

led assembly.

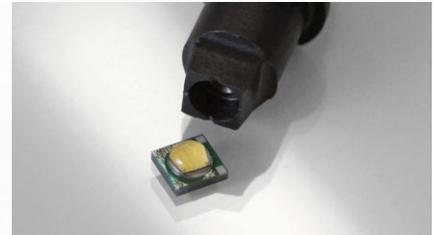
Facing an SMD Challenge: Reliably process LEDs

Essemtec developed a retrofitable option for their SMD Pick-and-Place machines, Paraquda and Cobra, that increases reliability when placing LEDs. To test the developed solution Essemtec teamed up with OSRAM Opto Semiconductors.

OSRAM Opto Semiconductors is one of the leading opto component manufacturers worldwide with a broad range of LED, infrared LED and semiconductor laser diodes. To continuously deliver high quality to customers, OSRAM in Regensburg performs Pick-and-Place reliability tests with their LEDs. For this task an Essemtec Paraquda is used.

Introduction LED „Blow-Off“

Most LEDs have a silicone dome which tends to stick to the nozzle and thus makes reliable placing of LEDs tricky. Essemtec provides geometrically optimized nozzles to handle a variety of LED types that are made of a special material. The new features are fully integrated in the easy-to-use ePlace software.



The Blow Off Option is able to overcome the remaining adhesion between the nozzle and the component. However, this process is not as simple as it sounds. Blowing too strong leads to a bad placement accuracy. Thus the blow off pressure has to be chosen as low as possible. The main features of the option are:

- In-field retrofitable on the Paraquda and Cobra machines
- Selectable blow off pressure for each component. While placing the blow off pressure is dynamically adjusted –
No need to manually adjust the blow off pressure
- Fully compatible with existing component libraries: If the blow off pressure is specified as zero, the system behaves as if the blow off option is not present
- Reusable blow off timing parameters as already present in the dialog
- The blow off feature can be globally turned on or off in the system configuration
- Warning message during production start if blow off is not enabled or not present
- Self-check of the blow off during initialization of the machine

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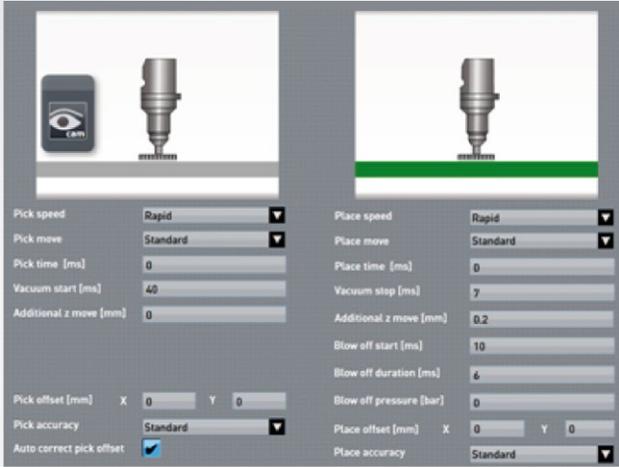


Figure 1: Screen "Teach – Package – Process Parameters" with new "Blow off pressure" parameter

Test Results

After successfully testing the Blow Off Option at Essemtec premises it was time to look for a customer willing to do beta testing. We are proud, that the "Reliability Testing" Team at OSRAM Opto Semiconductors, which owns a Paraquda, agreed to perform tests with the Blow Off Option. This is especially favourable for Essemtec as the Blow Off Option would be tested by the LED experts themselves.



During the tests multiple LEDs from the Duris, Oslon and Synios series were processed with standard nozzles. First the tests were performed with the Blow Off Option switched off; next the tests were repeated with the Blow Off Option enabled. The results show, that with correctly set blow off parameters the failure rate cloud in the mean be reduced by a factor of 17 down to 0.3% compared with the original system.

Correctly choosing the blow off pressure and timing is essential. Using a too low pressure will not reliably remove the component from the nozzle while using a too high blow off pressure can easily lead to misplaced components.

Summary

The newly available Blow Off Option, which can be retrofitted on the Paraquda and Cobra, is useful for increasing reliability when placing LEDs. It is very flexible and allows one to specify the blow off pressure per package in the software. During the pick and place process the pressure is dynamically adjusted on the fly for each component to be placed. Tests performed at OSRAM showed remarkable increase in the placing reliability.