Light-Curable Materials for Electric Vehicle Battery Systems

Create Battery Packs with Reliable Performance

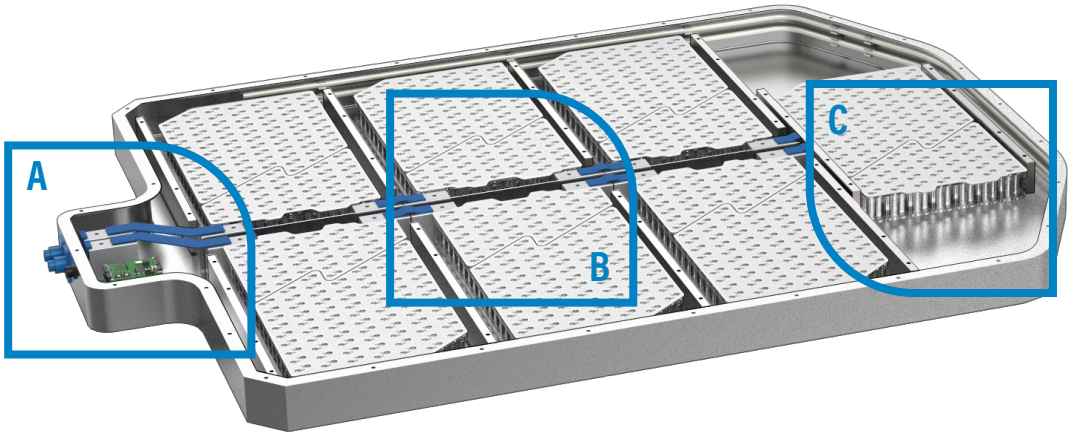
- Cures in just seconds upon exposure to UV/Visible light
- One-component materials with no solvents added
- Secondary heat or moisture cure available for shadow areas
- Blue and Ultra-Red® fluorescing products available for easy inspection of coverage
- Multiple viscosities for desired flow characteristics
- Products with excellent thermal shock, moisture, and corrosion resistance
- IPC, MIL, and UL listed products

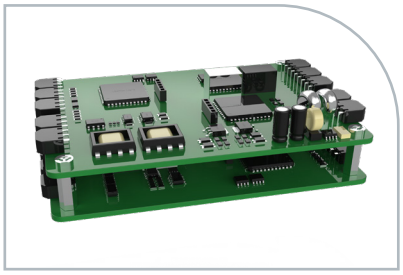
The battery is the heart of an electric vehicle. It must deliver top performance in some of the harshest environments, deal with drastic temperature changes, and withstand corrosive elements like salt and sulfur, moisture, vibration, and shock.

Dymax light-curable materials can be used to bond, seal, pot, or coat hybrid and electric vehicle battery components to ensure top performance, functionality, and a long service life. Our products are suitable for applications using cylindrical, pouch, or prismatic lithium-ion battery designs as well as applications involving electrical components inside charging stations.

Our light-curable materials cure in seconds for faster processing and higher throughput and are available with many innovative and patented technologies that turn problems like shadow areas, cure confirmation, and difficult inspection into non-issues. Our materials have no solvents added and are one-part, requiring no mixing or prep before application. Most products are available in multiple viscosity grades so the material flow can be tailored to the individual application. IPC approved, MIL-I-46058C, and UL listed self-extinguishing grades are available.

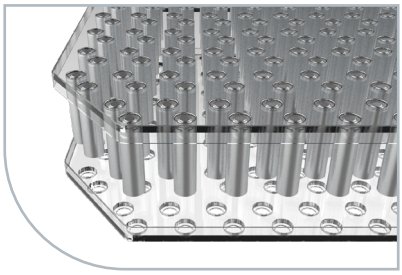
Typical EV Battery Applications





A. Conformal Coating of the Battery Management System

B. Solder Joint Protection on the Battery Pack



C. Fixturing the Battery Cell to the Base on the Battery Pack

Available Light-Curable Materials

Conformal Coatings: Our conformal coatings protect PCBs in battery management systems (BMS) and charging stations from thermal shock, humidity, and corrosive elements like salt and sulfur.

Potting Materials: We provide potting materials that have excellent bond strength to both plastics and metals. They also provide excellent resistance to chemicals and thermal shock, making them a great choice for fixturing battery cells to the base.

Encapsulants: Dymax encapsulants protect critical electronic components throughout the electric vehicle battery system. Standard grades cure in seconds with UV/Visible light, but secondary moisture cure grades are also available for applications where shadow areas are a problem.

Form-in-Place (FIP) Gaskets: Dymax 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, and air sealing. These gaskets conform to complex and intricate channels, on both vertical and horizontal surfaces, and cure in place upon exposure to light.

Product	UV/Visible Light	Heat	Moisture	Features	Nominal Viscosity, mPas	Durometer Hardness	Tensile at Break, MPa [psi]	Modulus of Elasticity, MPa [psi]
General								
6-621-VT	•	•		Forms hard, clear bonds to plastics, metals, and glass; secondary heat or activator cure	14.000	D80	28 [4.000]	730 [106.000]
9501-F	•			Structural bonder with excellent adhesion to metals and plastics; blue fluorescing; LED curable at 385 nm	10.000	D65	17,2 [2.500]	545 [79.000]
Conformal Coatings								
9-20557	•	•		Flexible; blue fluorescing; excellent thermal shock performance; approvals: MIL-I-46058C, IPC-CC-830-B, UL 746, UL 94	2.300	D60	15,8 [2.300]	37,9 [5.500]
9481-E	•		•	Low viscosity; excellent chemical resistance; rigid; bright blue fluorescing; approvals: MIL-I-46058C, UL 746E, IPC-CC-830-B, UL 94V-0	125	D75	11 [1.600]	150 [21.800]
9482	•		•	Blue fluorescing; flexible; approvals: MIL-I-46058C, IPC-CC-830-B, UL 746E, UL 94V-0	1.100	D70	15,8 [2.300]	275 [40.000]
9483*	•		•	Excellent chemical and thermal shock resistance; good adhesion to PCB; flame retardant; bright blue fluorescing; great temperature/humidity performance; approvals: MIL-I-46058C, IPC-CC-830-B, UL 746E, UL 94V-0	750	D60	16,2 [2.350]	276 [40.000]
9-20557-LV	•	•		Flexible for enhanced thermal shock performance; blue fluorescing; MIL-I-46058C; IPC-CC-830-B	850	D70	21,7 [3.150]	310 [45.000]
Potting Materials								
9-20557	•	•		Can also be used as a conformal coating; Low modulus for enhanced thermal cycling performance; blue fluorescing; one-part - no mixing or dilution required	2.300	D60	15,8 [2.300]	37,9 [5.500]
9008	•			Can be used for potting or as an encapsulants; remains flexible at low temperatures; highly moisture resistant	4.500	D35	10 [1.500]	45 [6.500]
Encapsulants								
9014	•		•	Flexible; room temperature stable	12.500	A70	8,9 [1.300]	9,1 [1.320]
9037-F	•	•		Flexible; good moisture and thermal resistance; blue fluorescing	55.000	D40	5,8 [850]	6,2 [900]
9-20558-REV-A	•	•		High viscosity; thixotropic for minimal movement after dispense; flexible; bonds well to FPCs	20.000	D50	6,2 [900]	2,3 [340]
9100 Series	•		•	Flexible; good moisture and thermal resistance	7.000 17.000 25.000	D30-D50	5,06 [735] 4,8 [703] 4,9 [718]	17,5 [2.550] 18,4 [2.670] 17,6 [2.560]
9001-E-V3.1	•		•	Moisture and thermal cycle resistance; good ionic and electrical properties	4.500	D45	5,2 [750]	17,2 [2.500]
Form-in-Place Gaskets								
GA-140	•			Low outgassing; excellent tear resistance; cures soft and tack free; conforms to intricate channels and recesses; silicone free	39.000	A35	1,5 [211]	0,71 [104]
GA-201	•			Moisture and chemical resistant; cures soft and tack free; conforms to intricate channels and recesses	65.000	A35	0,93 [135]	0,75 [110]

* Measured after UV cure followed by 15 days at 25°C / 50% RH

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 with no solvents added and other materials of concern for improved worker and user safety

Fast curing products and equipment designed for less energy consumption

Dymax meets global statutory and regulatory requirements

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AB008EU 20 Oct 2023