



One-part, halogen-free materials with no added solvents

- RoHS compliant and REACH registered materials
- Materials cure in seconds with light for faster processing and increased productivity
- Products available that meet ASTM E595 Low Outgassing NASA specification
- UL94-V0 flammability rated and fluorescing products available
- Dual-cure secondary moisture cure materials available for shadow areas

Light Curable Materials for Satellites and Spacecrafts

The aerospace industry is evolving, and design requirements push the limits for avionic systems controlling and supporting satellites and spacecraft - manned and unmanned. Systems such as navigation, communication, weather, system controls, and terrestrial must be engineered using materials that can withstand the harsh environments these systems are exposed to. Dymax meets these rigorous aerospace industry demands with brilliant and green material solutions.

Low Outgassing & MIL-STD Compliant Materials

Under conditions of heat, vacuum, or both, plastic material can exhibit a loss in weight due to gaseous emission. Severe outgassing could be a concern for any or all the following reasons:

- Outgassing could indicate decomposition or a change in the structure of a substrate, coating, or adhesive.
- Vapor deposition on a surface must remain clean or retain its electrical properties.
- Vapor depositions could conceivably indicate potential corrosion, plastics crazing, or other surface weakening mechanisms.
- Contamination of the environment the part is used in.

Due to this, materials used in these systems must be NASA low outgassing approved to ASTM E595. This is a requirement before considering the evaluation of a new adhesive or coating.

NASA low outgassing testing is run at 125°C (257°F) under a 5 x 10-5 Torr vacuum for 24 hours. The total weight loss (TML) and condensable volatile material (CVCM) are measured. CVCM is of particular interest to avionics or optoelectronic applications. It might indicate that optical parts could become fogged, electrical continuity lost, or some other effect caused by material being deposited where it is not intended.

Additionally, Mil-Std 883 is the requirement for military and aerospace electronic systems, including environmental tests to evaluate resistance to deleterious effects of natural elements and conditions surrounding military and space operations; mechanical and electrical tests to ensure a consistent level of quality and reliability for these critical components.

Available Light-Curable Materials for Satellite and Spacecraft Applications

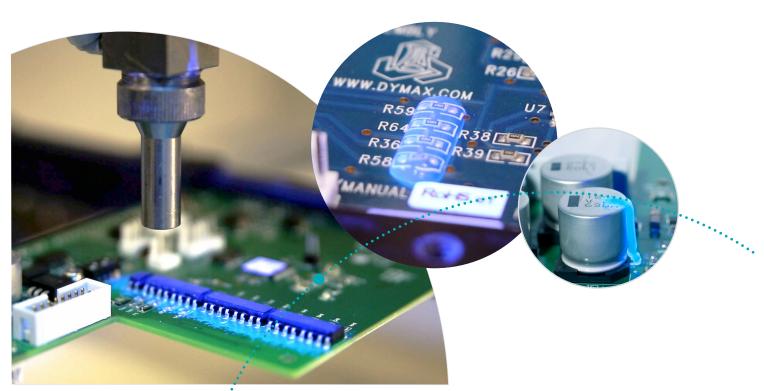
Conformal Coatings: Our conformal coatings have no added solvents and protect printed circuit boards from environmental hazards with innovation that meets both ASTM E595 and Mil-Std 883 Method 5011.

Encapsulants: Dymax encapsulants protect critical electronic components protect sensitive components against moisture, chemicals, and contaminants.

Maskants: Maskants provide selective surface protection during conformal coating.

Positioning Adhesives: With very low volumetric shrinkage and low CTE, our positioning adhesives ensure precise placement of critical components during active alignment.

Staking & Ruggedizing Adhesives: Our staking and ruggedizing adhesives fortify components and reduce stress due to shock and vibration.



	Cure				Applications									
Product	UV/Visible Light	Heat	Moisture	Features	Conformal Coating	Encapsulation	Masking	Positioning	Staking & Ruggedizing	Viscosity, cP	Durometer Hardness	Elongation at Break. %	Modulus of Elasticity, MPa [psi]	Tensile at Break, MPa [psi]
9771	•		•	Meets ASTM E595 low outgassing; low ionic content (MIL-STD 883 Method 5011 compliant); corrosion and temperature/humidity resistance; blue fluorescing; NASA MAPTIS material number 09841, UL 94V-0, UL 746-E, MIL-I-46058C, IPC-CC-830-B	•					780	A62	13	910,3 [132.026]	20,4 [2.952]
9801	•	•		Low shrinkage and outgassing; one- part epoxy; low temperature heat cure (80-85°C); good moisture and thermal resistance; cold storage/ship; flexible		•		•	•	60.000	D90	2	1.600 [230.600]	45 [6.600]
9803	•	•		Very low volumetric shrinkage and water absorption; low outgassing; one-part epoxy; low temperature heat cure (80-85°C); moisture and thermal cycle resistant; cold storage/ship		•		•	•	86.000	D94	1,2	3.983 [578.000]	36,7 [5.328]
9-20479-B-REV-A	•			Blue, peelable mask; compatible with gold and copper connector pins; silicone and halogen free			•			115.000	A75	140	4,13 [600]	3,37 [490]

The below products have been tested to the ASTM E595 standard and meet the TML and CVCM thresholds historically used as screening for spacecraft materials:

Adhesive Tested	Product Type	Total Weight Loss (TML), %	Volatile Condensable Material (CVCM), %			
9771	Light + Moisture Conformal Coating	0,09	0,02			
9801	Low Shrinkage Active Alignment Epoxy	0,57	< 0,01			
9803	Low Shrinkage Active Alignment Epoxy	0,48	< 0,01			
	Screening Level	1,00 maximum	0,10 maximum			

^{*} Estimated to be primarily entrapped air or moisture.

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 added solvents or 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



©2022-2023 Dymax Corporation. All rights reserved. All trademarks in this guide, except where noted, are the property of, or used under license by, Dymax Corporation, U.S.A.

Technical data provided is of a general nature and is based on laboratory test conditions. Dymax Europe GmbH does not warrant the data contained in this bulletin. Any warranty applicable to products, its application and use is strictly limited to that contained in Dymax Europe GmbHs General Terms and Conditions of Sale published on our website. Dymax Europe GmbH does not assume any responsibility for test or performance results obtained by users. It is the user's exponsibility do tearmin the suitability for the product application and purposes and the suitability for use in the user's intended manufacturing apparatus and methods. The user should adopt such precautions and use guidelines as may be reasonably advisable or necessary for the protection of property and persons. Nothing in this bulletin shall act as a representation that the product use or application will not infringe a patent owned by someone other than Dymax Corporation or act as a grant of license under any Dymax Corporation Patent. Dymax Europe GmbH recommends that each user adequately test its proposed use and application of the products before actual repetitive use, using the data contained in this bulletin as a general guide.

B019EU 8 Nov 2023