CASE STUDY

Make plastic parts shine

High-value metallic coatings add appeal and durability to easy-to-manufacture materials

Consumer products manufacturers are forever on the lookout for new ways to improve their products' appearance, durability, and quality. Molded and cast plastics and other materials are cost-effective and easy-to-use in manufacturing; however, their moldable nature reduces their durability and limits the types of surface finshes that can be applied. With hard coating technologies, manufacturers can use these cost-effective base materials for parts while delivering a premium look and cool metallic feel on their end products.

Maintaining a high-end look

Vapor Tech's Low-Temperature Arc Vapor Deposition™ (LTAVD) systems deposit colorfast finishes on a variety of materials from cost-effective substrates, such as plastics and metals that can be cast, to high-end materials. LTAVD technology enables the creation of an array of metallic colors that resist abrasion, corrosion, chemicals, wear, and scratches at temperatures as low as 50 degrees celcius.

When applied to plastics and other materials (including plastic/polycarbonate blends, foam, and graphite), coatings deposited with the Vapor Tech LTAVD process deliver a metal ceramic coating that has a uniform look and the same as or better durability as products manufactured with expensive substrate materials.

Since the mid-1990s, LTAVD has been the premier coating technology used in producing high-end kitchen and bath fixtures and products that require durable metal finishes. With LTAVD deposition technology in their supply chain, designers can deliver a wide variety of colorfast, durable, decorative finishes on a number of substrates. They also have met the ever-increasing customer demand for durability and long-term appearance without relying on specially maintained lacquers or thick chrome plating that's only available in silvers and muddy greys. This benefit is especially noteworthy as more attention and new regulations have been placed on the environmental and occupational impacts related to the chemistries required in hexavalent chrome plating.

Aesthetics only matter if they last

Manufacturers use LTAVD-deposited metallic finishes to provide superior durability – twice as hard as steel and three times harder than plated chrome – and improve aestethics. These finishes are engineered to be easy-to-clean and resist chemicals, abrasion, and ultraviolet light.

As kitchen and bath hardware is exposed to UV light, chemicals, and harsh abrasives in cleaning, typical paint, powder coated, and lacquer colors fade at different rates – causing hardware to look old and degraded. With LTAVD process technology, manufacturers can coat a wide range of substrate materials and achieve a lasting color, while matching part to part. This is especially important

for companies that need to offer sets of parts, as well as replacement parts for current and legacy products.

Also important to note, Vapor Tech's deposition systems do not emit toxic wet chemical by-products. Studies have shown that LTAVD-deposited chrome and chromium nitride coatings deliver equivalent or better performance and aesthetic characteristics as can be obtained with hexavalent chrome plating – with none of the chemical waste, health risks, and high compliance costs.

Substrate considerations

As LTAVD coatings efficiently use raw materials, only requiring less than 1 micron of thickness, they efficiently deliver hardness, beautiful color, and chemical resistance, without waste. The bulk material substrate serves as the main support for the coating, ultimately, determining gouge and impact resistance and final surface texture (polished, matte, brushed, etc.). Deliberately conformal, LTAVD coatings preserve the fine features and details purposefully built into a part. Therefore, prior to coating, part lines and mold tags must be removed to ensure no surface inconsistencies or unwanted features will appear.

The hardness of the substrate material is a key manufacturing consideration. If underlying substrates yield, a thin-film coating will yield with the substrate material as the material changes shape, exposing the base material. Vapor Tech recommends plating plastic with a thin layer of material to harden the plastic and planarize the part. Additionally, manufacturers could use a UV-curable coating base layer to create a strong surface to support the hard, abrasion-resistant properties of the surface coating applied with LTAVD technology. These steps increase the effective stiffness of the support structure, and where needed, level the substrate surface.

Gain a competitive advantage

By incorporating LTAVD into the manufacturing process, companies can satisfy consumer demands for metallic color choices, high-end appeal, and increased durability. Additionally, companies can address their own requirements for more efficient manufacturing processes and leverage a wide variety of cost-effective substrates.

Achieve superior coatings with the VT-1500 or VT-3000

- Process parts at temperatures as low as 50 degrees Celsius
- Maximize uptime, reliability, and coating uniformity
- Meet production throughput requirements with a large coating zone
- Receive access to thin film experts and world-class support

Vapor Tech®

About Vapor Tech

For more than 25 years, companies in a variety of industries have relied on Vapor Tech's industry-leading coating technologies to ensure their products feature premium surface finishes and functional coatings. Vapor Tech is a subsidiary of Masco Corporation.

(303) 652-8500 | **VaporTech.com** | vtsales@VaporTech.com