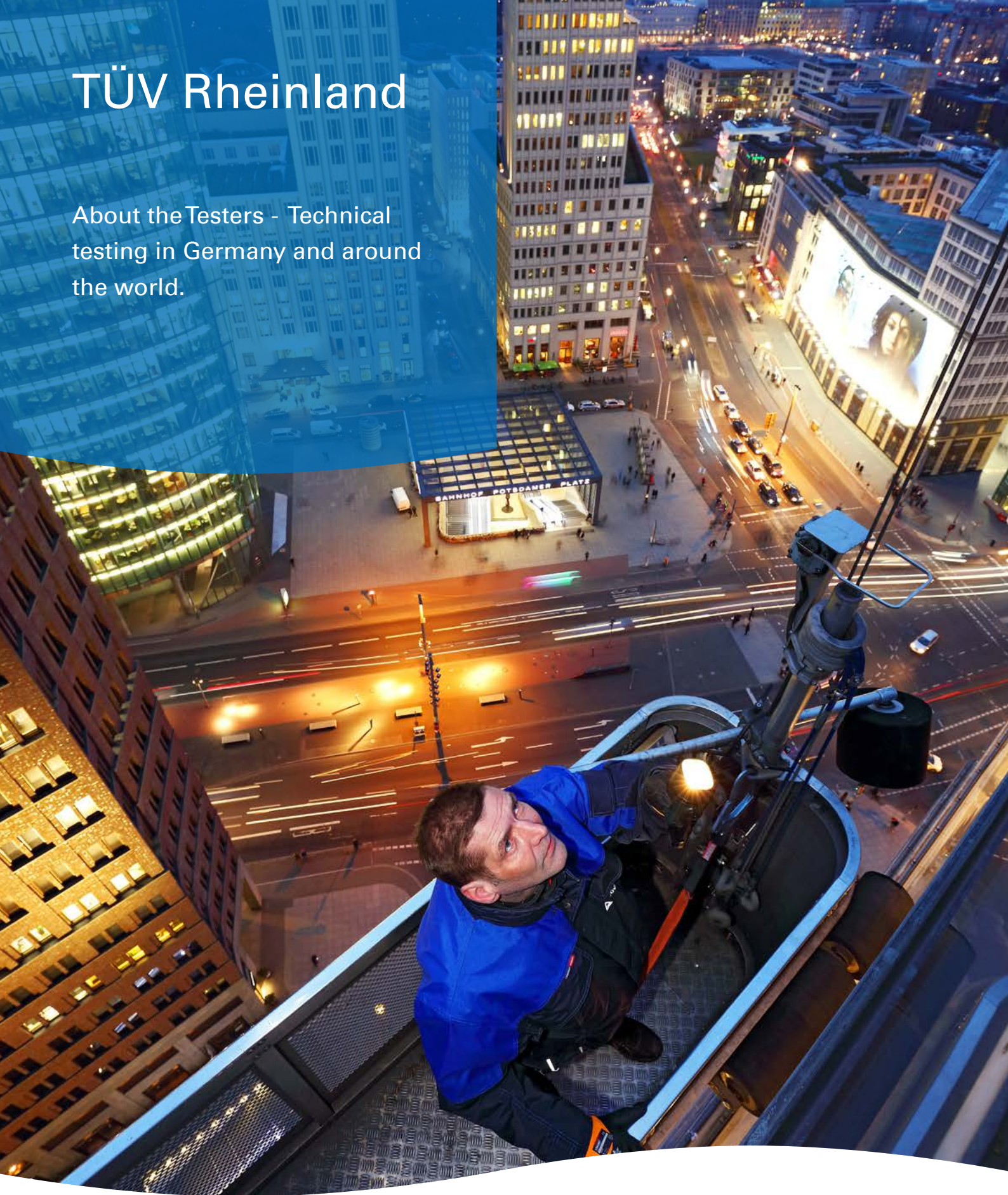


TÜV Rheinland

About the Testers - Technical testing in Germany and around the world.





4

About TÜV Rheinland
PURSuing TECHNICAL PROGRESS



8

Activities and Inspections
THE LICENSE TO TEST



18

Car and Mobility Testing
MORE THAN JUST A STICKER



22

Academy & Life Care
**HEALTH AND QUALIFICATIONS:
KEY FACTORS FOR COMPANIES**

30

**GLOSSARY
POSTER**



Cover photo: Inspecting
a façade elevator at Potsdamer
Platz in Berlin, Germany

**10**

Testing Technical Installations
EVERY DETAIL COUNTS

**14**

Testing Products and Components
LEAVING NOTHING TO CHANCE

**26**

Testing Management Systems
A CRITICAL LOOK BEHIND THE SCENES

**28**

Testing IT Systems and Telecommunications Networks
WORKING FOR A SECURE DIGITAL WORLD

Ensuring quality and safety in the interaction between man, technology, and the environment: This has been TÜV Rheinland's mission for over 145 years. As a global testing service provider, we face a range of challenges to pursue this every day. Our experts test cars, technical installations, and entire power stations as well as process workflows and management systems. They are committed to lifelong learning and are dedicated to upholding holistic health management within companies. Issues such as Industry 4.0, digitization, and networking systems are becoming increasingly important. And when it comes to these issues, quality, reliability, safety, and functionality are also particularly critical factors. How can all these factors be addressed? How does TÜV Rheinland ensure that this occurs? In other words: How do independent testers work today? Read on to learn all about the testers.



Pursuing technical progress

Whether you're flying over the Atlantic, taking the elevator, or shopping on the Internet, you have to rely on technology. But just how safe are the products, systems, and processes involved? As an economically and professionally independent testing service provider, TÜV Rheinland offers answers to this question. Our experts check whether existing safety standards are complied with in all major spheres of work and everyday life – and also bring their own standards to bear to ensure the responsible development of technical innovations.



FROM OUR CORPORATE MISSION STATEMENT

TÜV Rheinland is a leading international provider of technical services. Our goal is to be the world's best sustainable and independent provider of technical services for testing, inspection, certification, consultation, and training.

Since 1872, we have been developing solutions to ensure the safety and quality of the interaction between man, technology, and the environment. We firmly believe that social and technological progress is intrinsically tied together.

The roots of TÜV Rheinland date back to the dawn of the Industrial Revolution. In the 19th century, steam engines were increasingly replacing manual labor, including in Germany. This automation fueled the economic boom and enabled production to skyrocket. At the same time, industrial production also carried the risk of serious accidents. The newer the technology, the more inexperienced the operators. Although government-imposed controls were put in place early on, the responsible officials in Prussia and other German states were not specially trained to enforce these. The industrial companies themselves therefore took the initiative to set up the first technical inspection associations at the regional level.

PIONEERING WORK FOR THE ECONOMY

1872 saw the birth of the Verein zur Überwachung der Dampfkessel (an organization to inspect steam boilers) in the districts of Elberfeld and Barmen, Germany, an association that would one day grow into TÜV Rheinland. Fittingly, the general nature of the association's work is similar to that of TÜV Rheinland's work today: Economically and technically independent tests performed by specially trained engineers to increase plant safety and allow companies to keep pace with technological developments. These additional private-sector controls also relieved government authorities of some of their burden (and continue to do so today). After 1872, private

technical inspection associations were officially entrusted with the implementation of state control tasks; to use the jargon of the sector, these tasks are 'loaned out' (i. e., outsourced). This led to increasing success – the number of boiler explosions dropped drastically, which also coincided with an increase in production output.

Making people's lives safer is a principle that has permeated the entire development of TÜV Rheinland from regional auditor to international group. The advance of industrialization made the reliable and responsible use of innovative processes, products, and production facilities increasingly important. Accordingly, the scope of the testers' tasks rapidly expanded.

TÜV Rheinland Business Streams:

Industrial Services Products Mobility Academy & Life Care Systems ICT & Business Solutions

Alongside steam boilers, the focus in the 20th century would turn to power plants, tank facilities, elevators, and motor vehicles. Consequently, the Rheinisch Boiler Inspection Association (DÜV) developed into the Technical Inspection Association of Cologne, and, finally, TÜV Rheinland. It then expanded to assume a Germany-wide presence – and an increasing international focus.

REMAINING CONSTANT IN CHANGING TIMES

As the economy has globalized, so too has TÜV Rheinland has expanded its scope of action. The challenge is to ensure quality and safety for more and more new products and technologies in more and more new markets. The Group is committed to that aim, currently engaging around 20,000 employees*, numerous subsidiaries in Germany and many other countries around the world, and a global network of testing centers and laboratories to ensure it is met. Now that we are at the threshold of the fourth industrial revolution, we are faced with fascinating questions: How can self-controlling industrial systems and the Internet of Things be inspected? What does information security mean in today's digitally

networked world? How can new forms of energy supply be implemented in an environmentally and consumer-friendly way? Global standards for new technologies are needed to minimize the risks inherent to using innovative products and processes. 140 years ago, steam engines were made safer through the work of TÜV Rheinland; today, the Group ensures greater safety for renewable energy storage, autonomous driving, and new IT applications, to name a few examples. However, TÜV Rheinland not only conducts individual tests, but also oversees complex processes and projects. Industrial plant or hospital planning, or occupational health management within companies are examples for such comprehensive operations.

RESPONSIBILITY TOWARDS PEOPLE AND THE ENVIRONMENT

As a technical partner of businesses, government agencies, and organizations, TÜV Rheinland currently provides quality and safety control in nearly every sphere of economic and personal activity, from the energy industry, to environmental engineering, rail engineering, and IT, to the consumer goods sector. This task entails a special responsibility, one that the Group

takes very seriously. The entire test system itself is therefore subject to strict rules and controls. These rest, among other things, upon the high level of education and personal skills of our employees and the independence of the tests. People or companies pay for TÜV Rheinland's testing services. However, the test results remain impartial and cannot be purchased. This goes for driver's licenses and vehicle inspections, as well as for product testing and industrial plant monitoring. Our impartiality is guaranteed through the organization of our company and strict government oversight, among other things. In Germany, TÜV Rheinland's work is monitored by state and federal authorities, among others. The Group holds over 350 accreditations worldwide (also known as 'licenses to test'), which are issued by third parties – in most cases, public authorities.

For more information, visit
www.tuv.com.

* Annual average of full-time employees in 2015

TÜV Rheinland Berlin Brandenburg
Pfalz e. V.

TÜV Rheinland Foundation

TÜV Rheinland AG

TÜV RHEINLAND GROUP

Company or association? The TÜV Rheinland Group is both. At the core of this globally active technical service provider is an association that is known today as TÜV Rheinland Berlin Brandenburg Pfalz e. V., which is predominantly devoted to industrial and commercial companies. As a non-profit organization, it has and continues to have official authorization to conduct most public functions in this area. The operational testing activities have been outsourced to subsidiaries that are consolidated into TÜV Rheinland AG. To date, the association is the sole shareholder of this company, but does not operate with the aim of making a profit. This form of organization is an important prerequisite for independent testing by TÜV Rheinland experts.

Together with the TÜV Rheinland Foundation, which plays an active role in social issues, the association and corporation combine to form the TÜV Rheinland Group, or TÜV Rheinland for short.





The license to test

TÜV Rheinland operates internationally to ensure the safety of products and processes and the smooth operation of technical systems. In this capacity, the testing service provider is itself tested; the individual process steps are bound by clear rules. Keeping the 'license to test' depends on compliance with these rules.

All participants in our modern economic system – industrial corporations, product manufacturers, commercial bodies, authorities, and last but not least, consumers – are called upon to do their part to ensure the safe use of technology. Independent testing and quality control help make this possible. But who guarantees that the testers themselves are reliable? In Germany, additional E.U. member states, and many other European countries, a control system has been established to ensure the economic and professional autonomy of private-sector testing services. This control system applies to TÜV Rheinland, too.

TÜV Rheinland's operations are thereby monitored by a number of public authorities all over the world as well as organizations that have set standards that regular the way in which TÜV Rheinland works. We also have our own quality assurance system that involves regular internal monitoring of employees, test laboratories, and

company processes. In order for TÜV Rheinland, a private company, to be permitted to conduct certified testing and take over public tasks such as driver's license tests, we first have to obtain accreditation from the competent authorities and provide comprehensive performance records. The Deutsche Akkreditierungsstelle GmbH (DAkkS), based in Berlin, is the responsible accreditation body in Germany, for instance.

NON-BIASED TESTING

Even individually state-recognized experts are under the supervision of the authorities. They fulfill public duties in certain areas and take an oath to be objective and impartial. The fact that TÜV Rheinland operates independently is convincingly demonstrated by the results of the tests it conducts. For example, 20 percent of all cars fail TÜV Rheinland's general vehicle inspection, and 50 percent of all products fail to obtain a GS mark (GS stands for 'Geprüfte Sicherheit,' or 'tested safety').

The contracting companies, organizations, or authorities demonstrably cannot buy a positive test result. They simply pay for the qualified testing services of TÜV Rheinland; even in the event of a negative outcome, this is a sensible investment. This is because detected defects provide information on vulnerabilities and corresponding optimization possibilities.

NO SUCH THING AS 100 PERCENT SAFETY

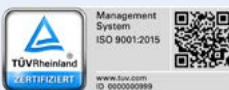
The test mark that TÜV Rheinland awards products upon passing a test gives consumers extra peace of mind – but there is no such thing as 100 percent safety. One of the reasons for this is that in modern mass production, only samples can be examined, and the tests usually focus on certain attributes of a product. However, if mistakes are found despite careful examination, TÜV Rheinland follows up in self-critical and unbiased manner.

MARKS FOR SAFETY AND COMPLIANCE – A SELECTION

To help consumers and companies make informed choices, TÜV Rheinland awards marks when products, technical installations, and IT and management systems meet the required criteria. For product testing, TÜV Rheinland also uses an additional test mark based on the traditional logo of LGA, which has belonged to TÜV Rheinland since 2005. TÜV Rheinland is also authorized to issue other test marks, including the GS mark for products that have been approved as safe in Germany, as well as the ENEC mark.



The TÜV Rheinland test mark uses several key terms such as 'safety,' 'functionality,' and 'ergonomics' to make it clear what has been tested. A test number ('ID') or a QR code link to further information on the scope of the test on the Internet.



TÜV Rheinland tests management systems according to the internationally recognized ISO standards 9001 (Quality Management), 14001 (Environmental Management) and 50001 (Energy Management), among other criteria.



In the IT security sector, TÜV Rheinland certifies enterprise data protection, tests the security of online applications and online stores, and more.



In Germany, certain technical installations (such as elevators) require regular maintenance and are regularly inspected for safety.



The voluntary GS mark serves to ensure that a product has satisfied technical safety requirements and has been checked by an independent testing service provider.



The LGA tested test mark can be found on washing machines, other domestic appliances, furniture, and toys, to name a few examples.



The ENEC mark is a voluntary test mark used to label electrical products such as lights, power tools, and related components.



The CE marking is not a test mark; instead, it is the manufacturer's declaration that the product meets the requirements of European law.

Every detail counts

Testing technical installations was one of TÜV Rheinland's first tasks, and remains at the core of the Group's activities to this day. The knowledge and the work of our testers have developed and changed since the era of the steam engine, just like the state of technology itself. Today, TÜV Rheinland employees monitor complex industrial plants as well as escalators, elevators, and carousels. In many cases, these systems are subject to a statutory audit requirement – and TÜV Rheinland relieves the state and the operator of the burden of performing the respective audits.

AUTHORIZED TO TEST

In many cases, manufacturers may need to have the safety and environmental aspects of their technical installations and products inspected by an independent, qualified entity. In Germany, the Central Body of the Federal States for Safety (ZLS) is responsible for accrediting and monitoring testing laboratories, certification bodies, and inspection bodies that inspect and certify the safety of devices, machines, and installations. Installations requiring inspection, such as elevators or certain technical systems for industrial applications, may only be checked by approved monitoring bodies (ZÜS) such as TÜV Rheinland. These inspection bodies must annually prove to the Central Body of the German Federal States for Safety through extensive audits that they work strictly independently and are qualified to carry out these tasks in terms of their structure, equipment, and personnel.



Today, economic productivity and social progress are unthinkable without sophisticated technical installations. In order for these to fully benefit people and do no harm, they must be inspected regularly for safety and quality. For example, strict regulations apply in the chemical industry regarding operational safety, occupational safety, environmental protection, and accident prevention. For installations requiring inspection, such as steam boilers, pressure tanks, or tank and storage

facilities for hazardous substances, recurring technical examinations are required, according to the German Ordinance on Industrial Safety. The operator is responsible for assessing the risk and complying with the tests. However, the operator can also commission an approved monitoring body such as TÜV Rheinland to perform these services. The TÜV Rheinland experts' test reports must then prove that the company has properly fulfilled its responsibility. This is ultimately

under the supervision of the relevant occupational health and safety authorities. These authorities can also prohibit operation in the event of non-compliance.

REGULAR SAFETY CHECKS

Technical installations keep both industry and everyday life up and running. For example, elevators make urban life above the fifth floor of buildings possible, and escalators tirelessly support moving people in public buildings. TÜV Rheinland has





TÜV Rheinland has specially trained experts who can carry out the required inspections of installations and technical systems for industrial applications.

specially trained experts who can carry out the inspections that are legally required for such installations. Before they are sent into the field, the employees are intensively trained in theory and practice, and they constantly undergo further training during their employment so that they can identify and assess any safety-relevant detail on the spot. Just 200 engineers are entrusted by TÜV Rheinland with the testing of elevators in Germany. These experts closely inspect ride comfort, the safety and emergency stop devices, the operation of the doors, and the emergency call systems, among other things. The so-called catch test checks whether automatic emergency braking

is triggered in the event of a problem. All defects are then identified in a test report to the operator. Although it is the manufacturer who must demonstrate that the elevator meets the applicable standards and technical regulations, when the elevator is in operation, it is the operator who is always responsible for maintenance, repairs, and inspection. As a result, the operator is liable for any damages.

EXPERTS IN TEMPORARY STRUCTURES

Special safety requirements also apply to temporary structures. These are technical installations and structures that are intended to be assembled for a certain length of time and then disassembled – such as amusement park rides like carousels, Ferris wheels, and roller coasters, as well as tents or

concert stages. TÜV Rheinland has been active in this field for more than 40 years, testing some 1,200 temporary structures, including 750 amusement park rides, every year in Germany alone. For these structures, the inspections required by law start even before the structures are first assembled. The operator needs an official design approval before even being allowed to put the installation into operation. Have all of the legal requirements been implemented? Can the roller coaster or chair swing ride be used with no risk of accident? During operation, a final acceptance inspection must be conducted on site each time the ride is assembled – either by local authorities or by a commissioned testing service provider like TÜV Rheinland. The range of service includes regular intensive technical inspections by certified experts. The experts from TÜV Rheinland check all relevant components for reliable function, aging, and wear.

SHARING KNOWLEDGE WORLDWIDE

TÜV Rheinland is made up of around 20,000 people on every continent, contributing their skills and proven practical experience to the overall performance of the testing group. The range of services the Group provides is as widely varied as the disciplines and career paths of our employees. The international team of TÜV Rheinland experts includes engineers, natural scientists, and physicians as well as IT specialists, economists, social scientists, laboratory technicians, business people, geologists, and geographers. Our experts are in close contact, sharing knowledge across national borders. Existing knowledge can be accessed by all employees around the globe. This is the only way to consistently implement high standards worldwide. All employees take part in the latest technical developments and findings – and can jointly develop innovative solutions for ensuring the safety of technical installations, products, and processes.

WIDE-RANGING SKILLS

The testing services of TÜV Rheinland also contribute to the smooth and efficient operation of technical systems in many other sectors and industries. The spectrum ranges from materials testing, to fire and explosion protection, to the certification of offshore wind farms, to supporting entire building and infrastructure projects. Our wide range of services require a wide range of employee skills. At TÜV Rheinland, these skills are cumulatively based on nearly 150 years of experience – and on the high qualifications of all employees.



“You’ve Got to Constantly Be on the Ball”

Cris Clauß, born in 1964, an expert in technical installations such as elevators and service lifts, discusses exciting challenges in his professional life and the monitoring of his audit work.

As an expert at TÜV Rheinland, you’ve been responsible for the testing of cranes and service lifts on skyscraper facades, among other things, since 2013. That’s a challenging job done at dizzying

heights. What makes you qualified for this unusual job?

Well, obviously, you can’t have a fear of heights – but apart from that... I’m a mechanical engineer by nature, focusing on automotive technology, and I’d worked for a long time as a project manager in conveyor technology. In addition, I completed special training in the field of new building elevators and mechanical engineering. Unlike in construction technology, there’s no government oath-taking for experts in our field.

How do you ensure that your tests are water- and airtight?

There are regular compulsory courses for training and for exchanging experience among experts; we also have

to always be up to date on new standards. If you miss an appointment twice, you lose your authorization. We’re also reviewed by the DAkkS (German Accreditation Body), as well as by the in-house IT Security department. As soon as someone isn’t working on the installation often enough or failing to participate in the prescribed trainings, it gets registered in the system. The built-in electronic security mechanisms then prevent that person from generating any more test reports.

What makes your work especially appealing and fun?

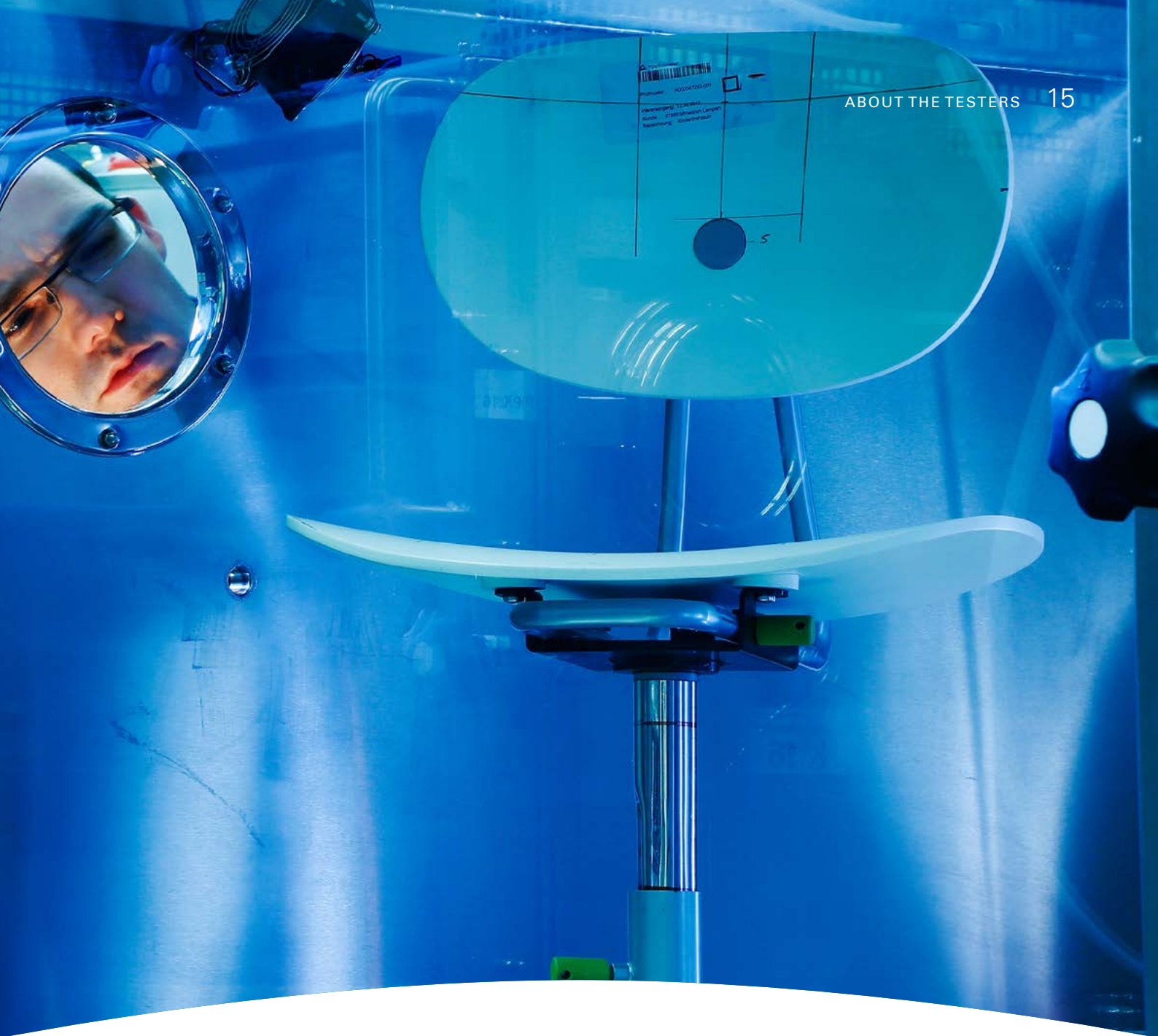
I get to constantly deal with new technologies and recent developments in electrical engineering, electronics, and software. You’ve got to constantly be on the ball, and that makes the job so exciting. I also like exchanging information with colleagues. If I come across something I don’t know, I can always use my ‘phone a friend’ lifeline. We help each other, even across disciplines. I really feel at home with this setup – and I always will.





Leaving nothing to chance

Does the bicycle helmet meet the applicable standards? Is the LED light safe? Does the office chair satisfy all the requirements for stability and ergonomics? The product testers at TÜV Rheinland put consumer goods as well as individual components under the microscope. By issuing the TÜV Rheinland test mark, the LGA test mark, or the TÜV Rheinland GS mark for tested safety, the testers provide consumers with guidance for making purchases – and help the contracting companies with the quality assurance of their products and production processes.



According to product safety law, products in Germany may only be placed on the market if they do not compromise the safety and health of persons 'under normal or foreseeable conditions of use.' But who determines whether a manufacturer has done everything right in designing and manufacturing a washing machine, jigsaw, or hairdryer? Our testers have the knowledge, experience, and modern test devices to determine whether a product meets applicable legal requirements – for example, with respect to mechanical safety, chemical stresses, or energy

efficiency. TÜV Rheinland maintains a global network of highly specialized testing centers for the necessary tests. For instance, in Germany the Group operates the world's largest testing laboratory for furniture and toys in Nuremberg and one of the most modern testing centers for solar modules in Cologne, among other facilities. The majority of product testing takes place outside of Germany, though – for example, in one of the Global Technology Assessment Centers (GTAC) in Bangkok (Thailand), Budapest (Hungary), Shanghai (China), or Yokohama (Japan).



“We Have to Be Extremely Accurate”

“It’s not a bad thing for a toy tester to have kids themselves. It makes it easier to imagine what stresses the products need to withstand every day. It’s not just about the teddy bear in question having its button eyes bitten off; the kid might also slam his stuffed animal against the edge of the table.” Heiko Kampf, born in 1975, is toy tester through and through. The trained construction materials tester has worked in this area since 1999. Today he is one of the managers of the world’s largest toy testing labs, operated by TÜV Rheinland in Nuremberg.



As the person responsible for technical customer support, Heiko Kampf sets the test program. Depending on which approvals or certifications are being sought, the 50-strong lab team then conducts mechanical-physical, chemical, and electrical tests. The list of defects that can be detected through these tests is long. “This ranges from small swallowable parts to remote-controlled cars that can short-circuit and spontaneously combust,” says the expert. “Since it’s all about children’s safety, each of us has to work with absolute accuracy.” They also have to ‘be well trained. Anyone starting a career in the testing lab has usually already completed technical training. “After that, it will take about a year before a tester can test according to the European requirements,” says Kampf. For good measure, they all maintain a strict two-man review rule. Each report goes through a review and is approved by a second expert. There are also extensive external controls, including ones by the German Accreditation Body (DAkkS). “During regular

audits, we have to prove that our employee skills, training, and overall quality assurance system are adequate, down to the inspection of the test equipment. Only then is the accreditation renewed,” explains the lab manager.

Always being up to date with the newest technical developments is a daily challenge, even for an experienced tester. “We sit on the respective standards committees and are therefore the first to know when normative rules change, for instance,” says Kampf. “We’ve also got the toy fair here, and the Toy Award – so we’ve got our ears very close to the ground when it comes to new technical developments.” The current expertise flows from here directly to the employees – and into the global testing network of TÜV Rheinland. As a Competence Center for Toys, the laboratory in Nuremberg is the top technical body for all toy labs in the world.

TESTED AND CERTIFIED

The safety of a product can mean the difference between life and death – when it comes to safety clothing, for instance. In order to make safety vests, protective goggles, or work shoes as reliably protective against injury as possible in the worst-case scenario, they need to meet clearly defined criteria. This is something lawmakers demand as well. TÜV Rheinland tests such products according to the European directive for personal protection or in accordance with specific test programs. For everyday items such as consumer electronics, bicycles, or children's toys, safety and quality are also paramount. Are the products low in pollutants, shatterproof, and free of electrical flaws? A test mark such as the approved GS mark serves as a valuable aid for consumers in making the right decisions. TÜV Rheinland is authorized as an independent testing service provider by the Zentralstelle der Länder für Sicherheitstechnik to certify many product groups, and is also certified to do so by the German Accreditation Body DAkkS.

BEYOND THE LEGAL REQUIREMENTS

In many cases, TÜV Rheinland awards its own product test mark. One example is the design test for compo-

nents and products for which no GS mark may be awarded (by law), such as switches or plugs that are not intended as finished products for the consumer, but rather solely for incorporation into finished products.

Other test marks provide information such as whether alarm systems and mobile phones are electromagnetically compatible, leather shoes are colorfast, or computers are energy efficient. In terms of its test criteria, TÜV Rheinland often goes beyond legal requirements in force in Europe – such as with pollutant testing for textiles, furniture or building materials.

Overall, TÜV Rheinland conducts approximately 400,000 product tests a year – and always keeps the global supply chain in mind when doing so. The international experts from TÜV Rheinland are familiar with the various approval requirements in all countries. They support the contracting companies in product certification on all continents and thereby assist them in tapping into new markets.

Are the products low in pollutants, shatterproof, and free of electrical flaws? Using modern testing equipment, the testers from TÜV Rheinland determine whether a product complies with applicable regulations.



More than just a sticker

German car drivers mainly associate the term 'TÜV' with one thing above all: the regular general vehicle inspection. Experts from TÜV Rheinland inspect vehicles for any technical defects at around 140 inspection bodies in Germany – and these experts must meet a long list of quality criteria themselves. Vehicle and driver's license tests in Germany are precisely regulated; the testers act on behalf of the federal states and are monitored in their work by state regulatory authorities.







There are more than 650 motor vehicles for every 1,000 residents of Germany. To ensure that the dense traffic runs as safely and environmentally friendly as possible for all, legislature in Germany sets strict requirements – which also apply for technical vehicle inspection. Only technical inspection bodies and officially recognized monitoring organizations such as TÜV Rheinland are authorized to conduct these inspections. Based on the German law on officially recognized experts and inspectors for motor vehicle traffic, test engineers inspect vehicle modifications and perform the prescribed general vehicle inspections. They check the lighting system, chassis, tires, brakes, seat belts, and the exhaust system, among other things. A test sticker is applied to the rear license plate as proof of a successfully passed inspection. This sticker remains valid for the passenger car in question until the next inspection is held after 24 months.

STATE-CERTIFIED EXPERTISE

The respective state ministries are responsible for supervising the technical inspection bodies that TÜV Rheinland operates in Berlin, North Rhine-Westphalia, Rhineland-Palatinate, and the Saarland, as well as the officially recognized, Germany-wide TÜV Rheinland monitoring organization. The authori-

ties demand that the experts and test engineers working at these sites possess certain qualifications. In addition to studying mechanical, automotive, or electrical engineering, the experts-in-training must complete an 18-month training. Upon completion of this training, said employees must pass an exam held by the competent authority. Regularly conducted overt and covert tests for quality assurance, continuous training, and extensive professional exchange are essential prerequisites for providing professional, independent assessment. This applies to testing the technical conditions of vehicles as well as to drivers' skills. Based on the relevant laws, the TÜV Rheinland experts in Germany conduct over 250,000 driver's license tests and nearly 2.6 million general vehicle inspections each year.

ON THE WAY TO SMART TRAFFIC CONTROL

When it comes to ensuring mobility, TÜV Rheinland doesn't just work on behalf of public authorities. Our traffic experts work on behalf of companies too, in fields such as railway technology, aerospace, the automotive sector, transportation, and logistics. They provide advice and assist companies with product development – always with an eye towards the use of innovative technologies. For example, in the field of transport telematics, TÜV Rheinland experts work together with users, developers, and manufacturers on electronic toll and traffic management systems around the world. The smart control of traffic flows and logistics processes is a promising approach for conserving resources, reducing CO₂ emissions, and further increasing road safety. TÜV Rheinland pursues the same goal with strategies and concepts for autonomous driving.

MORE SAFETY FOR BEGINNING DRIVERS

In order to reduce the accident rate among beginning drivers, TÜV Rheinland and other operators of technical inspection bodies are committed to optimizing the driver's license test. For instance, they have designed a computer-based theoretical test with videos that will better prepare beginners for real-life traffic situations. For more information, visit www.tuv.com and search for "driver's license".

“Every Day is Different”

Carola Buchwald, born in 1987, has turned her passion for technology into a profession. At TÜV Rheinland, she tests vehicles and independently conducts driver’s license tests.

“A desk job? No thanks!” Carola loves the practical challenges her work involves. She decided to pursue a technical career early on, studied automotive engineering in Cologne, and then started working in the automotive industry in the field of prototype construction. “I worked on innovative auto parts – for example, developing braking systems. Of course that was exciting, but it was still too theoretical for my taste.” She switched paths and trained as an officially recognized expert at TÜV Rheinland. “Now I’m right at the site, right there with the customer. That means you never run the risk of any day being the same as the one before.”

At the Cologne-Mülheim inspection body, Carola Buchwald screens the cars of customers coming in for the general vehicle inspection, examines modifications to the vehicle, and conducts driver’s license tests. Her position entails a great deal of responsibility and constantly making decisions independently – she’s not left completely to her own devices, though. Regular trainings guarantee that the tester is always up to date. “If you run into a vehicle model or a component that no one here at the inspection body is familiar with, we consult the Competence Center,” says Buchwald. “There we’ve got experienced experts who monitor the market and combine the collective know-how of the international TÜV Rheinland expert network.”

For added security, internal and external quality controls are applied. Reports are checked by random sampling; for the



general vehicle inspections, for instance there are covert tests with prepared vehicles and unannounced follow-up controls. “When differences in results emerge, such as when an expert overlooks a defect, these are immediately counteracted to improve the quality of the testing.” If your assessments are wrong too often, you can lose your license to test.

Buchwald finds the fact that her work is constantly under scrutiny proper and important. “Ultimately there’s a real point to it – we can’t afford to make any mistakes where safety is concerned.” This also goes for how the experts drive. “It just makes sense,” says the young expert, who restores classic cars in her spare time. “The person who decides whether someone gets their driver’s license or not shouldn’t have any black marks on their driving record.”





Health and qualifications: Key factors for companies

A crucial element of TÜV Rheinland's business activities is focusing on people at their workplaces and in their professional environments. Some of the testing organization's main missions are to curb the number of workplace accidents, to protect the health of workers, and to simultaneously improve worker qualifications. Today, the services related to occupational health and safety as well as to training and continuing education are bundled into the globally active Academy & Life Care Business Stream at TÜV Rheinland.

Although occupational safety long focused purely on technical measures to avoid workplace accidents, today the focus is on comprehensive prevention and holistic health care. This trend is continually on the rise, thanks in part to digitization, global networking, and an aging workforce. Providing for long-term employee health and performance is in a

company's best interests, as work-related illnesses and injuries carry business risks. Employers also have a statutory duty of care and are responsible for providing their employees with a safe and healthy workplace.

Small and medium sized companies (SMEs) often lack the necessary resources to implement healthcare

requirements. With over 700 employees working in this field, TÜV Rheinland is one of the largest providers of qualified occupational health and safety services in Germany. Thanks to their education and regular training sessions and courses, the occupational physicians and specialists responsible for occupational safety are able to create risk assessments that are required



TÜV RHEINLAND OFFERS THE FOLLOWING SERVICES FOR EMPLOYERS – IRRESPECTIVE OF THE SIZE OF THE COMPANY OR ORGANIZATION:

- Occupational medicine
- Occupational safety
- Occupational, industrial, and organizational psychology
- Occupational health management
- Occupational healthcare
- Care management
- Health and safety coordination at construction sites
- Workplace fire protection
- Hazardous substance management

by German occupational health and safety regulations. For certain occupational medical fields, such as radiation protection, the physicians from TÜV Rheinland acquire additional special qualifications.

A CONSTANT GOAL: OCCUPATIONAL SAFETY

Despite the overall downward trend, 950,000 workplace accidents still occur in Germany every year. Pursuant to the German Occupational Safety Act, all employers without exception are obligated to create and document risk assessments for each workplace. To comply with this, they can hire occupational physicians and occupational safety specialists, or transfer those functions to a service provider. The occupational safety experts from TÜV Rheinland assist employers in preparing the statutory risk assessments and in developing an appropriate occupational health and safety system. They perform workplace measurements, test electrical equipment, advise on matters of fire protection, and provide

safety consulting on installations and work equipment.

OCCUPATIONAL HEALTH MANAGEMENT

The employer's duty of care refers not only to physical hazards, but also to mental stress. By setting up a professional occupational health management system, companies can meet current challenges systematically and effectively. TÜV Rheinland supports employers in establishing such a system.

OCCUPATIONAL MEDICAL TESTS AND EXAMS

TÜV Rheinland operates special occupational medical centers at around 60 locations. Hearing and vision exams are performed here, as are aptitude tests or preventive measures such as flu vaccinations, check-up exams, and travel medicine consultations.

ASSISTANCE WITH MENTAL STRESS

Stress, exhaustion symptoms, and burnout: Mental stress in the workplace has measurably increased in

recent years and is reflected in sick leave statistics. Since September 2013, every German employer, from micro-entrepreneurs to major corporations, has been required by law to also determine mental stress as part of their risk assessment and take appropriate action. The occupational psychologists from TÜV Rheinland assist employers in meeting this challenge. Our professional employee and social counseling service has proven effective, especially in dealing with serious illnesses and crisis and stressful situations. The aims are to improve the quality of life of those affected for the long term, facilitate reintegration into the work world, and avoid economic losses for employers through absenteeism.

QUALIFYING PEOPLE, EMPOWERING COMPANIES, AND ASSISTING IN THE DIGITAL TRANSFORMATION

In addition to occupational safety and healthcare, occupational qualification forms the second pillar of the Academy & Life Care Business Stream at TÜV Rheinland. As is the case with



The TÜV Rheinland Academy offers numerous occupational training options, from traditional fields of work such as welding, to logistics, mobility, and IT, through to health and care.



occupational safety, TÜV Rheinland has been commitment to education right from the start. Technical training and professional qualifications for the staff of industrial companies have always been an integral part of the activities of TÜV Rheinland.

As part of the digital transformation, the requirements for the expert operation, inspection, and maintenance of equipment and systems are continuously on the rise. At the same time, knowledge-based services and products are becoming increasingly important. TÜV Rheinland stays abreast of these changes with a targeted training and continuing education program and by effectively linking analog and digital forms of learning. The Academy is now active in more than 20 countries world-

wide and offers a diverse, cross-sectoral range of occupational qualification programs – in traditional fields of work such as welding, as well as in the fields of IT, healthcare, mobility, construction, and real estate.

EMPLOYEES WITH PROVEN QUALIFICATIONS

The success of a business largely depends on the expertise and competence of its employees. Employees with a personnel certificate have an independently certified qualification – an important factor in competition on the job market. The TÜV Rheinland Personnel Certification Center is accredited by the German accreditation body DAkkS in accordance with DIN EN ISO 17024. This international standard establishes uniform requirements for the operation of personnel certification bodies. The personnel certification is based on an internationally recognized set of rules that allow certifications to be standardized internationally.

Both individuals and companies can check and confirm the qualification of employees through independent third parties such as TÜV Rheinland. The TÜV Rheinland Personnel Certifica-

tion Center, or PersCert TÜV, issues 25,000 to 30,000 of these kinds of personnel certifications annually. The spectrum of certifications ranges from Specialist Fire Protection Planner, to IT Security Officer and Environmental Manager, to 1st and 2nd Party Auditor Medical Devices International (TÜV). Alongside granting qualifications under the accreditation according to DIN EN ISO 17024, PersCert TÜV develops numerous certification programs that are implemented with cooperating partners from the industrial and service sectors, along with training providers, associations, and authorities. PersCert TÜV documents the qualifications on TÜV Rheinland's freely accessible online platform, www.certipedia.com.

TÜV RHEINLAND UNIVERSITY CAMPUS

The TÜV Rheinland university campus is a new concept that combines vocational training for career development and academic study. The campus provides on-the-job training and courses in the fields of engineering, IT, healthcare, and management. All of the courses and further training lead to nationally and internationally recognized qualifications.



Personnel Certification: Knowledge Transfer Guaranteed

Jörg Lochmann, born in 1971, works as a Personnel Certifier at the TÜV Rheinland site in Nuremberg. The native Rhinelander is a trained industrial manager and occupational therapist. After studying social education, he worked in vocational training for many years and designed courses in the field of hazardous material transport before joining Personnel Certification at TÜV Rheinland in early 2014.

As a member of an independent monitoring body, he can provide a direct assessment of an individual's success in training to receive

a certification and, above all, ensure the quality of performance evaluations. Taking on this work was a logical professional decision for Lochmann. "It's true that most training ends with a participation certificate or a certificate. But this only relates to the content of the training, confirmed by a test that confirms the participant has understood what has been taught," says Lochmann. Receiving a certificate from an accredited personnel certification body according to the DIN EN ISO 17024 standard for personnel certification is quite another matter. This certificate plainly states who is allowed to evaluate and who is being evaluated. And above all, it verifies a skill; in other words, it confirms the ability to meet defined requirements. Because of this, the certification program itself includes precise specifications for admission requirements, for example, regarding professional experience, the knowledge acquired, or the scope of the training and the examination procedure.

More and more companies and employees want such a certificate as a follow-up to a training, as it stands for reliably proven skills, up-to-date knowledge, and international recognition. To respond to this demand, TÜV Rheinland now offers a variety of personnel certifications. For instance, Lochmann has developed a test together with a well-known screed producer for individuals who would like to become certified screed pavers. The manufacturer wanted to create this certification this to ensure that their building material was also being used professionally in practice. Industrial companies as well as consultancies and service providers attach a great deal of importance to an independent test mark that ensures and verifies the skills of their employees. A recent example of this is the certification program for certified resilience counselors, which ensures the quality of occupational healthcare counseling. Jörg Lochmann sees considerable need in this area: "Personnel certifications allow companies to raise groups of employees as well as suppliers and dealer networks to a consistently high qualification level, and in turn be able to show this to their customers as well."



A critical look behind the scenes

Better product quality, efficient processes, and increased customer satisfaction: Modern management systems help companies optimize their processes and achieve their goals on schedule. Specially trained auditors from TÜV Rheinland check and certify these systems according to internationally recognized standards such as ISO or EN. In order to meet certain industry or market requirements, TÜV Rheinland has also developed its own testing standards – for example, for sustainable corporate management or the quality of service in companies.



From Quality Management (ISO 9001), to Environmental Management (ISO 14001) and Occupational Health and Safety (OHSAS 18001), through to Information Security Management (ISO 27001), recognized standards are designed to ensure consistent safety and quality in global production and supply chains. TÜV Rheinland uses a multistage audit to verify whether a system meets the relevant requirements. After successful passing a test, a company receives a certificate valid for a maximum of three years certifying compliance with standards and the effectiveness of the management system.

THE AUDITORS KNOW WHAT THEY'RE TALKING ABOUT

TÜV Rheinland has special approvals for the auditors known as accreditations.

The German Accreditation Body (DAkkS) in Berlin is responsible for these in Germany. The DAkkS is an important supervisory body for ensuring the independence and competence of TÜV Rheinland. The auditors themselves must meet high standards before they are approved by TÜV Rheinland for testing management systems. After completing vocational training or a university degree, they need to gain several years of professional experience, especially in the area in which they will later be working. This is followed by qualified auditor training with 20 audit days as a trainee and a subsequent evaluation by an experienced lead auditor. Even when certifying services and processes according to its own standards, TÜV Rheinland still follows the existing ISO standards as well as other official standards. The



difference between these internal and external standards is that the ones TÜV Rheinland has developed are more focused on specific industries or market requirements. For example, TÜV Rheinland has developed its own standard for service quality based on specific requests from the hotel industry.



“Those Who Identify Their Weaknesses can Overcome Them”

Ralf Radtke, born in 1971, works as Lead Auditor at TÜV Rheinland, where he is approved for conducting tests according to ISO 9001 (Quality Management), ISO 14001 (Environmental Management), and ISO 50001 (Energy Management). The trained environmental and process engineer held various professional positions before he started at the Cologne-based testing service provider in early 2016. He has also acquired special qualifications in the fields of environmental and energy management.

“Without broad technical expertise and a good deal of experience in the area where you will be employed as an auditor, it just doesn't work – after all, we need to be able to assess complex processes and procedures,” says Radtke. Most of the time, Radtke carries out the audit at the customer's site. He also prepares and reviews audits and reviews audit results. Regular further education and training are also on his professional agenda.

An intensive audit of a company's energy management system can take several days, depending on the company's size and complexity. For instance, the company's energy consumption figures play a role here. Every detail is scrutinized. “But the companies need not fear such an audit – quite the contrary. They benefit from identifying any weaknesses, and can improve their energy and cost performance accordingly,” says Radtke.

In addition to the audit situation itself, the variety that the job entails appeals to him the most. “I get deep insight into a wide variety of companies ranging from basic laboratories to manufacturers of aircraft engines – that's so interesting for me.” In accordance with the two-man review rule, another TÜV Rheinland reviewer verifies the audit process once again, and also carries out a plausibility check. TÜV Rheinland Cert GmbH is an accredited certification body whose auditing and certification activities for quality, environmental, and energy management systems are monitored by DAkkS, the German Accreditation Body. This also includes witness audits, for which DAkkS monitors and assesses the auditors as they work.

Working for a secure digital world

Self-controlling robots, mobile business, cloud computing: In light of digital advances, companies and organizations are under pressure to integrate new technologies into their business processes at ever shorter intervals. This increases safety requirements, as well as requirements for network speed and efficiency. The international team of TÜV Rheinland experts has been working for more than 20 years on protecting network and information systems. TÜV Rheinland also continues to promote the development of efficient networks on behalf of telecommunications companies and the public sector.

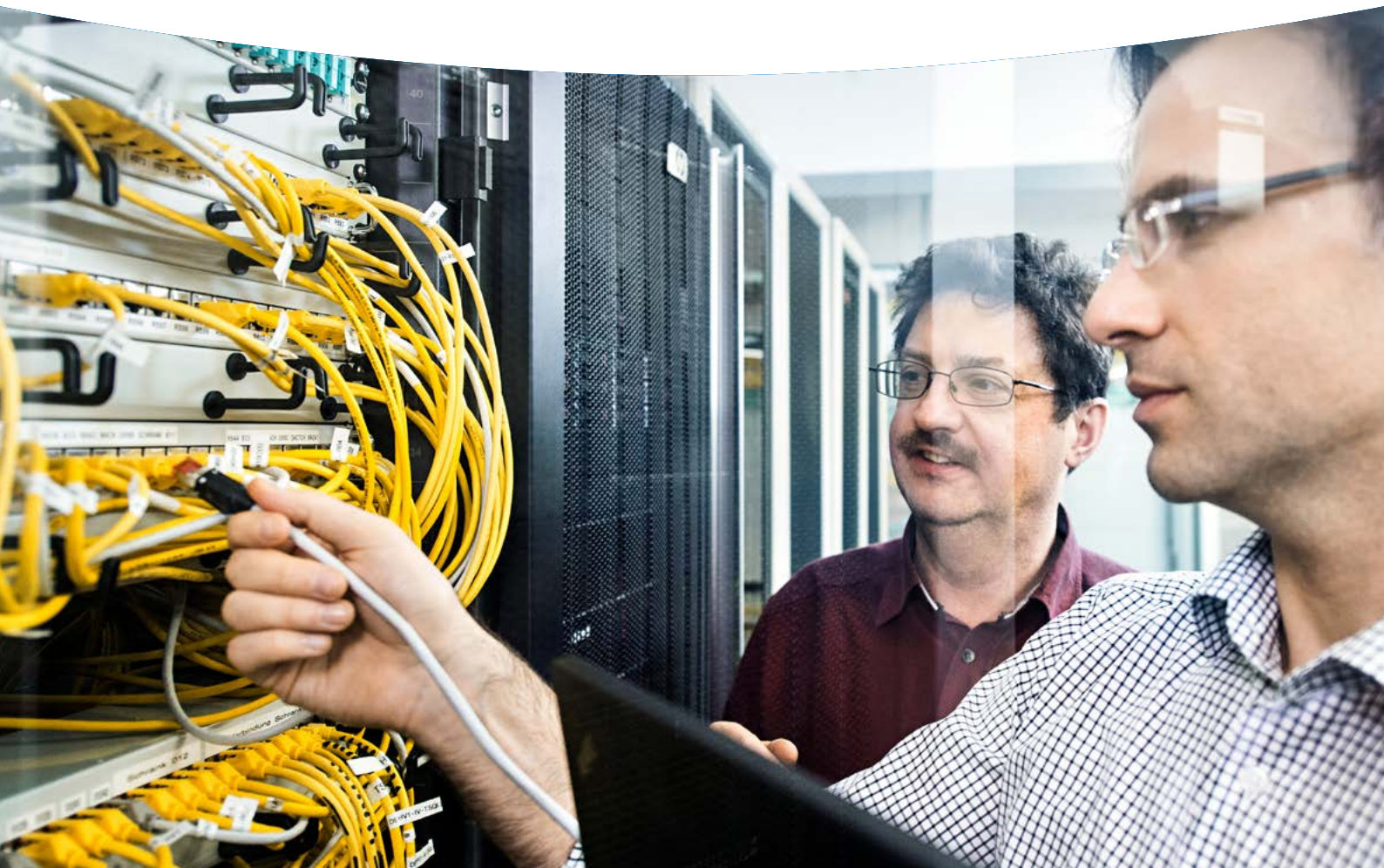
In recent years, the likelihood of becoming a victim of a digital attack has increased significantly. In 2015, 38 percent more cyber attacks were reported than in the preceding year, and the resulting damage to the German economy has been estimated by the industry association Bitkom to be nearly 51 billion euros annually. German legislators are trying to counteract this with measures such

as the IT Security Law. Under this law, operators of so-called critical infrastructures such as industrial plants or power and water supply networks are required to report IT security incidents and to comply with minimum standards for IT security. The new EU directive on cyber security takes this one step further. It prescribes that, in the future, hardware and software used must be

checked for possible vulnerabilities and upgraded accordingly, if necessary.

CYBER SECURITY – A GLOBAL CHALLENGE

Lack of resources, lack of expertise, tight budgets, and increasingly complex IT systems: Many companies are too overwhelmed by these factors in their everyday business to establish an



adequate level of security. As far back as the 1990s, TÜV Rheinland had already begun creating special services for IT security and telecommunications. The ICT & Business Solutions Business Stream currently includes approximately 600 specialists offering services worldwide, from strategic consulting, to process optimization to the implementation and certification of secure IT systems and telecommunications networks. Key regions include Germany, the U.K., the U.S., and the Middle East.

Given the growing degree of networking in business and society, cyber security is continually increasing in importance. TÜV Rheinland therefore supports companies and the public sector in increasing their IT security at all levels. Our experts analyze existing IT security measures and determine the actual need. Based on this need, they create security concepts that factor in the threat level as well as the respective legal requirements in force.

CERTIFIED IT SECURITY

The IT security audits that TÜV Rheinland individually carries out include technical inspections and safety audits as well as safety tests for applications and systems (so-called penetration tests). Processes, concepts and security policies are inspected, as is compliance with the standards set by TÜV Rheinland for safety, quality, and compliance. These are often based on international standards and have been expanded by TÜV Rheinland to enhance employees' skills and experience. For example, TÜV Rheinland issues 'Certified Data Protection' and 'Privacy and Data Security for Online Applications' certificates and has created 'Certified Cloud Service' and 'Certified Online Shop' standards. In addition, state-recognized certification experts assist customers with setting up and conducting regular quality checks on information security management systems (ISMS) in accordance with the internationally recognized ISO 27001 standard.

POWERFUL NETWORKS FORMING PART OF THE DIGITAL TRANSFORMATION

Developments such as Industry 4.0, the Internet of Things, eGovernment, smart cities, and eHealth will definitely provide further motivation for increasing security levels and seeking verification of these increases from independent third parties. At the same time, the data volumes associated with these developments are continually increasing. This data can only be managed with powerful broadband networks. With this in mind, TÜV Rheinland reliably assists companies and public authorities at the local, state, and federal levels in advancing the development of digital infrastructures throughout Germany.



Three Questions for Dr. Daniel Hamburg, Head of Security Engineering

“Ensuring Information Security is a Mission”

Daniel Hamburg, born in 1978, studied electrical and information technology in Bochum, Germany and holds a Ph.D. in this field. Since 2011, he has been managing TÜV Rheinland's Security Engineering division. Together

with his team, he mainly conducts safety testing and technical analyses – for large corporations as well as for medium-sized companies and municipal institutions.

WHAT QUALIFIES YOU FOR YOUR JOB AT TÜV RHEINLAND?

I was fortunate to be able to put the theoretical knowledge I gained in my doctoral work directly into practice at an international trading company. As a result, I find it much easier to understand information security in the broadest sense: The integrity, confidentiality, and availability of data is not just a question of technology, but also one of the processes and the organizational framework.

WHAT IS IT ABOUT INFORMATION SECURITY THAT FASCINATES YOU?

Making companies and institutions in the digital world more secure and protecting them at the technical and organizational levels has always fascinated me. In this respect, ensuring information security is an important mission for me. I'm also fascinated by the wide range of industries and companies. We advise major corporations, medium-sized companies and public institutions, electricity and water utilities, and financial and telecommunications service providers.

HOW DO YOU MAKE SURE THAT YOUR ASSESSMENTS ARE ALWAYS RIGHT?

Our team undergoes continual training to try to ensure that we remain one step ahead of potential hackers. Secondly, the two-man review rule applies: Each test report is reviewed again internally. Finally, we also have our own organization regularly, independently checked and certified in accordance with ISO 9001 for Quality Management and ISO 27011 for Information Security. This means that our customers can be sure that their information will be handled reliably and confidentially.

Important to Know

ACCREDITATION

The specific recognition of the ability and authorization to conduct testing may be provided by governmental agencies or authorities – for example, the DAkkS provides this recognition in Germany. TÜV Rheinland holds 350 accreditations that are subject to regular external auditing and renewal.

AUDIT

This investigative procedure involves specially trained auditors checking whether processes or management systems comply with the applicable requirements and guidelines.

NOTIFIED BODY

This title is given to independent testing and certification providers recognized by an authority to perform testing in accordance with European law. TÜV Rheinland works in Europe as a notified body.

DAKKS

In Germany, the recognition of qualified testing service providers is a government matter. The Deutsche Akkreditierungsstelle GmbH, which is based in Berlin, is the responsible accreditation body (www.dakks.de).

CONFORMITY ASSESSMENT

A conformity assessment determines the level of compliance with specified requirements – for example, for a product, a procedure, a process, a service, a system or a person. Well-known test marks for product conformity in terms of safety include the German GS mark and the TÜV Rheinland test mark.

MANAGEMENT SYSTEMS

TÜV Rheinland tests in accordance with international standards, including the following: ISO 9001 (Quality Management), ISO 14001/EMAS (Environmental Management), ISO 50001 (Energy Management), OHSAS

18001 (Occupational Health and Safety), ISO 27001 (Information Security Management), and ISO 22000 (Food Safety).

STANDARDS

Standards are not laws; they are generally recognized, standardized regulations that provide comparability in trade. They include a set of requirements for products or processes and exist at national (e.g., DIN), European (e.g., EN), and global levels (e.g., IEC and ISO standards).

TEST ORDER

TÜV Rheinland often carries out tests due to legal requirements and is thereby controlled by public authorities – this is the case when it comes to general vehicle inspections and the examination of certain technical installations, for instance. Other tests are voluntary, but are still carried out according to legal rules – for example, tests carried out for the GS mark. Moreover, TÜV Rheinland tests in accordance with its own standards and criteria. For example, TÜV Rheinland creates damage assessments for accidents, tests new products, and conducts tests on the planning of major projects on behalf of companies or other authorities.

EXPERT

In Germany, only officially recognized experts can carry out certain tasks, such as vehicle inspection. In other areas, TÜV Rheinland experts are usually authorized to conduct specified inspections based on their personal skills, qualifications, and employment at TÜV Rheinland (an accredited testing organization).

TÜV

Everyone in Germany knows the term 'TÜV'. For many, 'TÜV' is (justifiably) synonymous with neutrally tested quality and safety. It's less well known that various TÜV companies that

compete with each other use the brand name. Just as TÜV Rheinland is protected, so too is the TÜV brand. It may only be used by TÜV companies. This is ensured by trademark law protection in Germany, Europe, and in many other countries around the globe.

CERTIFICATION

By providing a certificate (for example, for a product that receives a GS mark), independent bodies such as TÜV Rheinland confirm that said product was inspected in accordance with GS mark regulations or with a quality management process that meets the applicable ISO standards. All the services, companies, systems, product features, and personnel certifications tested by TÜV Rheinland are publicly listed on the online database www.certipedia.com.

ZÜS

TÜV Rheinland is an approved monitoring body (ZÜS) in Germany recognized by the Central Body of the German Federal States for Safety (ZLS) as authorized to perform tests on a range of hazardous installations. Visit www.baua.de for a list of all authorized monitoring bodies.

TÜV 라인란드 코리아

TÜV 라인란드 코리아는 지난 1987년 해외인증기관으로는 국내 최초로 한국 시장에 진출하여 국내 기업의 든든한 파트너로서 국제 표준과 각 국가 규격 및 규제에 따라 다양한 산업 분야에서 시험, 검사, 인증 및 교육 서비스를 제공하며 국내 기업의 글로벌 시장 진출을 위해 노력하고 있습니다.

TÜV 라인란드 코리아 서울 본사에는 무선/IoT, Safety, 에너지 효율 등 다양한 제품 시험을 위한 최신 시험 설비와 시설을 갖추고 있으며, 대구와 창원에도 지사와 시험소를 운영하고 있습니다. 현재 150여 명의 엔지니어와 심사원이 중립성, 독립성, 전문성을 가지고, 전기·전자제품, 배터리, 조명, 통신, 압력용기, 산업용기계류 및 부품, 의료기기, 태양광, 개인보호장비, 완구, 자동차 및 부품, 철도, 경영시스템 인증, Functional Safety, 산업검사, 선적검사, 해외 인증서비스 등 다양한 산업 분야에서 원스톱 시험·인증 서비스를 제공하고 있습니다.



ELECTRICAL SAFETY 시험소 / 서울

가전 제품, AV/IT 기기 등 다양한 제품에 대한 안전 시험 및 성능 평가를 수행합니다. 또한, IP 테스트, 인체 공학 시험, 에너지 효율 시험, LED 및 조명기에 대한 광생물학적 영향 평가 서비스를 제공하고 있습니다. 광생물학적 안전 시험소 (Photobiological Safety Lab)는 국내 최초, 유럽연합 산하 ENEC인증을 시험할 수 있는 공인 시험소인 ENEC-TL로 인정받았습니다.

통신기기 시험소 / 서울

TÜV 라인란드 통신기기 시험소는 일본의 유·무선통신승인 (JPA, JRF) 및 Bluetooth SIG, AirFuel (PMA), Open ADR, WPC (qi 인증), LoRa, ZigBee, Wi-Fi, Thread 등 다양한 시험·인증 서비스를 제공하고 있습니다.

태양광 공인 시험소 / 경산

태양광 모듈에 대한 국제 표준 IEC 61215, IEC 61646, IEC 61730에 따른 시험 및 국내 KS 인증을 동시에 진행할 수 있는 국내 유일한 태양광 모듈 시험소입니다.

또한, 국제전기기술위원회 (IEC) 산하 국제전기기기상호인증제도 (IECEE)로부터 국제공인시험소 (CBTL)로 지정되어 있어 CB 성적서 발행이 가능하며, ISO 17025에 따른 KOLAS 인증을 취득하였습니다.

에너지 효율 시험소 / 창원

독일국가인정기구인 DAkkS 뿐만 아니라 한국 인정기구인 KOLAS로부터 에너지 효율 분야 (03.013)의 공인시험기관으로 인정되어 있으며, 사우디 아라비아 표준청 SASO에도 등록되어 있습니다. 또한, 히트펌프에 대한 유럽의 KEYMARK 시험 서비스도 제공하고 있습니다.

TÜV 라인란드는 날이 발전하는 기술과 다양한 제품 및 시장의 요구사항에 따라 지속적으로 시험 역량을 강화하며, 새로운 시험 서비스와 범위를 확장해 나가고 있으며, 관련 국내외 기관과의 협력을 통해 더욱 효율적이고 신속한 서비스를 제공하기 위해 노력하고 있습니다.

TÜV 라인란드 코리아의 연혁

- 1987 TÜV 라인란드 코리아 설립 (국내 최초 해외 인증기관)
- 1992 안전 시험소 설립
- 1998 TÜV 라인란드 코리아 대구지사 개소, 인체공학 시험실 설립
- 2004 TÜV 라인란드 코리아 창원지사 개소
- 2010 Wi-Fi 시험실 설립 및 서비스 시작
- 2012 태양광 시험소 개소, LED 조명 CB (Certification Body)로 지정
- 2013 Wi-Fi test scope 확장 (VHT, PMF 등), 배터리 사업부 신설
- 2014 창원 에너지 효율 시험소 개소, 태양광 시험소 국제공인시험소 (CBTL)로 지정
- 2015 블루투스 시험 설비 확충, 에너지 효율 test scope 확장
- 2016 LoRa 인증 서비스 시작, 에너지 효율 시험소 국내 KOLAS 인정
태양광 공인 시험소: 태양광 모듈에 대한 KS 인증 위탁시험기관으로 지정
- 2017 TÜV 라인란드 코리아 창립 30주년, 광생물학적 안전 시험소 개소
상업용 대용량 에어컨에 대한 SASO 에너지 효율 시험소로 지정
중동 GCC 회원국 연합 인증인 GSO 인증기관으로 지정
- 2018 무선시험소 확장: 스투드 시험 시작



TÜV 라인란드 코리아

서울 본사 / 테스트 센터

서울시 영등포구 문래로28길 25

세미콜론 문래 N타워 2층

Tel: 02-860-9860 Fax: 02-860-9861

E-mail: info@kor.tuv.com

대구 지사

대구광역시 수성구 동대구로 334

(교원공제회관 12층)

Tel: 02-860-9870 Fax: 02-860-9871

E-mail: info@kor.tuv.com

태양광 공인 시험소

경북 경산시 삼풍로 27 한국섬유기계연구소 1층

TÜV 라인란드-영남대학교 태양광 시험소

Tel: 02-860-9860 Fax: 02-860-9861

E-mail: info@kor.tuv.com

창원 지사 / 에너지 효율 시험소

경남 창원시 의창구 죽전로 74번길 49

Tel: 02-860-9850 Fax: 02-860-9851

E-mail: info@kor.tuv.com

www.tuv.com