

Light-Curable Materials for Electric Vehicle Battery Systems



Create Battery Packs with Reliable Performance

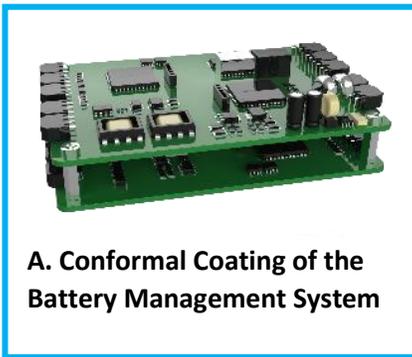
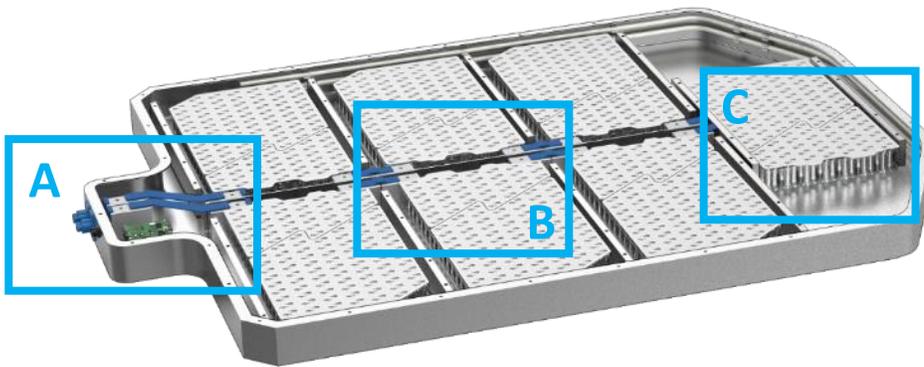
The battery is the heart of an electric vehicle. It must deliver top performance in some of the harshest environments, deal with drastic temperature changes, and withstand corrosive elements like salt and sulfur, moisture, vibration, and shock.

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 are also solvent free and 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.

- Cures in just seconds upon exposure to UV/visible light
- One-component, solvent-free materials
- 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

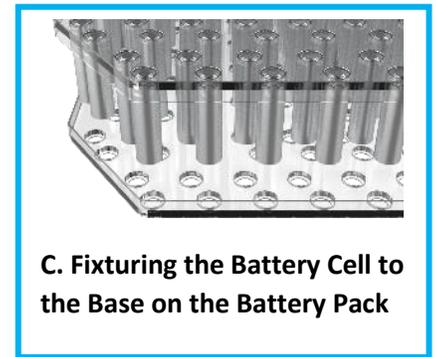
Typical EV Battery Applications



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

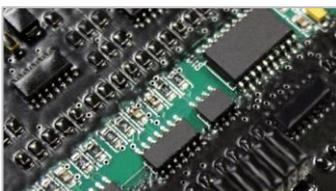
Available Light-Curable Materials

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.



Conformal Coating



Encapsulants



Form-In-Place Gaskets

Available Products

	Light Cure	Heat	Moisture	Features	Viscosity, cP	Shore Hardness	Tensile at Break, MPa [psi]	Modulus of Elasticity, MPa [psi]
GENERAL								
3022-GEL	●			For solder-joint application; very fast, tack-free cure; excellent thermal shock resistance; excellent strength	50,000	D80	47 [6,800]	830 [120,000]
9422-T-SC	●			For solder-joint application; blue to clear upon exposure to UV/Visible light; thixotropic for minimized movement after dispense	8,000	D50	16 [2,300]	98 [14,000]
CONFORMAL COATINGS								
984-LUVF	●	●		Thin; excellent chemical and abrasion resistance; flexible for enhanced thermal shock performance	160	D85	55.8 [8,100]	724 [105,100]
9451	●	●		Matte black finish for tamper evident security applications; optimized for single pass coating up to 0.004"; can be coated in multiple passes if needed	6,000	D80	42.7 [6,200]	717 [10,400]
9481-E	●		●	Low viscosity; excellent chemical resistance; rigid; bright blue fluorescing	125	D75	-	150 [21,800]
9482	●		●	Blue fluorescing; flexible	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	600	D65	17 [2,398]	235 [34,124]
POTTING MATERIALS								
9-20557 Series	●	●		Can also be used as a conformal coating; Low modulus for enhanced thermal cycling performance; blue fluorescing; one-part - no mixing or dilution required	2,300 850	D60 D70	15.8 [2,300] 21.7 [3,150]	37.9 [5,500] 310 [45,000]
9008	●			Can be used for potting or as an encapsulants; remains flexible at low temperatures; highly moisture resistant	4,500	A85	10 [1,500]	-
ENCAPSULANTS								
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]
9037-F	●	●		Flexible; good moisture and thermal resistance; blue fluorescing	45,000	D35	5.8 [850]	6.2 [900]
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]
FORM-IN-PLACE GASKETS								
GA-140 Series	●			Low outgassing; excellent tear resistance; cures soft and tack free; conforms to intricate channels and recesses	39,000 35,000	A35	1.5 [211] 1.3 [200]	0.71 [104]



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