

# UV Curable Dome & Decorative Coatings



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*Improve the way you  
work and do business*

# Advanced Coating Technology for Faster, Better Processing

Since 1980, DYMAX has pioneered adhesive curing technologies that dramatically reduce assembly costs and increase the profit potential of manufacturing processes. Chemistries that slash curing times from days to minutes and hours to seconds, provide productivity increases or 90% or more for automotive, medical, electronic and general industrial assembly operations.



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## Process Tips for Successful Coating

### *Avoid resin running over the edge of the label or object*

1. Resin is deposited at the center of the label or object and flows towards the edges. Sharp edges tend to repel overflow. Irregular edges encourage overflow. Thick label stock tends to maintain its edge and minimize over flow.
2. Label backing can minimize or encourage overflow. If the backing material "wets" more readily than the label surface, it tends to draw the coating over. Using a backing that repels the resin encourages it to remain on the label.
3. Use an X-Y dispenser to dispense a pattern instead of a single drop on noncircular objects. Pattern dispensing lets the resin flow to all the edges at the same time rather than all running to one edge where it can flow over before reaching the remaining edges.
4. Level the dispenser, transfer and curing stations.

### *Avoid air bubbles in the coating*

1. Purchase products in air free packages (syringes or cartridges).
2. Dispense directly from the shipping container. If resin must be transferred from one container to another, then transfer the container at the end of the last shift.
3. Use low pressure dispensing. Since pressure drops can pull air into the dispensing line, dispense with the lowest pressure possible.
4. Use the shortest possible lines between the container and the dispensing needle.
5. Pass the uncured (liquid) coating underneath a natural gas flame to burst surface bubbles.
6. Process by continuous dispensing and purge tip when restarting line. Whenever fluid flow stops completely, the resin may retract. When resin retracts it can pull air into the line or dispensing tip. The air can create bubbles before it is purged from the line.

### *Eliminate warpage during cure*

1. Some thermoplastics curl or warp when hot. Use a thermoplastic with a higher melting point or reinforcement to solve this problem. Using a thicker substrate may also eliminate warpage.
2. To eliminate curl when doming on thin polyester labels try precuring with a "black" light. The "black" light should have a maximum intensity at 365 nm (available from most industrial electrical lighting supply houses). Regular purple colored bulbs or germicidal bulbs will not work. The precuring polymerizes the coating below the coating's surface. A second lamp is then used to cure the surface to a scratch resistant state. As the label gets larger, softer resins are necessary to prevent warpage.
3. Use of thicker polyester stock or stiffer backing sheets minimizes curl of domed decals.

**For technical assistance with your application  
contact the DYMAX Tech Center at  
1-877-DYMAX-UV  
(1-877-396-2988)**

# Considerations for Selecting a Coating

- Viscosity.** How thick a coating is necessary? Protective decorative coatings are clear and usually thin. Dome coatings have curved domes, which optically magnify and enhance the appearance of a label. Higher viscosity, thicker resins generally produce taller domes.
- Substrate Flexibility.** Flexible substrates, like thin polyester labels, paper, or soft plastics, may require careful selection of coating and enhanced curing equipment. Flexible substrates may bow or warp when thick coatings cure. Soft coatings shrink less and are designed to reduce or eliminate warpage during cure. Rigid substrates don't bend when stressed; so, they can be coated with all of the products.
- Substrate Adhesion.** Individual formulations may have excellent adhesion to some inks (or substrates) and little adhesion to others. The right coating should have good adhesion to the substrate. Adhesion should be tested after product lifetime testing, as well as after cure. Inks and substrates from second source suppliers may improve or worsen adhesion. Some plastics require surface treatment to enhance adhesion. DYMAX 4-20586 responds well to surface treatment.
- Hardness.** Both soft and hard coatings can be scratch resistant. Hard coatings resist scratching because of their hardness. Soft coatings resist scratching because they momentarily dent and then spring back when the scratching object is withdrawn. Hard coatings are measured on the D-hardness scale. Soft coatings are measured on the A-hardness scale. On both scales, higher numbers imply harder coatings.
- Environmental Durability.** Coatings should be lifetime tested on your product. Some properties, like UV weatherability, provide a relative guideline to distinguish endurance of clarity and durability among the available products offered.

## Industrial Dome and Decorative Coatings Selector Guide

Product	Applications	Characteristics	Hardness Durometer <sup>(1)</sup>	Viscosity (cP)	Relative Weatherability
<b>Dome Coatings</b>					
4-20564	Small decals (up to .25" x .5")	Hard scratch resistant surface; resists yellowing	D-75	6,000	Limited outdoor <sup>(3)</sup>
4-20435	Pen tops and small labels (to .25" x .5")	Hard scratch resistant surface; resists yellowing	D-75	3,400	Excellent indoor
4-20577	Medium decals (up to 1" x 3")	Surface springs back from dents; difficult to scratch; resists yellowing	A-70	1,500	Limited outdoor <sup>(3)</sup>
4-20429	Large decals (up to 1" x 8")	Surface springs back from dents; resists warping	A-70	1,500	Good indoor
4-20586	Plastic and metal name badges	Cures with lowest intensity lamp	D-60	1,200	Indoor only
4-20508	Plastic and metal name badges	Hard scratch resistant surface; resists yellowing	D-80	800	Excellent indoor
4-20630	Medium decals (up to 1" x 2")	Surface springs back from dents; difficult to scratch; resists yellowing	A-75	800	Limited outdoor <sup>(3)</sup>
4-20645	Small decals and objects	UV curable "rubber feet"; clear antiskid coating	A-75	600	Good indoor
<b>Decorative Coatings</b>					
4-20624 <sup>(2)</sup>	Matte finish, low gloss, low viscosity	Low gloss is atypical of UV coatings	D-85	800	Good indoor
4-20630	High gloss	Hard, high gloss coating	D-80	100	Limited outdoor <sup>(3)</sup>

(1) Durometer Hardness (A = soft; D = hard)

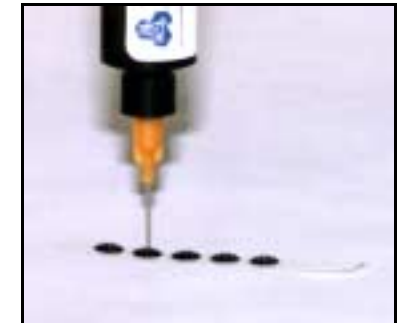
(2) Shear sensitive coating; is easy to apply as a very thin coating

(3) Does not withstand three (3) weeks QUV test

# Dome Coating Applications



DYMAX 4-20435 resin is used to seal a label in a pen cap.



DYMAX 4-20564 is used to continuously coat logo decals.



DYMAX 4-20577 is used to coat a medium size decal.



DYMAX 4-20508 with a high gloss finish is used to decoratively coat key chains.



DYMAX 4-20624 and 4-20638 low and high gloss coatings are used to entirely cover the handles of knives.



DYMAX 4-20508 is used as a high gloss dome coating on a nameplate.

# UV Lamp Selection is Critical to a Successful Process

The UV curing lamp used affects appearance and feel of a coating. Although the highest power lamp will cure the coating fastest and produce the smoothest, slickest surface, it may also warp, yellow or melt the object being coated (and it will cost the most). It is always best to test an application with several light sources. Lifetime tests sometimes favor one lamp system over another.

Send parts to the DYMAX Technical Center for coating and curing trials with various lamps so that the best and most economical system for the application may be selected.

## DYMAX Has What You Need for Safe UV Processing and Process Control

DYMAX equipment is shielded so that operators and others are not exposed to UV light. DYMAX also supplies protective goggles and face shields. The DYMAX ACCU-CAL™ 30 radiometer, an essential tool for measurement and control of the light curing process, is also available.

## Match a DYMAX Curing System to the coatings and application for the best process, every time!

Applications	Recommend Lamps	Considerations
Small decals and pen tops on rigid substrates	5000-EC or conveyor with Fusion D-bulb	
Large decals on rigid substrates	5000-EC or 2000-EC followed by 5000-EC	Second option manages heat
Small decals on flexible substrates	2000-EC	
Medium and large decals on flexible substrates	2000-EC or black light followed by brief exposure to shortwave light or a high power lamp	Second option manages heat and possible label warpage



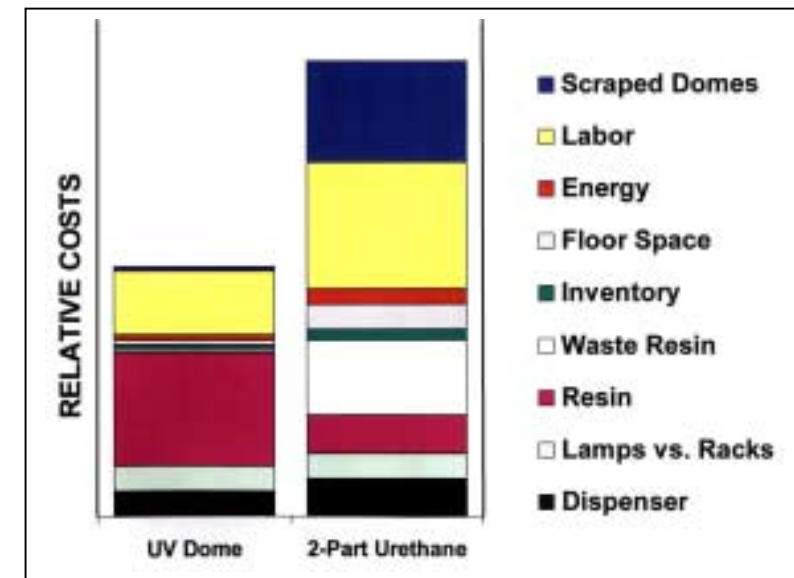
Shielded Light Curing Chambers



Conveyorized Curing Systems

# Upgrade Your Plant!

DYMAX coatings combined with DYMAX light curing systems can save you **TIME, MONEY, and IMPROVE** the **QUALITY** of the workplace!



- UV coatings cure in seconds
- Greater productivity
- J.I.T. process and delivery
- Less inventory
- Eliminate hundreds of racks
- Eliminate ovens
- Regain floor space
- Eliminate mercury and isocyanates from the workplace

## Advantages of DYMAX Dome and Decorative Coatings

Feature	Benefits
Faster Production	<ul style="list-style-type: none"> <li>• Faster customer response</li> <li>• Reduced order to shipment time</li> <li>• Greater productivity</li> </ul>
"Cure on Demand"	<ul style="list-style-type: none"> <li>• Instant light cure "locks out" airborne contamination</li> <li>• Cure occurs when and where you want it</li> </ul>
One-Part Resin	<ul style="list-style-type: none"> <li>• Consistent viscosity means fewer rejects; less scrap</li> <li>• Less chance for air entrapment; improved yield</li> <li>• Reduced purge and resin waste disposal</li> <li>• Eliminates the need for meter mix equipment</li> </ul>
Small Footprint	<ul style="list-style-type: none"> <li>• Frees factory space for more production</li> </ul>
Less Labor	<ul style="list-style-type: none"> <li>• Reduced costs</li> </ul>
No Mercury No Isocyanates	<ul style="list-style-type: none"> <li>• Fewer health and safety issues</li> <li>• Fewer disposal issues and costs</li> </ul>