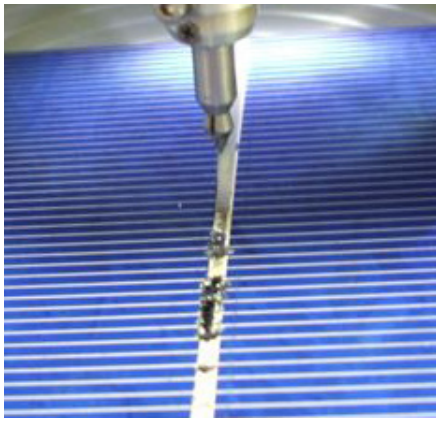
Solar Panel Bond Testing

Application Note

The reliability and integrity of the electronic interconnects within solar cells is paramount as they deliver essential functionality including the conduits for the current output and the ancillary microelectronics which manage the output or control the tilting in more sophisticated solar panel arrays. Bond testing of these interconnects as well whole sections of solar panel assures their mechanical integrity and guarantees performance.



Tweezers gripping aluminium ribbon in peel test

Features and Benefits

- **Large working envelope for testing large sections of solar panel**
- **Specialized fixtures to handle large area arrays**
- **Choice of test methods according to ribbon dimensions**
- **True 90 degree peel testing**
- **Wide range of load tools for all ribbon sizes**

Nordson DAGE

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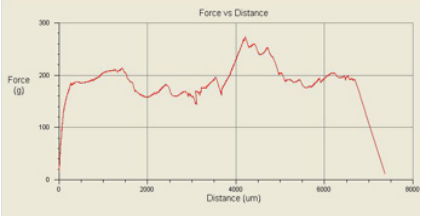
The Nordson DAGE 4000*Plus* bondtester addresses the specific requirements of testing solar panels. Using highly accurate load cartridges and a variety of load tools, the bondtester applies a load to the aluminium or copper ribbon interconnects to the point of destruction. The principal output is the force measured at the point of failure. Non-destructive testing can also be performed.

The most relevant bond test is the 90 degree peel test. To perform this test correctly requires coordinated movement of both Z- and either X- or Y-axes; something not available on all bond testing equipment. The load cartridge is mounted on the Z-axis and applies a vertical load to the ribbon gripped by tweezers. An important consideration for these tests is the clamping of the solar cell – an inadequate fixture will result in failure of the panel rather than the ribbon. The load at failure force is the most significant measurement, but in a peel test, it is also important to evaluate the evenness of adhesion along the length of the ribbon and this is revealed in the force versus displacement graph.



Force displacement graph for a ribbon peel test. Note variations in adhesion strength

In addition to the ribbons, there are numerous other types of interconnect in the ancillary microelectronics. These are tested for their mechanical reliability using the conventional bond testing methods of wire pull, ball and die shear, before and after accelerated life tests.

Further Information

- Please consult for advice on the system set-up and tooling specific for the solar panel
- Full technical support is available worldwide

For more information, please contact your Nordson DAGE regional office or speak with your Nordson DAGE representative, all of which are listed on www.nordsondage.com.

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