

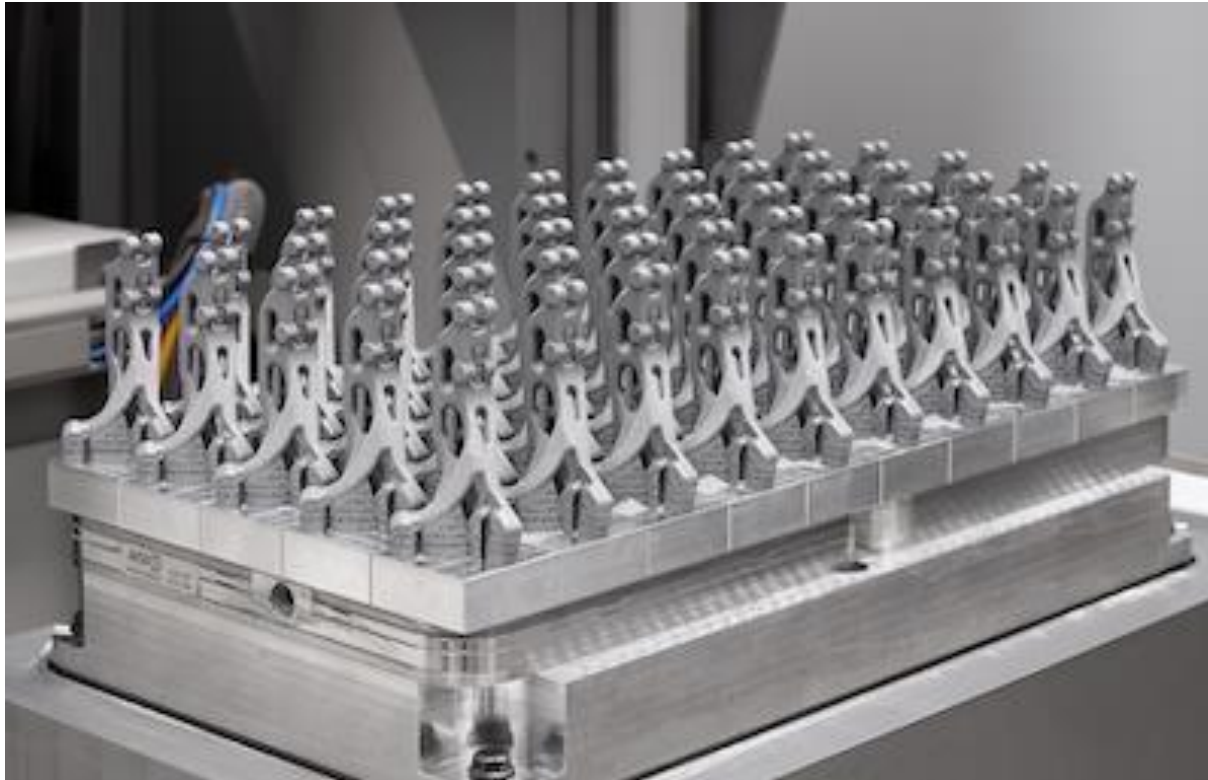
Press release

Application M&H CNC Technik

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The patented AMF substrate plate clamping system acts as a booster for post-processing in metal 3D printing, delivering unprecedented cost-effectiveness



Zero point to go: The Formula 1 of 3D production

Any company that manufactures parts for motorsport using 3D metal printing knows the value of speed. M&H CNC Technik shares this view and has accelerated the pace of its printing processes to the max by using high-performance machines equipped with more and more lasers. However, even the most seasoned experts are left in a state of incredulous amazement by the speeds that can be achieved with the modular AMF substrate plate clamping system combined with zero-point clamping technology, both during and after the process. Suddenly, efficiency and cost-effectiveness have reached unprecedented heights, catapulting 3D metal printing from the industrial future into the here and now.

"The segmented AMF substrate clamping plate with defined zero-point interfaces makes our processes completely end-to-end and, above all, even more efficient during the transition from one post-

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processing stage to the next following 3D metal printing," says Patrick Herzig, Managing Director and founder of M&H CNC Technik GmbH in Ilz near Graz, Austria. Chris Vogel, Head of International Key Account Projects at AMF, puts it even more specifically: "Users regularly report time savings of several hours because the finished 3D-printed part retains its defined interface with all subsequent processes."

From substrate to substance – only faster than ever before

And this is what's it all about: The 25 segments of the patented AMF substrate clamping plate can be removed individually together with the printed 3D part, and clamped into the next process straight away. In the past, a great deal of time was wasted unproductively on cumbersome clamping, alignment, calibration or re-clamping; today, on the other hand, value creation on the component can continue immediately after printing without any loss of time. Philipp Schwemberger, Head of Additive Manufacturing at M&H, sees another advantage: "As well as the time saving, we also benefit when it comes to milling. As the components are passed on individually to the subsequent processes, there are no interfering contours that could affect the 5-axis machining." Roland Mittendrein, Production Manager at M&H, adds: "In addition, we can dispense with additional clamping lugs, which were previously required for further processing and later had to be removed again. This simplifies the design and reduces the effort in the downstream processes. The key advantage, however, is that each component retains its defined zero point throughout the entire process chain."

It is really possible to sense how highly motivated everyone at M&H is, which is hardly surprising. After all, when an owner-managed SME operates in sectors such as medical technology, aerospace, defence technology and motor racing, it can be expected to possess a high level of expertise and interesting applications – which, unfortunately, cannot be discussed publicly due to non-disclosure agreements. But: M&H CNC Technik also supports the *Formula Student* team at Graz University of Applied Sciences. The level of confidentiality there may be lower, but it is by no means any less demanding. For the students who compete every year in their self-built Formula racing cars on the Hockenheimring circuit, it's all about winning after all. M&H manufactures damper mountings using 3D metal printing, with a focus on lightweight construction, precision and the rapid implementation of new developments.

Substrate clamping plate: From a tool to an efficiency boost

But back to the facts: Further production processes usually follow on from metal 3D printing – such as removing powder, machining, cleaning, polishing, measuring and sawing. The patented AMF substrate clamping plate, presented as a world first in the summer of 2025, measures 248 x 248 x 23 mm and contains 25 zero-point

interfaces. The base plate is made of stainless steel and can accommodate substrate plates made of various materials. An additionally available adapter plate allows flexible installation on different drilling templates of 3D printing machine tables.

On the substrate clamping plate, there are 25 segments with zero-point pull-studs K5 in the dimensions 49.2 × 49.2 × 20 mm together with the indexing pin, which can be removed individually. The pull-studs are secured mechanically, centrally, simultaneously and without screws using a T-handle torque tool. "We deliberately opted for the mechanical interlock. Any other solution, such as pneumatics or hydraulics, would have been far too complex and expensive," explains Chris Vogel.

Easy-to-use high-tech instead of time-consuming manual labour

M&H now prints 25 approximately 80 mm tall and 40 mm wide damper mountings at the same time. These are now picked up individually using the substrate plate segment and positioned one after another in the further machines and systems involved in the subsequent processes. That is where size K5 pneumatic zero-point clamping modules from AMF are located, providing repeatable and reliable clamping with an accuracy of less than 5 micrometres. They hold the parts securely with a force of 13 kN. Pneumatic pressure is only required for opening the clamping modules. "It's quick and easy," assures Roland Mittendrein, "remove, insert, clamp, and you're done." Chris Vogel agrees: "We're actually talking about all these follow-up processes taking just a few minutes, whereas in the past whole hours could be wasted unproductively. It may be hard to believe, but anyone who has seen it is immediately convinced."

For example, milling on the 5-axis DMG 60 evo machine can start immediately without having to calibrate the component. As parts are only fed individually into the next process at any one time, there are no interfering contours and the five-sided cutting runs smoothly. At the end of the machining process, the part can also be clamped directly on the measuring machine. If the measuring result is not satisfactory, reworking is quickly possible on the machine responsible. If the part meets all tolerance specifications, the last process is to separate the component from the substrate plate segment. Depending on the component and the supporting structures, the part is either sawn off or it can be broken off directly. Finally, the substrate plate segment is ground over and can then be immediately used for 3D printing again.

A flexible and modular approach to completely new 3D printing processes

A further key feature of AMF's patented substrate plate clamping system is its versatility. Customers are not limited to components

with a maximum of 50 × 50 mm (L x W). "The building platform actually adapts to the component," emphasises Chris Vogel. This means that relatively large components can simply be clamped using large plate segments designed to accommodate multiple clamping positions, without the need to use every pull-stud mount. Individual or several different components can also be placed on a clamping plate. "That's obviously extremely interesting, because it means we can print various components simultaneously, either singly or in small batches, particularly during the prototyping phase of a product," enthuses Philipp Schwemberger. "The simplification and increased efficiency we have achieved have clearly paid off for us," Patrick Herzig concludes.

And, to sum up, Chris Vogel is keen to emphasise that "Our patented AMF substrate plate clamping system, together with the zero-point clamping technology, virtually eliminates set-up times for metal 3D printing and simplifies all processes from start to finish. Mechanical clamping, aligning, calibrating or reclamping – all of these are entirely omitted." It is clear that the cost-effectiveness of metal 3D printing is decisive here. With this patented technology, AMF is bringing the process from the industrial future into the here and now. A round substrate clamping plate is available for 3D metal printing machines with round construction panels, on which individual octagonal segments are mounted. In addition, several systems can also be used next to one another for larger structures, as shown by the example of M & H. Furthermore, the manufacturer is open to accommodating its customers' individual production requirements and also manufactures to order.

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((AMF company information))

Market leader in machine-table clamping

Today, Andreas Maier Fellbach (AMF), originally founded in 1890, is a one-stop supplier in clamping technology and is one of the world market leaders. With a global market presence, the company and its employees always have an open ear for the problems of their customers. By listening to these needs, and through its strong problem-solving ability, professional consultancy, intelligent engineering and high manufacturing quality, AMF repeatedly develops project fabrications and customised solutions for customers as well as standard solutions that succeed in the market. With more than 5,000 products and numerous patents, it ranks among the top innovators in the industry. Speed, flexibility and 240 highly qualified employees guarantee success at Andreas Maier GmbH & Co. KG. In 2023, AMF posted sales worth 51 million euros.

((M&H CNC Technik GmbH company information))

Committed to precision and quality

M&H CNC Technik GmbH, based in Ilz, specialises in the additive manufacturing of metal components and precise CNC machining. The company supports projects along the entire value chain – from technical consulting and component optimisation to metal 3D printing, mechanical post-processing, heat treatment and quality assurance. The range of services includes the processing of high-performance materials such as Inconel 718, titanium, aluminium and other metallic materials as well as the production of prototypes, individual parts and small batch

series. The portfolio is supplemented by CNC milling and turning, surface processing, measurement technology as well as documented testing and quality assurance processes.

M&H supplies customers from sectors such as aerospace, motorsport, machine building, energy technology, medical technology, defence and other industrial applications.

AMF image directory, Fellbach. AWB M&H CNC Technik



Image no. 142-01 AM_AWB-MH-3D-Metall.jpg

50 damper mountings for Formula racing cars, manufactured using 3D metal printing, can be removed individually for further process steps thanks to AMF's modular substrate clamping plate. The zero point always shifts along with it.

©Image source: AMF



Image no. 142-02 AM_AWB-MH-Substratspannplatte.jpg.

The patented AMF substrate clamping plate measures 248 x 248 x 23 mm and contains 25 zero-point interfaces.

©Image source: AMF



Image no. 142-03 AM_AWB-MH-Modul.jpg

The printed workpieces are removed individually using the substrate plate segment and positioned in the subsequent machines for the next stages of the process. That is where size K5 pneumatic zero-point clamping modules from AMF are located, providing repeatable and reliable clamping with an accuracy of less than 5 micrometres.

©Image source: AMF

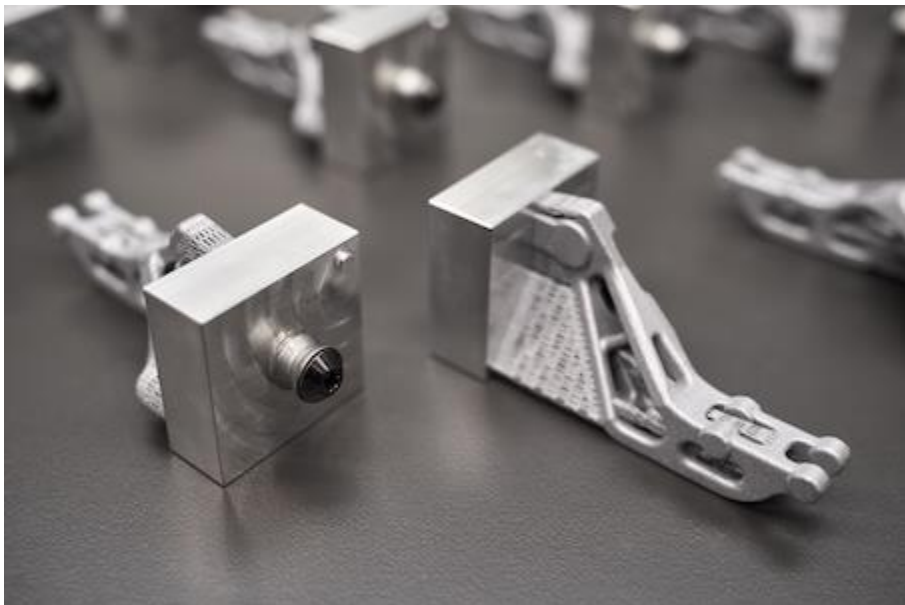


Image no. 142-04 AM_AWB-MH-Werkstück.jpg

Each segment contains zero-point pull-studs of size K5. This allows immediate further processing after 3D printing without needing to calibrate.

©Image source: AMF



Image no. 142-05 AM_AWB-MH-Fräsen.jpg.

Thanks to AMF zero-point clamping technology, milling operations on the 5-axis machine can begin immediately, without the need to calibrate the component.

©Image source: AMF



Image no. 142-06 AM_AWB-MH-Druck.jpg

Since the components are removed individually and transferred to the subsequent processes, there are no interfering contours that could impair 5-axis machining.

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Image no. 142-07 AM_AWB-MH-.jpg

After machining, the workpiece retains its zero point on the measuring machine and can be clamped in place straight away.

©Image source: AMF



Image no. 142-08 AM_AWB-MH-Platte-in-Maschine.jpg

A workpiece is produced using metal 3D printing on each individual, separately removable segment.

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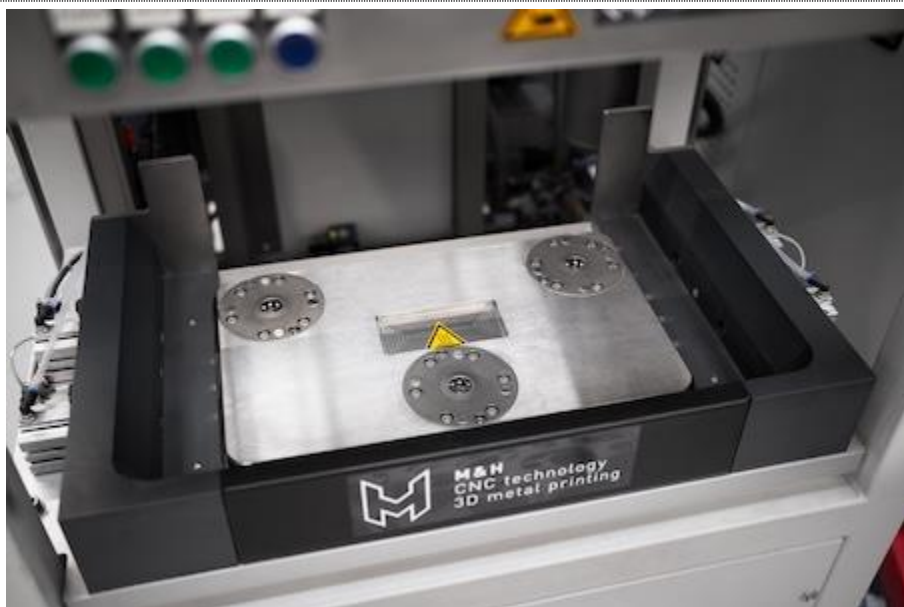


Image no. 142-09 AM_AWB-MH-ZPS.jpg

AMF zero-point clamping modules are also installed in the base plate of the 3D printing machine. An additionally available adapter plate allows flexible installation on different drilling templates of 3D printing machine tables.

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Image no. 142-10 AM_AWB-MH-People.jpg

Managing Director M&H Patrick Herzig (left): "The segmented AMF substrate clamping plate with defined zero-point interfaces makes our processes completely end-to-end and, above all, even more efficient during the transition from one post-processing stage to the next following 3D metal printing."

"Our patented AMF substrate clamping plate, combined with the zero-point clamping technology, drastically reduces set-up times in 3D printing and makes all processes straightforward from end to end," emphasises AMF's Chris Vogel (2nd from left).

Philipp Schwemberger, Head of Additive Manufacturing at M&H (right): "As well as saving time, we also benefit when it comes to milling. As the components are passed on individually to the subsequent processes, there are no interfering contours that could affect the 5-axis machining."

Roland Mittendrein, Production Manager at M&H (2nd from right): "In addition, we can dispense with additional clamping lugs, which were previously required for further processing and later had to be removed again.

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