



Advanced  
Manufacturing  
Solutions



# Delcam Electrode

Fast, integrated design, manufacture and  
inspection for EDM electrodes

[www.delcam-electrode.com](http://www.delcam-electrode.com)

- 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 CAD/CAM solutions
- Headquartered in a purpose-built 63,000 sq. ft. facility in Birmingham, UK

**DID YOU KNOW**



Delcam develops all its machining code in-house and tests it in its own Advanced Manufacturing Facility.

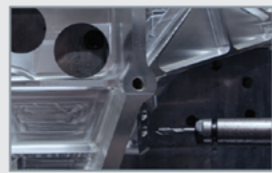
Powering your productivity

**PowerSHAPE**



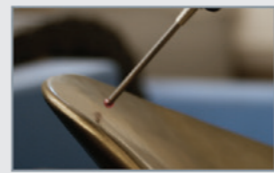
PowerSHAPE integrates surface, solid and triangle modelling. Design complex 3D models from scratch, or prepare imported data for manufacture, quickly, simply and accurately.

**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.

**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, multi-tasking lathes, turn/mill, and wire machines.

**PartMaker**



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

**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.

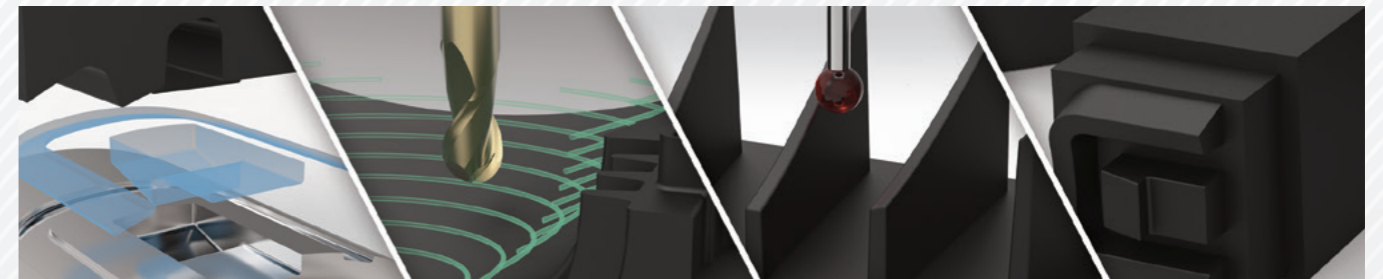
Connect with Delcam

[www.delcam.com](http://www.delcam.com) | [www.delcam.tv](http://www.delcam.tv) | [www.delcam.tv/lz](http://www.delcam.tv/lz) | [www.youtube.com/delcamams](http://www.youtube.com/delcamams)  
[www.facebook.com/delcamams](http://www.facebook.com/delcamams) | [www.twitter.com/delcamams](http://www.twitter.com/delcamams)

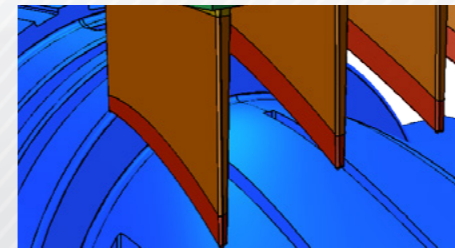
\*According to CIMdata

# Delcam Electrode

Fast, integrated design, manufacture and inspection for EDM electrodes



By combining PowerSHAPE for design, PowerMILL for machining and PowerINSPECT for inspection, Delcam Electrode offers a complete solution for manufacturing complex EDM electrodes. Design, manufacturing, and inspection information is all stored in a single .TRODE file, simplifying data management and ensuring consistency in your processes. Delcam Electrode is fully customisable, capturing your own manufacturing knowledge and expertise so you can manufacture your electrodes the way you want to.



**Design**

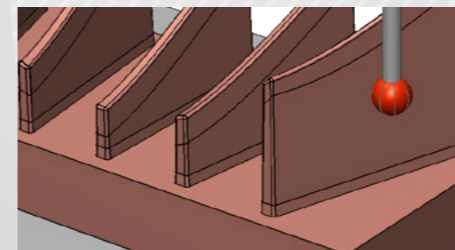
Delcam Electrode automates the creation of electrodes by using a simple wizard through the entire design process. Combined with PowerSHAPE's powerful Direct Modelling tools, Delcam Electrode enables you to:

- 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

**Manufacture**

Delcam Electrode captures your own machining methods and knowledge, guaranteeing consistent results. The 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 automatically to all toolpaths



**Inspection**

PowerINSPECT measures the finished electrode and generates a detailed report which is saved within the .TRODE file. Any necessary re-alignment can then 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

**DID YOU KNOW**

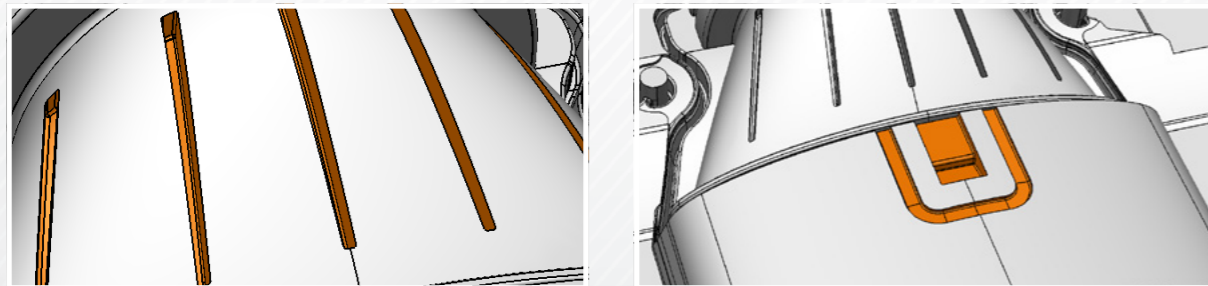


You can visit [www.delcam-electrode.com](http://www.delcam-electrode.com) to see how Delcam Electrode can help your business.

# DIRECT MODELLING FOR ELECTRODE DESIGN

Strong modelling tools are essential for fast, accurate electrode extraction. Delcam Electrode's Design Wizard combines the latest Parasolid™ technology for Direct Modelling with Delcam's surface modelling, developed from over 30 years' experience in the industry.

## Burn Region Selection

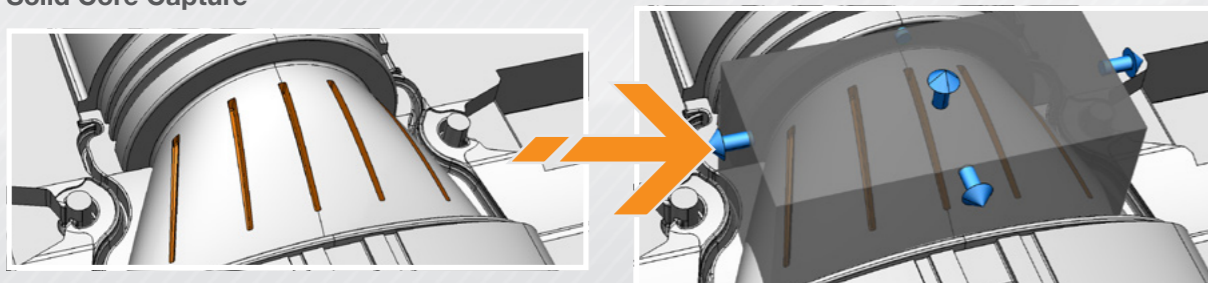


Powerful selection tools make it easy to select the burn region on your workpiece.

With Delcam Electrode, you can:

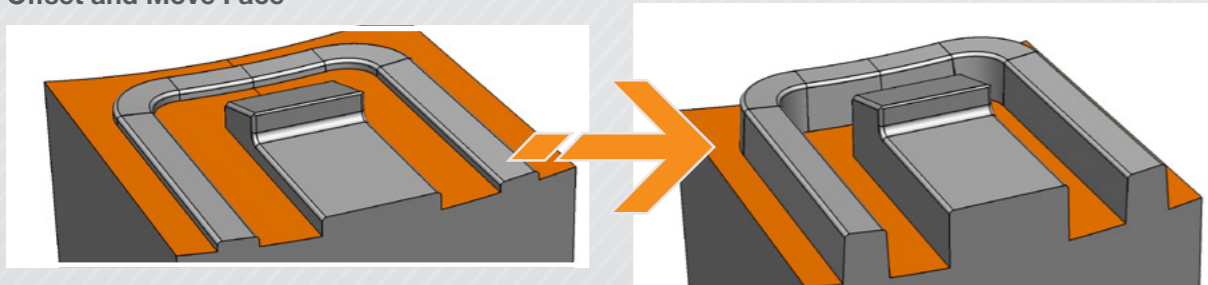
- Select faces by sketching a polygon or by dragging a lasso around them
- Select complex regions by flood-filling areas
- Add or remove individual faces
- Box select regions

## Solid Core Capture



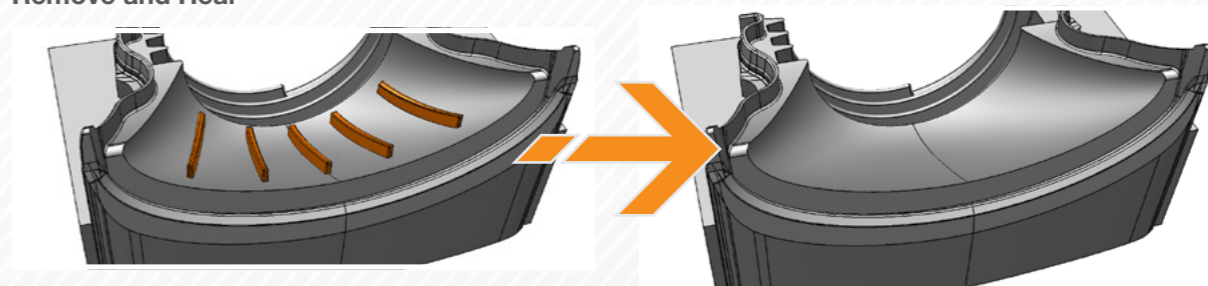
Extract the burn region from the workpiece using a Solid Core. Select the faces that surround the region to be extracted and then choose an appropriate blank, either from major suppliers such as EROWA, or your own user-defined library. The blank can be adjusted dynamically to your exact requirement using intuitive drag handles. The new core, extracted directly from the workpiece, can be modified if necessary using any combination of surface, solid or Direct Modelling techniques.

## Offset and Move Face



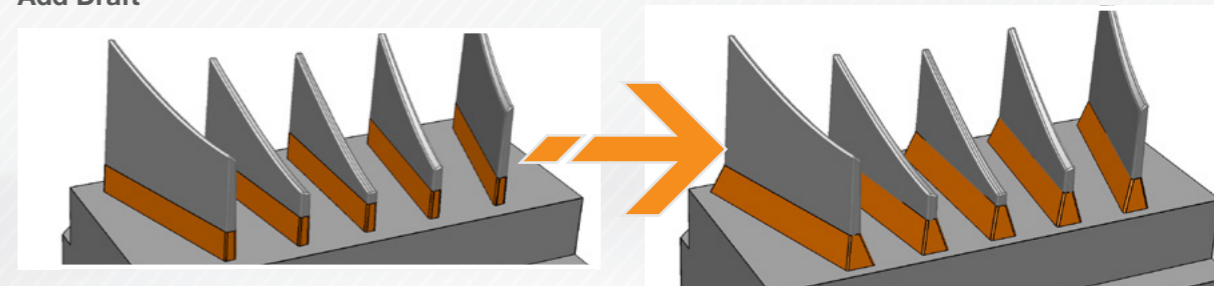
To prevent scarring caused by over-burn, faces of the electrode can be moved or offset to provide clearance. All adjoining faces are extended and re-trimmed as needed to ensure high quality, easy-to-machine results.

## Remove and Heal



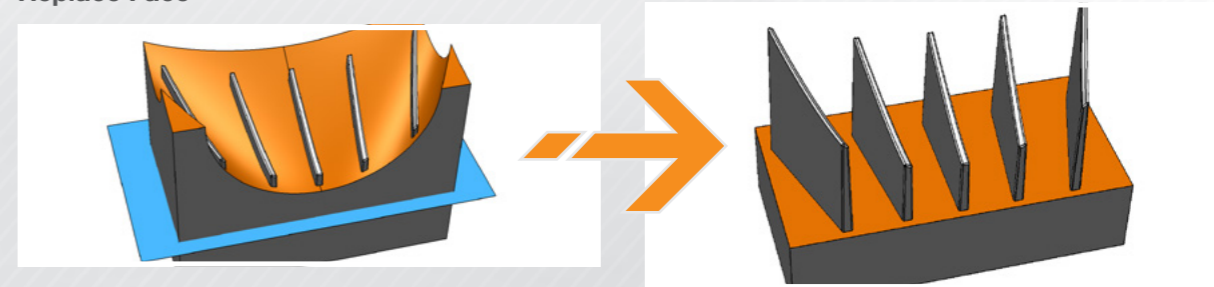
Remove unwanted detail to simplify electrode geometry and enable efficient manufacture. Remove and Heal re-intersects all surrounding faces automatically to close any gaps. If necessary, electrode geometry can be further simplified by splitting the solid along selected faces.

## Add Draft



Add taper to strengthen thin electrodes, quickly and easily. Select the faces to Draft, and enter the required taper angle and a reference position. All surrounding faces, including fillets, are re-trimmed and re-blended automatically as needed.

## Replace Face



Simplify electrode geometry quickly and easily by replacing a complex region with another surface. The replacement face can be a single face of the same solid, a face from a separate solid, or an entirely new surface.

“The modelling tools allow you to easily and automatically create the electrode.”  
Mr. C Tri Djoko Irwanto, Astra Otoparts, Indonesia

DID YOU KNOW



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

# WORKFLOW

## Electrode Design

- ✓ Import and fix part geometry from any CAD system using the Solid Doctor
- ✓ Extract electrodes using Direct Modelling
- ✓ Specify electrode blank size, holder, surface finish and material
- ✓ Create General Assembly and detailed drawings, to your own company standard
- ✓ Identify key geometric features for inspection later
- ✓ Save the .TRODE file for the project
- ✓ Export all sparking data to your EDM machine

## BENEFITS

Powerful yet easy-to-use Direct Modelling tools allow you to deal with the most challenging electrodes quickly and simply

PowerSHAPE calculates default undersizes for rougher, semi-finisher and finisher electrodes automatically, based on the desired surface finish, burn area and electrode material

Drawing templates are fully customisable to your own company standard

Delcam Electrode supports all commonly used EDM machines

## Electrode Machining

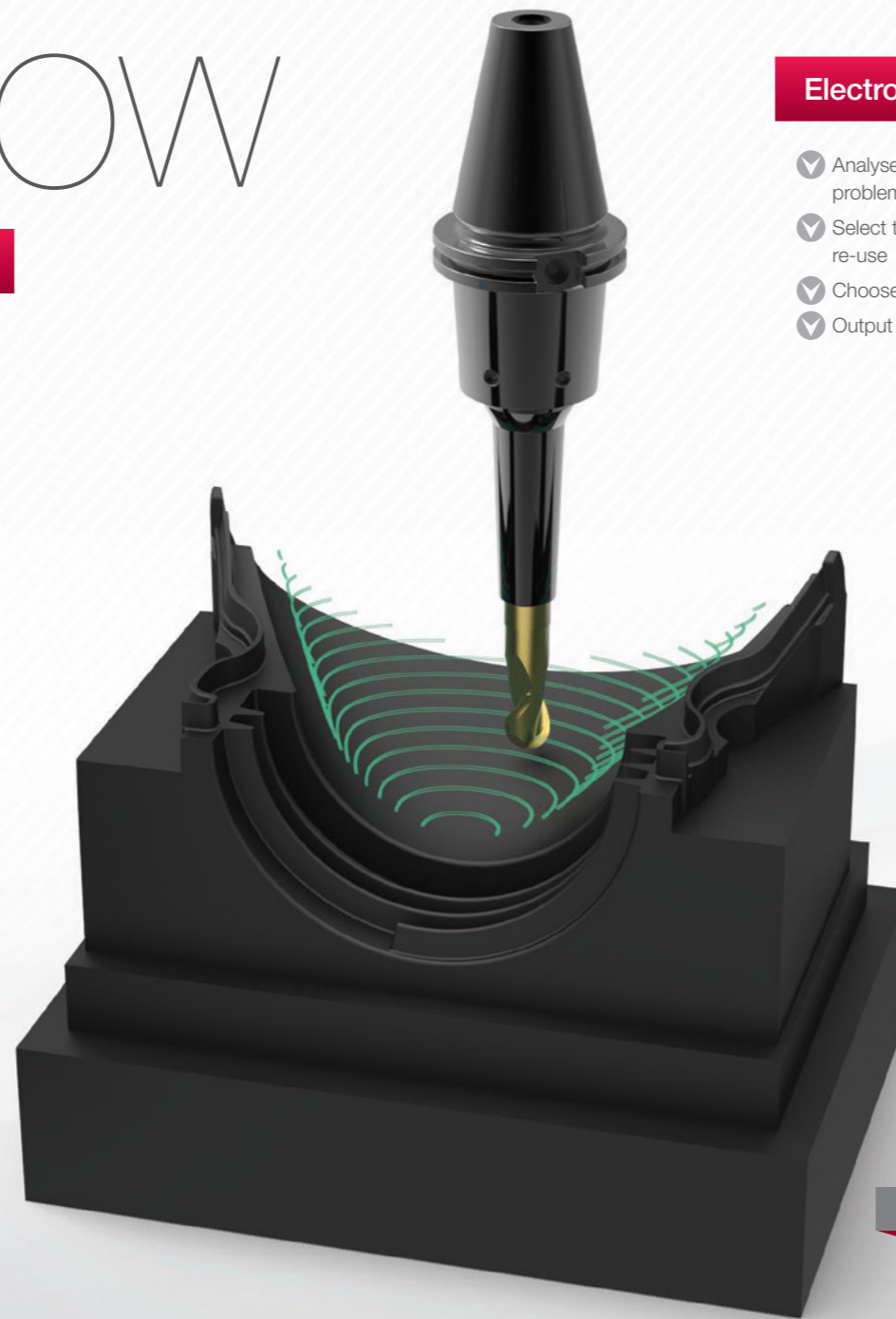
- ✓ Analyse the electrode using dynamic shading tools to identify potential problems such as small radii, undercuts or thin walls
- ✓ Select the appropriate machining strategy, or record your own for later re-use
- ✓ Choose the machine tool you will use
- ✓ Output NC data

## BENEFITS

Eliminate human error by using a single file throughout the entire process

Automate your processes using your own manufacturing knowledge and experience

Save time and money by manufacturing electrodes on the shop floor, rather than disrupting the CAD office



## Electrode Inspection

- ✓ Create the probe path for your CMM or machine tool using the points and spark gaps defined at the design stage or by PowerINSPECT
- ✓ Output the complete inspection report
- ✓ Re-align or re-machine the electrode if it is out of tolerance

## BENEFITS

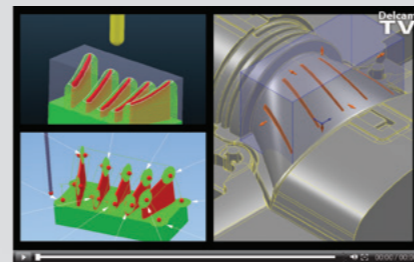
Inspection points can be adjusted or removed with ease in PowerINSPECT

Full manual inspection using any of PowerINSPECT's easy-to-use measuring tools is available at any time

Avoid costly errors by ensuring that the finished electrode is correct, and within required tolerances



To learn more about the Delcam Electrode Workflow



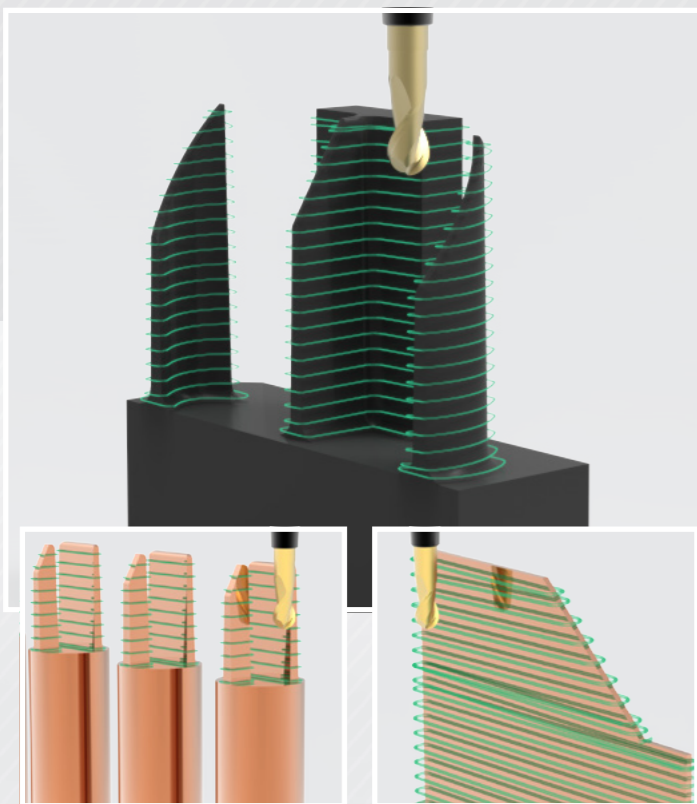
Visit: [www.delcam-electrode.com/workflow](http://www.delcam-electrode.com/workflow)

DID YOU KNOW



Delcam Electrode automatically transfers sparking data to all major EDM machines, eliminating human error associated with manual data entry.

# DELCAM ELECTRODE MACHINING WIZARD



Delcam Electrode Machining Wizard ensures high-efficiency EDM electrode manufacture. Whether you machine from graphite or copper, PowerMILL will get you from blank to finished electrode in the shortest possible time, offering automation, customisation and flexibility at every step along the way.

Powerful, customisable templates and macros provide you with complete control of your manufacturing processes. Once the templates have been created, generating the machining toolpaths becomes a fully automated process.

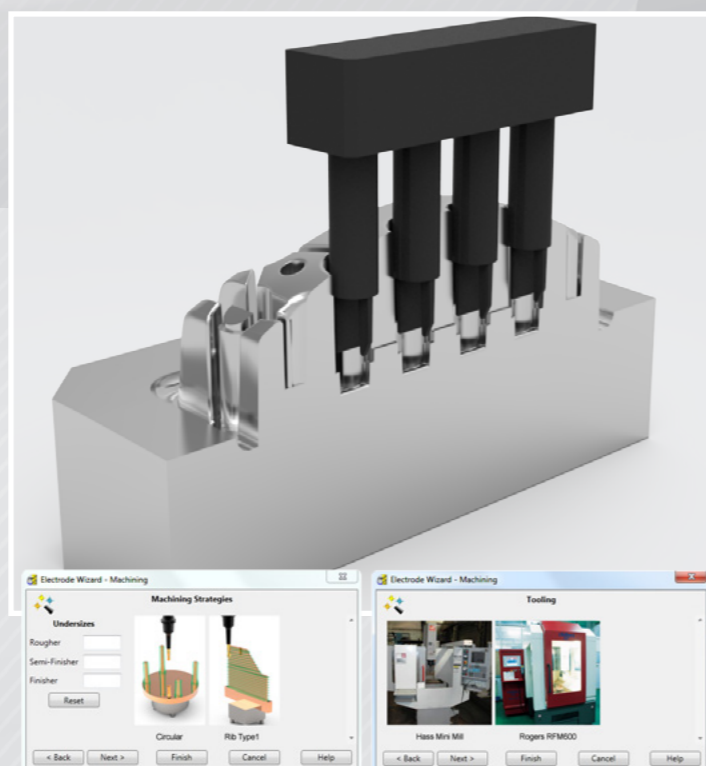
## BENEFITS

- Ease of customisation – machine how you want to with your own tooling and strategies
- Import colour-identified burn, clearance and blank faces from the Electrode Design Wizard
- Automatically apply electrode blank size and spark gaps to your toolpaths
- Dynamically analyse the electrode draft and radius

PowerMILL allows you to create and machine your electrodes on the shop floor, helping to eliminate bottlenecks in your manufacturing process. Patented high speed machining and multi-axis toolpath strategies enable you to quickly program the most difficult and challenging parts whilst achieving faster machining times, reduced tool loads and smoother surface finishes.

## BENEFITS

- Minimise calculation times with 64-bit support, multi-threading and background processing
- Modify toolpaths easily with powerful editing tools
- Automate specialist processes, or calculate simple toolpaths unattended
- Detect and avoid collisions for complete confidence and peace of mind
- Minimise machining times and maximise finish quality



# DELCAM ELECTRODE INSPECTION WIZARD

Delcam Electrode Inspection Wizard reads the inspection points in the .TRODE file and compares the electrode directly against the original CAD model for control and consistency. The wizard distinguishes between the electrode frame and the burn surfaces and helps you to create automated measurements with a CMM or machine tool. Colour coded inspection results take into account tolerances and spark gaps and are easy to read at a glance. The wizard calculates 2D or 3D preset data and automatically post-processes it to generate a presetting program.



## BENEFITS

- Highly automated design includes measurement and presetting points, ensuring speed and consistency
- Eliminate unnecessary data translation steps between design, presetting and inspection, saving time and reducing opportunities for errors
- Automated presetting is faster, more accurate and less prone to errors, improving consistency and quality

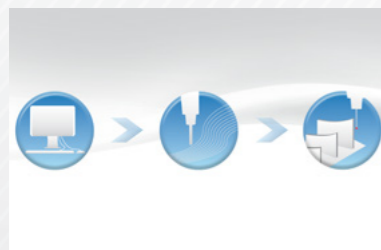
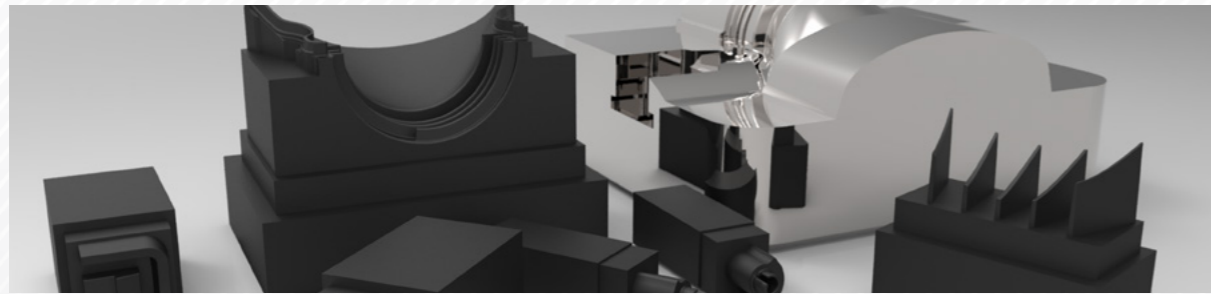
You can also use PowerINSPECT with a wide variety of inspection and measuring equipment. It provides maximum flexibility for inspection programming, allowing you to quickly create attractive and easy-to-read reports. PowerINSPECT's automation functionality allows further integration into existing processes.

## BENEFITS

- A single software solution across multiple inspection devices reduces training requirements and maximises flexibility
- Fast and easy programming of additional inspection routines as required
- Measurement results can be quickly understood by anyone
- Easy comparison of presetting results with final inspection reports
- Provides the optimum balance between automated processes and user control



# ADVANTAGES



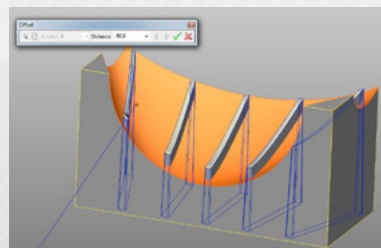
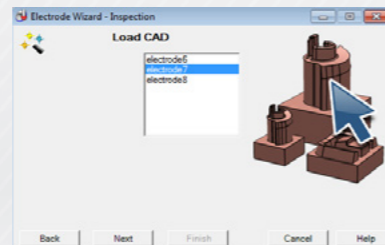
## Single Solution

Take advantage of the comprehensive technologies in PowerSHAPE, PowerMILL and PowerINSPECT to manufacture electrodes of any complexity quickly and accurately. Delcam Electrode provides a single-supplier solution, reducing learning times and support costs, whilst at the same time guaranteeing high quality finished electrodes. Delcam Electrode offers an easy-to-use completely integrated solution, saving you time on the shop floor.

## Data Management

Delcam Electrode simplifies data management by storing all the information for an electrode project in a single file. The .TRODE file contains:

- Geometry for any number of electrodes
- Spark gap and under-size information
- Inspection routines
- Material specifications, including blank sizes
- Set-up sheets and setting data
- Scripts to drive the EDM controller



## Direct Modelling

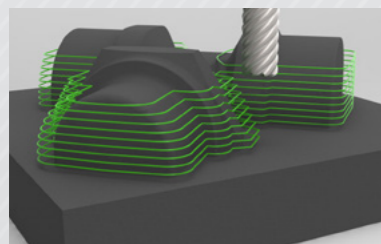
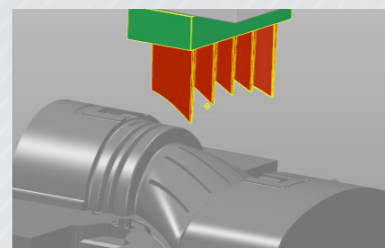
Direct Modelling lets you modify complex geometry simply and easily. Even on imported models with no history, Direct Modelling allows you to:

- De-featurise solids, removing unwanted solid faces and features
- Offset selected faces to provide clearance and avoid over-burn
- Divide a complex electrode into several easy-to-machine pieces

## Automation

Delcam Electrode automates electrode manufacture by recording your own strategies for machining specific types of electrode. This allows you to:

- Use your own preferred strategies and tooling
- Machine similar electrodes automatically
- Add new electrode types and strategies at any time



## Customisation

With Delcam Electrode you can customise any stage of the process from design through to manufacture and inspection, including:

- Electrode blanks and holders
- Set-up sheets and drawings
- Machining strategies
- Inspection routines and reports

# TECHNICAL PARTNERSHIPS



## Automatic Script Generation

Electrode setting and use information is automatically generated into a script file which can then be directly inputted into your EDM machine, thereby eliminating any potential human error. Close collaboration with major suppliers and OEMs ensures that Delcam Electrode continues to provide best-in-class solutions throughout your entire electrode manufacturing process, from design to final inspection.

Delcam is proud of its strong relationships with the following EDM machine and holder suppliers:



“Modelling is quicker, there is less information required for the EDM process and the information we get is of higher quality; there are simply no more errors.”

Fernando Loureiro, Simoldes

[www.delcam.tv/simoldes](http://www.delcam.tv/simoldes)

DID YOU KNOW



Delcam's close relationships with major EDM suppliers helps you take advantage of the most up-to-date techniques and technology available.



Advanced  
Manufacturing  
Solutions

Powering your productivity

Delcam  
Small Heath Business Park | Birmingham | B10 0HJ | United Kingdom  
Tel: +44 (0)121 766 5544 | Fax: +44 (0)121 766 5511

[www.delcam-ams.com](http://www.delcam-ams.com) | [marketing@delcam.com](mailto:marketing@delcam.com)

© Copyright Delcam Ltd 2014. All trademarks are the property of their respective owners.

