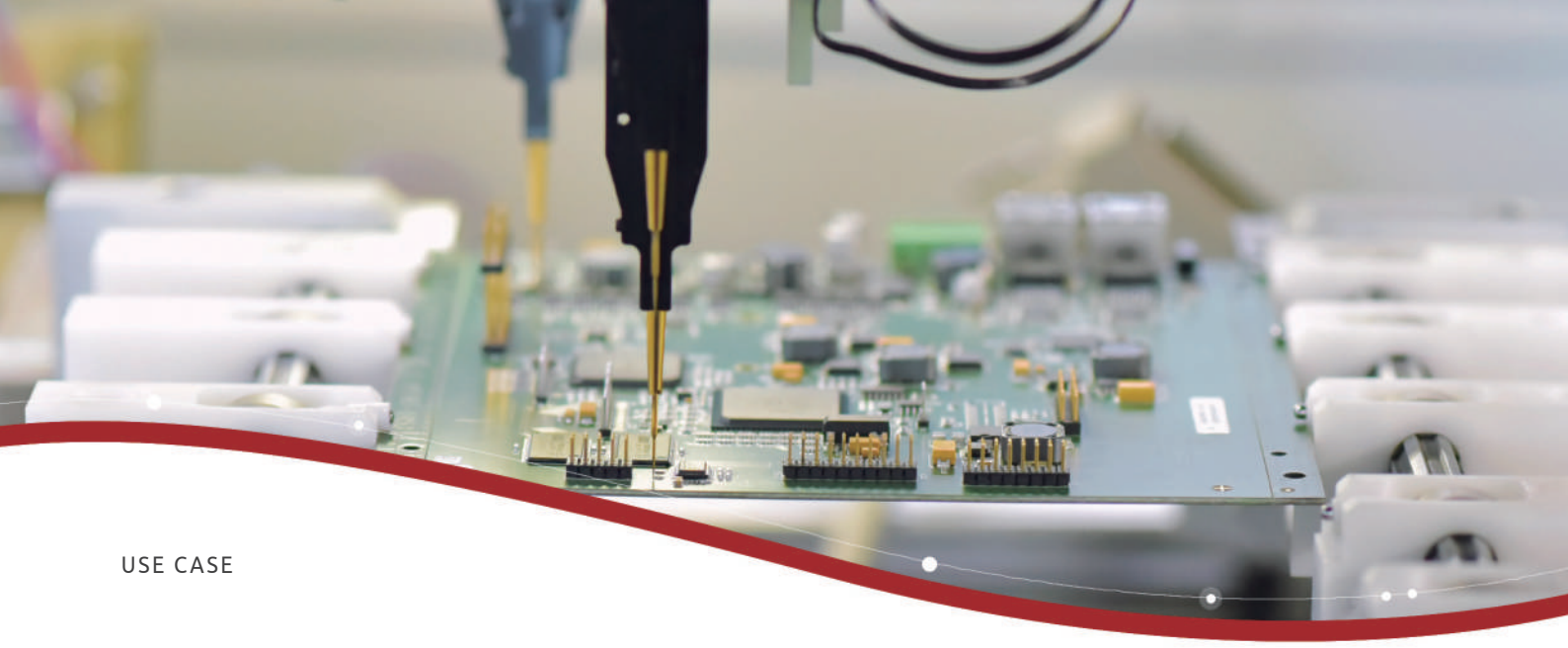


USE CASE

ADLINK's 3D Equidistant Spiral Motion Solution Reduces Material Costs and Increases Yield of the Silver Dip Process

Rapidly rising internal space constraints caused by the miniaturization of electronic devices is pushing component manufacturers to re-evaluate the reliability and yield of their current production processes. These new devices utilize around 50% more components in packages that are smaller and thinner than previous generations. 4G mobile phones, for example, have about 800-1,100 passive components, while new 5G phones push that number to 1,400-1,800 pieces. For these reasons, the high output and high yield of small components are increasingly critical issues for component manufacturers, especially passive component factories.



Smaller passive components have more delicate termination electrodes with tighter tolerances. The traditional vertical silver dip process fails to make the grade when applied to these smaller parts because it is susceptible to inaccurate alignment, uneven surfaces, lower yield, and other technical issues.

The traditional vertical silver dip procedure can result in the sub-optimal application of silver paste, such as general unevenness, half-moon shape, and thick center with thin edges. Besides the waste of silver paste, there are other pressing concerns. Components with rough surfaces or unusual shapes are especially prone to gaps between the component's surface and the silver paste when using this technique. After the baking process is complete, these gaps have a detrimental impact on the components' electrical performance.

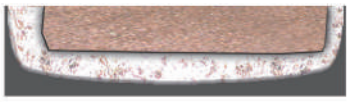
Dip with a twist

ADLINK's 3D equidistant spiral motion technique eliminates vertical silver dip inefficiencies by adding a spiral motion to the silver dipping process that evens silver application. The spiral motion process makes the surface of the component uniformly stressed during the dipping process, reducing unwanted gaps, making the electrical contact more consistent, and improving the viable production yield. The result eliminates the uneven half-moon and applies a consistently flat and uniform coating that reduces waste by applying the precise quantity of silver paste.

Based on ADLINK's observations, the silver dip process, combined with the 3D equidistant spiral motion, brings the following benefits to passive component factories:

- ***Less silver paste applied, decreasing material costs.***
- ***Consistent electrical contact, improving production yield.***

3D Equidistant Spiral Motion produces a more even surface with less paste



Vertical Silver Dip Motion
Uneven and thick



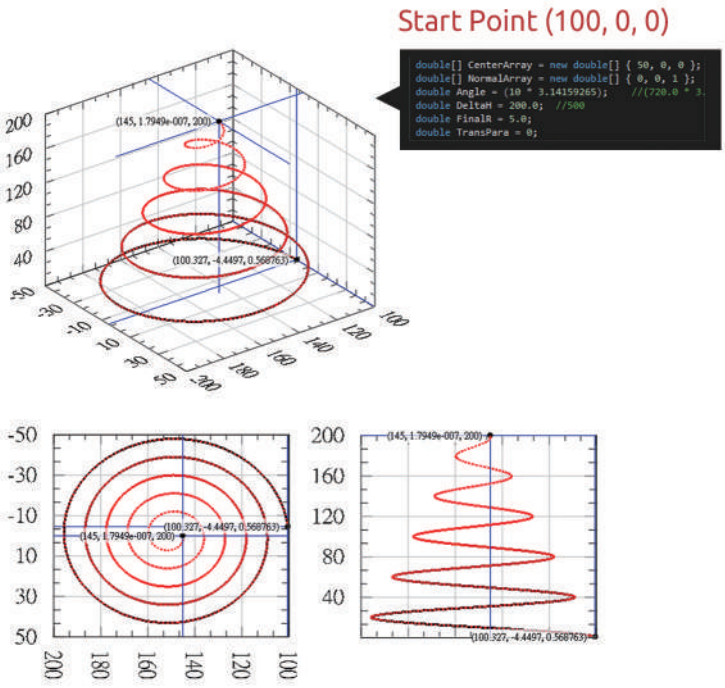
Silver Dip with 3D Equidistant Spiral Motion ***Even and thin***

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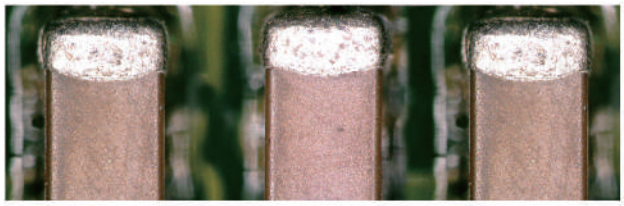
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Examples of ADLINK's 3D Equidistant Spiral Motion Silver Dip Appearance



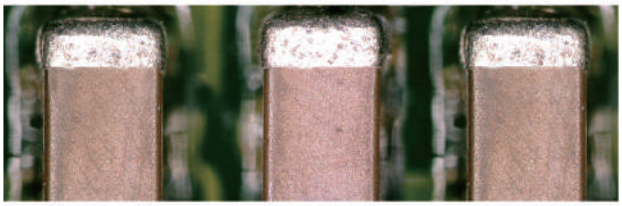
Vertical Silver Dip Motion

Uneven Electrode Line



Silver Dip Motion with 3D Equidistant Spiral Motion

Even Electrode Line



Advantages

With over 20 years in motion control, ADLINK provides complete hardware and software solutions that streamline implementation. Due to its reliability, durability, and accuracy, ADLINK's solutions have been adopted in several industries, including industrial automation, smart medical, military and aerospace, transportation, and IoT.

The same expertise of providing a complete hardware and software package streamlines the implementation of 3D equidistant spiral motion. There's no need to write complex programs from scratch because a single API provides all the packages needed to execute the equidistant spiral motion. Complex mathematical formulas and the 3D model are efficiently handled by a dedicated ARM processor, relieving the CPU from overload—quicker implementation with less development cost.

Default settings are not optimal for every scenario, so ADLINK provides a variety of APIs ranging from basic to advanced. The APS_spiral_ca and APS_spiral_ce APIs are the most commonly used and utilize preset motion speeds. Four advanced APIs provide granular control of start speed, maximum speed, acceleration, deceleration, and other parameters.

The 3D equidistant spiral solution utilizes the following ADLINK products.

- ***AMP-204C/208C***
- ***PCI-8254/8258***
- ***Automation Product Software (APS) function library***

AMP-204C/208C and PCI-8254/8258 are high performance, high accuracy centralized motion controllers with comprehensive application functions, and used in semiconductor, display, and traditional manufacturing. These controllers support the ADLINK APS function library, reducing implementation time by providing the bulk of core functionality, thereby speeding up the launch process.

For the near future of the passive component industry, 5G mobile phones, electric vehicles, and IoT products are the key segments to boost growth. Miniaturization, high performance, and integrated components are important trends for product development. Therefore, ADLINK has specifically addressed the silver dip process problems and launched the 3D equidistant spiral motion solution. By adopting the solution, passive component factories can reduce the cost of materials, increase the production yield, and successfully overcome technical problems. ADLINK's solutions help customers to launch more competitive and powerful products.

Do you want to reduce software development time and costs? Try the ADLINK APS SDK
https://www.adlinktech.com/en/Motion_Control_Software_Utility

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