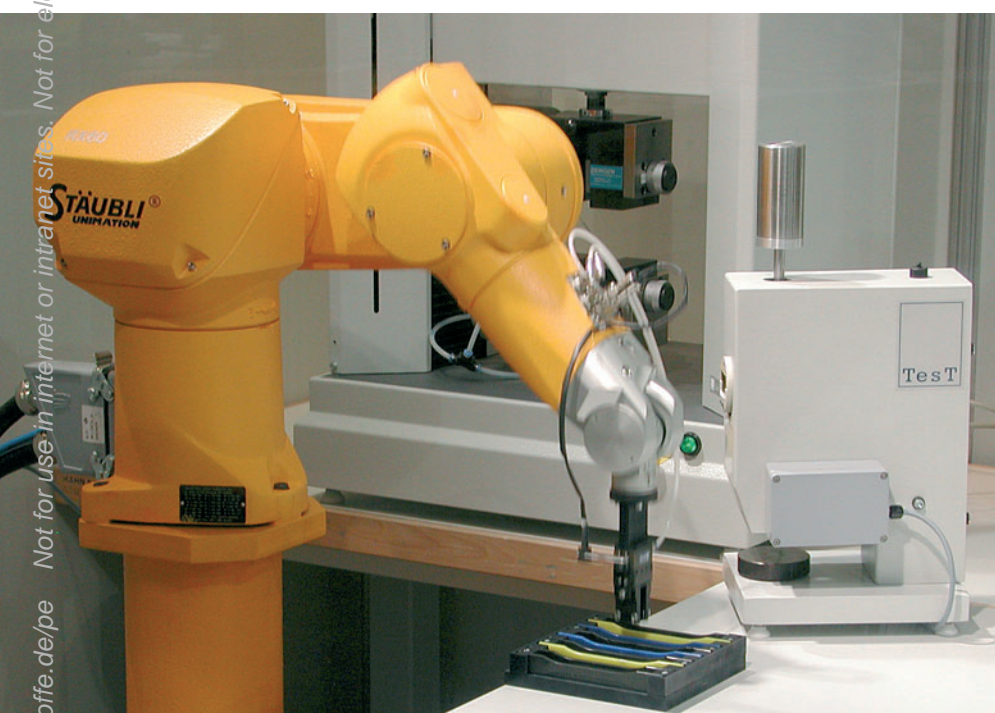


Testing Technology. Fully automated material and component testing is being increasingly discussed and implemented. The main reasons for this are the high testing frequency, manipulation-free, reproducible tests and cost savings it permits. The real need for automated or semi-automated testing must be carefully considered in each individual case.

Fully Automated Serial Testing

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Robot during sampling at the magazine

or hydraulic tighteners as well as PCs with PC circuit boards and software. The model was conceived primarily for classical material testing. However, due to its high flexibility and versatility it also offers the possibility of component testing. Thus a system was created that can not only adapt to the respective desires of the customers, but also manages future problem definitions in test techniques.

Control of the entire plant is made possible by the TestWinner software. The samples are supplied by a transport device with appropriate magazines. The centrally placed robot takes over the actual handling and transport of the samples to the individual stations. The number of stations and their arrangement can be varied according to the customer, differently for each set of needs.

Goal applications of such a fully automatic mechanism are primarily in the range of series production of individual components and the development of new materials. The focus is essentially directed toward the plastics industry and the automobile supporting industry as well as manufacturers of long series, e.g. in medical technology.

MARC BOHR

Quality standards and above all product requirements are now so high that they make a fundamental renewal of testing techniques indispensable and force relinquishment of conservative procedures. The trend toward ever more precise measurement methods has now reached inconceivable dimensions. Accuracy, freedom from errors, reproducibility and speed are the centre of attention as well as processing and documentation of the results of measurement and the resulting improvement of product quality for increasing competitiveness. Restless, error free work-

ers become the crucial factor in the fight for an enterprise's stable market position, automation is the sign of up-to-date inspection techniques.

Test Equipment with Integrated Robot

Test GmbH, Erkrath/Germany, extended their product offering with fully automated robot-integrated test equipment and at the same time set new yardsticks in production-accompanying batch testing. Based on standard modules the new fully automatic machine represents an important extension of quality assurance in large-scale industry and consists of test equipment with force and displacement measurement, six axle robot, pneumatic

i	Manufacturer
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Reproducible Measurement Conditions

The advantages of the system are also the basis of the actual concept. Thus manipulation of the test and the results resulting from it is no longer possible because human factors of influence are impossible due to the robot handling of the samples. From this results a further important advantage for close-to-reality measurement results: The robot achieves by far more exact reproducibility (< 10 µm) regarding the positioning of the sample in the tightener and thus provides for exactly the same measurement conditions. Also on sensitive samples the influence of the temperature through hand warmth is excluded. There only remains the small effort expended on equipping the transport device, an activity that can be carried out during the usual work time, while the automatic testing apparatus is in use 24 hours a day. Already plants with up to 2000 samples in 9 hours have been implemented.

The specially conceived PC circuit board provides the crucial accents in the context of evaluation of the measurement points determined in the test. Direct coupling of the PC board to the PCI bus of the computer guarantees a high transmission frequency, whereby very precise evaluation of the measured values is ensured. The data acquisition as well as their handling and processing likewise take place on the PC board, which has its own processor. Collection of the measurement values can thus be adjusted individually between the ranges 50 Hz and 10 kHz. At a frequency of 10 kHz the actual control speed lies in the upper range.

Due to its free programmability with macroinstructions the TestWinner user



Robot after positioning the sample in the clamping fixture

software is suitable for all users also without programming knowledge. The software validated in medical technology using network and database integration has the reliability necessary for restorable documentation of all measured values for many years.

Supplementary Options

The multiplicity of potential extension modules as well as the adaptations specific to an individual customer's requests open new perspectives on testing techniques. Here not only can numerous test steps and/or processes be coupled together and thus automated, but furthermore there is the possibility of implementing the entire test technique of a range with a plant. To the extension modules belong a sample measuring station as well as length variation and lateral contraction sensors, a sample balance as well

as a surface roughness and humidity measuring station. All modules have an interface and can be connected to a database.

Automatic batch testing using bar code readers, automated magazine supply to the withdrawal position as well as camera monitoring of the plant on a central PC are being perfected.

The necessity of an automated plant must be examined carefully. For this the manufacturer offers a consulting service with economically based analysis. If the analysis shows the necessity of an automated or perhaps only a semi-automated plant, a solid concept is prepared together with the client and implemented if necessary. ■

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