



Parylene Frequently Asked Questions

MATERIAL FAQs

What is Parylene?

Parylene is an ultra-thin conformal coating applied in a chemical vapor deposition (CVD). This coating is classified as XY.

Is the parylene coating reworkable/repairable?

Yes, the PCB coated with parylene can be reworked. Options for rework: mechanical (micro-blaster or dry ice), heat (localized heat), chemical (organic solvent). Repairing the coating can be achieved with UR or AR/UR coatings.

Does parylene coating add weight to my PCB?

This coating is ultra-lightweight with minimal added weight to the PCB surfaces.

Is parylene coating optically clear?

Yes, parylene C and N ultra-thin coatings are colorless and transparent.

Is parylene a rigid or flexible coating?

Parylene C elongation is 200%, and parylene N elongation is 40%.

Is parylene a hydrophobic coating?

Yes, parylene coating has hydrophobic properties repelling water and moisture.

Are parylene coatings cryogenic resistant?

Yes, this ultra-thin coating is cryogenic resistant to -200°C.

Are there different types of parylene coating?

Parylene C is the go-to parylene coating. Parylene N is used for medical applications.

Is parylene biocompatible?

Yes, parylene N and parylene C met the requirements of USP Plastic Class VI. Testing completed by Advanced Coating.

Does parylene bond to all surfaces on the PCB?

Yes, the parylene (CVD) process will deposit the conformal coating on all surfaces of the PCB.

Does your parylene C meet Mil-I-46058C/IPC-CC-830-C?

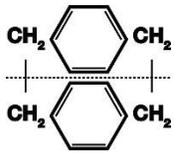
Yes, parylene C meets the requirements of Mil-I-46058C/IPC-CC-830-C. Testing completed by Advanced Coating.

What are the advantages/disadvantages?

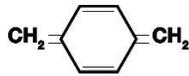
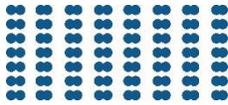
Advantages	Disadvantages
 <p>UNIFORMITY Complete, uniform coverage on all surfaces.</p>	 <p>LONG PROCESS TIME Limited throughput due to batch process cycle time.</p>
 <p>ULTRA-THIN Ultra-thin coating between 0.25 to 0.75 microns.</p>	 <p>ADHESION Adhesion promoter required to achieve parylene bond to the PCB.</p>
 <p>CONSISTENT THICKNESS Consistency of coating thickness across the entire board.</p>	 <p>COST Higher process and material costs than other conformal coatings.</p>
 <p>EXCELLENT PROTECTION Complete protection from moisture, fumes, gases, salt water, corrosion, fungus, and other environmental conditions.</p>	 <p>DIFFICULT TO REWORK Very challenging to rework localized and complete PCB.</p>
 <p>CLEAR APPEARANCE Parylene C and N are clear in appearance and ideal for optical applications.</p>	 <p>PREP TIME Labor intensive cleaning and masking process.</p>
 <p>NO CAPILLARY FLOW No capillary flow under components on the circuit board.</p>	 <p>FAILURES Failures can occur from parylene lifting at the de-masking site, cracking, no transparency, or voids anywhere on the coating.</p>
 <p>LIGHTWEIGHT On 1" x 1" x 0.00125 mils FR4 board with no components, parylene added 0.040 grams.</p>	 <p>NOBLE METALS Poor adhesion to noble metals – gold, silver, and stainless steel.</p>
 <p>NO STRESS ON COMPONENTS Deposition is completed at room temperature preventing stress on PCB components.</p>	

PROCESS FAQs

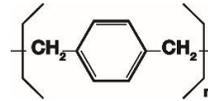
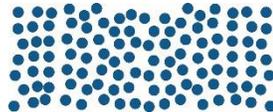
What are the phases of the parylene process?



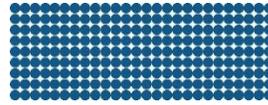
1 – Sublimation
The dimer granular is vaporized into a gas.



2 - Pyrolysis
The dimer gas is heated to a high temperature to produce a monomer gas that splits the dimer molecules.



3 - Deposition
The monomer gas is transferred to the coating vessel to deposit onto the PCB as an ultra-thin coating at room temperature.



4 - Chiller & Vacuum
The chiller captures the excess parylene at the end of the cycle. The vacuum pulls all the air and gasses from the chamber, facilitating the parylene deposition.

PROCESS FAQs

Does parylene conformal coating add weight to my PCB?

Parylene is an ultra-thin conformal coating that adds minimal weight to the PCB. The weight of the parylene layer over a 1" x 1" x .00125 mils on an FR4 board with no components is .040 grams.

Does parylene coating evenly coat complex and intricate surfaces on my PCB?

Yes, parylene is a uniform coating over complex and intricate surfaces, controlled during the deposition phase.

What is the thickness of your parylene coating?

The parylene coating thickness can range from .1 to 50 microns (.001 – 2 mils). Typically, most customers require mil-spec standard thicknesses, which are repeatable and achievable batch after batch with our equipment.

How is the thickness of the parylene coating controlled?

The thickness of the parylene coating is impacted by the dimer mass, deposition rate, temperature, and other factors, such as the topography of the PCB.

What masking techniques will be used?

The complexity of the PCB topography determines masking techniques. Masking options are liquid maskants such as UV-curable maskants, latex maskant, polyester or Kapton tape, caps, and boots (standardized or 3D printed).

Why is an adhesion promoter used before the parylene coating deposition process?

Pre-treatment with silane stimulates parylene adhesion to promote a molecular bond from the substrate to the applied parylene coating.

Is a cleaning process necessary before the parylene process?

Yes, all PCBs are cleaned before applying the adhesion promoter and the parylene process to ensure the adhesion of the parylene coating.

ECT FACILITY FAQs

What is the ECT inspection process for my PCBs?

ECT inspects PCBs to IPC-A-610 standards for all our in-house customers, no matter the material applied. We use 4x and 24x magnification on 100% of the customer product to ensure standards are met. Or ECT will use the inspection criteria requested by the customer.

What quality management system standard does ECT meet?

ECT is certified by ISO 9001:2015 and ISO 13485:2016.

Is ECT an ITAR-registered facility?

Yes, ECT NY is an ITAR-registered facility.

Is there a fast track/expedite available?

Yes, please get in touch with ECT to discuss your needs.