

Two Solutions to Static Problems in Semiconductor Die Bonder Operation

One phase of the semiconductor manufacturing process involves a die bonding machine. Several manufacturers produce this type of equipment with similar designs for the actual bonding operation. A fine gold wire (approximately 2 mil. in diameter) is attached from the semiconductor component to opposing leads on the hermetic package. Eventually this hermetic package encases the entire die or chip. These leads are the link from the semiconductor die to the rest of the circuit when it is mounted on a circuit board or flex circuit substrate.

During the bonding process the gold wire is unspooled and fed to an attachment head which moves very quickly around the die to make the bond or attachment. During this operation a static discharge occurs resulting in static failures on the devices. When the hermetic package is being fed to the bonding machine, a triboelectric charge takes place. And there is usually one pin or attachment area that becomes grounded; it's possible that when it is attached at that point, there is a rapid discharge directly to the die, causing an electrostatic discharge failure.

The static problem that occurs during the die bonding operation is cause for concern, since components are being damaged or destroyed during this process.

The challenge is how to eliminate static and increase yields.

The Solution: Nuclespot™ and Nuclecel™ Ionizers

There are two types of NRD alpha ionizing devices available to solve this problem:

- A Nuclespot™ P-2042 spot can be mounted just before the bonder head so that components pass directly by it before loading in the bonding station.
- Mounting a Nuclecel™ P-2021 nozzle in close proximity to the die bonder head will blow a very small volume of compressed air or nitrogen on the components in the bonding station of the machine.

It should be noted that "creative mounting" is usually called for in this type of application, due to space limitations. Some die bonder manufacturers supply NRD ionizers with the equipment. Call the manufacturer of your die bonding equipment to find out if they have optional mounting hardware available for NRD ionizers.

Installing Nuclespot™ and Nuclecel™ Ionizers in Die Bonding Operation

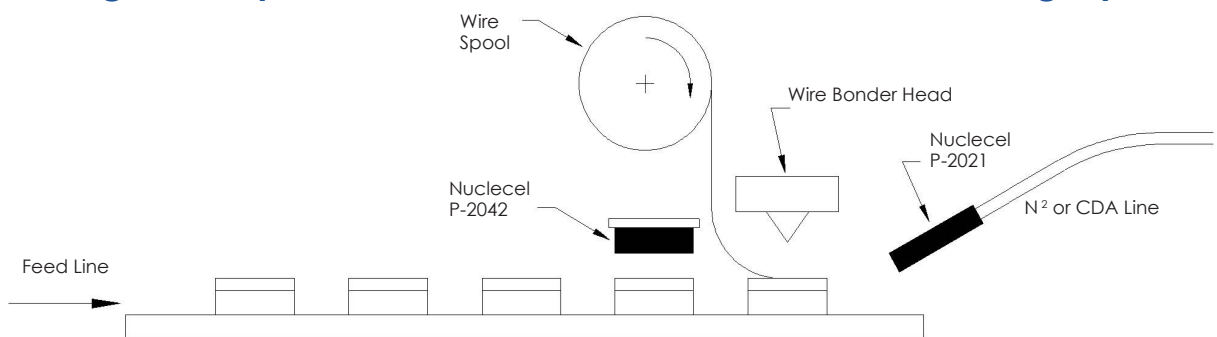


Figure 1

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