HORIZONS

The Feintool U.S. Operations Magazine

2019 Issue

"Feinclutch" New Integrated Clutch Plate Production System

Operational Excellence: Industry 4.0 and Lean Management

40 Years in Cincinnati, Our Hometown

FEINTOOL

EXPANDING HORIZONS

The automotive industry is undergoing significant changes. It may be the most drastic shift since evolving from the horse and buggy to the combustion engine-driven automobile over 100 years ago. There is no denying that the new mobility created by electrified drivetrains and the trend to autonomous driving bring challenges and opportunities to everyone in this fast-paced industry sector.

Companies are not born as market leaders; technology, persistence, people and hard work create them. At Feintool U.S. Operations, we are working hard every day to maintain our position as the market leader, while being a strong partner to our customers. Thanks to our customers, we are celebrating 40 years in Cincinnati, Ohio, and 20 years in Nashville, Tennessee.

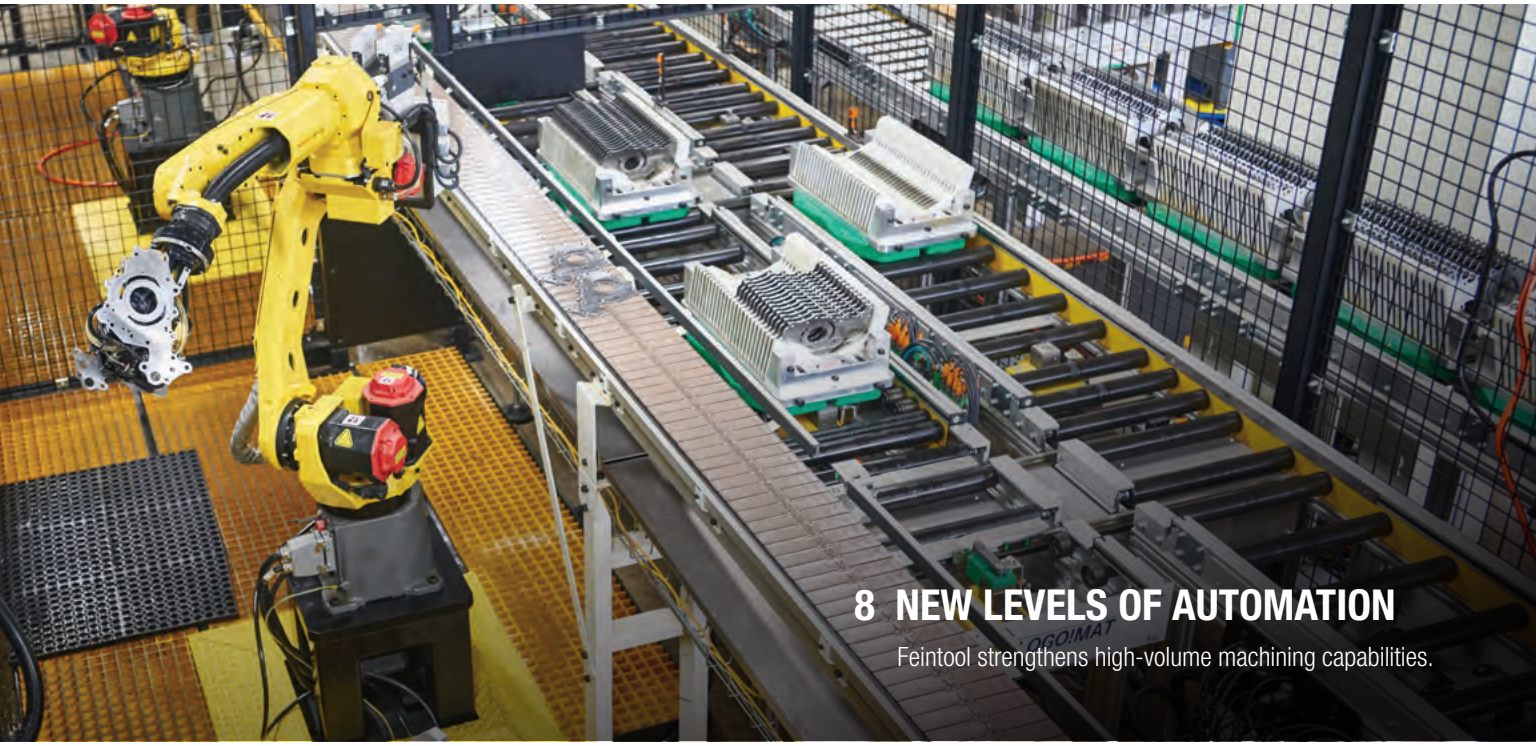
In this issue of *Horizons,* Feintool U.S. Operations' customer magazine, we invite you to join us on our journey to learn more about our latest innovation, "Feinclutch": an integrated production system for clutch plates that delivers the quality of fineblanking at the speed and cost of a conventional process.

We will also explore how Feintool has invested in automated, flexible 4-axis machining cells and the latest high-precision double-disc grinding equipment to meet our customers' desire for "ready-to-assemble" components.

The automotive market is changing, and we are ready to face the current and future challenges together with you, our North American customers. We are a partnership; and working together, we can overcome any challenge and seize every opportunity. Because nothing is stronger than the power of us.

Best regards,

Christoph Trachsler
CEO, Feintool U.S. Operations



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FEINTOOL EARNS GM SUPPLIER QUALITY EXCELLENCE AWARD FOR THREE CONSECUTIVE YEARS

Feintool U.S. Operations has been awarded the General Motors (GM) Supplier Quality Excellence Award for three consecutive years. GM recognized Feintool with this award for its unmatched commitment to quality and for achieving zero parts per million defects.

Feintool makes fineblanked and forming parts for GM, including automatic transmission parts, where safety and reliability are paramount.

"It is an honor to be recognized by GM for the highest levels of quality performance," said Christoph Trachsler, CEO, Feintool U.S. Operations. "This award reflects the commitment to quality that our employees foster every day."

"Often in manufacturing as production rates increase, quality decreases; but that's unacceptable when manufacturing automotive components that have a direct impact on safety and reliability," said Dan Swiger, Vice President, General Manager, Feintool Tennessee, Inc. "We're proud to be a valued GM supplier, because we share GM's unwavering commitment to excellence."

GM's Supplier Quality Excellence Award recognizes those suppliers that meet or exceed a very stringent set of quality performance criteria, including producing parts and components without defects. While GM has thousands of suppliers, only a few earn this prestigious quality award.

FOX BUSINESS'S *INSIDE THE BLUEPRINT*

Feintool was featured on Fox Business's *Inside the Blueprint* in March. The segment – which was on the larger subject of manufacturing, automation and competitiveness – included both Makino, a premier machine tool manufacturer, and Feintool, which has integrated Makino machining cells into a larger integrated manufacturing process. "Automation provides a continuous flow of parts, which allows Feintool to make a low-cost product in a high-cost country. Our automation speeds up our efficiency, so products can be manufactured and jobs can be kept here," said Lars Reich, EVP Sales and Marketing, Feintool U.S. Operations.

FEINTOOL EARNS AISIN SUPPLIER AWARD

Tim Runyan, VP Quality, Feintool U.S. Operations, receives the AISIN Supplier Award.

AISIN Group has awarded its prestigious Supplier Award to Feintool U.S. Operations, in recognition of quality and delivery performance. In 2018, Feintool had zero parts per million defects, outstanding quality and 100% delivery performance. "Feintool is proud to be a valued partner of AISIN Group and is honored to receive this award, having met or exceeded the most stringent quality requirements," said Christoph Trachsler, CEO, Feintool U.S. Operations.

OPERATIONAL EXCELLENCE – OPEX

by Yannick Schilly, *President and CEO, Altix Consulting Inc.*

IS LEAN MANAGEMENT STILL RELEVANT IN THE FACTORY OF THE FUTURE AND INDUSTRY 4.0 ENVIRONMENT?

We live in an incredible and fascinating time! Never before in the history of mankind has the pace of innovation and technological acceleration been faster than today. We are in the midst of the fourth industrial revolution, or industry 4.0. Digitalization and the connectivity of things will profoundly change industry and create completely new dimensions, solutions and opportunities. Robotics and automated systems are becoming intelligent; machine learning and artificial intelligence are no longer nice science fiction ideas or academic concept papers, but the new reality in a fast-paced global manufacturing and supply chain industrial world. Today new factories are being built with the latest of these technologies – not only in advanced economies, but also in emerging industrial countries – for mass production environments. The best example is China.

It took humans thousands of years to go from an agriculture-driven society to an industrial, technical and scientific society. In just 300 years, our world's population grew from less than 700 million people to 7 billion; that is a 10X development that was supported by technology and innovation. Mass production had to be invented in order to support that development during the second industrial revolution. About 100 years ago, Ford and Taylor, together with the first management consulting firms, invented the principles of scientific management and industrial engineering. In just a little over 100 years, our world went from thousands of factories to millions. Competition became global, and the survival of the fittest concept became a metaphor and a new paradigm shift for the corporate world. In 1982, Peters and Waterman published their best-selling book *In Search of Excellence.* An updated edition today would have to be called ***Forced to Excellence.***

Why so? Corporate fitness is no longer a nice-to-have, but a **must-have.** Like athletes and champions, weak companies can't win in a global permanent ultracompetitive environment; only the strongest will be prepared

for changes of the political, economic, technological and social fast-paced evolution. The health level of the organization is measured not only in terms of financial strengths, but also in terms of process maturity, innovation capacity, sales and operational performance, customer orientation, market leadership and brand recognition, people culture and change, and evolution ability. Over the past 100 years, all management tools and methods were designed to reduce costs (sales costs, design costs, production costs, etc.) and time (lead time, delivery times and cycle times), while increasing quality, reliability and product features – quality management systems, production systems, research and development (R&D) architectures and systems, information technology (IT) systems, Lean Management and Six Sigma, to name just a few. Those trends will not stop; they will continue to challenge companies, requiring them to permanently innovate and disrupt not only their competition, but also themselves. The bar continues to be raised!

The factory is becoming digital, automated and smart, partially gaining increased autonomy through massive computing power, machine learning and artificial intelligence. Technology will be a terrific enabler to increase productivity in our manufacturing and supply chain processes and can't be ignored. If your technology and smart factory roadmap are not yet established, please start; it's in your own best interest.

Which role do traditional methods and philosophies like Lean Management or Lean Six Sigma play in the factory of the future?

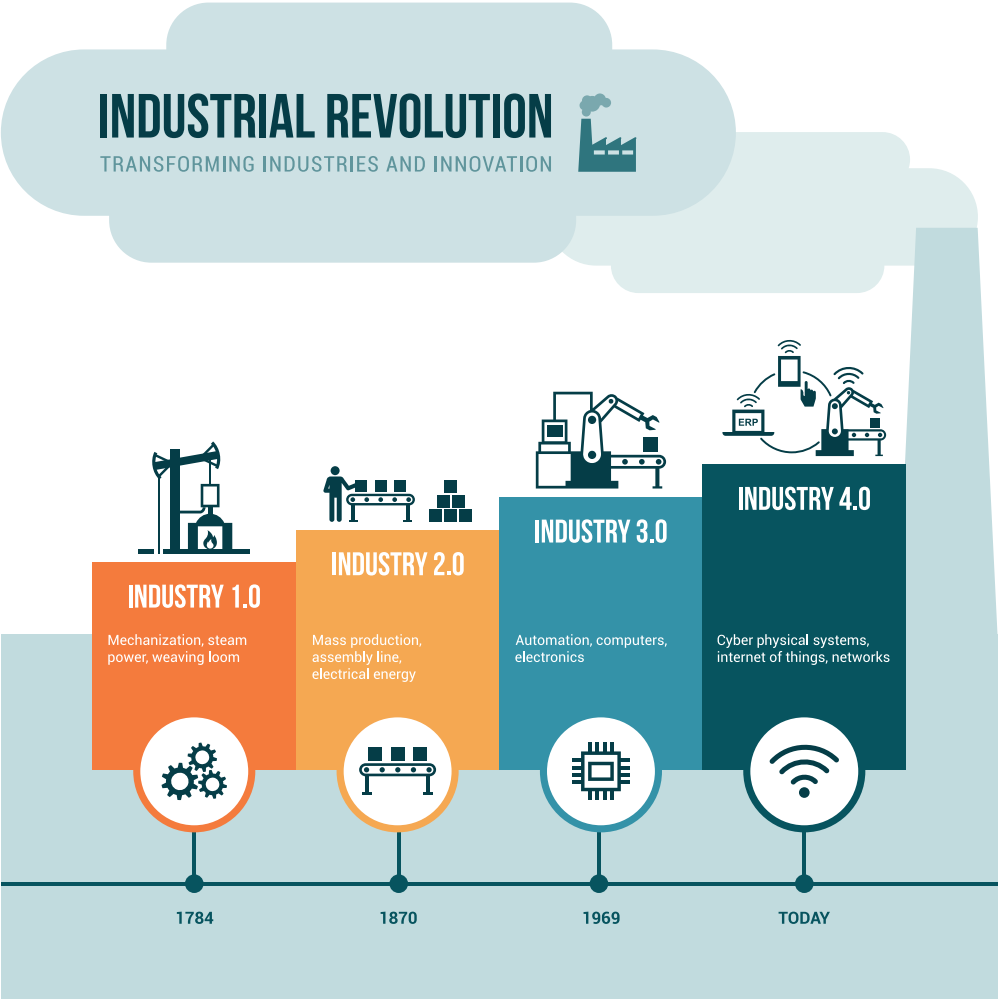
While evolving to Lean 4.0 principles and methods, they will play an even more critical and essential role, as they build the foundations for operational and business excellence. The workforce 4.0 needs to be educated and trained, but also prepared to adopt a lifelong learning and continuous education mind-set; training and education academies or in-house training departments will support that. But beyond preparation, every employee needs to actively participate in corporate performance programs. As a matter of fact, they will enjoy doing that and will get actively involved, as long as the culture and environment are right.

Operational excellence and business excellence ambitions don't drive up costs, as I sometimes observe executives fearing; they drastically reduce costs, through permanent elimination of waste and by driving continuous improvement. Once you have the best machines and the best manufacturing equipment, you want them to run at 100% efficiency, like a Formula 1® racecar. But this requires that the entire system around them performs at 100% as well; the supply chain provides components on time and in full; maintenance ensures machine availability through perfect monitoring and preventive interventions; people are trained, skilled and reliable and; processes and methods are optimized and reflect high maturity levels.

Best-in-class industrial manufacturers and companies are able to generate return on sales in impressive >20% ranges. Excellent companies are between 10 and 20%, depending on the year, but averaging 15%. Wherever you are today, aim for more, but through balanced and smart management objectives and initiatives – no short-term actionism. Only healthy future-oriented and long-term fitness programs will sustain. Financial strengths will help invest in the future including modern and smart buildings, innovations and R&D, news technologies, best in class employee training, and M&A.

"Operational excellence and business excellence ambitions don't drive up costs, as I sometimes observe executives fearing; they drastically reduce costs, through permanent elimination of waste and by driving continuous improvement."

A great sports coach pushes champions to leave their comfort zone, exposing weaknesses, thus showing the way to fast and sustainable improvements. Qualified third parties can play a critical role in accelerating process and system design and implementation, offering and sharing best practices from best-in-class companies. The best example is my very own experience in 2010, when I started my mission in China for a global German industry champion in the factory automation sector. My company sent me to China to integrate a newly acquired company, with the goal to accelerate the development of the Greater China supply chain and operation footprint, as China was a strategic focus market for future growth. The acquired company was in a very different league and maturity level. Besides new buildings, enterprise resource planning (ERP) implementation, new technology implementation, and product and production transfers, we had to completely transform the company culture, management principles, and performance and management systems. Besides the width and depth of my project roadmap, we decided to implement Lean Management as a philosophy, along with all of the related tools and methods to ensure a sustainable continuous improvement culture. Tackling this alone, relying solely on internal resources, would have been overwhelming, as it required sustained involvement and commitment to training, coaching and education. We had 1,000 employees in the factory, and Lean is really about involving everyone in the company to drive continuous improvement every single day. My boss at that time recommended a coach and Lean expert with an impressive 30-year track record in successfully turning around poorly performing operations, supply chains and suppliers. The project turned out to be a great success; the Lean expert, Liam C., knew exactly how to push and challenge me and my team; and we were open to learning and embracing his coaching, as we understood that it would equip us professionally for all future challenges. The team embraced it as we took the time to develop a solid narrative and storyline. (People want and need to understand the journey and where the organization is headed.) The project was so successful that the plant is still delivering double-digit annual productivity increases, averaging 15% nearly a



decade later. (Just do the math for your operation and estimate what this could mean for your company, in terms of competitiveness.) Our people embraced the Lean culture, and the pride in their eyes was evident when they reported improvements to the executive team. Making each and every person in the company part of the journey and part of the competition will make a huge difference, while a modern production system will help to structure and organize the activities. We transformed a poorly performing company into one of the best performing plants in the entire supply chain network.

In conclusion, outpacing competition is not impossible, but becomes more challenging by the day. Do not wait to embrace new technologies. Be smart and purposeful, and embrace holistic approaches and industrial systems architectures. Invest in employee training and continuous education; drive your operation and business through business excellence programs. **BE OBSESSED ABOUT IT, BECAUSE THE WINNER TAKES ALL!**

The team performing at a combined 90% performance level will beat the competitor performing at 85% combined performance level. Nowadays the next competitor might not yet be known, but may outpace all others in a matter of a few years (e.g., Amazon). Do not take that risk for your business. Be that champion and disruptor yourself, and aim for 100% or a Six Sigma level at all times!

Like in sports, train to compete and to win – like a champion. As an organization, don't be afraid to leave the comfort zone. It needs to hurt a little, in order to progress! Many Lean implementations fail. While there are multiple reasons why, leadership commitment and long-term commitment are critical to its success. Finding the right partners with the right experience is essential. Investing in Lean Management is a substantial investment into the future, preparing for long-term health, wealth and organizational fitness.

BEST OF LUCK WITH YOUR BUSINESS TRANSFORMATION!

ABOUT THE AUTHOR

Yannick Schilly is a senior strategic advisor, senior consultant, industrial engineer and senior management executive with more than 25 years' experience developing and executing complex global expansion strategies throughout Germany, China and the U.S.

Yannick's unique expertise includes all aspects of global and international business, market entry, industrial best practices and excellence in advanced manufacturing, industrial engineering, logistics and multinational supply chain management. During his successful career as Chief Operating Officer for a leading German-based international industrial technology company, Yannick established and managed regional production and logistic centers in China and North America.

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FEINTOOL STRENGTHENS HIGH-VOLUME MACHINING CAPABILITIES WITH INVESTMENT IN CINCINNATI FACILITY

Spend any amount of time in automotive manufacturing, and you'll see an increased interest in original equipment manufacturers (OEMs) wanting quality, lightweight, ready-to-assemble components. These components replace heavy cast and forged parts, making vehicles easier to assemble, while reducing total manufacturing costs.

The demand for these components is so high that in 2018, Feintool invested $8 million to expand its line of fully automated, flexible manufacturing cells at its Cincinnati facility.

The new manufacturing cells enable Feintool to machine highly precise features for transmission, engine, seating and other vehicle applications that can't be added during the conventional fineblanking and forming processes. For example, countersinks that are too close to the outside geometry of a component can be manufactured cost-effectively by fineblanking a through hole and then countersinking the hole on a high-speed vertical mill.

"Feintool now has a flexible manufacturing system with the highest output at the lowest cost possible," said Lars Reich, EVP Sales and Marketing, Feintool U.S. Operations. "With these new capabilities, we can now produce a complete part that's ready to be delivered to the customer with no additional processing."

"Feintool now has a flexible manufacturing system with the highest output at the lowest cost possible."

ADDING MULTIPLE MACHINES

Feintool's multimillion-dollar investment includes four Makino L2 4-axis vertical machining centers (VMCs) and two 6-axis Fanuc M-10iA robotic material handling systems, as well as double-disc grinding machines – ideal for variable-valve timing parts – to achieve the tightest thickness/parallelism tolerances possible (0.02 mm).

The company's expansion also included the construction of new shop areas and remodeling existing floor space to add offices for production control and logistics.

Feintool is using these new capabilities to produce components for automotive pumps, including parts for variable-valve timing systems used in engine oil pumps on vehicles with fuel-saving start/stop technology.

FAST AND PRECISE

Feintool produces two pump components on a fineblanking press. Next the Fanuc robots load the workpieces into the VMCs using rubber grippers that identify, pick up and place the parts in standardized fixtures. The VMCs chamfer, groove, center bore and countersink holes to the customer's specific requirements for part flatness, within a tolerance range of 15 to 30 microns.

"As precise as our fineblanking and forming processes are, these next steps in the new manufacturing cell add features that we can't do conventionally to deliver ready-to-assemble parts," added Reich.

At the same time, codes to identify the VMC and fixture position are cut into each component, as part of Feintool's quality control processes.

While the VMCs run two parts at a time, the robots load two more parts into fixtures outside the machines. The VMCs and robots are combined in two cells that can operate together or independently, to provide not only high volume, but also flexibility and redundancy.

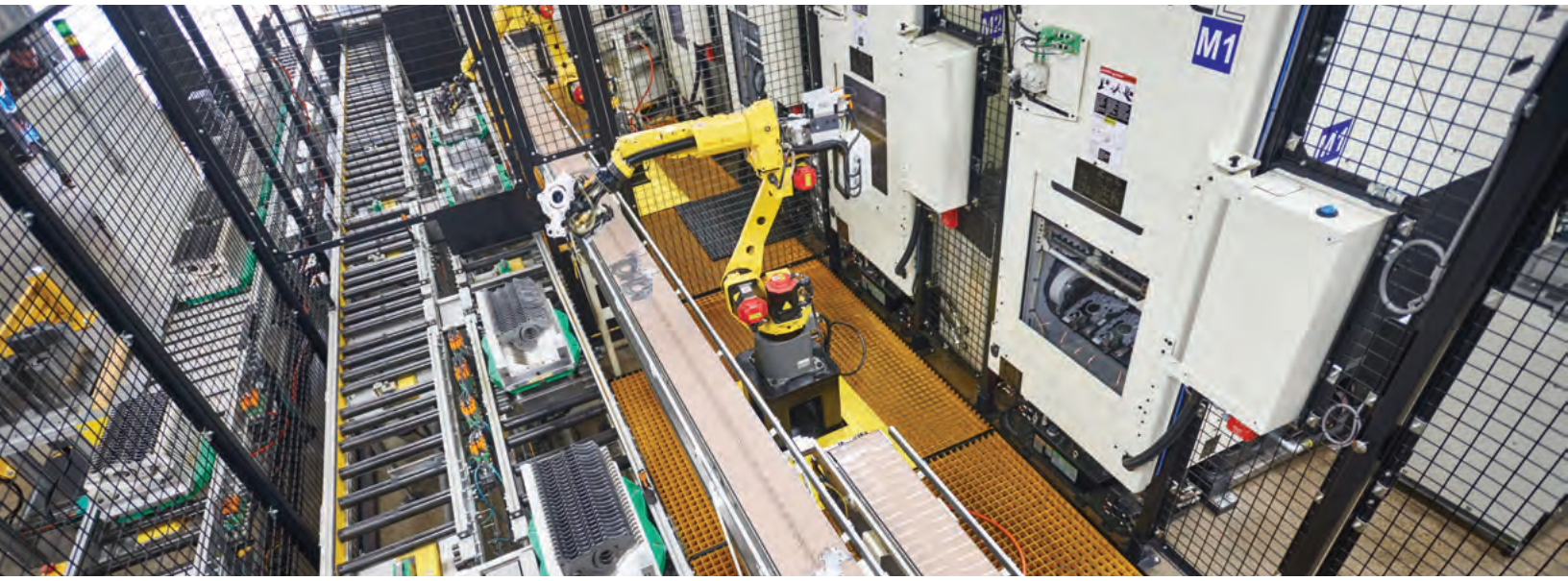
After machining, the parts are washed, inspected and heat-treated, before being shipped to customers.

A LONGTIME USER OF MAKINO VMCS

Feintool is no stranger to Makino VMCs; the company was already running PS95, F5 and V33i machines. Feintool added the L2s for their precision, acceleration and cutting speed, which dramatically minimizes part cycle time. L2s can easily be integrated into flexible automation systems and deliver a standard 30-tool magazine, to ensure a wide variety of tools for any part configuration.

The VMCs include a built-in pallet changer for fast, efficient part exchange, which maximizes machine utilization and minimizes part floor-to-floor times. A standard A-axis rotary table also makes it possible to machine features not typically accessible on a traditional VMC.

The automotive manufacturing industry doesn't stand still, and neither does Feintool. In addition to



4-axis automated machining cells

CNC machined part features

Cincinnati, Switzerland and China facilities are also adding vertically integrated operations.

Feintool is a technology-driven company; with capital investments of over $130 million in North America since 2009, including machines, tool room, measuring equipment and quality control upgrades, it offers the most advanced fineblanking and forming capabilities and the most modern machine fleet of any supplier on the continent. Vertically integrated and automated secondary operations, including computer numerical control (CNC) machining and double-disc grinding, ensure the highest-quality parts and best value for customers. With the purchase and integration of Jessen GmbH for electric motor lamination, Feintool offers a full spectrum of parts production capabilities for internal combustion engine, hybrid and electric vehicles.

As an innovation driver, Feintool will continue to invest in those capabilities and technologies that help it meet its customers' evolving needs and changing market demands.

The company is truly ready for the future.

Let's make 1-in-a-million like the other 999,999.

Integral tooth plate
seat reclining mechanism

Together, we can. From our line to yours, Feintool delivers precise, repeatable parts, through the world's most advanced vertically integrated processes. Featuring fineblanking, forming, machining, double-disc grinding, deburr-and-wash and more. We're more than parts. We're a partnership. **Because nothing is stronger than the power of us.**

FEINTOOL

EXPANDING HORIZONS

feintool.us/power

Various clutch plate products by Feintool

"FEINCLUTCH" INTRODUCES

NEW INTEGRATED CLUTCH PLATE PRODUCTION SYSTEM

THE QUALITY OF FINEBLANKING AT THE SPEED AND COST OF A CONVENTIONAL PROCESS.

by Lars Reich, *EVP Sales and Marketing, Feintool U.S. Operations*

FEINCLUTCH DELIVERS THE QUALITY OF FINEBLANKING AT THE SPEED AND COST OF A CONVENTIONAL PROCESS.

In the highly competitive automotive manufacturing industry, fractions of a second can mean the difference between winning and losing a lucrative multiyear contract. Feintool maintains its competitive edge by continuously refining its manufacturing processes, to be as efficient and cost-effective as possible.

Some original equipment manufacturers (OEMs) and Tier 1 suppliers still believe fineblanking is expensive and slow, compared to traditional blanking processes. To meet automotive manufacturers' growing need for lightweight and ready-to-install drivetrain components, Feintool has developed "FeinClutch," a high-speed fineblanking system that's a real game-changer for the production of clutch/separator plates.

FeinClutch enables the company to manufacture clutch plates at the speed of a conventional process, but with the quality of a fineblanking part. Using the new production system, Feintool can produce high-precision clutch plates at a speed of 40 to 60 strokes, or up to 120 parts per minute, which is almost double the previous production rate. FeinClutch generates significant savings on the individual component cost, compared to a regular fineblanking process, due to the increased output.

FINEBLANKING OFFERS A MORE REPEATABLE AND ROBUST PROCESS

Fineblanking produces higher-quality parts, compared to conventional stamping; the fineblanking process is a hybrid way to form metal by combining stamping and cold extrusion technologies. Fineblanked parts are manufactured using three forces instead of one, as in a conventional stamping press. This triple action, which uses specially designed tooling, results in clutch/separator plates with unique features, including:

- Improved overall part flatness, via the hydraulic clamping process. The clutch plates are fully supported by the counter punch during the entire fineblanking process, and parts are checked for 100% flatness before packaging.
- Improved perpendicularity, resulting in straight walls, provided by the tight cutting clearance between the punch and die plate.
- Up to a 100% cleanly sheared fineblanked finish on the part edges, through the fineblanking extrusion process.
- Consistent surface finish, through the advanced double-sided planetary brush deburring/surface preparation process.

IMPROVING AN ALREADY LEAN PROCESS

Over the years, the automotive manufacturing market has pressed for lower prices on high-volume, high-precision parts, including clutch plates, which has encouraged manufacturers to find new ways to increase efficiencies.

Clutch plate manufacturing at Feintool is already a very efficient process, but the company considered how it could make an already efficient operation faster and more cost-effective. The answer was in getting the part out of the tool as quickly as possible.

FeinClutch fineblanking tool installed in an 880-ton Feintool fineblanking line

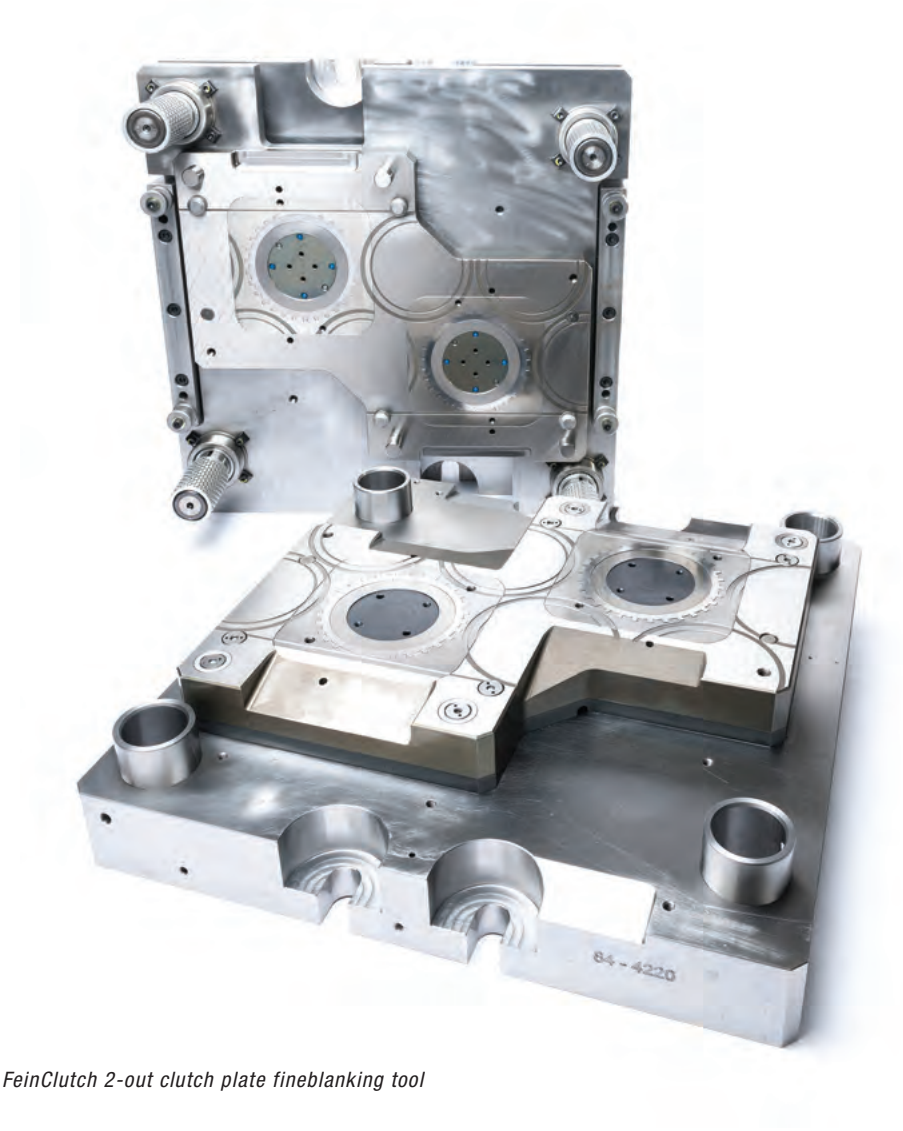
The FeinClutch engineering team had several requirements for a new removal system. Not only did it have to be fast, but it also had to be maintenance friendly, robust, simple and cost-effective.

The team worked to develop a solution at the Feintool Technology Center in Cincinnati, Ohio. At the heart of the project was finding a way to optimize part removal speed. The team built a prototype and explored a variety of different configurations for how the removal arm entered the tool, grabbed the part and exited the press. The team also had to find a way to synchronize the arm's path with the tool and fineblanking press's internal sensors; they had to get the removal arm's movements precisely right, because the press wouldn't run the next cycle until the removal arm had cleared the tool.

A SIMPLE AND ROBUST SOLUTION

After 18 months of designing, building, testing, tinkering and testing again – which even included

100% sheared finish



FeinClutch 2-out clutch plate fineblanking tool

using slow-motion video and simulation software to evaluate part ejection – the team delivered a solution that not only enhanced part production, but shattered all expectations.

Born in a tool room in Cincinnati, FeinClutch is currently cranking out clutch plates at record speeds at the company's Nashville facility.

"The advantage of the FeinClutch system is that the removal arm travels a shorter distance and can separate the scrap and grab the part simultaneously, shaving off even more time," said Beat Andres, Operations Manager, Toolroom and Production Tooling, Feintool U.S. Operations.

"We're saving valuable seconds by minimizing the time the tool is open," added Jens-Uwe Karl, Vice President Engineering, Feintool U.S. Operations.

"As soon as the press raises, we move the arm in, knock the slug out the back and pull the part out, so the press can hit the next stroke a split second faster than before."

FeinClutch isn't just fast; it is also versatile. "The basic components of the removal system are standard, so that we can use it on tools manufacturing the same parts family," said Andres. "If the part is thicker, we can make a few minor adjustments. And, because FeinClutch is made from aluminum, it's easy to move from tool to tool."

This simple installation means the system can be shipped to a production facility and easily installed without extensive training. This adaptability also decreases costly downtime. Should a FeinClutch system go down, the operator can quickly swap out another unit, to keep production moving.

PART OF AN INTEGRATED CLUTCH PLATE PRODUCTION SYSTEM

The new FeinClutch parts removal technology is only one part of an integrated clutch plate production system at Feintool.

The process begins with a precision leveling system for the coil material before the fineblanking process. Feintool uses 21 roll precision levelers with closely spaced 50mm (2-inch) diameter straightening rolls, to ensure flatness of the material and the finished component.

"It's unique technology that competitors do not have," said Steven Childers, Manufacturing Engineer, Feintool Tennessee, Inc. "The process works the coil material very closely. We use small-diameter straightening rollers because they're spaced close together. This is really critical to achieve consistently flat material, resulting in an extremely flat final clutch plate."

The FeinClutch fineblanking tooling system can operate in a two-cavity tooling layout for clutch plates up to approximately 220mm (8.66-inch) outer diameter. The two-cavity configuration optimizes the strip layout, minimizes scrap and saves an average of 8-12% of raw material, compared to a one-out fineblanking tool.

After the FeinClutch removal system removes the parts from the tooling area in the fineblanking press, the parts are automatically transferred to a stacking station at the back of the press. Then the parts are loaded to a high-tech deburring line equipped with planetary deburring/brush heads. An automated parts flipping station ensures a controlled and repeatable surface finish on both sides of the clutch plates. A 3-stage, 21-foot wash/rust protection line is connected to the deburring line. The ability to go from a fineblanked clutch plate to a finished product on one continuous operation without any manual labor speeds up production and reduces labor costs.

Specially trained employees perform the final inspection, because the human eye is still the best way to evaluate every part. These individuals check for 100% flatness and visually inspect each clutch plate for surface quality, before packaging and shipment to customers.

It is this drive for efficiency and continuous improvement that led to the FeinClutch production system. Feintool has a strong reputation as a clutch plate manufacturer globally. The company has already won quality awards and has been awarded additional contracts, based on the production levels and cost saving that FeinClutch can deliver.

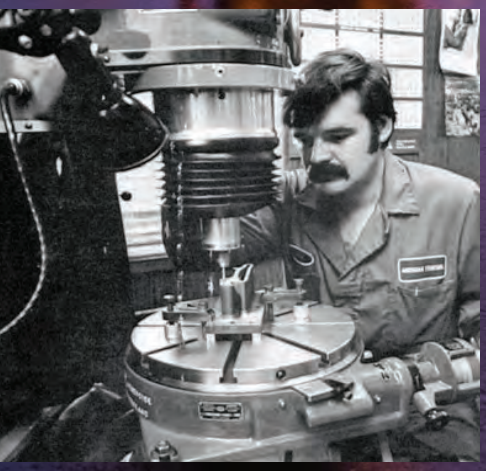
- Fineblanking 2-out
- HFA8800speed
- Planetary Head Deburring/Brush
- Turnover
- Planetary Head Deburring/Brush
- 3-stage Wash/RP
- 100% Flatness Check
- Visual Check
- Pack

FeinClutch production system process flow

Automated planetary brush deburring/brush surface preparation process

Improved strip layout delivers 7.9% material saving. (Part example: O.D. 145mm, thickness 4.2mm, 1-out usage 1.723 lbs./part, 2-out usage 1.587 lbs./part)

CELEBRATING 40 YEARS IN CINCINNATI



Feintool opened its North American headquarters (and production facility and technology center) in Cincinnati, Ohio in 1978, and the Nashville, Tennessee, facility in 1998.

This year marks the 40th anniversary of our Cincinnati location. Over the years we've learned that we have a lot in common with the city we call home. You might not think a Swiss company known for manufacturing complex automotive parts and a city once known for pork production and soap manufacturing would have many similarities, but you might be surprised.

A HISTORY OF FIRSTS

Both Cincinnati and Feintool are known for "firsts." Cincinnati is home to the first professional baseball team (Cincinnati Reds), the first paid municipal fire department, the world's first steel reinforced skyscraper and the first airmail delivery service (by way of hot air balloon).

Feintool has a few firsts under its belt too. We developed the first mechanical fineblanking press, which precisely controlled three forces: closing force, counter pressure and blanking pressure. We are also the first (and only) global specialist capable of supplying the entire fineblanking process, from component design to prototyping, engineering and tool design, right through to series parts production.

TECHNOLOGY INNOVATION

Cincinnati has delivered some incredible innovations. Visionaries at the city's Children's Hospital Medical Center helped invent the first heart-lung machine, making open heart surgery possible and changing healthcare forever.

Feintool has a strong history of technology innovation. The company pioneered fineblanking manufacturing with advancements including the HFAplus hydraulic press, XFTspeed servomechanical fineblanking press, and «FB one» hydraulic direct drive press.

RAPID GROWTH

After Cincinnati was incorporated as a town in 1819, it experienced rapid growth and quickly became a center for art and commerce, which attracted thousands of new settlers. This cultural and population explosion led to Cincinnati's nickname, the "Queen of the West," which later evolved into the "Queen City," a nickname that Cincinnati still retains.

While Feintool doesn't have such a regal nickname, it too has experienced rapid growth over the years. Although it started as a small shop in Biberist, Switzerland, Feintool has grown into a global powerhouse, with nearly 3,000 employees and operations in the U.S., England, Japan, Switzerland and the Czech Republic.

FAMILY ROOTS

Over the years Cincinnati has been home to several famous family-owned companies. The Gorilla Glue Company, Graeter's (a premium ice cream maker), toymaker Kenner (now owned by Hasbro) and LaRosa's Pizzeria are just a few of the family-owned companies that started in Cincinnati.

Feintool has its own family roots. Fritz Bösch started Feintool as a family business; but with his intuition for new applications and markets, coupled with a pioneering spirit, he built the company into a world market leader.

AUTOMOTIVE MANUFACTURING

At one point Cincinnati was the largest manufacturer of carriages in the world, with nearly two dozen companies cranking out 140,000 carriages a year.

While Cincinnati passed its four-wheeled manufacturing crown to Detroit a long time ago, Feintool continues to be instrumental in the global automotive manufacturing market. There are up to 200 fineblanked and formed parts in every automobile, and Feintool is a globally recognized leader in automotive component production.

Feintool has been a part of the fabric of Cincinnati for four decades, and we're excited to see what the next 40 years will bring.

INNOVATION ENLIGHTENMENT

According to Sidney Yoshida and his work known as the "The iceberg of ignorance," only 4% of an organization's front-line problems are known by top management, 9% by middle management, 74% by supervisors and 100% by employees. In creating a culture of innovation, we should make sure that management and your company problem solvers (R&D) see these problems and are put to work solving them.

Innovation: We all know we need it. It helps our companies compete, helps our countries thrive and helps mankind forge a brighter future. Yet the pathway to innovation remains a mystery. Innovation at larger companies is declining globally, and no one seems to have an answer. As a serial innovator, I'd like to share new insights on the problems and solutions, all backed up by the latest research.

SELF-IMPOSED BARRIERS

Having spent much of my career inside large corporations like BASF and Electrolux/Frigidaire, I have firsthand experience of the frustration that one encounters when trying to deliver innovation from within a corporate behemoth. It turns out that when you check the scientific studies, many of the practices favored today simply do not work. Six Sigma can make companies uncompetitive. Stage-Gate® slows companies down. Open plan offices are proven to reduce effectiveness. Brainstorming doesn't work. ISO 9000 takes time and resources, but fails to deliver any competitive advantage. The list goes on.

STEP ONE – REMOVE BARRIERS

As we discover that our favorite tools are broken, we need to ditch them. Let's abandon any tool that has been proven ineffective. In fact, every process and rule that we implement are like a tax on our innovation efforts. They sap our energy, steal our resources and slow us down, until we become uncompetitive. That is what has happened to almost every large company.

STEP TWO – NURTURE INNOVATION

There are plenty of articles about encouraging a culture of innovation. It sounds nice, but no one seems to know how to actually do it. I was asked to give my views, so here they are.

World-class innovators are extremely rare. You need to take care of them, because they deliver tremendous value. One study showed that each one can deliver millions of dollars in new products and profits, and yet only one person in several thousand actually does it. Clearly such rare and valuable people deserve recognition and reward for their work. The people who invented billion-dollar products like the post-it® note and Kevlar® brand received nothing at all. Think about the message that you are sending if you don't reward those who take the career risk to push a new product through the system. The creatives will become frustrated and leave the company. Others will see that you are not serious about innovation and give up on it.

In what other ways can companies and managers reward and encourage creatives?

- Extra vacation earned, plus access to unpaid vacation
- Permission to consult externally (in areas that do not overlap with the company's interests)
- Royalties from their patents
- Ability to attend conferences (which increases creativity)
- Tenure (so they can take risk without fear)

That addresses the creatives who have the initial idea and are able to bring the "fuzzy front end" into focus. They are comfortable handling the uncertainty in the initial stages of bringing an innovation to market, but they are not good at following rules or following through with tasks.

It has been shown that as the innovation proceeds out of research and development (R&D) to product development and then on to production, we need to use people with progressively less creativity

and more persistence, reliability and focus. These are the people who can successfully transfer a prototype through product development and then on to production.

Detailed long-term investigations have shown that using this alignment of personalities and job task creates far better success; but just as important, it leads to better happiness and job satisfaction. Dow found this approach to be stunningly effective and published the method for all to see. Sadly the company ended up firing the creatives who made it huge profits. Why? Because people fighting for change are rocking the boat. Big companies don't like change, so they fire all of the difference makers and ruin their innovation pipeline in the process.

My advice is to implement this simple change, in which the people are in the right positions, and make sure to maintain it. You will see an upward spiral in your success, which will feed on itself. People see success and are energized to repeat it. Furthermore, creating a stable environment means that the teams formed are able to continue operating effectively. Most organizations today suffer from the reverse. Turnover is so high that projects are continually disrupted and delayed, as members come and go.

I can imagine that some of you are wondering how to identify creative and consistent people. How can we be sure that we're putting people into their ideal roles? Luckily experts have spent decades measuring people's personalities, so they can tell you how smart, hardworking, honest and, yes, creative they are. One test that many Americans have heard of is the Myers-Briggs Type Indicator® (MBTI®) assessment; but psychologists prefer to use the Big Five personality test or the HEXACO Personality Inventory – Revised, which adds the measurement of integrity. These tests are tremendously useful in making sure you hire the best employees. Renowned investor Warren Buffett commented, "Somebody once said that in looking for people to hire, you look for three qualities: integrity, intelligence and energy. And if you don't have the first, the other two will kill you."

It turns out that his advice is backed by science. The top three qualities you need are intelligence, to be hardworking and to have integrity. That translates to high IQ, high conscientiousness (from the Big Five test) and integrity (from the HEXACO test). Screening for these traits will give you a consistent and substantial edge over your competitors.

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It is well-known that top management only sees the tip of the iceberg. A famous study revealed that this segment is exposed to just 4% of the company's problems. There are executives who would like to help, but just can't see the way forward. That's what this article is about. It turns out that the path is known; and now you can form an action plan that is proven to deliver stunning results. Dow did it, and so can you.

CONCLUSION

Companies struggle to innovate and have made no progress because all of the advice is wrong. They've been turning to "experts" who aren't. I wrote my book *Innovation Abyss* because, as a serial innovator, I was tired of seeing them mislead you. The answers are known, proven and published. Now that you are aware of them, I hope you feel inspired. You can make a more fulfilling career for yourself, while delivering breakthrough innovations that give you a competitive edge.

MBTI: FOUR PREFERENCES

E	SOURCE OF ENERGY	**I**
EXTRAVERSION		INTRAVERSION
S	WAY OF GATHERING INFORMATION	**N**
SENSING		INTUITION
T	DECISION MAKING	**F**
THINKING		FEELING
J	HOW TO RELATE TO THE EXTERNAL WORLD	**P**
JUDGMENT		PERCEPTION

The Myers-Briggs Type Indicator® (MBTI®) assessment has proven to be an excellent indicator of innovation success. The "NT" type personality has created $8M in profit, versus only $0.7M for all other types combined (NF, SJ, SP). When you consider that only about 12% of the population has an NT personality type, it starts to become clear why innovation struggles and why companies need to have the right people in the right roles for individual and corporate success.

As a refresher, "NT" stands for iNtuition (What could be. What if. Patterns. Looking ahead.) and Thinking (Objective analysis. Logical.).

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Chris DeArmitt is considered one of the top plastic materials experts and problem solvers in the world, which is why companies like Apple, Disney, Eaton, Exxon, HP, iRobot, P&G and Total come to him for help.

A deep understanding of materials, combined with high creativity, allows him to quickly solve even the toughest challenges. In 2016, he published the book *Innovation Abyss,* which reveals the true reasons for innovation failure and the proven path to success.

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