

# Automation at FOERSTER



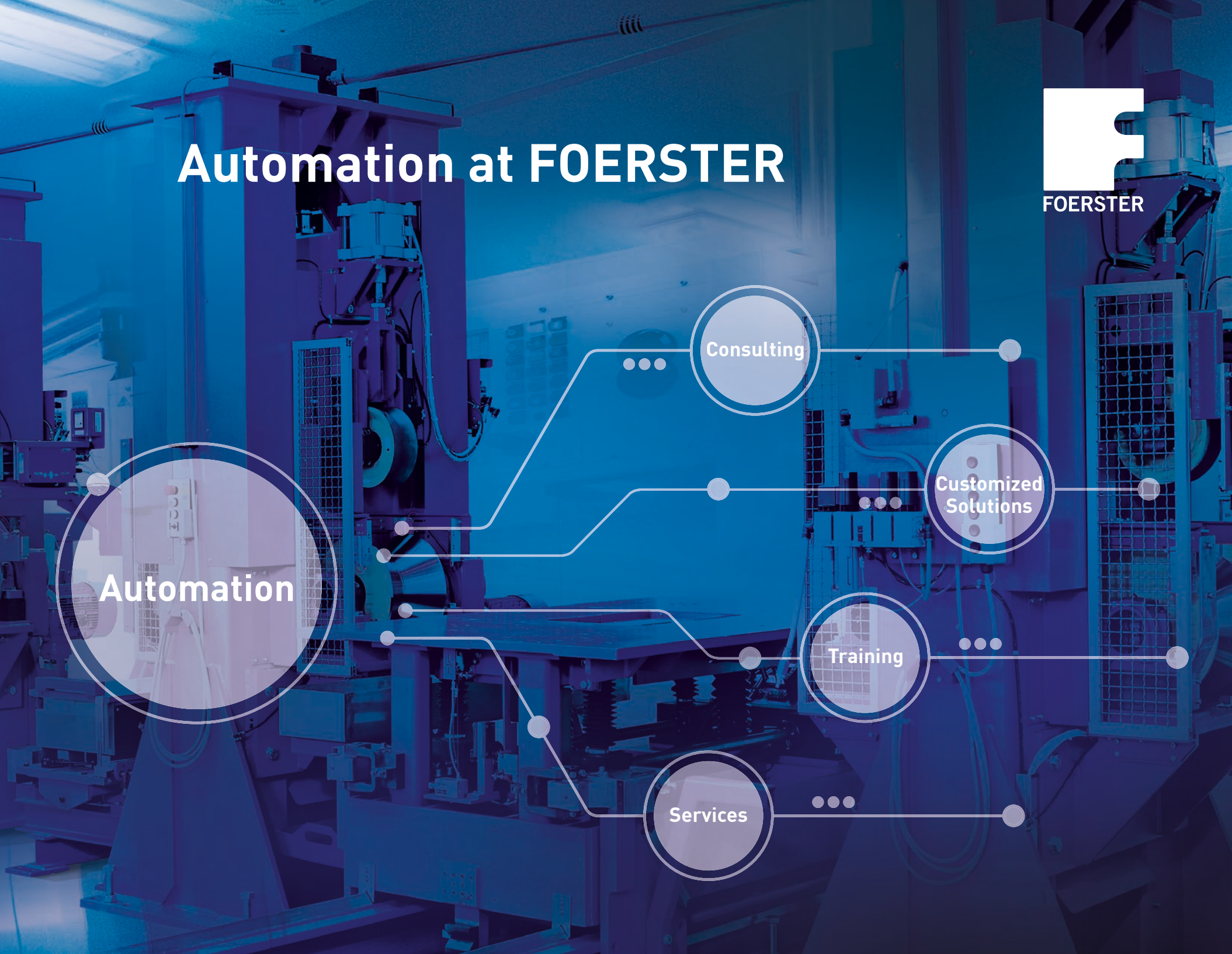
Automation

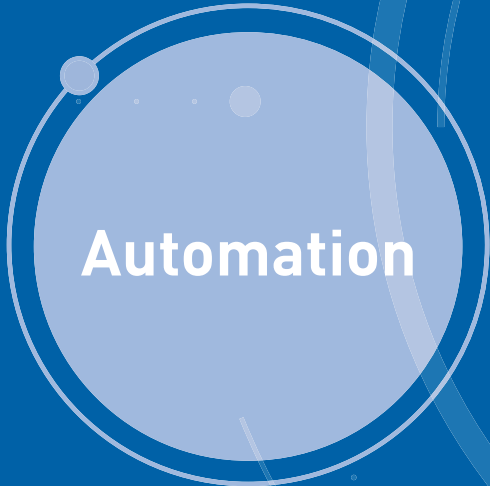
Consulting

Customized Solutions

Training

Services





Automation

Consulting

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Solutions

Training

Services

# Non-destructive testing solutions – automated and from a single source

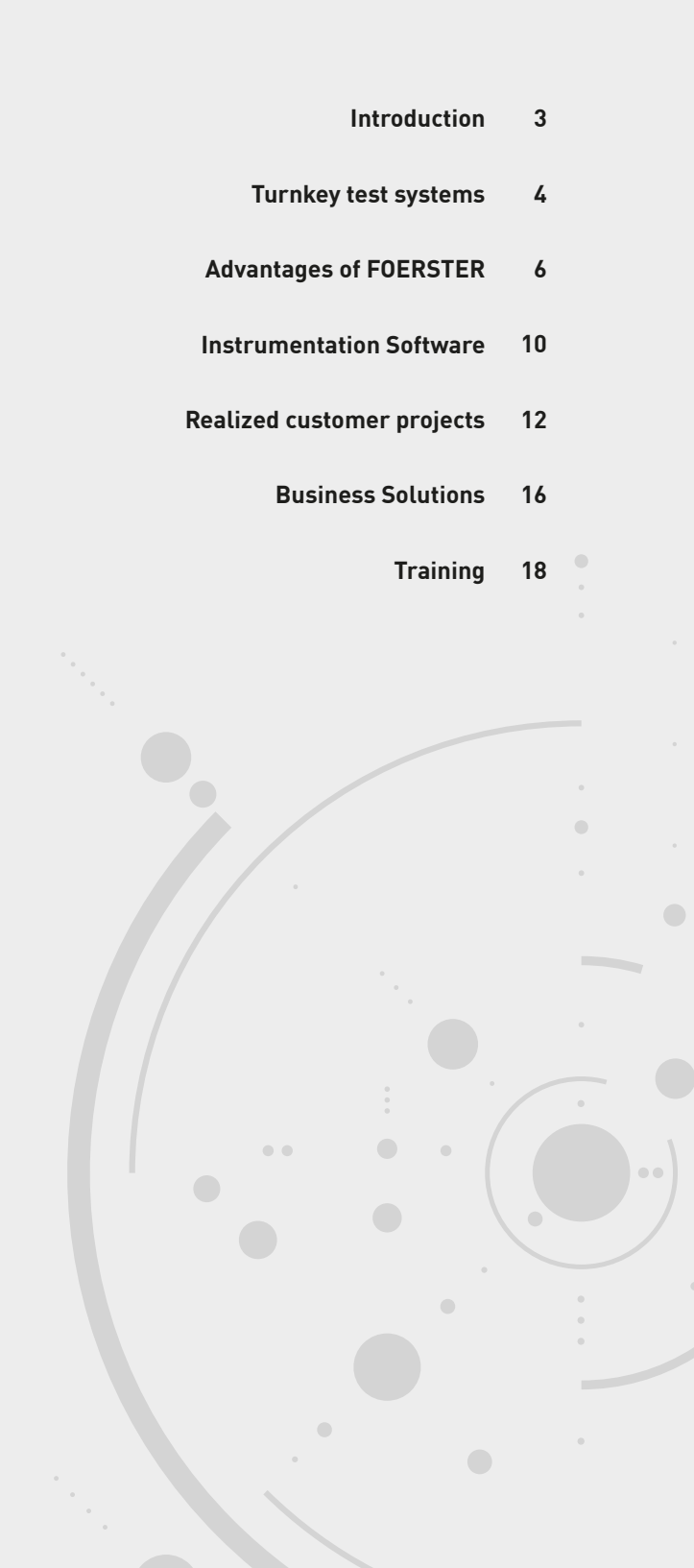
For more than 70 years, the name 'FOERSTER' has stood for unparalleled quality in non-destructive testing systems. We owe this to our many years of experience, the company's extreme production depth and our exclusive use of premium components. Every day, our highly trained employees help us achieve our quality goals, so that the products and services we deliver to you are both effective and beneficial.

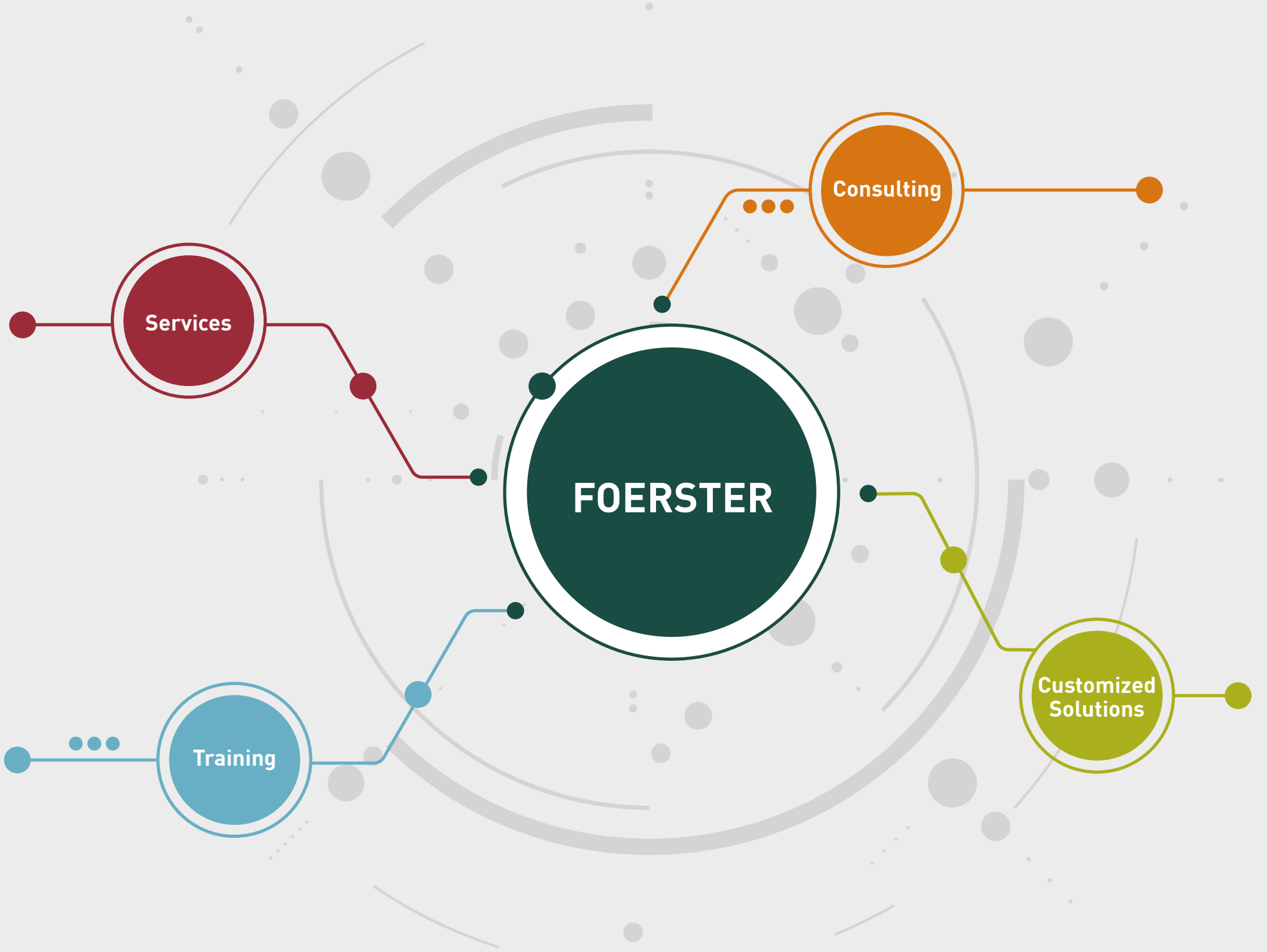
Our guiding light in this endeavor is our sharp focus on the needs of our customers. That's why we offer both individual test/measurement systems as well as automated test lines tailored to your specific requirements. Working in partnership with you, our team of specialists from diverse fields of expertise will plan the ideal test line.

Besides the proven FOERSTER testing and measuring systems, this also includes the high-precision drivers and tables necessary for reliable testing. If requested, complementary test and measurement technologies from third-party manufacturers can also be integrated into the line.

We also offer a wide range of attractive service packages to ensure that you can start making full use of your test system from day one. These range from various financial services to regular inspections, training, and round-the-clock technical support. Our worldwide network of highly qualified service engineers will help you get the most out of your system to increase your profitability. One contact for all your questions: FOERSTER.

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# FOERSTER – on your side from the very start

We at FOERSTER truly believe that the best testing solution is always the outcome of close cooperation with the customer. This is why you'll have one central contact person for the planning and implementation of your turnkey test system – from the offer phase right through to the final acceptance onsite. Not only do we assist you at each step of the acquisition process, we'll still be there for you throughout the entire productive service life of your system.

## Consulting

We analyze your testing task in onsite visits and joint discussions. We then carry out a feasibility study in our application laboratory and develop a concept tailored to your needs – and all of it closely coordinated with you, meticulously scrutinized and optimized until it completely fulfills your requirements.

## Customized Solutions

Our expertise lies in the design, development and provision of complete testing systems including all the mechanics and drives, the electronics and any customer-specific software solutions. Utilizing the latest tools, our very experienced team transforms your individual solution into reality. Then, our service team installs, commissions and conducts acceptance tests on the ready-to-run system.

## Training

We want you to be able to use your FOERSTER instrument optimally from day one. To ensure this, we offer individual user, service and maintenance training courses, either at your premises, our local FOERSTER organization or at our headquarters in Reutlingen, Germany. To make sure that we cover all the topics that are important to you, we organize this with you in advance.

## Services

For us, service begins with regular maintenance and inspections to keep the system's availability as high as possible: only if wear and tear is detected at an early stage, can it be properly addressed to minimize downtime. In an emergency, however, our service team is just a phone call away via our 24/7 service hotline – 365 days a year.





# 10 reasons to choose FOERSTER

**When investing in a test line, you have to consider a wide range of factors. That's when it really pays to have a knowledgeable partner on your side – FOERSTER. Because you can trust us and our many years of experience in the industry.**

## 1. The perfect fit

Each testing system/test line is customized to your requirements and your production environment. The concept is tailored to take the test speed and the type of testing section into account. We also look at how best to integrate the testing system into your test line to create a comprehensive and reliable solution.

## 2. Made in Germany

Our instruments and systems are developed, designed and produced in Reutlingen, Germany. This is how we guarantee that the testing system you receive is state-of-the-art and first-class. Our extreme production depth enables us to respond specifically to your wishes and requirements and to manufacture a customized system.

## 3. Premium is simply best

For your testing system, we rely exclusively on components from renowned premium manufacturers. This ensures that spare parts will always be available – worldwide.

## 4. We really know our interfaces

All the internal interfaces are optimized and correctly implemented before the equipment ever leaves our facility. Plus, we have over 20 years of experience with level 1/2/3 connections and interfaces to external instruments. Let us rise to your challenge!

## 5. Our TECHNIKUM

Before shipping, every system is assembled, tested and put into operation in the TECHNIKUM. This saves you valuable time during commissioning, and you can rest assured that everything will work as intended.

The TECHNIKUM is also the place where employees from production, development and product management join forces. But not only on current projects – the TECHNIKUM is also our incubator for new products still in development, and a crucible where they're put through their paces before going into series production.

## **6. Long service life**

Our rugged testing sections and systems are designed to withstand the harsh conditions of a steel mill. Their long service life ensures the best return on your investment. And with available updates and upgrades, you can keep your testing section current for years to come.

## **7. All our instruments speak the same language**

All of our installed components speak the same “FOERSTER language”. This greatly reduces the handshaking required between the test instruments, the test line and the individual software. This measure streamlines the implementation of technical fixes.

## **8. Consistent and intuitive operation**

To help you get up to speed quickly, the operation and user guidance functions are harmonized across the entire system (test section, test instruments and Instrumentation Software). All the user interfaces have a similar structure. This significantly enhances the user experience as well as the overall efficiency of the system.

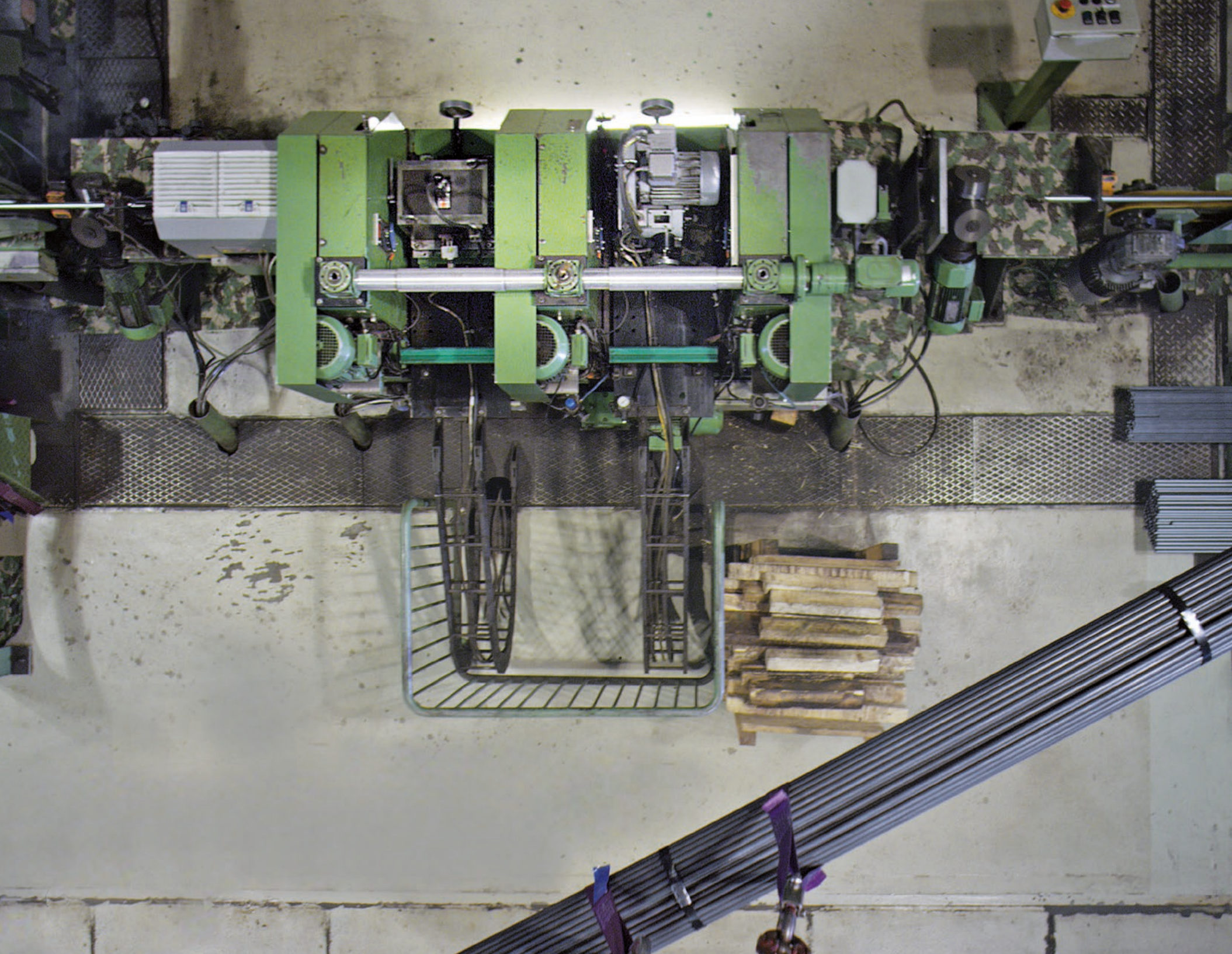
## **9. Problem? Solution!**

If there’s ever a problem with your test line, our service team is always available to support you. This can save you a lot of time, as we can immediately start looking for the solution. Behind the scenes, we work together across departments to get you competent help – fast!

## **10. Future-proof investment**

Because all the instruments of the test line are optimally tuned to each other and come from the same source, it’s easy to update and adapt the system later. We continuously develop our products and components, and all in the same direction. This is expressly so that we can offer end-to-end solutions and upgrades that will dovetail with our existing technology.







# FOERSTER Instrumentation Software – for the entire testing section

**Complex test lines are made up of many different test instruments. Each relies on a different non-destructive method to inspect your test material for a specific kind of defect. But you don't have to set up and operate each instrument individually; for that, FOERSTER developed its superordinate Instrumentation Software, so all the instruments in your test line speak the same language.**

## **Advantages**

- Central management of jobs and settings for the entire test line
- Integration of third-party instruments from other manufacturers
- Collection of test results for combinatorial statistics
- Common test protocol for all instruments
- Integration into superordinate systems

## **Central management of jobs and settings**

Imagine that each of the different test instruments in your line had to be adjusted individually before starting any testing task. This would take a lot of time – plus familiarity with all the different software interfaces!

With FOERSTER's Instrumentation Software, you can control the jobs and settings for the entire test line via a central software interface. Simply enter the testing task information such as the job name and accompanying data. Then the relevant settings are loaded from the instruments' archives. And with just one click, the information is propagated to all the test instruments down the line.

## **Integration of test instruments**

Of course, every FOERSTER instrument can be connected through the Instrumentation Software. But it's also possible to integrate almost any third-party device as well, for example for diameter measurement or an ultrasonic inspection instrument. The only prerequisite is that the manufacturer provides a suitable interface.

## **Summary of results and joint test report**

The Instrumentation Software summarizes the results across all the test instruments and allows you to perform combinatorial statistics. Important test-part results – such as individual sorting, single defect details, measured test-piece length and the test signal curve – are collected by each individual instrument after testing each sample and then

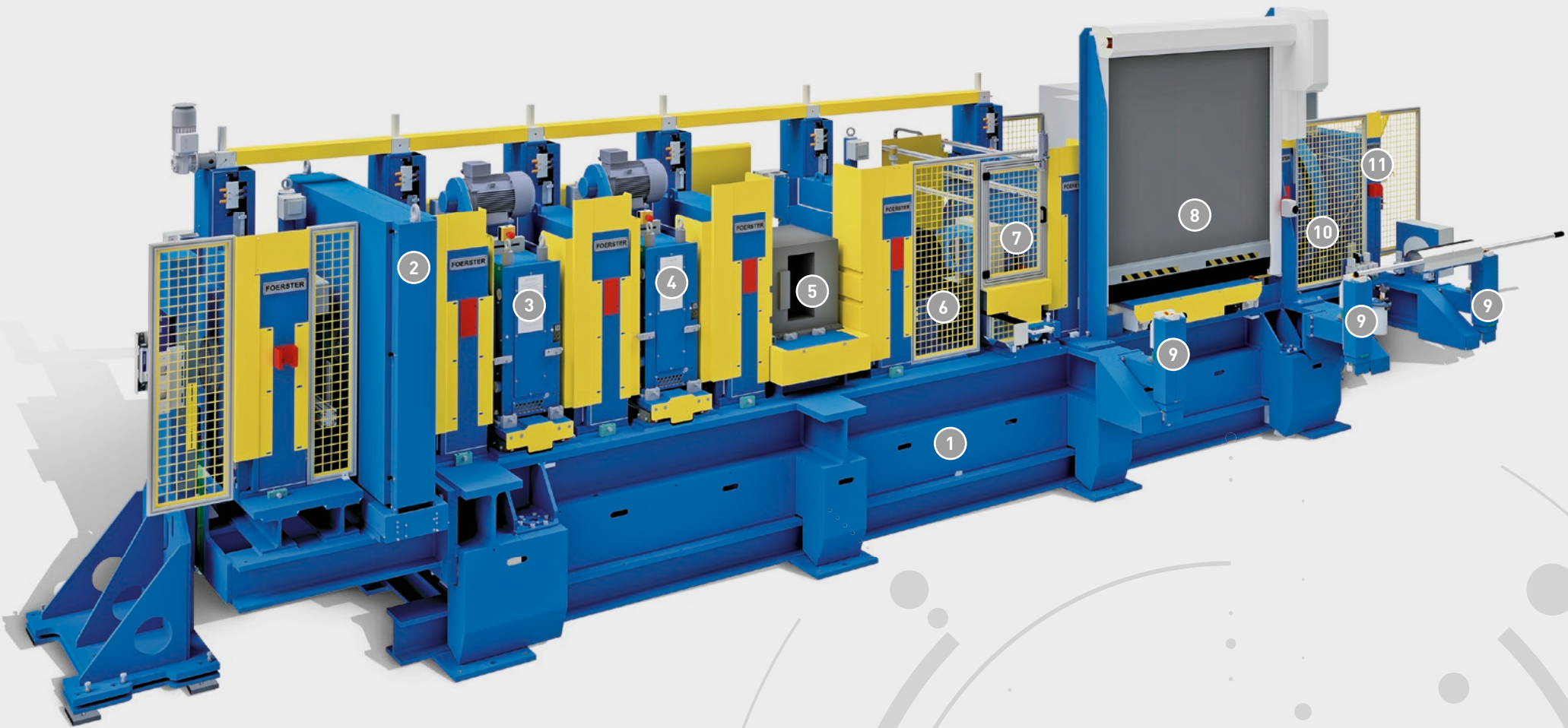
are stored in a central database. Protocols with the combined test results are generated for each test part and job. These can be easily viewed via the software and saved as a PDF.

## **Industry 4.0 – Connections to level 2 or 3**

Our test instruments offer a high level of integration to superordinate systems such as L2/MES/BDEs – all the way up to system control. This allows processes such as job management and instrument settings to be fully automated, thus significantly reducing operator and input errors. In addition, our interfaces provide access to all the accumulated test results, making further processing and archiving possible.

One central data interface for the entire system – saves you time coordinating, implementing and commissioning. Plus, you benefit from reduced susceptibility to errors and the resultant cost savings.

We know our test instruments and test lines inside out – down to the tiniest detail. This enables us to offer customized solutions that fit seamlessly into the FOERSTER world you know and trust.



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# Realized customer projects – Multi-test block for a steel mill

**The largest, highly automated and most complex test line in the history of FOERSTER was developed for inspecting API tubes and pipes. The whole test line weighed some 32 metric tons.**

The system tests hot-rolled, seamless tubes using non-destructive testing methods such as DC-leakage flux, eddy current and ultrasound for detecting different types of defects according to API standard. The high-precision test section encompasses all the mechanical equipment, complete with centric drivers and shift tables, as well as extensive testing technology. The test instruments DEFECTOMAT, ROTOMAT/TRANSOMAT, MAGNATEST and CIRCOSON were integrated into the system as well as various 3rd party instruments.

The tubes are used in energy production, including oil and gas, as well as in the chemical and petrochemicals industry. This customized solution from FOERSTER created a multifunctional test line to ensure that geometric properties, such as the wall thickness and the external diameter of the tubes, meet the specifications exactly and any surface defects ID/OD are reliably detected.

## **Tested material**

Hot-rolled seamless tubes with diameters ranging from 26.7 – 139.7 mm (1.05” – 5.5”).

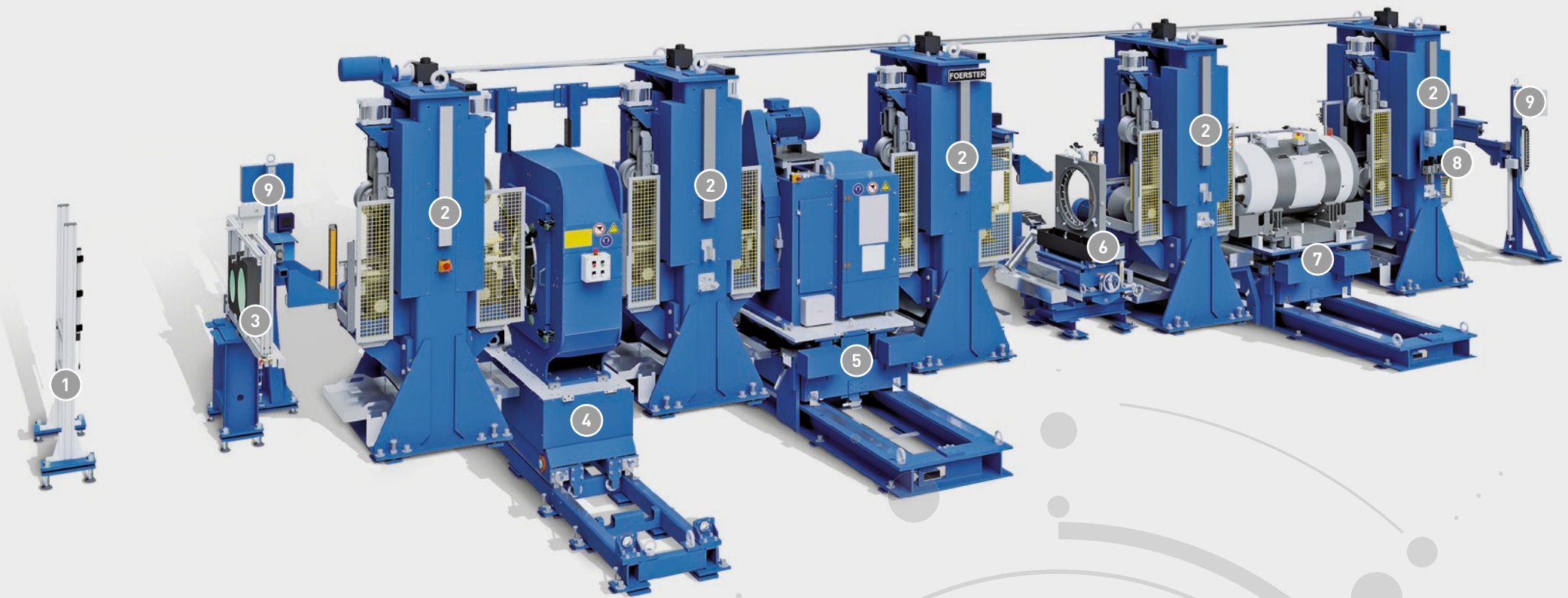
## **Type of test section**

Centric section with automatic dimension adjustment.

## **The multi-test line consists of**

1. Overall lift table with entry protection and 8 centric drivers
2. Motorized sliding console for diameter measurement (4 measuring heads in 2 levels)
3. Motorized shift table for ROTOMAT DS Ro 180
4. Motorized shift table for CIRCOSON WT Ro 180
5. Motorized shift table for TRANSOMAT DS Tr 180
6. Demagnetization coil EMAG F200
7. Manual shift table for prewetting unit
8. Motorized shift table for rotating ultrasonic flaw detector
9. Test tube manipulator (off-line calibrator)
10. Rotary MAGNATEST coil change unit for material mix-up testing
11. 2-channel color coding with rinsing unit and color sensors
12. Speed detection via 3 tracking measuring heads
13. A separate assembly stand for the FOERSTER test tubes was also supplied, as well as a central extraction system for the ROTOMAT, CIRCOSON and TRANSOMAT test instruments





# Multi-test line for testing seamless tubes

The following test line was developed and produced by FOERSTER to test hot-rolled seamless tubes. The tubes are utilized in the oil and gas industry as well as in the chemical and petrochemicals industry.

The system inspects the tubes for various types of defects using non-destructive testing methods such as DC-leakage flux and ultrasound. The V-test section encompasses all the mechanical equipment, complete with drivers and shift tables, as well as extensive testing technology. The test line contains, among others, the test instruments ROTOMAT/TRANSOMAT, MAGNATEST and a rotating ultrasonic flaw detector.

The ROTOMAT/TRANSOMAT testing systems are equipped with the latest DA technology from FOERSTER which, among other things, makes it possible to visualize the defects in a high-resolution C-scan and, for the first time, to detect oblique defects in addition to longitudinal and transverse defects on the outside and inside of the tube. Moreover, the new technology makes it possible to reduce the untested ends to an absolute minimum, i.e. just a few millimeters (couple of inches).

## Materials tested

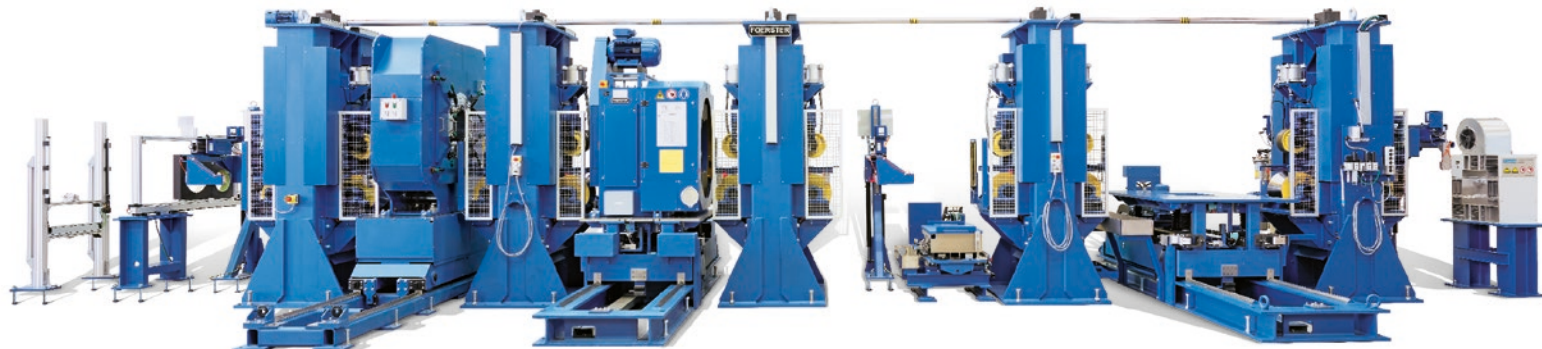
Hot-rolled seamless tubes with diameters ranging from 114.3 – 273.1 mm (4.5" – 10 3/4").

## Type of testing section

V-roller test section with automatic dimension adjustment.

## The test line consists of

1. Optical inlet protection with light grid
2. 5x V-driver
3. MAGNATEST instrument for detecting material mix-ups with 250 mm (9.84") and 350 mm (13.78") coils
4. Lift and shift table for TRANSOMAT DA Tr 520
5. Lift and shift table for ROTOMAT DA Ro 440
6. Demagnetization coil
7. Lift and shift table for rotating ultrasonic flaw detector
8. 6-channel color coding from FOERSTER
9. Speed detection via 3 tracking measuring heads



# FOERSTER Business Solutions Landscape

## Application Consulting Services

- Consulting
- Feasibility Studies
- Individual Customer Solutions
- Optimizing Parameter Settings
- Test Runs

## Software Services

- Software Updates
- Software Upgrades
- Software Maintenance
- Software Subscription
- 24/7 Service Hotline
- Remote Service
- Life Cycle Contract
- Pay-per use

## Hardware Services

- Production Support
- Permanent On-site Service
- 3rd Party Service
- Proof Service
- Vibration Analysis
- Rental Service
- Leasing
- Preventive Maintenance
- Calibration
- DAkkS Calibration
- Repair Service
- User Training
- Service Training
- Installation
- Commissioning
- Spare Parts
- Wear & Tear Parts
- Consumables
- Maintenance Training
- Test Field

## Financial Services

## Training



# The FOERSTER Business Solutions – our services for your requirements

**With our FOERSTER Business Solutions, we offer a wide range of services for your testing and measuring systems or NDT inspection lines. This includes hardware and software services, flexible financing solutions, our application consulting expertise, and customer-specific training courses.**

Together with you, we create an individualized package of defined service elements. Choosing from our complete range of testing/measuring systems and/or inspection lines and the associated services, we tailor a solution precisely to your needs.

## **You test, we take care of the rest**

The Life Cycle Contract provides you with a FOERSTER testing or measuring system for a defined contract period at a fixed monthly rate, all services included.

The **Life Cycle Contract** allows you to start using the latest FOERSTER test and measuring technology right away and to its full extent – with no up-front investment. We offer you tailored solutions for your production process: from individually configured testing/measuring systems or inspection lines to commissioning, calibration and regular preventive maintenance, through to the training of your employees.

We take the entire product life cycle into account, starting with planning and the custom-fit configuration through to installation and commissioning. Then we offer hands-on user and service training for your employees, and we conduct regular maintenance. Furthermore, we take charge of the calibration management for you. Our remote service lets us attend to your inquiries quickly and professionally and, in many cases, to solve them without necessitating an onsite visit.

Within the scope of the Life Cycle Contract, we provide you with the use of the testing/measuring systems and equipment you require; you concentrate on your core business. We're happy to work with you to define which Business Solutions modules are included in your Life Cycle Contract.

## **Ensure the quality of your testing**

Do you need to conduct a quality management audit? Do you need to prove to your customer that you comply with certain testing standards? Then you have to ensure that your FOERSTER testing/measuring instruments and systems are regularly calibrated. For this purpose, we offer a comprehensive service package in our **Calibration Contract**. So you can prove your test quality to your customers at any time.

During calibration, our specialists compare the values determined by your testing/measuring system with those of a calibration standard. This checks whether the system complies with the FOERSTER specifications. Our latest calibration guidelines serve as the basis for this procedure. The calibration can be performed either at your site or in our calibration laboratory.

On request, we can issue a detailed calibration protocol with the instrument's most recent values. You can also take advantage of our active calibration management, where we keep track of your upcoming calibration dates and automatically schedule the next one with you.

This not only enhances your process reliability but also prepares you perfectly for your next audit. With our Calibration Contract, you can rest assured that your test quality stays the same over the long run.

Thanks to the modularity of our Business Solutions and our many years of experience, you benefit from service packages that are tailored precisely to your needs. Our support extends above and beyond the planning and purchasing phases!



# Well equipped – with training courses from FOERSTER

## **Individual and practice-oriented**

We don't keep our extensive expertise to ourselves; it's important to us that you can run your instruments correctly. We regularly offer comprehensive operator and user trainings for our instruments, to ensure that you and your employees know how to operate FOERSTER test electronics and sensor systems – and not just in theory but also in everyday practice. Our training courses build skills! In addition to teaching the fundamentals and basic hands-on use, they focus on the most important parameters for adapting a given instrument to the respective test line and test task.

We also offer in-depth seminars on service and maintenance, the contents of which we're happy to adapt to your particular demands. If requested, we can provide training on your premises. This means that trainees can apply the course material directly on their own test line. Alternatively, we're always happy to host a training in our local FOERSTER organization or at our training center in Reutlingen, Germany.

## **Our instructors – always up to date**

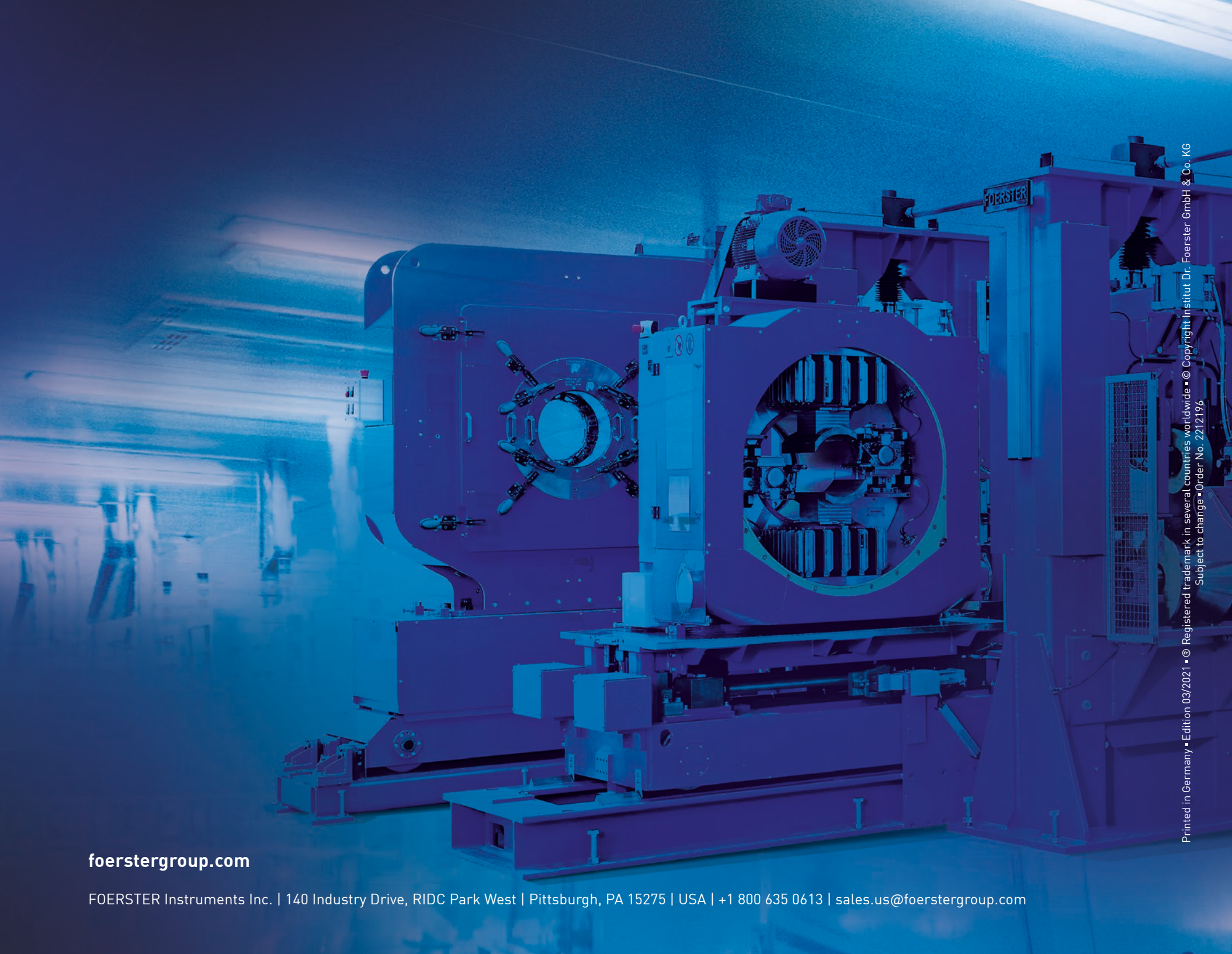
We want you to get the most out of our training courses, so that you feel competent and confident when using the equipment. So, in order to keep abreast with the latest technology, our instructors regularly take part in internal and external trainings themselves. Plus, they pay frequent customer visits – ensuring that all our instructors maintain their skill in operating the equipment. This means that they're well versed in a wide range of applications and parameter settings. It also puts an enormous pool of knowledge at our fingertips, which helps us set up your instrument to meet your requirements ideally.

Our service specialists from around the world are also regularly trained in Reutlingen to ensure high-quality product information worldwide. Our global presence is one of FOERSTER's great strengths: it allows us to adapt to local conditions and enables extensive knowledge-sharing.

## **Digital and analog**

Of course, we love having personal contact with our customers and communicating the training materials directly. But this is not always possible. So at FOERSTER, we're constantly working on novel ways to share our know-how digitally.

In our very own film studio, we shine the spotlight on new products and present them to you in detail. This helps us keep you closely informed about our products. We also offer live demonstrations directly from our in-house test line via video streaming upon request. A factory acceptance test via livestream is also possible – just contact us!



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