Inspection Integrated with Production

Perfection is unattainable in the real world, particularly for complex technical processes. The challenge for Parylene coating application is to achieve and maintain a very high level of quality while operating efficiently and cost-effectively. To that end, Para Tech Coating recently implemented a data-based process that integrates quality control with production rather than at each processing stage to monitor performance.

The traditional quality management approach of the low-volume/high-mix Parylene process has been one hundred percent inspection of coated assemblies at each step. Para Tech has adopted a new dynamic quality method, with statistical monitoring as work is done, wherein individuals are responsible for checking and measuring their work underway, based on specialized training. A quality inspector interprets and measures the results of this monitoring against statistical standards for a dynamic assessment of performance, with the goal of consistent "fit for use" results.

Using this approach, any required troubleshooting and process refinement can be accomplished in real time as work proceeds rather than in an interruptive fashion. These standardized methods are being implemented at each Para Tech Coating production facility.

The only formal process inspections - apart from the constant attention of the Para Tech production staff - are incoming parts review; following part masking when assemblies are ready for coating; and final check of every coated assembly. The entire process is under the review of a quality compliance manager, using assembled data for statistical analysis and process tweaking to optimize quality assurance.

Expanded Medical Coating Competencies

Medical devices and instruments generally require an FDA compliant, fully conformal coating protection that is biocompatible and biostable in the presence of living tissue. Inert, vacuum deposited Parylene film has long been distinguished as the material that meets rigorous medical coating requirements more effectively than any other conformal coating. Parylene film is the material of choice for medical items ranging from needles and catheters to epidural probes, medical device circuits, mandrels, catheters and surgical tools.

Para Tech Coating has served the medical industry with Parylene coating services for decades, meeting stringent demands of these components. As a part of Curtiss-Wright Surface Technologies, we now have enhanced medical coating application capabilities with the ability to serve the full range of Parylene medical coating applications including wires and mandrels used in the extrusion of high precision tubing.

Parylene is an FDA-approved, USP Class VI polymer. Para Tech obtained FDA drug and device master files in September 2011 and this FDA record allows customers to use our process information on premarket approval applications (PMAs), investigational device exemptions (IDEs), premarket notification submissions (510(k)s), reclassification petitions, color additive petitions or other FDA submissions pertinent to Parylene coating. Parylenes N and C supplied by Para Tech comply with USP biological testing requirements for Class VI plastics.
Customers Benefit from Curtiss-Wright Relationship

Established in 1968, Para Tech has been a Parylene coating technology leader for fifty years, with problem solving experience that extends across a wide range of industries and applications from electronic circuit assemblies and military/aerospace assemblies to automotive, industrial and medical coating solutions.

Para Tech is now able to apply expanded technology and best practice resources to coating challenges as needed, based on the multiple resources of sister Curtiss-Wright Surface Technologies (CWST) companies. Customers benefit from both the breadth and the depth of new corporate resources. With a global network of 74 facilities and on-site field teams, the CWST affiliation offers Para Tech customers a single point of contact for a broad range of surface treatment options and process solutions.

CWST is a division of Curtiss-Wright Corporation, a global innovative company that delivers highly engineered, critical function products and services to the commercial, industrial, defense and energy markets. Click here for more details.

Beyond Liquid Coatings

Coating materials used in industrial, aerospace and medical applications are many and varied, including various acrylics, silicones, urethanes, epoxies and PTFE, as well as para-xylylene, or Parylene. Each category has a particular mix of properties, advantages and limitations. The challenge in selecting the best conformal coating option for any given application is to define and quantify performance requirements, and then identify the coating that best meets the need.

Some process decision makers may not be familiar with the distinctive characteristics of Parylene. While this optically transparent, thin film coating is not suitable for every use, it offers certain functional advantages that are not matched by any alternative material.

For example, liquid-based coatings add physical mass to a substrate, with the potential to create damaging cure forces and thermal stress to delicate components. Liquid pooling and surface tension properties add further risk. At a nominal thickness of only 20 microns (0.00075-in.), compared to 125-150 microns (0.005-0.010-in.) for liquid coating, Parylene delivers high dielectric insulation, with a fully conformal and pinhole-free barrier against fluids, gases and chemicals - with no stress forces. The film polymerizes on substrates at ambient temperature - no solvent and no cure phase. Parylene is chemically inert, non-toxic, free of catalytic, plastic and solvent residues, and produces no leachable ingredients. Click here for more details.

Purchase Equipment or Outsource Coating?

For demanding conformal coatings applications where Parylene is the preferred coating choice, our customers have two production options: bringing Parylene coating in-house or ordering rapid-turn off-site coating services at one of our regional facilities. There are pros and cons to consider for either approach.

The process choice calls for careful cost analysis that considers substrate properties, the manufacturing setting, production scheduling and other details. Para Tech Coating production specialists are ready to assist with this important decision with the benefit of long years of vacuum deposition coating experience. Where appropriate, on-site coating is implemented with attentive Para Tech production support and sophisticated Para Tech vacuum deposition systems.

Call Para Tech Coating customer support at 800-999-4942 ext. 861 with questions or for immediate assistance.

For locations and contact information, visit parylene.com