A Room Temperature Stable and Jetable Solder Joint Encapsulant Adhesive – Capillary Underfill Replacement

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ABSTRACT:

With the increasing demand of device miniaturization, high speed, more memory, more function, low cost, and more flexibility in device design and manufacturing chain, YINCAE has published a white paper on a first individual solder joint encapsulant which can eliminate underfilling process with at least five times solder joint increase and provide more flexibility for fine pitch and high density application. In order to meet the demand of manufacturing of high speed and low cost, YINCAE has invented a room temperature stable and jettable solder joint encapsulant adhesive – SMT 266. The invention of SMT 266 has allowed our customers to have more flexibility in their high-speed production line such as worry free on the work life of adhesive and workable jetting process.

Solder joint encapsulant adhesives (SMT266) can be applied by jetting or dipping process onto a substrate or component, SMT266 can remove metal oxide from pads and bumps to allow solder joint to form, then cure with the formation of 3-D polymer network encapsulating each individual solder joint. Between solder joints, there are no adhesives blocking outgassing channel to ensure process yield.

After being used in the customer field for a few years, the implementation of SMT266 can improve the process yield, eliminating voids and cracks in solder joint, eliminating head-in-pillow issue for large component during lead free reflow process. The results from thermal cycling test indicated that the first failure cycles using SMT266 is high up to 6000 cycles, at least 4000 – 5000 cycles higher than other processes. The pull strength is 1.5 times higher than using solder paste plus underfilling process. All reliability data implied encapsulating each individual solder joint is the right direction to move toward. The enforcement mechanism will be discussed in our paper.

Keywords: Solder joint encapsulate adhesive, room temperature stable, underfill

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