Condor Sigma shear sensor fitted with a diamond Nano Indenter tip performing scratch tests
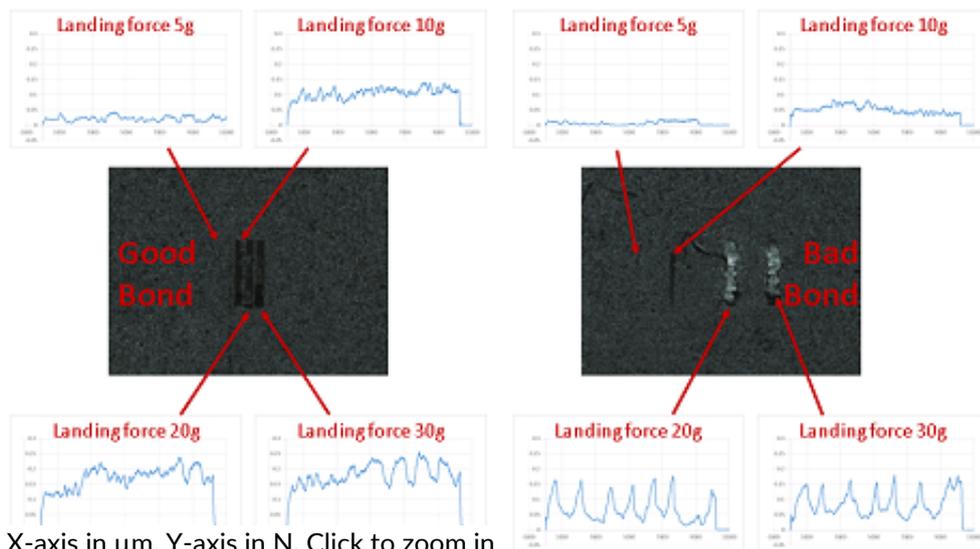
Scratch test / Coating test

Maintaining high quality coatings, paint and films is an important requirement within the semiconductor industry. The XYZTEC "Scratch Test" (PDF) provides a new means of measuring the quality of the adhesive bond of single or multiple coatings to the substrate and/or each other.

As shown in the video a special shear tool is used to land on to a coating or multiple coatings and then scratch along the surface. Another excellent solution is to use a diamond Nano Indenter tip.

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

The depth of the cut and layer being tested can be controlled by a programmable landing force and the ability to drive down into the coating or coatings to a programmable depth. Weak bonds can be seen in the failure mode of delamination and the force displacement graph of the shear tool. In the example shown the difference between a good and bad bond can be clearly seen.

X-axis in μm, Y-axis in N. Click to zoom in

There are three standard procedures for scratch testing;

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- Progressive Load Scratch Test (PLST)
- Constant Load Scratch Test (CLST)
- Multipass Scratch Test (MPST)

As with any scratch tester the quality of the bond between layers can be seen in the failure mode and force displacement graph. The examples in the picture below show the same PLST on multi layer films of different constructions.

These examples show the same Progressive Load Scratch Test (PLST) on multi layer films of different constructions

Additional failure mode analysis such as EDX helps to show at what point layers fail. With this deeper understanding quality assurance may subsequently only require scratch testing.

The Condor Sigma is a highly flexible micro materials tester specifically designed for the semiconductor and electronics industry. From its very beginning it was designed for easy and comfortable manual use, making it much faster than any dedicated scratch tester.

Its fully automatic mode delivers even more benefit. Samples are simply loaded and tested. The Sigma has fiducial mark pattern recognition to locate the samples position and then tests with precision with whatever combination of scratch tests you want. These can be different positions, procedures, directions and speeds. Being automatic, every sample is tested in exactly the same way.

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- Taiwan
- Thailand
- United Kingdom
- USA: California
- USA: Massachusetts
- Distributors

Bond testers

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

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Click here for the web version.

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In a recent application, a product that required 1 day to test takes a mere 2 minutes on the Condor Sigma!

Relevant products

- Condor Sigma
- Condor Sigma Lite
- Condor Sigma W12
- Condor 150HF
- Revolving Measurement Unit
- Sensors
- Tweezers
- Vision
- Software
- Calibration
- Work holders

Increase your bondtesting throughput

The Condor Sigma is not only the most accurate bondtester in the world, but also the fastest. Click here to read the study that proves the Condor Sigma is up to 39% faster than the competition.

Special applications

Please contact us if you have any questions or special bond testing requirements.

Condor Sigma brochure

Click here to download the Condor Sigma brochure, the Condor Sigma W12 brochure or the Condor Sigma Lite brochure or the Condor Sigma Vision brochure (PDF).

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Click here to access the XYZTEC consumables webshop

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