

Case Study #1

A major electronic components supplier
for the Automotive Industry.

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info@epotek.com

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|--------------------------------------|---|
| Sales/Marketing | <u>salesinfo@epotek.com</u> |
| Engineering and Technical Assistance | <u>techserv@epotek.com</u> |

Or if you prefer, you can write us, call us, or fax us with your questions:

Epoxy Technology
14 Fortune Drive
Billerica, MA 01821
Tel: 978.667.3805
Fax: 978.663.9782

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The Company:

A major electronic components supplier for the Automotive Industry.

The Challenge:

The company approached Epoxy Technology for a product that performed multiple functions in their assembly.

1. They needed a thermal solution that would manage heat dissipation in the component to increase reliability.
2. They were seeking a high strength bonding solution to meet the strenuous environmental conditions required in the automotive industry.

Material Challenges:

- Thermal conductivity
- Fatigue resistance to thermal shock
- Chemical/environmental resistance

Processing Challenges:

The product was going into multiple automated assembly systems, which would require several different versions of the material to be developed. EPO-TEK was able to present them multiple solutions for all of their assembly processes. Liquids were developed to run on their dispensing equipment and b-stage films were developed for their Pick & Place assembly operations.

The Solutions:

Materials:

The Research and Development department of Epoxy Technology worked closely with the electronic engineers to come up with a product that would fit all of their requirements. Since the product needed high thermal conductivity, Boron Nitride was chosen as filler. This product also needed great thermal shock resistance. The R & D department decided to use a single component epoxy chemistry with a solvent carrier. This combination allowed a long pot life and easy workability in both paste and film form; The product could be applied in a paste form, or turned into a solid, solvent-less film, performable to any design.

Epoxy Technology designers used all of the criteria to come up with a B-stage epoxy that was named B9021-13. This product passed testing with the Company and was specified for use in their process. The next step was for the engineers to inform EPO-TEK how they wanted to dispense this product so it would be delivered in accordance to their specifications.

Automation:

The Company wanted to use automation to make the application easier and more reliable. They had different options based off of the type of product. If they used a paste, they could place up to 60,000 dots per hour. This is done through syringe application. If they wanted to go with a film, they could use a vacuum pick and place system or a tweezer system. Both of these systems dispense at a slower rate than the paste syringe system.

The company chose to go with the films for ease of use and reliability on the bond line thickness. The tweezer system could not be used because of area where the EPO-TEK product was going to be placed was too small. The pick and place system was chosen. A film also brought about new challenges, including how to remove the film from the release liner, and how to avoid cracking that would cause the automated system to lose its vacuum. After some testing, it was discovered that the film would release from the liner very easily if the product was baked at 80°C for ten minutes. To avoid cracking, the products were stored at room temperature instead of -40°C. This removed the thermal cycling that the film was subject to before cure. With these final modifications, EPO-TEK was able to provide a superior product and excellent results for the customer!

Need a solution?

Call Technical Services at 1-978-667-3805

Or

Email: techserv@epotek.com