



Solutions for Adhesive Curing
An Application Case Summary

Glob Top & Potting Cure

Ref: 2-303

Topic Reference:

High value electronic assemblies & medical devices requiring Glob Top or Potting cure

Problem Statement:

Medical instrumentation and other high value electronic assemblies often require the use of high performance potting and glob top encapsulation. The field performance of such assemblies over their intended functional life depends on the quality of the encapsulation. These potting materials typically require long thermal cure cycles. This causes two problems in the manufacturing process of high value products. First is the overall thermal budget for the assembly. Long exposure of the device at elevated cure temperatures can stress the packaging and device interconnects. Second, is the time between the application of the encapsulant and inspection of the device for quality. Feedback on quality or yield loss to the assembly or encapsulant process of the manufacturing line can often take up to 4 to 12 hours, while high value products sit in a curing oven. A significantly reduced cycle time would allow rapid feedback for QC purposes while simultaneously reducing stress and the overall thermal budget on the device.

Proposed Solution:

Variable Frequency Microwave (VFM) provides a solution that dramatically reduces the cure cycle times while providing equivalent post cure material properties. Generally, microwave is well known for accelerating reaction rates such as needed to cure adhesives, by as much as 10 to 20 fold. Variable Frequency Microwave technology that allows the rapid curing benefit of microwave curing without the disadvantages associated with single frequency, conventional microwave. Rapid sweeping of frequencies through a broad range produces uniform energy distribution while eliminating arcing conditions. The VFM process is compatible with metals, circuits, and high value semiconductor assemblies. The rapid cure is achieved on standard encapsulants through the rapid excitations of the cross linking agents without compromise to material properties.

Realized Benefit:

Manufacturers of advanced technology medical devices have qualified and adopted VFM for cure of potting compounds that encapsulate sensors and similar medical devices. VFM's rapid cure features allowed reduction in the cycle time from 10 hours to only 30 minutes. Material properties were identical and product functionality was equal to or better than products produced in the long convection cycle. As a result, the objectives of reduced thermal budget and faster reporting of QC results were achieved.

Summary:

- ///* Reduced Process Cycle Time by 95% (10 hrs to 30 min)**
- ///* Enabled Rapid Feedback to Manufacturing Quality Control**
- ///* Provided Equivalent or Improved Product Specifications**