

Ribbon Testing

Application Note

Testing Aluminium Ribbon Interconnects

Aluminium ribbons are commonly used interconnects in a variety of electronics applications, especially microwave, high-frequency, power and solar applications. The wide variety of ribbon sizes, loop heights and spans calls for a flexibility in test methodology which Nordson DAGE provide.

Wedge Shear Testing

Wedge shear testing is commonly used on ribbon bonds where the ribbon is thicker than 3mm (75µm). Similar to wedge bond shear testing, the face of the tool is aligned parallel to one side of the ribbon. For most ribbon sizes above this, the S5kg is appropriate. Especially important for this test is the step back (shear height) accuracy and repeatability. Step back is assessed for each individual ribbon ensuring consistent load application to the bond. Also important is the accuracy of load measurement. Nordson DAGE load cartridges, in combination with the system design, provide excellent accuracy and repeatability. These characteristics are provided across all the selectable ranges on each load cartridge.

In addition to standard shear tools, custom tools are also available, including a tool with a small overhang on the shear face to prevent 'roll-up' during testing. Some very heavy ribbons, (e.g. 80mm wide and 8mm thick), may require a high force and shear cartridge which has accurate step back adjustment for low profile features.

Features and Benefits

- Choice of test methods according to ribbon dimensions
- Wedge shear testing to high forces
- True 90 degree peel testing
- Wide range of load tools for all ribbon sizes
- Pull testing using tweezers

Two types of tools are used in ribbon pull testing: hooks and tweezers. The latter are generally used for wider ribbons where the use of a hook would not allow even application of the load. Tweezers can be used with Nordson DAGE T1kg and T5kg load cartridges.

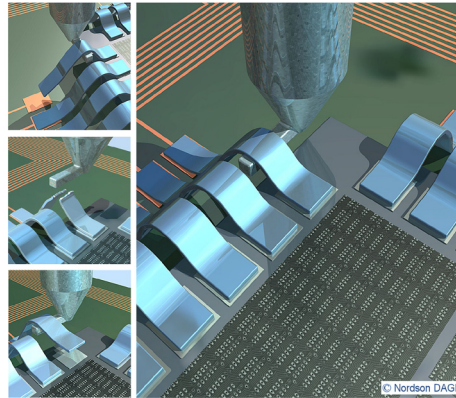
The use of hooks will probably be restricted to the smaller ribbons, less than 20mm wide and 4mm in thickness. Hooks are used with the P1kg and P10kg load cartridges. There are two types of wire hook, tungsten and stainless steel. Tungsten wire hooks are restricted to a diameter of 10mm; stainless steel wire hooks can be manufactured to cope with a thicker diameter.

Wire hooks are usually only suitable for higher loop heights. For lower loop heights a machined hook can be made.

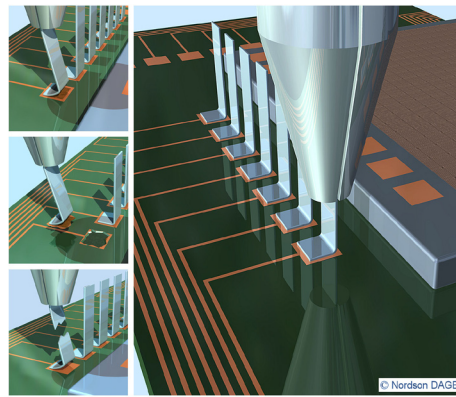
The upper profile of the hook can be matched approximately to the loop profile, thereby distributing the load, enabling more consistent testing.

As ribbon thickness and width increases, hooks are not strong enough. In this case tweezers can be used with the T1kg and T5kg. The load is shared between each jaw of the tweezers. Each jaw is shaped in a similar way to the solid hook in order to match the loop profile. Tweezers can be used on ribbon up to 8mm thick. A useful feature in the software enables the results to be expressed in force per unit area. For very heavy ribbon a T10kg is also available.

Using software control and standard tweezers, in either the T1kg or T5kg, a true 90 degree peel test can be performed. The XY stage will move simultaneously with the Z drive ensuring that the ribbon is pulled at right angles throughout the test.



Ribbon pull test



Ribbon peel test

Further Information

- Ribbon testing is easy to set up on the Nordson DAGE bondtester. New Test Groups can be set up with the chosen load cartridge; shear, tweezers pull or hook pull. These test groups can be saved and used in subsequent test sessions
- Standard load tools, hooks, tweezers, or shear, are available for the most common ribbon sizes: from 4mm to 8mm thick and 20mm to 80mm wide. Please consult for advice on the appropriate tooling for both standard ribbon testing and sizes outside the range quoted above
- Full technical support is available worldwide

**For more information,
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