Light-Curable Dome and Decorative Coatings

Advanced Coating Technology for Faster, Efficient Processing

DYMAX Light-Weld® and Ultra Light-Weld® light-curable dome coatings create crystal-clear protective coatings in seconds upon exposure to ultraviolet light. The instant, on-demand cure "locks out" airborne contamination. Optimized product flow allows consistent shape, producing consistent domes, resulting in fewer rejects. The higher-viscosity coatings are engineered for producing curved domes, which optically magnify and enhance the appearance of labels and images. Fast cure times allow for greater productivity and less inventory. No mixing, racks, or ovens are required. UV curable dome and decorative coatings are solvent free and do not contain mercury or isocyanates. Light-curable dome and decorative coatings are ideal for coating labels, badges, nametags, pens, key chains, decals, and novelties.

Dome-Coated Pen Tops

Upgrade Your Manufacturing Plant!

DYMAX coatings, combined with DYMAX light-curing systems, can save you time and money and improve the quality of the workplace!

- Crystal-clear, protective coatings cure in seconds
- Greater productivity
- Reduced work in process
- Eliminate racks, saving floor space
- Eliminate ovens to lower energy costs
- Regain floor space
- Eliminate mercury and isocyanates from the workplace

Feature	Benefits
Faster Production	Faster customer response Reduced order-to-shipment time Greater productivity
"Cure on Demand"	Instant light cure “locks out” airborne contamination Cure occurs when and where you want it
One-Part Resin	Consistent viscosity allows for consistent product flow Less chance for air entrapment; improved yield Reduced purge and resin waste disposal Eliminates the need for meter-mix equipment
Small Footprint	Frees factory space for more production
Less Labor	Reduced costs
No Mercury **No Isocyanates**	Fewer health and safety issues Fewer disposal issues and costs

Dome-Coated Novelty Products

Considerations for Selecting a Coating

1. ***Viscosity***. How thick does the coating need to be? 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.

2. ***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.

3. ***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. 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.

4. ***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.

5. ***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.

Product	Applications	Characteristics	Hardness Durometer(1)	Viscosity (cP)	Relative Weatherability
Dome Coatings					
Light-Weld® 4-20508	Doming nameplates, key chains, and pens	Rigid; scratch-resistant surface; clear; moderate dome	D80	735	Excellent indoor
Light-Weld® 4-20564	Coating small polyester labels, metal, and plastics	Very high dome profile; scratch resistant; clear	D80	6,000	Limited outdoor
Light-Weld® 4-20577	Coating small- and medium-size polyester labels	Clear; soft; flexible; springs back when dented	A70	1,500	Excellent indoor
Decorative Coatings					
Ultra Light-Weld® 4-20638	Coating novelty items such as knives and nameplates	Low viscosity for thin coating applications; high gloss; abrasion-resistant surface	D85	65	Limited outdoor

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

Process Tips for Successful Dome and Decorative Coating

Avoid Coating Running Over the Edge of the Label or Object

1. Coating 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 overflow.
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 coating encourages it to remain on the label.
3. On non-circular objects use an X-Y dispenser to dispense a pattern instead of a single drop. Pattern dispensing lets the coating 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

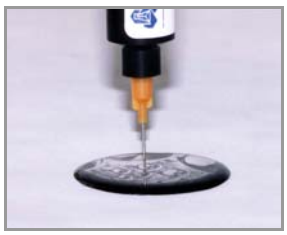
1. Purchase products in air-free packages (syringes or cartridges).
2. Dispense directly from the shipping container. If coating must be transferred from one container to another, then transfer the container at the end of the last shift.
3. Use low-pressure dispensing. Since pressure drops can pull air 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 coating may retract. When coating 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 pre-curing 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 pre-curing 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 coatings are necessary to prevent warpage.
3. Use of thicker polyester stock or stiffer backing sheets minimizes curl of domed decals.

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

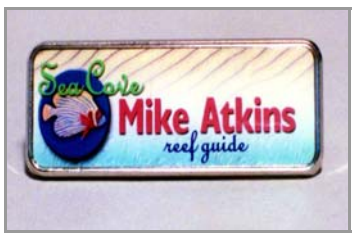
DYMAX 4-20564 is used to dome coat a pen cap.



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

DYMAX 4-20638 high-gloss coating is used to cover knife handles.

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



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

Light-Curing Lamp Selection is Critical to a Successful Process

The light-curing lamp used to cure a coating affects appearance and feel. 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 your parts to DYMAX Applications Engineering 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. DYMAX supplies protective goggles and face shields, and curing equipment is shielded so that operators and others are not exposed to UV light. The ACCU-CAL™ 50 radiometer, an essential tool for measurement and control of the UV light-curing process, is also available.

Match a DYMAX Light-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

Conveyorized Curing Systems

Radiometers for Process Control

Shielded Light Curing Chambers

For further assistance with adhesive and equipment selection, contact DYMAX Applications Engineering.

In the U.S. Call: 877.396.2988
In North and South America Call: +1.860.482.1010
In Europe Call: +49 (0) 69 / 7165-3568
In China Call: +86.755.83485759
In Asia Call: +852.2460.7038
In Korea Call: 82-2-784-3434

www.dymax.com ◆ www.dymax.de ◆ www.dymax.com.cn ◆ www.dymax.co.kr

DYMAX Corporation - 318 Industrial Lane - Torrington, CT 06790 - Phone: 860.482.1010 - Fax: 860.496.0608 - E-mail: info@dymax.com - www.dymax.com

DYMAX Europe GmbH - Trakehner Strasse 3 - D-60487 Frankfurt am Main - Germany - Phone: +49 (0) 69 / 7165-3568 - Fax: +49 (0) 69 / 7165-3830 - E-mail: dymaxinfo@dymax.de - www.dymax.de

DYMAX UV Adhesives & Equipment (Shenzhen) Ltd - Unit 807, Talfook Building, No. 9 Shi Hua Road, Futian Free Trade Zone, Shenzhen, China 518038 - Phone: +86.755.83485759 - Fax: +86.755.83485760 - E-mail: dymaxasia@dymax.com - www.dymax.com.cn

DYMAX Asia (HK) - Unit 1006, 10/F., Carnarvon Plaza, No. 20, Carnarvon Road, T.S.T., Kowloon, Hong Kong - Phone: +852.2460.7038 - Fax: +852.2460.7017 - E-mail: dymaxasia@dymax.com - www.dymax.com.cn

DYMAX Korea LLC - #903, CCMM B/D, 12 Yeoido-Dong, Youngdungpo-Gu, Seoul, Korea, 150-869 - Phone: 82-2-784-3434 - Fax: 82-2-784-5775 - E-mail: info@dymax.kr - www.dymax.co.kr

LIT217 Rev. 4/9/2010