Robot-based materials and components testing

Automated Testing Systems

Zwick / Roell

Automated testing systems

Robot-based quality control and quality assurance

Automated testing systems assume the specimen handling task in the testing lab and carry out repeatable and reproducible tests according to standard requirements.

Robot-based quality assurance testing ensures compliance with demanding test and system-operation requirements.

Automated materials testing is especially useful for high throughput rates.

ZwickRoell is a worldwide leading supplier of static materials testing machines

approx. 40 new systems are delivered every year

>190

product and industry experts
Worldwide network of experts

>900

automated testing systems delivered worldwide

>40 years

of knowhow and experience

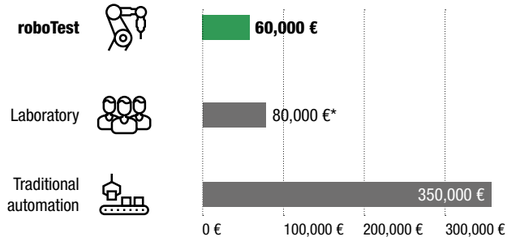
ZwickRoell headquarters in Ulm, Germany

Why you should consider automating your materials testing processes

An automated test system costs a lot of money, and yet robotic testing systems have been used successfully for years. Learn more about why investing in a robotic testing system is worthwhile and how it pays for itself in a very short time.

Maximum efficiency/flexibility

Today, automation and flexibility are no longer mutually exclusive, but rather dependent on each other. So, today 10 specimens and tomorrow 100 specimens? With automation—no problem. Or, do you have specimens to be tested with urgency by the end of the day and your colleague running the testing machine has to leave early? With automation—no problem.



* Annual cost for laboratory staff in Western Europe

Fact check: 3 common myths about automation

Myth #1:

Automation will solve all your problems

- *It's not a magic bullet*
- *It won't solve quality and reliability issues*
- *However, if requirements and objectives are clearly defined, it results in greater efficiency, shorter processing times, greater reliability, and, consequently, improved competitiveness and profitability.*

Myth #2:

Automation is too complicated

- *It doesn't have to be*
- *Start small and simple; scale fast*
- *New, extremely user-friendly tools: autoEdition3 and ZwickRoell teaching tool autoEdition3 und ZwickRoell Teaching Tool*

Myth #3:

Automation is too expensive

- *Purchase equipment according to actual requirements; do not overspecify*
- *Focus on total cost of ownership*

Only the material counts

The three influencing factors in materials testing are the human factor, the machine factor and of course the material itself. Through automation, we essentially reduce the human factor, as well as the machine factor. Ultimately, we determine the pure material characteristics—only the material counts.

Ready for the future

Which products tomorrow's market will demand and what the corresponding tests will look like is difficult to predict today. This makes the advantage of ZwickRoell machines all the greater: When you automate an existing testing machine, you can continue using up to 80% of your components. From day one, your testing system is future-ready.

The Smart Lab even goes a step further. An intelligently networked test environment reduces manual intervention and delivers a high level of transparency and efficiency. With ZwickRoell, you're ready today for the test requirements of tomorrow.

Automated function testing:

Medical industry

Especially in the medical and pharmaceutical industry, the safety requirements for products are more pronounced than in most other industries. The test sequence for products such as **autoinjectors, pen injectors, Luer lock connections, or syringes** is precisely defined in industry standards. A test often consists of different steps and can teak several minutes to complete.

Automated testing systems especially support **quality testing** by relieving laboratory personnel. The robotic testing system assumes performance of the test, which leaves employees free focus to on more complex testing and analysis tasks.

By **eliminating user influences,** automated testing of medical applications is reliable and repeatable.

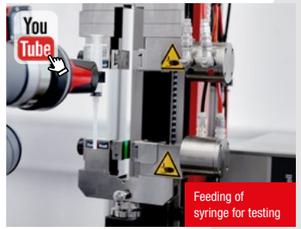
Our robotic testing system software solution consists of the higher-level autoEdition automation software and our testXpert testing software. While autoEdition assumes data management and control as well as process visualization, testXpert manages the results of the automated test.

Function test on autoinjector: feeding device

Specimen magazine for dosage pens: Pick-up device


Optical imaging with HD camera


Specimen magazine for autoinjector: Pick-up device with smart robot



Feeding of syringe for testing


Automatic priming of dosage pen

Automated materials testing:

Plastics

Thermoplastics and thermosetting molding materials, polymer foams, elastomers and composites are tested in terms of quality assurance and for research and development purposes. When it comes to large volumes of specimens in particular, these tests tie up a lot of personnel.

A testing system for **automated tests on plastics** relieves qualified laboratory personnel of these routine tasks. This allows employees to take on more complex tasks, such as interpreting test results, evaluating new materials or participating in other research activities.

Small specimen dimensions, or—especially in the case of elastomers—somewhat **unstable specimens** are often more difficult to grip. By using the robotic testing system to position the specimen, user safety is increased and operator influence on the specimen results is minimized, making test results more reproducible and statistically more reliable.

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Testing of elastomers in the temperature chamber

Testing system roboTest N for flexible testing of adhesive joints

Testing system ALEX for tensile tests on PE/PP

Testing system roboTest N for flexure tests on PE/PP

Measurement and weighing of foam cube

Automated materials testing:

Metals

Manufacturers of steel and metals must test their products for quality assurance, which includes, among other things, performing tensile tests. Robot-based quality assurance testing is typically used for high specimen throughput rates.

ZwickRoell offers various testing systems for **automated tensile tests on anything from sheet metals to heavy plate.**

For **sheet metals,** in addition to determining characteristic values such as yield strength, tensile strength or offset yield, the r-value and n-value are also commonly measured. Prior to the tensile test, the robotic testing system measures the thickness and width of the specimen.

One advantage in the case of **heavy plate** in particular, is that the testing system takes over the task of handling the heavy specimens. Using a robotic testing system also eliminates hazards created by rough edges or falling specimens.

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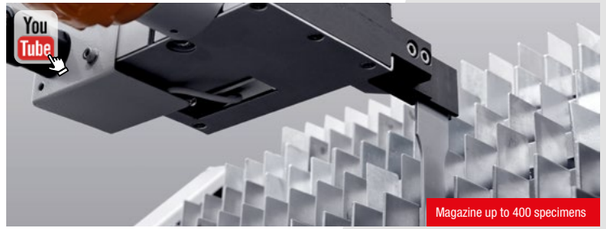
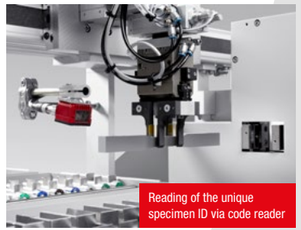
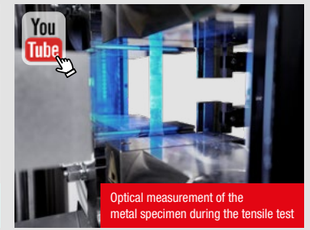
Feeding of thin sheet metal Tensile specimen through ALEX gripper


Magazine up to 400 specimens


Robotic testing system roboTest R


Feeding of the tensile specimen with roboTest L


Reading of the unique specimen ID via code reader


Optical measurement of the metal specimen during the tensile test

Whether small or large, we offer automated testing systems for every requirement.

From compact solutions for small batch sizes to powerful automation systems for high throughputs:
Our systems increase efficiency, precision, and repeatability.

Our automated testing systems take over specimen handling, reliably run tests according to standards requirements and deliver reproducible, comparable results, whether it's for plastics, metals, or medical devices. We optimize your testing lab – efficiently, flexibly, and ensuring future viability.

autoEdition3

Automation software for control and operator interface

Easy operation

Future-proof design

Flexible integration

autoEdition3 controls, regulates, and monitors specimen handling, the automated processes for measurements and tests, as well as the data storage of test results.

Robert Kaifler
Product Manager

Reliable and efficient testing

Reliable import & export of data

autoEdition® 3

Your clever companion for automated materials testing

The intelligent wizard

>600

successful autoEdition installations

Traceable and tamper-proof test results to FDA 21 CFR Part 11

Seamless communication with testXpert testing software

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