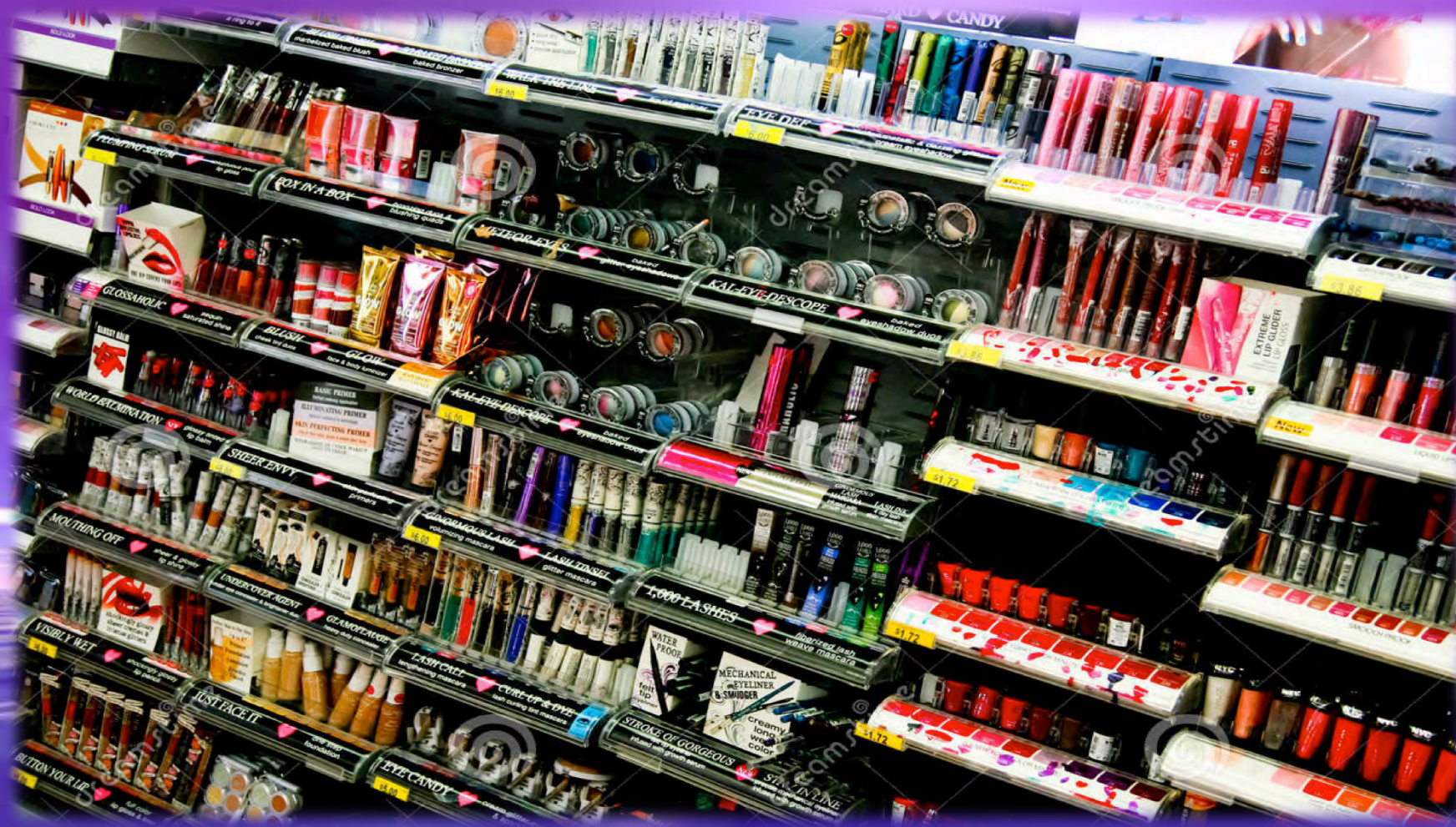


Functional Coatings to Enhance Decorative Packaging

by Kristy Wagner
Red Spot Paint and Varnish

Containers and Closures



Containers and Closures



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Plastic

Rigid

- ABS
- Polypropylene
- PET*

Flexible

- HDPE
- LDPE

Plastic - Appearance

- Top Coat
 - Clear
 - Abrasion
 - Protection
 - Post Decorating
 - Inks – screen; pad
 - Foil
 - Labels



Plastic - Appearance

- Top Coat
 - Pigmented
 - Opaque
 - Transparent



- Special Effect
 - Pearl
 - Metallic



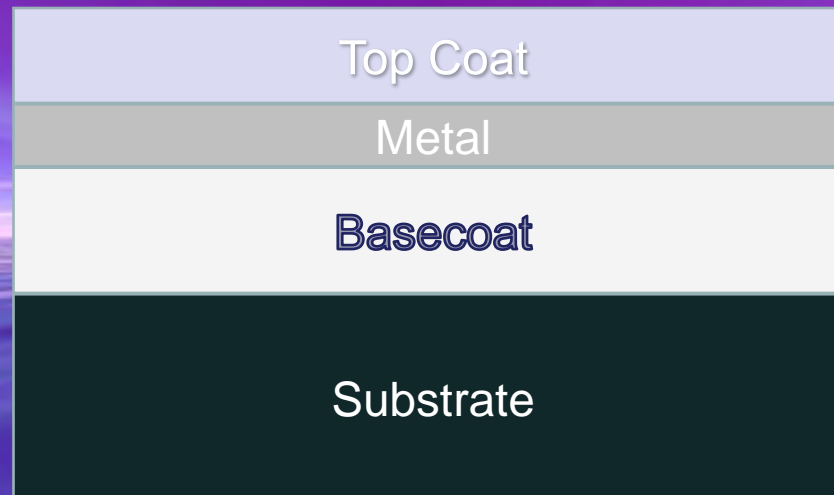
Plastic - Appearance

- Top Coat
 - Low / Mid Gloss
- Tactile
 - Soft Touch
 - Textures



Plastic - Appearance

- Physical Vapor Deposition

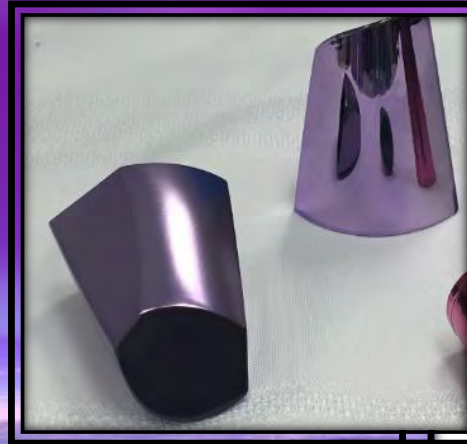


Plastic - Appearance

- PVD

- Top Coat

- Clear
 - Tinted
 - Satin



- Post Decoration



Plastic - Performance Requirements

- Scratch / Abrasion Resistance
 - Rub Test
 - Taber
 - Steel Wool
 - Falling Sand
 - Transportation Simulation

Plastic - Performance Requirements

- Chemical / Product Resistance
 - Alcohol resistance
 - G1 solution
 - Synthetic Perspiration
 - Product itself

Plastic - Performance Requirements

- Moisture
 - Water Soak
 - Humidity Resistance

Glass - Appearance

- Clear
- Tinted
- Frost



Glass – UV Coating Performance Requirements

- UV Protection
- Chemical / Product Resistance
 - Essential Oils
- Moisture Resistance

Glass – UV Coating Performance Requirements

- Abrasion Resistance
- Heat Resistance
 - Accelerated Aging
 - Transportation Simulation

UV Coating Advantages

- Adhesion to multiple plastics
- Basecoat / Topcoat
 - Less complex inventory
 - Lower cross contamination risk

UV Coating Advantages

- Performance
 - Better abrasion resistance
 - Better chemical resistance

UV Coating Advantages

- Versatility
 - Metallization
 - Tintability
 - Pigments
 - Pearl
 - Metallic Flake
 - Flat paste



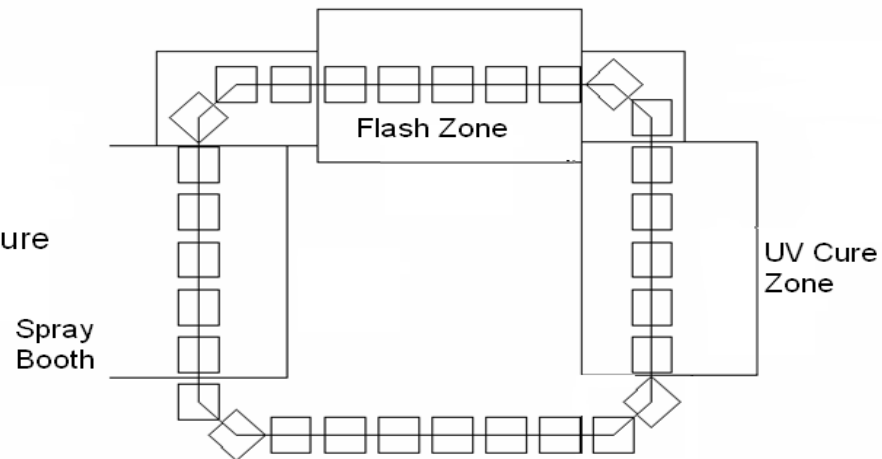
UV Coating Advantages

- Processing
 - Smaller foot print
 - Less work in process
 - Higher throughput

Line Comparison

UV Curing System:

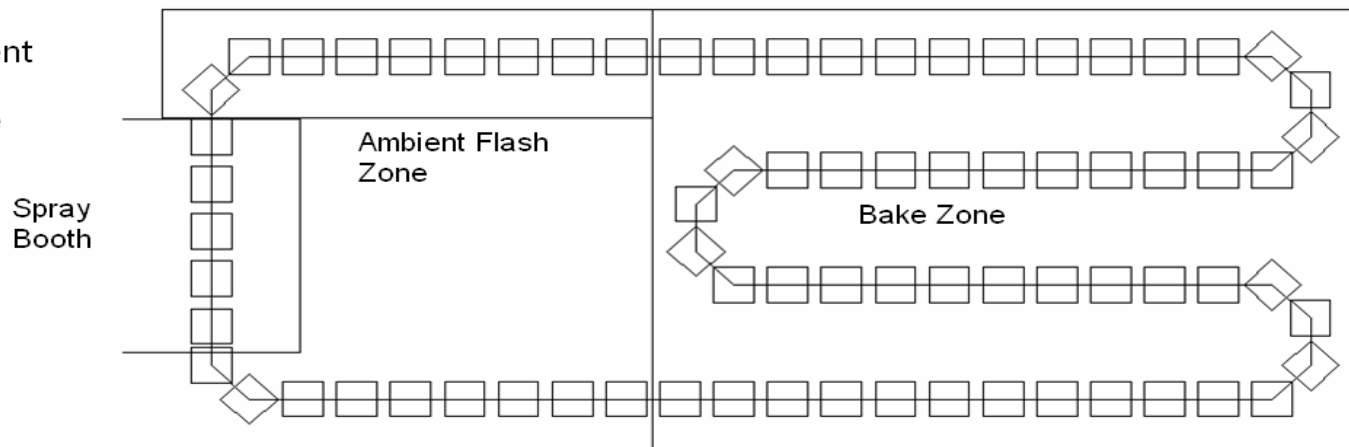
1. Spray
2. 2 min. Flash
3. 30 Second Cure



Assuming Same Part and Fixture Size on Both Lines

Thermal Curing System:

1. 5 min. Ambient Flash
2. 30 min. Bake



UV Coating Advantages

- Environmental
 - High solids
 - Low / Zero VOC / HAP
 - Energy Savings

UV Coating Advantages

- Safety
 - Frost vs. Acid Etch
 - Hydrofluoric Acid
 - Easily penetrates tissue
 - Limited exposure can be harmful or fatal

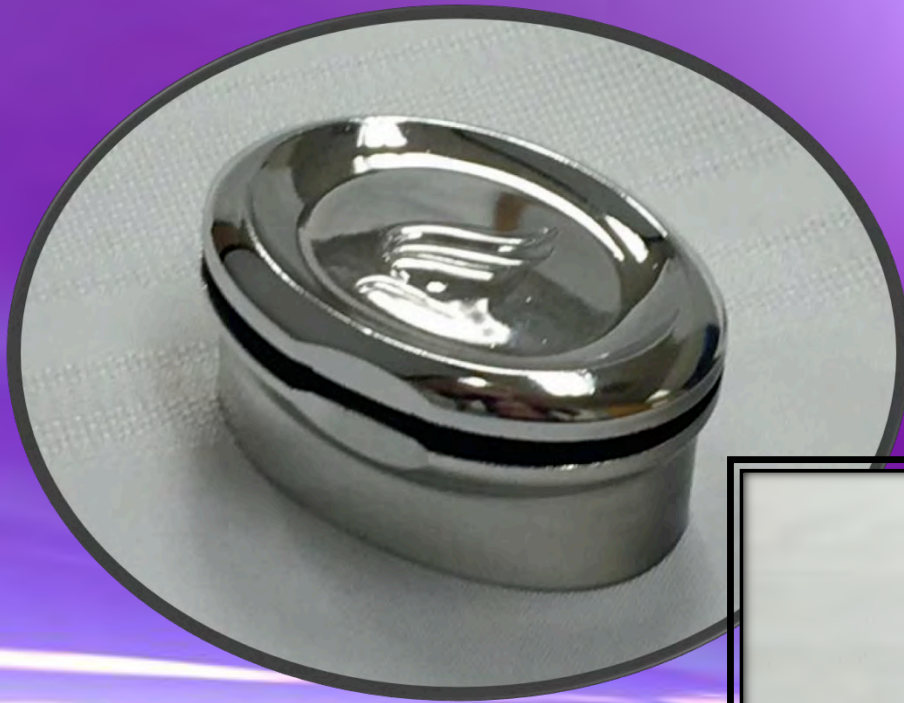


NFPA 704 Signal for
Hydrofluoric Acid
Courtesy of www.cdc.gov/niosh

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Questions?