
Delcam
Advanced
Manufacturing
Solutions
Delcam
PowerSHAPE
Powerful, versatile, easy to use CAD software
for the design of complex 3D parts
www.powershape.com

Delcam
Complete CADCAM Solutions

- A wholly-owned, independently-operated subsidiary of Autodesk
- 150 offices and partners in over 80 countries
- More than 800 employees
- The world's largest CAM development team*
- 50,000 customers worldwide
- 40 years of experience developing CADCAM solutions
- Headquartered in a purpose-built 63,000 sq. ft. facility in Birmingham, UK

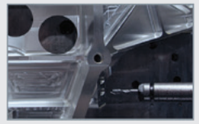
DID YOU KNOW ?

PowerSHAPE is the CAD engine behind Delcam's Healthcare and footwear design products - DentCAD, OrthoMODEL and ShoeMaker.

Delcam Advanced Manufacturing Solutions

Powering your productivity

PowerMILL



PowerMILL is the world's leading specialist NC CAM software for the manufacture of complex shapes, providing advanced machining strategies to minimise machining time and maximise finish quality.

PowerSHAPE

PowerSHAPE integrates surface, solid and triangle modelling. Design complex 3D models from scratch, or prepare imported data for manufacture, quickly, simply and accurately.

PowerINSPECT

PowerINSPECT delivers a CAD-based inspection solution that can accept data from all types of hardware, including manual and CNC coordinate measuring machines, portable arms, optical measuring devices, and CNC machine tools.

FeatureCAM

FeatureCAM is the unique CAM system that uses feature-based and knowledge-based technologies for automated machining, minimising programming times for mills, lathes, turn/mill, and wire machines.

Delcam for SolidWorks

Delcam for SolidWorks is an integrated CAM system for SolidWorks for programming milling machines, turning and turn/mill centres, and wire EDMs.

PartMaker

PartMaker applies a Patented Visual Programming approach to automate the programming of multi-axis Swiss-type lathes and Turn-Mill Centres.

Connect with Delcam
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*According to CIMdata

PowerSHAPE

Powerful, versatile, easy to use CAD software for the design of complex 3D parts

What is the most important factor when choosing a CAD system?

☐ Ease-of-Use ☐ Flexibility ☐ CAM Integration ☐ Reliability ☐ Speed

☑ All of the above?

PowerSHAPE is a versatile CAD program that combines Parasolid™ with easy-to-use surface, assembly, and triangle modelling. Whether you start with just an idea, or a partially completed or fully detailed CAD model, PowerSHAPE will let you finish the job quickly and easily.

Easy-to-Use
PowerSHAPE makes sketching simple with its patented Intelligent Cursor, automates surface creation, and streamlines work-flow using process-driven Wizards for complex tasks.

Flexible
PowerSHAPE allows you to use any combination of surfaces, solids or triangles letting you define 3D models that could not be designed using conventional CAD techniques.

Integrated
PowerSHAPE has been designed to complement PowerMILL, FeatureCAM and PartMaker, allowing you to make any manufacturing changes you need without interrupting your machining processes.

Reliable
PowerSHAPE is based on over 40 years of CADCAM know-how, and uses Parasolid™, the world's most reliable 3D geometry kernel.

Fast
PowerSHAPE automates complex tasks such as cavity and core separation, and split surface creation, helping you get parts to your machine tools in the shortest possible time.

DID YOU KNOW ?

Over 45% of 3D CAD models created worldwide are designed using Parasolid™, the solid modelling kernel used in PowerSHAPE.

MODELLING FOR MANUFACTURE

Do you struggle to make manufacturing sense of your customer's designs?

In today's competitive manufacturing environment, the key to success is to reduce lead times without sacrificing part quality. PowerSHAPE lets you find and fix any issues that could cause a hold-up in production. Even better, all of these tools are available where you need them - on your shop-floor. Manufacturing issues can be addressed as part of your machining process, without disruption to your CAD office.

Import

Whatever software your customers use, PowerSHAPE will read their data quickly and accurately.

Commercial CAD Formats	Read	Write
AutoCAD (DWG & DXF)	✔	✔
CATIA	✔	
CATIA 5	✔	✔
Cimatron	✔	
Elite	✔	
IDEAS	✔	
Inventor	✔	
Pro-Engineer	✔	
Rhino	✔	✔
Solid Edge	✔	
SolidWorks	✔	
SpaceClaim	✔	
TopSolid	✔	
Unigraphics NX	✔	

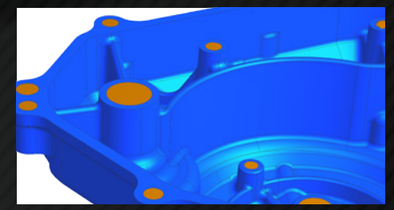
Neutral Formats	Read	Write
ACIS	✔	✔
IGES	✔	✔
Parasolid Export	✔	✔
STEP	✔	✔
VDA	✔	✔

Delcam Formats	Read	Write
DDX	✔	✔
DGK	✔	✔
DMT	✔	✔

Repair

Comprehensive model repair tools let you find and fix any modelling or translation problems.

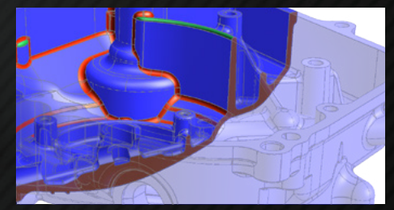
- Recreate missing or damaged surfaces
- Fill holes and gaps
- Remove duplicate geometry
- Repair trimming errors



Prepare

Interactive model analysis tools identify potential manufacturing issues before machining starts.

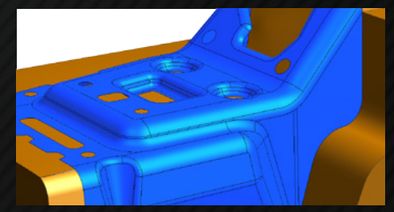
- Find thin walls and small radii that need special machining operations
- Offset surfaces to provide machining allowance
- Merge surfaces to simplify machining
- Create multi-axis reference surfaces



Modify

Powerful modelling-for-manufacture tools allow you to make any changes you need quickly and easily.

- Create or modify fillets to simplify machining
- Add draft angles to ease part ejection after moulding
- Identify and shield regions where EDM electrodes are needed
- Create complex split surfaces and shut-out faces



BENEFITS

Use Copy & Paste to pass complex geometry freely between PowerSHAPE and PowerMILL, FeatureCAM, or PartMaker

Identify issues before they become problems

Make changes where you need them – on the shop-floor

Streamline your manufacturing for maximum efficiency

DID YOU KNOW ?

Direct Modelling allows you to make complex changes quickly and simply, even on imported CAD geometry.

"The interaction between PowerSHAPE and PowerMILL has streamlined our process as far as being able to get files out right away"

Shawn McNamara, Chicago Mold Engineering

www.delcam.tv/chicagomold

POWERSHAPE FOR MOULDMAKING

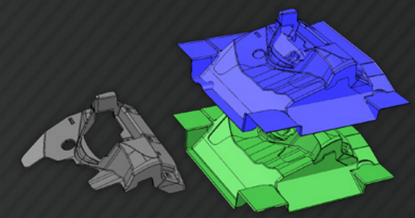
Can you get your mould designs right first time every time?

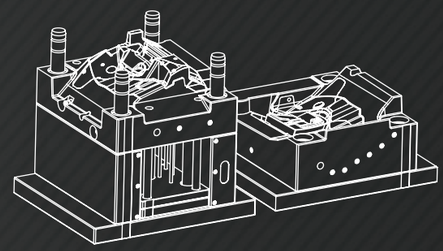
The route from initial design to finished moulded part is often complex. Designs are frequently subject to last minute changes, yet you must always keep to tight production deadlines. Even the smallest of problems with the tool design can lead to significant delay, and increase your costs. PowerSHAPE eases the process, from initial estimating and quoting, through to manufacture and delivery, helping you build the right tool at the right price, every time.

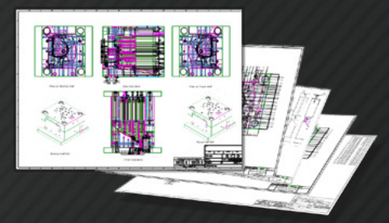
Workflow

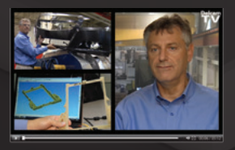
1. Import your customer's part design from any CAD source.
2. Convert even the most complex surface model into a perfect Parasolid™ using PowerSHAPE's Solid Doctor.
3. Use Direct Modelling tools to ensure the part can be moulded.
4. Orient the part into the optimum line-of-draw.
5. Divide the part into cavity and core halves, complete with complex split surfaces.
6. Extract sidecores for undercut regions as a complete sub-assembly.
7. Add catalogue or custom plates to finish the basic mould stack.
8. Interactively design waterways and cooling circuits.
9. Insert guide pillars, bushes, sleeves, ejectors, stop pins and lifters to complete the design.
10. Use your own component library to add non-standard features and sub-assemblies.
11. Use Power Features to create fit features and holes for components automatically.
12. Check clearances and fits between components to ensure there are no collisions.
13. Extract electrodes for non-machinable areas.
14. Automatically produce GA and detailed drawing sheets to your own company standard.
15. Manufacture the mould using PowerMILL or FeatureCAM.

Any changes in the initial customer part can be incorporated at any stage of the mould design process. As all components are fully associative, any changes are handled automatically.









"I do advanced engineering. I help the automotive industry make parts that we can mould. Delcam made sure that what they sold to their customers works."

Calvin Matte, Omega Tool Corp.

www.delcam.tv/omega

BENEFITS

Split moulded parts into tooling pieces, complete with run-off and split surfaces

Make complex changes simply and quickly with Direct Modelling

Use Power Features to ensure models update automatically if you move or change components

Automate drafting with powerful, easy-to-use templates

DID YOU KNOW ?

PowerSHAPE's Solid Doctor allows you to repair imported data from any CAD system, and create a fault-free solid.

WHAT MAKES POWERSHAPE UNIQUE?

PowerSHAPE seamlessly combines surface, solid, and triangle modelling into a single, easy-to-use product. This unique combination ovecomes the limitations of traditional modelling techniques.

Surface modellers can create complex curved forms but are inefficient when designing prismatic parts. Solid modellers can create parameterised parts but struggle to define smooth aesthetically pleasing shapes. Triangle modellers can create fine detail but models may not be suitable for manufacture.

With PowerSHAPE you can:

- Eliminate out-sourcing of jobs that require complex textures or Reverse Engineering
- Make design changes quickly and simply using surface or solid modelling
- Design parts that can be manufactured economically

Surface Modelling

- Smart Surfacer makes surface modelling simple by selecting the most appropriate surface type automatically based on the curves you have chosen
- Intuitive editing tools let you modify any surface at any time if it is not exactly what you need
- PowerSHAPE lets you use surfaces for solid modelling operations, simplifying the design of aesthetically pleasing, yet fully functional models

Solid Modelling

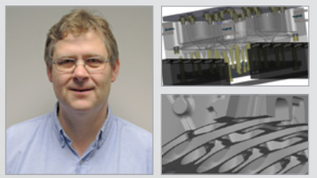
- Parasolid™ provides fast, robust history-based solid modelling, helping you to create reliable models quickly and simply
- PowerSHAPE's Solid Doctor converts poor quality models from any other CAD system into perfect solids for all your down-stream operations
- Direct Modelling provides quick, simple-to-use tools that let you make complex design changes even on imported models with no feature history

Triangle Modelling

- PowerSHAPE wraps Delcam ArtCAM reliefs onto complex shapes, allowing you to create richly detailed textures simply and quickly
- PowerSHAPE Pro's powerful mesh repair tools let you convert scanned points to usable meshes quickly and accurately
- Interactive sculpting tools help you remove any defects in the point data, giving you the best possible starting point for your design

> "I have been using 3D modelling software for over 20 years, and I have never found a part I could not model with PowerSHAPE."

Thomas Brandt, ASK Chemicals

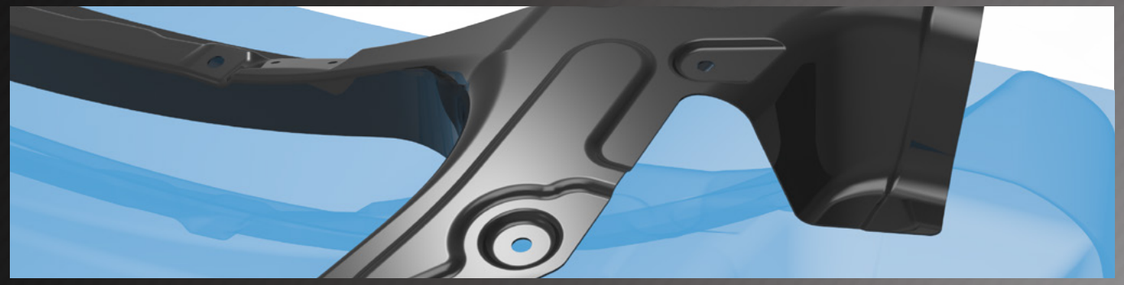


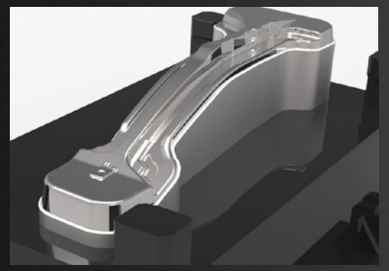
DID YOU KNOW ? You can experience PowerSHAPE completely free with PowerSHAPE-e. Download it now from www.powershape-e.com

POWERSHAPE FOR TOOLMAKING

Can you always make the right tool at the right price?

Market forces are continually driving tooling costs down, while at the same time demanding ever higher quality. Are you caught in the trap? Quote too high and you do not get the work; too low and you lose money. Whatever type of tooling you make, from lay-up tools to press dies, PowerSHAPE can help.





Press Dies

Modern sheet steel parts require state-of-the-art tooling for their production.

- Design complex doubly-curved surfaces simply yet accurately
- Use part geometry and key features such as strike points to position binders and draw beads
- Blend complex addendum surfaces directly into part surfaces for optimum metal flow
- Interactively 'morph' areas of the model to compensate for spring-back

BENEFITS

Use Direct Modelling to find and modify fillets, pockets, bosses, holes and other features

Isolate areas with inadequate taper and then interactively adjust draft angles

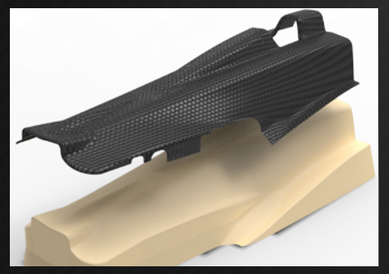
Create and modify complex spilt surfaces simply and efficiently

Find horizon curves around 3D parts at any draft angle

Blow Moulds

Blow moulds for both glass and plastic containers use a mixture of standard and custom parts.

- Store standard parts in a central library for easy access
- Create your own libraries of components
- Use simple solid modelling techniques to create mould pieces, no matter how complex the container
- Calculate shot weights quickly and accurately



Lay-up Tools

For manufacturers working in either fibreglass or composite materials accurate lay-up tools are essential.

- Create complex split and runoff faces straight from the component
- Compensate for material thicknesses by offsetting design models
- Unwrap complex 3D shapes to make the 2D pattern pieces required for lay-up
- Nest flattened pieces into the smallest area possible to make the most economical use of expensive materials

POWERSHAPE FOR ELECTRODES

Delcam Electrode's streamlined workflow helps you to manufacture EDM electrodes efficiently. From initial design, through manufacture, to final inspection, Delcam Electrode provides the complete solution.

BENEFITS

Extract electrode geometry from surface or solid models interactively using the Electrode Wizard

Use powerful Direct Modelling tools to provide clearances or remove unwanted features

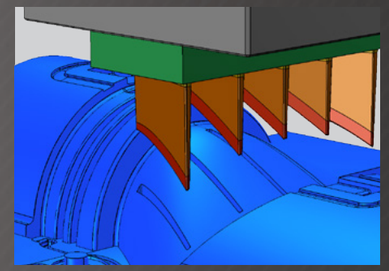
Store design, manufacturing and inspection information in a single .TRODE file, simplifying data management

Automate electrode manufacture by capturing your own machining know-how

Electrode Design

Delcam Electrode automates the creation of electrodes by using a simple wizard through the entire design process. Combined with PowerSHAPE's powerful Direct Modelling tools, Delcam Electrode enables you to:

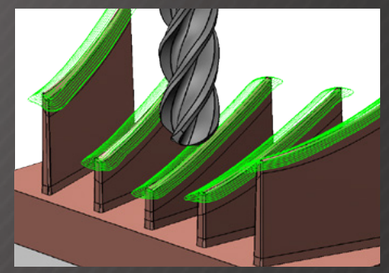
- Define the electrode blank, holder, spark gaps and EDM setting information
- Add inspection points
- Create detailed electrode documentation and EDM scripts
- Store all of this information in a single .TRODE file



Automated Toolpaths

Delcam Electrode captures your own machining methods and knowledge, guaranteeing consistent results. The PowerMILL machining wizard uses the geometric and setting information in the .TRODE file to:

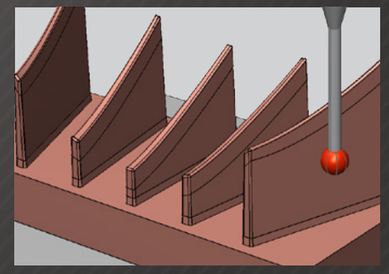
- Identify the burn, clearance and extension faces
- Select the appropriate electrode blank
- Apply the correct spark gaps to all toolpaths automatically



Automated Inspection

PowerINSPECT measures the finished electrode and generates a detailed report which is saved within the .TRODE file. Any necessary re-alignment can be made, simplifying the setting process. The inspection information contained in the .TRODE file includes:

- The electrode CAD model
- Pre-defined inspection points
- Spark gap size



POWERSHAPE FOR PRODUCT DESIGN

Can you design exactly what you want?

Design is all about achieving the perfect balance of form and function. All too often designers are forced to compromise simply because their CAD software does not have the tools required to achieve the shapes they want. PowerSHAPE Pro allows you to create 3D surfaces of any complexity, and seamlessly integrate them with solids to define mechanical parts. PowerSHAPE's unique Tribrid Modelling allows you to create designs that cannot be modelled using conventional CAD techniques. When compromise is unacceptable, PowerSHAPE Pro gives you total control.

Product & Industrial Design

Fast sketching tools allow you to create accurate curves quickly and simply, to develop surface forms. Interactive morphing tools let you explore design variants by bending, twisting and sculpting models. Simple to use surface editing tools let you modify your shapes as you develop your ideas. Surfaces, solids, and assemblies fit seamlessly together, providing you with a design tool that makes parts that not only look great, but work well, and are practical to manufacture. Powerful wrapping tools allow you to add decorative textures to complex free-form shapes, creating designs that would be impossible any other way. PowerSHAPE Pro gives you the complete freedom to create any shape you can imagine.

Packaging

Packaging designers are always looking for more innovative and attractive ways to present their customers' products. PowerSHAPE's fast, accurate surface modelling tools give you total freedom to create the most exciting shapes possible, letting you explore design ideas faster. PowerSHAPE's unique 'scale to volume' tool helps you guarantee that the design not only looks good, but holds the correct amount of product, and can be manufactured economically. Standard features such as caps and neck finishes can be stored in your own libraries, and added to the design in seconds, reducing time to market.

Jewellery

By combining PowerSHAPE's easy to use surface and solid modelling with Delcam ArtCAM's art-based approach, Delcam Designer helps you create stunning designs quickly and simply. Easy-to-use morphing tools let you create intricate shapes by bending and twisting the model using simple drag handles. Gems and holders can be added from standard or user-defined libraries, helping you build detailed, accurate models quickly and easily. Total Modelling tools let you wrap complex reliefs onto your designs as full 3D textures, so the design you see on-screen is exactly what will be made.

Rendering

PowerSHAPE includes fully integrated rendering, allowing you to create realistic images of your designs using pre-defined or custom materials and lighting studio set-ups. Alternatively, you can export your model, complete with all its materials, textures and labels, for use in the rendering system of your choice.

DID YOU KNOW ?

PowerSHAPE's unique combination of modelling tools lets you achieve the perfect shape quickly, accurately, and simply.

BENEFITS

- Use PowerSHAPE's Intelligent Cursor to simplify creation of wireframe sketches
- Create accurate 3D surfaces from sketches automatically
- Use powerful morphing tools to explore more design ideas, faster
- Combine surfaces, solids, and triangles to create any shape you can imagine

"We can start a new design with PowerSHAPE as soon as NIKON or CANON release a new camera to the market."

Luc de Brauwer, Leys NV

www.delcam.tv/leys

REVERSE ENGINEERING

Reverse Engineering is not simply a case of reproducing an existing part or component. Legacy parts are almost always worn, damaged, or imperfect; copying them will reproduce the errors. The aim of Reverse Engineering is to re-capture the design as it was originally intended.

By allowing you to combine traditional Reverse Engineering and surface modelling techniques with Parasolid™ based solids, PowerSHAPE Pro allows you to think as the original designer did. This Re-Engineering lets you make usable 3D CAD models of physical parts quickly and efficiently. PowerSHAPE Pro gives you the freedom to modify the design to suit modern manufacturing methods or new materials, no matter how complex the original shape. At any stage the 3D CAD model can be checked against the original scanned data to ensure total accuracy.

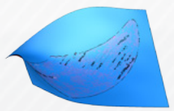
The Process

Scan

- Capture scanned data for complex parts interactively, ensuring that you retain every detail
- Import legacy scanned data in a wide range of industry-standard formats
- Align multiple point-clouds quickly and efficiently

Triangles

- Convert scanned point-clouds to triangle meshes quickly and simply, to any tolerance
- Use interactive sculpting tools to remove imperfections in the data, fill holes, or add extra detail
- Align meshes with other 3D geometry to simplify modelling



Surfaces

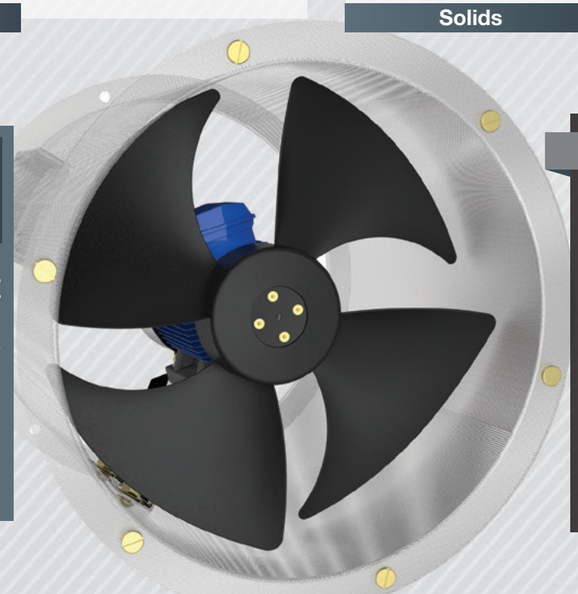
- Create tangent-matched surfaces by picking key points on the triangle mesh
- Fit smooth surfaces over large triangle meshes for faster creation
- Check surface quality and accuracy using easy-to-read visual error maps

Solids

- Build usable solid models using accurate 2D geometry created from key cross-sections through the triangle mesh
- Combine free-form surfaces with solid models to create shapes of any complexity
- Use any combination of modelling techniques, including Direct Modelling, to ensure that the final product can be manufactured

DID YOU KNOW ?

With PowerSHAPE Pro you can achieve every step of the process, from initial scan to finished part, in a single easy-to-use program



BENEFITS

Use interactive scanning to ensure that you capture every detail of the parts you scan

Re-Engineer parts exactly as they were originally designed

Reduce learning times by using a single program for both CAD and Reverse Engineering

Use solids, surfaces and triangle meshes in any combination for fast, efficient modelling

SUPPORT & MAINTENANCE

Everyone knows that business costs must be kept as low as possible but some cost-cutting measures could actually cost you more in the long term. Software maintenance safeguards your business, letting you get the best possible return on your investment and helping you stay one step ahead of your competitors.

Protect Your Investment

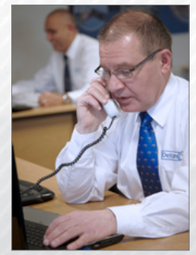
Your machine tools are an expensive investment and it is essential that they perform as efficiently as possible. The CADCAM software that helps you run those machines is under continuous development, becoming ever more efficient and cost-effective. Software maintenance ensures you are always at the forefront, using the best technology available and maximising your return.

Avoid Costly Re-training

Software development moves rapidly with new features and functions added every release. With two major releases a year, as well as intermediate patches, it does not take long to become out-of-date and to need complete re-training.

Get Help and Support

What happens when you hit a problem? With a maintenance contract, help is just a phone call or email away, in your own language, from your local Delcam Sales Partner. Delcam's support engineers are located at more than 300 offices worldwide and have thousands of man-years of experience between them. This knowledge and experience not only covers Delcam's products but also the specific manufacturing technologies and processes used within the market sectors that Delcam serves. The combination of all these resources ensures that whenever a problem occurs, your downtime is kept to a minimum by getting the help you need, when you need it.



Quickly Learn New Features

With every major release you receive a DVD kit containing a detailed "What's New" booklet to keep you fully up-to-date with all the latest tools and how to use them. You can also view tutorial videos on the new features and improvements from the Learning Zone at www.delcam.tv/lz, available in many different languages.

www.delcam.tv/apn

"Delcam's technical support is great. We get upgrades and new software versions fast and implement them quickly. We can keep using 100% of our machines, be more efficient and make more money."

Vincent Cote, APN

Delcam Advanced Manufacturing Solutions

Powering your productivity

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AUTODESK.