



Connect

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March 2022



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MiniTec Smart Solutions develops interactive assistance systems



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Effective protection against electrostatic discharge

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Modular creativity for research facilities and universities



Simply more efficient: **MiniTec automation solutions**

Very different techniques are required in the automation of production processes. In line with its "The Art of Simplicity" motto, MiniTec offers complete solutions for this from a single source.

Whether robots, linear axes, conveying technology or automated guided vehicle (AGV) systems: We combine the different worlds to form optimum overall concepts, with which we increase the productivity and efficiency of our customers sustainably.

Our solutions are as individual as the requirements. Find out more during a visit to the LogiMAT or the Automatica.

At our trade fair stands we will be presenting to you, innovative concepts for the automation of processes. Completely new products and solutions also await you. Wait and see – we look forward to your visit!



Messe Stuttgart, 31 May – 2 June 2022
Hall 1, Stand L08



Messe Munich, 21 – 24 June 2022
Hall A5, Stand 329



DEAR READERS,

Our modular system, which is based on aluminium profiles, linear technology and components, not only supports engineers and equipment builders in industry. This modular system is also the basis with which design ideas are realised in research, in universities and training establishments. There are therefore no limits to the technical creativity of talented technicians and young engineers. Our title story takes a look at the extensive activities in this area. For MiniTec has always been committed here; not only as a supplier, but also as a technology partner.

Cooperations with universities such as the Technische Universität in Kaiserslautern or the SmartFactory KL and the German Research Center for Artificial Intelligence (DFKI) and the Fraunhofer Institutes are just a few examples. Important experience has been acquired from many projects, for example, for automation, connection technology and ergonomics. And based on this, new products were in turn developed or processes optimised. A good example of this is our subsidiary, MiniTec Smart Solutions, which emerged from a university cooperation and has extended and improved our workplace system with assistance systems significantly. Read more about it in this issue.

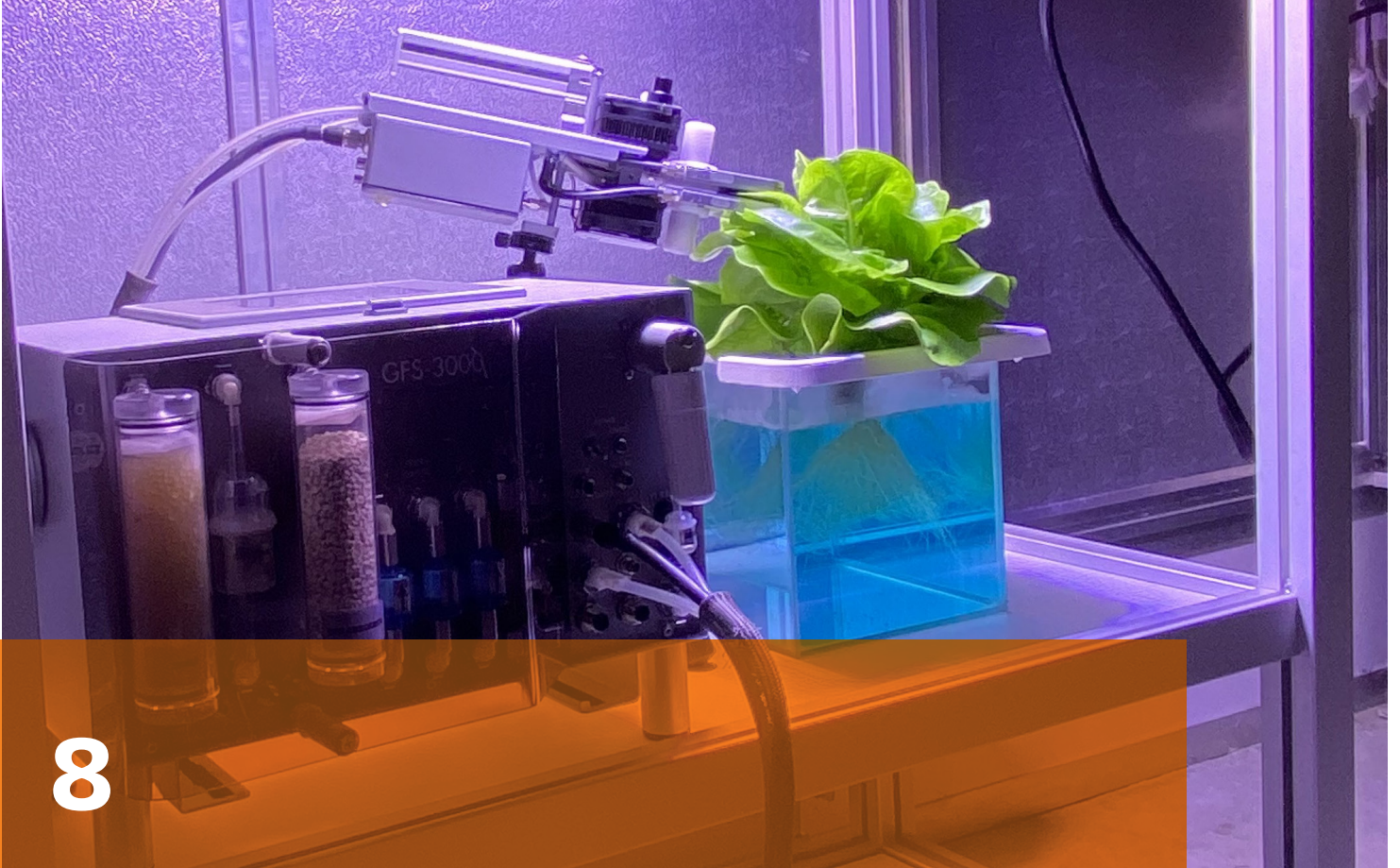
We have also long since been a sought-after partner firm of universities for training – to our mutual benefit: As a modern technology company, we offer students an attractive environment for their so-called “dual” study (sandwich courses) and their dissertations. We are then often the first choice for young engineers, who begin their careers with us. A real win-win situation.

Have a good read! We hope you find it interesting and inspiring.

Yours sincerely
Tobias Doll

Director of Production

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INNOVATION

Think tank for industry 4.0

MiniTec Smart Solutions is a startup, which devotes itself to developments within the environment of Industry 4.0. The company was created from a longstanding cooperation with the technology initiative, SmartFactory KL.



PRACTICE

ESD: Danger is all around

Electrostatic discharges are a danger for production, which is why all production plants and assembly workplaces have to offer effective protection from electrostatic discharge (ESD).

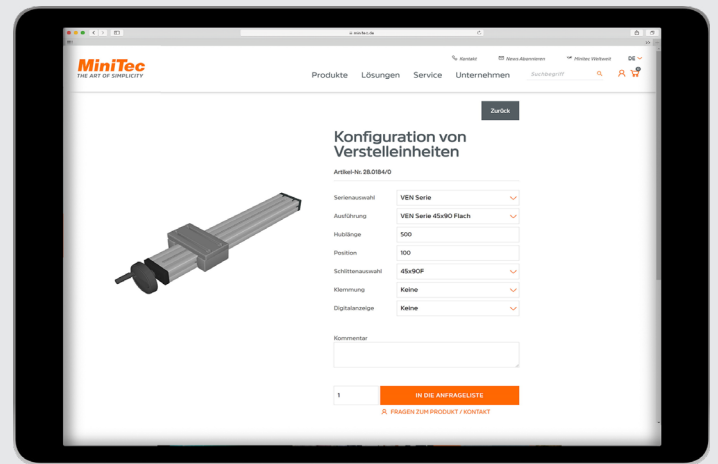
TO THE REQUIRED PRODUCT BY WAY OF THE CONFIGURATOR



We are familiar with it from many areas, for example, buying a car: There it has long since been possible to configure “your own” ideal vehicle, individually at the monitor. Numerous variants are occasionally possible for MiniTec products; to this end, various configurators are provided on the website – namely, for the following topics:

- Conveyor belts
- Adjustment units
- Shafts
- Linear axes LR
- Sliding guides

The configurators allow the user to define the products they want step-by-step, online and to then add them to their trolley and send a request for a quote to MiniTec. The summary of the respective configuration as a PDF and the relevant CAD drawing (including in STEP format) are generated automatically and are ready to download when you have finished. “Earlier” configuration products can also



www.minitec.de/service/konfiguratoren

be re-submitted for a quote. In future, MiniTec will also provide these convenient tools for other areas and further extend its service here.

TRADE FAIR CALENDAR 2022



This year, MiniTec will again be represented at the most important trade fairs of its industry. Customers and potential customers have the opportunity to exchange ideas there with the industry specialists of MiniTec and to look at the latest developments. All dates are also given at www.minitec.de/service/messen-events.

LogiMAT in Stuttgart, 31 May to 2 June 2022

International Trade Show for Intralogistics Solutions and Process Management

Abenteuer & Allrad, Bad Kissingen, 16 to 19 June 2022

The off-road trade fair

Interschutz 2022, Hanover, 20 to 25 June 2022

The world's leading trade fair for fire and rescue services, civil protection, safety and security

Automatica 2022, Munich, 21 to 24 June 2022

Leading exhibition for smart automation and robotics

Motek, Stuttgart, 4 to 7 October 2022

International trade fair for automation in production and assembly

NEW FIRE SERVICE CATALOGUE: MORE THAN 112 SOLUTIONS

An increasing number of fire services opt for the MiniTec modular system to fit out vehicles or to equip buildings and workshops. The new fire service catalogue provides an insight into the almost unlimited possibilities of the product range.

A modular profile system that offers almost limitless diversity: For more than 35 years, efficient and cost-effective solutions for many tasks in industry have been created on this basis. From the simple rack to constructions with maximum technical standards. For many years, the aluminium profile system has also proven its worth daily in many fire services in vehicle fit out, in the construction of mobile container racks precisely tailored to specific needs or in workshop equipment. Due to the many tasks solved by fire services with the system, MiniTec can call upon longstanding experience.

Everything fits perfectly

The modular system is based on different profile cross-sections as well as components and accessory elements. The use of DIN screws, bolts and nuts makes the system particularly economical. The patented MiniTec profile-lock fastener, which requires no machining of the profiles and also does not require any structural design, is unique. The finished connection is movable and does not block the clear profile sides. It is extremely easy and time-saving to handle.

Equally lightweight and robust

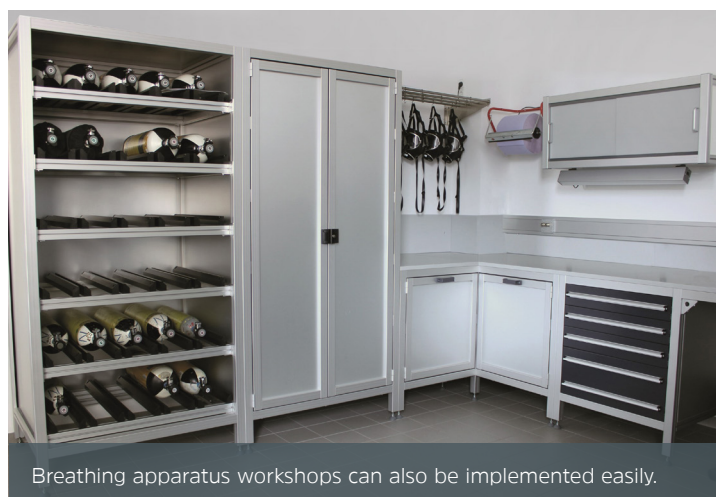
The MiniTec profiles are not only suitable for vehicle fit out due to their flexibility for any constructions required, but also due to their low weight. The lightweight and simultaneously stable grid size 30 is particularly suitable for the fit out of special vehicles with a gross vehicle weight of 3.5 to 7.5 tonnes. The highly stable profiles of the 45 series are particularly recommended for the fit out of mobile container racks and special vehicles with a gross weight of 7.5 tonnes and higher.



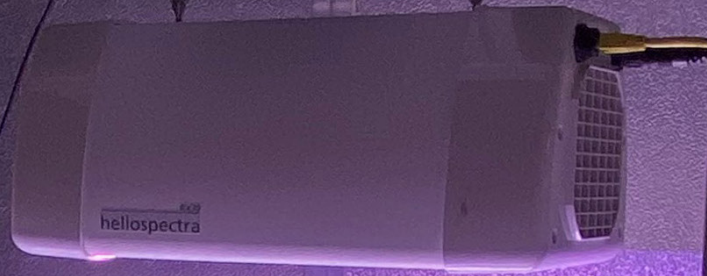
Assemble kits quickly and easily

Another special feature at MiniTec are its pre-picked kits or already assembled modules for special vehicles. The standard "Fire service mobile container rack" module, for example, can be assembled quickly without extensive prior technical knowledge and with only two Allen keys. Each fire service can add the individual shelves on top of this base module itself. The mobile container racks are also delivered already assembled on request.

The new MiniTec fire service has more than 140 pages with a wealth of information, ideas and tips for fire services and fire stations. Further information is available at www.minitec.de/feuerwehrtechnik.



Breathing apparatus workshops can also be implemented easily.



RESEARCHING AND DESIGNING WITHOUT LIMIT

The MiniTec aluminium profile system has already proven its worth thousands of times in industry. United in a well-equipped modular system, profiles and linear technology as well as complete components can be combined with each other easily. Many research facilities, which value the flexibility of the system in combination with a CAD solution and the reusability of the components now benefit from this. There are therefore no limits to creativity.

They are ubiquitous in industry: Aluminium profiles. Not only in production, but also in the stores or warehouse and even in offices, they form the basis for innumerable constructions. Workplaces, conveying equipment, machines and even entire plants are based on aluminium profiles. For many years, MiniTec has offered an aluminium profile system as a flexible kit with perfectly matched components. Individual designs are quickly planned, can be implemented in a very short time and despite this, thanks to the uniform groove system, they can be changed again at any time. The variety and flexibility of the field-tested system also make it a universal solution for diverse tasks for research facilities.

Well thought out to the smallest detail

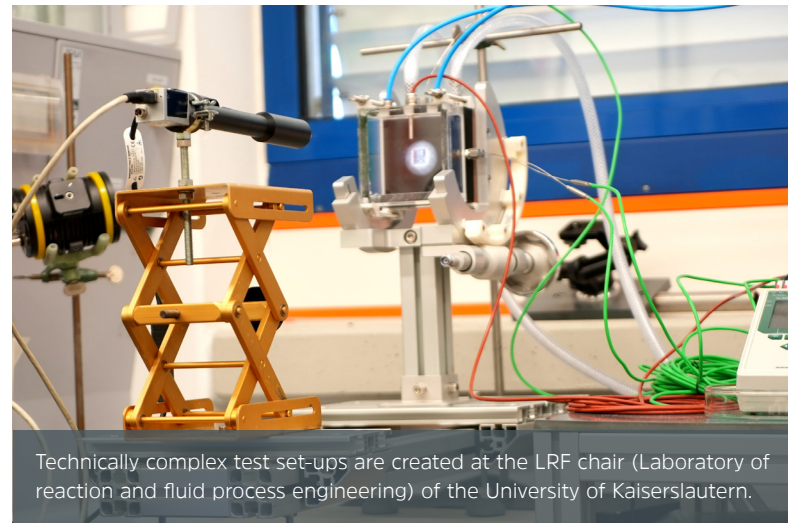
The modular system is based on standard profiles with which all common applications can be covered. Due to the identical shape of the grooves, the profiles can also very easily be extended with the MiniTec linear technology system and so linear rails, linear modules or linear guides can be implemented. For just like in industry, movement is also necessary in research facilities. Low friction, precision and stability are the main elements here that characterise the high-quality linear systems.

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

Always well connected

Another central element of the modular system is the profile-lock fastener developed in-house. Its use does not require any machining of the profiles, no special tools and does also not require any structural design. The finished connection is movable, does not block the clear profile sides and establishes the conductivity of the overall construction. It is extremely easy and time-saving to handle: Profiles can be connected reliably within seconds.

MODULAR CREATIVITY FOR RESEARCH



Technically complex test set-ups are created at the LRF chair (Laboratory of reaction and fluid process engineering) of the University of Kaiserslautern.

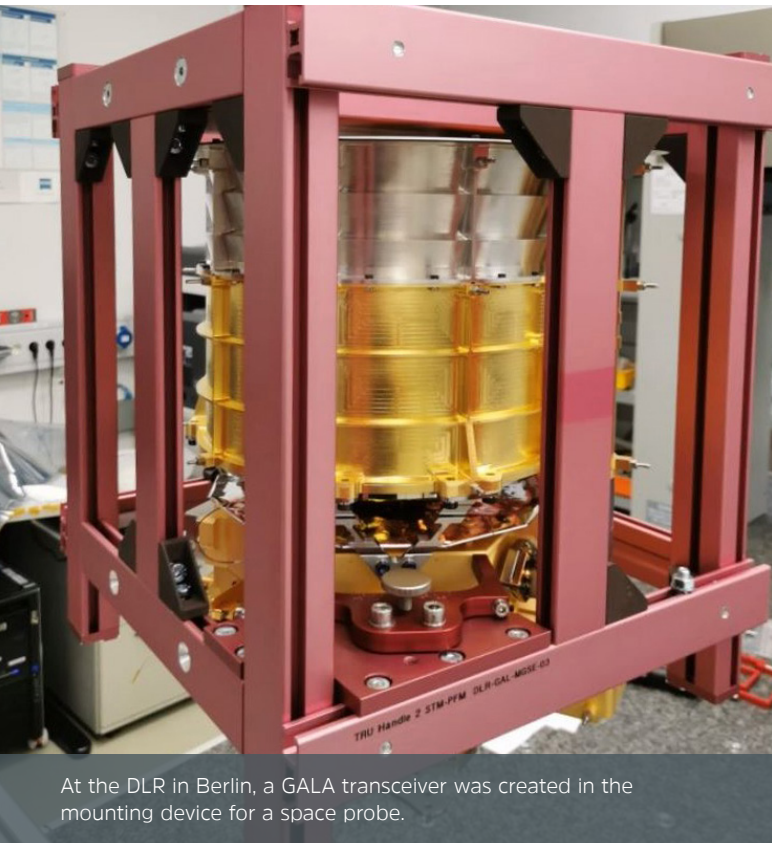
Plan quickly and easily

The modular system is completed with the iCAD Assembler free planning software for the easy, interactive assembly of components. The system-neutral 3D planning tool for design, work preparation and assembly enables components to be very easily configured independently of CAD software and to be joined for form a construction via insertion points. A plausibility check prevents errors in the planning or implementation. Especially for young designers, who do not yet have a lot of experience, this is a valuable tool for obtaining functioning and viable constructions.

The self-contained CAD tool also has an extensive component library, interfaces with all common CAD systems as well as an export function to other standard formats such as pdf.

From the profile to the research facility

A look at the applications in several universities and laboratories shows how different the areas of use are and how creatively the – mostly – young engineers handle the MiniTec modular system. It almost follows the ideas of the young researchers. This is particularly important, because creativity should not be constrained, neither by technical limitations nor by excessive implementation costs. And this is precisely what can be implemented with the MiniTec portfolio: The components of the modular system are matched with each other so that they always fit together and are easy to combine. If a development moves in a different direction to the one originally planned, all components can be undone and reused.



At the DLR in Berlin, a GALA transceiver was created in the mounting device for a space probe.

Test setups in Kaiserslautern

An almost exemplary example of this is provided by the LRF chair (Laboratory of Reaction and Fluid Process Engineering) at the Technische Universität Kaiserslautern. There the focus is on heat transfer, optical photogrammetry, chemical analysis with NMR spectroscopy and relative multi-phase processes, as the research assistant Raphael Raab explained: “Essentially we examine – including on behalf of companies – the behaviour of liquids and gases, heat transfer and material optimisation processes.” The test setups in the institute change repeatedly, they must be adapted to the changing circumstances and must be flexibly changeable.

“For a long time we worked with metal bar systems with grub screws – the set-up was very time-consuming and we were hardly able to react flexibly to changes in the set-up. With the MiniTec profile system this is not a problem, because it is very easy to install, it is self-explanatory and stable – like “Lego for adults”. And if specific accessories are needed, they are quickly found”, he explained.

The department even now has its own stock assortment: “We mostly buy off-the-shelf standard lengths of material and always have several metres of profile and accessories

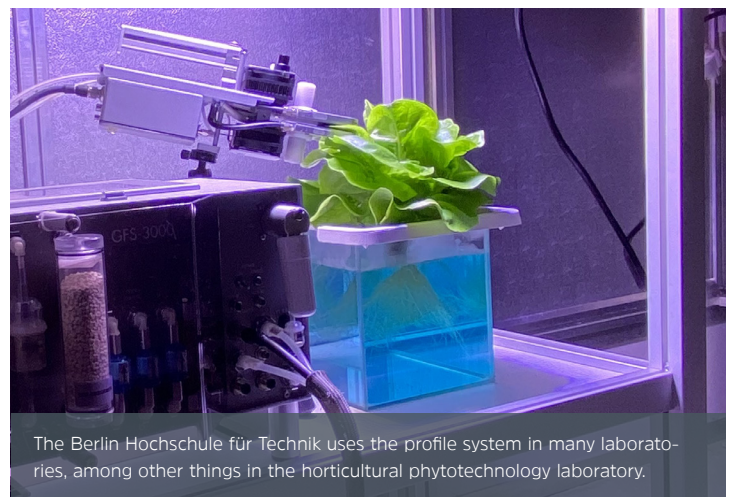
in stock, which we then assemble individually ourselves. Over time we have also built trolleys and standing desks with castors – which enable us to work flexibly and conveniently anywhere in our hall-type building. In fact, the odd mobile rostrum or two have been built, which the professors use in the lecture theatres.”

Research location Berlin

In Berlin, several research facilities were not only impressed by the modular system, but also the proximity of the MiniTec subsidiary with much expertise in plant construction. One of the most prominent is probably the German Aerospace Center (DLR), which is involved in exploring the solar system. This includes experiments and missions, starting with the idea, to conceptual studies, equipment development and calibration, as well as performing the experiment through to the data acquisition.

With MiniTec to Jupiter

Among other things, the institute is involved in the ESA JUICE project (Jupiter Icy Moons Explorer) with scientific instruments. To this end, for example, a device was provided for stress-free integration of an instrument in a difficult to access position in the space probe. The device holds an optical transceiver to enable the assembly. This was planned and set up with MiniTec. There were only a few millimetres clearance so that the sensitive optics of the instrument and the space probe were not damaged. A protective laser enclosure for the performance of instrument tests was also conceived, design and built with the help of MiniTec for use in the space probe.



The Berlin Hochschule für Technik uses the profile system in many laboratories, among other things in the horticultural phytotechnology laboratory.



The Helmholtz-Zentrum Berlin für Materialien und Energie builds its own clean rooms ...

This will enable functional tests of the laser altimeter to be performed on the space probe in the summer of 2022 to ensure that the experiment functions faultlessly. The start date for the space probe is scheduled for 2023.

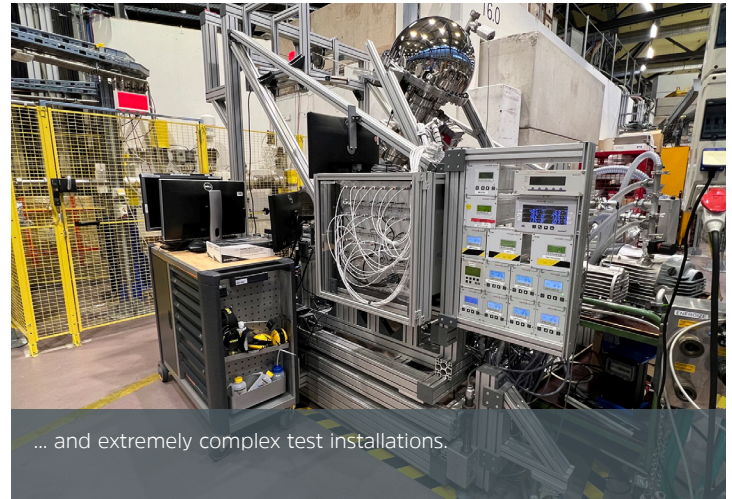
Furthermore, in the institute on the Adlershof site (where MiniTec Berlin is also based), the profile system is also used to make fixtures for diverse test set-ups in the laboratory, for example, for the testing and characterisation of electronic boxes for use in space under different temperature conditions.

Gardening with profile

The Berlin Hochschule für Technik concerns itself with far more down-to-earth issues: There the profile system is used in many laboratories. Especially in its Faculty V – Life Sciences and Technology – it is increasingly used in the horticultural phytotechnology laboratory. The modular set-up is valued as a measuring stand for optimising the photosynthesis rate under different LED spectra or in test set-ups for increasing the vitality of grass playing surfaces through to set-ups for measurements of vertical planting. Issues of climate adaptation in towns and cities and increasing well-being in interiors continue to pose new challenges for the test design. With the MiniTec profile system the necessary variability of plants and sensors was able to be purposefully combined.

Clean room from the modular kit

The Helmholtz-Zentrum Berlin für Materialien und Energie also works closely with MiniTec Berlin. There, among other things, clean rooms were built and equipped with a



... and extremely complex test installations.

ADVANTAGES FOR FACILITIES:

- Tried and tested modular system
- Constructions can be changed at any time
- Parts are reusable
- Students and research assistants learn how to handle an established modular systems
- There are no limits to creativity
- Free CAD system with component library
- Automatic plausibility checks during the design

profile construction for the set-up of a particle-free ultra-high-vacuum chamber, with which the semiconductor photocathodes can be transferred in an SRF photoinjector. The Silicon-Photovoltaics Institute operates two clean rooms for performing silicon-based semiconductor technological processes. The set-ups there change continuously, which requires the construction elements to be flexible.

The MiniTec modular system is also used for the BESSY II project, in which materials for a sustainable energy are researched and an electron storage ring is operated.

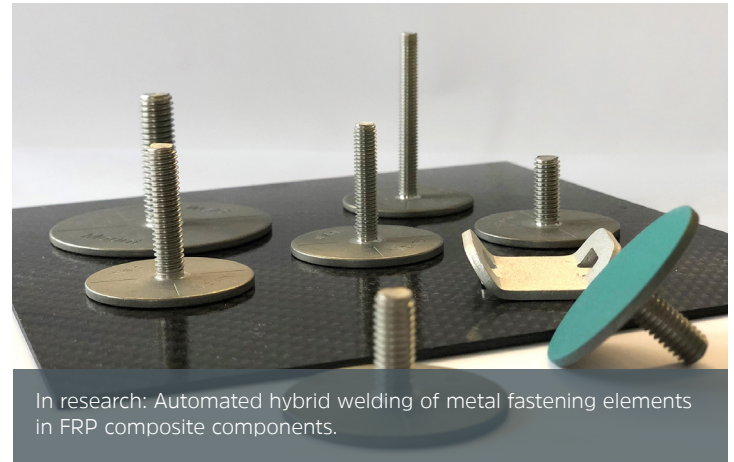
The large number of projects and very different applications show how flexible the MiniTec modular system is. And the philosophy, true to the company slogan, "The Art of Simplicity", is also a good basis in this area too.

RESEARCH PROJECT ON NEW JOINING METHOD

MiniTec has developed innovative joining methods for industrial use with its soldering and welding technology systems. Together with a project consortium from research and industry, the go-ahead has now been given for a new research project in this field, named "HyBe".

The objective of the HyBe project is to develop enabling technology for automated, digitalised and energy-efficient inductive joining of metallic fastening elements on thermoplastic fibre reinforced plastic (RFP) composites, such as those used in lightweight construction. This is achieved, among other things, by further development of induction welding. By coating the joining surface of the fastening elements with optimised coupling agents, high-strength joints are achieved even with difficult to bond matrix polymers such as polypropylene. The result of the project will be a hybrid joining method ready for use in industry, which advances efficient lightweight construction significantly.

The "Automated hybrid welding of metallic fastening elements on fibre reinforced plastic composite components

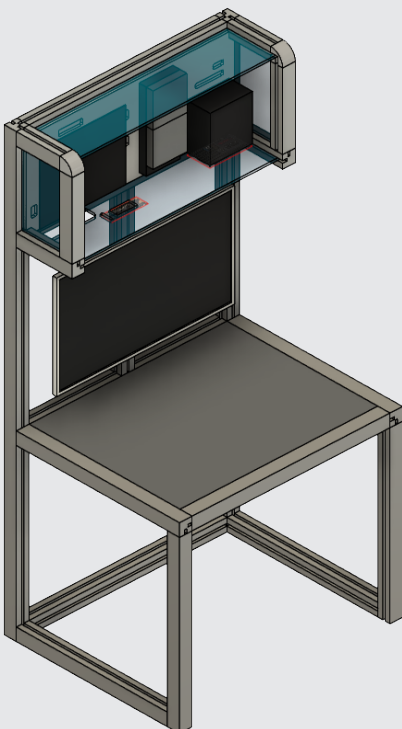


In research: Automated hybrid welding of metal fastening elements in FRP composite components.

(HyBe)" project is funded by the Central Innovation Programme for small and medium-sized enterprises (SMEs) (Zentrale Innovationsprogramm Mittelstand - ZIM) of the German Federal Ministry for Economic Affairs and Climate Action (Bundesministerium für Wirtschaft und Klimaschutz - BMWi).

For further information: www.ivw.uni-kl.de/de/projekte/hybe

'TIS EARLY PRACTICE...



MiniTec's cooperations are not only limited to research; schools are also important partners, as the example of the Heinrich-Heine Gymnasium, a grammar school in Hamburg, shows.

Boris Chen, supervising physics and IT teacher, is convinced that encouraging and challenging also go together where young people are concerned: "Many members of our Technik-AG ("T Club") start with professional CAD software, electronics, programming and

A combination of desk and computer was created with MiniTec profiles for "the beast", a high-performance PC.

project-based working in years 5 and 6. Sometimes the older ones even learn from the younger ones." The technical club's equipment is high-quality. It is almost all self-designed and built. Even a high-performance PC was built. A combination of desk and computer for this was created with aluminium profiles from MiniTec. "MiniTec makes a great deal of effort even where such small projects are concerned. In this way our students receive sound additional knowledge for a technical or natural sciences career at a later stage", the teacher was pleased to say.



THINK TANK FOR INDUSTRY 4.0

MiniTec Smart Solutions GmbH in Kaiserslautern is a startup, which devotes itself to developments within the environment of Industry 4.0. The company was created from a longstanding cooperation with the technology initiative, SmartFactory KL.

The digital transformation in industrial production is well underway. The networking of people, machines and processes with the help of information and communication technology is an important factor for success for an increasing number of companies.

MiniTec has been examining basic approaches to Industry 4.0 for years. Its collaboration within the framework of the SmartFactory KL, where experts of the TU Kaiserslautern and the German Research Center for Artificial Intelligence (DFKI) participate is of great significance. From this, for example, a concept for a production plant emerged that almost makes do without an overarching control system. The product searches its way through the production effectively by itself. In addition, it should be

possible to compile the plant as necessary, depending on what is to be produced.

Another focal area is workplace design. Especially in the area of variant production, customers have increasingly set the requirement for MiniTec to equip workplaces with assistance systems and thus support workers during the assembly.

Industry 4.0 for manual workplaces

The collaboration and the increasing demand for Industry 4.0 solutions for manual workplaces led to the foundation of MiniTec Smart Solutions GmbH in 2017.

The startup based in Kaiserslautern (with short routes and good links with the University) works closely

with the parent company in the field of workplace systems and can also use its resources and know-how. Conversely, MiniTec benefits from the new technologies developed by a highly specialised team. Seven employees now work there on interactive assistance systems for manual assembly and future technologies for the work area. The managing director is Andreas Böhnlein, Jochen Hellbrück, from MiniTec's automation technology department, is responsible for the operative tasks.

Andreas Böhnlein remembers: "Initially, individual solutions were always implemented for worker guidance. The projects are naturally also similar. We therefore looked for something to enable us to reach our goal more quickly, we wanted to achieve a certain degree of standardisation, to develop standard software for this purpose. That was also the start for the spin-off of MiniTec Smart Solutions, in order to uncouple the work from the day-to-day business somewhat. And to incorporate the research that had already been carried out by the employees at the DFKI. And, as the mechanical engineers, we contributed the hardware side and the industrial level. In MiniTec Smart Solutions we have brought the two worlds together." >>>



MiniTec Smart Solutions GmbH is based in Kaiserslautern

Modular principle for worker guidance too

The focus was on developing an editor, i.e. an easy to use tool with which the customers could create the assembly instructions themselves. With interfaces to different hardware components, which can be coupled for support.

Andreas Böhnlein explained: “We also aim to implement the modular principle for our assistance systems, just like we already offer a modular system for mechanical engineering. This ensures support for workplaces with all kinds of different requirements, as the system can be individually adapted to the work environment, task and process.”

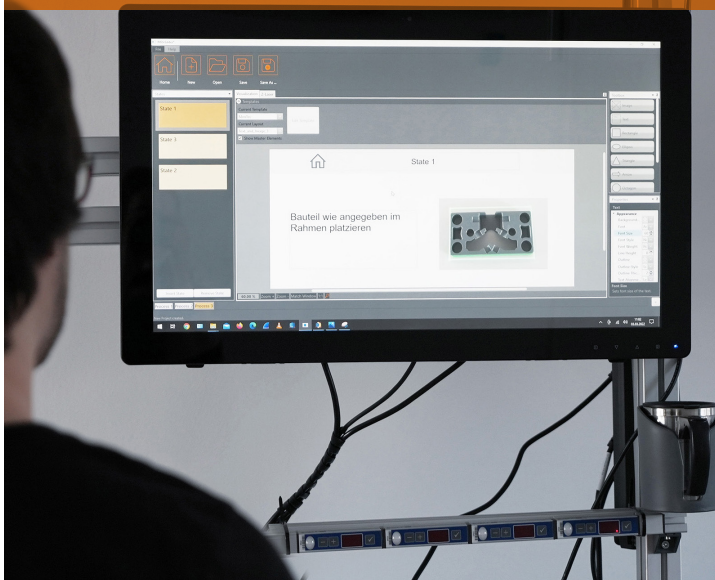
The advantages of a comprehensive assistance solution for instructions and quality control are many and varied, especially for small and mid-sized enterprises. Employees can be assigned flexibly, so that companies can respond directly to changing requirements and product variants as well as fluctuating demand.



The team in Kaiserslautern: Abdullah Sadal, Max Hardt, Markus Kaiser, Ramona Barie, Otto Gierling, Pascal Stahl (from l to r).

All who work on these new concepts are certain that in future many new innovations can be expected for manual assembly.

THE ART OF SIMPLICITY IN WORKER ASSISTANCE

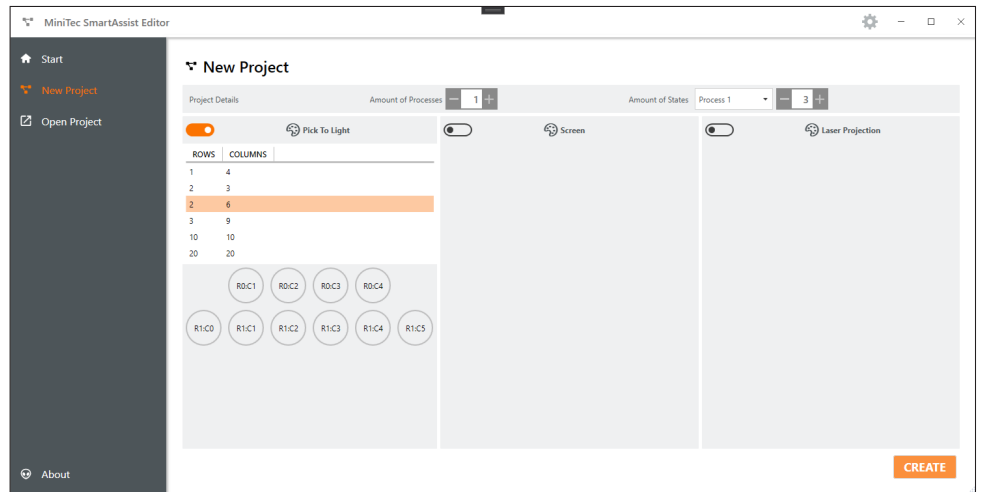


The development of MiniTec SmartAssist, the new MiniTec assistance system, focuses on a high degree of practicability and simple handling and operation.

For some time now, the Kaiserslautern team of MiniTec Smart Solutions has been working on a completely new assistance system. The entire development of MiniTec SmartAssist remained true to the MiniTec principle, “The Art of Simplicity”. This is seen, for example, in the interface of the Editor, where in future customers will be able to create the interactive descriptions for the assembly of products themselves. Specialists for the User Experience Design (UX) were brought on board so that it is as easy and intuitive to use as possible. The effort paid off: With the expertise of the professionals, the development of the MiniTec SmartEdi interface is now well advanced and is characterised by a decidedly simple operating logic that is also understandable for ordinary persons. Software development Markus Kaiser explained: “The user experience of the Editor is particularly important to us. Users should understand what is happening straight away. After all, it is the users themselves who find the best way for an assembly process. They know the requirements, the workflows and their employees best. We offer them the tool to achieve this goal in an uncomplicated way.”

Precise fitting user interfaces

The Editor is a special central feature of MiniTec SmartAssist. While in many assistance systems the assembly instructions for the workers have to be created by the respective system providers, the customer can do this themselves with the MiniTec solution. This gives them enormous advantages and as a result they are far more flexible and independent. Using the Editor must therefore also be child's play!



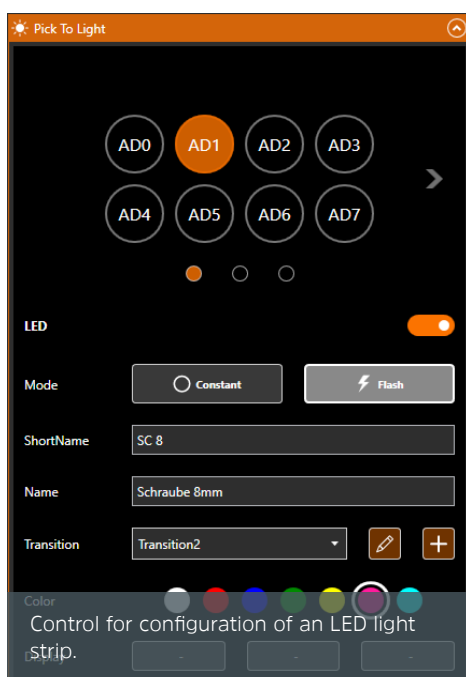
The creation of assembly instructions in the Editor will be similar to the structure of a slide presentation – and just as easy.

Ergonomics using the example of the LED light strip

A illustrative example of user ergonomics is provided by the control for configuring an LED light strip. This was made significantly more compact and clearer than the original approach. The figure shows a workbench on which a certain lamp flashes pink. A matrix layout of the LED units makes it clear at first glance, where the corresponding LED unit is on the bench. Both the flashing mode and the light colour



Clear presentation also in the "frontend" – i.e. for the fitter at the workplace who is to carry out the instructions



can each be changed with a mouse click.

User guidance by means of laser projection

When it comes to efficient support for the user during their assembly task, not only LED light strips are possible. Another possibility for an optical positioning system is provided by projection by means of a laser beam. A corresponding module has been in test use for several weeks and will be available for the market launch of MiniTec SmartAssist in the summer. A special laser projector is attached above the workplace. The assistance

system automatically controls which object the laser should highlight within the scope of the assembly steps. Depending on the structure and orientation of the system, markings can be projected onto the work area, components on it can be highlighted or objects and areas outside the work area can be illuminated. The laser projection can not only be a dot. A large number of shapes are available to choose from in the Editor. The market launch of MiniTec SmartAssist is scheduled to coincide with the Automatica in June 2022. From then it can also be ordered and implemented.



GOOD CONNECTIONS ARE DECISIVE

Profile systems are now standard in many industries. All systems are based on aluminium profiles with T-slots. However, it is the connection technology that makes the difference.

“The Art of Simplicity” applies to all areas of the MiniTec profile system, particularly to the connection technology. The number of different connectors and the scope of required machining for a connection are decisive for the economic efficiency of a system. The patented MiniTec profile lock fastener is exemplary in this respect.

The major advantage of the MiniTec profile system is that all profiles of the MiniTec system can be connected to form stable constructions with only two different connectors. Connectors 30 and 45 fit in all profiles of the respective series, and the same screws are used for both series. Choosing the right connector is therefore not a problem for the designer, error sources are excluded.

And the material management benefits from the low stockkeeping, the easy master data maintenance and the planning and scheduling. The work preparation and provisioning in the assembly are also completely unproblematic.

Connections without machining

The most important advantages of the MiniTec profile lock fastener, however, are the impressive technology, flexibility and time savings. This connector needs no machining whatsoever, even making a thread is not necessary, due to the use of self-forming screws. The special radius profile shape of the thread flanks of these screws causes



low material displacement with up to 50 percent lower rolling torques compared to cut threads. This ensures a process-reliable connection and higher clamping forces. These connections can be loaded with 6000 N.

Easily movable and adjustable

MiniTec profile connections with power-lock fasteners are easy to move later and are thus adjustable. The designer therefore does not have to produce elaborate machining instructions or a machining drawing. A significant avoidance of sources of errors. The provision of resources or jigs and the time needed for drilling or thread cutting are also no



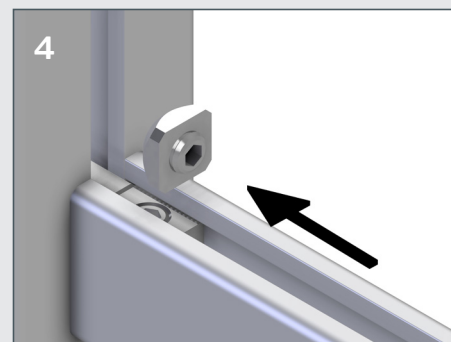
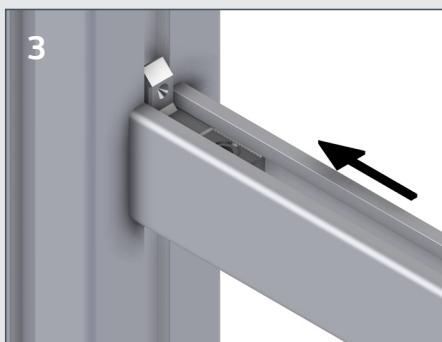
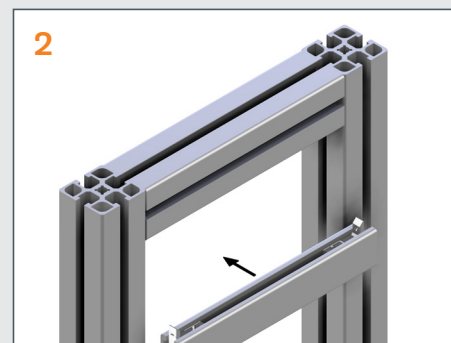
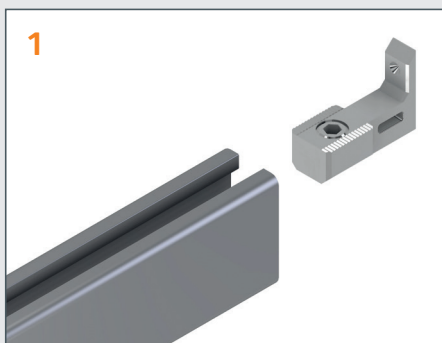
The fitter only needs two tools and possibly a handheld screwdriver.

PROFILE-LOCK FASTENER N PRACTICAL TIP

With the profile-lock fastener N, struts can be subsequently inserted in closed frames. Without machining or partial dismantling of the construction.

THE ASSEMBLY TAKES PLACE IN FOUR STEPS:

1. Push the connector into the strut to be retrofitted
2. Position the strut in the construction
3. Push the connector into the existing profile
4. Insert square nut with preassembled stud into the groove, position above the connector and tighten, the tighten screw in the connector (both with 10 Nm). Ready.



Ingenious and nonetheless simple: the patented MiniTec connector.

longer at all necessary. That is how cost efficiency is achieved: minimal necessary working time in design, work preparation and workshop, and simplicity. The fitter only needs two tools and possibly a handheld screwdriver.

ESD compatibility guaranteed

Modern designs regularly contain sensitive electronic components. ESD compatibility is indispensable for these applications. The connections with MiniTec power-lock fasteners are electrically conductive, no separate cable connections are required between the profiles.

Frequent applications of profile systems are racks and guards. Cross connections frequently occur in these constructions. This is no problem at all for the MiniTec profile-lock fastener. And because the corners of the connections remain clear, surface elements can be installed without cutting the edges of the washers. And: The connectors are a contribution to environmental compatibility. For the constructions can be easily dismantled and the profiles can be reused without restriction, as there is no damage caused by drillholes.

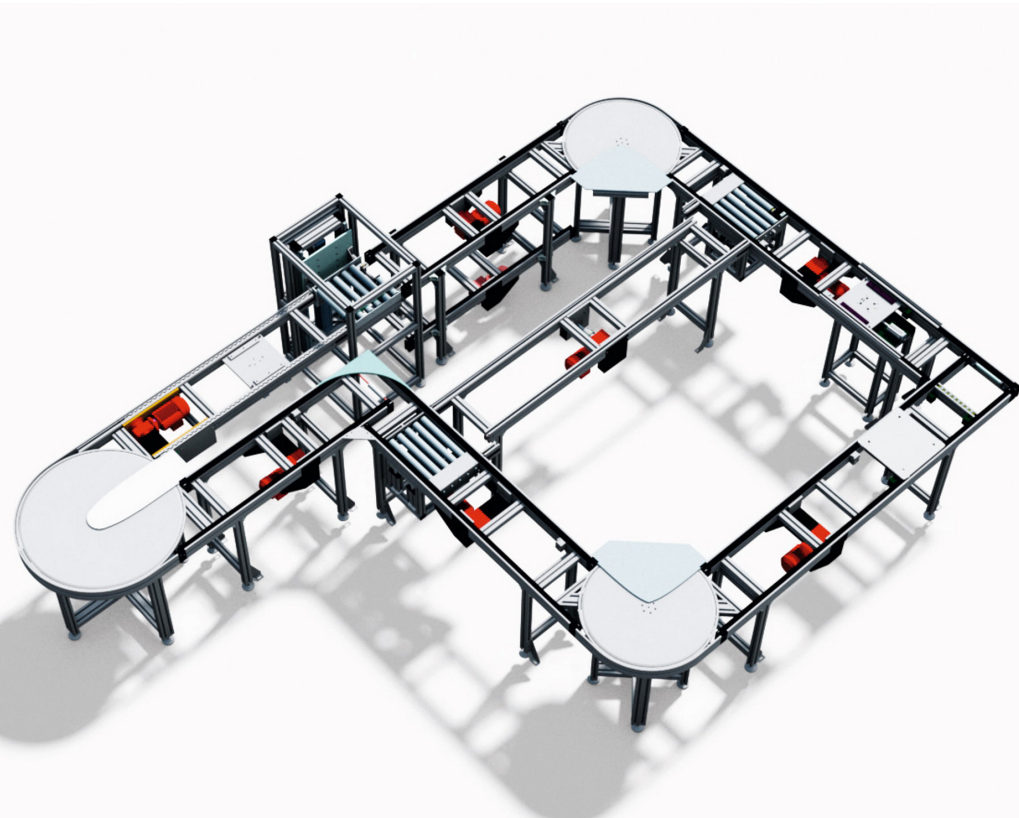


More information

< [Product page of the power-lock fastener N:](#)

[Video on use of the profile-lock fastener:](#) >





BACK TO LOCAL PRESENCE

Local production has become more important to avoid delivery bottlenecks. But increased automation is required to be internationally competitive. The MiniTec flexible assembly system (FMS) is a good basis for this.

The current economic and political creases have made clear the importance of secured supply, at the same time other risks of globalisation have become clear. Interrupted supply chains have already caused costs that extend far beyond the cost advantages of production in low-wage countries. Furthermore, ecology and political tensions require new strategies.

Renowned companies have therefore changed their strategy and have created the term "Glocalization". The aim of this strategy is to maintain the global presence, but to secure the supply of essential components through local production. Apart from securing the supply, other aspects are also become increasingly important: On the one hand, the production costs are now also rising in the previously low-wage countries. In addition to this, there are sharply increased transport costs, scarce means of transport and containers and uncertainties caused by political tensions. Ecological and social aspects also play an increasingly large role for companies as well as for their customers. The environmental footprint caused by a product is a criterion in an increasing number of purchase decisions. And the damage to a company's image in case of a so-called "shitstorm" in the social media can lead to a major collapse in sales.

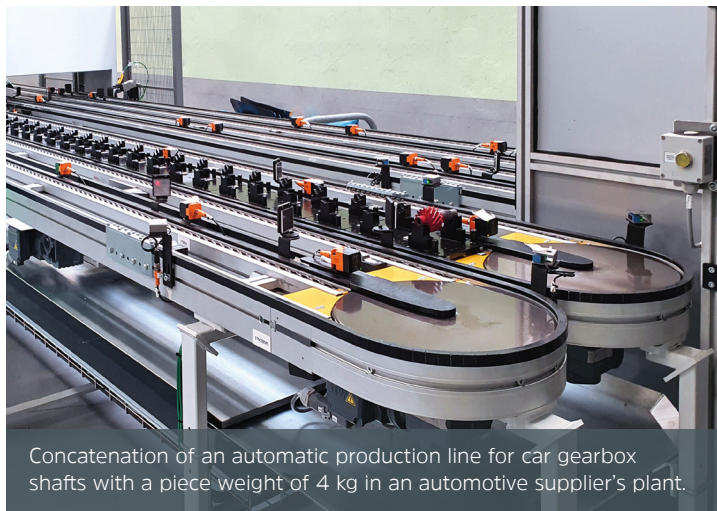
Local production is advantageous

To avoid all these risks, local production is indispensable, at least to a certain extent. However, at the same time, competitiveness is also necessary. These objectives can only be achieved with a greater degree of

automation and digitalisation of all processes. Suitable conveying technology is a basic requirement for optimised series production.

The MiniTec transport and assembly system FMS (Flexible Mounting System) provides all the preconditions necessary for economic automation. Following the company's strict design principles, the system is modular and can therefore be flexibly adapted to the customer's needs and is compatible with all the components of the MiniTec profile system. It is a complete transport and positioning system with workpiece carriers (WPCs), which are transported for the respective task on accumulating roller chains or double belts. The system is suitable for conveying speeds up to 18 m/min. Accumulation mode or reversing operation is possible with both types. Different reverse units make extremely space-saving system concepts possible.

The size and type of workpiece carriers with the retainers



Concatenation of an automatic production line for car gearbox shafts with a piece weight of 4 kg in an automotive supplier's plant.

for the products to be machined are individually matched to the customer's application. Systems with WPCs from 160x160 mm to 1000x2000 mm are already in use by numerous customers. The workpiece carriers are made of profile frames with a precision-milled Duralumin panel. Antistatic slide bars and rollers in the carrier corners ensure small clearance in the guide with simultaneous minimum energy use. Thanks to the accessibility of the WPCs from all sides, the products can also be machined from the underside.

Flexible due to different variants

The WPCs are transported on roller chains or a double belt, depending on the loading. The special guide profiles made of aluminium ensure precise guiding and positioning and low noise generation.

GLOCALIZATION COMBINES GLOBAL PRESENCE WITH LOCAL PRODUCTION

Roller chains are used for workpiece carriers with a mass up to 150 kg/m and a load of up to 1200 kg per drive. The drive variants are available depending on the load. All variants can be easily integrated in the line as standardised modules. The moderately heavy and heavy-duty drive units are designed for unidirectional conveying, while the lightweight unit is also

suitable for reversing operation. Long conveying sections can be upgraded with WPC accelerators, in order to optimise the cycle times in the system.

Economical to use

The double-belt conveyors are a particularly economic alternative for lighter products such as household appliances or for the pharmaceutical industry. The loading capacity of this system is 50 kg/m with 300 kg per drive in accumulation mode. Two drive variants are available for the double belt conveyors: A lightweight and a heavy-duty drive module, whereby the light drive is also suitable for reversing operation. Double-belt conveyors are distinctly low noise.

Different reverse units also make particularly space-saving system configurations possible. Turntables for 90°/180° reversing are available for the roller chain and double belt version. The advantages of this design are its freedom from maintenance and operation without control elements. The running direction of the WPC is not changed. Driven turntables are used, depending on the weight and speed.

Particularly large WPCs and high loads are reversed by means of lift-cross-transfer units. These turn the running direction by 90°. The transfer section is implemented with rollers, toothed belts or roller chains to ensure the optimum for every requirement. The lift-cross transport units are also used for inward and outward transfers.

In addition, two other, particularly cost-effective reverse units are available for double-belt conveyors. The 90° rotation is achieved by lateral forced guiding of the WPC without additional drive or control unit. The running direction is retained in this version.

Stunningly simple and efficient

The patented inertia reversing fully meets the MiniTec “Art of Simplicity” standard. It needs neither lifting

cylinders, valves, sensors, control unit or programming. Even a guard is not required. The propulsion of the conveying section pushes the WPC via a patented roller on the transverse section. The running direction of the WPC is turned by 90°.

The stoppers for accumulation, separating out or stopping in front of a machining station are important for careful operation. A large number of different stopper types, with or without damping, are available according to the application. The

variants are electrically or pneumatically driven, pneumatically adjustable or have a return stop to prevent the WPCs from rolling back.

From level to level

Large systems can make it necessary to cross vehicle routes or to move the WPCS to another level. Up to 5 m height differences can be overcome with the electrical lift system. The lift index unit enables precise machining of workpieces on the WPC. With it the WPCs can be positioned exactly with a tolerance of +/- 0.1 mm, with a maximum load of 100 kg. The lift index unit can be optionally combined with a turning device for change in direction.

The position of the WPCs at the stopper, at the end of a queue or in a passage control is registered exactly by sensors, which are optionally attached from underneath or at the side. Sensor sizes M12 and M18 are available. Write and read units, which record the respective machining status or mark the WPC are important requirements for efficient automation. They are also available as an option.

The systems are mounted on stable, height-adjustable supports made of aluminium profiles from the MiniTec system. Exact levelling is easily possible with threaded feet as well as the secure anchoring on the floor.



The accumulation roller chain conveyor with a length of 450 m includes the following assemblies: 120 drive units, 130 stoppers, 50 turntables for 90°/180° WPC reversing and 60 positioning units.



An FMS system for use in automotive production for the transport and assembly of cockpit or seal elements.



ON THE AIR WITH MINITEC

The MiniTec profile system is in use in many areas – including in the fitout of a production truck for television productions.

Regardless whether for large entertainment or theme shows, television series, sports broadcasts, events or product presentations, with its studios and outside broadcast (OB) trucks, Studio Berlin provides all options, from the planning through to the implementation.

In the summer of 2021, the company invested in the new “Ü10” OB truck for the greatest possible flexibility for mobile productions and at the same time also had its own production truck built. This separation of direction and technology was the largest new conceptual innovation. The technical components are not installed in the OB truck as usual but are completely accommodated in a central



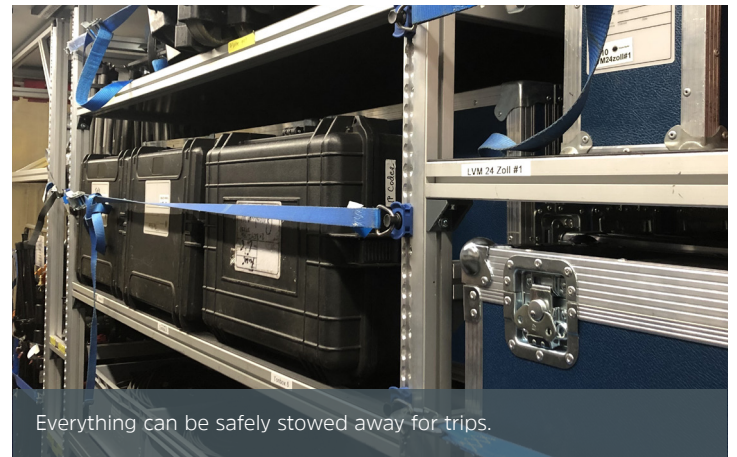
Everything for order: Shelves, drawers, slide-in units.

equipment room in the production truck. This offers many advantages for productions.

In the concept of the production truck, Studio Berlin attached great importance to the flexibility and stability of the interior fit out. What was needed was shelf systems and constructions that can hold material and equipment of all kinds of different size and some with very large weight and which can be modified with little effort.

Interior fit out of the production vehicle

Against this background, Studio Berlin instructed its system integrator to fit out the production truck with the modular aluminium profile system of MiniTec. It had already experienced and learned to value the stability and flexibility of this system in other areas, for example, for hygiene partitions or director's tables. It was also an advantage that MiniTec Berlin is in the immediate vicinity of Studio Berlin, both companies are literally a stone's throw away from each other in the Adlershof technology park.



Everything can be safely stowed away for trips.

Studio Berlin is extremely satisfied with the result, its technical manager, Matthias Alexandru, said: “We needed a living shelf system in our production truck, because the contents and their dimensions are constantly changing. We wanted to be able to carry out the changes largely independently, without having to assign the work to an external vehicle builder. With MiniTec as a competent partner and its modular profile system, this is possible at any time and has also already been put into practice often. This flexibility is of invaluable benefit for us!”

ESD: DANGER IS ALL AROUND



An increasing number of products contain highly sensitive electronic components, whose transport and assembly requires reliable protection against electrostatic discharge (ESD). Production lines and assembly workstations must fully meet this requirement.

Electrostatic discharges (ESD) in the production and assembly can cause major damage to electronic components. The causes are diverse and their origin can be in practically any point in the process chain. During production and assembly, for example, inadequately protected systems, equipment and employees are a risk. And damage due to ESD can even occur in the environment of quality assurance. A discharge of 100 volt is sufficient for a pre-existing defect in a component, while people do not notice discharges until a threshold of 3,500 V. The employee therefore does not usually see anything, hear anything, feel anything, and yet poor safety precautions can cause damage to a component.

To prevent this, ESD protection measures must be taken, which prevent electrostatic charging. Only an uninterrupted protecting ESD chain can reliably

prevent damage due to electrostatically caused dielectric breakdowns. MiniTec has addressed this topic from year one and offers effective ESD protection for all areas of production.

Safely connected

All MiniTec constructions are produced on the basis of the tried and tested modular profile system. For an ESD-fit set-up of constructions, all profiles must be connected with electrical conductivity. With the MiniTec profile lock fastener, the conductivity of the aluminium construction is always ensured without additional measures or earthing cable. Even small electrostatic discharges, which lie below the perception threshold of humans, can be harmful for electronic elements or lead to their destruction.

A particular challenge is the ESD-compatible production of conveyor systems in production. The risk of an electrostatic charge increases due to the friction of the movable elements such as conveyor belts or motors. Here, too, MiniTec offers appropriate solutions.

Workplaces with ESD protection

Workplaces in particular must have particular ESD protection. The MiniTec workplace system can be designed so that all components meet the ESD requirements. To this end, MiniTec offers a large selection of appropriate tabletops, lamps and accessories.

It is also important for no chargeable materials to be used within the handling area. If these are absolutely necessary in the form of computers or telephones, safety distances must be maintained from the handling area. The whole work area should be dissipative and earthed. This particularly applies to workstations, base cabinets, drawers, shelves and transport trolleys. Equally, open trays, storage boxes, covers and tools must be made of a dissipative material.

For example, ESD KanTainers, which support the kanban principle, and are included in the MiniTec product range are recommended for the safe storage and provision of sensitive electronic components. The containers, closed off with a cover, are designed for longitudinal and transverse transport on small roller conveyors and can be converted into open trays by folding out the tray. This removes the need to transfer goods from the storage container to the tray.

The workplaces can be equipped with ESD castors to make them moveable for the flexible design of production lines or islands. All other components and extensive workplace accessories are naturally also available in an ESD version.

Testing floorings and shoes

But it is not only workplaces, systems and machines that contain risks for sensitive electronic parts. Floorings must also be considered. Therefore, special ESD floorings should be used in ESD protection zones. These are conductive and are connected to the earthing. This ensures that electric charges, which can occur while an employee is walking, are safely dissipated.

Another risk factor is shoes! Conductive and earthed ESD floors are of little use if the persons in this area do not have any electrical contact with the floor. Normal shoes often act as insulators. Conductive shoes or shoe earthing straps establish a conductive connection between our bodies and the ESD floor, which means that charges are safely dissipated when we walk.

ONLINE SEMINAR ON 11 MAY 2022

A large number of measures are therefore necessary to produce with ESD safety. The specialists of MiniTec will be pleased to offer their support. An online seminar on 11 May 2022, from 14:00 to 15:00, will provide information about ESD protection in the workplace, explain the basic principles and will provide approaches to solutions as well as practical examples. Register free of charge at www.minitec.de/esd-seminar



MiniTec offers a modular system for ergonomic workplaces, which protect against electrostatic discharge (ESD), for the assembly of electronic components. The workplaces can be optionally electrically or hydraulically adapted to the employees' body size and offer the option of carrying out the work in an alternating sitting and standing position.



FLEXIBILITY MEETS SUSTAINABILITY

Good training is indispensable for a sure command of modern drive and automation technology. A customer in the automotive industry commissioned SEW-EURODRIVE to build a modular training model. Together with MiniTec, a solution was conceived that can be flexibly adapted to new technologies and retains its CE marking even after modification.

SEW-EURODRIVE with its head office in the North Baden town of Bruchsal, is one of the worldwide market leaders for drive automation products. In its company history of over 90 years, its innovations for new technologies were and are always groundbreaking. With its modular drive system, today alone SEW-EURODRIVE enables over 45 million possible combinations for geared motors. Here it is also important that the Bruchsal company can offer an extensive support package. One of these support elements involves the training and continued vocational/professional development of numerous customers' skilled personnel.

Safety writ large

Practical exercises on standard components is the most important guarantee for success for the learning result in vocational training and continued development. The correct electrical installations should also be taught at the same time. Electrical voltages within the range of 230 V or 400 V require a high degree of safety for the trainees and their trainers. Ultimately, they work on the "open heart". This requirement and the objective of reproducibility of the exercise series is met by using standardised connection technology via 4 mm safety test terminals.

Electrical safety is defined by VDE regulations and is documented by a risk assessment, to then confirm the functional safety to the user through CE certification. However, this declaration only applies as long as a tested system is not changed.

The increasingly shorter innovation cycles and increasing functionality in drive and automation technology also require the continuous adjustment of such systems to the new technologies.

Flexible didactic model

In 2021, a customer in the automotive industry commissioned SEW-EURODRIVE to develop and produce a training model for continued vocational development. This industry uses innovations and new drive technologies in its production early. To avoid expensive adjustments of the models (installation work and renewed complete CE certification), a new model philosophy was implemented here for the first time ever.

Working in close collaboration with the MiniTec design department, a transportable training rack was conceived,

TRANSPORTABLE TRAINING RACK FOR TRAINING AND CONTINUED DEVELOPMENT

in which the basic electrical supply and the monitoring of the power and control voltage are integrated in the rack. The current drive components to be taught in the seminar

can be compiled and installed individually. In addition, the installation of a linear axis system enables positioning exercises for finite and infinite movement sequences.

Declaration of conformity remains valid

This flexibility of the exercises is based on the didactic portfolio of SEW-EURODRIVE. These training modules have CE certification and, in combination with the new type of model rack, which is also CE certified, a new declaration of conformity does not have to be issued. The model concept is only subject to the annual periodic VDE test for movable electrical loads.

SEW-EURODRIVE and MiniTec are not only connected by the modular principle, but also a longstanding joint collaboration with reciprocal customer-supplier relationship.

Further information is available at www.sew-eurodrive.de/didaktik.



The basic concept enables diverse possible uses.

ADVANTAGES AT A GLANCE

- permanent CE marking of the model
- comprehensive functionality and a high degree of flexibility
- safe to touch electrical connections
- mobile and transportable training model
- integrated workstation with pull-out laptop platform
- modular design with individual add-on options
- based on the modular systems of SEW-EURODRIVE and MiniTec



"We want to make technologies comprehensible for trainees", said Gregor Wohlfart, Didactic Sales Engineer at SEW-EURODRIVE.



MADE TO MEASURE PROFILES

The MiniTec subsidiary in Berlin has developed a saw with automatic length stop. The system enables precise cutting to size of aluminium profiles.

MiniTec aluminium profiles can be ordered with any length between one centimetre and six metres. To supply our customers in Eastern Germany from our Berlin location, a complete set of cutting equipment, consisting of a saw, racks for feeding and removal and a motorised length stop was developed and built in the headquarters in the Western Palatinate for the branch on the River Spree.

The facility allows precise cutting to size of all aluminium profiles in the MiniTec product range. The profiles are placed on a roller conveyor for manual feed. The rollers used are brush rollers, which are particularly material compatible and avoid scratches and other damage on the aluminium.



A linear rail guide ensures precision and robustness

The required length is entered at a control panel. The length stop then moves into the relevant position at the press of a button. A linear rail guide with toothed belt drive serves as the run, which makes the construction particularly robust and reliable. An absolute magnetic tape measuring system picks up the position directly on the slide and thus ensures high accuracy of the cutting to size. If the required position is reached, a pneumatic clamp ensures fixed locking of the slide – which also helps to achieve the precision.

Precise cut

The convenient control panel allows a large number of other settings to be made, for example, the traversing speed or to accelerate the length stop. Equally, it informs about queued fault, warning and operating messages and can be used for diagnostic purposes. MiniTec can, of course, also produce such systems, or similar ones, for its customers. And not only for aluminium profiles, but also for other materials such as wood, plastic or steel. For example, a system is in use



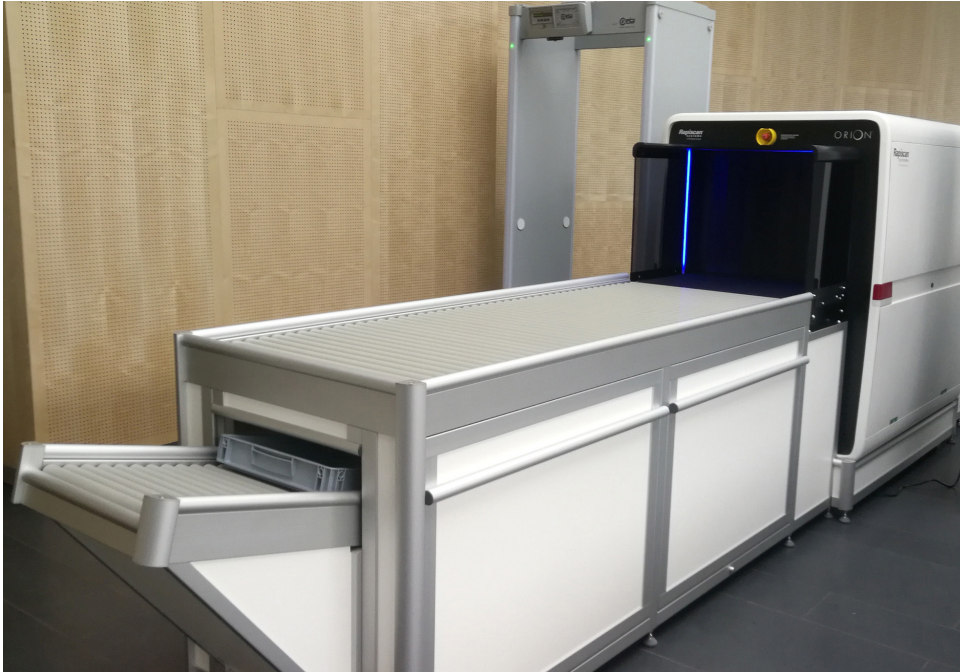
Brush rollers protect the workpieces.



The length is entered at the control panel

at the Waldmohr site with which shafts made of precision steel are cut. Any other individual requirements can also be easily implemented, for example, regarding the width and length of the roller conveyors or if an automatic feed is required.

WELL SECURED WITH MINITEC FRANCE



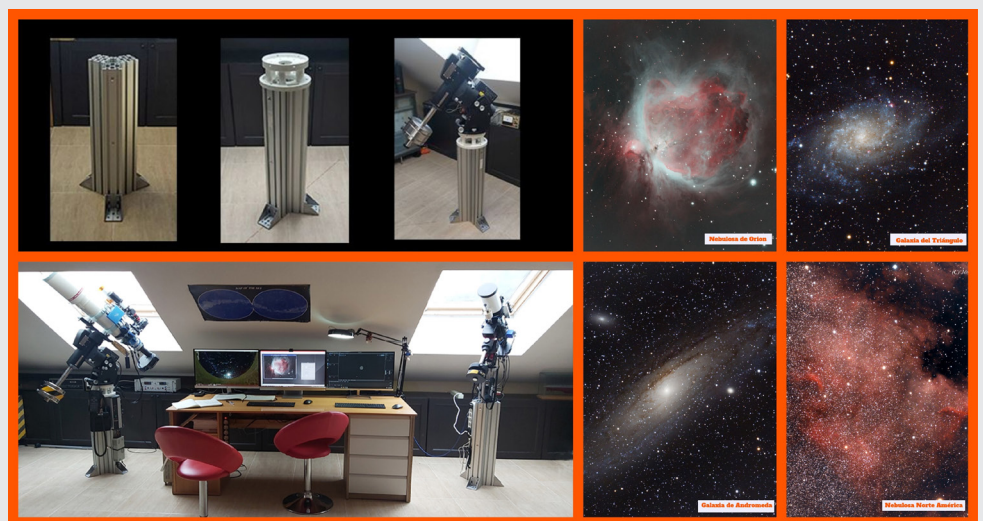
MiniTec France, together with HTDS in Massy near Paris, has design a system to ensure the security of people in airports, ports, railway stations, customs, transport companies, prisons and other large authorities. HTDS is specialised in the marketing and maintenance of high-tech security equipment for passenger security checks. Systems have now been installed and put into service in the new entrance hall of the European Commission in Brussels.

MiniTec France helped to develop a conveyor unit for this, which transports the containers into the scanning area in order to increase the throughput capacity for visitors. The system also includes access control security locks for people, also with test equipment. Security guaranteed.

STARGAZING WITH MINITEC

In Spain, the stable 90x90 MiniTec aluminium profiles were used to firmly fix heavy telescopes. These are anchored in the floor and carry the weight of the telescopes in an astronomical observatory in Madrid.

Several of the impressive images taken by these telescopes are of the Orion Nebula, one of the brightest in the night sky and around 1300 light years from the Earth. Or the Triangulum Galaxy, a member of the local group of galaxies, to which the Milky Way also belongs. The Andromeda Galaxy, around 2,5 million light years away from us is the furthest object that can be seen with the naked eye.



The telescopes in the observatory in Madrid enable a view of deep space.

And: The shape of the North America Nebula is similar to that of North America. Its reddish glow is caused

by the radiation emitted by ionised hydrogen.

PARTNER FROM THE VERY OUTSET

MiniTec Automation is based in the Midwest of the USA, not far from the Motor City Detroit. It is one of our first partners in the USA, with which the MiniTec founder, Bernhard Bauer, established contacts back in 1999. Apart from its own subsidiary, MiniTec Framing in New York, the most important American economic regions are therefore covered.



In 1986, Lloyd Schmaltz started his pneumatics company in Clarkston, Michigan. Only thirty minutes to the north of Detroit, it provided attractive opportunities for servicing customers in the automotive industry. However, the entrepreneur Schmaltz did not stay with this offer alone. He had always been fascinated by aluminium as a material and the extensive design options that are possible with aluminium profiles. At this time, Schmaltz had already developed a customer base which wanted to use these solutions, so he began to investigate the possibilities of developing sales for aluminium profiles.

Lloyd Schmaltz, who was interested in entering the USA market, met Bernhard Bauer at a trade exhibition in 1999. Only a short time later the two began business relationships with each other.

In the twenty years or so since, MiniTec Automation has grown to over 60 employees. Lloyd retired in 2020, and handed over the company to his son, Mike Schmaltz. He works at MiniTec Automation as an engineer and has been in the company from the outset.

Advantages quickly identified

As an experienced engineer, Schmaltz quickly recognised the important advantages of the MiniTec profile system with its innovative connector. The ease of assembly was therefore always a sales argument.



Mike Schmaltz took over MiniTec Automation in 2020 from the company founder, Lloyd Schmaltz.

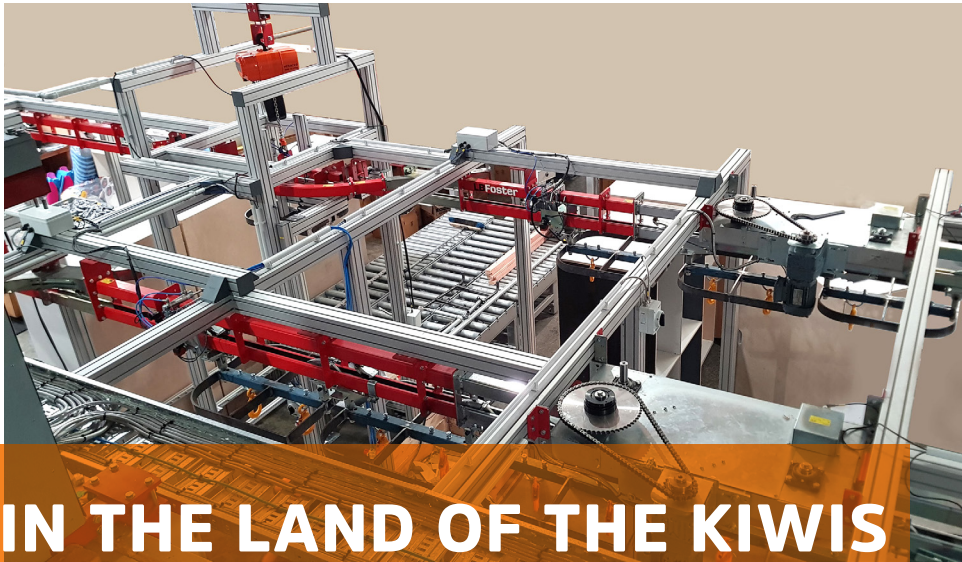
The profile-lock fastener shortens the time the designers need to create a project. This system has contributed to the creation of high-quality constructions and even more complex projects are usually able to be completed on schedule.

On a growth course

Above all, MiniTec Automation offered the automotive industry in Detroit machine protection and housing solutions. Solutions for sound, laser, light and robot cladding are in particular demand. There are two growth areas on which MiniTec Automation with particularly concentrate in the future: The provision of more information about the MiniTec system and establishing itself further on the market. And: The additional focussing on linear and conveying technology.



MiniTec Automation mainly supplies the automotive and supplier industry within the catchment area of Detroit.



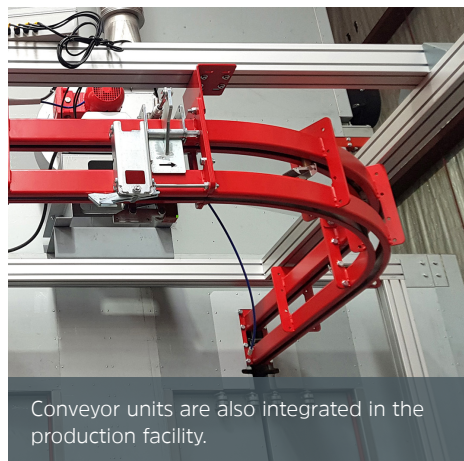
IN THE LAND OF THE KIWIS

MiniTec products are even used as far away as New Zealand. The engineering consultants Jonassen Industrial Project designed and produced an automated production facility with conveyor technology components for a manufacturer of protective sports clothing.

A cooperation with profile: The New Zealand firm of engineering consultants, Jonassen Industrial Project (JIPL), received an order for the development of a production facility for OBO, a worldwide leading New Zealand manufacturer and supplier of protective sports clothing, especially for field hockey. This also required profiles and conveying technology components. With the support of SMC New Zealand (a specialist for pneumatic and electrical automation technology) an automated production facility was designed, which solved OBO's production problems. The worldwide growth of OBO and its development into the dominant player in the sports industry had increased the requirements set for the outdated systems and processes. It became increasingly difficult to satisfy the additional market demand and at the same time maintain the high quality standards.

Rethought production processes

JIPL started a project and identified the problems, in order to develop a solution and a range of new options together with the customer. This led to the rethinking of the entire production process and changing over from the original batch process to a flow model. The solution also included a mechanism



Conveyor units are also integrated in the production facility.

for loading and unloading and for positioning heavy moulds on a section of the conveyor system. JIPL implemented the whole project as a turnkey contract, including the design, the project management, monitoring of the installation and the commissioning.

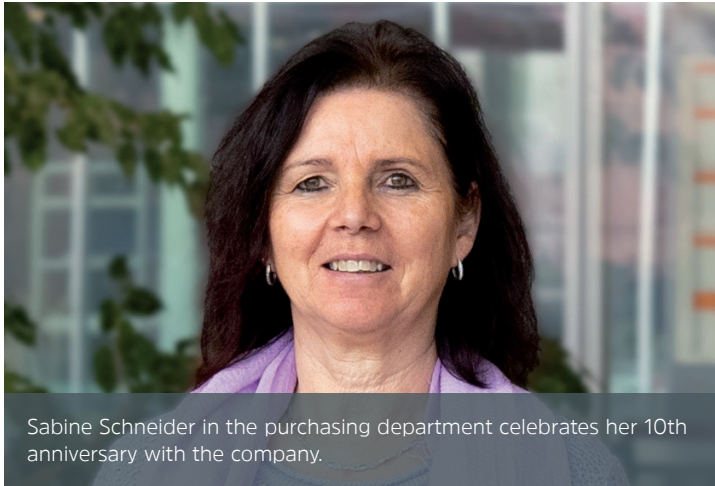
From the batch to the flow process

The process specialist JIPL redesigned the old batch process as a flow process. To satisfy this process optimally, JIPL opted to use MiniTec profiles as the basis of the conveyor belt and for the loading and unloading mechanism. The flexible, modular aluminium profile system was combined with a conveyor system.

JIPL contacted the MiniTec team at SMC New Zealand in advance to discuss several of the project's technical challenges and to see whether MiniTec could provide a solution. The MiniTec team was pleased to assist with application and design advice and also supplied CAD models of the components. Using the 90x90 MiniTec profile and a range of compatible standard components, among other things, a robust loading and unloading mechanism was developed. The system was flexible enough to meet all the design requirements and to minimise the assembly and installation time. The technical and economic results are convincing: The plant capacity was tripled and a uniform production quality was achieved in the entire facility, which solved an important business problem and the throughput was increased.

LONG-SERVICE EMPLOYEES AND FAREWELL TO MINITEC

During the past 36 years, MiniTec has continued to grow from a supplier of linear guides to a full-service provider in all kinds of different industries – and many employees have accompanied the company on this long journey. In Germany alone, 280 people now work for MiniTec.



Sabine Schneider in the purchasing department celebrates her 10th anniversary with the company.

We are pleased to celebrate our employee's service anniversary with them in this quarter:

Waldemar Kolloch (Engineering): 25 years
 Sebastian Kühn (Mechanical production): 10 years
 Sabine Schneider (Purchasing): 10 years
 Martin Mohrbach (Assembly/automation): 5 years
 Dominik Theobald (Mechanical production): 5 years
 Mark Lukas (Assembly/automation): 20 years
 Ernst Meichinger (Field service): 15 years
 Melanie Schröer (Sales): 10 years
 Gzim Alija (Warehouse/preassembly): 5 years
 Benjamin Schneider (Engineering): 5 years

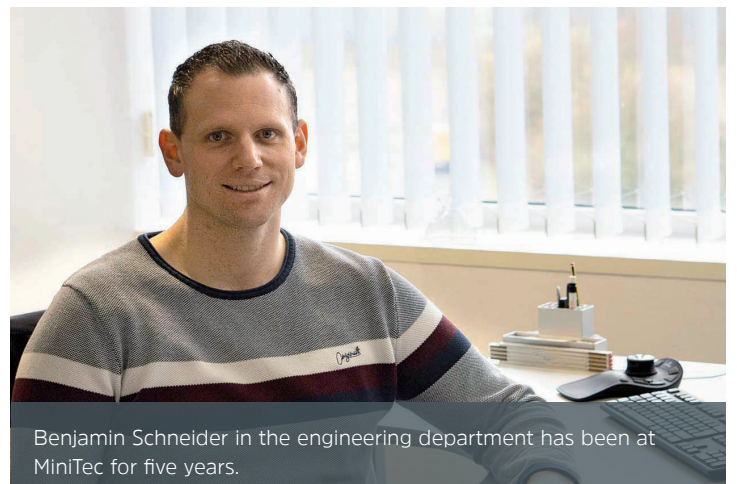
Benjamin Schneider looks back on five years:

"After I graduated, MiniTec gave me the opportunity to extend my knowledge and skills in many interesting projects. Due to the wide range of special mechanical engineering projects, I am repeatedly pleased to face interesting new challenges. This makes the everyday working life rich in variety."



Farewell to Ernst Meichinger in his anniversary year: Sandra Geyer-Altenkirch, Ernst Meichinger, Benjamin Renno (from l to r).

For Ernst Meichinger it is a case of celebrating his 15-year anniversary and at the same time saying goodbye, because the field sales employee is taking his well-earned retirement. During this time he was a fields sales representative in North Bavaria, always supported by his co-workers in the MiniTec location in Zirndorf near Nuremberg. He later changed to the South/East Bavaria sales region. From his home office he travelled over 50,000 kilometres yearly for our customers and always endeavoured to implement their impressions, ideas and visions with the help of the co-workers in the head office. "During my time at MiniTec, many new and close connections have grown, for which I am now very grateful", he remembered.



Benjamin Schneider in the engineering department has been at MiniTec for five years.



IMPRINT

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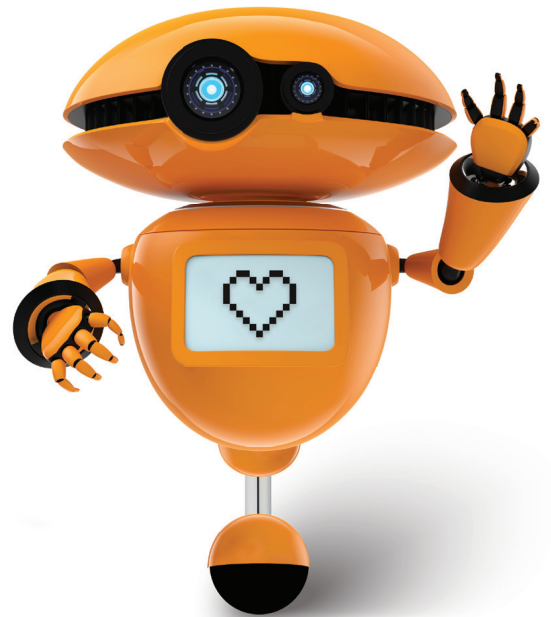
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