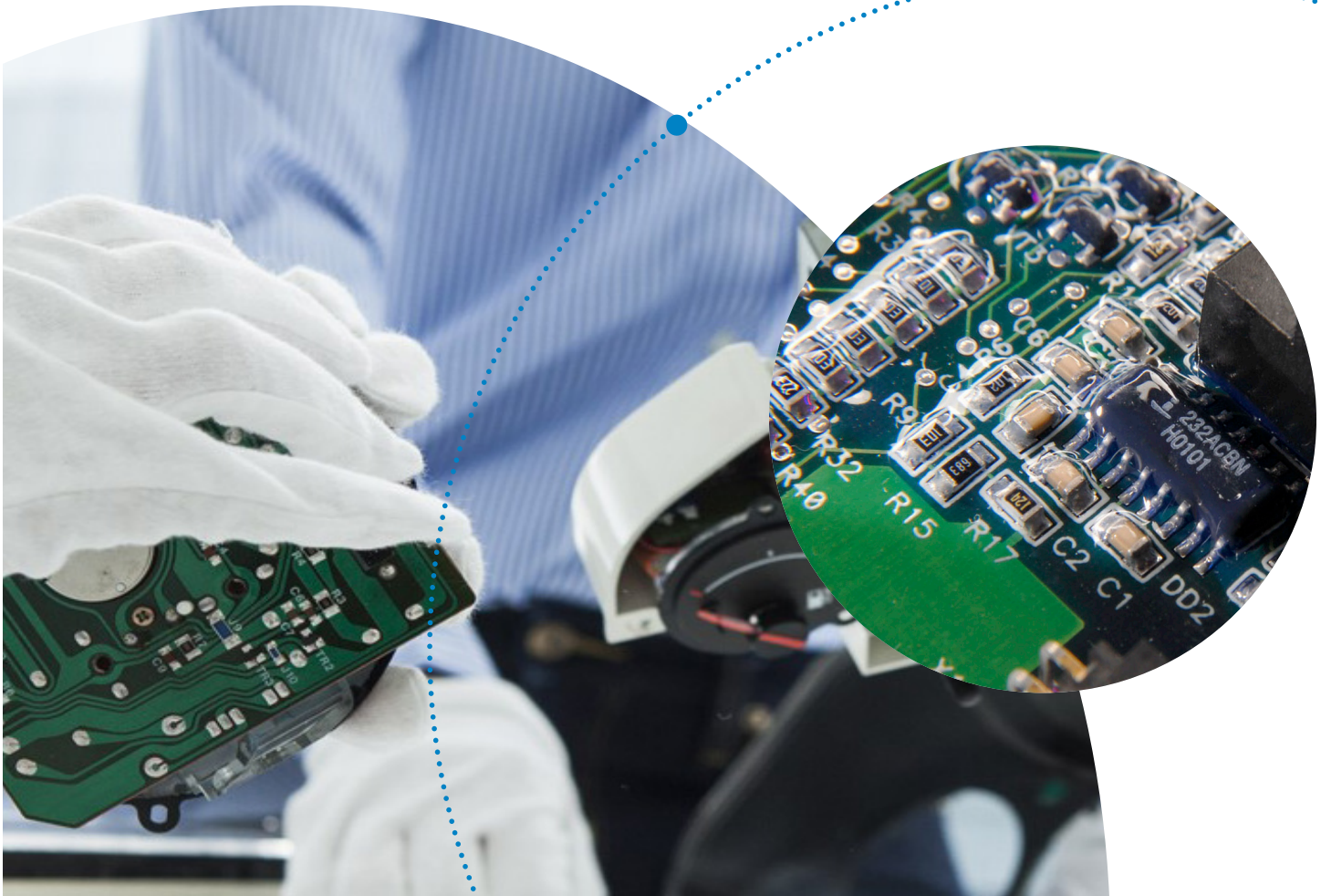


LIGHT-CURE CONFORMAL COATINGS:  
**CHEMICAL RESISTANCE STUDY**

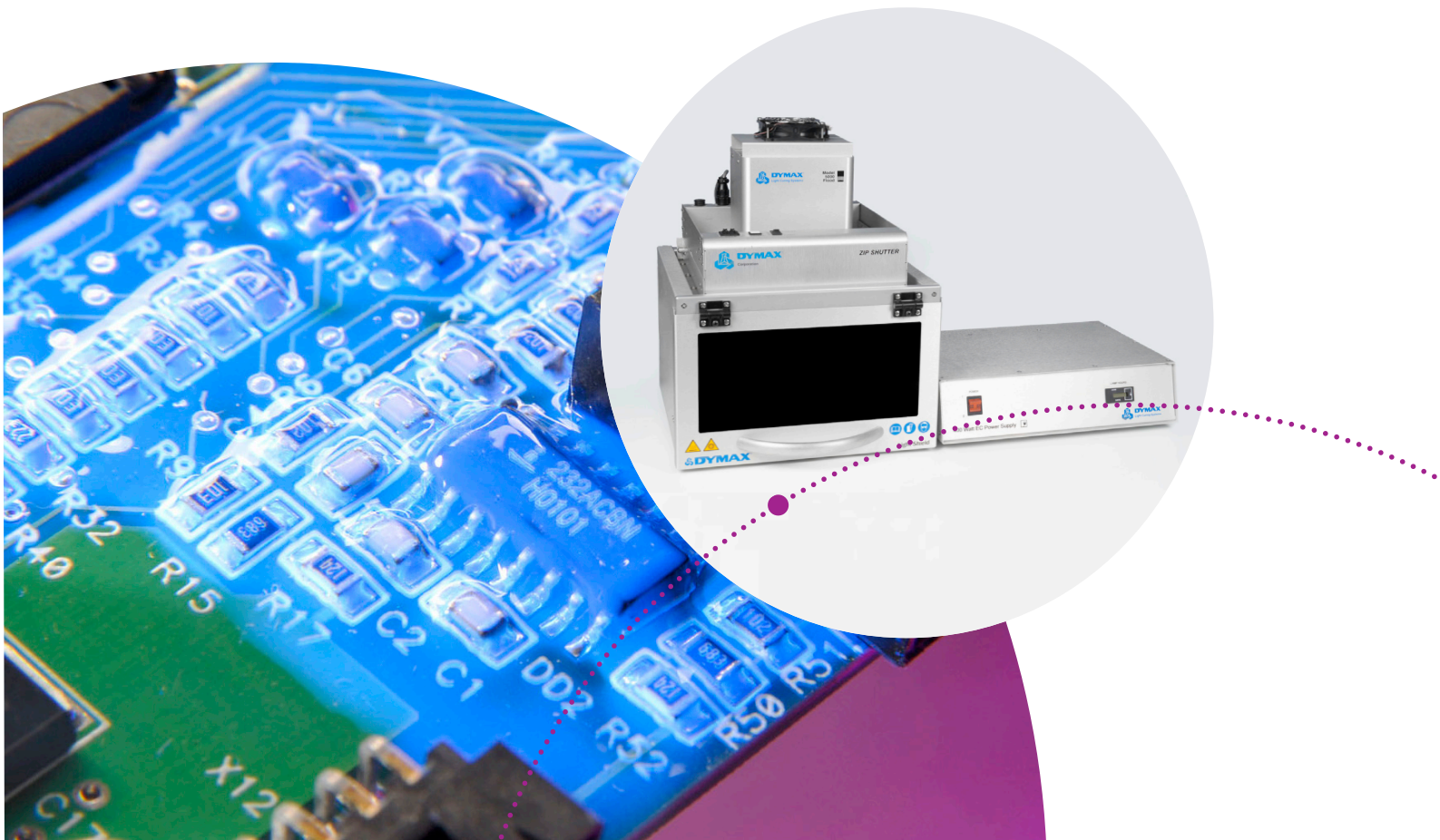


## Introduction

Every year the automotive industry uses thousands of printed circuit boards in automobiles and the rate of growth is accelerating. PCBs can be found everywhere in an automobile, from the controls for doors, windows, and seats, to the engine's electronics, like the electronic throttle control or EGR valve. Increasingly, more modules and sensors are expected to support added functionality and customization throughout the vehicle. It is important that PCBs are properly protected from fluids that may damage them and compromise the safety and operation of the vehicle. Conformal coatings provide this necessary protection. In this study, Dymax conformal coatings were tested for chemical resistance against fluids commonly associated with automobiles.

## The Study

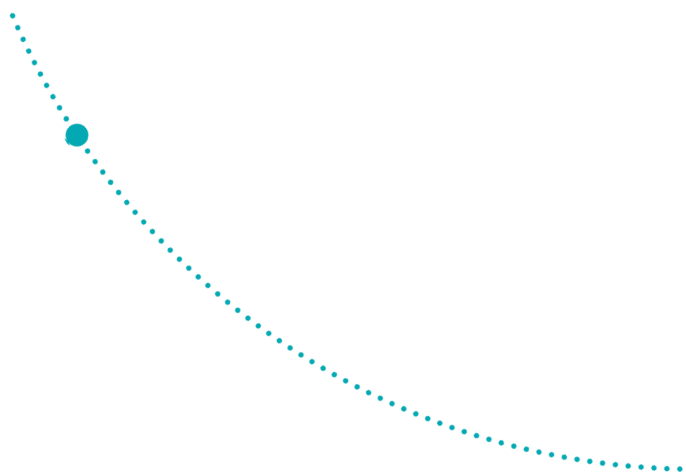
Dymax light-curable conformal coatings (9-20557, 984-LVUF, 9451, 9452-FC, 9481-E, 9482, and 9483) were tested for chemical resistance against seven fluids commonly used in the automobile industry. The conformal coatings were dispensed and then cured for 20 seconds using a Dymax 5000-EC flood lamp at an intensity of 200 mW/cm<sup>2</sup>. The samples were then immersed in the fluids for 72 hours, after which they were removed and wiped clean. The samples were then left at room temperature for 1 week. The initial weights of the sample coatings were recorded as well as the weights after the 72 hour soak and after the 1 week.



## The Results

The table below shows the initial weights of the tested circuit boards, the weight of the PCBs after 1 week at room temperature, and the percentage of weight change.

Product			Motor Oil	Brake Fluid	Transmission Oil	Power Steering Fluid	Water 5% NaCl	IPA 99%	Diesel Fuel
9-20557	Initial Weight (grams)		0.71	0.70	0.67	0.68	0.69	0.72	0.69
	Change from Initial Weight	72 Hours	0.24%	64.59%	0.88%	0.13%	3.02%	64.45%	9.02%
		1 Week	0.06%	60.29%	0.49%	-0.13%	-0.41%	2.49%	4.28%
984-LVUF	Initial Weight (grams)		0.70	0.70	0.70	0.70	0.70	0.70	0.69
	Change from Initial Weight	72 Hours	0.04%	13.40%	-0.07%	0.09%	5.57%	26.73%	0.08%
		1 Week	-0.02%	10.53%	-0.07%	-0.01%	0.00%	10.88%	0.02%
9451	Initial Weight (grams)		0.06	0.06	0.06	0.06	0.06	0.07	0.06
	Change from Initial Weight	72 Hours	0.32%	57.86%	0.69%	0.45%	2.57%	20.95%	-0.25%
		1 Week	0.31%	34.82%	0.42%	-0.19%	0.22%	2.17%	0.40%
9452-FC	Initial Weight (grams)		0.69	0.68	0.67	0.68	0.67	0.67	2.06
	Change from Initial Weight	72 Hours	0.27%	20.64%	0.31%	0.22%	4.49%	20.26%	0.20%
		1 Week	0.38%	18.55%	0.44%	0.34%	1.12%	5.38%	0.31%
9481-E	Initial Weight (grams)		0.71	0.72	0.70	0.70	0.70	0.07	0.71
	Change from Initial Weight	72 Hours	0.05%	1.00%	-0.04%	0.13%	0.66%	7.51%	0.07%
		1 Week	0.06%	0.45%	0.01%	0.04%	0.01%	5.08%	-0.03%
9482	Initial Weight (grams)		0.72	0.71	0.71	0.72	0.72	0.71	0.72
	Change from Initial Weight	72 Hours	0.02%	5.15%	-0.05%	-0.01%	0.73%	15.62%	0.49%
		1 Week	0.02%	3.74%	0.01%	-0.07%	-0.03%	5.35%	0.07%
9483	Initial Weight (grams)		0.75	0.76	0.78	0.78	0.78	0.78	0.80
	Change from Initial Weight	72 Hours	-0.90%	7.47%	0.00%	0.00%	0.44%	18.73%	0.42%
		1 Week	-1.33%	4.84%	0.00%	-0.44%	-0.43%	3.00%	0.42%



## Conclusions

Dymax conformal coatings performed well when tested for chemical resistance against fluids commonly found in the automotive industry. As can be seen in this study, in most cases the percentage of weight change after the 72 hour soak was minimal and continued to drop during the week resting period.

Dymax recommends using the data in this study as a general guideline when evaluating conformal coatings. Testing should always be performed on the product in the true application to validate that it will perform to the specifications needed. If you have questions about a specific application, the Dymax Application Engineering Team is available to answer your questions and even assist you in choosing and evaluating products.



[www.dymax.com](http://www.dymax.com)

©2020 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 does not warrant the data contained in this bulletin. Any warranty applicable to the product, its application and use, is strictly limited to that contained in Dymax's standard Conditions of Sale. Dymax does not assume responsibility for test or performance results obtained by users. It is the user's responsibility to determine 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 or act as a grant of license under any Dymax Corporation Patent. Dymax recommends that each user adequately test its proposed use and application before actual repetitive use, using the data contained in this bulletin as a general guide. ST002 10/15/2020