FORSCHNER
We know.

CONGRATULATIONS!

Premium technology with an individual touch:
Cabling systems / precision turned parts / electromechanical systems / own developments

WE KNOW ...

… that only solutions with a high degree of innovation and secure quality will give our customers the competitive edge.

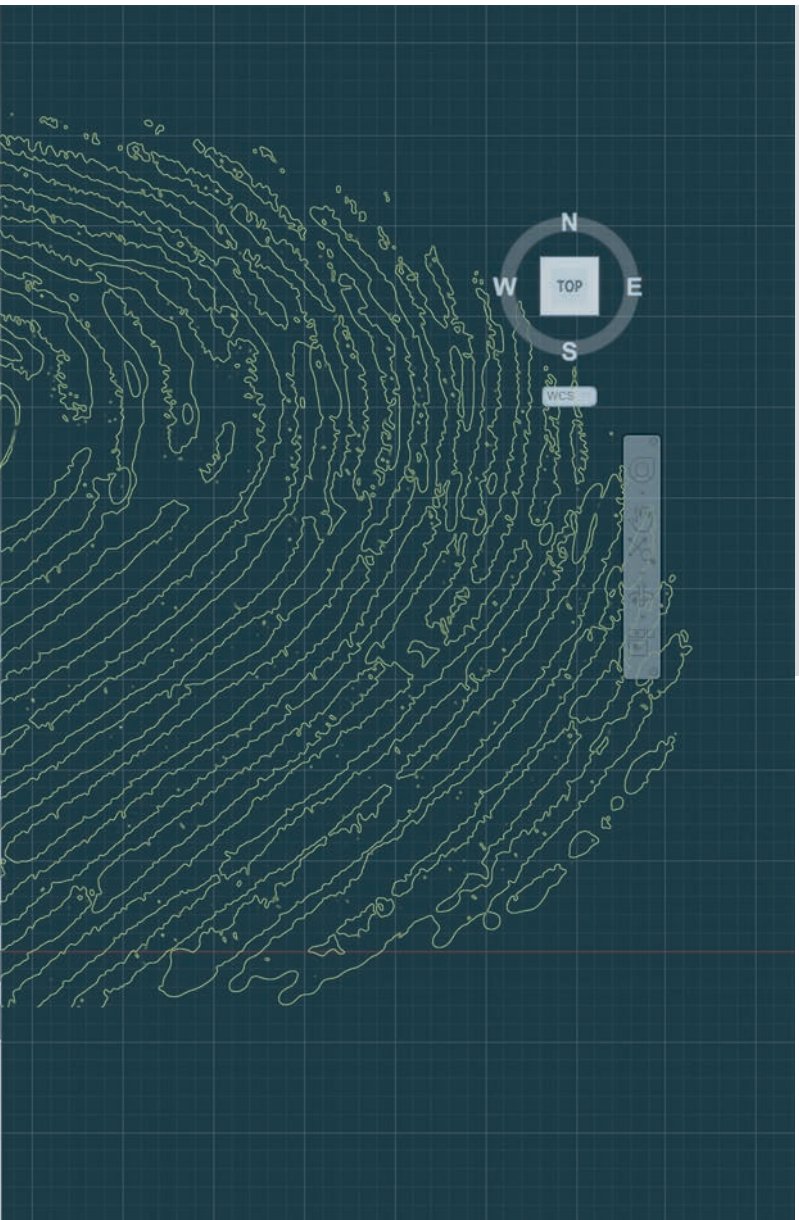
We have a local presence right at the heart of our markets. We think along with our customers, developing inspiring concepts for smart products. Efficient in our structure and our processes, we invest in a focused manner and our developments are tailored to the market.

Committed and flexible, we're a partner you can trust worldwide for cabling systems, precision turned parts and electro-mechanical systems. With our own developments FOR-hybrid and FOR-blue, we sustainably keep pace with the mobility of tomorrow, and with FOR-tech we provide R&D with tailored support. At the same time we combine advanced technology with service that has a personal touch.

Forscher develops and produces technology that serves progress and people!

FORSCHNER
We know.

... WHAT YOU'D LIKE TO KNOW.



CONTENTS

THE COMPANY

BETTER BASIS

PARTNERSHIP IS THE GREATEST GIFT.

Since our company was founded over 60 years ago, a lot has changed. Markets and technologies. Requirements and challenges. But one key factor has remained the same: without people, technology is still unthinkable. It is made by them, and used by them. This is why the focus at Forschner is on dialog and on customer-oriented developments. And why our solutions – whether in automotive, mechanical engineering or the medical sector – are especially effective.

Owner and Executive Director: Dr. Gert Forschner

THE COMPANY

An excellent past

The Forschner company was founded in 1948 by Mr Eugen Forschner and focused initially on the production of precision turned parts. Production of electromechanical components began during the 1960s. Around thirty years later, cabling and wiring systems for utility vehicles joined the production range. This diversification and development of new product areas created the basis for sustainable growth. Numerous supplier awards – such as the Daimler Supplier Award 2009 – are ensuring that Forschner's 2,000 employees worldwide are keeping their aims and standards as high as ever.

The Daimler Supplier Award – just one of many received by Forschner.

An international presence

From its headquarters in Spaichingen, Forschner coordinates a broad global distribution network – in addition to its production facilities in Germany and at various international locations. Plants in the Czech Republic, Ukraine and Turkey not only enable rapid and cost-optimized production but also guarantee proximity to key customers and centers of the automotive industry. Details about the Forschner sites can be found on the following double page.

Intelligent logistics concepts

A high level of delivery reliability and short restocking times are increasingly becoming key success factors. Forschner relies on networked production and logistics concepts that take into account all the strengths of its different locations. Transportation costs are reduced, and warehouse expenses at the customer are dispensed with. Transparent data and retrieval management and numerous safety and backup systems in the company's processes enable changes and alterations that are almost literally "last-minute".

Comprehensive certification

Forschner is certified to the DIN ISO 9001, VDA 6.1 and ISO TS 16949 norms, and undergoes all the relevant repeat audits. For almost all our production plants we also have an environmental management system certified to DIN ISO 14001.

Universal focus on solutions

We do not manufacture standard products. Our profound know-how is rather applied to customized solutions: high-tech cabling systems with maximum variance, highly complex precision turned parts, from prototypes to mass production, and electromechanical systems with intelligent details. Our creativity and pioneering spirit are also reflected in our own developments for passenger and utility vehicles: FOR-hybrid, the first plug-and-play distributor box, FOR-blue, the innovative heating hose. We also offer our comprehensive development expertise as a service. With FOR-tech, innovative ideas are part of the package.

Sustainable responsibility

With an environmentally conscious product range, in our actions we feel a strong obligation toward sustainability. This includes such small details as the use of environmentally-friendly energy. And also an overall attitude that contributes toward avoiding emissions and being gentle on resources. Sustainability is also important to us in our relations with our employees, customers and partners. On the basis of fairness, openness and partnership, we lay the foundations for long-term trust.

The Forschner headquarters in Spaichingen, Germany – where everything comes together.

PRODUCT RANGE AND PRESENCE

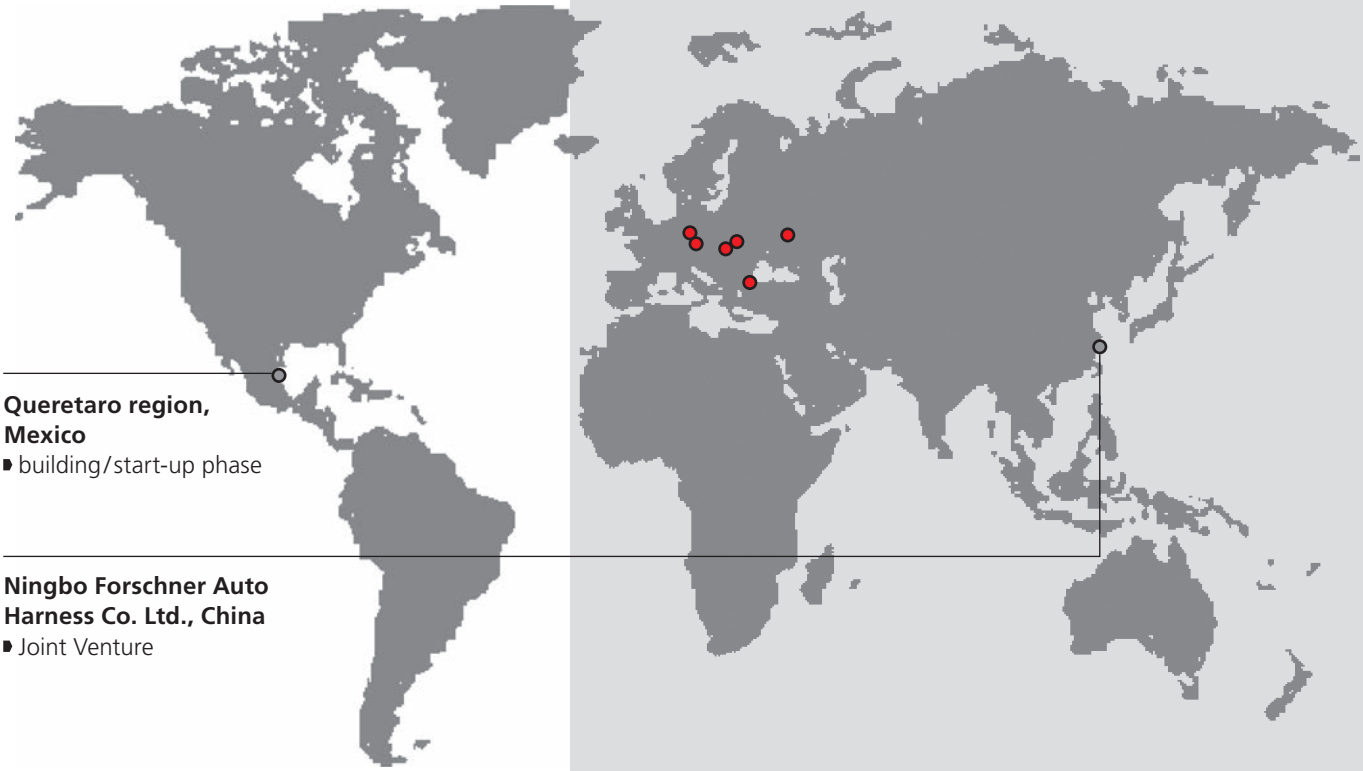
Our systematic thinking

Forschner realizes a flawless process flow without any interface loss whatsoever. Whether for cabling systems, precision turned parts or electromechanical systems, we see ourselves as a full service supplier, with a range of services that far exceeds that of any ordinary toll manufacturer!

Our efficient project management enables us to assume full responsibility for even large-scale projects, and to coordinate and control further suppliers! Continuous process optimization is important to us – together with our customers we identify optimization potential and implement it in ever better processes.

Consulting
Feasibility analyses and custom design – all the way to developing methods for processes – provide security from the very start.

Development
We shorten development times with lean, interconnected design processes. And we utilize state-of-the-art tools like FEM simulation, not only with simultaneous engineering. At our headquarters in Spaichingen we are currently constructing a large Technology Center, which will cover an area of more than 1,000 square meters.



Prototyping
Prototypes and samples at Forschner are manufactured with minimal reaction times!

Production
Six international production sites and a powerful machine park ensure the greatest possible flexibility and delivery reliability, from short runs to mass production.

Logistics
Forschner achieves transparency and absolute reliability through intelligent logistics concepts. These are coordinated to be synchronous with production as well as with regard to customer-specific requirements.

Headquarters in Spaichingen, Germany
- Overall area: ca. 8,000 sq m
- 80 employees
- Management and central administration
- Large Technology Center
- Production: electromechanical subassemblies (fully automatic manufacture)

Uherské Hradiste, Czech Republic
- Overall area: ca. 11,000 sq m
- 600 employees
- Production: cabling systems, electromechanical subassemblies
- Logistics management

Istanbul, Turkey
- Overall area: ca. 4,200 sq m
- 110 employees
- Production: cost-optimized cabling systems
- Own development and design capacity

Mahlstetten, Germany
- Overall area: ca. 3,000 sq m
- 60 employees
- Production: complex precision turned parts and subassemblies

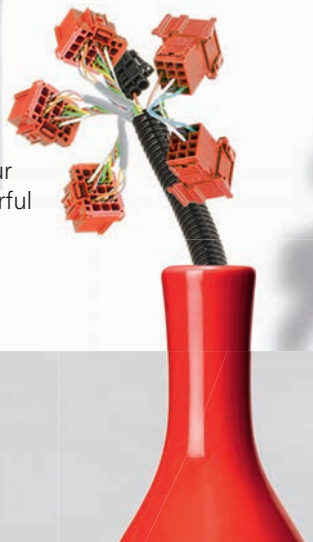
Otrokovice, Czech Republic
- Overall area: ca. 2,500 sq m
- 60 employees
- Production: cost-optimized precision turned parts and electromechanical systems

Svalyava, Ukraine
- Overall area: ca. 12,000 sq m
- ca. 1.000 employees
- Production: cost-optimized cabling systems

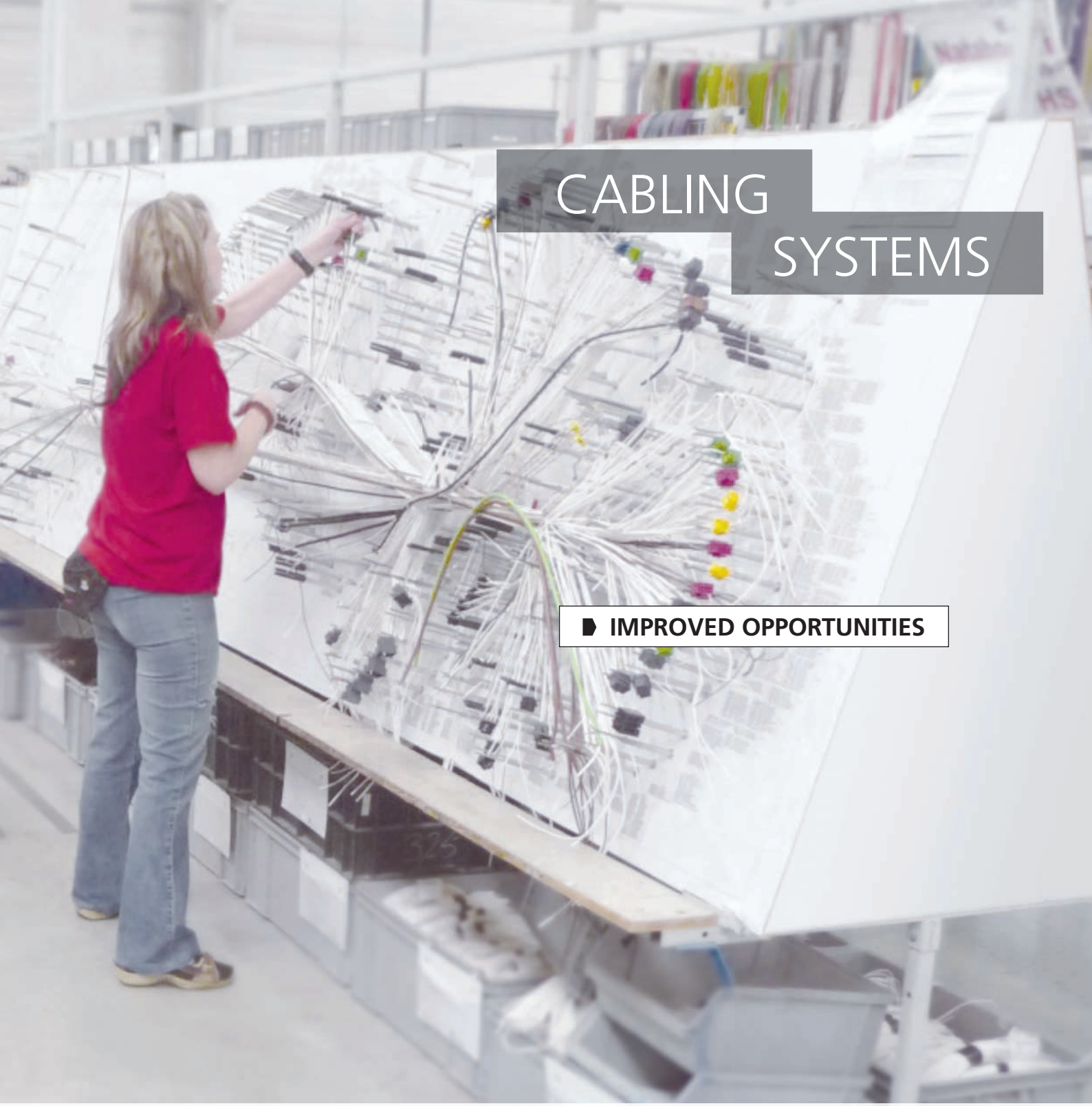
BETTER CONNECTIONS

WE'RE SURPRISINGLY VERSATILE.

Modern trucks and busses contain not only numerous electronic components that are functional and safety-based but also an increasing number of gadgets and technology utilized for entertainment and comfort purposes. The wiring harnesses are correspondingly complex and diverse. In order to fulfill our customers' requirements we combine our developers' commitment, expertise and experience in the 2D and 3D sectors with a powerful machine park – for highly productive, cost-efficient series production.



Head of Development, Cabling Systems: Klaus Conzelmann



CABLING SYSTEMS

IMPROVED OPPORTUNITIES

FORSCHNER
We know.

CABLING SYSTEMS

Unique consulting expertise

Which wiring-harness architecture matches your planned logistics concept in series production? What modularization and segmentation guarantees you the highest cost efficiency across the entire value chain? How should your wiring system be optimally designed, bearing in mind the relevant environmental conditions? As a specialist in everything related to cabling systems in trucks, busses and electrical subassemblies, we know that the best solution is always based on individual answers. We create tailored concepts – which are economically efficient in their implementation over the long term. This is because we accompany our customers from method development and design to sample and prototype construction, all the way to series production including change management. As a result, cabling systems from Forschner still perform reliably over many years of operation.

From cable to complete wiring harness

Single-core standard cables, multi-core special cables for data transfer with carphones or iPods, innovative coaxial and flat lines, all kinds of shields, geometries, core and sheath materials: cables are every bit as varied as their fields of application. Forschner is thoroughly familiar with all their idiosyncrasies, and can look back over many years of experience. Countless cables are combined to form functional subassemblies, for instance – as engine wiring systems of special vehicles and utility vehicles, or as door, heating and seat wiring systems – all the way to complete wiring systems with high failsafe performance and overall lengths of up to 20 meters.

PRODUCT OVERVIEW

From cabling solutions for individual subassemblies (e.g. in car engines) all the way to complete cabling and onboard wiring systems.

BUS CABLING

- **Vehicle-specific wiring harness variants, ca. 200 individual modules, freely combinable in accordance with vehicle equipment configuration**
- **One wiring harness per laying area, consisting of wiring for series, special equipment and customers' special requirements**
- **Up to 2,500 individual wires per vehicle, some over 20 m long**
- **Produced and delivered just-in-time / just-in-sequence**



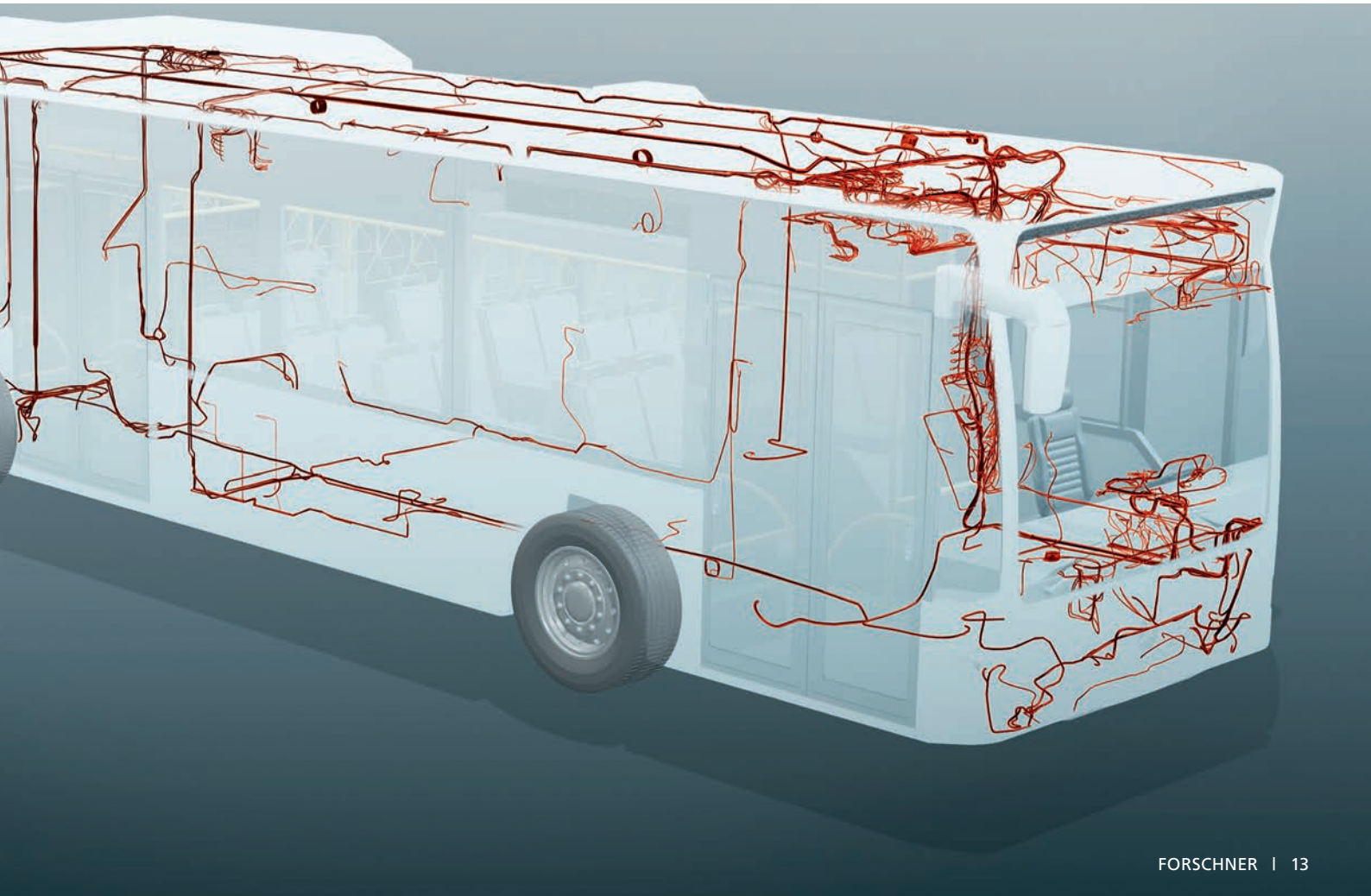
FORSCHNER
We know.

State-of-the-art tools

The route from customer requirement to complete cable harness follows a processing chain that utilizes state-of-the-art 2D and 3D development tools. At Forschner, experienced designers and engineers, motivated by a high degree of autonomy, ensure that the very latest tools give customers a major time advantage. Operations are highly flexible and transparent, and reaction times are rapid. Thanks to perfect logistics, transitions from one process to the next are smooth and seamless: harness assembly, harness preassembly, module preassembly and comprehensive harness testing all go hand in hand with the highest quality standards. Economic efficiency is further boosted by rational production at several international locations – as well as by automated technology including harness braiding.

The future on board

Whether they are used on the roads of this world in city or cross-country busses, robust special vehicles on impassable terrain, or ships on the high seas, cabling systems from Forschner today are already ensuring reliable power management and flawless power distribution. Whatever the mobility of the near and distant future, we ensure you benefit sustainably from the very latest cables and wiring systems.



BETTER PROCESSSES

WE FULFILL YOUR EVERY WISH

Essential where a lasting partnership is concerned are reliability, punctual delivery and an understanding of people's individual needs. In order to establish long-term supplier relations with our customers, we rely on precisely these values. Tailored applications consulting, our flexible production at two locations, and our large machine park all play a key role here. As an experienced solutions partner for demanding sectors of industry where mass-produced precision components are concerned, we can also offer complex turning and refinishing operations from a single source.

Head of Precision Turned Parts, Mahlstetten: Beyti Baran

PRECISION TURNED PARTS

BETTER RESULTS

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We know.

PRECISION TURNED PARTS

Variable production

Economically efficient production that is unique on multi-spindle machines in Otrokovice, Czech Republic, plus highly productive large series using state-of-the-art CNC technology in Mahlstetten, Germany: since 2009 we have almost doubled the size of our machine park, in order to be even more effective and to react even more flexibly. Whether the turned parts are short or long, Forschner processes all the usual free machining steels and brass, and handles a broad range of part diameters. Our machine park also includes machines for plunge-cut and through grinding, plus many more surface treatments. We also realize fast and economically efficient componentry assembly. In short – we have a depth and breadth of production that fulfills every requirement.

Constructive consulting

We also put our broad and highly flexible machine park to highly effective use. We successfully tailor production processes by focusing intensively on the requirements where design and production technology are concerned. This secures uniform quality, reduces throughput times and can sometimes save an entire processing step. The decision to use drilling rather than milling during processing can even lead to a tangible weight reduction of the turned part. The experts at Forschner have far-reaching know-how in this regard, especially where complex precision components are concerned.

Reliable quality

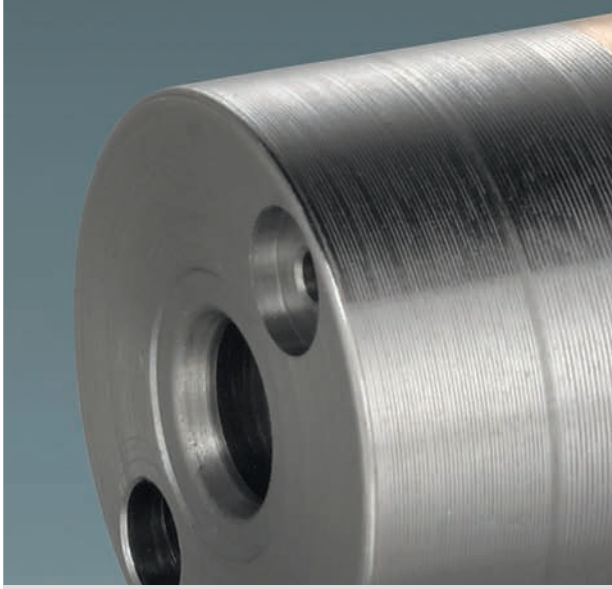
Batch sizes of one million and more every year call for uncompromising quality. Forscher is well positioned here, too, thanks to high-quality and reliable production machines that work efficiently regardless of batch sizes or interval length. Our quality assurance is also state-of-the-art. From the leak testing line and 3D measuring machines to SPC testing, innovative technologies enhance our employees' trained eyes and superior know-how. The same high quality standards apply at all our sites with regard to deadlines, amounts, tolerances and surfaces. Reproducibility is guaranteed even after years, thanks to transparent documentation.

Precision technology

Pushrods in pistons, shafts, bearing journals, or housings for infotainment systems: examples of Forschner precision technology are especially numerous and widespread in the automotive industry, and are used in leading international carmakers' passenger and utility vehicles. And also by Forschner in-house, like the SAE connectors employed in our Cabling Systems division. Numerous companies from other branches of industry rely on Forschner too – and on our passion for precision.

INNOVATION CLOSE UP

- **Anchor guide for electrical vehicle damping**
- **Manufactured on multi-spindle automatic lathe**
- **Integrated welding rod**
- **Drill holes and winding in one downstream process**



RANGE OF SERVICES

- **On multi-spindle machines: Ø 4 to Ø 35 mm**
- **On CNC machines: Ø 8 mm to Ø 65 mm**
- **CNC chucked components: Ø 10 mm to Ø 200 mm**
- **Componentry assembly**
- **Surface treatment**

PRODUCT OVERVIEW

From economically efficient small parts to shafts and housings, all the way to highly complex subassemblies.

BETTER CONCEPTS

IT'S GOOD TO HAVE A CONTACT PARTNER

Electromechanical systems are becoming increasingly complex in function while requiring ever smaller installation spaces. By combining all the relevant production steps in-house, from magnetic coil technology and welding technology to cable and plastics technologies, we know precisely how to tap the maximum potential. We combine superior engineering with economically efficient production – for constantly high quality even in large series.

Head of Electromechanical Systems: Michael Grotz

ELECTROMECHANICAL SYSTEMS

BETTER CONTACTS

FORSCHNER
We know.

ELECTROMECHANICAL SYSTEMS

Maximum variance

Electromechanical systems set the pace in many of today's sectors: in automobiles, electric appliances and also in hydraulic applications. Customization is a trend that is increasing across all sectors. Modular architectures are increasing product variety and reducing quantities. As a supplier of electromechanical systems, primarily based on coils, Forschner is optimally positioned for this. On the basis of universal coils, we design and manufacture low-cost adaptations with a wide range of different cables and contacts. In this way, we reduce development and costs, also thanks to comprehensive synergies across the entire value chain.

Complete offer

Our customers tell us what they need, and we take care of everything else. In the electromechanical systems sector, the Forschner service spectrum begins with a joint requirement analysis before customized development starts. One single process – transitioning smoothly from prototyping to qualification, all the way to series production. Transparent and lean – the key term here being „lean management". In contrast, our machine park is broadly stocked – with winding machines, welding machines, trickle and vacuum impregnation machines, cutting and clamping machines, and injection molding technology. This enables us to offer solutions from a single source, ranging from simple coils to electromechanical high-tech solutions involving integrated sensors.

PRODUCT OVERVIEW

From molded coils to sophisticated electromechanical solutions with cabling and contacts.

BEARING AND COIL FOR VISCO WATER PUMP

- **Functionally safe subassembly made up of electromechanical components, cabling and precision technology**
- **Insert-molded Hall IC sensor, pressed-in ball bearing**
- **Complex inductivity test**
- **Additional safety hose on cable components**
- **In-house winding of integrated coil**

Created from synergy

Especially complex applications require detailed and intelligent coordination of all components. Here, Forscher dispenses with unnecessary interfaces. The other company divisions, Cabling Systems and Precision Turned Parts, enable overall concepts that set new standards in the market. Not least of all, the interplay of our two locations creates synergy effects: while new concepts are elaborated at our headquarters in Spaichingen, our colleagues in the Czech Republic ensure they are implemented in an economically efficient way.

Contributing to safety

With construction space optimized winding, perfect coil layout, and designs specifically suited to plastic, electromechanical systems from Forscher are based on advanced technology and solid expertise. They fulfill the highest individual requirements, e.g. those governing heat resistance, and also make an important contribution in safety-critical areas such as chassis, alternators, dynamos or viscous coupling units.

BETTER IDEAS

CREATIVITY THAT THRILLS

Forschner reveals its high innovative strength in the customized design and production of cabling systems, precision turned parts and electromechanical systems. We transform our own ideas into market-oriented solutions, as proven by two of our own successful developments for the automotive industry: FOR-hybrid, the first plug-and-play distributor box with maximum safety, thanks to permanent connections inside the box and the narrowest of production tolerances. FOR-blue, the innovative heating hose developed by Forschner, is available for passenger vehicles as well as trucks. And with FOR-tech we utilize the synergies of all three of our divisions simultaneously: by means of targeted development support, from the conceptualization and consulting stage to series approval.

The Board of Management: Jörg Krieger (Dipl.-Ing., FH), Dr. Gert Forschner and Dietmar Geiger


BETTER INNOVATIONS
FOR-hybrid, FOR-blue,
FOR-tech
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FOR-hybrid, FOR-blue, FOR-tech

FOR-hybrid: the plug-and-play distributor box

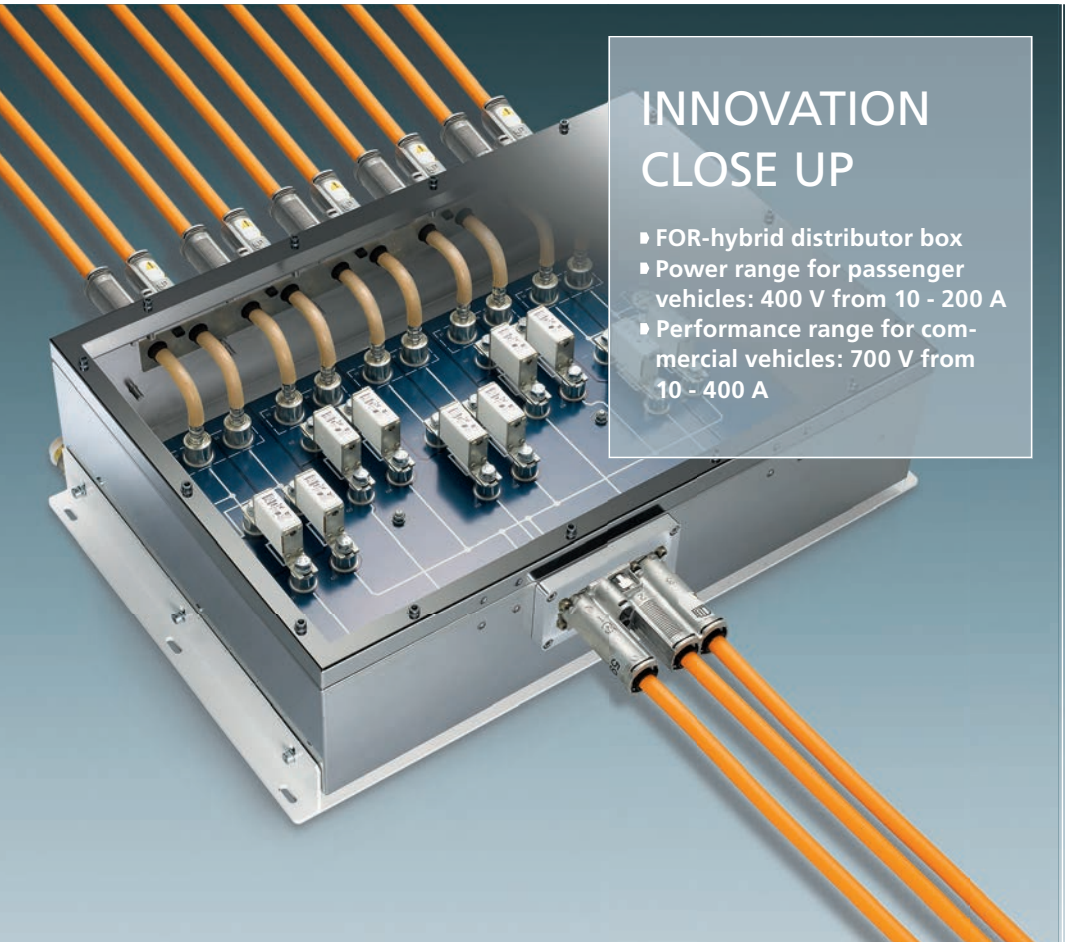
100 % preassembly, mechanically and visually codable, vibration-resistant, electricity-resistant and fireproof. In 2009, with FOR-hybrid, Forschner developed a solution that guarantees a safe high-voltage connection in modern hybrid vehicles, from SUVs to trucks. In contrast to competitor products, FOR-hybrid enables lower thermal distortion and also saves on material. The combination of PCB-based press-in technology and crimping technology results in unrivaled quality and process reliability.

If required, the distributor box can also be custom designed with fixed stops or plug connections, enabling any faults to be detected and repaired faster and more easily. The geometry and size of the box – including circuit boards, plugs and distributor variants – are always adapted to suit the power required. A cooling system and emergency cutoff unit are also optionally available. Comprehensive documentation in 2D and 3D plus HV tests are further impressive arguments in favor of FOR-hybrid.

FOR-blue: the innovative heating hose

Powerful heating hoses are required to ensure that SCR systems for reducing nitrogen oxides in diesel vehicles continue to function reliably even in low temperatures. Forschner has these hoses in its portfolio. FOR-blue features the highest media resistance, high-quality hose and insulation material, and a one-piece system design. This prevents thermal bridges and leaks and avoids the need for adapter plugs. It also makes things very flexible – especially for the high variance required by trucks – and by special vehicles in particular.

Forschner is also familiar with the specific requirements in the non-road sector. On the basis of a modular system, we offer market suitable adaptations for mobile cranes, construction machinery, tractors, etc. Small diesel units are also no problem, nor are production quantities – from prototype construction with the shortest of reaction times to six-figure mass production.



INNOVATION CLOSE UP

- **FOR-hybrid distributor box**
- **Power range for passenger vehicles: 400 V from 10 - 200 A**
- **Performance range for commercial vehicles: 700 V from 10 - 400 A**

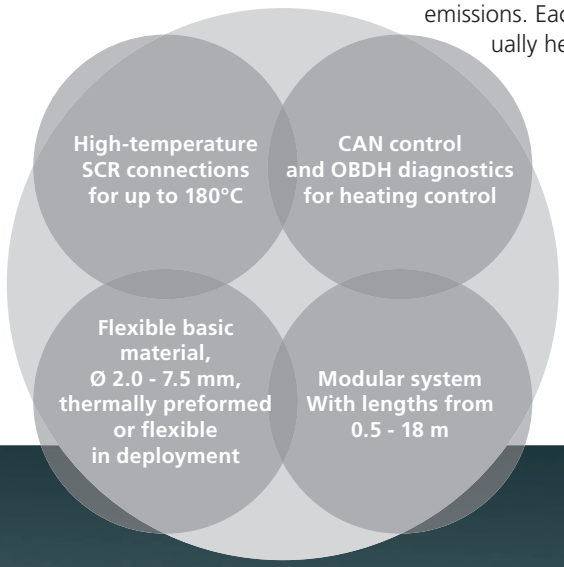
INNOVATION CLOSE UP

- **FOR-blue heating hose**
- **Inner hose**
- **Innovative heating-wire braid**
- **Robust fabric reinforcement**
- **Corrugated pipe providing mechanical protection**

FORSCHNER
We know.

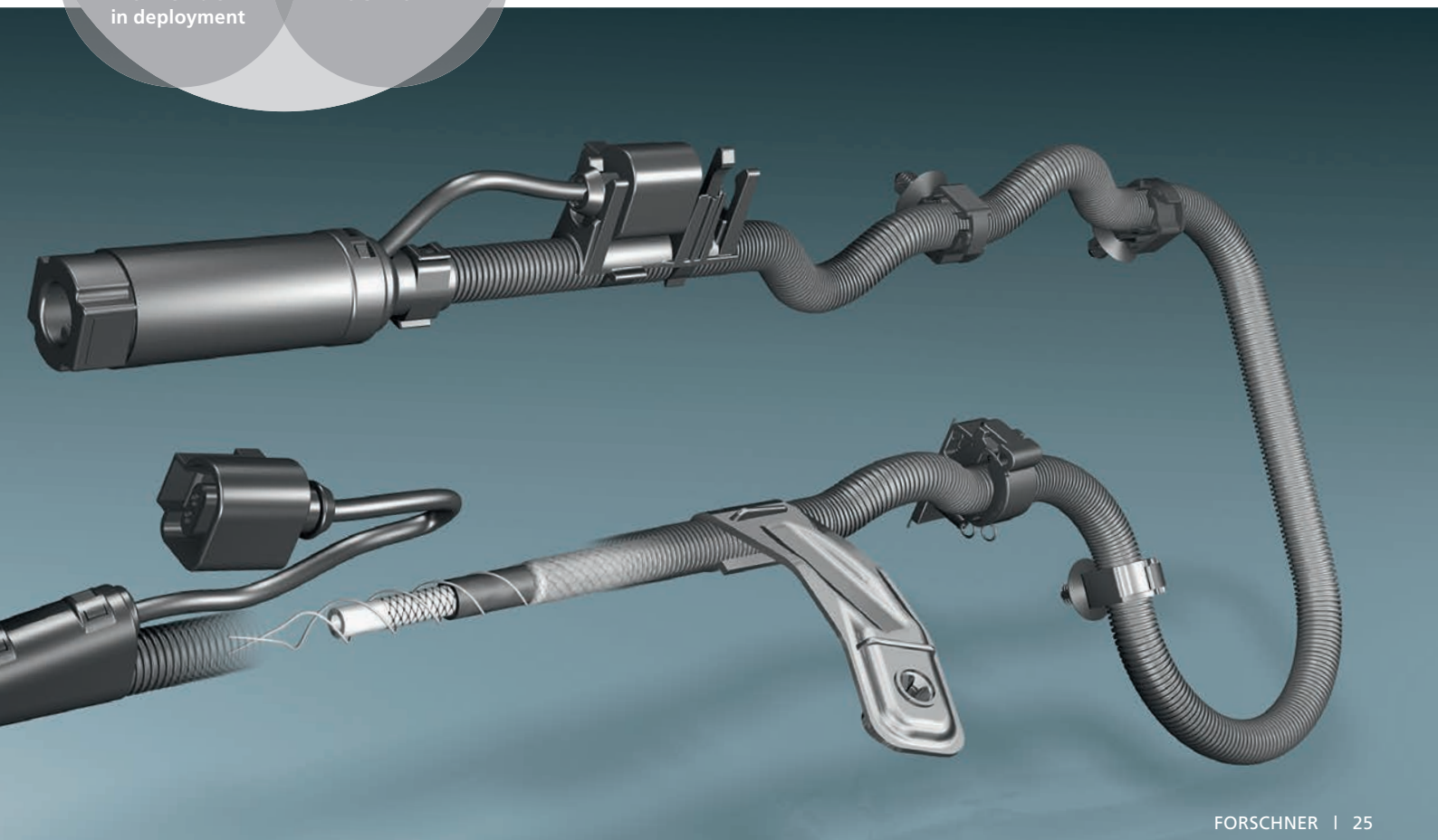
FOR-blue:
360° systems competence

Customers everywhere profit from Forschner's 360° systems competence: from our flexibility, customer proximity, engineering and validation expertise, and vertical integration. Specifically, FOR-blue guarantees especially fast heating-up, contributes toward reducing energy and power consumption, and lowers emissions. Each hose can be individually heated.



FOR-tech:
Development support to the highest standards

Whenever companies in the automotive industry, medical technology, plant technology and other sectors decide they want to profit from all-round development expertise while focusing on their core competencies, they rely on FOR-tech. For wiring systems development in trucks and special vehicles. For high-voltage cabling systems. Leading vehicle manufacturers appreciate our expertise in the SCR sector for complex precision turned parts, electromechanical systems and subassemblies – and also our partnerly support which covers the entire value chain, from development and prototyping to series production. With FOR-tech, we're shortening development times: resident engineers are facilitating operations on site, and intelligent concepts are lowering production costs. In short: together with our customers, we're creating technological solutions from practical experience for practical application, and enriching life in many fields of application.

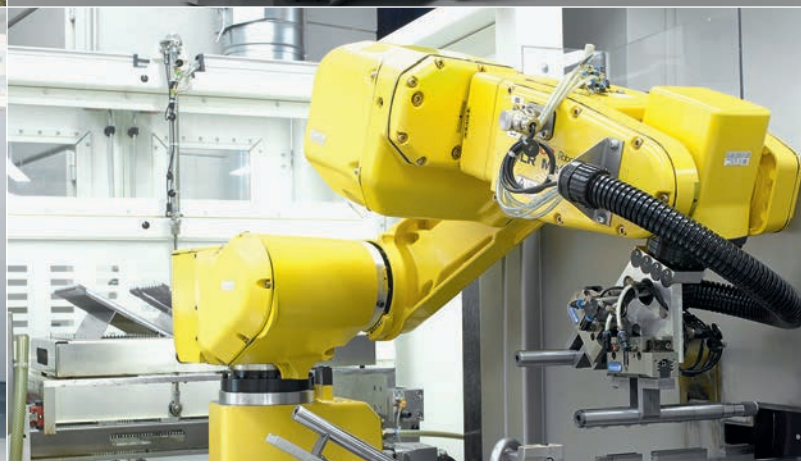


TECHNOLOGIES
THAT ARE HIGHLY VARIED

Clearly focused strategies and constantly high quality standards are in no way inconsistent with truly heterogeneous markets. Naturally, Forschner is an experienced partner to leading automotive manufacturers and suppliers, and this is where its main focus lies. Other sectors use our cabling systems, precision turned parts and electromechanical systems too, however – and that's because we know what's important. And because, with advanced technology and a committed workforce, we can play our part in numerous areas of industry!





Would you like to find out more about our company? About our range of services, our own developments and about FOR-tech? Then we look forward to a discussion with you! You can find out more about us on the Internet at www.forschner.com as well as in our detailed brochures.

OUR TARGET SECTORS

- **Automotive industry: for cars, trucks, busses and special vehicles**
- **Agricultural technology**
- **Plant technology**
- **Medical technology**
- **Automation**

FORSCHNER

We know.

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