TruServices Journal

#03

The Services Magazine from TRUMPF

RISK?

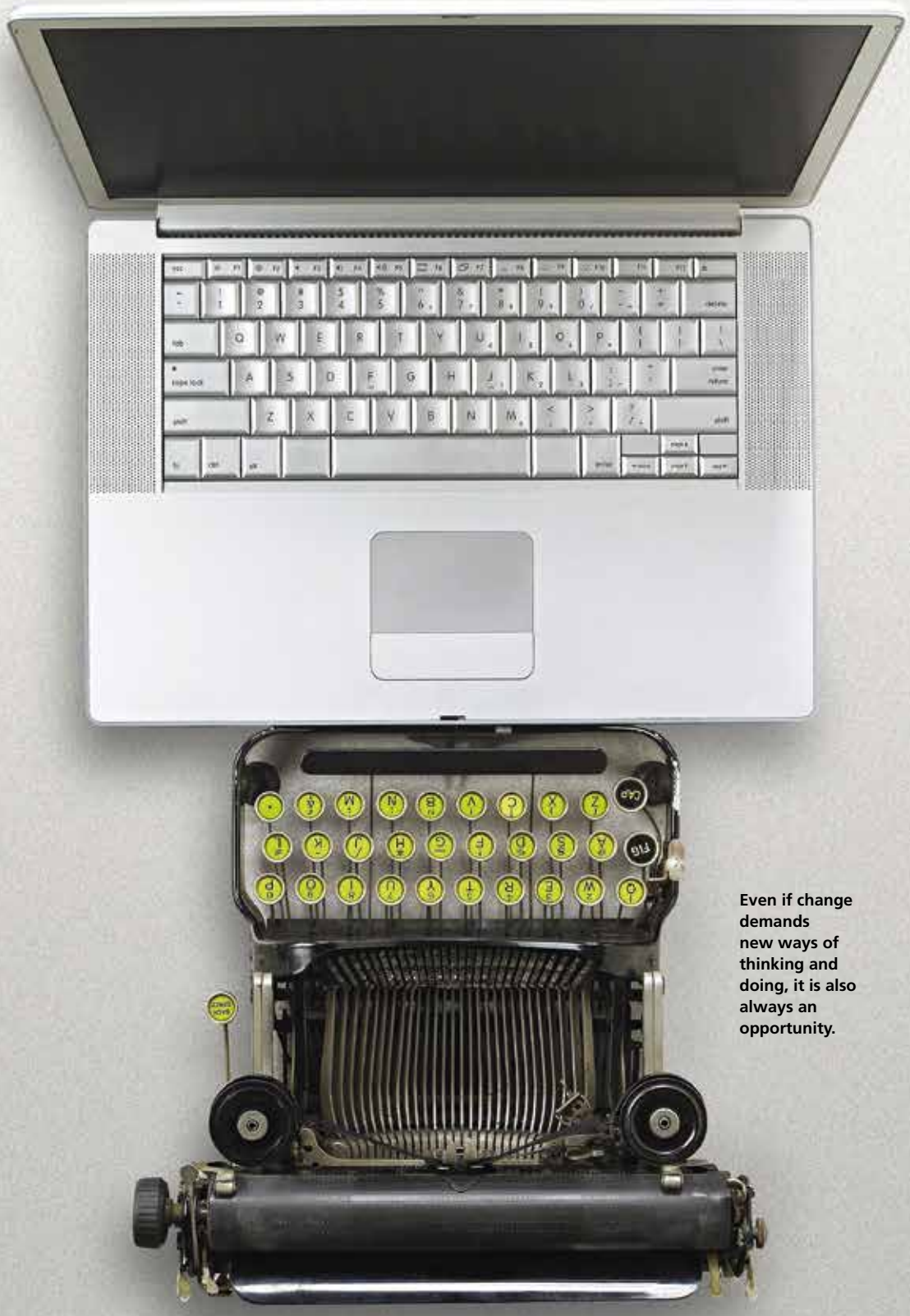
Don't even consider it!
When handling things of value,
we need to play it safe.
A comparison shows:
You can depend on original
spare parts *Page 10*

The outlook: Step by step toward the Smart Factory *Pages 3 and 18*

Protective coating: Saves time and money when bending galvanized sheet metal *Page 7*

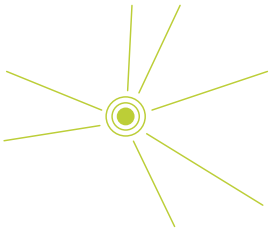
Well advised: More productive with a punching machine and punching tools *Page 13*

TRUMPF



Even if change demands new ways of thinking and doing, it is also always an opportunity.

Networking



At TRUMPF, Industry 4.0 has a name: TruConnect stands for all the products and services that support our customers as they embark on their individual paths toward implementing the Smart Factory.

AXOOM

With the founding of the digital business platform known as AXOOM, TRUMPF has made preparations for the road to Industry 4.0. The platform is open to all manufacturers.

In "TRUMPF LAB", both TRUMPF and the Fraunhofer Institute for Manufacturing Engineering and Automation (IPA) collaborate to develop innovative solutions for tomorrow's manufacturing technology.

INDUSTRY 4.0: WHAT DOES THIS HAVE TO DO WITH ME?

Even though the Smart Factory has been mentioned in many publications, it remains a vague concept for many people and its implementation seems to be more than complex. Maybe you're asking yourself: "What does all this have to do with me? Isn't that only something for the big players?" Not at all! We are sure that manufacturing networked for efficiency will secure your competitive position in the future. This might be through optimizing your indirect processes before, during and after production so that you can continue to work profitably, even as batch sizes are shrinking and variations for specific parts are increasing. That's just as important for small and medium-sized companies as it is for large companies.

Let's make one thing perfectly clear from the start: Developments in the direction of digital production are already moving along and many of the required components are available even now. Thus TruServices, for instance, already offers functions to lend efficiency to manufacturing orders and to avoid machinery downtime. Software solutions like TruTops Boost reduce programming times and offer maximum flexibility. Now it is a question of networking all the people, machines and processes involved in value addition. This is essential not only within a company, but beyond it, as well. Although no one will be implementing a Smart Factory overnight, this process will certainly take place over the coming years. This means that now is the right time to devote a lot of attention to the subject. With TruConnect, the TRUMPF technology for connected manufacturing, we support you in your efforts to comprehensively optimize your business processes right now. The current edition presents more on that topic and on many other exciting TruServices subjects.

By the way: Digitalization is a sign of the change which is transforming the value added chain, and we're just going with the times. In the course of this year, we will introduce a new editorial concept for you, our valued readers, which will unite production and services to a still greater extent. Just wait and see!

Reinhold Groß,
Managing Director Sales & Services,
TRUMPF Werkzeugmaschinen
GmbH + Co. KG

THE ROAD TO INDUSTRY 4.0

Declining batch sizes and an increase in versions for parts pose a major challenge to modern manufacturing. The effort devoted to indirect processes before, during and after production, such as job preparation and intralogistics, can easily take the upper hand. But this is exactly the opportunity for networked production. TruConnect, the TRUMPF technology for connected manufacturing, supports you as you comprehensively optimize business processes, from issuing bids to dispatching. The number of interfaces is also reduced. A core element of TruConnect is **Consulting for networked production.** TRUMPF's experts work on the basis of the actual situation and delve into development possibilities for that particular company. Working on site, they discover optimization potentials in manufacturing operations and determine the stability and efficiency of the existing business processes. Once areas of action have been identified, concrete recommendations for coming steps follow, right through to networked manufacturing. So that even short production runs can again be turned out at a profit.

↑ *http://www.trumpf.com/en/innovation/truconnect.html*

TruTops Boost – Version 2.0

The unique software **TruTops Boost** makes it possible to save time and money when designing components and when programming laser, punching and bending machines. TruTops Boost Version 2.0 brings even more advantages. For example, it is now possible to connect ERP/MES systems via a PPS interface and to reduce programming time by reusing existing sheet programs. What's more, machines built by other manufacturers are also supported in 2D laser processing. TruTops Boost and TruTops Fab share the very same data for administration of orders, parts and material, which effortlessly paves the way to production control — without time-consuming data migration.

24%

faster

The solid-state laser machines in the TruLaser Series 5000 fiber stand for high efficiency and productivity. These can once again be significantly boosted when cutting mild and stainless steel with nitrogen using the new **high-performance nozzle (EAU).** Increasing throughput can be achieved above all where the sheet layout is not very complex.
In this way, for instance, when cutting five millimeter mild steel, using a TruLaser 5030 fiber with 6 kilowatt of laser power, a 24 percent increase in productivity can be achieved when compared to the standard.

Bending foil holder

Bending foil protects against undesirable marks on the sheet metal, which is particularly important when bending visible parts. Positioning such foils on the lower tool is, however, both tedious and time-consuming. The **bending foil holder** is easier on the operator. The holder can be adjusted infinitely and ensures functionality and safety regardless of the position
on the lower tool clamp. The integral foil separation groove makes it possible to cut the foils cleanly.
The bending foil holder can be used with all TruBend series. A collision check is possible using TruTops Bend V5.0 or higher.

Organized punching tools

Integrated Tool Management makes it possible to reduce both tool search and set-up times and thus speeds up production. With a Data Matrix Code on the punching tools, they can be registered and tracked. Hence the location and condition of the tools is transparent at all times. A feasability check when putting the tools together avoids setup errors. Input errors at the machine are ruled out, since the tool data is transmitted electronically. The central overview of all the jobs pending and the remaining runtimes, makes it possible to align the set-up process to the current manufacturing situation perfectly.

Greater transparency for punching tools: Integrated Tool Management accelerates production.

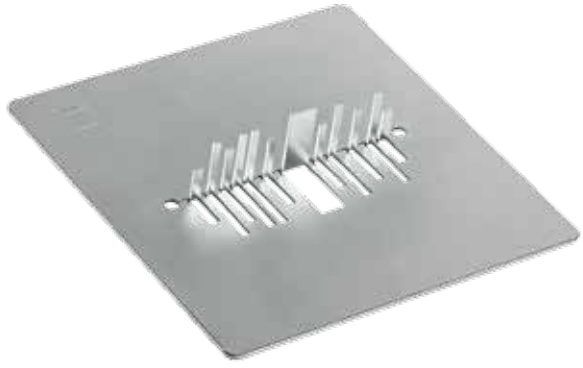
SERVICE CALL WITH AN APP

A practical alternative to ringing up the Technical Service is now provided by the new **Service App**. In five simple steps the user can specify the machine affected and select the reason for the call; he can also submit a description of the problem, attach a photograph, and name the person TRUMPF should get in touch with. Thus it is possible to call for service around the clock, even when the customer service staff is away from the phone. While the case is being processed the user can view the current status at all times and initiate action — like asking for a return call, for instance. To provide transparency, all the other registered users in a company have unrestricted access to the calls sent.

The *Service App* is available free of charge in selected countries for iOS and Android operating systems. The prerequisition to use the app is a registration on the customer portal MyTRUMPF at www.mytrumpf.com

Smart Collision Prevention

The **Smart Collision Prevention** feature reduces the risk of collisions during laser cutting to a minimum. To do this, this smart function generates an optimized processing sequence, including calculation for the tipping of parts that have been cut free. Thus, as a rule, users can do entirely without the use of microjoints. The avoidance of collisions boosts the machine's capacity. In addition, the time spent by the operator removing parts and doing refinishing work is reduced significantly. Smart Collision Prevention is now available as a **product enhancement** for the TruLaser 3000 and 5000 series.



MultiBend Extended

With the **MultiBend Extended**, it is now possible to bend lengths of from 5 to 90 millimeters and heights from 10 to 25 millimeters in just a single stroke. With TruMatic machines, a laser cut is all you need to free the flange.

TruServices at a glance

Financing
Stay flexible on a solid basis

Software
Programmed for success

Punching Tools
Know-how for every application

Bending Tools
Customized to your specifications

Spare Parts
Quality in every detail

Technical Service
You can count on us

Service Agreements
For the highest machine availability

Product Enhancements
Your machine can do more

Customer Training
The knowledge advantage

Consulting
Advice through experience

Pre-owned Machines
First choice for second hand

truservices@de.trumpf.com
www.trumpf-machines.com/services

"THIS LAYER IS WELL WORTH IT"

When machining galvanized sheet metal, galling or cold welding can damage the zinc layer on the part, after just a few bends. K-Metall GmbH in Oelsnitz, Germany, has put an end to all that by installing a LASERdur ZN coated die. Proprietor Sven Kölbel tells us about how he uses the tool and explains why this coating has paid for itself after just a short period of time.

The sets of dies coated with LASERdur ZN save both time and money at K-Metall.

Photos: TRUMPF, Thomas Abé

Where do you use galvanized sheet metal?
Sven Kölbel: This is used primarily for outdoor gutters, which is one of our own products. But mechanical engineering products that were made of stainless steel years ago are now being made up from galvanized sheet metal.

What problems are encountered when you process it?
Right after a few bends zinc collects on the die insertion radii, and that leads to galling. Even if these areas are really tiny, there will be damage to the sheet metal surface. This is complicated by angular tolerances of plus/minus one degree so that precise bending is no longer possible. To avoid this problem, we had to clean the die segments continuously and that, of course, meant non-productive machine time.

Are machine idle times really so significant?
The time it takes to clean a complete standard die set is about 90 minutes. It can sometimes require two hours, though. This means that a skilled worker has to spend about 25 percent of his working time on cleaning work. And this outlay happens all the time, even when smaller batches are being produced. Where the production runs are long, then the time needed to clean the tools in between is added, so that bending quality is always good.

Beginning last year you have used a LASERdur ZN coated die set with a die width of ten millimeters. What changes came about?
We use the die set both on our TrumaBend V320 and our new TruBend 5320, machining materials from 1.0 to 1.5 millimeters in thickness. And to clean the die you only need to wipe off the tool's surfaces with a cloth. That's quick!

Does this mean that the coated die pays off for you?
That's right. The additional cost for the LASERdur ZN coating quickly amortizes itself. In addition to the time savings – which are considerable – we are also easier on our standard dies. That is because using fleeces or scrapers in the past obviously caused wear. And so you have to include the longer service lives in the overall equation.

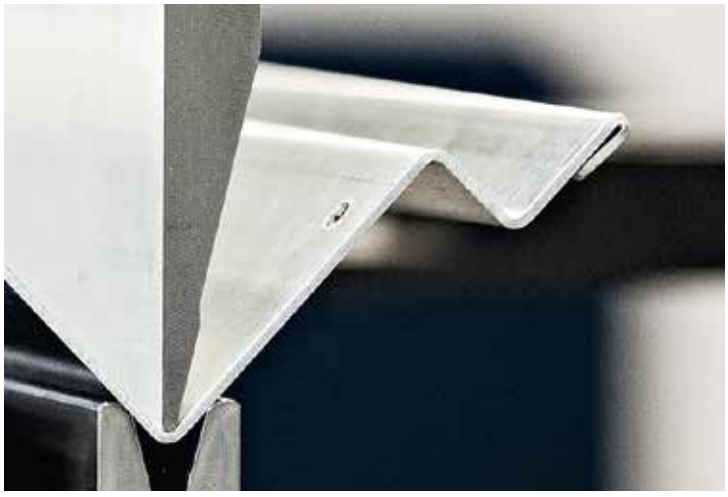
So that means, all in all, that you're satisfied with the coated die?
For sure. We process a range of parts that certainly justifies the additional investment in the die. It's a question of time savings, increased tool service lives, and improved parts quality thanks to manufacturing operations that can be precisely repeated. That was more than convincing for us.

i K-Metall GmbH, located in the town of Oelsnitz in Saxony, was founded in 1990 and employs a staff of 56. The company manufactures laser-cut parts, parts that are punched and nibbled, components that are milled or welded, complete assembly groups and finished products. It supplies the automotive, mechanical engineering, plant and equipment sectors. ↑ *www.k-metall.de/en*

Sven Kölbel, proprietor at K-Metall GmbH.

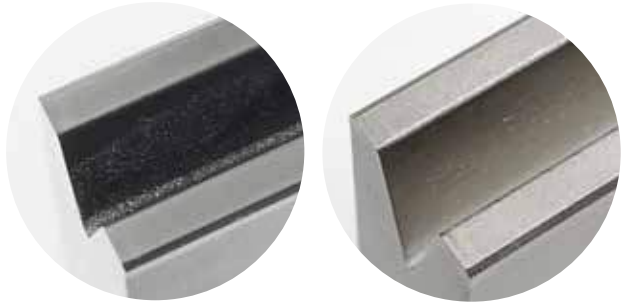
"A skilled worker spent up to 25 percent of his shift cleaning a set of standard dies. That is time that we now save."

Sven Kölbel



Die coated with LASERdur ZN after making 3,000 bends

Standard die with zinc deposits after making 300 bends



Left: Dies coated with LASERdur ZN keep the galvanized zinc layer intact.

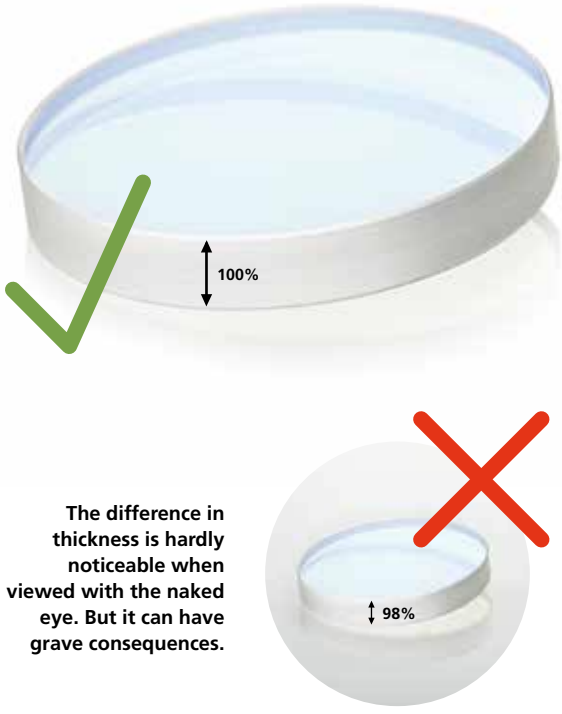
Cold welds on standard dies lead to angle deviations. Dies coated with LASERdur ZN guarantee precise manufacture even after many bends.

Photos: Thomas Abé

BETTER SAFE THAN SORRY

Inexpensive spare parts are tempting.
But be careful: what looks the same might not be identical.

High productivity and availability, the best manufacturing quality and a long service life – that's what customers rightfully expect when they invest a great deal of money in their machines. But that works out only if they also pay attention to the best quality when buying spare parts. Inexpensive alternatives to Original Spare Parts are not always crucially important. But it often turns out that even the smallest differences can have fatal and expensive effects. Four examples show that placing faith in Original Spare Parts will pay off in the long run.



The difference in thickness is hardly noticeable when viewed with the naked eye. But it can have grave consequences.

#1 Protective glass

The smallest deviations in the protective glass will make the cutting results worse

The Original Protective Glass has a special coating that is compatible with the machine's piercing sensor. In addition, it has the correct thickness and the surfaces are absolutely parallel, making for the best cutting results.

What happens when a protective glass is too thin? Protective glass that is too thin will not sufficiently seal the cutting gas. The result is excessive pressure above the protective glass and an error message issued by the machine. In the worst case, dirt can enter the optical compartment and make for poor cutting results.

#2 Filter Plates

Poor workmanship reduces the filter's capacity and shortens its service life

Original Filter Plates trap more than 99.995 percent of the fine particulate generated during laser cutting. Replacement is necessary only after four to five years.

What happens if filter plates are not properly manufactured? Even the tiniest bit of adhesive on the filter fleece will interfere with the air flow and thus reduce the filter's performance. The result: The filter has to be cleaned more often and replaced sooner. A further hazard: If the filter ruptures at the poorly worked areas, the filter will have to be replaced after a short period of time.

If there are any adhesive residues on the filter fleece, both the filter's performance and its service life will be reduced.

Photos: TRUMPF, KD Busch

If cooling water additives are very cloudy, they will not prevent corrosion but rather will accelerate it.

#3 Cooling water additives

Ineffective and contaminated cooling water additives can lead to operational malfunctions

Chemical additives help keep the cooling water in laser machines clean. In this way they protect the optics and the resonator against corrosion and thus ensure a long service life for the machine. The Original Easy-Kit contains all the components needed for safely changing the cooling water in a laser machine's cooling circuit.

What happens if cooling water additives are ineffective or contaminated? If the anticorrosive agent for aluminum is very cloudy, this is an indication of its ineffectiveness. The residues will be deposited in the filter cartridge. Traces of polypropylene glycol in the corrosion protection for copper can result in microorganisms growing in the cooling water. This would create a biofilm which promotes corrosion instead of preventing it and might endanger both the optics and the resonator.

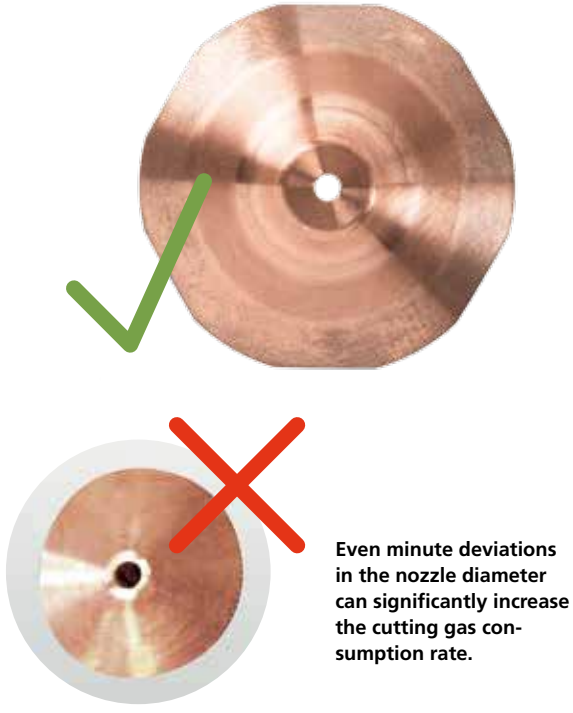
#4 Cutting nozzles

Nozzle geometries which deviate from the standard will cause increased cutting gas consumption and thus higher operating costs

The nozzle is decisive for the quality of the parts produced. High-quality material and precise manufacturing processes in nozzle production guarantee perfect nozzle geometry and optimal gas flow.

What happens when nozzles are manufactured so that they are not precise? Imprecise manufacturing can be recognized by a significantly larger chamfered area at the mouth of the nozzle. The manufacture of the part is, all in all, less exact and the cylindrical section in the nozzle opening has a surface which is not as smooth.

Nozzle diameters outside the production tolerances can result in higher cutting gas consumption. A deviation of more than 0.1 millimeter on a nozzle diameter of 1.0 millimeter can mean a gas consumption increase of up to 20 percent. With the high nitrogen prices and 4,000 production hours a year, that will add up to a lot of money.



Even minute deviations in the nozzle diameter can significantly increase the cutting gas consumption rate.

More time for tea, because the punching machine can do everything on its own when it has the right tools. This saves Future Automation two manual refinishing steps.

LOWER STRESS, HIGHER PRODUCTIVITY

Thanks to good consultation, Future Automation increases production and economizes on material – with a new punching machine and the right tools.

Photos: Michael Molloy

Above and below: The blanks for the enclosures are now made on the punching machine. Right: A MultiBend tool makes angle brackets out of scrap skeletons.

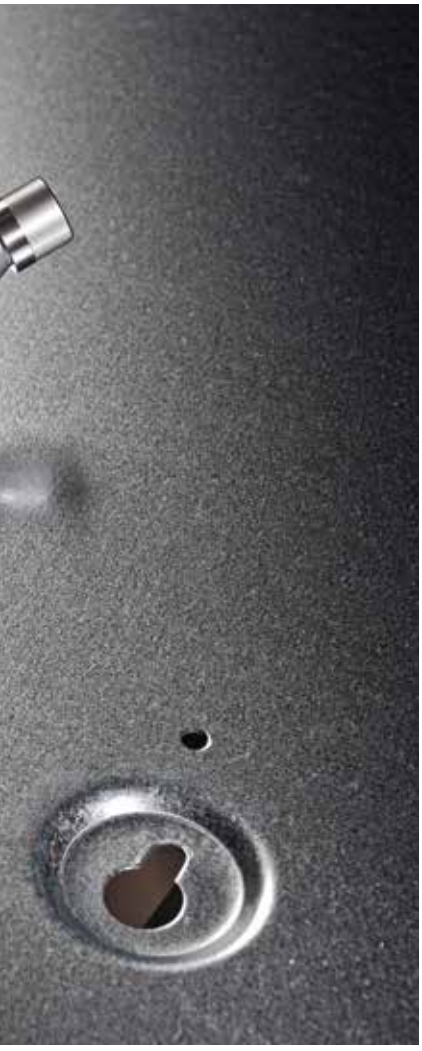
Whenever a gigantic monitor appears as though out of nowhere, travels into a room and seems to hover in space, it's probably based on mechanical mounts made by Future Automation. Jack Percival, the company's chief designer, grins: "We are renowned for technology with a James Bond flair." The firm, located in Stevenage, near London, specializes in mechanisms that move monitor screens, projectors and speakers within a space and can either hide or present them. In the summer of 2012, Future Automation opened up a new area of business and since then has also been manufacturing enclosures for advanced dimmers and smart home applications. "In the past we shaped the manufacturing process around a laser cutting machine and a press brake from TRUMPF, since we already had them on site. When an ever larger number of customers called for enclosures, production couldn't keep up with the heightened demand," Percival recalls.

Punching instead of manual work

The process at that time was divided into four steps. First the blank was cut with the laser; this was followed by bending and manual welding. Percival's co-workers finished by outfitting the enclosures with numerous tapped threads and bushings for captive screws, and they did this all by hand. "We needed between 15 and 20 minutes for a typical enclosure. That's a long time. At some point we realized that things couldn't go on like this. We had to become faster and more efficient. With this request we turned to TRUMPF and explained what we were thinking about."

A few days later, Percival and his Managing Director, Alun Williams, sat at a table with two TRUMPF punching tool specialists. They discussed all the details of the design for the part. The main concern was the modifications that could be made so the design would work better with a fully automated process. The solution would lie in a punching machine and suitable tools. "We didn't know much about working with punching machines. Of course, being engineers, we didn't start from scratch. The TRUMPF experts gave us thorough punching technology consultation. And I thought this was really super," said Percival and added, "They knew exactly what we needed, and we had a solution in no time."

The new TruPunch 3000 punching machine came with a thread forming tool, a MultiBend tool and an embossing tool.



"With these special tools, we now manufacture many of our parts entirely automatically – and all on a single machine. This saves the time needed by up to 75 percent."

Jack Percival, Chief designer at Future Automation

A turbocharger for production

"The best improvement is certainly the special tool for the threads and the bushings for the captive screws. This sped up the process enormously. Now we need just five minutes per enclosure – that's four times faster than before! We can now produce 60 more enclosures per day!" said Percival with satisfaction. "For two days a TRUMPF technician was here in production and explained the machine and the punching tools. Everything worked right away and has been running without problems, right down to the present." Percival took this opportunity to show another part to the visiting technician: a small angle bracket used as a holder within the enclosure.

Turning scrap skeletons into parts

Future Automation intended to laser-cut and fold this bracket on their press brake, but Percival wanted to know if it could be made on the punching machine as well. "The TRUMPF engineer looked at the part and told us that it should be possible with a few design tweaks and some modified tooling. He thought they could engineer a special MultiBend tool," Percival said with excitement. "The great thing is that this small part could be made using scrap segments of the sheet skeleton which would otherwise have wound up in the scrap container. This means that manufacturing this bracket costs us virtually nothing!"

Logos without additional cost

And yet another improvement: The company logo is now punched onto the dimmer enclosures with a custom embossing tool. "That was an urgent request of ours. Before, we had stickers with our logo, and they had to be attached in an additional working step. But these stickers kept falling off. We wanted absolutely everyone who laid hands on our enclosures to see who had made them. And that even years later when, for example, the enclosure should be extended. In this way they would see right away where they could order a new one," said Percival.

i Founded in 1998 Future Automation manufactures premium-quality mounts and mechanisms for audio and video equipment. Enclosures for illumination controls and ventilation form a second mainstay. The company with 65 employees is located in Stevenage, near London.
↑ *www.futureautomation.co.uk*

Photos: Michael Molloy

SIMPLER, QUICKER, MORE FLEXIBLE

At the **MyTRUMPF** customer portal, both tool data and software updates are available for download. What's more, you can calculate your financing options online.

Your software – always up to date

In the section on software you will find an overview of all the TruTops products that can be immediately updated. For customers with a service agreement for TruTops Boost, Punch, Laser, Bend and Tube, the latest service packs are available for download around the clock.

And if there are any questions?
Then your personal contact persons are on hand to answer any and all questions you might have about the software. Simply get in touch with them directly.

Financial calculator online

Which kind of financing is the most appropriate for an new investment? That is a question that MyTRUMPF users can explore online. With the financial calculator provided there, you can work through a variety of financing possibilities, determine the monthly rates and generate a personalized offer right away.

Enter, have the system calculate, compare
In just a few steps the financial calculator will show a number of different solutions and will display them for a direct comparison.

Download tool data directly

Customers who have ordered a ***special punching tool*** can now download the tool data from MyTRUMPF. The search for the desired data is possible with the tool designation, the drawing number, the order date or the order number.

For ***bending tools,*** not only the tool data for all the standard tools shown in the catalog and the e-shop, but tool data for custom tools will be available for download as of May. The data for older tools can be requested and then called up via the portal.

Not yet registered at MyTRUMPF?
Then obtain information today at www.mytrumpf.com

CHANGING THE FILTER MAT

1 Should the cooling unit for a TruLaser or TruMatic machine overheat, then a dirty filter mat is usually the cause. In this case the machine control issues the error messages: "Cumulative error, process cooler" and "High pressure — refrigerant circuit faulty".

2 To make the simple and fast fix, turn off the main switch at the control cabinet and then unfasten the knurled-head screws to remove the cover.

3 Insert the new filter mat and mount the cover. Then turn on the main switch and press the button "Start high-pressure control unit".

TRUMPF digital

Online information

YouTube videos on sheet metal processing ↑ *www.youtube.com/TRUMPFtube*

MyTRUMPF The TRUMPF customer portal ↑ *www.mytrumpf.com*

Pre-owned machine exchange ↑ *www.mytrumpf.com/um*

Course catalog ↑ *www.mytrumpf.com/training*

Magazine for Sheet Metal Processors ↑ *www.mastersofsheetmetal.com*

Useful apps

You can find all apps from TRUMPF, for example: the BendGuide app, TruTops Fab app, TruServices Journal app and PunchGuide app in the Apple and Google app stores.

Photos: Christoph Kalscheuer, KD Busch

INDUSTRY 4.0: READY FOR THE CUSTOMER!

It seems as though everything is getting smarter and more disruptive, networked and split up across platforms. Google, Amazon and other Silicon Valley leaders ought to serve as paragons for mechanical engineering companies. That's because they have "won the first half" of the game. In an interim balance drawn up at the beginning of 2015, it became clear that the actors are lacking in the fourth industrial revolution. The reason: The sorely needed discussion on the real added values of digitization often takes second place, at least in the mechanical engineering industry, to focusing purely on the technology or abstract examples, usually outside the industry. But a great deal of digitization does not automatically mean a generous profit margin or satisfied customers. The true winners in the second half will thus be those vendors who understand every aspect of the customers' problems, all along the value addition chain. And who translate these into innovative values and can serve their customers the most quickly.

Smart data, platforms, digital services, and on and on – these are all only the means to an end and not vice versa! Enterprises with a distinct bent toward service have already aligned themselves on additional customer value and thus are more holistic in their thinking. They tailor the means of digitization in a purposeful fashion to suit the needs of individual customers. Just as in Silicon Valley, everything in the mechanical engineering industry, too, has to start with the customer, and not with the technology.

Prof. Katja Laurischkat, D.Eng.,
Associate professor for product service systems in the Mechanical Engineering Department at Ruhr University in Bochum

Networking

4%

According to a study conducted by the Center for European Economic Research, only four percent of German companies have implemented or are planning digitization projects to date.

The companies in Silicon Valley report annual earnings of 188 billion dollars. That is almost 10 percent of California's gross domestic product.

Smartphones and the computer – it's no surprise that they are connected to the Internet. But there are, in addition, about 10 billion other everyday devices that are networked.

In the age of Industry 4.0, the age-old rule still applies: The one who fulfills his customers' requirements the best stays at the head of the pack.

SAFETY? THAT'S WHAT WE OFFER!

Anyone who banks on the highest safety level and maximum machine availability will want to conclude a service agreement with TRUMPF. The broad spectrum offers the right arrangement for every need, from expanded on-call service in case of a malfunction, right on to the full service agreement, covering all the costs for the required spare parts and work-related expenses.

IMPRINT TruServices Journal Edition #03 February 2016 **Published by** TRUMPF Werkzeugmaschinen GmbH + Co. KG, Johann-Maus-Straße 2, 71254 Ditzingen, +49 (0)7156 303-0, www.trumpf.com, V.i.S.d.P. Reinhold Groß **Editor-in-chief** Till Küppers, journal@de.trumpf.com **Project coordination** Melanie Brilhaus **Editorial staff** pr+co GmbH, Stuttgart **Design & Illustration** pr+co GmbH, Stuttgart **Reproduction** raff digital GmbH, Riederich **Printing** frechdruck GmbH, Stuttgart For address changes contact: journal@de.trumpf.com

TRUMPF