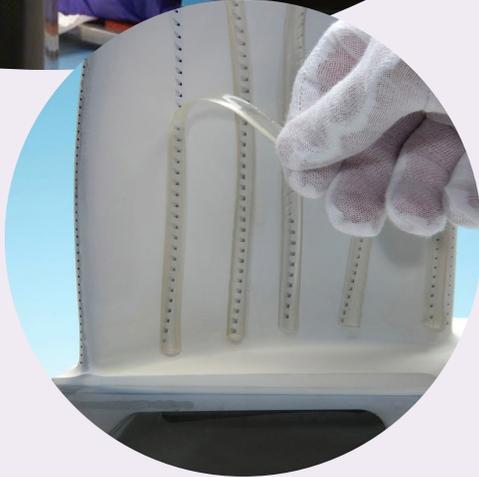


## SPEEDMASK® MASKANTS PRODUCT SELECTOR GUIDE



Only Dymax offers expert knowledge of light-cure technology, along with a full array of light-cure products. Dymax is committed to developing a true collaborative partnership — applying our extensive process knowledge to your specific application challenges.

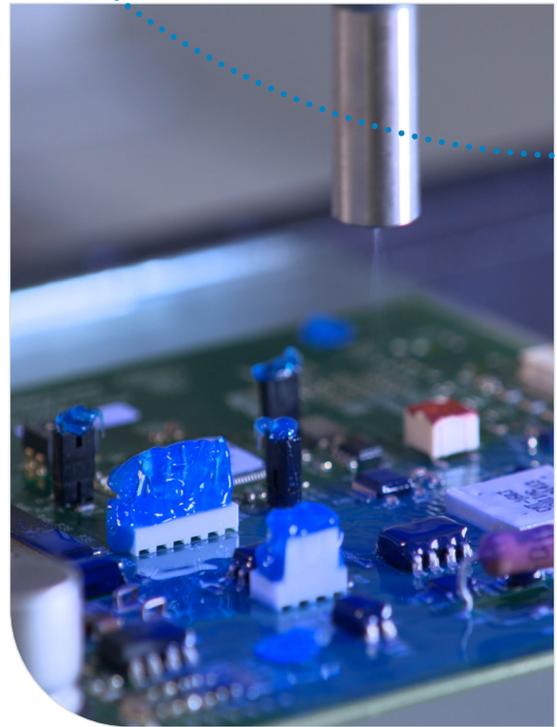
We create custom solutions to ensure that chemistry and equipment work seamlessly together with maximum efficiency. Our application engineering team works side-by-side with our customers, providing assistance with formulation, testing, evaluation, and pre-production trials. We also offer an extensive inventory of curing equipment, manual and automated dispensing systems to help you achieve a more efficient, cost-effective manufacturing process.

# About Dymax

Dymax Corporation is an ISO 9001 registered manufacturer of light-curable adhesives, coatings, oligomers, light-curing equipment, and fluid dispense systems. Dymax products provide design, research, and manufacturing engineers value-added tools to dramatically improve manufacturing efficiency and lower costs.

Since pioneering light-cure technology over 40 years ago, Dymax has continued to develop innovative ways to co-optimize the assembly process with customer-centric solutions that meet today's application challenges. Dymax owns over 30 patents and has a worldwide network of technical experts who understand manufacturers' demands and assist them with adhesive selection, dispensing options, curing recommendations, component design, and process validation.

The company's headquarters are located in Torrington, CT USA, with additional facilities in the USA, Germany, Ireland, China, Hong Kong, Korea, and Singapore.



## Our Commitment to Greener, Safer Manufacturing

Dymax is committed to green manufacturing that reduces environmental impact, conserves energy, and provides greater worker safety. Over the last 40 years, our light-curable materials and curing equipment have become the industry standard for fast, environmentally conscious assembly. Dymax products are readily replacing technologies that contain hazardous ingredients, produce waste, or require higher amounts of energy to process.



Eco-friendly, one-component materials



Materials without solvents and other materials of concern for improved worker and user safety



Fast curing products and equipment designed for less energy consumption



Dymax products conform to regulatory standards like RoHS and REACH



## SpeedMask® Process Guide

SpeedMask® light-curable temporary maskants provide reliable protection of component surfaces and cavities, PCB connectors, and keep out areas during surface finishing and preparation operations for metal, glass, and some plastics, as well as conformal coating of PCBs. They cure in seconds upon exposure to UV/Visible light and replace traditional masking materials, such as tapes, lacquers, waxes, boots, and caps.

Light-curable maskants are used successfully in many industries, including aerospace and defense, power generation, metal finishing, and the manufacturing of orthopaedic implants, medical devices, and consumer electronics. SpeedMask resins are easily applied by syringe or through dipping, spraying, or screen-printing, and are available in peelable or burn-off grades that leave component surfaces residue-free.

SpeedMask® maskants offer the following advantages over traditional masking methods:

- Apply and cure in seconds
- Residue-free surfaces after proper curing
- Reliable protection for complex and intricate configuration
- No additional investment for design changes or new components
- Superior protection with a single coat
- Masked components are immediately ready for production

### Anodizing

Anodizing masks feature chemical resistance for better surface protection of components from the strong acids used in the anodizing process. Cured SpeedMask maskants protect the substrate surface while the oxide layer of coating (which changes the microscopic texture of the component surface) is applied. These materials can tolerate most Type I (Chromic Acid), Type II (Sulfuric Acid), or Type III (Hard coat) anodizing processes.

### Plating

Plating masks feature chemical and heat resistance and provide superior surface protection of components during plating processes where particles are deposited onto conductive surfaces. SpeedMask maskants are able to withstand the most common plating processes such as Electroless Nickel (Ni), Platinum (Pt), Chrome (Cr), Gold (Au), Silver (Ag), and Copper (Cu). Plating masks are available in low, moderate, and high levels of adhesion to accommodate the various operating temperatures of plating baths.

### Acid Stripping

Acid stripping masks withstand soaking in hot acid without permeation or seepage under the mask. When cured, SpeedMask maskants provide superior surface protection from chemical processing of nickel super alloys, steel, and titanium. They hold up to the surface preparation of grit blasting, which may be required prior to, or in combination with, the hot-acid soak. These masking resins can tolerate most acid soaks such as Hydrochloric (HCl), Nitric (HNO<sub>3</sub>), Acetic (CH<sub>3</sub>COOH), Phosphoric (H<sub>3</sub>PO<sub>4</sub>), Hydrofluoric (HF) or various combinations of the acids.

## Chemical Milling/Etching

Chemical milling masks have enhanced chemical resistance and superior surface protection from the strong acids and alkalis used in dissolving metal substrates during the chemical milling process. Cured SpeedMask maskants can be trimmed to provide defined edge boundaries and accommodate the most complex and intricate components, while still providing excellent protection with no leakage. These resins withstand the typical 200°F+ Nitric Acid (HNO<sub>3</sub>) and Hydrofluoric Acid (HF) solution used for the chemical milling of titanium components and typical Sodium Hydroxide (NaOH) and Potassium Hydroxide (KOH) solutions used for the chemical milling of aluminum components.

## Air Plasma Spray and HVOF

Air plasma spray masks provide superior surface protection during thermal barrier coating processes. SpeedMask maskants are resistant to the aggressive force and heat of flame-spray processes. The cured masks absorb the energy from the force of plasma spray materials, such as zirconium, Molybdenum (used for thermal protection), Tungsten Carbide, or ceramics used for wear-resistant coatings. As the melted particles from the flame spray are deposited onto the substrate, the cured masking resin protects the surface underneath the protected area.

## Painting, e-Coating, and Powder Coatings

SpeedMask maskants offer superior surface protection of components during painting, e-coating, and powder coating, and are resistant to the heat and chemical exposure during these processes.

## Grit Blasting

Grit-blasting masks are resilient to both smooth and sharp particles and the pressure used during grit-blasting surface treatment. Cured SpeedMask maskants provide reliable protection from media such as aluminum oxide, garnet, plastics, and organic media. The cured resin absorbs the energy from the air stream blast, while the media bounces off the masked surface, protecting the area underneath.

## Shot Peening

Shot-peening masks have superior surface protection during the shot-peening, plastic-deformation surface-treatment process. Cured SpeedMask maskants are resistant to various peening media (such as cut wire,

round metal, ceramic particles, and glass beads) and the pressures used in peening applications. The cured resin absorbs the energy from the ball-peen hammer effect of the media blast, while the media bounces off the masked surface, protecting the area underneath.

## Vibratory Finishing

SpeedMask maskants provide reliable surface protection of intricate and complex configurations during vibratory finishing operations such as slurry, tumbling, or deburring. These masks withstand the compound solution (soap, water, or alternative cleaning/polishing agents) and abrasion from ceramic, plastic, or steel media while vibrating during the finishing process.

## Machining

Machining, buffing/polishing, and laser drilling masks provide excellent protection during the milling, grinding, drilling, polishing, and turning of turbine and metal components, orthopaedic implants, surgical instruments, medical devices, as well as glass and plastic substrates. The durability of the cured SpeedMask maskants allow the maskants to be machined through, without any lifting of the remaining masks, while continuing to provide reliable protection of the masked surfaces. These maskants can withstand various water-soluble and oil-based coolants used in machining, as well as absorbing the energy from laser drilling during the installation of cooling holes.

## Airflow Testing

When cured, SpeedMask airflow-testing masks allow for complete sealing of cooling holes and core cavities of turbines and other components, for either row-by-row or mass airflow testing. They also provide complete sealing, preventing air leaks during pressurized flow, leak, and duration testing.

## Conformal Coating

SpeedMask PCB maskants provide circuit board protection during conformal coating, wave solder, and reflow processes. SpeedMask is compatible with gold and copper connector pins. The masks are peelable for easy removal and resistant to UV and solvated conformal coatings.

# SpeedMask® Products

Product	Chemistry	Characteristics	Viscosity, cP (20 rpm) Nominal	Uncured Appearance	Durometer Hardness	Elongation at Break, %	Modulus of Elasticity, MPa [psi]	Cure Time* (Seconds)
726-SC	UV/Visible	See-Cure technology; excellent surface protection; easy peel off after heat exposure; spray or dip	52,000	Blue Gel	D40	160	3.9 [560]	8
758-H	UV/Visible	Secondary heat cure; low shrinkage; trimmable; sprayable; optimized to cure with 405 nm LED	10,000	Red Opaque Gel	A80	140	2.3 [330]	45
7601	UV/Visible	Color change upon cure; moderate adhesion; blue fluorescing; resistant to strong acids and etchants; trimmable	25,000	Translucent Pink Gel	A63	180	48.2 [7,000]	3
9-20479-B-REV-A	UV/Visible	Exceptionally thixotropic for manual or automated dispense; compatible with gold and copper pins	115,000	Translucent Blue Gel	A75	140	4.13 [600]	60
9-7001	UV/Visible	Compatible with gold and copper pins; lower shrinkage; non-slumping; resistant to solvent-based conformal coatings and primers	40,000	Translucent Pink Gel	A70	180	1.9 [275]	3
706	UV	High adhesion; excellent surface and cavity protection; hard/durable; chemical resistance	47,500	Colorless Gel	D75	5.5	965 [140,000]	40
707	UV	Prevents beam impingement; secondary heat cure for shadowed areas; reduces spatter; hard/durable	500	Colorless Gel	D70	71	270 [39,000]	1
718	UV/Visible	High adhesion; excellent surface and cavity protection during APS and HVOF; resists flame spray processes	46,000	White Paste	D80	3	965 [140,000]	30
724	UV/Visible	Good surface protection; fast curing; easy peel off	70,000	Colorless Gel	D40	200	2.7 [390]	15
728-G	UV/Visible	High adhesion; excellent surface protection to aggressive chemical processes; easy removal after hot-water soak; sprayable	25,000	Green/Blue Gel	D55	230	83 [12,000]	10
728-G-LV	UV/Visible	High adhesion; excellent surface protection to aggressive chemical processes; spray or dip	2,500	Green/Blue Gel	D50	260	293 [42,500]	17
729	UV	High adhesion; hard and durable; resists acid; spray or dip	20,000	Colorless Gel	D75	19	289 [42,000]	30
730-BT	UV/Visible	Excellent chemical resistance; spray or dip; trimmable after cure; easy peel off; ISO 10933-5	22,000	Blue Gel	D35	300	3.4 [500]	4
731-REV-A	UV/Visible	Excellent surface protection; sprayable; easy peel after hot-water soak; high adhesion; fluoresces yellow	18,000	Bright Yellow Gel	D55	300	28 [4,200]	70
733-G-REV-A	UV/Visible	Excellent surface protection; sprayable; fast curing; easy peel off	25,000	Green Gel	D50	294	193 [27,960]	10
734-BT	UV/Visible	Excellent surface protection and chemical resistance; moderate adhesion; spray or dip; trimmable after cure	24,000	Blue Gel	D25	220	5.5 [800]	5
740-BT	UV/Visible	Low-medium adhesion; compatible with MEK-based and heat-cure paint	45,000	Blue Gel	A65	203	2.42 [350]	35
750	UV/Visible	High adhesion; cures tack free; hard and durable; resilient to blast media	30,000	Translucent Pink Gel	A50	140	2.5 [370]	45
750-SC	UV/Visible	Turns purple to pink after sufficient exposure to UV/Visible light; sprayable; high adhesion	30,000	Translucent Purple Gel	A85	140	4.4 [640]	10
7701	UV/Visible	For metal finishing; flexible after heat exposure; low-medium adhesion; spray or dip	45,000	Colorless	D30	225	7.6 [1,100]	1
9-318-F	UV/Visible	Medium adhesion; blue fluorescing; highly thixotropic for manual or automated dispense	50,000	Translucent Yellow	A55	130	2 [310]	1

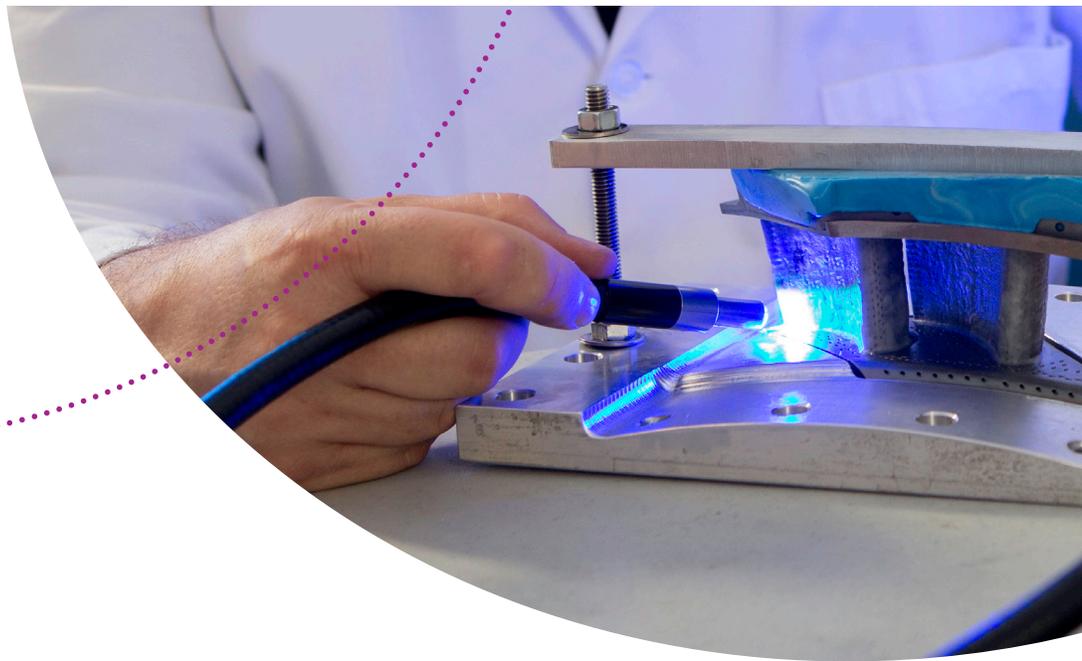
Featured Product

\*Cure time based upon Dymax 5000-EC Light-Curing Flood Lamp (200 mW/cm<sup>2</sup>)

Product	Removal Options	Chemical Processes				Coatings			Media Finishing			Manufacturing Aids				PCB Processes	
		Anodizing	Plating	Acid Stripping	Chemical Etching	Air Plasma Spray	HVOF	Painting & Powder Coatings	Grit Blasting	Shot Peening	Vibratory Finishing	Machining	Buffing/Polishing	Airflow Testing	Laser Drilling	Conformal Coating	Wave Solder/Reflow
726-SC	Peelable		•		•**	•		•	•	•							
758-H	Peelable or Incineration		•	•					•								
7601	Peelable	•	•	•					•								
9-20479-B-REV-A	Peelable															• light cure	•
9-7001	Peelable															• solvent based	•
706	Incineration			•		•						•					
707	Incineration													•			
718	Incineration					•	○										
724	Incineration							•	•	•			•				
728-G	Peelable or Incineration		•	•					•	•	•	•	•				
728-G-LV	Peelable or Incineration		•	•					•	•	•	•	•				
729	Incineration		•	•													
730-BT	Peelable or Incineration	•	•		•				•	•							
731-REV-A	Peelable or Incineration	•	•						•	•	•						
733-G-REV-A	Peelable or Incineration					•	○		•	•							
734-BT	Peelable or Incineration	•	•	•	•	•	○		•	•	•		•				
740-BT	Peelable or Incineration							•									
750	Peelable or Incineration					•	○		•		•	•					
750-SC	Peelable or Incineration	•	•			•	○		•								
7701	Peelable	•	•					•	•	•							
9-318-F	Peelable															• light cure	•

Featured Product

\*\* Decorative Etching



## Innovative Technologies

As an innovator in the adhesive and coating industries, Dymax strives to create new technologies that help manufacturers increase process efficiency, productivity, and throughput while decreasing costs and inventory. Through the years, our dedication to innovation has resulted in over 30 oligomer, adhesive, and equipment patents and numerous awards for our innovative technologies and service.

Our R&D experts are always striving to create new technologies that will help manufacturers improve their processes. Our current portfolio of technologies provide a variety of benefits including easier bond line inspection and cure confirmation for better quality control, faster cures for quicker processing, and curing in shadowed areas to eliminate concerns about uncured material.

### Confirm Placement & Cure - Patented See-Cure Technology

Dymax adhesives formulated with See-Cure technology have built-in cure validation that makes it easy for operators or simple automated inspection equipment to confirm cure without investing in additional specialized equipment. These materials are bright blue in their uncured state, making them highly visible when dispensed onto substrates. Workers can easily confirm the adhesive placement and quantity with just their eyes.

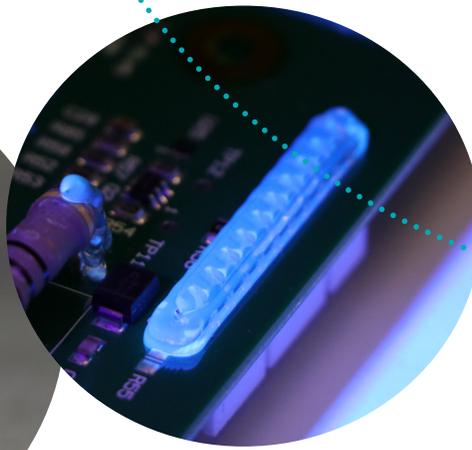
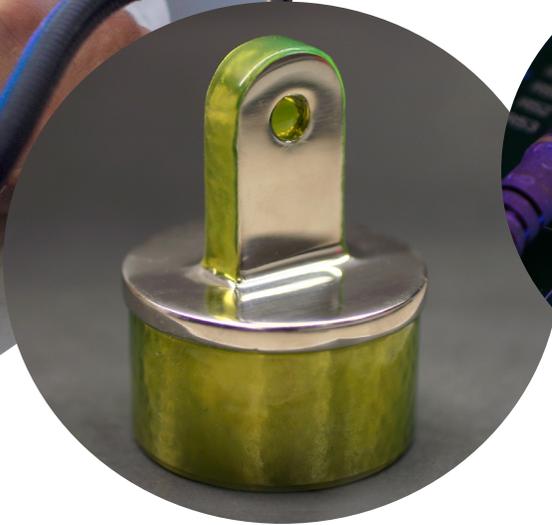
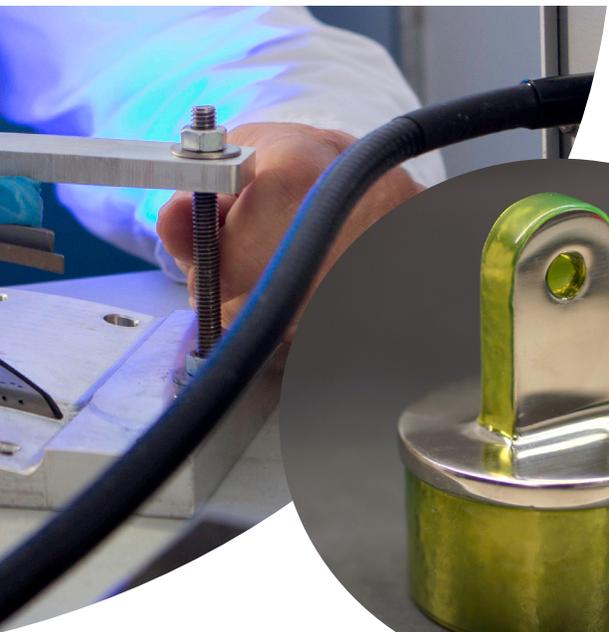
After the adhesive is exposed to light, the color transitions from blue to colorless. This cure indicator ensures the adhesive is completely cured, providing a critical safety feature for manufacturing processes. Maskants are also available in blue to pink and purple to pink versions.

### Enhance Bond-Line Inspection - Fluorescing Technology

SpeedMask maskants are available with blue, yellow, or Ultra-Red® fluorescing technology. The maskants fluoresce brightly when exposed to low intensity black light, allowing easy in-line inspection of bond lines.

Dymax Ultra-Red® technology is ideal for use on materials that naturally fluoresce blue. Ultra-Red® fluorescence does not absorb the same wavelengths as those used to cure the mask, resulting in faster, deeper cures when compared to blue fluorescing products.

The Ultra-Red® fluorescing compound is patented and exclusive to Dymax. When measured, this compound produces a unique energy peak that cannot be reproduced by other fluorescing compounds. This offers manufacturers the ability to assemble or mark their products so they can be positively identified.



### **Cure in Shadows - Multi-Cure® Light/Heat-Cure Technology**

Multi-Cure adhesives and coatings combine the high-speed cure of UV or UV/Visible light with secondary cure mechanisms that enhance polymerization. Secondary cure mechanisms, which include moisture, thermal, or activator cure, are useful when light can only reach a portion of the bond line, or when tacking a part prior to final cure to allow easier handling and transport during the manufacturing process.

### **Enhance Bond-Line Inspection & Confirm Cure Encompass® Technology**

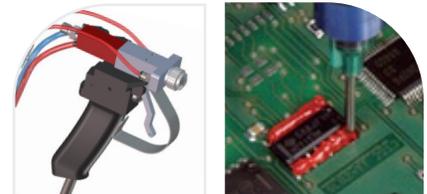
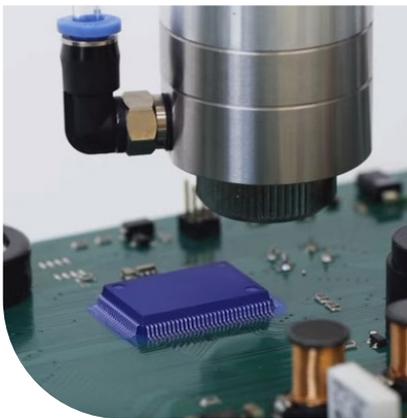
Dymax adhesives formulated with Encompass® technology incorporate Dymax exclusive Ultra-Red® fluorescing and See-Cure color-change technologies into one light-curable product. As a result, manufacturers gain efficiencies from rapid on-demand curing with easy cure confirmation and post-cure bond-line inspection.

### **Speed up Production with Faster Cures - LED Light-Curing Technology**

Dymax offers specially formulated LED light-curable adhesives that are optimized to work seamlessly with Dymax LED light-curing systems. The adhesives range from fast to ultra-fast cure speeds in order to accommodate specific assembly needs. LED-curing equipment is available in a number of different styles including spot lamps, flood lamps, and conveyors to accommodate various process requirements.

# Dispensing Equipment

Dymax has developed high-quality, field-proven dispense systems to fit many types of adhesive and fluid dispensing applications. These systems include various automated and manual dispensing valves, spray valves and guns, controllers, material reservoirs, and related components for seamless integration into assembly processes. The systems provide accurate, consistent dispense for a range of low- to high-viscosity fluids. Dispensing systems with adjustable suck-back control and dispensing valves that offer contaminate-free dispensing are available.



## SD-200 Digital Syringe Dispenser

This dispensing system is ideal for use as an operator work station and can also be integrated into an automated process if needed. It provides an accurate way to dispense low-to-high viscosity materials from a syringe. The system is easy to set up and operate.

## eco-PEN450 Dosing System

The eco-PEN 450 is ideally suited for dispensing very precise volumes of low- to medium-viscosity materials. It offers maximum volumetric precision for both dot and bead applications, making it an excellent choice for masking components on PCB boards or other small-area applications.

## eco-SPRAY Precision Micro-Spray System

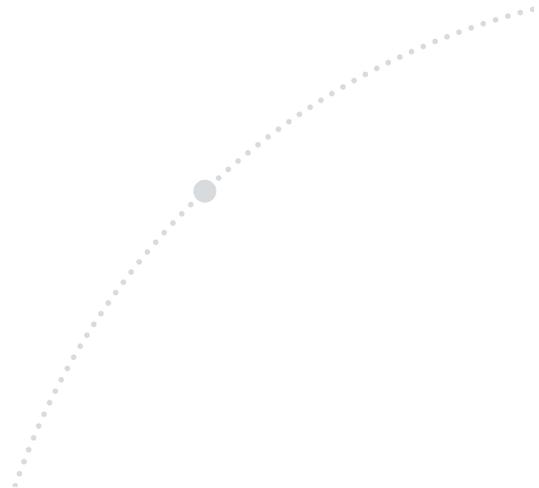
This micro-spray system is excellent for a wide range of applications and for use with a variety of low- to high-viscosity spray media. Users can achieve a variety of spray volumes, from dot to endless spraying.

## SG-200 Super-Flow Spray Gun System

Dymax SG-200 super-flow spray gun systems are designed for masking and coating applications where a significantly higher flow rate is required. The systems are ideal for dispensing fluids with viscosities up to 80,000 cP. If you are manually masking a large area, this is a great option.

## Model 400 Hand-Held Needle Valve System

The Model 400 needle valve is designed for dispensing very precise dots or fine beads of low- to medium-viscosity materials. The valve is hand-held but is compact and lightweight, making it easy and comfortable to handle.



# Light-Cure Systems

Dymax designs and manufactures a wide range of curing equipment including spot lamps, flood lamps, and conveyor systems, as well as radiometers and other accessories. Dymax systems are optimized to work with light-curable adhesives to gain process efficiencies by targeting rapid surface curing, depth of cure, and speed of cure, all while delivering light in a rapid and economical way. CE marked equipment is available.



## Spot Lamps

Spot lamps provide a variety of methods to deliver light to a very precise location. They can be used manually by an operator or incorporated into a high-speed automated assembly line. Dymax offers multi-spectrum light-emitting lamps which use high-pressure mercury vapor bulbs, as well as light-emitting diode spot lamps, which use an array of surface-mounted LEDs instead of traditional metal halide or mercury bulbs.

### BlueWave® 200

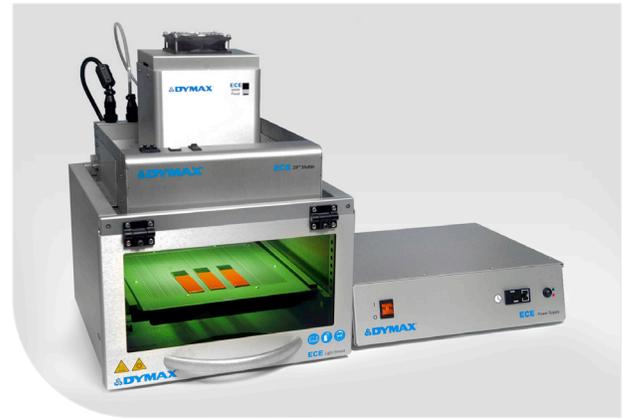
- UV curing with adjustable intensity
- Ideal for fast processing of small curing areas
- Suited for manual or automated processes

### BlueWave® MX-150

- Emitter design for set up flexibility and consistent intensity
- LED curing emitters in 365, 385, and 405 nm
- PLC interface

### BlueWave® QX4

- One controller controls up to four LED heads
- LED heads available in 365, 385, and 405 nm
- PLC interface



## Flood Lamps

Static flood-lamp systems are suited for area curing or for curing multiple assemblies. Dymax offers UV models which use moderate- to high-intensity, multi-spectrum UV/Visible light and LED models that use light-emitting diodes for fast curing. Dymax flood lamps can be easily integrated into existing manufacturing processes by mounting the lamps above high-speed assembly lines to achieve rapid cures. Shutter assemblies, mounting stands, and shields are available to create a custom curing system.

### EC or ECE 5000 Flood Lamp Systems

- Most popular and versatile
- Great for curing larger parts
- 5" x 5" curing area with 225 mW/cm<sup>2</sup> initial intensity

### EC or ECE 2000 Flood Lamp Systems

- Flood lamp with the largest cure area (8" x 8")
- Ideal for LED and masking applications
- 105 mW/cm<sup>2</sup> initial intensity

### BlueWave® AX-550 LED Flood Lamp Systems

- Compact, all-in-one design
- 5" x 5" curing area with up to 800 mW/cm<sup>2</sup> initial intensity
- Available in 365, 385, and 405 nm



## Conveyor Systems

Conveyor systems consist of a moving belt that passes through a curing tunnel with multi-spectrum lamps mounted above or on each side for rapid curing of parts. These conveyor systems are designed to offer consistent, fast, and safe curing. They can be outfitted with standard metal halide (longwave UV), mercury (shortwave UV), visible bulbs, or LED flood arrays. Consistent line speed, lamp height, and intensity provide a consistent light-curing process for high throughput.

### WIDECURE® Conveyor System

- 24" curing width for processing larger parts
- Line speeds from 4-30 feet per minute, adjustable in 0.1 fpm increments

### Edge-Carry Conveyor System

- Items move through the conveyor on a chain rail instead of a traditional mesh belt
- Ideal for curing low profile parts such as PCBs
- Chain rail is adjustable, accommodating part widths up to 12"

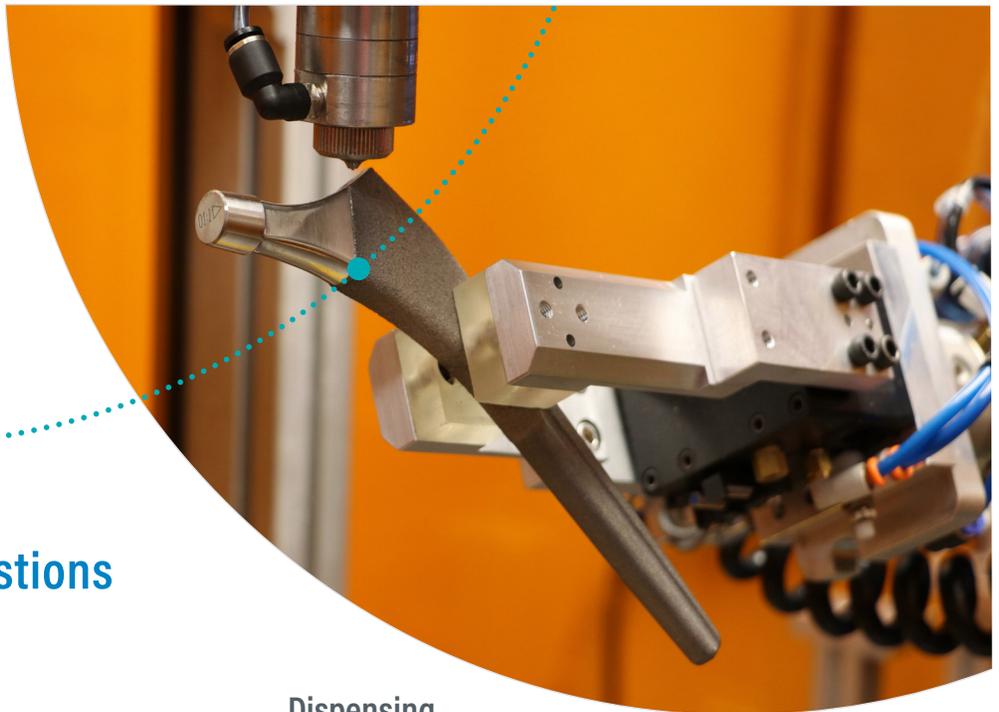
### UVCS Conveyor Systems

- Left, right, and top curing capability with 6"- or 12"-width cure area
- Available in a wide range of configurations with UV broad-spectrum or LED flood lamps



## Radiometers

Measurement of the lamp intensity and dosage is critical to the successful implementation of light-curing technology. Dymax radiometers allow operators to monitor and document a light-curing process.



## Frequently Asked Questions

### Application and Product Specific

**Q: What thickness is recommended for a mask?**

A: 0.015" (0.38 mm) is the recommended minimum thickness for a mask. We suggest that during the product evaluation a few thicknesses be tested to determine the appropriate thickness sufficient to hold up to each process.

**Q: How do you dispose of cured maskant?**

A: Cured maskant should always be treated in accordance with the local and state regulatory agencies. SpeedMask resins are 100% organic materials and considered to be an industrial plastic after curing. If the maskant has been exposed to plating baths or other chemicals, the user needs to consult their regulatory agency for guidance on disposal.

**Q: Are there fluorescing versions of SpeedMask?**

A: Yes, SpeedMask® 731-REV-A fluoresces yellow. SpeedMask® 7601 and 7602 fluoresce blue.

### Curing

**Q: Are SpeedMask® resins LED compatible?**

A: Yes. Some SpeedMask® resins such as 724, 726-SC, 728-G, 758-H, 7601, and 7602 are LED compatible. Please refer to the PDS for curing guidelines.

### Dispensing

**Q: Can I flush out a jetting valve with Acetone?**

A: The best choice is to flush a jetting valve with Isopropyl Alcohol. Acetone may leave a residue.

**Q: Would you recommend a ram pump or pressure pot to dispense masking resins?**

A: We recommend a ram pump for dispensing maskant from 15-liter or 1-gallon pails. The ram pump will prevent cavitation when compared to a pressure pot.

### Removal

**Q: Are there any ways to ease the removal of a cure peelable mask?**

A: The maskant can be exposed to warm air or ultrasonic bath at 150°F (66°C) for 3 to 5 minutes to ease the removal of the peelable maskant. Please consult *INF048 - SpeedMask Removal Infographic* for additional suggestions.

**Q: Can a mask be incinerated in a vacuum furnace process?**

A: SpeedMask resins can be incinerated in either an air or vacuum furnace.

**Q: Can a water jet be used to remove cured maskants?**

A: Yes, a water jet can remove some of the masking products. This removal process will need to be tested on a case-by-case basis.

# Reference Tables

## Viscosity

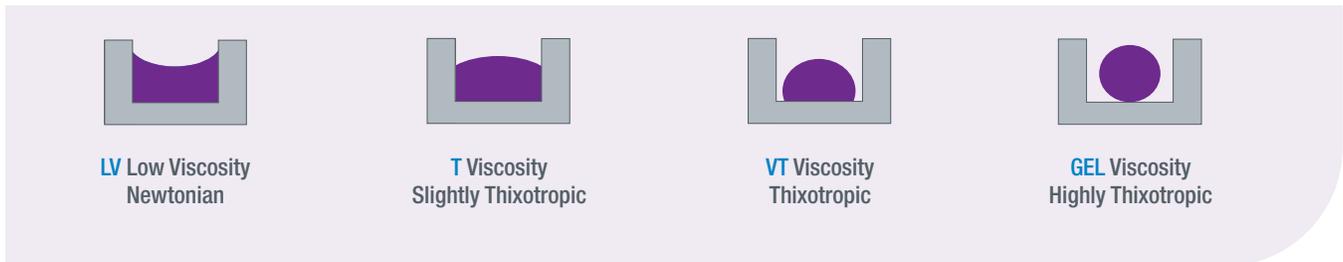
When choosing a viscosity, consideration should be given to how the adhesive must flow (or not flow) on the part after the adhesive is applied. Part geometry, process design, and assembly speed and method should all be considered when selecting viscosity. Viscosity is a material's resistance to flow. Low-viscosity adhesives flow more readily than high-viscosity adhesives. Thixotropic gels flow very slowly and are recommended when adhesive flow on a part after dispensing must be minimal.

Dymax adhesives are available in a variety of viscosities. The identifiers appear as suffixes on product names as follows:

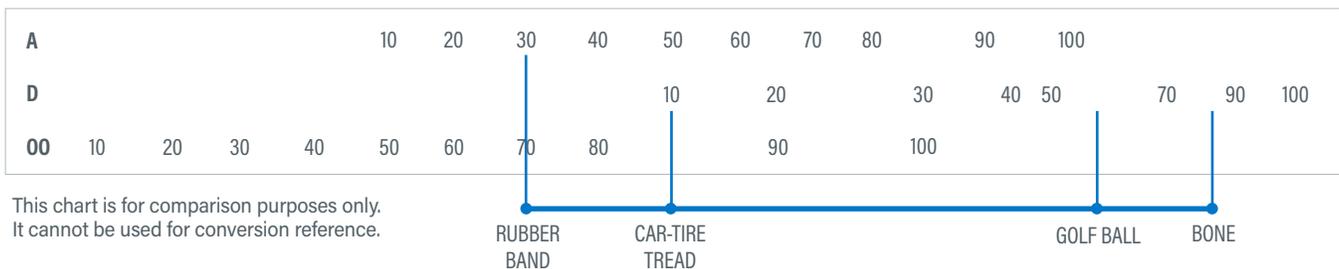
- VLV = Very Low Viscosity    VT = Very Thick
- LV = Low Viscosity            GEL = Gel
- T = Thick

Typical Centipose (cP/MPa)	Typical Reference Liquids at 20°C
1	Water
10	Kerosene
110	SAE 10 Oil
200	Maple Syrup
440	SAE 30 Oil
1,100	Castor Oil
3,000	Honey
10,000	Molasses
18,000	Chocolate Syrup
65,000	Vaseline
100,000	Sour Cream
200,000	Peanut Butter
1,500,000	Shortening

Standard viscosity products do not have a suffix.



## Hardness



This chart is for comparison purposes only. It cannot be used for conversion reference.

## Production Throughput Planner

1 Piece Every...	Minute	Hour	*Day (8 hours)	*Week (40 hours)	*Month (21 days)	*Year (50 weeks)
0.5 second	120	7,200	57,600	288,000	1,209,600	14,400,000
1 second	60	3,600	28,800	144,000	604,800	7,200,000
5 seconds	12	720	5,760	28,800	120,960	1,440,000
10 seconds	6	360	2,880	14,400	60,480	720,000
30 seconds	2	120	960	4,800	20,160	240,000
1 minute	1	60	480	2,400	10,080	120,000
5 minutes	-	12	96	480	2,016	24,000
10 minutes	-	6	48	240	1,008	12,000
30 minutes	-	2	16	80	336	4,000
1 hour	-	1	8	40	168	2,000

\*Based on 8-hour shifts.

## Estimating Usage

Bond-Line Gap or Coating Thickness	Theoretical Area Covered by 1 Liter of Adhesive or Coating
0.002" (51 μm)	30,500 in <sup>2</sup> (212 ft <sup>2</sup> ) (19.7 m <sup>2</sup> )
0.005" (127 μm)	12,200 in <sup>2</sup> (84.7 ft <sup>2</sup> ) (7.88 m <sup>2</sup> )
0.010" (254 μm)	6,100 in <sup>2</sup> (42.4 ft <sup>2</sup> ) (3.94 m <sup>2</sup> )
0.015" (381 μm)	4,070 in <sup>2</sup> (28.3 ft <sup>2</sup> ) (2.63 m <sup>2</sup> )

Bead Size	Theoretical Usage (Length per Liter)
1/32" (.79 mm)	66,300 in (1,684 m)
1/16" (1.6 mm)	16,600 in (422 m)
3/32" (2.4 mm)	7,400 in (188 m)
1/8" (3.2 mm)	4,100 in (104 m)
3/16" (4.8 mm)	1,900 in (48 m)
1/4" (6.4 mm)	1,000 in (25.4 m)



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