

Custom Fabricator Cuts Stainless to Perfection

Ulrich Planfiling Corp. (Lakewood, NY) is a custom fabricator of sheetmetal products that has developed its manufacturing and engineering capabilities producing its own proprietary product, the Ulrich Planfile vertical document

[Read more, P44](#)

At Ulrich Planfiling, Jamie Carlson (right), vp-manufacturing, and operator Bill Smith at the Mitsubishi laser that has propelled the custom fabricator into new made-to-order market opportunities.

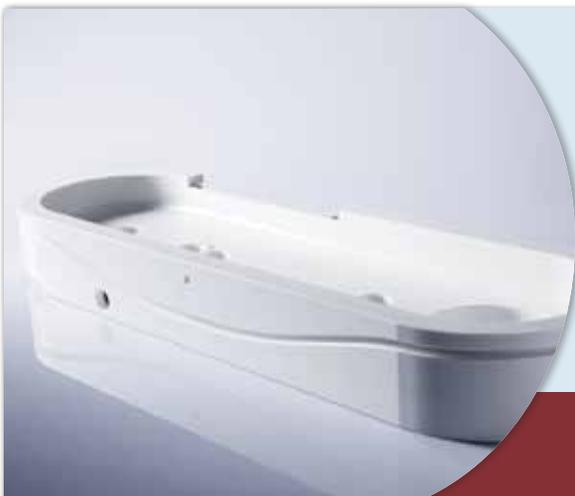


Milling Cutters are Perfect Fit for the Job

In keeping with the outsourcing concept, Werkzeug & Maschinenbau Heidelberg (WMH) likes to think of itself as a sturdy “extended workbench” that its customers can rely on its ability to process orders as quickly as possible.

[Read more, P48](#)

WMH in Wiesloch, Germany, specializes in the small-scale production of highly precise aluminum, steel, brass and plastic parts with demanding geometries using the full range of Horn milling cutters.



Tool Presetting Wins Diesel Engine Power

Italian engine manufacturer VM Motori relies on Zoller presetting machines to measure and set its precision cutting tools for machining its signature high-performance diesel engines which are renowned for their power.

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Reamers for machining diesel engines are measured with Zoller's “venturion 600” presetter at FCA/VM.



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filing system. Six years ago, Ulrich adopted Mitsubishi Laser cutting technology and a year ago updated to the latest precision laser cutting machine, a Mitsubishi 3015eX-45CF-R laser with 4500-W resonator from MC Machinery (Wood Dale, IL). Precision laser cutting, together with Ulrich's proven capabilities with punch press and press brake forming, welding, and powder coating processes, and a lean manufacturing philosophy have made it a go-to source for made-to-order products for the furniture, ultrasonic cleaning, and recycling industries, among others.



(Left to right) Jamie Carlson, President Dan Berry, and VP-Marketing and Sales Eric Livengood support Ulrich Planfiling's custom manufacturing capabilities and their made-to-order customers and products with full CAD/CAM engineering services.

Ulrich has been manufacturing the Planfile vertical document filing system in its current modern 44,000-ft² (3902-m²) facility since 1972. The Planfile itself was developed 100 years ago by Charles Ulrich as a compact and economical alternative to flat filing cabinets for large documents and blueprint storage. In 1915, Ulrich took his Planfiling system on the road in a van to promote its use in the fledgling auto industry, in electrification of the infrastructure, and in manufacturing and engineering, generally. In the intervening years, virtually every kind of document from blueprints for the Space Shuttle to Einstein's doodles have been safely stored in Planfiles throughout academic institutions, governmental agencies, and private industry.

The Planfile filing system and its siblings, the Minifile and CADfile, continue to be leaders in their field today with their quality measured in their suitability as furniture—free from scratches, defects, and other surface imperfections—as well as their functionality. The Planfiles are space savers, storing the same amount of documents in an area of 16 ft² (1.5 m²) with easy access at waist height compared with two stacks

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of flat file cabinets that take up almost 50 ft² (4.6 m²) unless stacked to reach an awkward-to-get-at height of 8' (2.4 m). Planfiles have standard locks, double steel wall construction and are designed to be fire, water, and dust-resistant.

They have wheels for mobility and are able to fit through any standard 32" (0.8-m) interior door.

"Manufacturing our own proprietary line of products has enabled us to use the latest sheetmetal processing technology to manufacture diverse and specialized sheetmetal products for customers in a number of industries," said Daniel H. Berry, president. "Our culture of lean manufacturing allows us to leverage the skills of our staff and the quick-change setup that the laser and our sophisticated back gages for our press brakes give us the ability to produce products in lots as small as one. We don't make anything to stock, even our Planfiles," said Berry.

Since 2001, Berry, along with his partners Eric Livengood, vice president of sales and marketing, and Jamie Carlson, vice president of manufacturing and engineering, have established Ulrich as a fabricating source for a variety of custom and standard products, some private label and others in partnership with companies that don't have the fabricating capacity to meet their own requirements. Typical of these applications are stainless steel tanks for ultrasonic cleaning systems, table frames for a manufacturer of wood-top tables, and a highly successful line of stainless steel recycling receptacles."

"The laser has given us the versatility to cut parts in small lots, ready to be fabricated on our state-of-the-art press brakes all with six-axis back gages and quick-change tooling," said Carlson. "Laser cutting makes it possible to cut letters on to the recycling receptacle lids to personalize them to the customer through simple programming. You would need a different punch tool for every letter processing them on a punch press. Laser cutting enables us to produce virtually any radius or profile and provides a clean-cut edge right off the table. Al-

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most no deburring is required." Typically, Ulrich is cutting 1/8" (3 mm) and thinner stainless steel, and cutting metal for the receptacle lids in five hours per production run due to faster travel speeds of the new Mitsubishi 3015eX-45CF-R, cutting that previously took eight hours.

Currently, Ulrich manufactures more than 150 versions of the receptacle lids in three languages as well as the matching bases for collecting anything that you want to recycle including food waste, battery, organics, paper, and plastics, among others.

"Our manufacturing for furniture-grade products is held to a high standard. It's all about finish and look and suitability for the application," said Livengood. "Stainless steel has to be handled carefully to avoid scratches or other blemishes for furniture used in libraries, universities, and other institutions. It's a part of our shop culture and employees are trained to leave the protective film on as long as possible during processing with the laser—even leaving notches on corners where welding is done. In some instances, the film isn't removed until the customers remove it themselves," said Livengood.

"Some of the stainless steel tanks that we manufacture for ultrasonic cleaning systems are the size of a small car, big enough for the welder to climb inside and do his welding and do it without making a single scratch on the inside of the tank," said Livengood. "Other tanks end up in ultrasonic cleaning systems that are used in labs for precision cleaning applications in the computer chip industry for silicon wafers for hard drives."

Ulrich has 38 full and part-time employees; 12 working in the front office and 26 on the shop floor: five welders doing MIG, TIG, and resistance welding; five pressroom operators, five in assembly, three in grinding/finishing, three

in powder coating, and five supporting several operations. In addition to the Mitsubishi laser, Ulrich's equipment includes a 95-ton Trumpf TruBend 5085 press brake with six-axis back gage with quick-change tooling and extra stroke, a 230-ton



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Cincinnati Autobend hydraulic press brake with six-axis back gage with quick-change holders and extra stroke, and a CNC punch press, among other processes like grinding, deburring, MIG and TIG welding, pretreatment and powder coating.

"We consider our full CAD/CAM engineering service capability to be an important support function. We work with our customers to develop products that may only be built once, currently don't exist and will serve new markets, as well as

established products that can be built and delivered in a timely fashion and with a high level of furniture-grade quality," said Eric Livengood, vice president-sales and marketing. ➤

For more information from Ulrich Planfiling, go to www.ulrichplanfiling.com; for more information from MC Machinery Systems, go to www.mcmachinery.com, or phone 630-616-5920.

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Milling Cutters are Perfect Fit for the Job

In keeping with the outsourcing concept, Werkzeug & Maschinenbau Heidelberg (WMH) likes to think of itself as a sturdy "extended workbench" that its customers can rely on. Its strengths lie in processing orders as quickly as possible and ensuring on-time delivery and high quality. Universality and flexibility are major factors, which explains why the company is also geared towards universal machines and tools. In tool specialist Paul Horn GmbH (Tübingen, Germany; Franklin, TN), WMH has found a partner that provides its full range of milling tools.

WMH in Wiesloch (Baden-Wuerttemberg, Germany) is still a relatively young company. Founded in 2009, it has two very experienced heads at the helm in Volker Maempel, managing director, and his son Ralph. WMH specializes in milling all common materials in three or five axes up to a maximum cube size of 900 x 630 x 600 mm. The

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materials include aluminum (soft to high-strength), all grades of steel (including stainless), copper and bronze alloys, and a multitude of technical plastics (including the filled and fiber-reinforced varieties). The installed machinery consists of universal milling machines from Hermle and Mikron.

Its customers from the medical technology, chemical engineering, automotive, optics, astronautics and defense industries value WMH for its high standards of quality. It does everything from the production of casings with deep cavities and undercuts, guides, drive components, and welded assemblies right through to finite surface treatment. Every year, its list of orders is packed with between 500 and 800 different parts, with some manufactured as individual parts, others in small batches of up to 100, and others as prototypes.

The drawings typically arrive in .dxf file format, which are then used to generate the programs for its machines. The level



At WHM, Horn's DSFA triple-edged solid-carbide high-feed milling cutter features uneven helix angle for easy cutting, internal cooling, and NE2K coating for machining aluminum.

of precision required is often extraordinarily high, as are the geometry and surface requirements.



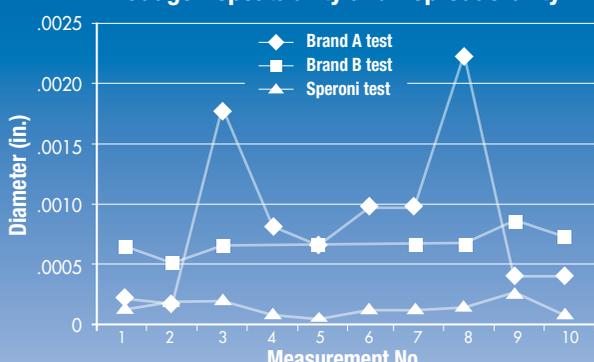
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5	0.0065	0.0065	0.0010
6	0.0100	0.0065	0.0015
7	0.0100	0.0065	0.0015
8	0.0225	0.0065	0.0015
9	0.0045	0.0085	0.0025
10	0.0045	0.0075	0.0010



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High feed rate milling cutters take center stage at WMH where 90% of the milling cutters in WMH's tool magazine bear the Horn brand name. This means that 60 different items representing the entire breadth of Horn's milling cutter range are immediately accessible there all the time. To date, WMH has been able to handle all its machining tasks using standard tools. The only one requiring special tools is a defense technology order that was recently placed with the company.

In the eyes of master precision engineer, Ralph Maempel, Horn tools offer major advantages including, for instance, its milling cutters with an uneven tooth pitch and various helix angles. These reduce vibrations, enable easy cutting and are equally suitable for rough machining and finishing alike. By way of an example, Maempel said type DSFA milling cutter, which features internal cooling and helix angles of between 36 and 40°, supports truly impressive feed rates, is center cutting, and has a balance quality grade of G2.5. It offers superb dimensional accuracy and, when used for pocket milling in series production, the last pocket is just as good as the first. Further

benefits include: sharp cutting edges, positive easy cutting and high-quality cut edges with virtually no burr formation.

Other products that really stand out inside the magazine are the DAHM and DAH high feed rate milling cutters with indexable inserts. In the case of steel, these support a feed rate of up to 2 mm per tooth and an infeed of 0.7 mm, depending on the application concerned. Alternatively, there is the type M409 milling cutter featuring tangential indexable inserts. Not only is this equally well suited to aluminum and tool steel, but it can also be used with high-strength materials such as Inconel or Hastelloy, making it a true high-performance tool. Other milling cutters in use at WMH include the circular milling cutter types 328, 332 and 311, thread milling cutters in screw-on (type 311 or 328) or DC mono block versions, the DG modular milling cutter system, type M310 side milling cutters, type M101 slotting cutters, solid-carbide end mills from the DP range, and also the complete DSA solid-carbide end mill range for aluminum, copper, and plastics.

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Ralph Maempel said: “After 15 years, I know what Horn tools can do and I also value our Horn technical consultant, Thomas Massinger, as a highly competent partner. When it comes to meeting my requirements, Horn milling tools fit the bill perfectly, particularly now that the milling range has been expanded. My jobs have very short lead times. Day-to-day production work is dominated by deadline pressures and stringent quality standards. Therefore, I have to be able to respond quickly,” said Ralph Maempel.

“Horn helps me with this in lots of ways. When a new inquiry comes in, I can use the online shop to put together the costs of the cutting tools for my quote in next to no time. If I get the job and order the tools by 5:30 pm, I can set to work the very next morning. Horn milling cutters offer high performance and reliability, are suitable for universal use, and are very flexible. I am familiar with all the competitors in the tools market and, although I have heard lots of promises made, the only tools that have so far managed to deliver what others could only promise are those from

Horn. In fact, in most cases, the Horn tools far exceeded these claims.”

“I have exactly the same problem as many of my colleagues who are involved in the extended workbench outsourcing system,” said Maempel. “Faced with an abundance of different parts—often involving individual parts with all kinds of different geometries and materials, I am forced to work with standardized clamping devices, usually a vise. When working on thin-walled parts that have to have large volumes of metal removed or have a small clamping surface, what I need are smooth-running, easy cutting tools that are still able to achieve high chip volumes. I need tools that will travel along their paths with a steady and cushioned cutting motion to prevent the workpiece from being deformed or forced out of the clamp, but that are still capable of achieving top-notch surface quality with a high degree of precision.”

Maempel said: “I cannot invest umpteen thousand euros in specialist tools that have been optimized for specific materials or cutting operations. I want an aluminum milling cutter that is just as good at cutting copper, bronze or most plastics as it is at cutting aluminum itself. I need milling cutters that can tackle most steel grades equally well. For me, it’s not about shaving off a few seconds. That would be important in the case of large-scale production, but what I need are directly accessible universal tools. That is what Horn—and nobody else—delivers. I find the cutting data tables in the catalog immensely helpful for my various machining tasks. I know I can count on them for absolute peace of mind. And if you want evidence of how Thomas Massinger has provided me with great advice that is in my very best interest, this recent example illustrates it perfectly: I needed to produce two parts, but the special tools required to create the specific geometry were going to cost me 600 euros. Thomas Massinger recommended that I could have this geometry created with eroding technology at a cost of 200 euros, meaning that he lost out on a sale.” ➔

For more information from Horn USA Inc., go to www.hornusa.com, or phone 615-771-4100.

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Tool Presetting Wins Diesel Engine Power

Italian engine manufacturer VM Motori relies on Zoller presetting machines to measure and set its precision cutting tools for machining its signature diesel engines. Motori’s

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high-performance diesel engines are renowned for their power, flexibility, and low maintenance. Since 1947, the engines have been produced in Cento, Italy. Today, VM Motori belongs to the Fiat Chrysler Group (FCA/VM) and is one of the most advanced manufacturers in the diesel engine segment and also one of the few companies that specializes exclusively in manufacturing diesel engines.

Its current product mix includes its most well-known engine, the 3.0 liter, six cylinder diesel engine with 275 hp and 600 N•m for the Maserati Ghibili III, which was introduced to the market in August 2013. With a workforce of 1350 employees, VM Motori produces 130,000 engines a year, primarily for the US market. Though the company focuses on passenger car engines, it also produces diesel engines for industrial and marine applications.

The production facility at the Cento location is organized according to lean management principles. There, crankshafts and engine blocks are produced primarily using large, heavy crankshaft cutters and reamers for high-precision components as well as milling cutters developed especially for FCA/VM. These special tools require very particular qualified measurement technology and, accordingly, place high demands on the mechanics and the software of the measuring devices.

More than 10 years ago, the company began relying on Zoller products to efficiently set and measure its machine tools. The FCA/VM machine toolroom is equipped with two Zoller “venturion 600” machines as



Zoller’s “gemini” automatic presetter and measuring machine is designed to handle and machine heavy crankshafts at FCA/VM for diesel engines.

well as one “gemini” unit. The “venturion 600” vertical presetter features autofocus for automatic user-independent focussing of tool cutting edges and fully automatic measuring of multi-insert cutting tools. The Zoller “ace” spindle toolpost for steep tapers, hollow shaft tapers, CAPTO and Kennametal KM holders can be changed via one ball bushing with guaranteed changeover precision of 0.001 mm. The “gemini” is presetter and measuring machine for automatically presetting, measuring, and checking crankshafts.

“The experience with our first Zoller presetter has been very positive. So far it has been running smoothly, 24 hours a day,” said Alberto Verri, head of the toolroom used for the engine block and crankshaft production line at FCA/VM. Strong growth required the company to expand its presetting and measurement technology. The fact that Zoller had branch offices worldwide, including one located near the company in Italy, was an important consideration.

“To measure the crankshaft cutter, we were looking for an easy-to-use machine specifically for this type of machine tool,” said Verri. “An important requirement was

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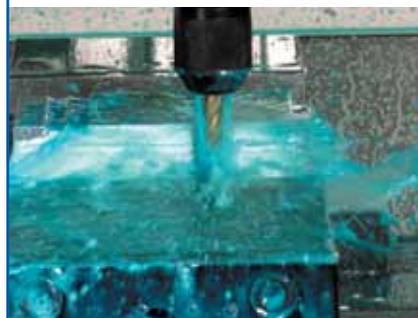
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and is that the measuring procedure be able to be performed reliably and quickly." The special and extremely ergonomic mechanics of the "gemini" are designed to handle these heavy tools simply and conveniently. They are easy to load from the front and come with an enclosed protective housing to keep the operator as safe as possible during operation.

At FCA/VM, the "gemini" is particularly important for the pre-owned crankshaft cutters and those newly equipped with cutting blades. "It enables us to manage the precision of our machine tools throughout their entire service life," said Stefano Mestieri, machine operator. "In the past, cutting blades were not always correctly installed. Not until now have we been able to reliably correct errors and thereby ensure that the machines are equipped with crankshaft cutters correctly measured and preset. It is also very fast, measuring 100 cuts per minute."

FCA/VM uses the "venturion 600" for the highly productive, yet difficult-to-set reamers that are frequently used in the automotive industry. In addition, all other tools for the production line individually produced for FCA/VM are preset and measured on both "venturion 600" measuring machines. Circular runout and runout are also checked. To ensure future machine tool performances, the "lasso" measurement program checks the exterior contours because the machine tools are delivered without a test report. The measurements are performed operator-independent and without contact, so that there is automatic compensation for potential axial eccentricity.

"The Balluff industrial RFID ensures that all relevant tool data are accurately transmitted to the machines. The data are written directly and without contact to the toolholder and immediately stored on the data medium, thus ruling out data entry errors," said Filippo Perletti from Multicontol, Zoller's branch office in Italy. "It is now a more integrated and reliable process. The machines are set, measured and the data transmitted via the Balluff RFID to the control systems for 30 machines," said Verri. The result is the complete integration of the Zoller measuring and presetting machines into the production process on the engine block and crankshaft production line.

Due to its strong performance, reliable processes, and working with partners like Zoller, FCA/VM has for years successfully maintained its preeminent pole position among diesel engine manufacturers in Europe, both in the toolroom as well as in the production process, but most importantly, on the highway in the engine class up 275 hp. ➔

For more information from Zoller Inc., go to www.zoller-usa.com or phone 734-332-4851.



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