

Tunnel Decapsulation Method for Wire- Bonded Packages

Introduction

Mechanical milling optimizes decapsulation applications where standard chemical decapsulation methods are **not** applicable, not fast enough, or risk the erosion of bond wires. **BLUE MILL** allows for rapid and effective pre-cavitation – followed by a short acid or plasma ‘final’ decapsulation -- with the resulting ‘live’ circuitry ready for QC / Counterfeit inspection, testing and failure analysis.

A method dubbed ‘**Tunnel Decap**’ improves upon this by producing successive smaller aperture cavities to avoid bond wires and other package features.

Rapid, Successful, High Yield Decap

Figure 3. (right) shows cross-sectional views of a BGA style package. A typical pre-cavitation operation requires only a single diamond tool.

A simple change of X and Y amplitude, after the first process has reached the bond loop height allows for a ‘stair step’ avoidance of the bond wires and the second step can proceed down to a few microns away from the die. Total Process times can be as low as 100 to 200 seconds.

BLUE MILL’s accurate Z-position control allows for the process endpoint to be achieved close to the complete removal of the mold compound (often as little as 10 to 20 microns remaining), directly above the die’s topside. A subsequent short wet or dry etch removes the final epoxy.



Fig. 1: **BLUE MILL** allows easy modification of all process parameters to achieve high decap yields, in very short process times

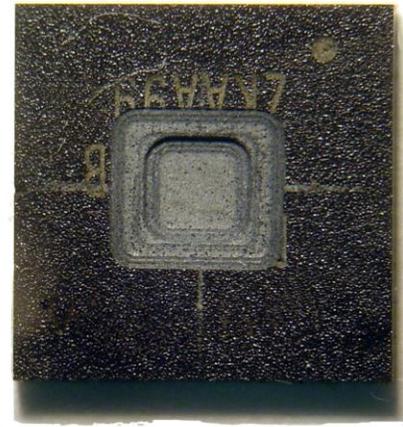


Fig. 2: A Tunnel-decapped Package showing stepped decapsulation with undamaged bond-wires close below the mold compound surface.

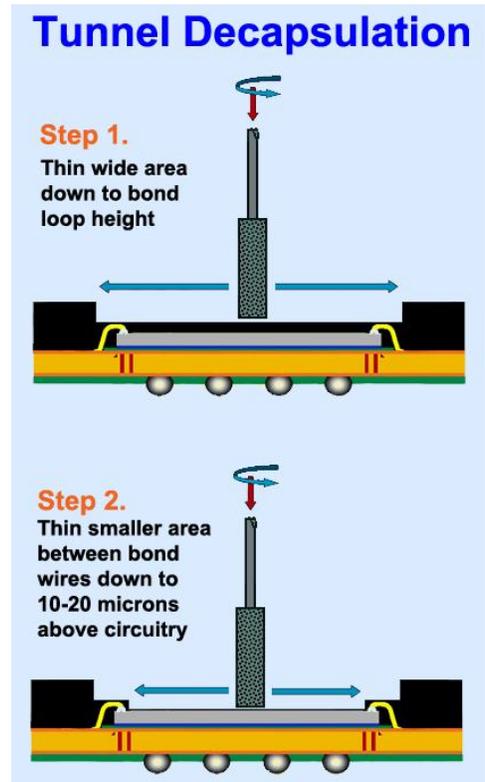


Figure 3

Improving Decapsulation!

Pre-Cavitation offers key advantages for frontside sample preparation. As well as for avoiding bond wires to optimize chemical-etch and plasma systems, the method may also be used to open up areas large enough to allow for high-power lenses to be positioned within their depth of focus.



Decap...done right!™

Toll Free (US) : 1.877.542.0609
Tel: 1.714.542.0608 Fax: 1.714.542.0627
www.ultratecusa.com