LIGHT-CURABLE MATERIALS FOR AEROSPACE & DEFENSE SYSTEMS

DYMAX®

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 Our Products

Since pioneering light-cure technology over 40 years ago, Dymax has continued to set new standards with innovative ways to co-optimize the assembly or repair/maintenance process with customer-centric solutions that meet today's application challenges. As the aerospace and defense industries evolve with new technologies to achieve longer engine service life, improved sensor imaging, and more durable printed circuit boards, components are pushing the limits of technologies. Dymax formulations are developed to address the growing industry challenges and demands for new technologies.

Environmental Benefits of Light-Curing Materials

Dymax understands that safe, ecologically friendly products benefit our customers, the environment, and us. We have created materials that minimize ecological impact. These attributes include:

- Materials with no added solvents
- Halogen-free materials
- RoHS compliance
- Eco-friendly, one-component materials

Dymax halogen-free conformal coatings, encapsulants, and adhesives are documented by an independent laboratory to meet or exceed standards set forth in IEC 61249-2-21. This international directive defines halogen-free as <900 ppm for chlorine, <900 ppm for bromine and <1,500 ppm total level of both combined. The current test method used for certification is BS EN 14582:2007.

REACH

Dymax endorses the outcome of the REACH program. We are pleased to report that we have registered all affected substances used at Dymax with the centralized database maintained by the European Chemical Agency (ECHA) in Helsinki.

Light-Curable Solutions for Aerospace & Defense Systems

Dymax manufactures light-curable materials, fluid dispense systems, and light-curing equipment that work together to optimize assembly processes. Our integrated light-cure solutions take into consideration all elements of the assembly process to provide design, research, and manufacturing engineers with solutions where chemistry and equipment work seamlessly together to increase process efficiency, improve product quality, and lower assembly costs. Some benefits that may be realized when using Dymax light-cure solutions include:

Minimized Risk/Enhanced Quality

- Formulations are matched to specific performance needs
- Materials and equipment are properly tested to ensure compatibility, reducing the chance for defects due to improper dispense or cure
- Materials that are absent of added solvents, volatiles, and materials of concern help ensure worker safety and regulatory compliance

Reduced Costs

- Fast cures increase production rates and reduce labor costs
- Patented technologies like See-Cure and Ultra-Red® make in-line inspection easy with no extra costs
- Improved quality reduces defects and ultimately waste and disposal costs
- On-demand cure and instant QC testing eliminate the need for excess inventory

Increased Efficiency

- Co-optimized adhesives and equipment provide the fastest cures for shorter cycle times
- On-demand cures reduce work-in-progress
- Small process footprint frees up space to perform other tasks
- No racking or heating required, saving time and floor space

Types of Dymax Light-Curable Materials

Adhesives

Dymax light-curable adhesives cure in seconds upon exposure to ultraviolet light and/or visible light, heat, or activator. The adhesives form high-strength, environmentally-resistant bonds to plastic, metal, and glass substrates. Because of their ability to bond to a wide variety of substrates, they excel at assembling dissimilar materials, something that cannot be done with traditional welding methods and other types of adhesives.

Conformal Coatings

Dymax manufactures UV/Visible light-curing conformal coatings to protect printed circuit boards. The conformal coating is applied to electronic circuitry to act as protection against moisture, dust, chemicals, and temperature extremes that if uncoated (unprotected) could result in a complete failure of the electronic system. Dymax conformal coatings are available in IPC approved, MIL-I-46058C, and UL listed self-extinguishing grades.

Encapsulants

Dymax encapsulants cure in seconds upon exposure to UV and/or visible light to provide tough, flexible protection for bare die, wire bonds, or integrated circuits (IC). The encapsulants' fast cure helps reduce processing and energy costs associated with alternative technologies. The materials are all one part, so no mixing is required and viscosity is consistent.

Form-In-Place Gaskets / Gap Fill

Light-curable form in place gaskets replace tape, PSA die-cut gaskets, 2K epoxies, silicone rope, and RTV sealants. The gaskets conform to complex and intricate channels, on both vertical and horizontal surfaces, with thixotropic formulations, and flow into channels with Newtonian formulations. Form-in-place gasket materials act as a barrier to prevent absorption or penetration of air, dust, noise, liquids, gaseous substances, or dirt for sound dampening, vibration dampening, moisture protection, chemical protection, air sealing, and gap filling.

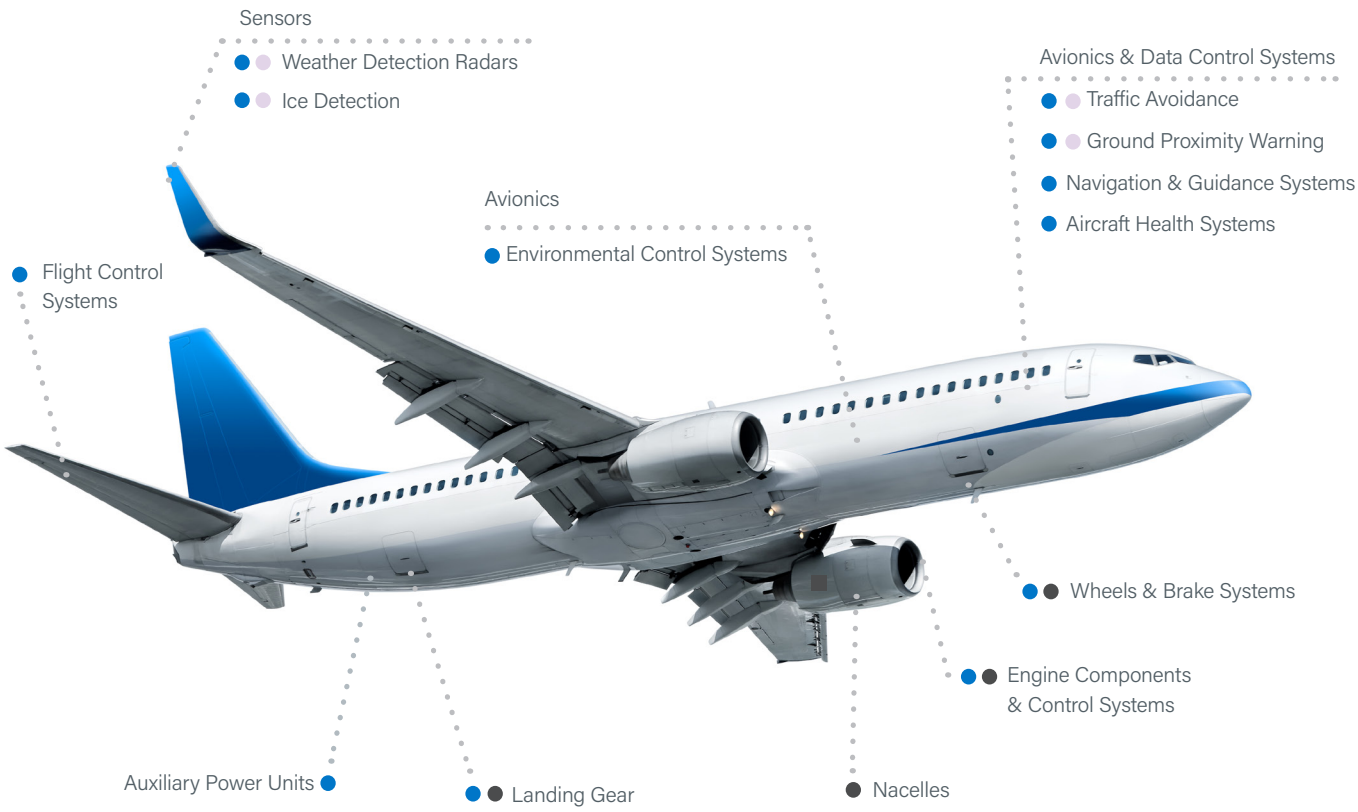
Potting Materials

Dymax shallow potting materials cure tack free in seconds upon exposure to UV/Visible light. Each potting compound is engineered to bond different substrates, offering tenacious adhesion to plastics and metals. UV potting resins reduce waste from off-ratio mixing and are free from isocyanates and heavy metals. Processing in seconds eliminates fixtures, jigs, racks, and ovens to increase space and lower total inventory costs.

SpeedMask® Maskants

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. 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.

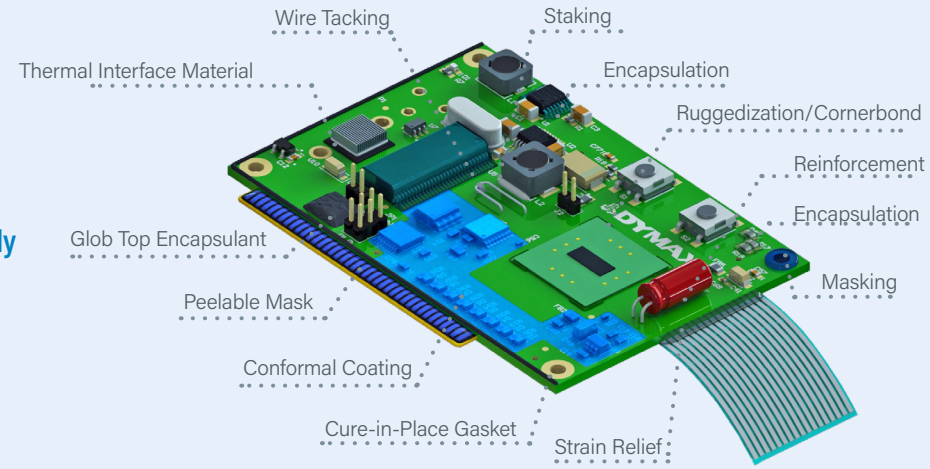
Typical Applications



Application Areas (See Page 6 for Details)

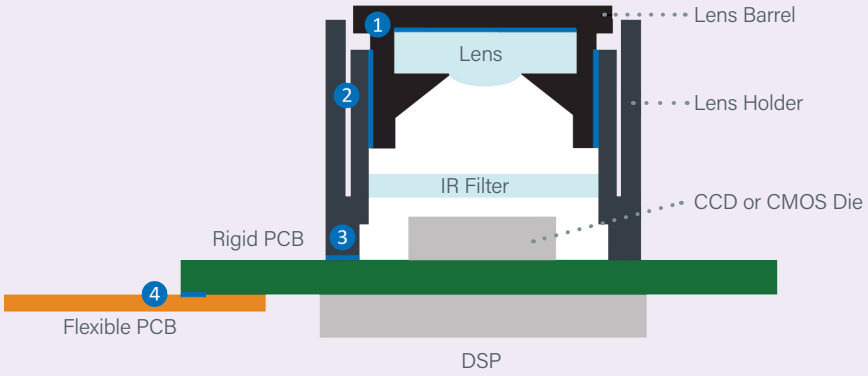
- Printed Circuit Board Assembly
- Sensor Camera Module Assembly
- Surface Protection for Engine Components

Printed Circuit Board Assembly



Additional Applications – Inductors & Transformers - Magnet Bonding

Sensor Camera Module Assembly



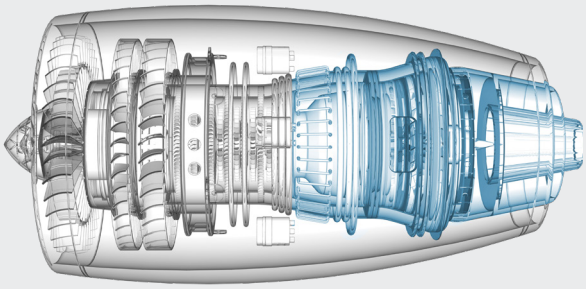
1 - Bonding the camera lens

2 - Fixturing the camera lens barrel to the lens holder

3 - Bonding the lens holder to the PCB

4 - Reinforcing the FPC

Surface Protection for Engine Components



Processes: Anodizing | Acid Stripping | Chemical Etching | Plating | Air Plasma | HVOF | Painting | Grit Blast | Shot Peen | Machining | Air Flow Testing | Laser Drilling

Compressor Blades & Vanes
Compressor Lines & Cases
Integrated Blade Rotors/Blisks
Fluid Line Fitting
Turbine Disks
Fan Blades
Air Seals Hot Section Blades & Vanes
Combustion Cases
Combustion Liners
Nozzle Guide Vanes
Stacked Vanes
Many, Many More Components

Light-Cure Materials for Avionics

Dymax light-curable materials are designed to address the growing industry challenges and demands in the aerospace avionics sector. Our light-cure solutions help manufacturers improve imaging sensors used for ground proximity, aircraft health management, surveillance, and missile guidance systems and even protect printed circuit board assemblies from the harsher conditions they must withstand. IPC approved, MIL-I-46058C, and UL listed self-extinguishing grades are available. Most products are available in multiple viscosity grades, so the material flow may be tailored to the individual application.

Product	UV/Visible	LED	Moisture	Heat	Activator	Description	Nominal Viscosity, cP	Durometer Hardness	Elongation at Break, %	Modulus of Elasticity, MPa [psi]	Tensile at Break, MPa [psi]	Shrinkage, %
CAMERA MODULE ADHESIVE												
9900-AA	•	•		•		Low shrinkage epoxy; low temp. heat cure (80-85°C); moisture & thermal cycle resistant; cold storage/ship; excellent bonds to LCP, PCB, PPS, and FPC	43,492	D92		1,962 [284,578]	57.7 [8,373]	
3094-T-REV-A	•					Fast curing; low shrinkage and stress; designed to bond to a variety of plastics	11,750	D65	184	698 [101,300]	14 [2,000]	0.7 Linear
3094-GEL-REV-A	•					Fast curing; low shrinkage and stress; designed to bond to a variety of plastics	30,000	D67	200	179 [26,000]	12.4 [1,800]	0.5 Linear
9906-AA	•	•		•		Very low shrinkage epoxy; low temp. heat cure (80-85°C); moisture & thermal cycle resistant; low water absorption; cold storage/ship	86,000	D94	1.2	3,983 [578,000]	36.7 [5,328]	1.1 Volumetric
CONFORMAL COATINGS												
9-20557	•			•		Low modulus for thermal cycling performance; blue fluorescing; suitable for most types of spray equipment; MIL-I-46058C, UL 94V-1, UL 746, IPC-CC-830-B, UL 94V-0	2,300	D60	150	37.9 [5,500]	15.8 [2,300]	1.1 Linear
9451	•		•			True black coating ideal for covering sensitive information; optimized for single pass coating but can be coated in multiple passes if needed	6,000	D80	4.4	717 [104,000]	42.7 [6,200]	-
9483	•			•		Excellent thermal shock resistance; corrosion resistant; blue fluorescing; MIL-I-46058C, IPC-CC-830-B, UL 94V-0, UL 746E	750	D60	22	276 [40,000]	16.2 [2,350]	2.0 Linear
984-LVUF	•			•		Flexible for enhanced thermal shock performance; good adhesion to a variety of metal, ceramic, and glass-filled epoxy surfaces; blue fluorescing; MIL-I-46058C, UL 94V-0, IPC-CC-830-B, UL 746C	160	D85	4	724 [105,100]	55.8 [8,100]	0.1 Linear
9481-E	•		•			High chemical and abrasion resistance; low viscosity for thin coatings; bright blue fluorescing; MIL-I-46058C, UL 746-E, IPC-CC-830B, UL 94V-0	125	D65	60	150 [21,800]	11 [1,600]	1.6 Linear
9482	•		•			Bright blue fluorescing; superior re-workability; excellent chemical and thermal shock resistance; MIL-I-46058C, UL 746-E, IPC-CC-830B, UL 94V-0	1,100	D70	26	275 [40,000]	15.8 [2,300]	2.0 Linear
9771*	•		•			Meets ASTM E595 low outgassing; low ionic content (Mil-Std 883 Method 5011 compliant); corrosion and temperature/humidity resistance; blue fluorescing; UL 94V-0, UL 746-E, MIL-I-46058C, IPC-CC-830-B, NASA MAPTIS material number 09841	780	A62	13	910.3 [132,026]	20.4 [2,952]	1.4 Linear

Featured Product

*This product is not available in China

Product	UV/Visible	LED	Moisture	Heat	Activator	Description	Nominal Viscosity, cP	Durometer Hardness	Elongation at Break, %	Modulus of Elasticity, MPa [psi]	Tensile at Break, MPa [psi]	Shrinkage, %
GAP FILL - FIP GASKETS												
GA-103	•					Excellent water and acid/base resistance; self-leveling; silicone free; low compression set; high/low temperature resistant good adhesion to plastic, electroplated plastic, and metal surfaces	60,000	00-75	63	0.2 [35]	0.9 [130]	0.8 Linear
GA-112	•					Excellent tear resistance; cures soft and tack free; low outgassing; moisture resistant; silicone free; Excellent adhesion to metals	40,000	A50	360	1.3 [190]	4.5 [660]	1.5 Linear
ENCAPSULANTS												
9037-F	•			•		Flexible with excellent moisture and thermal resistance; blue fluorescing	55,000	D40	110	6.2 [900]	5.8 [850]	2.2 Linear
7501-T-UR-SC		•				Formulated with Encompass® technology; optimized for 385 or 405 nm LED curing; deeper section cure; red fluorescing	6,500	D70	125	296 [43,000]	17.9 [2,600]	1.9 Linear
9-20558-REV-A	•			•		Flexible, thixotropic material; bonds well to FPCs; UL 94V-0	24,000	D35	160	2.3 [340]	6.2 [900]	1.8 Linear
9001-E-V3.1	•					Clear encapsulant with improved moisture and thermal cycle resistance; good ionic and electrical properties	4,500	D45	150	17.2 [2,500]	5.2 [750]	2.0 Linear
9008	•					Flexible encapsulant with excellent moisture resistance; ideal for COF applications; remains flexible to -40C	4,500	D35	270	45 [6,500]	10 [1,500]	1.2 Linear
9101	•		•			Flexible encapsulant with great moisture and thermal resistance	7,000	D30-D50	38	17.5 [2,550]	5.06 [735]	2.0 Linear
9102	•		•			Flexible encapsulant with great moisture and thermal resistance	17,000	D30-D50	34	18.4 [2,670]	4.8 [703]	2.0 Linear
9103	•		•			Flexible encapsulant with great moisture and thermal resistance	25,000	D30-D50	36	17.6 [2,560]	4.9 [718]	2.0 Linear

Featured Product

Product *	UV/Visible	LED	Moisture	Heat	Activator	Description	Nominal Viscosity, cP	Durometer Hardness	Elongation at Break, %	Modulus of Elasticity, MPa [psi]	Tensile at Break, MPa [psi]	Shrinkage, %
MASKANTS												
9-7001	•					Visible pink color in uncured state; resistant to solvent-based conformal coatings and primers; compatible with gold and copper pins; lower shrinkage; silicone free	40,000	A70	180	1.9 [275]	3.8 [650]	1.9 Linear
9-20479-B-REV-A	•					Blue color for easy visual inspection; compatible with gold and copper pins; silicone free	115,000	A75	140	4.13 [600]	3.37 [490]	1.6 Linear
9-318-F	•					Medium adhesion for peeling; blue fluorescing for black light inspection; silicone free	50,000	A55	130	2.0 [310]	3.0 [440]	1.9 Linear
POTTING												
6-621-VT	•			•	•	Forms hard, clear bonds to a variety of substrates including metal, glass, ceramic, and phenolic and filled plastics	14,000	D80	20	730 [106,000]	28 [4,000]	0.4 Linear
6-621	•			•	•	Forms hard, clear bonds to a variety of substrates including metal, glass, ceramic, and phenolic and filled plastics	800	D80	37	550 [80,500]	22 [3,200]	0.4 Linear
9-20557	•			•		Low modulus for thermal cycling performance; medium viscosity, designed to enhance wetting of leads; suitable for most types of spray equipment; blue fluorescing; approvals: MIL-I-46058C, UL 94V-1, UL 746, IPC-CC-830-B	2,300	D60	150	37.9 [5,500]	15.8 [2,300]	1.1 Linear
9-20558-REV-A	•			•		Flexible, thixotropic material; bonds well to FPCs; approvals: UL 94V-0	24,000	D35	160	2.3 [340]	6.2 [900]	1.8 Linear
9008	•					Flexible material with excellent moisture resistance; ideal for COF applications; remains flexible to -40C	4,500	D35	270	45 [6,500]	10 [1,500]	1.2 Linear
RUGGEDIZING												
9309-SC	•					Formulated with See-Cure color-change technology; high viscosity; highly thixotropic; reduces stress on components; great adhesion to various PCB substrates	45,000	D57	140	163 [23,800]	22 [3,200]	1.2 Linear

Featured Product

Product *	UV/Visible	LED	Moisture	Heat	Activator	Description	Nominal Viscosity, cP	Durometer Hardness	Elongation at Break, %	Modulus of Elasticity, MPa [psi]	Tensile at Break, MPa [psi]	Shrinkage, %
STRUCTURAL ADHESIVES - MAGNET BONDING - THERMAL INTERFACE												
6-630-T	•			•	•	Moisture and high-temperature resistant; flexible; high adhesion to glass and metal; clear bonds	6,000	D70	130	413 [60,000]	28.2 [4,100]	0.5 Linear
535-A-REV-A						Activator for Dymax 800-series structural adhesives; fixtures in seconds; recommended for metals, ferrite, ceramic, glass, and thermoset plastics	-	N/A	N/A	N/A	N/A	N/A
846-GEL					•	Activator cured with 535-A-REV-A; exhibits good thermal shock and excellent adhesion to a wide variety of plated surfaces; excellent bonds to a wide variety of metal surfaces, glass, ceramic. filled nylon, thermoset plastics, and epoxy board	29,000	N/A	N/A	N/A	N/A	N/A
9-20801	UV Only			•	•	Highly conductive; thixotropic for easy dispense and placement; superior adhesion to FR4 and many metals	110,000	D85	N/A	760 [110,000]	14 [2,100]	0.4 Linear
WIRE TACKING												
9037-F	•			•		Flexible with excellent moisture and thermal resistance; blue fluorescing for easy inspection	55,000	D40	110	6.2 [900]	5.8 [850]	2.2 Linear
9-911-REV-B	•			•		High viscosity for optimal coverage of wires; solvent resistant; blue fluorescing; high bond strength to circuit board components; compatible with Dymax conformal coatings	25,000	D80	30	552 [80,000]	24 [3,500]	0.7 Linear
921-GEL	•			•	•	High tensile strength with excellent bonds to a wide variety of substrates including metal, glass, ceramic, and many thermoset plastics; clear	25,000	D80	30	583 [84,650]	25 [3,640]	0.2 Linear
921-T	•			•	•	High tensile strength with excellent bonds to a wide variety of substrates including metal, glass, ceramic, and many thermoset plastics; clear	3,000	D80	50	563 [82,000]	24 [3,600]	0.3 Linear
921-VT	•			•	•	High tensile strength with excellent bonds to a wide variety of substrates including metal, glass, ceramic, and many thermoset plastics; clear	11,500	D80	35	540 [78,450]	22 [3,200]	0.3 Linear

Featured Product

Surface Treatment Protection for OEM & MRO Processes

Aerospace engine components are being designed for longer engine service life, pushing the limits of existing technology. Dymax light-curable materials address the growing challenges and demands for new technologies for applications in the MRO and OEM sectors of the aerospace and defense industry. SpeedMask® light-curable maskants replace tape, wax, lacquers, and fixtures and offer reliable protection against most surface treatment processing environments. SpeedMask® UV/Visible maskants seal and protect machined, ground, or polished surfaces and contain no added solvents for a greener manufacturing process without solvent lacquers. SpeedMask® temporary maskants are removed by incineration during heat-treat or heat-tint operations, or by peeling.

Product Name	UV	UV/Visible	Characteristics	Nominal Viscosity, cP	Uncured Appearance	Durometer Hardness	Elongation at Break, %	Modulus of Elasticity, MPa [psi]
SPEEDMASK® MASKANTS FOR TEMPORARY PROTECTION								
726-SC		•	Changes from blue to pink upon sufficient exposure to light energy; excellent surface protection; easy peel off after heat exposure; spray or dip	52,000	Blue Gel	D40	160	3.9 [560]
758-H		•	High adhesion; LED (405 nm) optimized; secondary heat cure; low shrinkage; trimmable after cure; resistant to nitric and hydrochloric acid	10,000	Red Gel	A80	140	2.3 [330]
7601		•	Moderate adhesion; LED optimized; blue fluorescing; color change upon cure; resistance to strong acid solutions and etchants; trimmable after cure	25,000	Pink Gel	A63	180	48.2 [7,000]
706	•		High adhesion; excellent surface and cavity protection; hard/durable; chemical resistance	47,500	Colorless Gel	D75	5.5	965 [140,000]
707	•		Prevents beam impingement; secondary heat cure; reduces spatter; hard/durable	500	Colorless Gel	D70	71	270 [39,000]
718		•	High adhesion; resists flame spray processes; excellent surface and cavity protection during APS and HVOF	46,000	White Paste	D80	3	965 [140,000]
724		•	Good surface protection; fast curing; easy peel off	70,000	Colorless Gel	D40	200	2.7 [390]
728-G		•	High adhesion; excellent surface protection to aggressive chemical processes; easy removal after hot-water soak; sprayable	25,000	Green/Blue Gel	D55	265	55 [8,024]
729	•		High adhesion; hard/durable; resists acids; spray or dip	20,000	Colorless Gel	D75	19	289 [42,000]
730-BT		•	Excellent chemical resistance including acids (Nitric, Sulfuric, and Hydrochloric); trimmable after cure; spray or dip	22,000	Blue Gel	D35	300	3.4 [500]
731-REV-A		•	High adhesion; fluoresces yellow; sprayable; easy peel after hot-water soak	18,000	Bright Yellow Gel	D55	300	28 [4,200]
734-BT		•	Moderate adhesion; acid resistance (Nitric, Sulfuric, and Hydrochloric); easy peel off; trimmable after cure	24,000	Blue Gel	D25	235	35 [5,044]
740-BT		•	Low-medium adhesion; compatible with MEK-based and heat-cure paint	45,000	Blue Gel	A65	203	2.42 [350]
750		•	High adhesion; hard and durable; cures tack free; resilient to blast media; sprayable	30,000	Translucent Pink Gel	A50	140	2.5 [370]
750-SC		•	Turns purple to pink after sufficient exposure to UV/Visible light; sprayable; high adhesion	30,000	Translucent Purple Gel	A85	124	29 [4,250]
LIGHT-CURABLE COATING FOR PERMANENT PROTECTION								
7502	•		High adhesion; reliable surface protection against environmental conditions, i.e. salt or moisture; spray or dip	20,000	Colorless Gel	D70	30	240 [35,000]

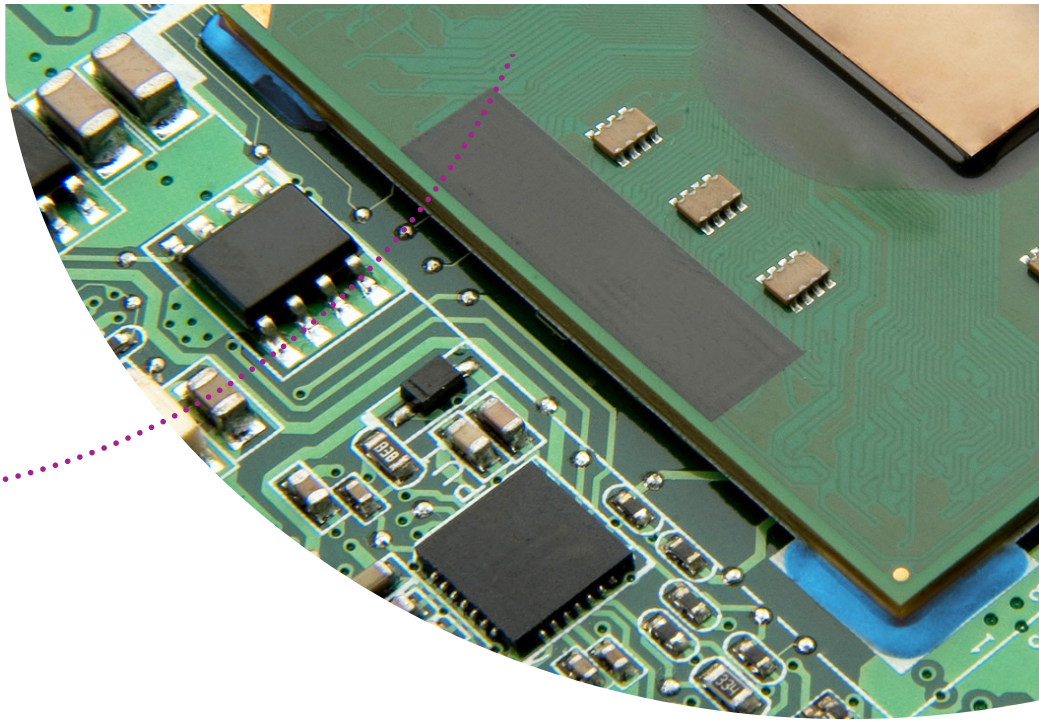
Featured Product

Process Guide

SpeedMask® maskants provide excellent surface protection during aggressive finishing processes including sand blasting, acid stripping, anodizing, machining, and more.

		Chemical Processes				Coatings			Media Finishing			Manufacturing Aids			
Product Name	Removal Options	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
SPEEDMASK® MASKANTS FOR TEMPORARY PROTECTION															
726-SC	Peelable	•	•		•*	•		•	•	•					
758-H	Peelable or Incineration		•	•					•						
7601	Peelable	•	•	•					•						
706	Incineration			•		•						•			
707	Incineration														•
718	Incineration					•	❍								
724	Incineration							•	•	•				•	
728-G	Peelable or Incineration	•	•	•					•	•	•	•	•		
729	Incineration		•	•											
730-BT	Peelable or Incineration	•	•		•				•	•					
731-REV-A	Peelable or Incineration	•	•						•	•	•				
734-BT	Peelable or Incineration	•	•	•					•						
740-BT	Peelable							•	•						
750	Peelable or Incineration					•	•		•						
750-SC	Peelable or Incineration	•	•			•	❍		•						
LIGHT-CURABLE COATING FOR PERMANENT PROTECTION															
7502	N/A														

Featured Product • Recommended ❍ Limited applications *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 and minimize risk. 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

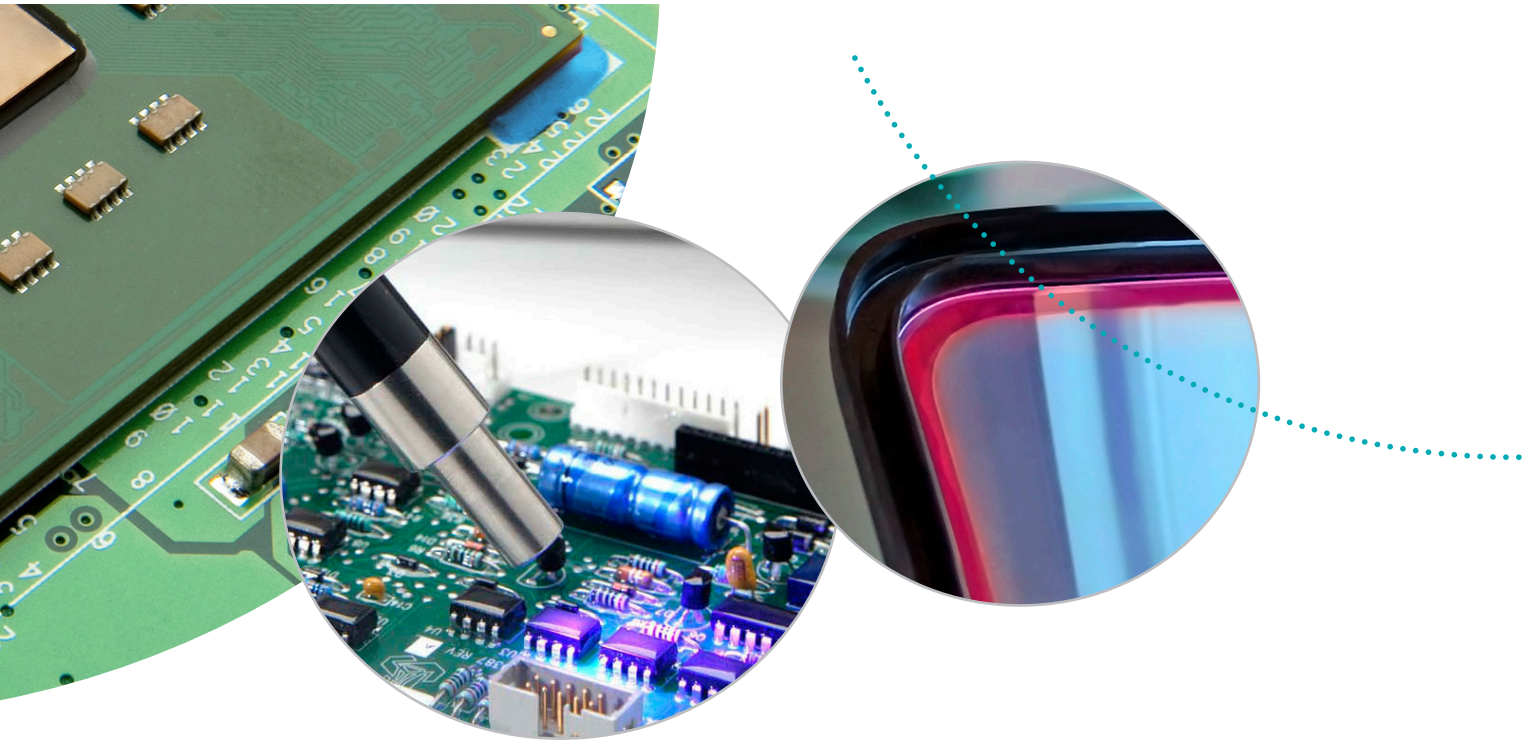
Dymax adhesives formulated with See-Cure technology have built-in cure validation that makes it easy for operators or simple automated inspection equipment to confirm cure without investing in additional specialized equipment. These materials are bright blue in their uncured state, making them highly 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.

Enhance Bond-Line Inspection - Ultra-Red® Technology

Adhesives formulated with Ultra-Red® remain colorless until exposed to low-intensity UV light (360-380 nm), at which point they fluoresce bright red. This is ideal when bonding plastics that naturally fluoresce blue. Ultra-Red® fluorescence does not absorb the same wavelengths as those used to cure the adhesive, 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.



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.

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

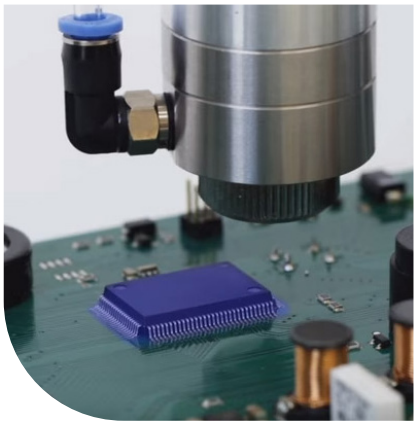
Dymax adhesives formulated with Encompass® technology incorporate Dymax exclusive Ultra-Red® fluorescing and See-Cure color-change technologies into one light-curable product. As a result, manufacturers gain efficiencies from rapid on-demand curing with easy cure confirmation and post-cure bond-line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

Cure in Shadows - Dual-Cure Light/ Moisture-Cure Technology

Dual-cure coatings are formulated to ensure complete cure in applications where shadow areas on high-density circuit boards are a concern. Previously, areas shadowed from light were managed by selective coating – eliminating the need to cure in shadow areas – or a secondary heat-cure process. Shadow areas cure over time with moisture, eliminating the need for that second process step or concerns of component life degradation due to temperature exposure.

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

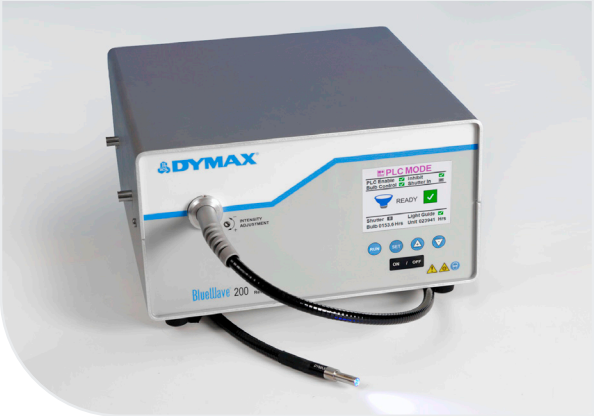
Dymax SG-200 super-flow spray gun systems are designed for masking and coating applications where a significantly higher flow rate is required. The systems are ideal for dispensing fluids with viscosities up to 80,000 cP. If you are manually masking a large area, this is a great option.

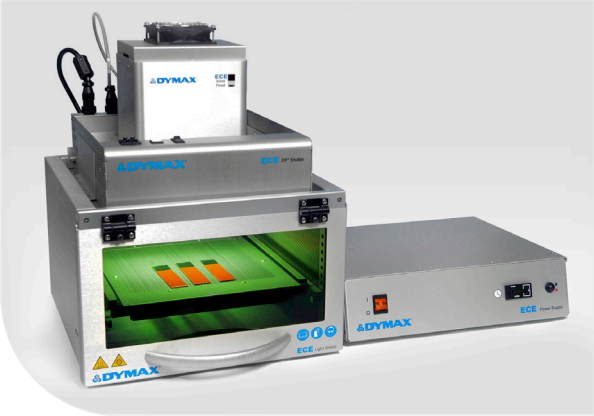
Model 400 Hand-Held Needle Valve System

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^2 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^2 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^2 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

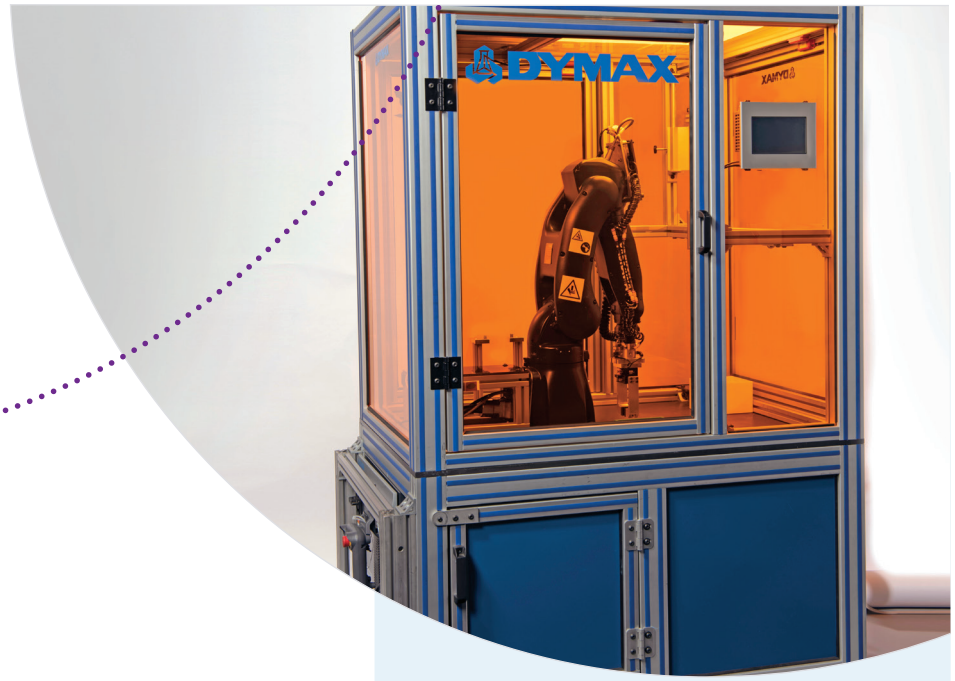
- Items move through the conveyor on a chain rail instead of a traditional mesh belt
- Ideal for curing low profile parts such as PCBs
- Chain rail is adjustable, accommodating part widths up to 12″

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.



Systems Integration

Dymax has the expertise to help customers with aerospace system integration projects. We have 35 years of experience in the masking and surface treatment of parts and assemblies for the aerospace industry, including turbine masking and post-process finishing applications. Our system integration team can assist companies with the design and implementation of automatic and robotic dispensing and curing systems into their manufacturing processes.

In response to demands for dynamic parts handling and automation, we partner with industry professionals to deliver complete system solutions to customers. Our expert system integrators work directly with Mil-Spec precision metal handling and robotics companies, as well as finishing partners to solve complex assembly processes. Past integration projects include a turbine lead-edge machining and masking cell, fin blade mask and peel unit, and turbine hole detection and fill systems.

With patented processes and continuing IP development in the handling and treatment of turbines, coatings, and metal finishing, Dymax can design and deliver added value to aerospace manufacturers.

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