



Connect

04

December
2023



ALWAYS PRECISELY IN MOTION

The MiniTec linear technology
system

___ page 20



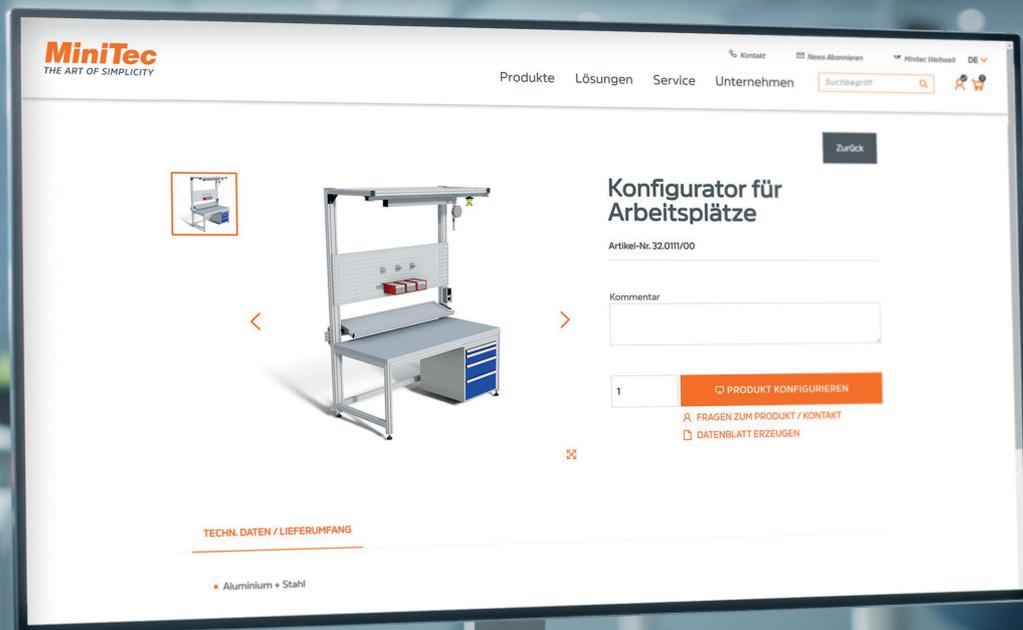
TINY HOUSE ON WHEELS

Do-it-yourself vehicle fitout

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ACHIEVING THE GOAL WITH AI: SORTING SYSTEM FOR GOLF BALLS

___ page 10



Easier access to required product:

The **MiniTec** website has practical configurators with which you can easily compile and enquire about more complex products. They cover the following topics:

- Workplaces
- Conveyor belts
- Linear axes
- Adjustment units
- Sliding guides
- Steel shafts

Use the configurators to specify your required product conveniently, step-by-step. Logical relationships and plausibilities are naturally considered. If your product configuration is finished, simply place it in the shopping basket and send an enquiry. A summary in PDF format and the corresponding CAD drawing are available to you automatically. And to save you even more time, previous configurations can be requested again at any time.

When will you discover the art of simplicity?





DEAR READERS,

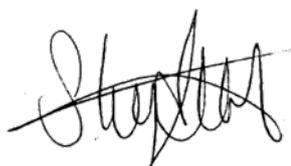
As a machine and special systems builder, we are active in two directions, as it were: In machine building the challenge is generally to develop machines that to some extent have already been built once or more often. The requirements are similar. The situation is different in special systems building: here the customer defines a specific task, and our designers must find a solution for it. This generally differs from the previously built machines and systems: hence the name “special systems building”.

As we have been active in both areas for a very long time, our engineers have accumulated plenty of knowledge from highly diverse sectors. Yet there are also limits to this. And it also often makes little sense to reinvent the wheel. In such cases we work with specialised partners from different sectors.

A good example of how such an approach is successful and the astonishing developments that result is demonstrated in the project involving a sorting system for golf balls, which we have described from page 10 in this issue. What initially almost sounds both technically and economically mundane has a concrete background. After all, millions of used golf balls accumulate on golf courses. Most of them are in a usable condition and can be easily returned to play. They naturally have to be tested and sorted first. This is very time-consuming if done manually. As a special systems builder working with a proven partner, we developed a very interesting machine which, among other things, unites optical testing and identification with artificial intelligence and conveying technology. This shows that we are also able to realise very unusual requirements.

Ask us if you want to solve such a task.

Yours
Sandra Geyer-Altenkirch



Managing Director

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ACHIEVING THE GOAL WITH KI – SORTING SYSTEM FOR GOLF BALLS

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ALWAYS PRECISELY IN MOTION

MiniTec offers an extensive linear technology portfolio with precision shafts, rail guides, drives and fully assembled linear modules. All elements are grouped together in a modular system. This ensures fast selection and perfectly matched components.



AROUND THE WORLD BY TINY HOUSE ON WHEELS

To travel around the world in a motorhome some day: a couple makes this dream a reality. The base vehicle is a Steyr truck, which is converted into an expedition vehicle suitable for long-distance travel using MiniTec components.

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MINITEC AT TRADE FAIRS AND EXHIBITIONS IN 2024

In the new year 2024, MiniTec will again be represented at the most important trade fairs of its industries and at its own events at which it will present its solutions.



all about automation, Hamburg

The theme of the regionally focussed trade fairs for industrial automation is systems, components, software and engineering for industrial automation and industrial communication. Our partner, the ISW company, will also be represented at the stand.

17 to 18 January 2024, Messehalle Hamburg-Schnelsen



MiniTec InHouse

A great success with staggering attendance in 2023, which we would like to continue in the new year. Everything worth knowing about new products and solutions, technical talks, practical demonstrations and tours of the premises.

25 April 2024, MiniTec company headquarters in Schöenberg-Kübelberg



New: MiniTec Future Day – Training Day, with plenty of information for everyone who is interested in an apprenticeship or a “dual” (sandwich) degree course with the practical part at MiniTec.

25 April 2024, MiniTec company headquarters in Schöenberg-Kübelberg



RETTmobil 2024

International leading exhibition for rescue and mobility. We will be presenting solutions for the fitout of vehicles or the equipping of buildings based on the MiniTec modular system.

15 May to 17 May 2024, Messe Galerie Fulda



Abenteuer & Allrad, Bad Kissingen

This trade fair focuses on individual vehicle fitout, in particular, the possibilities for campers based on the MiniTec aluminium profile system.

30 May to 2 June 2024, Off-Road exhibition site, Bad Kissingen



112 rescue, Messe Dortmund

Trade fair for fire safety, rescue and civil defence. MiniTec will be presenting its firefighting technology industry solution for the fitout of vehicles or the equipping of buildings and workshops based on

the modular system.

5 to 8 June 2024, Messe Dortmund



Intersolar, Messe Munich

Worldwide leading trade fair for the solar industry. MiniTec has longstanding expertise as a systems producer for photovoltaics. Visit our stand and find

out everything about our modular and flexible production solutions for PV modules.

18 to 19 June 2024, Messe Munich

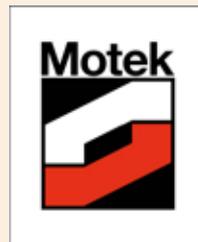


Caravan Salon 2024

Caravan Salon is an international trade fair for mobile holidays. The focus is on motorhomes, campervans and other leisure vehicles and their fitments. We

present solutions for vehicle fitout.

31 August to 8 September 2024, Düsseldorf, Am Staad (Stockumer Höfe)



Motek, Stuttgart

At the international trade fair for automation in production and assembly MiniTec will be presenting solutions for assembly, handling and conveyor technology.

8 to 11 October 2024, Messe Stuttgart



Florian trade fair

MiniTec will be presenting its firefighting technology solution for industry at the trade fair for fire safety, rescue and civil defence.

10 to 13 October 2024, Messe Dresden

An up-to-date overview of all trade fairs can be found at minitec.de/service/messen-events



BOOK: PROFILE SYSTEMS FOR MACHINE BUILDING

Profile systems are the backbone of machine and system building. Hardly any construction in factory halls can do without aluminium profiles. They consist of different shaped construction profiles (installation profiles), which are mostly made of an aluminium alloy, and elements with which the profiles can be stably connected. The most important quality criterion of a profile system is that it can be used as versatilely as possible with the smallest number of standard components and that all design and construction requirements are met. In a nutshell: a good profile system offers design freedom and application variety through standardisation. The central argument for the use of profile systems is the time saving. Planning and design times, delivery periods, assembly and

finishing times and periods of time spent on estimating and operations scheduling play an important role in machine building.

The MiniTec modular system has proven its worth in this respect and has demonstrated its reliability. But what are the special features of the aluminium material? What geometric and mechanical properties does it have? Which elements make up a modular profile systems? What connection technologies are there?

These and other questions are dealt with in detail in the book, "Profile systems for machine building", which MiniTec has now reissued. True to the motto "Everything you ever wanted to know about aluminium profiles", the reader will

find all important aspects of the topic explained on more than 100 pages. Software-based design aids are also dealt with, as well as typical applications and exemplary problem solutions are presented.

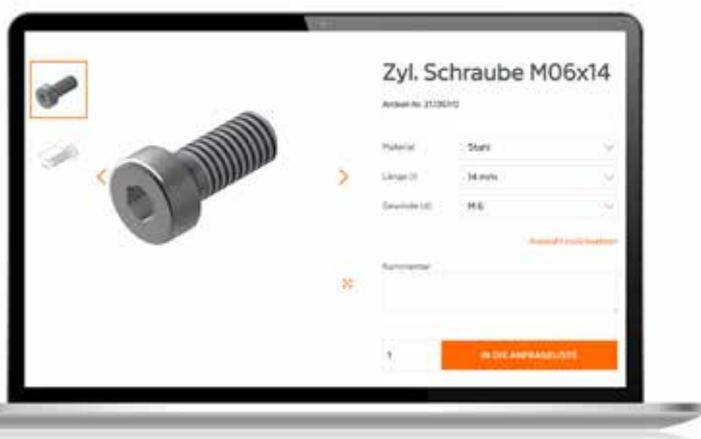


The book can be ordered free of charge at www.minitec.de/service/bestellformular-kataloge.

WEB: PRACTICAL FEATURES FOR THE PRODUCT RANGE

The art of simplicity is one of the most important underlying principles of the MiniTec website. We present two practical new improvements here: There are configurators for many items on the MiniTec website. These can be used to define the required product precisely to your own wishes. Until

now it was possible to re-enquire about already created configurations at a later date – however, unchanged. An option for duplicating and then editing previous configurations is now also available. Minor changes to an existing design can therefore be implemented quickly.



Selection menus for similar products: As a rule, items are displayed on the website individually. However, for certain very similar products it is more practical for the selection to make them compactly accessible via a menu with the possible properties. Precisely this has now been implemented. For cheese head screws, say, these characteristics are offered in a selection menu. The customer determines "their" screw and places the required quantity in the trolley. The new feature facilitates product finding and makes selection easier.

MINITEC BERLIN IN NEW LOCATION



As part of the MiniTec Group, MiniTec Berlin GmbH has been supplying companies and research institutes with components and solutions based on the MiniTec profile system for many years. The company is also an efficient partner for all aspects of machining shafts and machine components. Due to its steady growth, the company urgently needed to move into new premises.

Since 13 November 2023, MiniTec Berlin GmbH has been based in Berlin-Schönefeld. With a larger hall area of 1200 m² and an office area of over 200 m², the new premises offer significantly more possibilities. The hall has a production area of around 1,000 m², of which 200 m² is for assembly and 150 m² for mechanical production. The small parts store covers around 120 m² and the packing unit store has a good 170 m². The office area with a sales office, a design office and a conference room is also generously sized.

The new 5-axis Elumatec SBZ 122/75 machining centre also contributes to the expanded possibilities. Our company in Berlin is now independently able to offer and carry out complex profile machining promptly.

Top accessibility

Smooth logistics is also taken care of as, with three loading ramps, several trucks can now be loaded and unloaded at the same time. The general accessibility of the new MiniTec location is excellent, as it is in the Segro Park Berlin Airport

and thus in the immediate vicinity of the capital's new Berlin-Brandenburg airport (BER). The business park is located directly on the B 96a trunk road and, with the A 113 and A 117 motorways, offers an optimum link to the motorway network.

Last but not least, ecology and sustainability were also considered; the building meets the DGNB Gold Standard. Wooden beams are used in the production hall, all areas are equipped with modern LED lighting and there is generally plenty of natural daylight. The industrial park has beehives, insect hotels and nesting boxes for native birds.

“With our move we have created the conditions necessary for further growth at the Berlin location. We are pleased to be able to offer our customers along the Spree River even better service and an expanded range of services in future”, said Managing Director Sandra Geyer-Altenkirch. Works Manager Constantin Wernick added: “Thanks to the larger premises and the technical equipment, the company's new location also enables us to implement more complex projects independently on site – which benefits existing and new customers in equal measure!”



The new 5-axis machining centre enables complex profile machining.

The new address:

MiniTec Berlin GmbH | Melitta-Schiller-Straße 18 | 12526 Berlin

The phone numbers are unchanged.

TRAINEES ATTEND TRADE FAIR

The Motec international trade fair for automation in production and assembly in Stuttgart is a fixed date in the MiniTec trade fair calendar. This year, our first and second year trainees had the opportunity to visit our trade fair stand. An offer that they accepted enthusiastically.

For the trainees, there were numerous reasons for going to the Motek. On the one hand, they experienced the MiniTec trade fair stand and were part of the

trade fair team. On the other hand, on this day the trainees learned a great deal about the market, our products and the way in which they are presented.

The positive experience was confirmed by one of the participants as follows: "For the first time, we saw how many market partners there are in this industry. Through our discussions with customers and potential customers we were able to expand our knowledge in many areas."



For the first time at the Motek trade fair: the MiniTec trainees.

MINITEC FUTURE DAY – TRAINING DAY

Numerous opportunities are opened up for qualified young people at MiniTec: Whether in the technical environment as a mechatronics technician, industrial mechanic, metal cutting mechanics, cutting machine operator (machinist) or technical product designer or in the commercial area as an industrial clerk or marketing communications assistant – the options are diverse. However, the young people often lack the ability to picture what the individual occupations entail and what the training and everyday work at MiniTec are like.

Therefore, on Thursday, 25 April 2024, the "MiniTec Future Day" will take place for the first time. Here, from 14:00 to 17:00, talented young people will have the opportunity to

comprehensively inform themselves about the different training courses at MiniTec. Straight from the horse's mouth, as the current trainees will be actively involved and will pass on their experiences directly to the interested school students. The fact that the Future Day has been integrated into the InHouse trade fair and takes place on the same day makes the setting additionally interesting for the young hopefuls as, on this day, they are given the best possible overview of MiniTec's products, solutions and services.

Further info: minitec.de/future-day



MiniTec
FUTURE
DAY
DONNERSTAG
25/04/24
TAG DER AUSBILDUNG



ACHIEVING THE GOAL WITH AI: SORTING SYSTEM FOR GOLF BALLS



Lake balls are used golf balls, which are recovered from bodies of water on golf courses, recycled and then placed on sale again. The Easy Lakeballs company in Wiesbaden is specialised in doing exactly that. It engaged Meprovision and MiniTec to produce a system which sorts the balls by brand and type with the help of AI.

Every golfer is familiar with the situation in which an unlucky struck ball lands not on the fairway or green, but in the nearest water hazard. Many thousands of golf balls accumulate there very quickly, some of which have only been used once or a few times and can be in a flawless condition.

Especially in the USA and Great Britain, where golf is a popular participation sport and the golf course density is far higher than in Germany, vast numbers of balls slumber in the "lakes". Professional divers worldwide head for golf courses to retrieve these balls.

The Easy Lakeballs company in Wiesbaden has specialised in collecting, cleaning, sorting and then placing them on sale again. In this way, up to 3.5 million balls are reused. The balls are very popular, especially among low handicap players or beginners, as time and again, balls end up in the woods or back in a water hazard, particularly during their first rounds of golf, which can involve significant costs in the long run.

Manual sorting is time-consuming

Especially the sorting process, by brand and then by brand-specific types, is a very labour-intensive process. To counteract the prevailing labour shortage that also exists in this sector, in 2022, Lakeballs decided to scour the market for a solution to the task of automatic sorting.

POPULAR AMONG BEGINNERS AND LOW HANDICAP PLAYERS

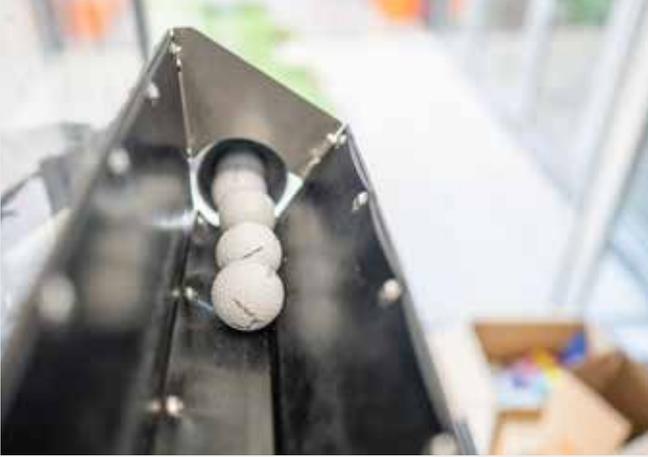
In the end it found the Meprovision company, a special solutions provider for optical testing and identification in the Saarland town of Dillingen, a partner to implement the detection part of the project.



Many golf balls lie in ponds and have to be retrieved by divers.



The system during the test run – a Meprovision employee fills it with golf balls. An automatic step conveyor will be used here later.



Inlet of the balls.



Further transport in the system and into the right tube by blowing nozzle.

50,000 IMAGES AS BASIS OF AI



A high-speed camera takes photos of the golf balls in different positions.

Automation solution requires AI

After very intensive study and long weighing up of the feasibility, it was clear that this project would only be able to be solved by using project-specific AI (artificial intelligence). In addition, there was the challenge of presenting the balls to the cameras so that the appropriate characteristics (brand or type information) also become visible with high probability. After finding the right product with Zebra Aurora Vision Studio for implementing the AI, it quickly became clear that MiniTec, as a longstanding partner of Meprovision, would be awarded the contract for the development and construction of the necessary automation technology and mechanics.

Working together, a transport concept was developed, which guides the balls along a rail with the help of a segmented conveyor. Three 12 MP colour cameras take nine images of each ball, from which the individual result for each ball is determined.

With this method, an AI was created based on around 50,000 images, which were taken for this specific project and were then trained in a time-consuming process. The system is thus able to identify around 20 brands and in turn, up to 30 different types for each brand.

Multistep process

The sorting process takes place in two steps. The balls, whose composition in each test job is completely unknown, are first sorted by brands. After the brand homogeneity has been ensured by this sorting step, the individual brands are then sorted by types, colours or type mix. The system has a total of 32 sorting positions plus an NOK outlet and is able to process up to 7,000 balls per hour.

The balls are ejected from the belt section via a tube system and are collected in different-sized container types. Thanks to an upstream ascending conveyor with a bunker volume of up to 15,000 balls, the system is able to work independently for somewhat more than two hours.



The challenge of type variety

The greatest difficulty associated with the task is the type variety itself within a class. For example, there are up to ten different logo versions to differentiate the Nike trademark alone. These differ in size and by their combination with other symbols. For this reason, identification of the logos using rule-based approaches is inconceivable due to the variety. An enormous effort is also necessary to train the AI, as the differences within the classes and the fact that there are many balls with logos and logo add-ons, which are not known, are incredibly challenging.

MiniTec design with numerous special features

MiniTec had to adapt the design and automation of the system to the particular task. For example, the conveyor belt has 88 screwed on cams to separate the golf balls during transport. As soon as a golf ball has been identified regarding its manufacturer and type, it is blown into the corresponding bin. To this end, each blowing nozzle is individually controlled (32 valves). The ejection point for unidentified golf balls is monitored by a sensor. This is used not only to count the "bad" balls, but also as overflow protection if the box is full and the balls can no longer be transported away.

Attention was also paid to the general handling and occupational safety. Thus, if necessary, the complete system can be moved manually by the lifting castors. Two sensor-monitored double-leaf doors are integrated for maintenance and servicing work. In addition, the machine has protection against intervention in the form of 5 mm thick transparent polycarbonate sheets.

System saves time and money

For the customer, use of the sorting system means enormous potential savings in the area of the sorting process and therefore a certain independence with regard to the personnel resources required. Meprovision continues to be responsible for system support, particularly maintenance and updating of the AI. Together with MiniTec, a highly individual solution was created for a very specific use case, which provides significant advantages for the customer.



The images are evaluated by AI.



System's control panel.



Variety in the ball bath – efficient sorting only possible with AI.

CONCENTRATED ASSEMBLY WITH PICK TO LIGHT SUPPORT



The U-shape of the system allows fluid, assembly in the team based on division of labour (task segmentation).

Kessel AG, working together with MiniTec, implemented a new assembly line for the production of a new product in Poland. A progress report.

Kessel AG in the Upper Bavarian town of Lenting has for many years stood for the protection of people and their environment from water damage and pollution. Kessel drainage solutions in more than 60 countries make sure that wastewater can be drained cleanly and safely. Among other things, the products include wastewater pumps. A new assembly line for the assembly of a new type of this category was built in the factory in Poland – with MiniTec as a partner.

Ten different wastewater pumps are assembled on the assembly line. The system is set up in a “U-shape” and includes ten workstations in total. Production takes place according to the one piece flow principle – with division of labour or task segmentation, which means that up to three employees assemble a pump on the system successively. It is also possible for different models to be produced on the line at the same time.

For this to be possible, all material must always be available for all pump types. And a pick to light system was implemented to make sure that errors do not occur during the assembly

WELL THOUGHT-OUT CONCEPTS FOR MORE ERGONOMICS AND EFFICIENCY

and that the employees always know directly which components they need at any one time. At the bins, from which the material is to be taken, LEDs

light up and constantly signal to the worker “this material is necessary at this station for this pump that I am now building”.

Traceability for every pump

To this end, each pump is labelled at the beginning by a laser. The label contains the serial number and a data matrix code with the respective type or model. At each station there is a scanner, which reads out the serial number and the type via the data matrix code. These data now form the basis for the pick to light control. At the same time, the system ensures clear traceability (“tracing”) of each pump produced. As all work content and tests carried out at the workstation are documented automatically, appropriately for the read out item and serial number.

Successful project execution

The tasks for realisation of the assembly line were clearly divided – the construction came from MiniTec, the programming and the work content in this case from Kessel. Kessel could also have made the construction itself, since the company has its own jig making department with five employees and a great deal of experience as far as the MiniTec modular profile system is concerned. However, for capacity reasons, in this case it was decided to bring MiniTec on board, said Tim Lehmeier, production expert and project manager at Kessel: “The implementation would not have been possible without MiniTec. We often do this when capacity bottlenecks exist.



Much importance was placed on ergonomics at the individual workstations.

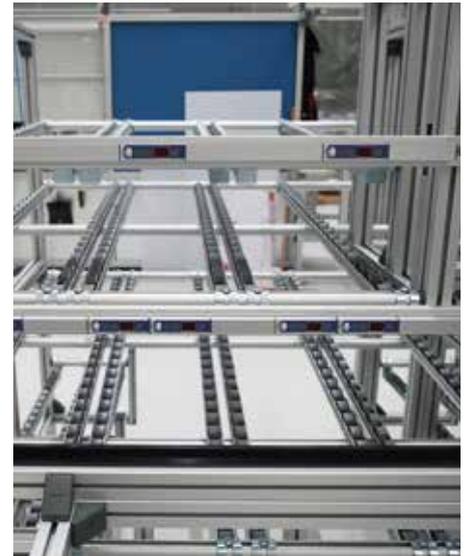
If there are too many projects at once or simply because it is sometimes more practical and faster via MiniTec. We therefore got MiniTec to make the basic structure for all workstations, including the material supply. Our own jig making department took care of the work content. I.e. everything involving the presses, assembly jigs and fixtures, riveting machines and other logic and intelligence aspects.”



Example of a Kessel AG wastewater pump.



The material is supplied via kanban bins on roller strips from the back of the workstations.



Pick to light strips indicate to the worker, which material they need for the pending assembly process.

Ergonomically thought out

Lehmeier is very satisfied with the how the project went: "The collaboration with MiniTec, especially Mr Trenz was super. There were a couple of challenges, for example, with the material supply. Because we build so many pumps at these stations and the material must always be there for all variants, we have a large lot of materials – via bin kanban – at the individual stations. The challenge was to accommodate them as ergonomically as possible so that the employees can always reach them easily. This is where MiniTec, with its experience, provided very valuable support."

MiniTec also provided the proposal for the transport system – a rail system with so-called angle slide strip. "We originally wanted to use roller strips", said Lehmeier, "but we liked the proposal, it isn't as loud, there is always a fixed position for the machining."

The extremely quick project progress – from the project start to the acceptance took barely five months – is a further indication of the good teamwork according to Lehmeier. The assembly line for the wastewater pumps will now be sent to Kessel AG's Polish factory, where the wastewater stations will be completely built. Apart from the pure pump line, there are two other stations there, where the final systems are built.

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ADVANTAGES OF THE MINITEC PROFILE SYSTEM



For the production expert Lehmeier, apart from MiniTec's know-how as a systems builder, its modular profile system also provides clear advantages: "We used to have five to six different profile manufacturers in the company and

at some time or other determined that this was bad, because nothing matched. And when we want to stock material, we have to concentrate on one. MiniTec convinced us with the best thought through concept and its unique connection technology. At the time, our jig building department therefore decided to only use MiniTec in the future, because we cope optimally with it."



BOOTH FOR OPTIMAL SOUND INSULATION

Active noise control makes a decisive contribution to a pleasant workplace in industry. With the MiniTec components and versions for industrial sound insulation, industrial noise can be reduced significantly, not only at the machines but also in production halls, and in recreation rooms and offices. A soundproof booth reduces noise significantly.

Wherever material is planed, chips are produced – and where nails are used, noise is emitted: A MiniTec customer built a system for one of their own customers, in which components are marked with a nail gun. The workpieces reach one side in the construction via a conveyor belt, are raised, marked, lowered and then conveyed out again on the other side. The noise generated by the marking device is enormous. MiniTec was therefore engaged to produce an effective soundproof booth. The result meets the requirements in every respect. The enclosure, based on the modular profile system, is completely clad with special acoustic panels (noise reduction



The booth can be completely opened at the front via two doors.

cassettes), which are available from MiniTec as a standard item and were adapted to the required dimensions. The external cladding consists of galvanised steel sheet, whereby they could have been coloured with powder coating or painting. Inside, a perforated metal sheet with mineral wool provides additional sound absorption. To eliminate vibrations, the profiles on the underside of the construction were fitted with a support profile made of rubber.

Optimum soundproofing

A fully-automatic workflow was implemented for optimum soundproofing. When a part on the conveyor belt arrives in front of the entrance, a signal reports this to the system. The vertical lift door moves upwards, the workpiece is carried in, the door then moves downwards again and closes the booth. The marking process now starts inside. After it is completed, the vertical lift door at the exit opens again briefly until the part has left the booth. To make sure that as little noise as possible penetrates the outside when carrying in and out, special brush strips are attached to the top and bottom of the openings.

Despite maximum acoustic absorption, MiniTec also paid attention to ease of maintenance. The enclosure thus has two swing doors at the front, which release the complete interior area. In addition, there are two maintenance panels at the rear, which can be removed if necessary, if anything cannot be reached from the front. Furthermore, the booth has a shelf for keyboard, mouse and other controls and a fixing angle for screens and the power electronics.

More info on suitable products can be found here:

- 1 minitec.de/produkte/schutzsysteme/laermschutz
- 2 minitec.de/produkt/auflageprofil-45-nbr-schwarz
- 3 minitec.de/produkt/buerstenleiste-30-45



TOOLS FOR THE PROFILE SYSTEM

With the MiniTec profile tools, users are provided with a wide-ranging assortment of accessories, with which aluminium profiles and linear modules can be easily assembled. The tools are the perfect helper for installation, conversion, production, assembly and maintenance.

The groove openers play a special role. They enable efficient opening of closed grooves in MiniTec aluminium profiles, for example, for the installation of surface elements, the attachment of linear guides, etc. They are easy to use: Place the slotted end of the tool on the end of the profile on the groove cover and break it upwards by repeated swivelling. Ready.



The groove opener is a special MiniTec tool for machining closed profiles.

The resulting break-out is designed for the assembly of MiniTec power-lock fasteners. After assembly, the groove is closed with a cap.

Further info can be found at: minitec.de/werkzeuge

CALCULATING DEFLECTION

More than practical software: With the free app from MiniTec and their smartphone, design engineers, equipment builders and production planners can easily calculate load-dependent deflection of the aluminium profiles from the modular system. They can then quickly determine whether the profiles are correctly dimensioned for the static and point loading in a specific case – or not.

Correct design of the installed profiles is of fundamental importance for safe and fault-free operation of assembly lines, conveyor systems or workplace systems. Do the components withstand the loading and is the deflection within the tolerances or are they still within a suitable range for the application? Users can answer this question very easily for all aluminium profiles of the MiniTec modular system. To determine the deflection, the three most common load cases are calculated on the basis of several inputs: For the vertical loading of a profile fixed at one end (cantilever), for vertical loading applied in the middle on a profile simply supported at both ends and for a vertical load acting in the middle on a profile fixed at both ends. The app immediately shows whether the profile used has been selected correctly for the relevant application or whether the deflection is

above the allowable limit values – and therefore a stronger component from the current MiniTec modular system is the better choice. It is available for all smartphones with iOS or Android operating system.

Further info can be found at: minitec.de/service/software/durchbiegungsrechner



The free app from MiniTec calculates the deflection of profiles.

SMALL PART, LARGE EFFECT

Self-locking end caps are an important component part of the MiniTec profile system. They protect the profile ends effectively and thanks to the integrated locking pin, in the right place even under the most challenging conditions.

Profile caps for aluminium profiles perform important functional tasks. Because dirt and foreign bodies can penetrate unprotected profile ends. This can lead to hygiene problems or malfunctions, not only in sensitive environments. In addition, aluminium profiles sometimes have sharp-edged burrs – a potential source of work accidents. All this is prevented by profile caps: The profiles remain clean and protected, the risk of cuts is minimised. Last but not least, they also harmoniously round off the appearance of the aluminium profiles.

Simple but effective

However, in practice, it is annoying for users if the named functions are no longer ensured due to loose and falling out profile caps. MiniTec identified this problem years ago and supplemented its offer with self-locking profile caps. These are permanently anchored in the profile by an integrated locking pin. The connection produced in this way effectively prevents the cap from detaching itself from the profile. It therefore remains in the planned position, even under extreme conditions and the toughest exposure. Unsecured plug-in connections or time-consuming threaded fastenings, which were necessary to secure to date, are thus a thing of the past.

SELF-LOCKING END CAPS MADE OF PLASTIC AND ALUMINIUM

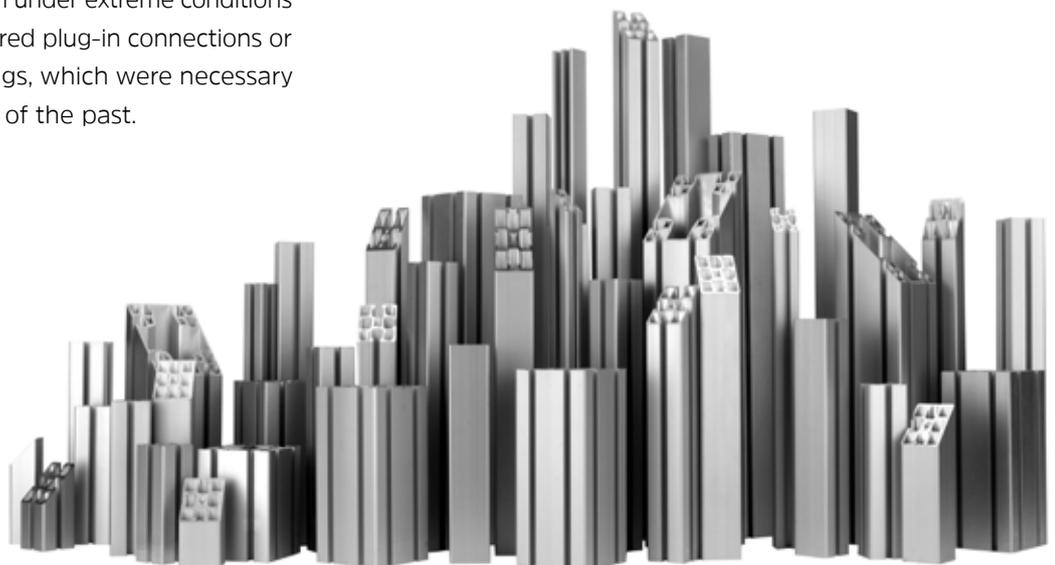


Available for all profile series: self-locking profile caps.

Firm hold without drilling

True to “The Art of Simplicity” motto, use of the MiniTec profile caps is extremely easy: The locking pin is knocked into the profile with a rubber hammer until it is flush with the surface. Drillholes or other machining operations therefore become superfluous. Nonetheless, the profile cap can be removed effortlessly: To do so, the locking pins are knocked through using a four millimetre diameter pin. Separately available replacement locking pins make the profile caps reusable. MiniTec thus achieves noticeable time and cost savings for the user.

The self-locking profile caps are available for all MiniTec profile series. They consist of grey, three millimetre thick ABS plastic and are ageing and oil resistant. Different models are also available in aluminium.





ALWAYS PRECISELY IN MOTION

MiniTec offers an extensive linear technology portfolio with precision shafts, rail guides, drives and ready-to-install linear modules. All elements are grouped together in a modular system. This ensures fast selection and perfectly matched components.

Linear technology undertakes central tasks in machine and system building: Linear systems convert drive forces and ensure movement. Low friction, precision and stability are the main elements that characterise the high-quality linear systems. When making their choice, the users of linear components and systems should therefore pay attention to the quality, easy combinability and fit of components of parts and their short-term availability. MiniTec has

been specialised in these requirements for more than 30 years. The linear technology system developed in-house is based on a modular system which, used in combination with the iCAD Assembler planning software, simplifies selection, procurement, planning and design significantly. MiniTec has grouped together the entire range of linear technology in an up-to-date and clear catalogue, which contains the extensive range of rail guides, ball

bearings, shafts, shaft supports and ball screws. It is available free of charge at www.minitec.de/service/downloads-katalogbestellungen.

The perfect shaft

MiniTec operates its own linear centre at its location in Waldmohr, which concentrates on conventional linear technology made of steel in the form of steel shafts, rail guides and also ball screws. An experienced team of specialists work with state-of-the-art CNC machining centres to produce the guides for the highest customer requirements. An extensive stock of precision shafts, rail guides and spindles in all commonly used diameters and materials and complementary linear ball bearings, housing units, shaft blocks and shaft supports are continuously in stock and enable fast response times. Numerous customers therefore value MiniTec as a dependable technical service provider, who ensures the shortest delivery periods.

From the linear module to the multiaxis system

All components of the MiniTec modular system are completely compatible with each other. Ready-to-install modules such as the LMS 90 or LMZ linear module serve as the basis of numerous constructions. The LMS 90 is intended for high accuracy and loadability requirements while at the same time requiring minimum installation space. It is designed for 2,800 millimetre travel. The modular system's guide with standard grid dimensions 90x90 millimetres is



The LMZ linear module is intended for high loads and accuracies.

based on high-precision rail guides, which are integrated in a profile system. The life is designed for a distance travelled of up to 10,000 kilometres. The LMZ linear module is intended for high loads and accuracies. These guides, with the same grid dimensions as the whole modular system, are based on high-precision rail guides, which are integrated in a profile system.

The MiniTec LB series guides are particularly suitable for strokes up to 1,000 millimetres.

The modular structure gives the designer complete design freedom with small space requirement.

The extensive modular system also includes high-precision adapters with which all linear axes can be combined easily and economically to form multi-axis systems. Tasks such as material handling, packaging, pick-and-place, material testing, marking or laser machining can thus be solved flexibly and precisely.

Ready to install components

The LR linear system offers ready-to-install components. This system is based on double-row profile roller wheels made of ball bearing steel and hardened precision shafts, which are made of material 1.1213 (CF 53). The guide shafts with 6, 12 or 16 millimetre diameters are fixed onto the system profiles of the profile system using a special shaft supporting profile. All shaft supports can be combined with all profiles so that the best solution is possible for every conceivable application. This system can also be used to implement very long guides. Required sensors can be fixed in the side grooves in the profiles and are easy to adjust.

**COMPLETELY
READY TO INSTALL
MODULES**

Small but excellent

Modern automation solutions require ever smaller and compactor linear guides. MiniTec covers these requirements with the MR miniature series. These rail guides are available from size MR 3 with a total height of only four millimetres. This series is available up to size MR 15 with 16 millimetre overall

height. All guides of the miniature series are made of low-corrosion stainless steel. The AR and HR 15 to 35 series are designed with replaceable slides for

larger loads and longer travel distances. These rail guides all have maintenance-free long-term lubrication.

Well planned, quickly implemented

MiniTec provides a free, practical planning and design tool for its customers with the iCAD Assembler software. With the system-neutral 3D planning tool for design, operations scheduling and assembly, components can be very easily configured independent of the CAD software and assembled via insertion points. The software operates independently of other programs and



The LW 90 carriage is composed entirely of profiles.

has direct interfaces with all commonly used CAD systems. It contains the complete component library and automatically generated parts lists and configurators for frequently occurring applications, such as workstations, linear axes, conveyor belts, roller conveyors or protective devices and guards. Use of the free software is worthwhile for the user: A plausibility check avoids errors in the planning and implementation and the time saving is more than 90 percent.



With the help of adapters, all linear axes can be easily and economically combined to form multi-axis systems.

MEASURING EXACTLY

The AOP tester is an optical measuring device built by ISW GmbH in cooperation with MiniTec. It works fully automated, measures and evaluate twelve product parameters within a minute and is non-contacting. IO products are fed back into production, NOK products are discarded and ejected. The technology can, of course, also be adapted to other needs.

Some measurement tasks not only demand high precision but also non-contacting measurement (pharmaceuticals sector, medical engineering, food technology), for example, if the human hand would cause contamination. If many parameters must then be measured in a short time and in a confined space, the task is very challenging. ISW GmbH has successfully solved these challenges with the development of the AOP testers (Automatic Optical Product Tester). The version illustrated can measure up to twelve parameters on a workpiece, some simultaneously. And does so with a very small footprint.

Use of small robots

This is made possible by using a highly precise small robot, which picks up the parts and feeds them to the various integrated measuring stations. After



A 6-axis robot with magnetic grippers supplies the measuring station with parts.

the measuring series is completed, the evaluation software decides whether the part is returned to the production cycle as "OK" or is discarded as "NOK".

At the heart of the solution are evaluation and control algorithms developed in-house, which can be adjusted to the respective individual circumstances. The currently presented solution could increase throughput of measurements by a factor of 60 and is capable of working around the clock. In addition, all "OK" tested parts can continue to be

used, while in the past disposal of the test parts was obligatory due to contact with people.

Many areas of use

This development results in very many alternative areas of use in all kinds of different industries, in which high precision, non-contacting measurement and speed are important.

The advantages of the system are, among other things, high-precision positioning (+/- 30 µm, reproducible), high-precision measurements (+/- 100 µm, possibly better), contamination-free measurements and an adjustable, individual test procedure.

A large number of measurements are combinable for a high throughput and low maintenance effort.

The machine will be presented at the "All about Automation" exhibition in Hamburg in January 2024.



TECHNICAL DATA

- Quality control/evaluation
- Telecentric measurement optics
- Gigabit ethernet cameras (line and row)
- Laser triangulation sensors
- Integrated 21" touch monitor
- Control voltage: 24V DC
- Supply voltage: 400 VAC
- Frequency: 50 Hz
- Data exchange with ERP and CAQ software

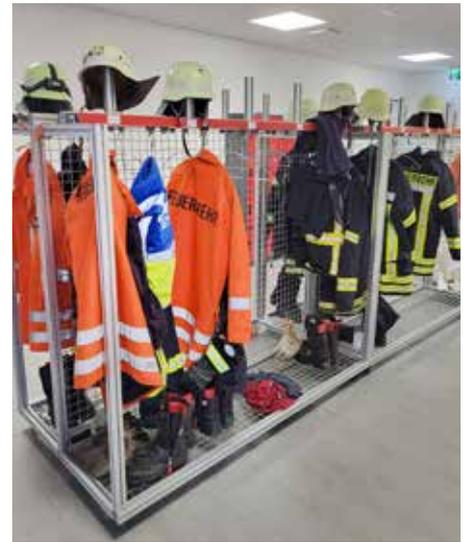
SELF-MADE COAT RACKS ON WHEELS

The voluntary fire service of the town of Niederstetten has been using the MiniTec modular profile system for many years. The team under the commander, Oliver Käss, designs and builds all possible constructions itself and in doing so, extends far beyond the portfolio of the MiniTec Fire Service catalogue. The most recent example



is special coat racks on wheels, which were implemented for the crew rooms. In their design they naturally took into account the specific requirements in the fire service sector: This begins with wire mesh mats for boots and shoes and extends to special helmet brackets through to sliding coat rack hooks.

It was also important for the coat racks to have castors and thus be flexibly movable. "This is an advantage, for example, when cleaning". Because after incident and emergency responses, the boots and clothing are often heavily soiled and leave behind marks accordingly. Thanks to the castors, we can also easily push the coat racks outdoors and clean them", said Käss. It was also worthwhile financially, as the MiniTec coat racks barely cost half the price of ready-made solutions.



Oliver Käss's team has made the iCAD Assembler design files available for downloading so that other fire services can also benefit from the concept: www.minitec.de/rollgarderoben



**Jetzt
downloaden**
oder als
Printversion
bestellen!

One profile system – more than 112 solutions!!

The **MiniTec** modular profile system is the ideal basis for construction in the fire service sector. Whether mobile container racks, vehicle fitout or breathing apparatus workshop – the system has the right components for every purpose.

Discover the unlimited possibilities in the fire service catalogue now!

minitec.de/feuerwehr





AROUND THE WORLD BY TINY HOUSE ON WHEELS

It is already almost a classic – the wish of pensioners to travel around the world in a motorhome. Sonja and Klaus are making this dream a reality. The couple from the Karlsruhe area are currently converting a Steyr truck into an expedition truck fit for long-distance travel with MiniTec components.

“It all started when we thought about what we would do when we stopped working? The idea grew, of buying a campervan and travelling around the world in it”, said Sonja. She and her husband Klaus visited trade fairs for a lengthy period and looked around for a suitable vehicle. They increasingly tended towards a vehicle with which they could not only drive on surfaced roads in order to be as flexible and footloose as possible.

There were many interesting concepts to see, they particularly liked a Unimog with a cabin on it. The finished mobile homes were tempting, but also had their disadvantages. They were not only very expensive, but also highly complex.

This contradicted the basic idea of the two adventurers: “We wanted to be able to take care of repairs ourselves if something packed up. This is not possible if you have a high-tech vehicle. If you break down in a place where there are no mechanics and no workshop, you have to be able to do the work yourself”, said Klaus. In addition, the finished vehicles did not always meet their wishes with regard to the layout, etc. They therefore decided to carry out the fitout themselves.

Ex-military truck as base

They chose a Steyr 12M18 as the starter vehicle. It is an old Austrian military truck that had been taken out of service (first registration 1986). “The Steyr is not only stable but also extremely suitable for off-road driving. With a length of 7.50 m and a width of 2.55 m, it is not too large and has a relatively small turning circle. In addition, due to its age of over 30 years, it has virtually no electronics on board, which is a clear advantage in remote areas”, emphasised Klaus. They got the Excap specialists in Lautertal-Gadernheim in the Odenwald region to completely prepare the truck and give

it a complete overhaul. The result is impressive – the truck is visually and technically restored to a top condition and is ready for the next 30 years. The body was then added by the Krug Expedition company in Schladming in Austria. It consists of a cabin including the frame, windows and doors. It is 4.70 m long, 2.30 m wide and has an internal height of 2 m.

Decision in favour of the MiniTec profile system

And suddenly, MiniTec was involved, as after visiting the Abenteuer & Allrad trade fair, they were quickly convinced of the advantages of the modular profile system for their own project. They decided to implement the framework for the interior fitout and all furniture on the basis of MiniTec, said Sonja: “Clear lines and the possibility of connecting things and then undoing them again was very important for us. The aluminium profiles are also relatively resistant to moisture. They are robust and can be used to build many shapes. Inside, everything can be accessed, because the installed panels can be unscrewed again thanks to the MiniTec GD 30 multiblocks. For us, the MiniTec modular system is the ideal solution.” This route is also less expensive by far than having such furniture made by a carpenter.

iCAD Assembler a great help

Before opting for MiniTec, Klaus, by profession a CAD administrator, had already created numerous designs for wooden camper furniture on his computer. He now used the iCAD Assembler to transfer them into the world of the MiniTec aluminium profiles: “Because it is significantly easier to do with this software. All components are available and the required connectors, end caps, etc. are also directly taken into account. What is more, you are continuously informed of the prices.” He then imported the designs from the iCAD Assembler into his CAD system and continued the work with it. Using the electronic design tools has clear advantages for the DIYer, because he can avoid errors in advance, which otherwise would not be identified until the installation phase.



The DIY globetrotter: Klaus assembling fitout parts.

Installation on site at MiniTec

After the preliminary work, the practical work began in November. Klaus and Sonja were able to use MiniTec’s assembly hall to assemble the components designed on the computer and then produced accordingly and install them in the vehicle. They were supported by help and advice from the company’s employees.

When everything has been installed, the Steyr will go to another company where the heating will be installed. Then the electricians. “We have solar cells on the roof, a power connection for 220 and 110 volts and a connection via the truck’s alternator so that the battery is charged while we are on the road. Electricity is the basis for almost all appliances and equipment, only the heating is operated with diesel”, said Sonja. By the end of the year, further elements will be installed and connected with external support: stairs, lamps, heating, water tanks and grey water tank. This will be followed by lots of minor works that they can do themselves and a bed. “When everything is finished we will own a complete 9 sqm flat”, commented Klaus.



This is what it will eventually look like – CAD drawing of the fitout.

Part 2 in the Connect 1/2024 – Presentation at the InHouse

The further fitout measures and the presentation of the finished vehicle will be described in the second part of the story in issue 1/2024 of Connect. The world trip campervan will then be at the InHouse 2024 where it can be viewed live!

“MUSIC EDUCATES!”



Social responsibility is very important to MiniTec. The company is not only a generous sponsor of schools and sport clubs in its home region, but also sponsors project in Africa. Twelve years ago, the founders of the company, Sonja and Bernhard Bauer, initiated a charity foundation for youth work in the region. It concentrates on promoting early music education in schools and child daycare centres, foreign language classes and the so-called MINT subjects (acronym of Maths, IT, Natural sciences and Technology) - similar to STEM in English (Science, Technology, Engineering and Maths).

It is unfortunately a fact that many children do not meet the minimum language requirements when they start school. This not only applies to the large number of migrant children. Due to the excessive preoccupation with digital media, language skills are frequently neglected. The long-term effects of poor language skills are academic failure, behavioural disorders, a lack of self-confidence and problems in job training. One of the foundation's goals is to counteract this. To this end, it funds the weekly music classes for more than 400 children in daycare centres and in several school classes.

The head of the Plus music school in Kusel, Klaus-Peter Bösshar, is active in many schools and daycare centres with his project. We asked him about the goals and results of the early music education.

Mr Bösshar, you trained as a Germanist and grammar school teacher of German and social studies. What caused you to set up a music school instead?

I taught piano while I was a student. After my finals in 1984, there were initially no suitable jobs vacant, so I made music my career.

What do you think of your decision to open a music school now?

It was the right decision! I can reach and support many more children with the music school than I could have as a grammar school teacher.

How many school students do you support with your music school?

Before the COVID crisis we had more than 700 school students in the singing and rhythm groups. Around 500 school

students are currently supported. Their ages range from nine months up to high adult age. We place importance on regular, weekly instruction in the schools and daycare centres; the goal can only be achieved with regular practice. We also support a successful youth choir.

What was your most impressive experience to date in your work with the children?

In 2020, our choir at the Brücken primary school was chosen from several hundred school choirs to be the stage choir at the nationwide "Klasse! Wir Singen" (Great! We sing) event in Trier. This success permanently strengthened the children's self-confidence and stimulated motivation. This also has a positive effect on the feeling of belonging in class and on discipline.

In your experience, what effect does the music education have on overall school performance?

Put simply: music educates. Particularly singing improves articulation and language. The community experience creates identity, strengthens the immune system and reduces aggression. Several more points can be added to the list of the positive effects of singing. It trains the understanding of grammar and sentence formation in a playful way, the ability to communicate is improved and learning other languages is fostered. And apart from that, the children really enjoy singing.

What effect does the funding from the foundation have on your work in the region?

The sponsored child daycare centres and schools, as well as the music schools are extremely grateful for the

foundation's support. Without this financial contribution, music education in our region would not be possible in this form and intensity, especially as the funds provided by the providers and public authorities are nowhere near enough.

What do you wish for the future?

For the future, we wish for low threshold further training options for the teachers in order to deepen what they have learned in their daily work with the children. In addition, a small financial contribution from the parents would also be good, as recognition of the value of the early music education and to generate funds for public appearances. Especially the presentation of what they have learned and the associated experiences of success are great motivation for the children.

SUPPORT FOR VOLLEYBALLERS

MiniTec has been supporting the Saint Arnold Sports Academy (SASA) for several years. It is a sports club that was especially founded for girls aged 10 to 16 who are from the slums of Soweto. MiniTec commits itself here regularly, for example, to enable the girls' participation in training camps.

Participation in the camps often entails major financial problems. The girls are hardly able to pay the costs of transport, accommodation and even the drinking water during training and the games. MiniTec provides support, for which it receives many thanks from the SASA Volleyball Academy.



MiniTec also completely finances the purchase of balls, shirts, shoes, knee pads and tracksuits. The girls' school education is also supported and therefore contributes to enabling a better life for the girls outside of the slums.

COMPANY ANNIVERSARY OUTING

Great atmosphere, smooth course of events and a great programme of events were the recipes for this year's company event of MiniTec. Two coaches took all participants to their colleagues in France, who were celebrating their 25-year anniversary. An excursion to the Lorraine town of Bitche with its historic citadel and a visit to a estate rounded off the company outing.

The first part of the outing led to the Lorraine town of Saargemünd, where the colleagues celebrated the 25-year company anniversary of MiniTec France with the Managing Director, Patrick Jaeck. A tour of the company and tasty food awaited the visitors from the headquarters in Rhineland Palatinate. "All employees really enjoyed this German-French meeting, which made relationships between our colleagues even closer, in order to actively practice the family spirit of MiniTec", determined Managing Director Jaeck later.

The growing demand for MiniTec products and solutions on the French market is handled by a highly motivated team. Its own automation developments are impressive. It sets standards here and offers simple solutions for complex production workflows.



The citadel in the town of Bitche in Lorraine.

Bitche Citadel

From Saargemünd, the group continued to the fortified town of Bitche in Lorraine. The town has the strategic character of the rock formation that protrudes above it to thank for its formation and which has had defensive fortifications since the 12th century. Here people witnessed the major turning points in history: From the French revolution to the Franco-Prussian war of 1870 up to the end of World War II.

After a varied but strenuous programme of events, the group returned to Germany for the grand finale. The event location was in an extensive forest area in the Saarland town of Neunkirchen. A historic estate and the ideal location for ending the company outing fittingly with an exuberant party and lots of delightful moments.

CULTURE, LOTS OF FUN AND TASTY FOOD

After a sparkling wine reception, the employees were then able to enjoy culinary highlights in the special ambience, accompanied by very attentive service. The specially booked DJ rounded the evening off perfectly.



A team from two countries at the anniversary party of MiniTec France.

THAT'S HOW IT SHOULD BE!



"I have been using the MiniTec profile system for at least 15 years, as the system is impressive. I simply have to praise the fact that in all these years, there hasn't been a single error in the delivery. The cut to size parts always reached us in the shortest possible time and are always perfect."

Robert Klaus
Managing Director
Flow Capture Germany GmbH

Our customers' satisfaction is our highest priority. We are therefore pleased when someone declares this spontaneously, like Robert Klaus of Flow Capture recently did on LinkedIn. Among other things, the company developed inline X-ray systems for conveyor belts and real time 3D tomographs for flow measurement. With XRAY ONLINE, it also offers nondestructive material testing as a service. We thank him for the pleasant words!

LONG-SERVICE EMPLOYEES AT MINITEC

The first 5 years have flown by – this is the experience of Gaby Koob, who began her work in the MiniTec warehouse on 1/10/2018. Sabine Fell in the accounts department has been with the company somewhat longer, namely a quarter century. Despite this, she does in no way consider herself to be on the scrap heap and still enjoys her work.

We are pleased to celebrate with the two employees who have work anniversaries this quarter and thank them very warmly for their committed support and loyalty to the company!



"Collectively with each other and for each other – that has been the motto in my department, financial accounting, for 25 years. I am happy to be part of this team and will continue to be in the future too!"

Sabine Fell



"Even though plenty of high-tech dominates in the MiniTec warehouse, the people who work here are just as important for fluid workflows. I am pleased to have been a member of this well-functioning team, which also has a lot of fun outside of work, for 5 years."

Gaby Koob

2024
3

DEAR READERS,

An eventful year with many challenges lies behind us. And the new year 2024 will doubtlessly be no less taxing. You'd almost think that we must learn how to cope with a permanent crisis mode.

2023 was certainly difficult, but many positive things also happened and we got many things off the ground. Our "InHouse" trade fair clearly showed that we started the year well. Its popularity was so huge that we were unfortunately unable to welcome all interested persons on our premises. Which is why we will be continuing this successful event on 25 April 2024. It will then be complemented with the "Future Day" day and also very much influenced by the training initiatives of MiniTec. These activities play an important role for us, in order to find talented people and to present ourselves as an attractive employer. To this end, we also have numerous cooperations with universities and training facilities.

Of course, much also happened in our core business: During the past year we presented a real innovation in special systems building at several trade fairs, our new production cells. These are individually adaptable, can be used in production very flexibly and can even be combined to form production lines. Interest in them on the market is large and will likely earn us further interesting orders and projects next year.

A completely different area is also currently running very well and involves real future potential - the design and construction of photovoltaic production facilities. An area in which we have been in business for a very long time, is finally experiencing a revival in Europe. In the past year, among other things, we sent systems abroad and further projects are being planned for 2024.

We are proud of the outstanding team performance of our employees in the different countries. They have again managed to meet our standards as an innovative company and reliable technology partner. We also have high standards for ourselves as a supplier. The fact that we could meet these even in times of uncertain supply chains is also a real team effort, for which we thank all employees.

Exchange with each other within the Group is also very important to us. Our employees are not only connected to each other virtually, projects are also tackled across borders and in 2024 (following an interruption due to the pandemic), an international sales meeting will finally also take place again in the company headquarters.

And we also celebrated in 2023. Two European subsidiaries celebrated their anniversary in the same year: MiniTec España has been part of MiniTec for 15 years and MiniTec France even longer with 25 years. The latter was reason enough to celebrate the traditional company outing as a cross-border event.

We wish you and your family a happy Christmas and a good start in the new year!

Yours
Sandra Geyer-Altenkirch



Managing Director



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Phone +49 (0) 63 73 / 81 27 – 0
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Sandra Geyer-Altenkirch, Stefan Graf, Sven Kraus,
Karl Schaarschmidt, Christian Stemler

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Simply more precise: **MiniTec test systems**

Due to increasingly complex products and growing requirements for their quality, test systems have become an indispensable part of production processes.

MiniTec produces customised test systems, which work with different test technology and methods depending on the requirement. They all have in common high precision and reliability, which ensures uniform quality for you.

Regardless of whether an optical test with efficient image processing systems, eddy current testing or another method: **MiniTec** implements the suitable automation solution for you, with which your components and products are inspected effectively. We also use technology components of accomplished partners, e.g. camera systems. At the end there is a solution that optimally supports your quality requirement.

When will you discover the art of simplicity?

