

Productive SolidCAM



Indispensable tools

An increasing number of companies are on a course of growth with SolidCAM and SolidWorks

Contract manufacturers who only offer their manufacturing capacities to the market are more replaceable than any time in the past. Modern machine tools are available worldwide and today willing and capable operating staff can be found in more and more countries with highly competitive rates and very attractive business environments. How can the loss of manufacturing jobs be stopped? The successful machining service providers will be those who, apart from having modern machinery, will demonstrate problem-solving qualities – and are ready to join in product development with their own ideas and resources for both designing and machining. For this to succeed, a CAD/CAM process chain, that is both compatible with many different customers, as well as internally manageable, is a must. The fact that the matching software doesn't have to cost a fortune and can also be used efficiently without designated specialists, is substantiated by the experiences at the contract manufacturer Barth Mechanik GmbH and at Wilhelm Gerdt, a metal and plastics fabricator specialising in 3D parts. This is where, thanks to combined SolidCAM and SolidWorks solution, good product ideas with high-quality become marketable in record time.

For design and manufacturing service providers SolidWorks and SolidCAM are a time-saving, money-saving and quality-improving dream team. The functionality and value for money of the 3D CAD system exceeds all other alternatives and the same applies to the fully integrated 3D CAM. NC programming for 2D/2.5D milling and drilling jobs up to complex NC programs for 5-axis machines is always successful and, thanks to the reliable simulation options, error-free. After modifications to the part a few clicks of the mouse bring the CAM up to date, due to its single window integration and full associativity to the design model. (All illustrations: SolidCAM/Hennecke)



How will service providers and contract manufacturers survive the competition? In principle, it's very easy. Contractors have to offer their customers something that their customers can't do by themselves due to a lack of machine capacity, staff resources, or in-house competence. Especially attractive are contract manufacturers that give their clients real added value. This succeeds best when you become a link in your customer's value chain, and at the same time "3D CAD and 3D CAM play a decisive role," explains Herman Barth, the founder and managing director of Barth Mechanik GmbH, located in Zimmern, Germany.

With nearly 15 years of experience as an independent development partner for complex prototypes and sample parts such as paper trays for printers and since 1994, assembly systems for power diodes of special machine tool manufacturers, he knows that "as a service provider you always have to keep up to date with technology." Customers include leading companies, such as the BDT, MRS, Metrax, Bosch, Marquardt, Flextronics and Venray. The clients are themselves in global competition – increasing the frequency of their new developments, while always striving for the shortest time to market – and thus creating the demand from their suppliers not only for rapid on-schedule order fulfillment, but also for the best quality at marketable prices.

Many CAD data translators

In order to meet these demands in the future, along with the move into a new modern building at the end of 2003, an investment was made in the current versions of SolidWorks and the fully integrated SolidCAM. Hermann Barth explains, "With this solution we have a completely closed process chain, with which all tasks can be done in-house from the initial draft of ideas to milling on our four Hermle universal milling machines. Furthermore, CAD data can be very reliably imported directly into SolidWorks from various third-party systems for further development." SolidWorks provides more than 15 CAD interfaces, including all major 3D and 2D CAD formats; namely, Parasolid, ACIS and STEP, VDAFS and IGES as well as DXF and DWG. Furthermore, SolidWorks can read CAD

Barth Mechanik GmbH

Founded in 1989 as a contract manufacturing business using conventional milling machines for prototypes and sample parts, the Barth company has been investing ceaselessly in NC milling technology since 1991. In 1994 the portfolio of services was expanded to include its own specialized machine manufacturing. Customers include leading companies, such as BDT, Bosch, Marquardt and MRS. The company moved to a new, modern and spacious building at the end of 2003. Prototyping and machine manufacturing play an equal role here, where SolidWorks and SolidCAM have become established as an indispensable link between customers, in-house designs and NC milling. (www.barth-mechanik.de).



"Everything from one source"

For every part to be manufactured there is a specific contact person at Barth who bears both final responsibility for NC programming and is also in charge of milling.

data created by mainstream systems such as Inventor, SolidEdge, Cadkey or high-end systems such as Pro/E or Unigraphics. Note that none of these CAD interfaces cost one cent extra. For CATIA, which is popular in larger companies, third-party solutions are available; with these interfaces CAD designs in CATIA V4 and CATIA V5 formats can also be imported and NC-programmed using SolidCAM.



Hermann Barth, managing director of Barth Mechanik GmbH, Zimmern, Germany says, "...3D CAD and 3D CAM play a decisive role."

protracted training courses. This benefit extends to SolidCAM equally.

Perfect CAD/CAM Integration

SolidCAM is completely integrated in SolidWorks! Only through this seamless integration does the full associativity exist between SolidCAM and the SolidWorks CAD geometry. This means that users can design and NC program directly on the same 3D model within the SolidWorks work environment. Competing CAM solutions use

In a world with an increasing division of labour, this far-reaching data compatibility between client and contractor is certainly not an advantage to be underestimated, but of course it only brings benefits if further processing of the data succeeds just as easily, reliably and economically. In respect to these benefits, SolidWorks and SolidCAM reap praise from the managing director as well as his sons, involved in the company since 2001. It's certainly not without reason that with over 300,000 licenses sold worldwide SolidWorks is one of the most successful 3D CAD systems for PCs. You can quickly achieve the desired result without



the same geometry kernel with Parasolid, however they lack the single-window integration and the true associativity with the original CAD model.

Best Value for Money

Hermann Barth states, "In my view, as an integrated 3D CAD/CAM solution SolidWorks and SolidCAM currently provide the best value for money available."

There's still more; for instance using eDrawings, SolidWorks users can put their designs on the Internet for appraisal by the client. The freely available eDrawings browser plug-in is the only tool that is required to view it. Moreover, Barth GmbH uses eDrawings to present their own capa-

bilities on the Net. Examples of their work are located at www.barth-mechanik.de/produkte.htm, where there is also a download link for the eDrawings viewer.

Rapid Growth at Gerdt GmbH

While at the Barth company 3D designs of prototypes, sample parts, fixtures and mechanical engineering components determine day-to-day business, the experiences of Gerdt GmbH in Villingendorf show that the team of SolidWorks and SolidCAM is also without question a dream-team increasing efficiency for demanding 3D milling with 5-axis machining centers.

The history of the company, which was founded in 1995, is even more remarkable, considering that Gerdt started out as a service provider for welded constructions which has very little to do with machining metal. At least that's what most people think.

Wilhelm Gerdt says, "Drilling and tapping threads are also done in steel construction. At first we outsourced these tasks, but



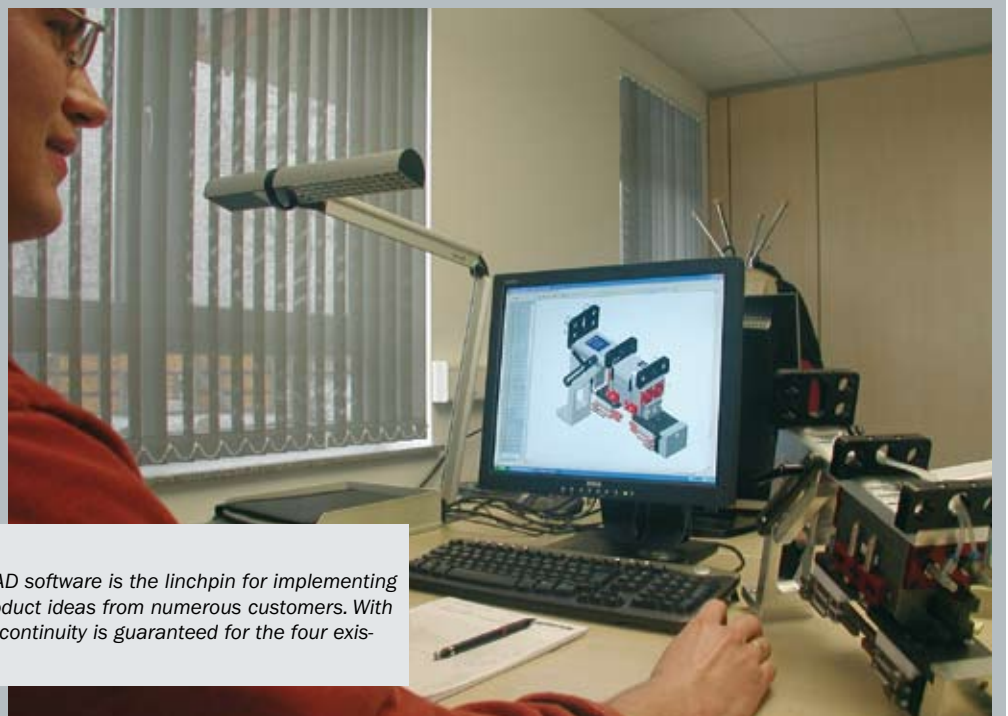
"Come what may"

The Gerdt company specialises in the complete manufacture of complex, high-precision parts. With a share of over 60% and a consumption of 2,000 kg per year, titanium is the preferred material. Pieces range from individual parts to series.

that didn't always work..." That's why this young businessman acquired a Fadal VMC 3016 in the same year the company was founded and in the following year invested in CADTOOL/NCTOOL for more efficient NC programming, and thus started the dramatic and speedy transformation of the company. Gerdt continues, "...Machine capa-

SolidWorks

SolidWorks Corporation, a company of Dassault Systems S.A. (Nass: TASTE, Bourse de Paris), develops and sells 3D CAD software solutions. SolidWorks was founded in 1993 with the mission of unleashing the power of 3D in product development. Since first releasing this product, SolidWorks has sold over 300,000 software licenses worldwide. The vendor of 3D CAD has offices around the globe and sells, distributes, and supports its products through a worldwide reseller network. The company is headquartered in Concord, Massachusetts (www.solidworks.com).



"The key to success"

At Barth the equally powerful and cost-efficient 3D CAD software is the linchpin for implementing our own machine designs and the great variety of product ideas from numerous customers. With SolidCAM fully integrated into SolidWorks processing continuity is guaranteed for the four existing Hermle machine centers.

city was soon reached with contract work." A Fadal VMC 4020 was thus added in 1997. "Because the requested parts were becoming more and more demanding geometrically", Gerdt upgraded to a 4-axis machine in 1998. Gerdt comments, "Re-clamping takes time and makes it difficult to maintain high manufacturing precision". To be able to take advantage of a 4-axis machine, efficient NC programming is needed.

Trend towards Free-form Surfaces

Just at this point in time SolidCAM, the successor to CADTOOL/NCTOOL for 3D programming, was released. Gerdt comments, "The change from 2.5D to 3D was a real improvement." Then in 1999 with Microstation Modeler, a professional 3D CAD system with SolidCAM as a plug-in was also available, it seemed that CAD/CAM had matured. Yet utilization and the demands of customers continued to increase with the existing capacities. Wilhelm Gerdt says, "For us there was a downright trend away from mechanical engineering parts to parts with freeform surfaces." The move into a new building consequently took place in April 2002 along with an investment in a C 800U from Hermle. However, NC programming again became a bottleneck. In addition, more and more clients were providing CAD data that could not be optimally processed using the existing CAD/CAM solution. However, the problem almost solved itself at the beginning of 2003. Wilhelm Gerdt explains, "After SolidCAM presented to us its then brand new system completely



integrated in SolidWorks, it was immediately apparent that this was the solution." As 5-axis NC programs can also be generated since SolidCAM2003, Gerdt's second insight followed, "If you want to be competitive, you have to be at the forefront of technology." In April, 2003 they invested in a Hermle C 40 U with swivel bridge, together with two integrated NC circular indexing tables. Wilhelm Gerdt professes, "The technology is demanding. If you want to profit from the advantages of complete processing, you have to look intensively into machines and programming. The use of SolidCAM was really helpful to us in this."

thus largely without risk. Gerdt relies completely on SolidCAM, when it comes to creating programs for the 5-axis Hermle machining center equipped with two tables. "If you are familiar with the system, everything is really easy to do. The post-processors deliver very good NC programs and through the simulation options we use SolidCAM to generate process-sure NC programs with very short runtimes." SolidCAM supports all milling strategies that you can expect from a modern CAM system, including rest-

Gerdt GmbH

Originally founded as a welding business in 1995, through good investments in milling machines the company developed at a rapid pace into a capable service provider for 3D CNC manufacturing and prototyping with a current focus on titanium work. Gerdt GmbH have been doing 4-axis CNC machining since 1998. After relocating to a new building in April 2002, an investment was made one year later in a Hermle C 40 U 5-axis milling machine for complete processing. Since 1998 Gerdt has relied on SolidCAM for NC programming and at the beginning of 2003, he switched to full SolidCAM integration with SolidWorks. Customers include leading companies from, among others, the medicine and military engineering fields. (www.gerdt-cnc.de).

Meanwhile, with the experience of approximately 1,200 NC programs designed in SolidWorks and generated by SolidCAM, Wilhelm Gerdt confirms that the integration of SolidWorks with SolidCAM "noticeably shortens the path from product idea to finished part."

Powerful G-Code Simulation

With SolidCAM we handle complete NC programming for all of our machining centers." Even the creation of complex NC programs, such as the casing for an aiming device Gerdt recently manufactured for Heckler&Koch or demanding surgical instruments with complex geometry, succeed "in record time and error-free thanks as well to the reliable simulation options" and is

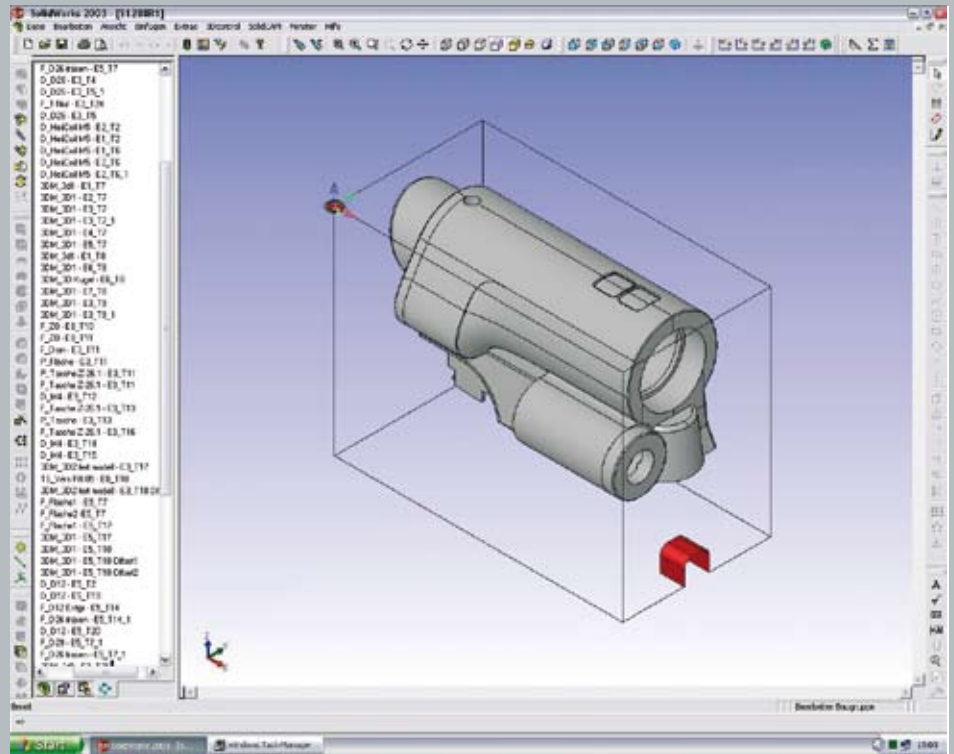


Wilhelm Gerdt, Villingendorf says, "... noticeably shortens the path from product idea to finished part"

machining. The simulation enables a complete visual overview of tool paths, tool and tool holder. SolidCAM post-processors are versatile and adaptable and generate optimized NC programs for all popular CNC controls. Another advantage with SolidCAM, is that users can create complete machining processes, store them systematically and link them in any way. In this way acquired know-how can be built up systematically,

“Powerful, yet easy-to-use”

For the rapid and low cost transformation of demanding designs into ready-to-install parts, the 6-man company relies on SolidWorks and SolidCAM as well as leading-edge machine tools such as a 5-axis Hermle C 40 U.



bundled, structured and reused as jobs require them.

Another great advantage of the complete integration of CAD and CAM is pointed out by Gerhard Lägeler, business manager of SolidCAM GmbH located in Schramberg, Germany, also present at the meeting on site, “With a few clicks of the mouse you can bring the CAM operations up to date

to the most current state of the design model a workpiece, when modifications have been made to the design.” It’s also important to note that SolidCAM can do more than milling. In addition to 2D and 3D milling and multi-sided milling up to five axes, users of SolidCAM can use turning with driven tools and wire-edm in 2 to 4 axes.



Gerhard Lägeler, business manager, SolidCAM GmbH, Schramberg says, “...SolidCAM supports also turning with driven tools and wire cutting ...”



It’s readily apparent why SolidCAM was the CAM system with the greatest growth in global revenues in 2003 and 2004, according to a study conducted by CIMdata. SolidCAM has now even implemented features such as simultaneous 5-axis milling and automatic feature recognition and machining.

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No matter whether simple 2D/2.5D Mill and Drill jobs need to be done or the most complex G-code for 5-axis machines needs to be generated – NC-programming is performed fast and, due to reliable simulation capabilities, error-free.



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SolidCAM

SolidCAM is involved exclusively in the development and use of CAD/CAM systems. The current product, SolidCAM 2006, bundles the experience of 21 years of focused, continuous development work. SolidCAM CAM modules are completely integrated into the SolidWorks CAD system and certified by SolidWorks as a Gold Product for CAM. Last, but not least, this successful integration allowed SolidCAM to become the fastest growing CAM vendor in the world based on revenue, according to an analysis conducted by the CIMdata market research institute in 2004 and 2005. SolidCAM is supported by a worldwide network in 40 different countries. A list of SolidCAM Distributors and resellers can be found at www.solidcam.com.

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