



THE BIG PICTURE, AND THE DETAILS.
FRITZMEIER – YOUR PREMIUM PARTNER FOR CAB CONSTRUCTION.

WHETHER FORKLIFT, CONSTRUCTION MACHINE OR AGRICULTURAL MACHINE,
THE CAB MAKES THE DIFFERENCE.



- 1 Clear view through elimination of both A-pillars, 3-piece front windshield and large PC roof panel
- 2 Tested FOPS structure of steel



- 3 One-piece bent side aluminium section with integrated sliding windshield
- 4 Tested ROPS and FOPS structure of aluminium



- 5** Plastic rotation components with integrated air conditioner and air channel
- 6** Clear view through large glass roof panel

TRENDS AND DEVELOPMENTS IN THE OEM BUSINESS: AT FRITZMEIER WE KNOW WHAT IT TAKES.

With seven plants in Europe and one Joint Venture in India, Fritzmeier is one of the major players in vehicle cab construction. What does that mean for customers, and how is the company prepared for the future at the international level? An interview with Erich Thrainer (Development), Martin Schulz (Production) and Alexandra Herrmann (Sales & Marketing).

Fritzmeier is a company with decades of experience. How does this benefit customers?

Erich Thrainer: Definitely our deep specialist knowledge is a benefit, as is our engineers' very close understanding of market developments and customer needs. Our large components portfolio is also helpful for customers who don't want to have to order every component purpose-developed. With our longstanding market presence we have a very good knowledge of the current state of the art and of future developments, so we can give sound advice.

Alexandra Herrmann: Since we've been on the market so long, our network is very good and very extensive. From customers, suppliers, other market participants, and associations like the VDMA,

VDBUM and the Market Intelligence Group, we're familiar with the cabs in the off-highway market and we know what's important for our customers.

Martin Schulz: These days production naturally requires a high level of automation and the latest production technology. We continually invest in our machinery, but the experience of our employees is just as important. Many of our people have been with us for a long time, so we have a lot of practical knowhow and continuity in our operations.

How does Fritzmeier make sure that its customers around the world are taken care of?

Erich Thrainer: Via our Europe CAB plants and the CAB Alliance partners we ensure that customers have knowledgeable contacts everywhere in the world. Through regular coordination on technical developments in the market and on regional differences that we need to take into account for international projects, we are always in a position to offer the right solutions to our global customers.



Cooperation partner in North America

FRITZMEIER CABS

Our plants in Europe



Systems

GERMANY | HQ
Großhelfendorf



Wels

AUSTRIA
Wels



Systems

GERMANY | Logistics
Weyarn



Engineering

ROMANIA
Sibiu



Vyškov

CZECH REPUBLIC
Vyškov



Carwall

BELGIUM
Sombreffe



Banovce

SLOVAKIA
Banovce

Fritzmeier Group
Cabs and Metal Construction
in Europe



NINOMIYA

Cooperation partner in Asia

ethos
Metalúrgica

Cooperation partner in South America



Joint Venture in India



The Fritzmeier headquarters in Großhelfendorf, Bavaria



Under discussion: Martin Schulz, Erich Thrainer and Alexandra Herrmann

TRENDS AND DEVELOPMENTS IN THE OEM BUSINESS: AT FRITZMEIER WE KNOW WHAT IT TAKES.

Speaking of that, in terms of current projects, what expectations do customers have today?

Alexandra Herrmann: In sales, customers don't want to have to deal with changing contact persons. So we work by the principle of One Face to the Customer. It's especially important for smaller OEMs to have a concept partner that they can stay with as they develop, and that's exactly how we go about things.

Erich Thrainer: The customer is a specialist in his field, and expects us to be specialists in our field. We bring our knowledge of standards, materials and processes into every development project, so we can build the perfect cab. It is also getting more and more important to provide thorough and high-quality documentation on products, such as instruction manuals. We start working on them as early as the development phase.

Martin Schulz: Production is expected to deliver the right cabs in the right quantity on the right day. We do everything we can to make that happen. Another point is that we make sure that replacement parts are available throughout the product life cycle. That means at least ten

years after the end of production, and usually even longer.

Digitization, integration capability, etc.: How are current trends affecting what you do?

Martin Schulz: To reach the goals I just mentioned, i.e. high delivery reliability, we need to automate our systems and processes, have fully automated data exchange, and have very highly networked production. We've initiated many of these things, but just as with other companies, implementing Industry 4.0 is an ongoing process.

Alexandra Herrmann: Networking is the key in digitization. We need to work with strategic partners, but also build up in-house expertise. One example of cross-industry cooperation is the CAB Concept Cluster, with which we introduced the Smart CAB at Agritechnica 2017. It features highly integrated digitization at a level that could only be reached through cooperation.

Erich Thrainer: The technology in cabs is changing rapidly. Cables are disappearing and CAN/BUS controls are coming into use. New HMI's with touchscreens are

replacing switches, and automatic systems are helping operators work efficiently. We set up the Leading Expert programme in order to build up and expand on the necessary specialist knowledge. Our engineers regularly attend continued training sessions, learn about trends and give in-house training to raise the level of knowledge in the company.

In your view, what sets Fritzmeier apart from the competition?

Alexandra Herrmann: Certainly our over ninety years of market experience, with currently over 50 OEM customers and more than 80 cab models in our portfolio. Our market knowledge, our role as an innovation driver, our extensive roster of customer-neutral developments to save investment costs - I think there are many things that set us apart. And customers often tell us that we're easy to like at the personal level. That's a special bonus, and has to do with the people who work at Fritzmeier.

Erich Thrainer: We're a full-service development partner, from product design to ergonomics studies to control engineering. We can do almost everything - and

we're working on doing even more.

Martin Schulz: We make annual production runs of between 50 and 10,000 units. Almost no manufacturer offers this kind of flexibility coupled with high product complexity.



WHAT MATTERS TO YOU: SAFETY.

In cab construction, the challenge today is to combine safety with reduced use of materials, high functional integration, and modern, sometimes very lean designs. Fritzmeier continuously works on new technologies and materials on order to meet this challenge. At the same time, we keep track of all standards and regulations so that we can fill all safety mandates.

A GREAT VIEW:

Slim cab made of glass and completely safe.

The best possible view is a fundamental factor contributing to safe and effective working. This can be achieved with carefully designed steel sectional frames and large glass panels. All ROPS and FOPS safety test requirements must be met; we can accomplish this through proper design and the right glass materials. In applications where weight is an issue we can use aluminium safety cabs or structures which likewise pass ROPS and FOPS safety testing. In addition to saving weight, aluminium allows considerably more design leeway.

EVERYTHING IN VIEW:

System support for human and object recognition.

Driver assistance systems are coming into increased use to reduce accident risks. Thus, safety design includes the integration of components like Birdview, mirror replacement systems and ultrasonic sensors, data processing and in-cab presentation. We can also integrate multisensor warning systems.

PUT THROUGH THEIR PACES:

Dependable simulations.

CAD cab developments are repeatedly tested by FE calculations from an early stage. This ensures that subsequently in actual operation the cab will meet all prescribed ISO tests for ROPS/FOPS while also having a cost-effective design. With years of experience and comparing real test results with simulated results, Fritzmeier is able to make very accurate calculations upfront. This reduces the costs of testing and shortens development time immensely.



ISO tests for ROPS/FOPS safety structures

THE FRITZMEIER-DETAIL

Stacker cab with a view.

In order to offer an unhindered upwards view from a stacker cab, we used a large polycarbonate roof panel with scratch-proof coating that requires no extra protection and is tested to ISO 6055.



FEA (Finite Element Analysis) for safety structures



Durability tests for sliding windows and door stoppers

WHAT MATTERS TO YOU: ERGONOMICS AND COMFORT.



Modern ergonomics and perfect HMI, boost operator control

Over the last few years, the comfort standard for utility vehicle operators has steadily risen. In some cases it comes up to automotive levels. With solid design, pleasing colours and optimized ergonomics appropriate to a workplace, our cabs help long shifts of eight or more hours go smoothly.

A PLEASANT WORKING ENVIRONMENT:

From materials to HVAC.

Industrial designers lay out our interiors. There are very few limits to the choices of interior cladding – from rotational parts with integrated ventilation to sound-insulating pressed fibre components to high-end ABS moulded parts with soft-touch surfaces, we can outfit cabs to order. Signature lighting in the customer's corporate design rounds off the look.

A good working climate plays an increasingly important role, and we ensure it with optimized interior air distribution. In high temperature environments this results in effective air conditioning, and in cold weather it means good cab heating and efficient window deicing.

RAMSIS MAKES IT POSSIBLE:

Ergonomics for all.

Whether armrest, operating console or seat position, the better everything fits the operator, the better the ergonomics and the less physically fatiguing the work. With the RAMSIS 3D-CAD human model from Human Solutions, Fritzmeier can simulate any kind of operator. This results both in faster product readiness and in ideal ergonomics.



THE FRITZMEIER-DETAIL

Service & maintenance made easy.

A cab with every comfort doesn't help the operator if service and maintenance are a major effort. So our strategy is to make access for all maintenance and service work in the cab as easy as possible.

Easy service and maintenance work via service flap

WHAT MATTERS TO YOU: ECONOMY AND INTEGRATION CAPABILITY.



Welding robot for welding sub-groups e.g. side frames



Full-automated grinding robot for cabin structures



THE FRITZMEIER-DETAIL

New processes, new potential.

Automated process, new potential – during the development process Fritzmeier focus on automation-friendly design, enabling later cost efficient manufacturing.

Whether construction machine, agricultural machine or forklift, manufacturers of off-highway vehicles are usually under high cost pressure. So it is very important for cab projects to be cost-effective. Fritzmeier offers solutions aligned to the product and planned unit quantity. Based on the available budget, the implementation possibilities are detailed out without losing sight of quality or safety.

STANDARDIZATION, AUTOMATION, NEW PROCESSES:

Cost-awareness has many names.

Thanks to our long experience, we can offer customers a wide range of existing components that can be incorporated into new cab designs. Thus, not everything has to be designed from the start for each cab, which reduces investment costs. Naturally many of these are non-variable items like metal sectional frames, wiper motors and gaskets. But many are also our own customer-neutral developments based on general customer needs; these include lock systems, coverings, handles, hinges and door stays.

Our cost optimization also goes much farther, to include automation-friendly design from the development phase, enabling later cost-efficient manufacturing.

INTEGRATION CAPABILITY BRINGS BENEFITS:

Lower costs through thoughtful design.

Intelligent function integration has two advantages. It reduces the number of individual parts and so cuts costs, while making cab exterior and interior design much more appealing. Fritzmeier has a wide range of variants to choose from – integrated headlights and signal lights, guide and seal systems in aluminium, multifunctional cladding components, HVAC incorporated into the cab structure, and much more.



CONCEPT — DESIGN — PROTOTYPING — TESTING — PRODUCTION: WE STAY WITH YOU THE WHOLE WAY.

1 INDUSTRIAL DESIGN

Fritzmeier offers customers complete cabs, cladding parts and system modules by the plug & play principle. To have the right answer for any customer request, we offer the entire value creation chain from concept and design, to prototyping and testing, to production. This is the only way to supply customers reliably with high-quality products.

In styling, development and construction Fritzmeier sees itself as an expert partner for its customers. Customers can get form, function and ergonomics to order. Our large and coordinated pool of injection moulded plastic parts, extruded aluminium section and rolled steel tubing is a special plus.

Development includes comprehensive simulations by the latest methods, reducing the outlay for physical testing. Prototypes go through an extensive test phase including endurance, shake and shower tests as well as customer-defined analyses. Standards-pursuant testing is done by the Deutschen Landwirtschafts-Gesellschaft (DLG).

Once series production starts, customers benefit from our in-house tool and jig production, which ensures that everything

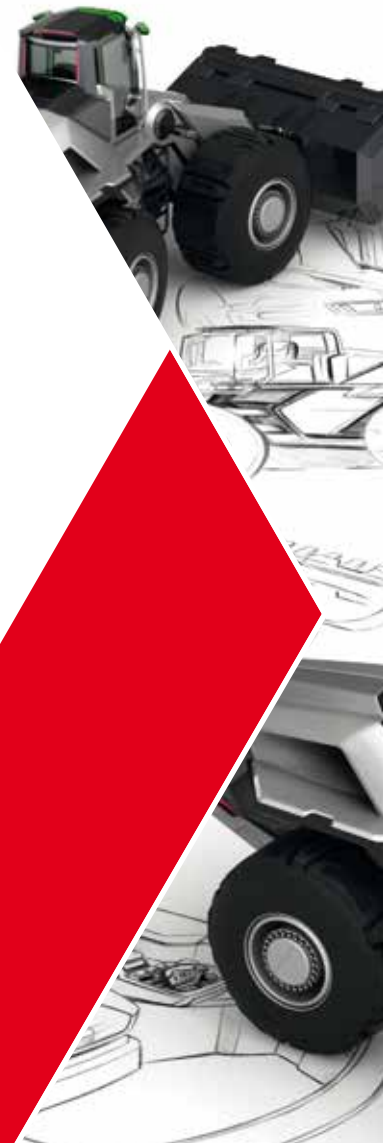
is tailored to the project and the production line. Expertise in many different manufacturing technologies is needed to build the enormous diversity that over 80 different OEM cabs involve. We accomplish this with highly skilled employees and continuous investment in new systems.

FOR EXAMPLE:

- New pipe lasers cut pipe sections and drill holes in the designated positions. The system then passes the pipes on to bending machines.
- Automated laser systems take in parts, laser them, and send them on for further processing with little human involvement, 24 hours a day. Another advantage is the fact that the cutting gas used is nitrogen, so cut edges are ready for coating without further work.
- A robotic metal bending system works fully automatically, using a laser measurement system for high precision. It makes even small lot sizes efficient.

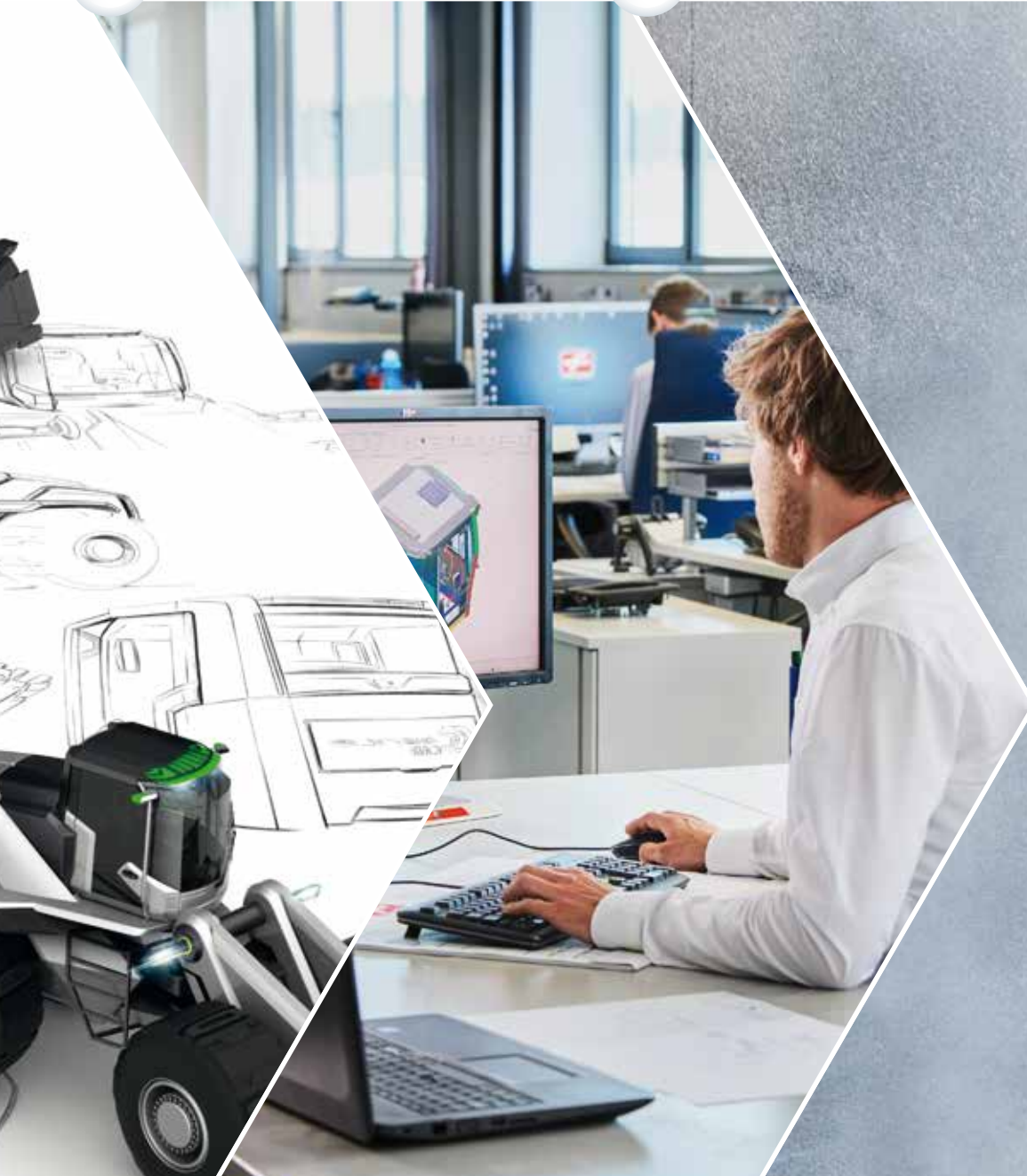
- Robot welding stations deliver a wide range of product variants at top quality.
- A new robot does grinding. In upcoming projects this innovation will boost capacity and quality, and reduce the burden on staff.

To make processes even smoother and eliminate sources of faults, we are increasingly digitizing and automating our intralogistics. A computer-assisted central warehouse improves material availability at the production lines. When materials are needed at a line, a transport order automatically goes to the forklift driver, who can track and confirm all orders on a tablet PC. For complex systems, in the kitting zone supply cars are loaded per cab, which further saves time and storage space in production.



2

RESEARCH AND DEVELOPMENT



3

SIMULATIONS AND TESTS



4

PROTOTYPES, TOOLS AND JIGS



5

STEEL AND ALUMINIUM PRODUCTION TECHNOLOGIES



6

E- AND TOP COATING

**THE FRITZMEIER-DETAIL**
Experts in aluminium.

Fritzmeier also develops and manufactures cab safety structures in aluminium. These are 30 percent lighter than steel, have lower investment costs and improved functional integration. A dedicated production plant in Sibiu, Romania has been built for this purpose, with the requisite expertise in development and technology.

7

SERIAL ASSEMBLY



8

QUALITY CHECK



9

LOGISTIC AND SPARE PARTS



ALMOST A CENTURY OF EXPERIENCE AND COUNTLESS PRODUCTS: OUR REFERENCES.



Like Fritzmeier, our company has been in the market for many decades, and stands for innovative products and high quality. Based on the shared successes over the course of our long development partnership, we hope to continue this fruitful collaboration going forward. We greatly appreciate the reliable service we get from Fritzmeier, and consider them a valuable strategic development and production partner for all our cabs.

STEFAN LINDNER

Managing Partner, Traktorenwerk Lindner GmbH

As an internationally successful company in the Cargotec Group, we select our suppliers based to a large extent on delivery performance and quality. Since 2011 we have sourced the EGO-CAB from Fritzmeier. This cab is highly variable and complex. In recognition of their very good performance, we have given Fritzmeier our supplier award.

HANNA WIBERG



































Sourcing Category Manager, Kalmar, Cargotec Sweden AB

Fritzmeier has been our supplier for many years. In the summer of 2014 we first decided to have an aluminium cab made. The weight reduction, form options and systems integration were clear advantages that we wanted to use for our new machine. With their great expertise in lightweight aluminium construction, Fritzmeier did an outstanding job. The cab adds another future-oriented element to our innovative machine design.

JOACHIM STEIN

Leader Product Support, Construction Machinery, KUBOTA Corporation



MATERIAL HANDLING						
						
AGRICULTURAL MACHINERY						
						
CONSTRUCTION MACHINERY						
						
						

FRITZMEIER: WHO WE ARE.

Fritzmeier CABS is an OEM supplier for manufacturers of off-highway and utility vehicles, and produces complete cabs, cladding components and system modules.

In development and production, Fritzmeier delivers the central customer benefits of safety, ergonomics, comfort, economy and integration capability. For many years the company has been active globally, with multiple production facilities in Europe, a Joint Venture in India, and cooperation partners around the world. Fritzmeier is a major source of cabs for construction, agricultural vehicles and for forklifts.

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