



Newsletter: Highly reproducible stud pull tests are possible

28 October 2015

For the modern and complex electronics industry working with surface coatings becomes more and more a basic requirement. 3D MID (Molded Interconnect Device) is based on every conceivable free geometric shape in order to incorporate solutions for robotic fingers or portable electronics in textiles. Glass coatings are used for highly complex multi-layer display solutions to add even more functionality. However, all these components have one thing in common, they need a long service life and be resistant to various environmental influences.



In order to ensure this, destructive material testing is usually performed. The most well-known are **scratch-**, **stud pull tests**. Our **September 2015 newsletter** described the scratch test. In this newsletter we now describe a practical solution developed by XYZTEC to perform a very reproducible stud pull test. The stud pull test is based on the principle that an adhesive connection is made with the carrier (or object to be tested) by using a glue that is stronger than the bond that needs to be tested.

Two of the biggest challenges are to get an even distribution of the glue and the long curing time

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Bond testers

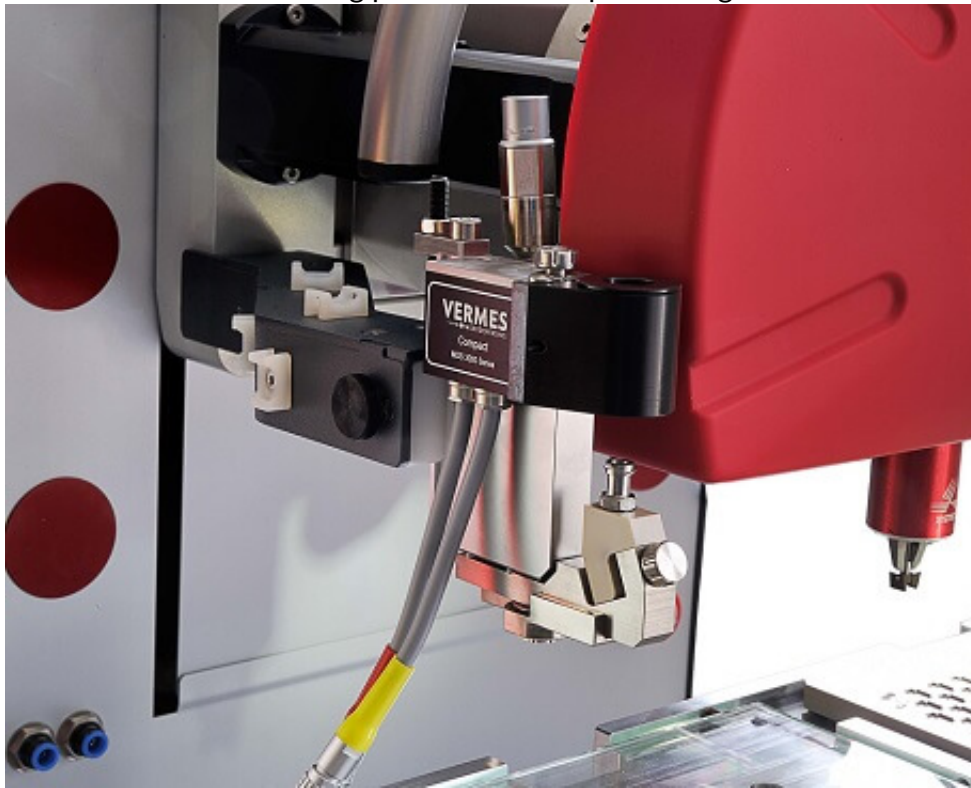
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associated with some adhesives. If, due to uncontrolled application, the distribution of the glue is not even, menisci are formed that can have a significant influence on the standard deviation and make reproducibility almost impossible. This explains why the stud pull test is only used in limited cases and not during production. The positioning of the studs and the vertical force



The Sigma as a pick and place machine

The solution developed by XYZTEC (in cooperation with other partners) has looked at all these problems and found a solution. The **Condor Sigma tester** was provided with a micro dispenser that can dispense very small drops of glue (micro liter amounts) very accurately and is cured with UV light. Combined with a **USB Tweezer** and special tips that look like the inverse of a mushroom, a glass stud can be taken from a magazine fully automatically and placed with a predefined pressure on the surface with the glue. The push force is just sufficient to get a strong connection, without forming any menisci. A special UV light that has been mounted on the machine cures the glue within seconds. The **tweezer** holds the stud until the test is performed. Before the test the **tweezer** is positioned in such a way that no unwanted load is applied on the stud, to avoid any influence on the measurement.

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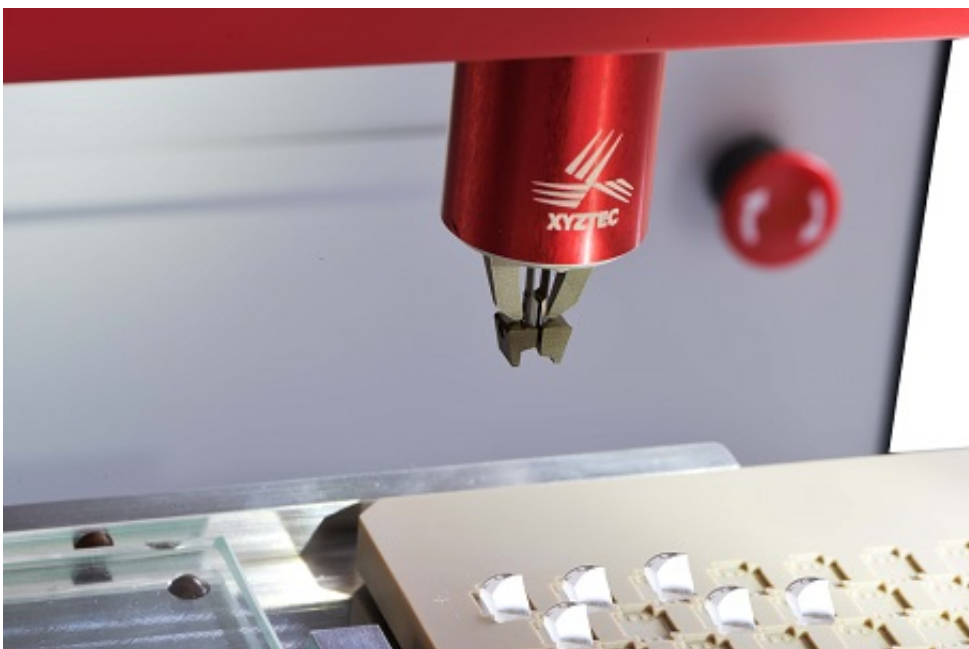
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Why is holding the tweezers so important?

When the **tweezer** is released and the operator manually moves the stages, there is a very real risk that the operator due to carelessness bumps into the stud. This applies an unwanted load that can have a significant influence on the test result. With the above method this is nearly impossible. Because UV light cannot be used for all applications **XYZTEC** also offers different solutions with other studs and glue. Please **contact us** for more information if this article has aroused your interest, or if you have any **questions**.



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