Crowley Tool, based in Hendersonville, Tennessee manufacture insertable form tooling for the screw machine industry and run several Agie Wire machines. In 2001 they evaluated the market for software to drive these machines. They did not choose PEPS at that time, instead choosing to go with another leading brand. Commented Todd McDonald, Systems Manager; “We decided to go for the comfort factor of what appeared to be a large and reputable organisation, however I felt severely let down - the software did not generate code that would run every time, maintenance pricing was expensive and when I reported a bug it was ignored.”

Two years later, the time came to replace one of their Agie machines, so Todd installed an Agie Classic 2S, with a view to purchasing five more. The machine was supplied with PEPS Wire. Said Todd, “I immediate felt at home with PEPS, and was able to use it very quickly in conjunction with our existing CAD system to automate the programming cycle. In the trial period I familiarised myself with the system completely without needing training, and from installation to this day PEPS has never generated code that the Agie wouldn’t run first time.”

The most apparent difference between their existing system and PEPS was speed. Crowley prides itself on fast setup times, which were already at 12 minutes - with PEPS this was reduced to only three! Added Todd, “The forms we produce daily are very straightforward. The number of stages you need to go through with PEPS is reduced because so much is handled automatically by the default settings.”

As with any new system there are always questions to which the answers are not immediately apparent. Todd’s experience of PEPS support, however has far exceeded his expectations. “Whenever I’ve had to call technical support my questions have always been readily dealt with - they’ve always gone that extra mile to make sure that the question has been answered fully. The software has always performed reliably as well - a marked difference from previous experiences.”

Crowley Tool made the decision to purchase five more Agie Classic 2S machines after the success of the first machine, and at the same time decided to replace their CAM system with PEPS. As the company continues to grow, new machines may be on the horizon, and Crowley will continue with the Agie machines because of their reliability and accuracy. PEPS will also continue to drive their entire Agie range of Wire machines. Todd finished by saying “It makes sense to have one system to drive all of our wire machines. I can train a member of staff with only a basic understanding of CAD on PEPS Wire in only half a day. We use and recommend PEPS simply because it’s easy to use and generates 100% accurate code - every time.”

Comments
“I have received better support for PEPS than I have from any other software or hardware vendor - ever.”

Todd McDonald
Systems Manager
3-D CNC, Inc., based in Hutchinson, MN, is a precision tooling job shop that specializes in EDM intensive tooling, component parts and assemblies. They were using a CAM system that had been discontinued, which was causing problems with newer file formats being incompatible. They decided to evaluate the market and finally chose Camtek’s PEPS SolidCut Wire EDM because of its ability to handle solids and create technology files at the computer for their Charmilles Wire EDM machines.

PEPS SolidCut Wire was installed along with postprocessors for all of 3-D CNC’s Wire EDM machines. Mike Getzke, Director of Business Development commented; “We immediately noticed several improvements. Firstly, forward and reverse profiling was much easier. Previously we had to draw both the forward and reverse toolpath onto the graphics file, and even had to make manual changes after NC code was generated to get it to run.”

One of the initial reasons for updating their CAM system was the lack of support for newer CAD file formats. Added Dave Hall, EDM Department Lead Toolmaker; “Previously we were limited to IGES, DWG and DXF import, with no support for solid models from CAD systems such as SolidWorks or SolidEdge. As PEPS SolidCut Wire ships with several CAD design integrators as standard this was no longer an issue.”

Once the CAD file had been imported into PEPS further programming time reductions were noted, especially with 4-axis programming, where the reduction was up to 30%. “Converting imported graphics to toolpath is much easier within PEPS. The solid view of the component is also excellent - what you see during the graphic check is exactly what you will see out of the machine. We also saw benefits at the machine tool, as PEPS also created the technology files required for our Charmilles machines. This saves us up to 15% of the overall machine setup time.”

As many processes are automated through the use of databases storing common actions and settings, errors reduced significantly. This was most apparent on the 4-axis programs. Thorough training also helped to educate users on the best methods of programming each particular machine. Of the training Dave commented; “We thought the onsite training was very good, but it is also backed up by strong help documentation. Camtek’s telephone support has also proved very effective in quickly answering any questions we’ve had.”

3-D CNC has seen an overall improvement in programming time, a reduction in errors and increase in the file formats they can accept from customers. One of their major customers was so impressed with PEPS that they have also installed it to further streamline their CNC programming coordination. 3-D CNC plans to upgrade their vertical machining centres and will be standardizing on PEPS for this process. Dave finalized by saying; “PEPS is very easy to use and learn. Our maintenance contract allows us to download the latest version from their website, which has also continued to deliver new benefits.”

**Benefits achieved**

- Can now import more file types, including solids from all major CAD systems
- Now spend up to 15% less time at the machine setting tec files
- Up to 30% reduction in programming time
- Forward and reverse profiling much easier, with no further manual editing required
- Excellent on-site training and software help
- Converting imported graphics to tool path is much easier
- Significant reduction in the number of errors, especially on 4-axis programs

**Comments**

“I spend much less time at the machine creating and modifying technology files.”

Dave Hall
EDM Dept Lead Toolmaker

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**About 3-D CNC, Inc.**

Established: 1989

Staff: 30

Business: Precision tooling job shop

Machines used:
- 3 x Charmilles Robofil Wire EDM
- Charmilles Roboform Sinker EDM
- Mitsubishi FX10 Wire EDM
- Mitsubishi SX Wire EDM

**Camtek**

A part of the JETCAM group
Ter Hoek Vonkerosie B.V., a job shop with locations in Tilburg and Rijssen, Holland has a wide range of Wire EDM, sink EDM and milling machines. The software driving some of their Charmilles Wire EDM machines was text-based with many limitations, so, after recommendation from Charmilles in 1997 they purchased SolidCut Wire from Camtek’s local reseller, Produsoft. Said Gerrit Ter Hoek, Managing Director; “Most of our business is high precision work required on a fast lead-time. It is quite common for work to be delivered same day, so we need the time from receiving the customer’s CAD file to having code on the machine to be at a minimum.”

After only three days training operators were able to design components and generate NC code. Added Ter Hoek; “The system had to be fast and precise. None of our operators program at the machine tool so it is important that the NC code is right first time, which it generally is. With SolidCut it is very easy and uncomplicated to navigate around the system with the menus, so a less skilled user can find their way around quite easily. Sometimes we might have to rework an entire machining strategy, but these things are very straightforward within the software. Also, SolidCut is excellent in generating NC code for ruled surfaces - Constraint conditions can easily be added or removed using interactive graphical tools so you get the desired results. Pre-drilled wire thread positions are easily taken into account, ensuring that the wire is automatically placed on the right side of the part. Because of all of these features preparation time is shorter and the chance of errors is reduced. Rapid generation of toolpaths in all strategies enables programmers to quickly create and apply options to generate ideal machining and code. Simulation verifies all toolpaths and eliminates first-off prove-out, which is important where low quantities are required.”

The most immediate benefit after installation was a reduction in design time. Depending on the complexity of the component this could range from 20% to 200%. This can be partly attributed to features received in updates of the software such as the DXF healing capability, which checks for errors, gaps etc within a DXF and converts them to usable geometry.

In addition to the quality of the component files provided, customer provide parts in a variety of different 2D and 3D CAD formats. SolidCut ships with many design translators that will seamlessly import the native CAD file, ready for cutting information to be applied. Ter Hoek commented; “This facility has helped us to help our customers - if they have to deliver a 2D file to us it takes them time to convert from their 3D file. By being able to accept many native formats we can continue to improve our service and leadtimes.”

As speed of turnaround is such a priority, the trapping of errors is also paramount. Collision detection checks the position of the component, cutting surface and machine, flagging up potential crashes.

With eight licenses driving Wire EDM, Sink EDM and milling machines, Ter Hoek recently invested in SolidCut Surface to provide 3D milling strategies covering roughing, semi-finishing, finishing and high speed operations. Ter Hoek concluded; “Our goal has always been to produce all the code from the CAM system so that the operator simply downloads to the machine and starts cutting. SolidCut also has the strongest CAD functionality of any CAM system I’ve seen. To meet our customer delivery timescale every program must be 100% error-free, which it generally is.”
CTE Inc., based in York, Pennsylvania, is a vertically integrated contract manufacturer with capabilities to design & build high precision progressive tooling, prototype metal stamping and reel to reel plating. After purchasing an Agie Challenge machine in 1999 they also purchased an alternative CAM system. The system was extremely slow to work with and they could not get it to generate code for their new machine. After 6 weeks of failing to output accurate NC code for their machine they took advice from Agie, who recommended PEPS SolidCut Wire.

The system was installed in 1999 and was immediately outputting 100% accurate NC code. Said Joe Gallagher, EDM Technician at CTE, “After our previous experience I was impressed that we could get accurate code every time. I also found the system extremely fast and easy to use in comparison. I didn’t even have the formal training after the initial installation but was able to get to grips with the system straight away.”

After using the system for a few weeks further benefits became clear. Joe added; “The solid modelling capabilities were outstanding, and the slug retention module alone saved us at least 30 minutes in programming time per job. The knowledge base for the wire machines is very useful because it simplifies learning and saves time - at least 10 minutes per part. Time is money, so this is very important to us.”

Since installing PEPS SolidCut Wire, CTE has also expanded the services that it can offer its customers. Joe explained; “Originally we were producing standard profiles, but now with SolidCut Wire and the new Agie machine’s capabilities we are able to do any four axis programs with varying tapers and no core operations, which enables unmanned operation by removing the core automatically. We have had great success with No Core operations as there are no resulting slivers in wire guides.”

Compatibility with all CAD formats has also been assured, thanks to Camtek’s relationships with all major CAD vendors. CTE can receive data in all popular formats (such as 2D line/arc, 3D wireframe, surface, and solid data) and immediately apply simple or complex wire paths to it. All new releases of SolidCut Wire are shipped with the latest CAD design integrators, keeping CTE up-to-date with industry requirements and ensuring that they can handle all future components that customers might need.

Customer service is always an important issue for mission-critical systems, and CTE has been extremely pleased with the service provided by US distributor Camtek North America, Inc. “Whenever I had a question it was either answered straight away or within 10-20 minutes. Staff at Camtek were always friendly and courteous, and always able to help.”

CTE plans to expand their range of wire EDM machines in the future, with PEPS SolidCut Wire playing an important part. Joe finalized; “SolidCut was recommended by the machine manufacturer, is extremely easy to learn and use, produces accurate code and is backed by excellent customer service. When we buy more machines PEPS SolidCut Wire will be driving them.”
ES Tooling, based in Beringen, Belgium is a small precision manufacturing company with large goals. Founded by a husband and wife team in 1996, ES Tooling has a policy of investing, not only in terms of new equipment purchases, but also in training its staff. They work with a highly skilled work force that uses machinery that is never more than 5 years old. This desire for precision and performance won them the coveted Hermes award for SME Managers in 2004 (pictured right). In 2001 they purchased an Agie Challenge Wire EDM machine, and decided on PEPS SolidCut Wire EDM from local reseller Produsoft B.V.B.A. Said Erik Schildermans, Director; “We needed a system that would allow us to respond to customer demands on extremely high precision parts. In comparison to two other systems I had the experience that PEPS was the best in its class. There was less keying of data as the mouse did all of the work.”

Despite the programmer having limited CAM experience, only two days training was required for him to be able to program the machine effectively. The ongoing support was also minimal. Commented Erik; “There have been relatively few questions about PEPS since it was installed and those we do ask are generally answered immediately.”

Continuing their philosophy of expansion and investment, an additional Agie Challenge was purchased in 2001, followed by the Agie Vertex twin wire machine in 2004. This was the first twin wire machine to be delivered to the Benelux region. Additional postprocessors were purchased for PEPS, immediately allowing the programmer to drive all three machines through a single, common interface, but without compromising on functionality. “This machine was a major investment for us as it allowed us to work within very small tolerances. We can, for example make a groove of 0.05 mm.”

Although a machine’s capabilities remain unchanged after purchase, software continues to develop, and ES Tooling took full advantage of a maintenance contract. This allowed them to receive several new releases, each of which provided new functionality and better ease of use. Features such as the creation and selection of quality targets, clearance & corner and variocut settings dialogues in PEPS deliver ease of use and ‘familiar feel’ as they mirror the information shown on the machine tool controls.

ES Tooling has set itself high targets for the future, with a five-year plan to double turnover by 2008 but without increasing staff. Automation is therefore paramount, with machines already running 24/7. The original Agie Challenge was replaced with an Agie Progress in Q1 2005. Erik finalised; “Since 2003 the turnover is already up 22%, and we plan to expand PEPS with the advanced gear module in the future to widen our capabilities. Since installation we have never had a problem of not being able to produce a part because of software limitations. Precision is our target for everything, and this is the reason that we use PEPS.”
LH Corp, based in Dublin, VA, USA, has a wide range of CNC lathes and mills. Their existing CAM system provided limited functionality and produced NC code that still required substantial editing before being run on the machine. The purchase of a new Agie Wire EDM machine made them question whether they should look for a product that covered all of their technologies, while providing a more robust, automated solution. Agie recommended PEPS SolidCut Wire to drive the Classic 2S, and Camtek confirmed that postprocessors were available to drive the other machines. Clemens von Claparède, President, commented; “As PEPS was recommended for the Agie, and because of its 3D capabilities we decided to investigate its suitability for our other machines. I did not want to throw good money after bad to upgrade the previous system as we were more or less hand coding due to the poor postprocessed code.”

PEPS was installed at the same time as the Agie in the summer of 2004, and information on the existing machines was provided so that postprocessors for the other machines could be written. Said Clemens; “Given the problems I’d had with our previous system I was pleased with the turnaround to get PEPS running all the machines. Within three months we had all systems being driven by PEPS and both programmers fully trained and competent. The people who wrote the postprocessors were excellent - they really understood the difficulties generally faced by a programmer. The support team were easy to work with and always available.”

After the system had been running for a few months LH Corp started to notice a change in the overall programming process. Clemens added; “Once we had familiarized ourselves with the system, all of a sudden it was apparent that it performed functions in a much more sophisticated way. Firstly, we no longer needed to manually reprogram jobs on the machine as PEPS was producing accurate code for all technologies. This, along with other aspects of the software reduced setup time at the machine by as much as 15%. Programming time in general was cut by a quarter due to the automation PEPS provided, which in turn also delivered a drop in overall errors. We no longer even allow manual programming because of the accuracy of PEPS.” Programmer Allen Gusler added; “Machine operators can understand the NC code better as it is written in a much clearer way, plus they can see an on-screen simulation before the job is run. Machine runtime was also reduced because there is less ‘cutting of air’ - PEPS can program the job to cut the most time-efficient path.”

Customers work with a wide range of CAD systems, and previously LH Corp would have to redraw most components from scratch as they often could not read customer files. “As PEPS was supplied with many standard translators we have been able to read most customer files, but where we’ve received CAD files in other formats we simply purchased the required filter and received it by email” added Clemens.

“The functionality that PEPS has provided has allowed me to ‘open my mouth wider’ when talking to prospective clients. I can accept virtually any file formats, and those I don’t have I can normally get translators for quickly. We can now also program 3D work, which was impossible in the past. In fact, we are still finding new benefits and new ways of working with the software” Clemens concluded.

**Benefits achieved**
- Using a single package to program for three different technologies
- Generating error-free code every time, requiring no manual modifications
- Additional translators quickly available as required
- Reduction in number of errors
- Overall reduction of 25% on programming time
- Machine running time reduced through less ‘cutting of air’
- Machine setup time reduced by up to 15%
- Increased overall company capabilities

**Comments**

“PEPS does a great job of providing a single CAM solution for our entire range of machines.”

Clemens von Claparède
President
Micrometric Techniques Limited, based in Lincoln, UK, specialises in subcontract machining covering a wide variety of cutting technologies. In 2002 they decided to replace their existing Agie Wire EDM machine with the Challenge 2. They initially tried to use their existing CAM software to drive the new Agie, however it could only handle the most basic of shapes, requiring code to be hand-edited.

Said Neil Main, Technical Director, “We started looking for software to drive the machine as our existing system was not capable and our CAD supplier could not supply a working solution, despite trying to write a post for several months. We talked to several companies, all of which said that they could write a post to support the machine, but only one company actually had a working solution - Camtek. We were not prepared to buy a system without trying it first, which Camtek were happy to offer. It was an advantage that they could also drive our Cincinnati milling machine.”

Camtek supplied PEPS version 5 modules of Mill and Wire and provided training for Richard Horton, Senior Programmer. Commented Richard, “As we’d already trialed the system prior to purchase I had a general understanding of the system and was already producing NC code, however the training gave me a much better insight into some of the more advanced features. The decision to purchase PEPS was easy given that it was already competently driving our machine where no other manufacture could even guarantee support” Neil added, “PEPS tackles things in different ways to our previous products. Having the CAD included was an additional bonus.”

The most dramatic effect that was immediately noticed was the speed at which code could be generated. Richard attributes much of this to features such as the PEPS tooling database - “All the information is predefined - I just choose a tool and all the relevant information is selected and used. In addition to this the fully rendered solid model simulation made it very slick to get from drawing to code to simulation. We also reduced the possibility of errors and speeded up testing by performing dry runs via the PEPS simulator before running parts live on the machine.”

As with any product that covers such a comprehensive and technical process, Micrometrics did require additional support after training. Said Richard, “I was having difficulty getting my head around no-core cutting - I rang Camtek’s support line and got the help I needed the same day. We’ve also seen several software updates, one of which even arrived during our trial period, which was refreshing! Having a CADCAM suite that is common to both machines is very beneficial.”

Micrometric plans not only to develop their milling and wire business but also to branch out into new product areas, such as flexible membrane couplings that will require wire erosion to extreme accuracies (of less than 10 microns). Neil is satisfied that PEPS has already lived up to its promises; “We weren’t prepared to beta-test postprocessors for manufacturers. Camtek was the only company that had a working solution that could take full advantage of all the features on the Agie. We bought it, it worked and it worked well - it’s as simple as that! Producing any job on PEPS is just quicker.”

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Setting up a new business requires forward-thinking and planning when making major purchases - one bad mistake now can hinder a company for years. Pure-EDM Ltd is a new company based in Darlington in the North-East of England set up to deliver Wire-EDM subcontracting services. Their Technical Director, Robert Metcalfe, had experience of Agie machines, having previously worked with the company. This had given him a great deal of knowledge of the wide variety of machines and software available in the market. When the company was formed the decision was immediately made to purchase an Agie Challenge 2 machine powered by Camtek’s PEPS Wire EDM software.

The Solution:
Camtek supplied PEPS EDM version 4.3.9, which was immediately put to use. Robert Metcalfe commented, “As I was already familiar with PEPS I trained the other operator. I installed the software myself and was running our first job within 30 minutes! The Agie is a very powerful machine, allowing us to manufacture very complex parts - PEPS takes away the complications. It’s very straightforward, particularly if you’ve already used systems like AutoCAD.”

Geometry is supplied by customers in many different file formats such as DWG, DXF, IGES and NC Code, however the data is not always suitable. “Some of the files we receive contain many errors which prevent programming, such as overlaps, poor intersections, non-tangencies and breaks in geometry. In the past it has taken me hours to sift through each line to ensure ‘clean’ geometry - the PEPS ‘Repair Drawing’ facility does all of this in just a few seconds”

Although much of Pure-EDM’s business consists of toolmaking and precision machining, they are dedicated to finding new markets for the EDM process. The PEPS Gear and Turning modules have helped a great deal with this objective, by increasing their capabilities and reducing the workload of the programmers. “These were very impressive and useful modules. The list of figures supplied with gear drawings is complex to say the least. The PEPS Gear module allows me to enter all or even just part of this information to produce a DIN/ISO-standard gear. The Turning module works in the same way - you draw the shape of the component you wish to produce with the cutting tool, providing the rake angles that you want for front, top and side and it modifies your geometry. Basically all you need to know is what you want the cutting tool to make - PEPS does the rest…”

When starting from scratch, support is important - down-time is doubly critical when you are trying to impress new customers. “Camtek gave the personal touch with support - they went to great lengths to meet our needs.” commented Robert. “My experience, now and previously has always been that they go out of their way to help the customer.”

Pure-EDM Limited has a simple mission - to support existing EDM users and to increase awareness of the EDM process in new market sectors. “We know that by using the best software, tooling and machines, EDM can often be a cheaper, faster method of production than more conventional techniques.” Already a second machine is anticipated within their first year and they expect PEPS to play a continued role in their success. Robert finished by saying; “With the constant software updates I know that PEPS will support whatever feature our machines have - now and in the future.” Andrew Moore, Managing Director added “If only every company followed Camtek’s example for service and support, engineering would be a lot easier!”

Benefits achieved

- Ideal compliment to Agie Wire EDM machines
- User installed software and was cutting metal within 30 minutes
- Drawing Repair facility removes hours of manual fixing of bad drawings
- Gear and turning modules simplify the complex task - user no longer needs to know complex math algorithms
- Gets the most out of the advanced technology of the machine through continual updates
A&M EDM Ltd, based in Smethwick, West Midlands, offers subcontract wire and spark erosion services. Founded in 2002 and starting with two Sodick Wire EDM machines, they have expanded this to nine, with three Hurco milling machines. Both founding members had CAM experience and, whilst they had previously used PEPS SolidCut decided to evaluate the market. After reviewing other systems they came to the conclusion that SolidCut could still meet all of their needs. Said Mark Wingfield, Managing Director; “The main reason we selected SolidCut was that it was easier than anything else we tested or had used at other companies we’d worked at.” Arthur Watts, Works Director added; “I had used SolidCut since the 90’s when it was a Dos-based product, and even then it was the easiest system to use - I taught myself! We wanted to standardise on a single system that all staff could use.”

Two seats of SolidCut were initially installed, which has since been expanded to six. What was immediately noticeable was the reduction in programming time. Said Arthur “There are features that are standard in SolidCut that we’ve not seen in other systems. For example, the Quick Die feature, which allows us to apply start points and technology to multiple apertures just by dragging a box over them. We had one job with 500 holes which would have taken hours on another system, but was done with a couple of mouse clicks using SolidCut. Overall it was about a third quicker than the previous system I’d used.”

A knock-on effect of SolidCut’s automation was a reduction in the possibility of errors. Arthur added; “Another system I’d previously used relied on me entering codes such as T, M, high pressure etc. Many a time I’d put in a T85 instead of a T84, which may not be enough to scrap the job but caused cutting time to increase. SolidCut applies these codes automatically, which knocks out the human error factor. We queue up 10-12 hours of work to run unmanned overnight, so accuracy is paramount.”

Over 80% of their customers provide CAD files with orders, so the ability to handle multiple file formats was essential. As SolidCut is supplied with many data translators as standard this was never a problem. Mark commented; “Customers supply us with all manner of formats, however we never have a problem importing files ready for programming.” Arthur added; “As SolidCut has continued to improve on solid modeling we have been able to manipulate 3D models easier. This means that our customers do less work – with other systems I had to tell them that I could not work with 3D model but now I can generally extract what I need, project it to a 2D plane ready for cutting.”

A & M has received several software updates under maintenance which have continued to deliver further savings. Features such as corner relief, which automatically applied sharp corners which previously were manually programmed could reduce larger jobs by up to a third. The ability to offset curves to allow for cutting clearance added a further 15% on more complex parts. Arthur noted; “One of the functions I really like is the 4-axis - it’s quick and easy to use, and you don’t have to have the same number of elements at the top or bottom. You can put constraint lines in to tell SolidCut to blend in certain areas. The auto-destruct feature is also a major benefit - very easy and more accurate than any other auto-destruct feature I’ve seen elsewhere. Cutting time has been further reduced by using features such as ‘near neighbour’, which jumps to the nearest shape to optimise the cutting path.”

A & M’s business has grown rapidly since its inception, with business only showing signs of increasing due to their ability to offer fast turnaround and high accuracy. Arthur finalised; “Basically, we wanted the best. With SolidCut we have a fast, accurate and easy to use system, which is very important to the way we work.”

**Case Study: A & M EDM Limited**

Making the Cut with: PEPS SolidCut Wire/Mill/Surface

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**Benefits achieved**

- The easiest and most efficient solution from several CAM systems evaluated
- Programming time reduced by 30%
- Can manipulate solid models much easier, thus providing better service to customers
- Quick die feature allows technology to be applied to multiple apertures easily
- 100% accurate code every time for all machines
- Data translators allow for auto import of many CAD formats
- Features received under maintenance reduce programming time further still
- Reduction in the possibility for human error due to automatic code generation

**Comments**

“SolidCut can do more than I originally appreciated - especially the solid modeling.”

Arthur Watts

Works Director
CUSTOM FLUIDPOWER PTY LTD, based in Australia, utilises the latest in Cartridge Valve Technology including SUN Hydraulics and Waterman Hydraulics to design and manufacture state-of-the-art hydraulic manifolds covering industrial, mobile, agricultural, marine and aerospace applications. Until recently, however, they were still programming their Okuma horizontal machining centre using an internally created database of machine code for individual features. Bob Nolan, Manifold Manager commented; “All features were hand-written in G-code, which was time-consuming when features changed. Also, we had no way to simulate the cutting cycle. This process required a great deal of technical expertise.”

They decided to investigate CADCAM solutions, but no single system offered the end-to-end solution they desired. After speaking with Camtek Pacific they decided to purchase PEPS SolidCut Mill, with Camtek Pacific developing a parametric manifold generation application - CAM Expert - using the PEPS open structure and customisation facilities. Functions and interfaces available include creating user-commands and algorithms, interface dialogue boxes and database accessing.

Once PEPS was installed and configured in January 2004 several benefits became immediately apparent. Machine efficiency increased by 25% to 80% through optimised code routines, which yielded greater capacity. Denver Pollock, Engineer, added; “The most recent manifolds we produced were completed in 3.5 hours as opposed to the usual 6.”

Said Bob; “The main advantage is the capability to generate complete NC program to machine a manifold directly from the design data practically eliminating human factor. The reliable NC program ready to go for unmanned NC machining is generated in minutes instead of hours.” Denver added; “I am a lot more confident using Peps programs over previous when we set up and prove out our first blocks. It is always correct once we have proven features.”

Through PEPS and the integrated parametric module written by Camtek Pacific tool changes were reduced by 75%, which also constituted to a half hour saving on an average manifold. For every parametric feature CAM Expert has rules for its machining, configured by the company’s personnel. CAM Expert uses these rules and the tool cut database to resolve all required machining operations to produce all features and to cut the manifold.

Bob concluded, “PEPS has been an important ingredient in gaining efficiency within our manufacturing facility. Our main objective with PEPS was to produce a superior product where we could guarantee quality and consistency of our products. This alone has made us more efficient and substantially reduced our manufacturing costs. When you get this right all the other issues seem to fall into place. In conjunction with our customized design software, PEPS has been the nucleus for our success in reaching our objective.”

Bob Nolan
Manifold Manager
Since 1947 Talbot Designs of Finchley, London has manufactured products for a broad spectrum of clients - from the yellow beacons on pelican crossings to set designs for films such as Star Wars, and Harry Potter. A PEPS Mill user since 1995, they recently updated their Milling module to the latest version, which played a leading role in the creation of set pieces for the latest James Bond movie, Die another Day.

Said Richard Woolff, Sales Director; “I’d been looking at CADCAM in the early nineties and had spoken to Camtek back then. Several years later I was in the market for a system and Camtek was one of the companies I contacted - I even spoke to the same salesman. With a product such as CADCAM the stability of the company was important to me. We purchased their entry-level PEPS system as it more than met our needs at the time and was the easiest to use. Our business grew, as did the complexity of the products we were asked to design. After re-assessing the market I decided to upgrade PEPS as the new features would broaden the work we could handle. Also, our programmers were already familiar with the interface and would require minimal training on newer functions such as solid simulations, prove-out and tooling libraries.”

Once the PEPS update was installed the most noticeable benefit was that of speed - on average jobs were taking 25% less time to program. This was attributed to many of the now-automated features and pre-defined parameters. Shopfloor flexibility was also improved, as PEPS takes full advantage of each machine’s features and allows jobs to be moved easily between them. Commented Richard, “Moving a job from one machine to another is as easy as printing a document on a different printer on our network.”

Talbot’s business is such that many of their jobs are small runs or even one-off jobs. For the Bond movie Die another Day they were asked to produce a number of items for a scene set in the Ice Palace in Iceland. Scale models were submitted by the Eon Production Art dept and technical drawings were quickly generated for the prototypes. “At this point, we were able to quickly change small details within PEPS to enable continuing development and tweaking of the internal supports of the chairs. Due to tolerances in the manufacturing processes, some dimensions required individual adjustment and the ease of use of PEPS allowed us to fine tune the measurements.”

Many customers supply their required parts in electronic format, which often prove to be poorly drawn. PEPS includes an auto-repair function, repairing several thousand errors per minute. Richard added, “Getting information into PEPS is a much quicker, cleaner process. PEPS also checks for errors and allows us to simulate cutting on-screen so we no longer need to prove a part - it generates 100% accurate, machine-ready code every time.”

In a market where delivery times and margins are crucial, Richard’s decision to invest in new software rather than new machines has been a good one. “In addition to the initial improvements and automation since the PEPS update, we’ve noticed a subtle, constant improvement in our design and manufacturing processes. By putting a bit more in at the CAM end we are able to get much more out of our existing machines” But Talbot also has plans for hardware expansion in the future; “We always look at modernising machinery, and now anticipate buying new equipment in the future to cope with the extra capacity and flexibility that PEPS has delivered.”

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All companies are continually striving to improve productivity and efficiency, removing bottlenecks and reducing errors. M.J. Allen ENC is one such company that managed to succeed simply by replacing their CAM software. A part of the M.J. Allen Group, they specialise in machining castings, mostly supplied by a sister company within the group. Robert Williamson, Programming Planning Engineer, needed to overhaul their existing programming methods. Their previous CAM system in many cases was insufficient, resulting in most jobs being programmed manually. This not only took time, but also led to a greater number of errors. A decision was made to replace the system. After evaluating several products in the market they decided to buy from a British company with a long and stable background that could offer the level of support and security, both for staff and machines that they required. They chose PEPS Mill from Camtek.

The Solution:
Camtek supplied PEPS Mill version 4.2.1, supporting all five of M.J. Allen’s milling machines. This obviously dramatically reduced programming time, although the overall amount was surprising - over 75%. Commented Robert, “Programming was much faster, and the number of errors was greatly reduced - there is simply much less to check. For example, if I wanted to drill 100 holes, previously I would have to enter the position for each hole - this is now completely automated.”

As the main programmer it was important that Robert was fluent with PEPS as quickly as possible, and was able to train others. “I certainly rate the trainers at Camtek. After my training I was able to train other operators here to competently use the system in under 3 days. And if I had a technical question afterwards they always responded within 1-2 hours by phone or email. They’ve taken me through questions over the phone until they are fully answered.”

Whilst PEPS is supplied with its’ own fully functional CAD software, many users have their favourite CAD software, as did Robert. PEPS did not tie him into using PEPSCAD as it is compatible with virtually all CAD packages available, supporting all popular file formats. Whether jobs are programmed using PEPS’ in-built CAD, their existing CAD software or supplied by a customer as a DXF file, the output is always the same - fast, reliable code.

Another positive side-effect of installing PEPS Mill was an improvement in the accuracy of quotations. Previously, machining time was calculated either manually or as an ‘educated guess’. “When you write a program in PEPS it tells you how long it will take to machine. I can quickly write a program to, for example pocket out a component and know exactly how long it will take, which is extremely useful for estimating. It’s a small feature, but very useful to me.”

The M.J. Allen Group is an ever-expanding organisation, only recently acquiring a Midlands-based toolmaking company. This is in the process of being relocated and integrated into the Kent site, and it will be Robert’s task to integrate their CNC milling machines. “I’ll need to be able to program these machines, plus we are also looking to purchase a new vertical milling machine.” He is confident that PEPS will competently handle these requirements: “PEPS certainly didn’t under-deliver!”

Benefits achieved
- Programming time reduced by over 75%
- Number of errors reduced, as many tasks are now automated
- Programmer was able to train other users in-house competently in under 3 days
- Estimating is now more accurate as PEPS displays program running time
- Existing CAD software can still be used with/instead of PEPS CAD
- PEPS Mill is compatible with all of the (current and planned) machines in use

“The support is excellent - if I have a question they normally respond with an answer within 1-2 hours.”

Robert Williamson
Programming Planning Engineer

Camtek Limited
117 Church Street, Malvern, Worcs, England WR14 2AJ
Tel: +44 (0)1684 892290
Fax: +44 (0)1684 892269
E-mail: sales@camtek.co.uk
Web: www.peps.com

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