

Thin Film Protection of Critical Substrates

AEROSPACE & AVIATION | ELECTRONICS | MILITARY & DEFENSE | MEDICAL | AUTOMOTIVE & INDUSTRIAL

Why Parylene? Ultra thin Parylene coating offers superior protection and lubricity of critical and delicate substrates making it an obvious choice for many challenging applications. Benefits of Parylene include:

- Ultra Thin, Durable and Transparent Polymer Film
- Truly Conformal and Hydrophobic Coating
- Absolute Surface Conformity
- Excellent Crevice Penetration
- No Mechanical, Thermal or Chemical Stresses on Fragile Components
- Dielectric Strength Greater Than 5,000 Volts Per Mil
- Resists Moisture, Chemicals and Solvents
- Chemically Inert and Pinhole-Free
- High Optical Clarity
- Biocompatible, Biostable and Non-Reactive
- Enhanced Lubricity and Surface Encapsulation to Avert Flaking or Dusting
- Prevention of Microbial Toxicity

Why Partner With Us? When it comes to choosing a Parylene coating provider, it is critical to select a company that thoroughly understands the process, material options and quality standards. Advantages include:

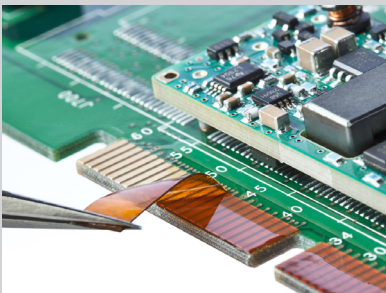
- Fast, Reliable, Flexible and Collaborative Approach
- Largest U.S. Owned Parylene Conformal Coating Provider
- Innovative Patents Optimize the Parylene Vacuum Deposition Process
- Monitored Processes Meet or Exceed All Industry Standards for Quality
- Choosing the Right Supplier Up Front Saves You Time and Money
- Technology Leaders with Unparalleled Industry Experience
- Integrity, Trust and Confidence in All That We Do
- Commitment to Customer Satisfaction and Success
- Partners in Problem Solving, Quality Assurance, and On-Time Production Scheduling

Providing Parylene Solutions That Meet Your Coating Needs

As a high-end protective coating, Parylene has the ability to enhance the performance and improve the surface features of various products. For instance, Parylene applied to silicone rubber can help remove tackiness and provide a dry lubricant to reduce friction and improve sorting and handling of parts.

Electronic devices exposed to high reliability testing or rugged environmental conditions such as salt fog, humidity and temperature may fail due to insufficient surface protection or no protective coating at all.

Whatever leads you to Parylene, Para Tech offers custom engineered solutions that can lengthen the lifespan of your product, reduce warranty costs and increase your customer satisfaction.



Parylene Coating Services

Para Tech is ready to meet your production coating needs at one of our full service coating centers. We operate as an extension of your manufacturing team, committed to your business success and partnering in problem solving, quality assurance, and on-time production scheduling. We offer some of the shortest turnaround times in the industry, are reliable and known for our responsive customer service.

We offer application engineering support on any project as needed.



Vapor Deposition Systems

If production requirements and coating volumes justify bringing some or all of your Parylene coating processes in-house, Para Tech offers innovative Parylene deposition systems. We manufacture three different high quality equipment models for R&D applications through large scale production volumes. We can help you select and, if necessary, customize one of our advanced coating systems to your particular application.

As your business partner, Para Tech provides on-going training and technical support to assist with the operation and maintenance of your equipment.



Dimer Raw Materials

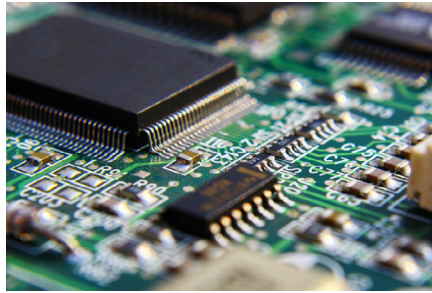
Para Tech offers three commercial Parylene dimer types, each having its own unique electrical and physical properties. As one of the few suppliers in the industry, we offer raw material that is on the QPL and approved for both military and aerospace applications.

Our experienced team will assist you with material selection that meets your specific industry standards as well as help determine film thickness and substrate preparation requirements.



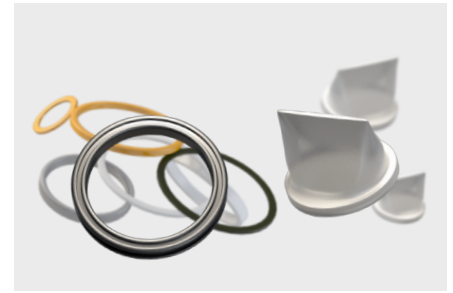
Medical

This ultra thin, highly lubricious, hydrophobic film resists the effects of moisture, organic and inorganic chemicals, organic solvents, acids, reagents, bio-fluids and oils. With its biostability, biocompatibility, dielectric properties, and effectiveness as a non-toxic thin film barrier against a full range of threats, Parylene has long been the preferred choice for medical coating.



Electronics

Parylene is the coating of choice for high reliability electronics. The transparent polymer film provides physical, chemical and mechanical isolation, and adds essentially no weight. It is deposited under vacuum at ambient temperatures, requires no cure phase, and presents no thermal stress. Parylene protects electronics from chemicals, moisture, temperature extremes, atmospheric variation, humidity, corrosion, mold, current leakage and dendritic growth. It is also the preferred coating for tin whisker mitigation.



Elastomers

Parylene film flexibility enhances the performance of rubber and elastomer components by protecting surfaces without degrading functionality or adding weight. Truly conformal film coverage and consistent thickness across surfaces prevents the transfer of substances such as solubilizing chemicals or plasticizers in either direction. Pinhole-free Parylene adds dry film lubricity and enhances elastomer wear resistance. It offers full crevice penetration and adds chemical resistance.

Advantages of Parylene

- Ultra thin, truly conformal coating
- Vapor deposition process allows Parylene to penetrate and coat surfaces that are unreachable by liquid coatings, including sharp points and deep cavities
- Removes tackiness of elastomers
- Low dielectric constant will not compromise signal processing speeds of electronic devices and components
- Polymerization at room temperature protects circuit board or other device from thermal stress
- High optical clarity leaves surface features and printed nomenclature clearly visible
- Superior dielectric properties make Parylene an ideal solution for insulating electronic components with minimal dimensional impact
- Pinhole-free, inert barrier against moisture, chemicals, bio-fluids and bio-gases



- Hydrophobic and highly lubricious coating
- Performs well under vacuum conditions and extreme environments as proven in multiple spaceflight applications
- Increases separation of parts for easy sorting or feeding through machinery

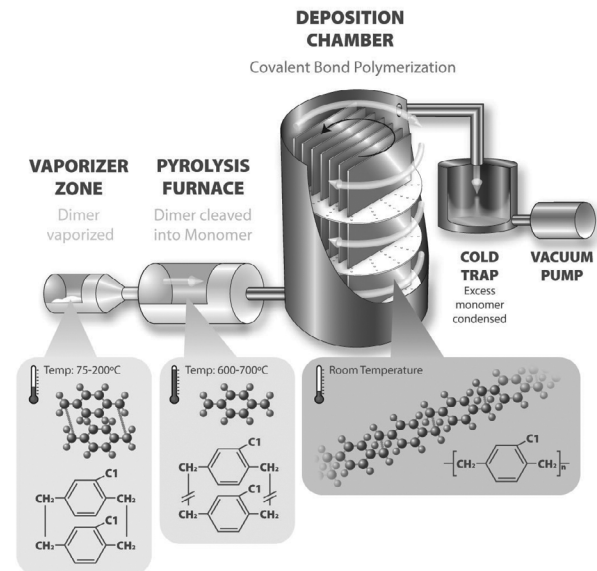
Parylene Coating Process

A Choice of Pressure Control and Monomer Flow Methods Allows our Engineers to Optimize Parylene Coating Effectiveness

Curtiss-Wright Parylene Services offers two distinct coating deposition options that make it possible to adjust the vacuum deposition sequence to best meet the particular requirements of every coating task. The best control method for a given coating application is determined on the basis of multiple factors that include chamber load and substrate geometry.

Our production specialists have extensive process experience and coating management expertise across many application categories and will select the optimal production method and equipment configuration to quickly and efficiently meet customer needs.

The illustration shows the three-phase Parylene deposition sequence, which is based on precisely adjusted and timed steps.



Fixtured Coating

Parts such as printed circuit boards, medical components and other assemblies that require selective Parylene coverage are masked before coating to restrict exposure of selected areas to the polymerizing gas. Masked parts are then placed in fixtures that position and retain them during the coating cycle for optimum loading efficiency and even exposure to the monomer gas. This method insures Parylene-free areas such as conductive pads on PCBs.

Tumble Coating

High quantity and uniform components such as elastomers, ferrite cores or prosthetic components that do not require masking can be placed in a rotating cylinder that is sealed within the vacuum chamber. These components are kept in motion through the deposition cycle to allow the polymerizing gas to reach and coat all surfaces evenly. The parts are delivered fully encapsulated with no contact points.

Quality Standards

Curtiss-Wright Parylene Services has an ongoing commitment to meet the quality requirements of international standards such as ISO9001:2008 and ISO13845. Our national Parylene coating centers have quality management systems (QMS) that are certified to the aerospace standard AS9100C.

Skilled and qualified Curtiss-Wright Parylene technicians are trained to fulfill the requirements of IPC-J-STD001 and IPC-A610 standards, and the company is fully compliant with every governing ISO, IPC, NASA (8739.1) and FAA industry qualification. Para Tech meets MIL-I-46058C, Army Regulation 70 71, NAV. INST. 3400.2 and USAF-80-30 Regulations.

Our Parylene coatings are tested to USP Class VI and ISO10993 for biocompatibility and biostability. Our FDA drug and device master files allow medical device manufacturers to use process information on premarket approval applications (PMAs), investigational device exemptions (IDEs), and other official submissions pertinent to Parylene coating for medical products. Contact us for a complete list of certifications.