Light-Curable Materials for Off-Highway Electric Vehicle Battery Systems

Create Battery Packs to Withstand Harsh Environments

- Cures in seconds upon exposure to UV/ Visible light
- One-component, solvent-free materials
- Secondary heat or moisture cure available for shadow areas
- Fluorescing available for easy inspection of coverage
- Products with excellent thermal shock, moisture, and corrosion resistance
- Multiple viscosities for desired flow characteristics
- IPC, MIL, and UL listed products

The battery is the heart of electric industrial equipment and other applications powered by electric motors. 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 one-part, requiring no mixing or prep before application, and solvent free, making them a green alternative to other materials on the market. 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.

Available Light-Curable Materials

1. Conformal Coatings

Our conformal coatings protect printed circuit boards in battery management systems (BMS) and charging stations from thermal shock, humidity, and corrosive elements like salt and sulfur.

2. Encapsulants

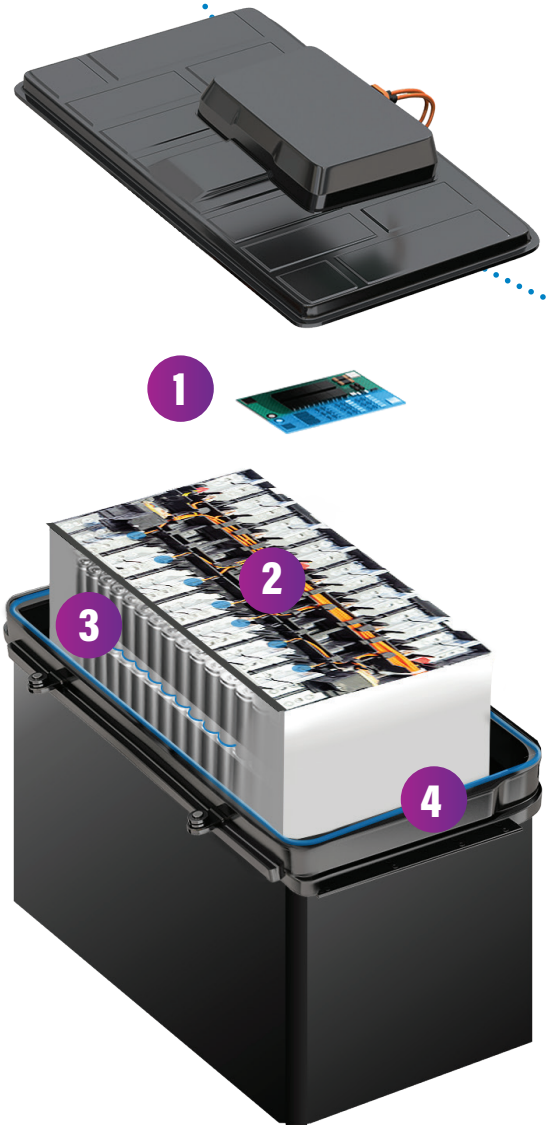
Dymax encapsulants protect critical electrical components - such as solder and wire joints - throughout the battery system. Our standard encapsulants cure in seconds with UV/Visible light, but secondary moisture cure grades are also available for applications where shadow areas are a problem.

3. 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.

4. Sealants

Dymax form-in-place(FIP)/cure-in-place (CIP) gaskets 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.



Our Commitment to Greener, Safer Manufacturing

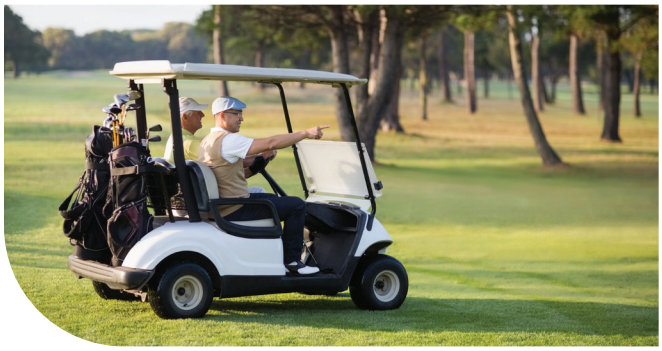
Dymax is committed to green manufacturing that reduces environmental impact, conserves energy, and provides greater worker safety. Over the last 40 years, our light-curable materials and curing equipment have become the industry standard for fast, environmentally conscious assembly. Dymax products are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

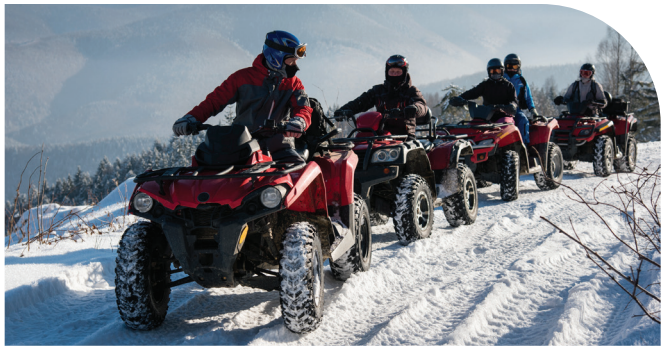
- Eco-friendly, one-component materials
- Materials without solvents and other materials of concern for improved worker and user safety
- Fast curing products and equipment designed for less energy consumption
- Dymax products conform to regulatory standards like RoHS and REACH

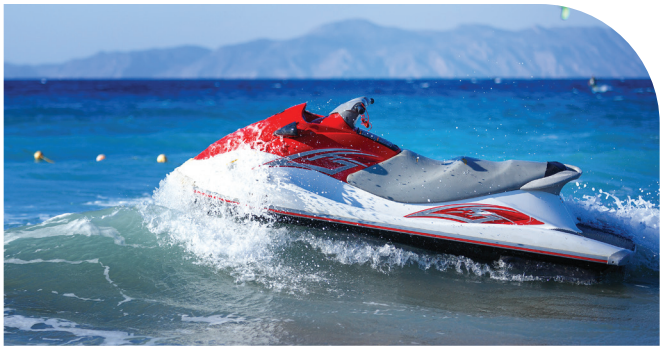
Product	UV/Visible Light	Heat	Moisture	Features	Nominal Viscosity, cP	Durometer Hardness	Tensile at Break, MPa [psi]	Modulus of Elasticity, MPa [psi]
General								
6-621-VT	•	•		Forms hard, clear bonds to plastics, metals, and glass; secondary heat or activator cure	14,000	D80	28 [4,000]	730 [106,000]
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]
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]
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, Hyundai MS941-04 Data measured after UV cure followed by 15 days at 25°C / 50% RH	750	D60	16.2 [2,350]	276 [40,000]
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]
Sealants								
GA-140	•			Form-in-place and cure-in-place for process efficiency; 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	•			Form-in-place and cure-in-place for process efficiency; moisture and chemical resistant; cures soft and tack free; conforms to intricate channels and recesses	65,000	A35	0.93 [135]	0.75 [110]

Formulated to Withstand Drastic Environmental Changes

Dymax light-cure materials are made to withstand drastic temperature changes and damaging elements like salt, sulfur, moisture, vibration, and shock, making them ideal for use in a variety of off-highway electric vehicle batteries.







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