x 100mm x 20mm (pack of 50).



**ROUND PINE BILLETS**

Ideal for use with the Rotary Fixture attachments.

BI03509J

Billet size: 65mm Dia. x 150mm Long (pack of 10).



**BALSA WOOD BILLET**

Ideal for manufacturing sports cars for the 'GT in Schools - The Sports Car Challenge.'

N8055GT

Billet size: 80mm x 55mm x 223mm



**FOAM** These rigid, closed cell foam blocks are ideal for the rapid machining of parts on the full range of Denford Milling Machines and Routers.

**HIGH DENSITY FOAM**

Ideal for most 3D prototyping applications. Offering plenty of surface detail, it is commonly used in moulds for vacuum forming and is also suitable for painting.

Billet size: 150mm x 110mm x 45mm (pack of 50).

Billet size: 70mm Dia. x 150mm long (pack of 15).

Ideal for use with the Denford 4th axis programmable rotary fixture.

BI03508A  
BI03508E



**MODEL FOAM**

A low density and low cost foam product with easy machining properties which is particularly suitable for quick 3D realisation of design ideas.

BI03508Z

Billet size: 160mm x 100mm x 50mm (pack of 50).



**MODELLING BOARD**

A high density (0.47gms per cubic metre) board ideal for high definition 3D work.

**Modelling Board**

For prototyping high quality models

Billet Size: 1500mm x 500mm x 50mm (1 off).

BI03508K



**VINYL**

9 x 10 metre rolls of assorted coloured gloss finish 200mm width vinyl (for use with Craft ROBO).

B103521

**SIGNMAKING VINYL EDUCATION PACK includes:-**

5M x 610mm Signmaking Vinyl in the following colours:

BI01819X

white, black, buttercup, red, green, blue, ultramarine, gold and silver. 1M x 500mm Hotmark 60, soft heat sealable 50micron matt film (for use on fabrics) in the following colours: black, white, red and blue, High Tack Application Tape 100M x 300mm & 100M x 150mm, 5 x Plastic Applicator, 5 x Snap off Knife, 1 x Weeding Tweezer, 1 x Sheet Slitter,



**PCB BOARD**

Ideal for use in conjunction with VR CNC Milling 5, PCB manufacturing feature.

**COPPER COATED CLAD PCB BOARD (SINGLE SIDED)**

Size: 233.4mm x 160mm x 1.6mm (1 off).

4X40079



**PHOTO RESIST COATED PCB BOARD (SINGLE SIDED)**

High quality dip coated positive working photoresist. This high resolution photoresist contains a dye which gives a good contrast against the copper allowing boards to be easily inspected at the developing stage. Panels are protected by a specially designed light-proof blue film which allows them to be guillotined without the risk of fracturing the photoresist. Size: 233.4mm x 160mm x 1.6mm (1 off).

4X40080





ALUMINIUM

Free cutting aluminium bars and billets are ideal for producing quick prototypes of metallic components. Easily polished, they yield professional looking component parts.

ALUMINIUM BAR

Suitable for cutting on Denford Lathes.  
Bar Size: 20mm Dia. x 55mm.  
Non-Anodised (pack of 50).

BI03512A



ALUMINIUM BILLET

Suitable for cutting on Denford Milling Machines.

Billet Size: 100mm x 100mm x 12mm.

Non-Anodised (pack of 50).

BI03511B

Red-Anodised (pack of 50).

BI03511C

EXTRUDED ACRYLIC SHEETS

Excellent thermoforming characteristics enabling the production of intricate, delicate shapes.

30 off 3mm Red 600mm x 300mm.

BI03523

30 off 3mm Yellow 600mm x 300mm.

BI03523A



CAST ACRYLIC SHEETS

High quality, perfect surface finish and superb optical qualities.

30 off 3mm Red 600mm x 300mm.

BI03522

30 off 3mm Sky Blue 600mm x 300mm.

BI03522A

30 off 3mm Racing Green 600mm x 300mm.

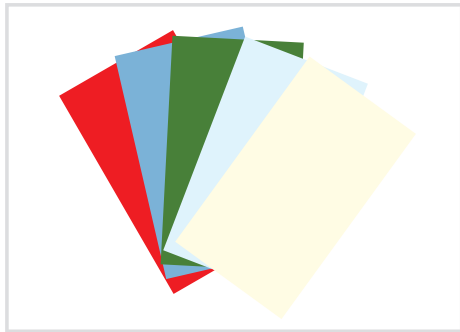
BI03522B

30 off 3mm Transparent Smoked Blue 600mm x 300mm.

BI03522C

30 off 3mm Transparent Yellow 600mm x 300mm.

BI03522D



HIGH IMPACT POLYSTYRENE

Rigid, easy cutting thermoplastic used for 2D projects. Can be quickly "layered" in different colours to produce low cost nameplates etc. Easily held on temporary machine tables using heavy duty double sided tape.

Billet Size: 160mm x 90mm x 2mm.

White (pack of 50).

BI03501F

Multi-Coloured (pack of 50).

BI03501



ACRYLIC RODS

1 metre x 6mm dia. fluorescent round – Red.

BI03524

1 metre x 6mm dia. fluorescent round – Yellow.

BI03524A

1 metre x 6mm dia. fluorescent round – Green.

BI03524B

1 metre x 6mm dia. fluorescent round – Blue.

BI03524C

1 metre x 6mm dia. round – Clear.

BI03524D



CRAFT ROBO

CONSUMABLES PACK

Consumables for projects including:

BI01819CRD

- vinyl
- coloured card
- button magnets
- mirrors
- double sided tape
- pack of coloured card

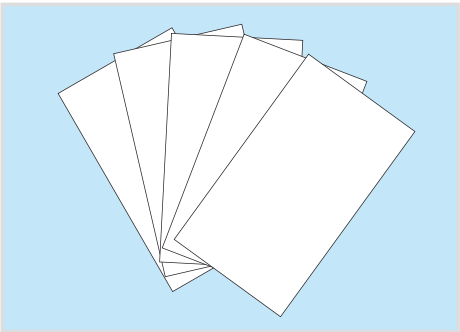


DOUBLE SIDED TAPE

HEAVY DUTY

Size: 25mm x 33M (pack of 10).

BI03502A



PLOTTER CARD

White Plotter Card (280gsm)

BI01819NE

Size: 450mm x 320mm (pack of 100).



MANUFACTURING PACKAGES

F1 MANUFACTURING PACKAGE

F1 R-Type Car Consumables Package x 25 Sets  
F1 in Schools Car Manufacturing Fixture (D & R-Type)  
Dust Pro 50 Extraction Unit 110v  
Virtual Wind Tunnel Software (single seat)  
QuickCam Pro (site licence)  
1/4" Dia Ball Nose L/S 2FI Cutter (Solid Carbide)  
Paint Stand x 2  
Safety Glasses x 2

MPF101



DRAGSTER MANUFACTURING PACKAGE

D-Type Car Consumables Package x 25 sets  
F1 in Schools Car Manufacturing Fixture (D & R-Type)  
Dust Pro 50 Extraction Unit 110v  
Virtual Wind Tunnel Software (single seat)  
QuickCam Pro Site Licence  
1/4" Dia Ball Nose L/S 2FI Cutter (Solid Carbide)  
Paint Stand x 2  
Safety Glasses x 2

MPDRAG01



CURRICULUM PACKAGES

10 HOUR MILLING CURRICULUM AND CONSUMABLES

Milling Curriculum CD (10 Hour)  
QuickCam 2D Design (Site Licence)  
CNC Milling Basics Software  
Consumables Package 10 Hour Milling (50 Student)  
Engraving Cutter 0.4mm (1/64") 1/8" Shank 45 Degree  
Toolholder 1/8" Dia Bore  
Swarf Brush  
Scissors, Safety Glasses x 2, 6" Steel Ruler

PKM10



30 HOUR MILLING CURRICULUM AND CONSUMABLES

Milling Curriculum CD (30 Hour)  
CNC Milling Basics Software  
Consumables Package 30 Hour Milling (50 Student)  
Milling Vice  
Swarf Brush  
Scissors  
Safety Glasses x 2  
6" Steel Ruler  
3" Engineers Square  
Ball Pein Hammer 1/4oz

PKM30



40 HOUR MILLING CURRICULUM AND CONSUMABLES

Milling Curriculum CD (10 Hour)  
Milling Curriculum CD (30 Hour)  
QuickCam 2D Design (Site Licence)  
CNC Milling Basics Software  
Consumables Package 10 Hour Milling (50 Student)  
Consumables Package 30 Hour Milling (50 Student)  
Milling Vice  
Swarf Brush, Scissors, Safety Glasses x 2, 6" Steel Ruler  
3" Engineers Square, Ball Pein Hammer 1/4oz

PKM40



10 HOUR ROUTER CURRICULUM AND CONSUMABLES

Router Curriculum CD (10 Hour)  
DXF Graphics CD (10 Hour Curriculum)  
QuickCam 2D Design (Site Licence)  
Consumables Package 10 Hour Router (50 Student)  
5/32" Dia 1/4" Shank Router Plunge Bit  
Safety Glasses x 2

PKR10



10 HOUR TURNING CURRICULUM AND CONSUMABLES

Turning Curriculum CD (10 Hour)  
LatheCam Designer (Site Licence)  
Consumables Package 10 Hour Turning (50 Student)  
Swarf Brush  
6" Steel Ruler  
Safety Glasses x 2

PKT10



TOOLING PACKAGES

QUICK CHANGE ROUTER TOOLING

For Compact 1000 and Router 2600:

3/8" Router Collet  
1/4" ID Reducing Bush 3/8" Shank x2  
1/8" ID Reducing Bush 3/8" Shank  
1/64" Engraving Cutter 1/8" Shank 45 Degrees  
Photo Engraving Cutter 1/4" Shank, 45 Degrees  
1/4" Dia Ball Nose L/S 2FI Cutter (Solid Carbide)

MRTPO1



QUICK CHANGE ROUTER TOOLING

For Compact 1000 PRO and Router 2600 PRO:

3/8" Dia. Collet to suit ER 20 Collet Chuck  
1/4" ID Reducing Bush 3/8" Shank x2  
1/8" ID Reducing Bush 3/8" Shank  
1/64" Engraving Cutter 1/8" Shank 45 Degrees  
Photo Engraving Cutter 1/4" Shank, 45 Degrees  
1/4" Dia Ball Nose L/S 2FI Cutter (Solid Carbide)

MRTPO2



RECOMMENDED ROUTER TOOLING PACKAGE

For all Routers

1/8" Dia x 1/4" Shank 2 Flute Cutter  
1/8" Dia x 1/4" Shank Ball Nose Cutter  
1/4" Dia x 1/4" Shank 2 Flute Cutter  
1/4" Dia x 1/4" Shank Ball Nose Cutter  
60 Degree V Cutter x 1/4" Shank.

BI00846





TOOLING PACKAGES

MICROMILL QUICK CHANGE TOOLING PACKAGE

Engraving Cutter 0.4mm (1/64") 1/8" Shank 45 Degree  
1/8" 3FI Slot Drill 1/4" Shank  
1/4" 3FI Slot Drill 1/4" Shank  
Toolholder 1/4" Dia Bore x 2  
Toolholder 1/8" Dia Bore

MMTP01



VMC 1300 RECOMMENDED TOOLING AND HOLDERS

**Recommended Set of Tools**  
20mm End Mill, 2mm HSS Slot Drill 6mm Shank  
2mm Ball Nose Slot Drill, 4mm HSS Slot Drill 6mm Shank  
6mm HSS Slot Drill 6mm Shank

**Recommended Set of Toolholders**  
Spanner for ER32 Collet Chuck  
7 - 6mm Dia Collet to suit ER32 Collet Chuck x 2  
Pull Stud for Toolholder x 5, BT30-ER32 Collet Chuck x 2  
ER32 Collet Chuck Spanner, BT30-EM06-050 6mm Toolholder x 2  
20mm Sidelock Holder

VMC/0500RT

VMC/0500RH



MICROTURN RECOMMENDED TOOLING PACKAGE

Quick Change Toolpost & Holders  
1/4" Braised Carbide Tipped Cutting Tool LH  
Quick Change Carbide Insert RH Turning Toolholder  
Parting Off Tool Blade for Quick Change Toolholder  
Pack of 10 Inserts - Quick Change Carbide Turning Tool

MT1/0100B



TURN 270 COMPREHENSIVE TOOLING PACKAGE

5mm Stub Drill, 10mm Stub Drill, TORX T8 Screwdriver  
Parting Off Tool, External Threading Tool  
Set of 10 Inserts for Boring Bar, Set of 10 Carbide Tips (Parting)  
Set of 10 Carbide Tips (Threading), 8mm Shank Boring Bar  
RH Turning Tool, LH Turning Tool  
Set of 10 Carbide Tips (RH/LH Turning)  
No. 2 Centre Drill Sleeve for QC Toolpost Boring Bar  
No. 2 Centre Drill  
Toolpost Boring Bar Holder x 4  
Adjustable Toolholder for Quick Change Toolpost x 4

TRNCMTP

MANUAL  
TOOLPOST



TURN 270 COMPREHENSIVE TOOLING PACKAGE

5mm Centre Drill, 5mm Stub Drill, 10mm Stub Drill  
TORX T8 Screwdriver, Parting Off Tool, External Threading Tool  
Set of 10 Inserts for Boring Bar, Set of 10 Carbide Tips (Parting)  
Set of 10 Carbide Tips (Threading), 8mm Shank Boring Bar  
RH Turning Tool  
LH Turning Tool  
Set of Carbide Tips (RH/LH Turning)  
Turret Bush 5mm Bore x 2  
Turret Bush 8mm Bore  
Turret Bush 10mm Bore

TRNCTP

AUTOMATIC  
TOOLPOST



CONSUMABLE PACKAGES

F1 R-TYPE CONSUMABLE PACKAGE (25 SETS)

R-Type Car Kit (Fusion Wheels) x 25 Sets

CPRTYPE01



DRAGSTER CONSUMABLE PACKAGE (25 SETS)

D-Type Kit Bag (PX & LX Wheels) x 25 Sets  
D-Type Balsa Wood Blanks (Pack of 10) x 2.5

CPDRAG01



50 STUDENT LITHOPHANE CONSUMABLE PACKAGE

Cast Acrylic Sheet: 3mm Sky Blue 100x100mm x 50  
Cast Acrylic Sheet: 3mm White 100x100mm x 50  
50mm Wide Duct Tape (double sided) x 2  
1/8" ID Reducing Bush 3/8" Shank  
Engraving Cutter 0.4mm (1/64") 1/8" Shank 45 Degree x 2  
MDF Billet 5" x 8" x 5/8" (cut to size) x 2

CPLITHO



ROUTER CURRICULUM CONSUMABLE PACKAGE

10 Hour 50 Student

MDF Billet 5" x 8" x 5/8" x 150  
MDF Billet 4" x 4" x 5/8" x 150  
Green Golf Tee (Pack of 250)  
Red Golf Tee (Pack of 250)

CPR01



TURNING CURRICULUM CONSUMABLE PACKAGE

10 Hour 50 Student

Aluminium Bar 20mm Dia x55mm Non-Anodised  
(Pack of 50) x 3

CPTURN01



## CONSUMABLE PACKAGES

### MILLING CONSUMABLE PACKAGE

10 Hour 50 Student

CPMILLO1

Acrylic Billet 6" x 2.75" x 0.25" x 50  
Acrylic Billet 4" x 2.75" x 0.25" x 150  
Double Sided Tape x 2



### MILLING CONSUMABLE PACKAGE

30 Hour 50 Student

CPMILLO2

Protofoam Billet 3" x 2.75" x 0.75" x 150  
Protofoam Billet 1" x 1" x 1" x 50  
Acrylic Billet 4" x 2.75" x 0.25" x 250  
Double Sided Tape x 3



### MILLING CONSUMABLE PACKAGE

40 Hour 50 Student

CPMILLO3

Acrylic Billet 6" x 2.75" x 0.25" x 50  
Acrylic Billet 4" x 2.75" x 0.25" x 400  
Protofoam Billet 3" x 2.75" x 0.75" x 150  
Protofoam Billet 1" x 1" x 1" x 50  
Double Sided Tape x 5

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