Streamlining the Coating Process

Electronics manufacturers that have traditionally built circuitry to Class 1 standards may experience unanticipated field failures related to corrosion, chemical exposure or other threats. Such malfunctions may be resolved with effective conformal coating. In some cases, only Parylene coating is able to meet the challenge, but not all companies have the production expertise and processes in place to effectively prepare assemblies for Parylene deposition.

In the past, it was necessary for circuit manufacturers to rely on an external cleaning supplier, or for Para Tech to divert their boards to a contract cleaner before Parylene could be applied. The demand for Parylene coating is growing across applications categories, and Para Tech has responded by adding in-house defluxing capabilities to its arsenal of services. This defluxing service streamlines the coating process, reduces turnaround times, and ultimately improves the performance and profitability of customer systems.

The Para Tech defluxing process removes flux and solder paste residues and other contaminants from printed circuit board assemblies to allow for dependable Parylene adhesion and long-term encapsulation dependability. Customers can now deliver Class 1 boards directly from production to Para Tech, where substrates are defluxed, tested against a high standard for ionic cleanliness, Parylene coated, and promptly returned.

Parylene coating is particularly advantageous for adapting currently-off-the-shelf (COTS) assemblies for rugged and demanding military or industrial systems. An investment in Parylene protection (moisture and chemical resistance, dielectric strength, stress-free encapsulation) yields a substantial reduction in the total cost of ownership to ruggedize off-the-shelf boards compared to other encapsulation options.

The myth: "Parylene is costly". The fact is that Parylene can be an economical coating option.

Dispelling the Parylene Myth: “Parylene is Costly”

An accurate assessment of value for products and services should focus on both direct and indirect expenses to determine total applied cost. This is particularly true for conformal coating calculations. Coating expense is not the full measure of coating value over a system’s life cycle.

While Parylene coating may have a higher cost than standard coating application methods, it leads in performance under challenging conditions, and is superior in its ability to preserve product function over time. Consequently, Parylene greatly reduces the possibility of field failures and resulting warranty costs. In some cases, the value of a coated part may be even less than the cost of protective coating. However, the warranty and productivity savings Parylene delivers over time makes it the most economic coating option.

Vacuum deposition coating with Parylene also offers manufacturing savings. Alternate coatings can present environmental issues not necessarily considered in price calculation, including toxic byproducts, waste disposal, VOC emissions, flammability and health concerns. Parylene is a clean process, free of such environmental and safety concerns.

Furthermore, Parylene may restore failed projects and help recover lost investment. For example, expensive commercial aircraft fitted for firefighting suffered pump controller failures due to moisture. After Parylene treatment, these units were put back into dependable service rather than being abandoned.

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Meet the Para Tech Team

MD&M West 2015 - February 10 - 12, 2015
Anaheim Convention Center, Anaheim CA - Booth #1683

IPC APEX EXPO 2015 - February 24 - 26, 2015
San Diego Convention Center, San Diego CA - Booth #3417

Parylene Conformal Coating Services, Equipment and Raw Materials
Certified to Latest Industry Standards

Para Tech has a long tradition of early certification to the most stringent industry standards and regulations, meeting the needs of customers in demanding technologies across the full range of military, aerospace and industrial applications. Most recently, Para Tech has achieved certification for NASA 8739.1 (Workmanship Standard for Polymeric Application on Electronic Assemblies) and FAA 8130-9 (Statement of Compliance).

The demanding NASA 8739.1 standard applies to every aspect of the conformal coating process from training and safety through deposition processes, quality assurance, final testing and rework. It requires rigorous documentation, uninterrupted attention to detail, and the highest level of consistent professionalism.

FAA 8130-9 is a training protocol required for suppliers to FAA product manufacturers. Para Tech’s certification confirms that our staff have completed the necessary training, and can satisfy ongoing testing and ratification procedures in order to maintain this certification for aeronautics work. Compliance covers all aspects of the company’s fitness to meet the FAA’s very high standards, including random drug and alcohol testing.

Partnering for In-House Coating Success

Para Tech supports two key business areas with its family of programmable Parylene deposition systems for in-house coating. These consist of production level systems for OEM coating operations, and smaller table-top systems for short-run R&D and academic laboratories. Both categories benefit from attentive process development and production support by experienced Para Tech specialists.

Some original equipment manufacturers require in-house coating capabilities to ensure efficient supply to market, or have special security requirements that restrict their ability to release materials from custody. Others have need for uninterrupted cleanroom conditions throughout production. Para Tech’s production systems enable these companies to meet their specialized coating requirements with in-line coating processes.

The same benefits are provided to industrial and academic laboratories that use Parylene coating for prototyping operations or poly-para-xylylene research.

Both OEM and laboratory users benefit from Para Tech’s decades of experience in vacuum deposition coating across a very wide range of applications, and from the company’s proprietary coating system design features. Para Tech experts provide timely process engineering and consultation services, with the objective of partnering for success. For more details, see Para Tech Equipment and Supplies.

Effective Coating of Elastomers

While conventional liquid coatings have little or no ability to deform without fracturing, more flexible Parylene coating is able to elongate slightly in any direction without compromising its surface integrity or adhesion to elastomer substrates. This makes Parylene ideal for surface protection of flexible elastomeric keypads, gaskets, seals and similar parts.

An inert Parylene layer as thin as 1 micron seals surfaces against environmental threats, adds surface lubricity, and eliminates tack without adding stiffness. Parylene extends the life of printed keytop legends, and enables elastomer components to operate under more challenging conditions.

Essentially invisible Parylene coverage does not alter the physical appearance of elastomers, nor does it impact their elasticity or hardness values.

Para Tech applies Parylene to elastomer parts in a proprietary tumble coating process. Contact our Engineering Department for more details.