

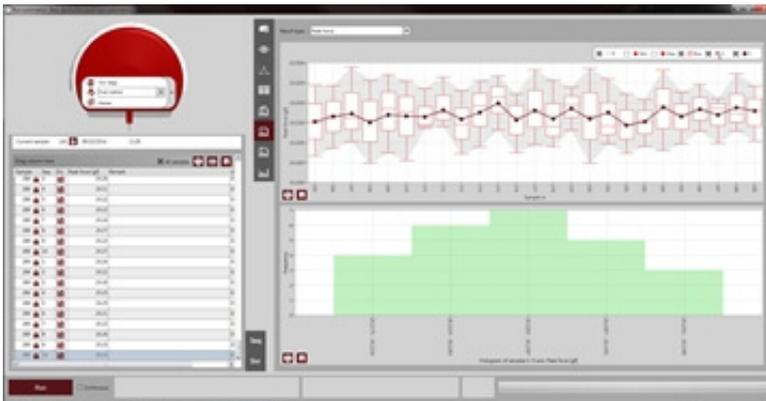


[Video not included in PDF: [click here to view online](#)]

Full automation ^s [YouTube channel](#)

The **Condor Sigma** is the only truly fully automated bondtester in the world. In the video to the left, you see an operator clamping her sample on the **Condor Sigma**. She presses 'start', the tester references by fiducial mark, does a series of pull and shear tests and shows the results live on the screen. This simple example barely scratches the surface of what is possible with the fully automated **Condor Sigma**.

What makes the Condor Sigma so great at automation?



Screenshot of automation run screen, in which one is able to analyze the data directly, in this example by boxplot and histogram (click to zoom)

- Positional accuracy with 0,5µm repeatability
- Automatic grading and advanced image processing
- Long stages (370mm) and smart camera positioning enables automatic testing of large samples
- High speed stages (50mm/s) ensure high throughput
- Revolving Measurement Unit switches between 6 sensors ranging from 10gf to 200kgf, push, pull and shear
- 1° sensor rotation resolution and 5µm hook concentricity
- Two perpendicular camera's at stable positions, combining high quality image capture for grading and fast fiducial mark recognition
- Powerful automation editor allows for easy programming and great flexibility
- Grading run functionality allows for the operator to focus on other things while the tester goes through the tests; after all tests are finished, the operator is presented with the failure modes to do the grading
- During automation, the tests results come available immediately for in depth analysis by the operator
- The unique electrically actuated **USB Tweezers** can be controlled from within the automation
- **Automatic wire detect functionality**

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Bond testers

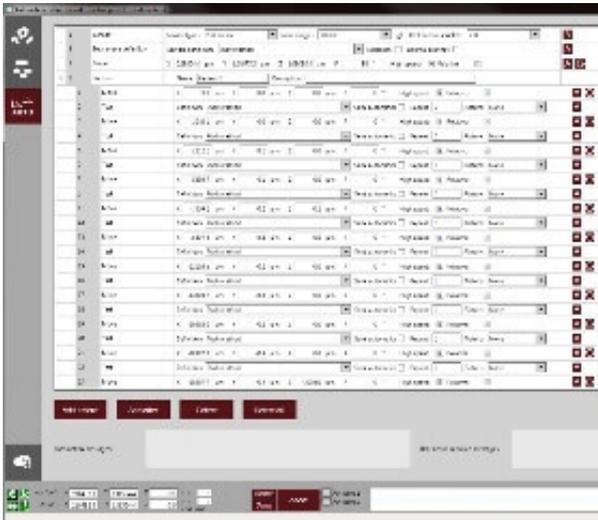
- Condor *Sigma*
- Condor *Sigma Lite*
- Condor *Sigma W12*
- Condor *150HF*

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Technology leader in bond testing worldwide

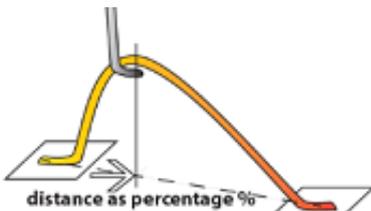


- Execute fiducials while programming
- Program from tool position or camera
- **Matrix programming**



Screenshot of automation programming structure (click to zoom)

Automatic wire detect



Program where to pull the wire between the first and second bonds

As more and more companies are making the transition to automatic **wire pull testing**, the engineers are also finding out its limitations. On many products, the placement of wires is not consistent and simple automation programs will miss the wire or pull two wires at once. XYZTEC's **Condor Sigma** is the only bond tester in the world to overcome this problem with its **automatic wire detect functionality**: [click to learn more](#). [Contact us](#) to see what is possible on your samples.

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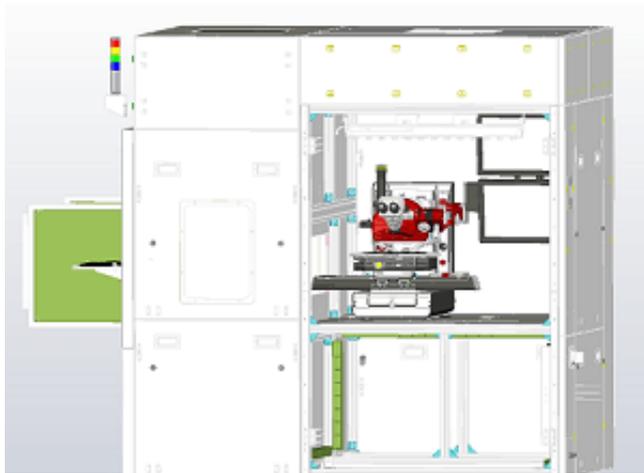
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Schematic overview of the Condor Sigma W12 integrated in a cabinet with a wafer handler. XYZTEC has delivered Condor Sigma bond testers with various different wafer handler systems

Wafer handlers

Another form of automation is the integration with wafer handlers (Equipment Front End Module, EFEM). The Condor Sigma W12 interfaces with various types of wafer handlers. Integration transforms the bond tester into a fully automated system.

Please [contact us](#) for more information and your specific wishes. We have experience with various wafer handler suppliers.

Automatic grading and advanced image processing

The Condor Sigma software can do automatic grading for ball shear testing. Using the advanced Halcon library and high resolution perpendicular cameras with smart lighting systems, we have achieved successful determinations of failure modes for several customers. The computer can accurately determine the percentages of brittle and ductile failures.

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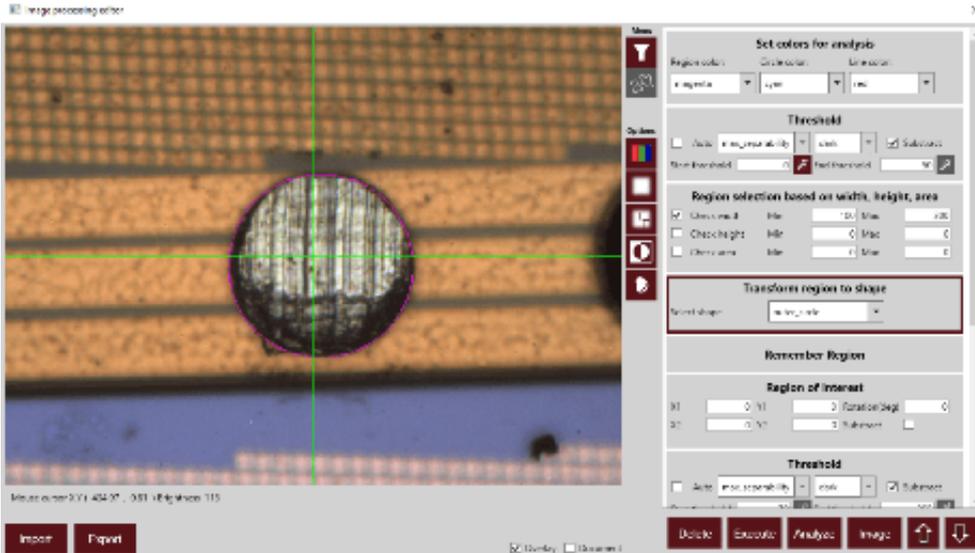
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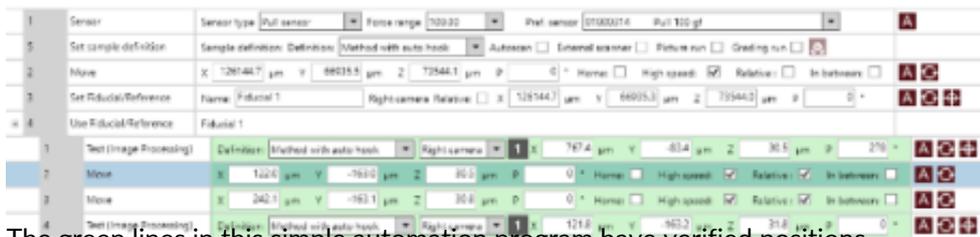


Screenshot of the advanced editor for Halcon; program to calculate ductile percentage in failure mode

The same library is also used for advanced fiducial recognition for applications that have difficult and inconsistent fiducial marks or where no fiducial marks exist enabling other features to be used. The advanced shape recognition features of Halcon allow engineers to use separate color channels and several image filters. Image segmentation techniques can help to further isolate the unique features that the engineer is interested in. The result can be used as the basis for positioning correction (for example wire detect).

Execute fiducials while programming

The programming of an automation sequence just got a whole lot easier, with the possibility to execute fiducials during programming. Even if the sample has slightly moved or is replaced with a different sample, running the fiducials from the editor will ensure that added or changed test positions and commands are correct.



The green lines in this simple automation program have verified positions

Program from camera

Automation programming can be done from the tool position or either of the camera systems on your Sigma. Another improvement is that it is now possible to check fiducials against multiple photos so that failed recognitions during the automation runs occur less often.

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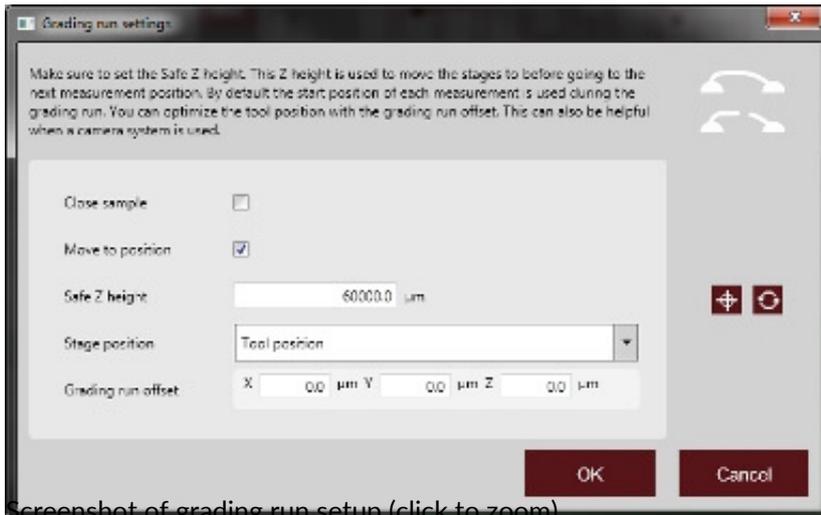
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Screenshot of grading run setup (click to zoom)

It works on your sample too!

If you are interested in a live demonstration of the Condor Sigma on your sample or perhaps for more bond testing inspiration, [contact us today!](#)

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