MAKA

INFO 06

CNC Spezialmaschinen

Dr Jens Muckli and Klaus Kern, Managing Directors

Flexible MAKA technology for high-quality material mix

The list of products that can be manufactured from plastics and composites is long. On the other hand, there are only a few leading CNC machine manufacturers for these materials. One of them is MAKA Systems. We have been involved in lightweight construction for over 60 years, and have long since established ourselves as a leader in this sector. Apart from the quality of the machines, MAKA customers particularly appreciate the "exchange at eye level", as one customer phrased it. MAKA provides ideas for the lead over the competition, and when it comes to service, always gives the feeling of being "just around the corner". And that is rewarded by the market. We are particularly proud of our references in key industries such as aerospace or automotive. But other customers looking quite simply for precise form milling on a stand-alone solution also benefit from this experience in the networked high-tech sector.

Our high-performance 5-axis centres prove themselves in the machining of a boat hull measuring 50 x 6 metres, but also during drilling with a precision of one-tenth of a millimetre in a delicate honeycomb structure. Around the table with our customers, we are happy to develop full-line solutions ranging from individual machine technology through intelligent workpiece handling right up to sophisticated tool systems. When it comes to plastics applications, we attach particular importance to specially designed extraction systems and tool cooling. Health & safety and environmental protection are just as optimally integrated into our projects as the gentle handling of the workpieces.

In this latest MAKA Info, we give you a taste of just what is possible with MAKA CNC technology. And, of course, the experience that our customers have gained with our solutions. If you have a special application, don't hesitate to contact us. We look forward to every new challenge.

Title photo:
MAKA perfection in detail is particularly called for when it comes to complex medical components (here: meta-technik®)

Ambitions need MAKA know-how

Stephan Konstanzer: From garage company founder to pioneer in the plastics industry

Going beyond the horizon

The patented bbq-donut® party boat is not necessarily typical of the meta-technik® product range. But it is symbolic of Stephan Konstanzer's practically boundless world of plastics. The successful company boss shows his customers every day just what is possible with thermoplastics. MAKA Info spoke to him.

MAKA Info: Mr Konstanzer, just a few words to start about bbq-donut …
Stephan Konstanzer: We concentrate predominantly on finished parts and assemblies made from technical plastic intermediates. But under the trade name Artthink we also market other products such as the boats designed and manufactured by us. They are equipped with a fixed charcoal barbecue and offer party fun on the water for groups. Sales are very positive worldwide. Even a number of heads of state own a bbq-donut®.

MAKA Info: Apart from statesmen – who else are your customers?
Stephan Konstanzer: We supply the industry with technical plastics in the field of finished parts and assemblies. As we offer not only modern vacuum forming but also an extensive range of machining operations, including rough machining with subsequent assembly, we are active in a wide range of fields – from medical implants, through motor vehicle interior and exterior parts right up to mobile toilet parts.

MAKA Info: What are the company's particular strengths?
Stephan Konstanzer: Through the wide variety of materials – we offer around 170 in the meantime – and the exceptional manufacturing depth, we have gained ourselves a leading position in the German plastics processing industry. At the same time, however, we are not a classic plastics processor that produces according to a model. Instead we consider the plastic material in its entirety. Statistically we develop or manufacture around 30 new articles of varying complexity every day. We wish to accompany the customer in the long term and become involved when we see a possibility of achieving significant improvements in the finished product. With meta-pro® we have a special optimisation tool for substitution of the existing material. In doing so, we often push back borders that no-one has dared to touch in the past.

MAKA Info: How can we imagine that in practice?
Stephan Konstanzer: Many of our customers want to make their prod-

ucts more competitive. They are faced with a situation where the product as such undergoes no revolutionary changes in its processes. The potential often lies in the moving parts. They are trimmed for shorter cycle times through the use of a modified material. These modifications can include improvements in the material properties, e.g. improved wear resistance or longer service intervals. Weight reduction also plays a major role. The modern materials also allow applications in higher temperature ranges and offer greater cost-effectiveness than conventional materials. Furthermore, our products often satisfy the demand for a modern industrial design.

MAKA Info: The development of substitutions no doubt involves a high financial input…
Stephan Konstanzer: We're talking here about plastics worth between 1 Euro per kilo and a few thousand Euros per kilo. When I spend a lot of money, I naturally make quite different demands on the material because it has to pay off. And that is exactly where our engineering know-how comes in. We offer a tailored package based on our material know-how that almost certainly makes us unique on the market.

MAKA Info: You work with an incredible number of materials. What demands does that make on a CNC centre?
Stephan Konstanzer: Our machines have to be universal, flexible and fast – and suitable for a wide range of applications. Short tooling times and precise machining with minimum maintenance are the goal.

MAKA Info: Why did you decide in favour of MAKA?
Stephan Konstanzer: meta-technik® and MAKA have been working together since the 1990s. We have several machines from MAKA of which even the first generation is still producing flawlessly. That says a lot about the reliability of the MAKA CNC technology. We particularly appreciate the outstanding business relations built on partnership with MAKA. Individual demands are implemented with a great deal of technical know-how and experience. The milling machines are very popular among our staff. A great additional bonus with MAKA is they react quickly to our individual wishes, allowing us to further successfully expand our position on the market.

Always at the party: Side panels, drinks bowl and seat inserts of the bbq-donut fun boat are milled on the MAKA MM 7t

MAKA Info: What products are manufactured on the machines?
Stephan Konstanzer: We manufacture widely differing parts on the CNC milling machines. We have both large numbers of parts for special medical applications, as well as numerous motor vehicle parts and general technical parts that make very high demands on tolerances and surface finish. The part sizes range from a few millimetres up to several metres. And by the way: The seats and shields for the bbq-donut® party boat are also produced using MAKA technology.

MAKA Info: You recently invested in MAKA technology again. What are the production goals of that investment?
Stephan Konstanzer: We have a total of six MAKA CNC centres. Two more are on order. We bought three machines with different configurations just in the last few months. The latest generation of MAKA milling machines purchased belongs to a strategy aimed at increasing our production capacity, extending the product range and boosting productivity with a further improvement in the quality standards.

MAKA Info: How satisfied are you with MAKA as partner?
Stephan Konstanzer: At MAKA you feel understood, and that is the basis for a good cooperation. You always feel that the MAKA service is "just round the corner", and therefore quick and easy to contact as well as competent. That is a great benefit, particularly with our three-shift production.

01

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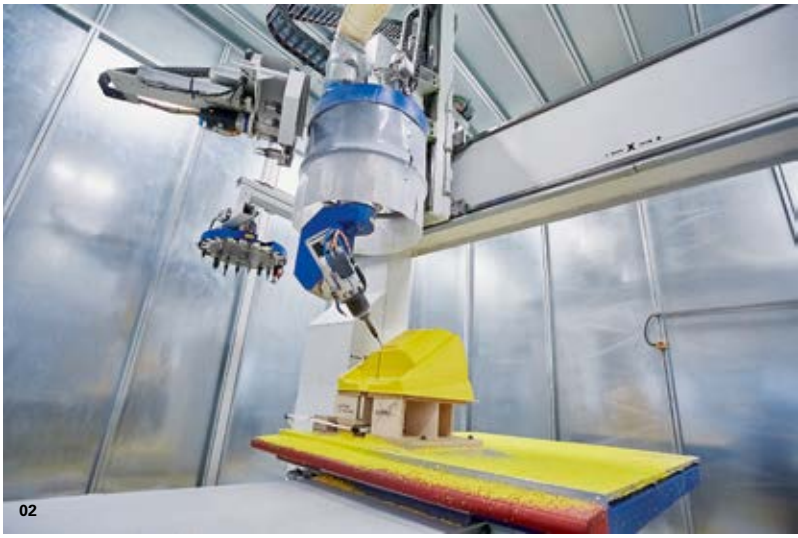

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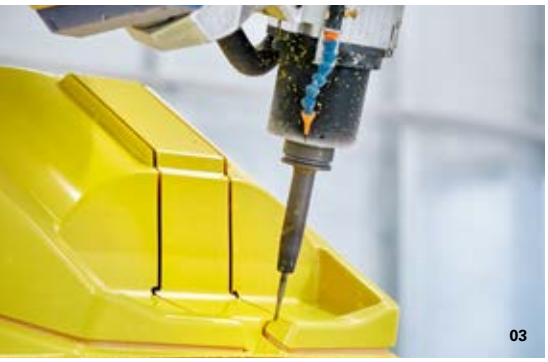
MAKA CNC machines for a vast array of demands



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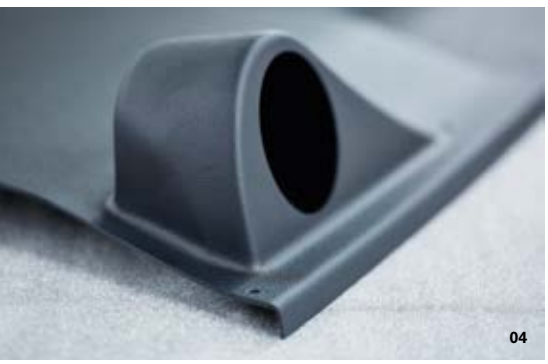

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Anyone who manufactures as many different products as meta-technik® needs a wide range of material cutting machines. The extensive MAKA portfolio is reflected accordingly in the company's production shop. Three compact MD 6 rotary table machines are used for small technical parts. In addition, there are two MM 7 table machines and a PM 270 sliding gantry machine, particularly for deep-drawn parts with larger dimensions. One of the MM 7s is characterised in particular by a flexible customised solution for tool changing: "Here we have combined two different demands, and as a result significantly boosted the efficiency of the machines," says Michael Meer, Sales Manager North at MAKA. On the one hand, the machine is used for post-processing of deep-drawn parts. There it is mainly a question of saving time. On the other hand, parts are machined on the same MM 7 where the priority is on convenient access to a large number of tools. MAKA solved the task by integrating two tool changer variants into one machine. A travelling 10-tool changer supplies the deep-drawn part post-processing unit with the required tool within seconds. In addition, a stationary changer with 20 tool places is available that provides sufficient capacity for the other application. A high lifting axis of 1,000 mm for the large parts completes the customised machine package.

Two further MM 7s will be delivered at the end of the year. The outstanding feature of the one machine are two 5-axis units. The other machine has only 3 axes, but six units. It is designed for high performance and can machine several parts at the same time. The new investment makes meta-technik® even more flexible in its production.

01
Tooling time killer:
The MAKA tandem table allows continuous production

02
Ready at all times: Two tool changers for different tasks

03
MAKA precision: In demand, for example, for the production of lawn mower components

04
MAKA precision: Motor vehicle parts are also produced using CNC technology from Nersingen

"The trend in plastics is: Faster, more attractive and more cost-effective and this development is picking up more and more speed."

Company profile meta-technik®

meta-technik® was founded in 1991 by Stephan Konstanzer in his father's garage. The business idea right from the beginning was to optimise plastic parts for a very wide range of applications. Today, the self-made man generates an annual turnover of approx. 14 million Euros with his 150 employees at the main site in Hörstel. The company sees itself predominantly as a service provider for innovative product developments. The basis for this is the vast know-how of plastics and their behaviour in widely differing environments. meta-technik® shares this know-how with its customers as part of an R&D partnership. And a dedicated brain trust has been established for further training purposes with the "meta-akademie®". The production is divided into the competence fields deep drawing and machining. The company regularly invests in the most high-performance machines on the market.

Beverage can lid feeder

Fascinating product world

Flow sensors

Medical implants

Valve technology

Inspired by the local region

Bücker Kunststoffe from Emsdetten is a classic supplier. Products and customers are a part of Northern Germany. The company found the reliable CNC partner needed for its high-quality production in MAKA.

New flagship: The "L" model is the top model in Bücker's horse box trailer product segment

“We get first-class support here from MAKA Service.”

Emsdetten is located in the Münsterland, not far from the Dutch border. Anyone who lives here has a special bond with agriculture and equestrian sport. Strong breezes signal the proximity to the North Sea – and keep the wind turbines on the horizon turning. And this background is reflected in the business segments of BKT Bücker.

Impressive growth

When father Bücker became self-employed in 1976, his first customer came from the horse box trailer sector. Today the production of trailer mudguards is an important mainstay of the company now headed by Tobias Bücker. In the meantime, a complete proprietary product is produced and marketed under the “Careliner” brand. Other fields of business are the production of caravan components and machine housings. In addition, the company has made itself a name in the renewable energies segment, producing i.a. nacelle housings for wind turbines. Organisationally, the company has grown in the meantime into a group. It includes the administration of Bücker Kunststoffe and BWH Bücker Kunststoffe GmbH & Co. KG, BKT Bücker Kunststofftechnik GmbH, RC Umwelttechnik GmbH and Bücker Trailer GmbH. The plastics specialist currently has some 300 employees at several sites in Germany.

A dusty affair

BKT Bücker processes exclusively GFRP. The raw material, unsaturated polyester resin, is delivered in tanks or drums. After the addition of glass fibre matting and hardening agents, the material is pressed as a laminate into a negative mould. The GFRP part produced in this way is subsequently formed on the CNC machine. The workshops are dusty places. That is why the three MAKA MM 7t stationary gantry machines at the Heek site are completely enclosed. A sophisticated integral extraction system ensures the thorough discharge of the dust produced during CNC milling. An important role is played here by the MAKA MTB system directly at the milling head.

Continuous expansion of the production

The first MAKA was purchased in 2004 during a move to a larger production facility. It replaced a number of smaller CNC machines

01


02

03

01
On course for growth: The main works in Heek has already been expanded several times

02
Sophisticated series production: These panels for agricultural machines are milled on a MAKA

03
That’s quality: Michael Meer, Sales Manager North at MAKA, and production manager Jürgen Rosing are satisfied

01


02

Each MAKA solution is characterised by an individual concept

whose tables were no longer large enough for the product range. BKT Bücker jumped at the opportunity and decided in favour of the tandem table version with extension stroke. The benefit lies in the avoidance of tooling times. While the part on the one table is being machined, the other table is loaded. The extension stroke allows the table to be loaded completely outside the cabin. This allows better access to the table, for example when large parts have to be pressed manually onto the fixture. Linked together, the two tables have cubic dimensions of 3.5 x 5 m. The z-axis of 1,200 mm was selected very generously in order to be able to handle, for example, the front panel of agricultural machines.

The second MAKA MM 7t followed in 2008. Only a sturdier milling head was selected because the trend was to more model making. Otherwise the configuration was the same. "A sign of our satisfaction," says Managing Director, Tobias Bücker. The satisfaction of the Heek-based company with the MAKA technology obviously continued, because a third MAKA MM 7t followed in 2015; in the meantime, the company was producing increasingly larger parts. For this reason, the third MAKA has a z-axis stroke of 1,700 mm. "We can now reach more customers and have become more flexible," emphasises Tobias Bücker.

Impressed by MAKA

BKT Bücker makes full use of the flexibility of the MM 7t during day-to-day production. The complete cubic dimensions are needed for the trimming of large parts or the milling of models. The prototype of the "Careliner" was also produced by this method. The clever shuttle table technology, on the other hand, is used for series of smaller parts as it enables uninterrupted production. Travelling magazines with 10 places are used in both cases for tool changing.

Operation in up to three shifts poses no problems for the three MM 7t. "Apart from the changing of wear parts, we have so far never needed to call on the assistance of MAKA," says a delighted Tobias Bücker. In addition to the efficient technology, the managing director is particularly pleased with the price/performance ratio offered by the MAKA machines. His experience with the first MAKA had already convinced him of the high productivity: The caravan front sections previously requiring 3.5 hours of manual labour can now be machined on the CNC special machine in just 0.5 hours per part using the two-layer process. With lot sizes of 100 - 120 parts per year, the pay-back was achieved after just six months. He has good recollections also of the service. "We get first-class support here in the North," he says.

03

04

01
Ideal for large parts: Coupling of the two tables allows the production area to be doubled

02
Tidy edges: The MAKA machines are also used for trimming

03
Perfect appearance: The mudguards of the trailer look classy. With the help of MAKA

04
Day-to-day business: The blanks for the mudguards are produced in a negative mould

05
Perfect form: Machine housing as an aesthetic highlight. MAKA CNC technology makes it possible

05

The digital

01
Philip Häussler,
Programmer
02
Rolf Gräßle,
Programmer
03
Alexander Hiller,
Project Management
04
Zuran Jonuzi,
Hardware Designer
05
Peter Schäch,
Team Leader and
Programmer
06
Christian Römer,
Hardware Designer

challenge is growing

5-axis CNC machines contain a great deal of electronics know-how right from the start. It goes without saying that highly qualified specialists are involved in this at MAKA. Alongside the IT department, the electrical design engineering department ensures that even the most complex routines function smoothly on the customers' machines.

Team leader of control and electrical engineering is Peter Schäch. He has already experienced many a digital storm in his more than 20 years' service at MAKA. The changeover to 840 D, the digital variant of the Siemens Sinumerik controller, sticks particularly in his mind. The latest version is standard today at MAKA. At that time, however, it was initially developed for tests on a small single-table machine. Peter Schäch and his colleagues were just taking their first steps when the "worst case" occurred. An extremely challenging project suddenly came up, and with it a tight deadline. The team managed it. That is a real character test. And it makes a team strong. Peter Schäch has needed that strength often enough during a career rich in innovations. It is important for him that he can rely on a good team.

Strong team

The department headed by the keen outdoor sportsman has five workstations. Two colleagues are responsible for the circuit diagram engineering. Three others, including himself, prepare the software for the MAKA machines. The PLC software for the periphery of the machine is developed by the team completely in-house. It includes all the functions outside the CNC, such as the tool changing and in some cases also the tool management. The interface to the CNC also has to be configured. The team writes the software specifically for each project and makes changes at the customer's request. The in-house electrical design engineering department works closely together with IT. While the Schäch team is responsible for the connection and communication via the normal system controller, the IT colleagues handle the PC connections and the data exchange. Their responsibility in particular is the high-level language development, i.e. they focus on the Windows-based programs. The two teams work closely together particularly for applications in which the machine is interfaced to SAP.

Wide range of duties

Peter Schäch's day starts with the checking of his e-mails. If there are no urgent calls, he prepares the software for the current machine projects. At 9 o'clock every morning there's a permanent appointment – the meeting of the management staff in the workshop – where he meets the colleagues from production, design engineering, service and applications engineering. The group discusses projects and looks to find answers to problems. Purchasing is also represented, because bottlenecks in part procurement can easily threaten the punctual completion of a project. Peter Schäch generally comes out of the meetings with a few more challenges. His tour then often takes him into the assembly shop where he is responsible for the software of the machines under production. His schedule also includes appointments out-of-house. He has to go to Austria tomorrow, and a week later to Barcelona. "In complex machines, existing components often come from different manufacturers. We are then sometimes criticised unjustly and the search for the real cause of the fault can often be difficult," says Peter Schäch. But in most cases the team is able to solve the problem fairly quickly. "There are good reasons why MAKA technical competence has such an outstanding reputation worldwide," says a proud team leader.

Close ties to the customer

He has established personal contacts to many of the customers. That is not surprising, because the relationship generally lasts from the project planning through the "whole machine life". When complex machines are involved, Peter Schäch and his team are on site right from the commissioning. Later they are on hand when modifications or modernisation measures using the MAKA Retrofit system are called for.

Growing level of automation

One feature of modern machines and systems is their high complexity. That is due in so small part to the many automated processes finding their way into the machine technology. "That is the biggest challenge for the coming years," says Peter Schäch. For him and his colleagues, that means more interfaces, more data exchange, more log files. These have to be kept particularly for safety-relevant parts. For example, the criteria for good part / bad part have to be defined, parts have to be rerouted or marked as barred. The tracking of the parts that is being employed in more and more systems also makes high demands on the electrical engineering. Industry 4.0 sends its regards!

Permanent atmosphere of change

Peter Schäch sees the development calmly. Although the challenges grow with the digital world, it does at the same time result in new tools that make the work easier. Most recently it was "virtual commissioning". Peter Schäch was involved from day 1 and trained on the MAKA trial machine in Renningen. The "digital twin" is already being employed in customer projects in the meantime. At the moment during the installation of a system for a leading door manufacturer. "The simulation of the routines in advance accelerates commissioning and will soon become standard in our production," enthuses Peter Schäch. He is used to his professional world changing at a startling pace. And he's already looking forward to the next challenge.

THE MAKA SUCCESS HAS NUME FACETS.

WHAT CUSTOMER SAY ABOUT US.*

* The quotations can be found either in this issue of MAKA Info or in issues 2 to 5.

"You always feel that the MAKA service is "just round the corner", and therefore quick and easy to contact."

"At MAKA there's always someone with a good idea and an individual solution."

"The reliability of the MAKA machines is quite simply perfect."

ROUS

"Even the first generation of our MAKA machines is still producing flawlessly."

"We particularly appreciate the outstanding business relations built on partnership with MAKA."

"For us it was important that MAKA is a German company."

S

"With the MAKA design engineers, we have partners who get the best out of our ideas."

"With the new machine, the non-productive times are heading towards zero."

"When you see that we have bought three machines, we don't really need to talk about quality, do we?"

"MAKA was the only company able to meet our demands."

"The machining quality is very good and the productivity high."

"MAKA technology is simply more flexible."

"It wasn't a question of the cheapest offer – we wanted the perfect solution."

"With the configuration, we have come a major step closer to the goal of digitisation of our process and plant engineering."

"The MAKA service is worlds better than that of other suppliers."

"There are very few suppliers of special machines on the market who can offer what we need. With MAKA we have taken a good decision."

"We have been able to see an increase in productivity of 15 percent."

"In this constellation, the MAKA machine is far superior to everything else on the market."

"We have a very high level of availability with the MAKA machines."

"The cooperation with the MAKA technicians is a meeting on a technically equal footing."

"We enjoy working with MAKA."

Aerospace: Global

When an Airbus takes off from some airport somewhere in the world, there is a high probability that MAKA know-how is on board. MAKA is one of the few CNC specialists worldwide who have established themselves in the aerospace industry. Suppliers rely on MAKA solutions when it comes to meeting the high standards of their clients. The trumps of MAKA here include in particular many years of CNC experience, the ability to develop complete customised solutions and the innovativeness needed to convince the major players.

01
Less noise: Perforated insulating panels keep the noise level in the engine down

02
Flying sandwich: The brake flaps are made of several composite layers

Aerospace is an industry with the very highest standards. And the same applies to the demands imposed on the partners. MAKA has enjoyed the confidence and trust of the industry for many years. One guarantee for this is the outstanding competence in CNC composite machining.

MAKA references

Vast array of demands
A very wide variety of materials are used in the aerospace industry, from aluminium through to composites. Low weight is the central criterion. The demands on the CNC machining, on the other hand, vary widely. Abrasive, thin components call in particular for excellent part handling. Honeycomb structures such as those used in engine cowlings and cabin interiors need the highest precision tool control. The CNC machines have to be able to handle dimensions from small to large with the same precision. And, of course, the productivity of the machines must not suffer as a result. That means perfect automation with high throughput rates. The heart of this system are high-efficiency controllers. MAKA Systems has the integrated and comprehensive high-level solution: Machine, automation and tool system all come from a single source. As a result, the customer can count on maximum process reliability – and that with highly customised solutions for which MAKA is renowned.

Short cycle times for high demands
When the drill produces a hole in a CFRP panel with a cycle time of 0.6 seconds, a great deal is demanded of the machine technology. When the finished part is then installed in the cowling of an aircraft engine, absolute precision is the order of the day. Here, too, MAKA has developed a solution that satisfies the customer. The machine with its 12 synchronised drilling spindles has been in operation with a renowned European manufacturer of aircraft parts since 2014. It is used to drill 50,000 holes per m^2 with a hole spacing of 4.2 mm in thin acoustic elements of CFRP – reliably and at an incredible speed. The MAKA technicians developed floating bell and air cushion especially for the hold-down devices of the spindles in order to avoid scratches on the abrasive surface. The spindle technology was integrated into the system by the customer. A synergy solution that cuts costs.

Secure gripping of large components
MAKA production technology is used in the aerospace segment also in Asia. An integrated and comprehensive high-level solution for the production of small quantities down to batch size 1 is used in the works of a Taiwanese aircraft and component manufacturer. One highlight is the automated jig management. In practice, this means the handling of components with weights of up to 3 tonnes. The MAKA solution is based on two interconnected BC 150 machines. Powerful feeding and efficient control ensure optimum management of the jigs weighing up to 3,000 kg. One of the challenges is the changing of the around 60 jigs. This enormous number is required for the handling of the many different parts produced in very small quantities. For this application, MAKA developed a rack system from which the jigs can be fed to the machines automatically.

Absolute precision and minimum tolerances
Honeycomb structures with their benefits for stability and material use today account for over 50 percent of the structure weight

MAKA aerospace competence on board

in aircraft construction. Apart from the outer shells and partition walls inside the aircraft, honeycomb structures are also used in engine cowlings. Extreme differences in temperature prevail here, leading to the formation of condensation. A groove is therefore milled in the honeycomb chambers through which the water can drain off. For this, the tool has to mill a large number of defined grooves at intervals of just a few centimetres in the ridges of the honeycombs that are only a few tenths of a millimetre thick. One challenge for MAKA was the exact control of the individual honeycomb segments. A camera-based recognition process was therefore selected. The system was developed together with Leuze electronic. The camera first scans the honeycombs and transmits the exact coordinates to the machine. The exact machining positions are then transmitted to the milling spindle.

Packaged performance

MAKA has long-standing business relations with a German producer of interior linings for aircraft. A MAKA CNC machine is used here for the exact cutting of the deep-drawn, laminated composite parts. Vacuum clamping fixtures ensure that the roughly 1 metre large parts are held securely. The customer was particularly impressed with the speed of machining, the short tool times of the machine and the high efficiency of the solution. The MAKA MM 7t employed allows work to be carried out on two tables simultaneously.

Innumerable variants – innumerable possibilities

The MAKA CNC machining centres are intended predominantly for use in cutting, drilling and finishing. The outstanding feature is the very high machining quality with maximum dynamics. The

Various 5-axis concepts are available at MAKA for use in ambitious CNC projects in the composites sector. They form the basis for customised solutions for which the customer alone defines the limits.

01

02

The basis for high demands: With its sturdy body, the MM 7 stationary gantry machine stands for precise machining and reliability. The travelling tool magazine ensures quick tool changing. The optional tandem table offers high flexibility. With 2-unit configuration, in-parallel 5-axis machining is possible.

01
Precision and speed: The drilling unit operates with short cycle times

02
Copied from the bees: Honeycomb structures are very popular in lightweight construction

various unit configurations allows MAKA to meet the customers' different requirement profiles. The optional installation of a tandem table reduces the auxiliary process times for the loading and unloading of the work pieces. The two tables can be coupled for the machining of large components. The MAKA vacuum technology is a particular bonus for the jig management. Pneumatic, hydraulic and mechanical clamping methods are also available, depending on the customer profile. On request, a travelling tool magazine ensures that the tool is always available at the point where the machine is working at that particular moment. Controlled protective roller shutters separate the machining area from the loading position and thus ensure a high standard of occupational health and safety. The machine can be completely encapsulated.

On course for MAKA 4.0 with intelligent controller concepts

All MAKA machines employ the latest generation of the Siemens 840 Dsl or the BWO 910-RC controllers. As an open system, the new Siemens Black Line control system, in particular, offers an ideal basis for Industry 4.0 applications. MAKA has already completed such projects. The heart of such a MAKA 4.0 solution is the MAKA host computer that acts as communication manager between the order management system and the control system. It is sufficient to send information to the machine in order to start the production process. The machine then prompts the loading of the corresponding tool. Chip code-monitored clamping jaws and self-optimising NC cross bars are practice-proven examples of the possibilities offered by MAKA 4.0

It has to be a MAKA …

Lightweight construction competence has a long tradition at MAKA. The portfolio includes a range of CNC machines offering particularly good preconditions for the processing of plastics and composites. Whether flexible down to lot size 1 or series production with high output – MAKA has the right solution for every demand. All machines have features geared specially to the material to be processed. For example, the unit cooling system with ionising blowing air nozzle. It ensures the removal of statically charged plastic chips, thus preventing them from becoming deposited and melted on the workpiece. The MTB system mounted directly on the spindle, on the other hand, contributes to achieving extremely long tool lives. A wide range of customisation possibilities are also available. That applies to both the units and the tables, the tool and the automation system. Each machining centre can be equipped optionally with the latest generation of Siemens controller or with a BWO control system. The MAKA 4.0 standard guarantees simple interfacing to the customer's IT system.

MAKA BC 570

Sliding gantry machine, 2-unit technology for the highest machining demands, efficient machining of large parts, NC-adjustable chip collection system.

MAKA MM 7

Stationary gantry machine, ample work area for medium to large components, quick tool changing thanks to travelling magazine.

MAKA BC 150

Sliding gantry machine, specialist for flexible machining, 2 units possible, removing the internal partitioning allows the machining of large components.

CM 27

Stationary gantry machine, particularly powerful unit technology, maximum machining flexibility thanks to large tool magazine, also as tandem table version for minimum non-productive times and highest productivity.

Publisher:
MAKA Systems GmbH
Am Schwarzen Graben 8
89278 Nersingen - Germany
Phone +49 (0) 7308/813-0
Fax +49 (0) 7308/813-170
zentrale@maka.com

MAKA International
Please find our
distribution partners on
www.maka.com

For further information,
please contact our
Head of Sales:
Rolf Röhm
Phone +49 (0) 7308/813-275
rolf.roehm@maka.com

Conception & realisation
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