



SCS

PARYLENES for EVs

Protect your electric vehicle design,
build and brand investment



SPECIALTY COATING SYSTEMS™

A KISCO Company

The electric vehicle market transformation

The automotive market is undergoing a significant transformation – from numerous moving parts, combustion engines and all-too-human drivers toward computer controls, electric propulsion and autonomous operation.

This transformation is being driven by:

- Adverse environmental and health impacts of emissions from internal combustion engines (ICEs)
- Alarming statistics that show how detrimental human drivers are for passenger and vehicle safety
- Government and regulatory initiatives and incentives to create solutions for both environmental and safety challenges.

Several countries have mandated that 50% of new vehicles must be completely electric and must show steady development from the current level 2/3 semi-autonomous driving toward level 5 fully-autonomous driving by the year 2030. This is no small challenge.

In striving to meet to these mandates, many OEMs are finding themselves in intense iterative cycles, experiencing failures and unforeseen outcomes. The volume of new electronic components and variety of configurations in EVs require new degrees of protection from harsh operating conditions, including extreme heat and exposure to moisture, chemicals and UV light. SCS Parylene conformal coatings are uniquely positioned to address these challenges.



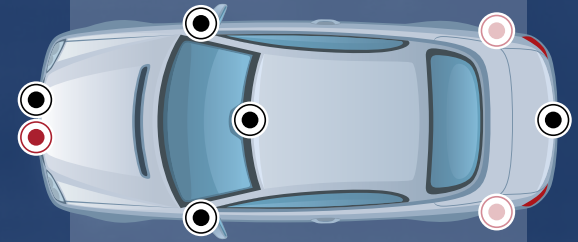
INCREASED EV ELECTRONICS REQUIRE INCREASED PROTECTION

Electronic components such as printed circuit boards (PCBs), electronic control units (ECUs) and LEDs are already 1.5X as numerous in EVs as in ICEs, and that ratio is expected to grow. This points to the need for corresponding growth in the protection of these components with conformal coatings like Parylenes.

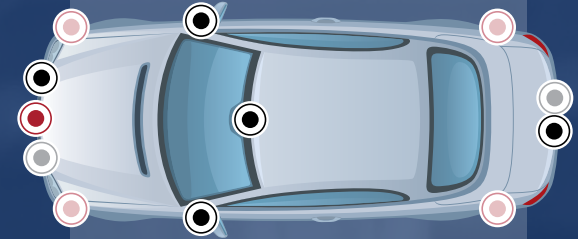
PCBs control critical systems in Battery Electric Vehicles (BEVs) and most of the systems in Plug-in Hybrid Electric Vehicles (PHEVs) and Fuel Cell Vehicles (FCVs). Therefore, the reliability, safety and performance of vehicle electronics and sensors has become a major differentiator in the automotive market. Protecting these systems is imperative for design, build and brand success.

The lightweight, ultra-thin and conformal nature of SCS Parylene coatings ensures the most complete barrier protection of electronics against corrosion and other contaminants. And, because Parylene is deposited as a gas, they're ideal for coating the ever-evolving, ever-miniaturizing electronic components used in EVs. SCS Parylenes also provide excellent dielectric properties to prevent power fluctuations or distortions, thermal stability for reliable protection in high heat (350°C long-term) environments, and optical clarity for use in safety sensors and LEDs to meet most EV application needs.

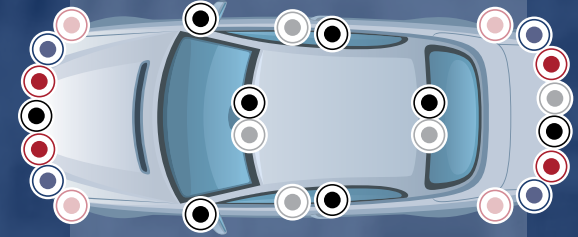
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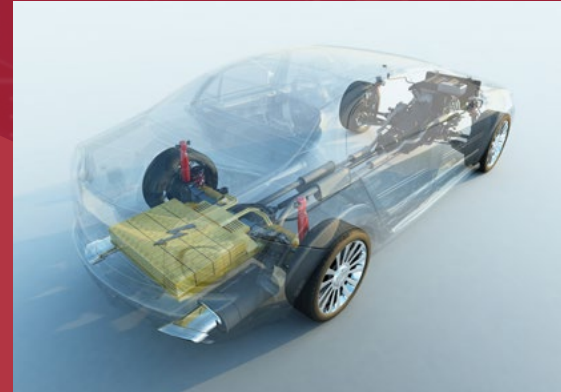


-  Long-range radar
-  Short and medium-range radar
-  Camera
-  Long-range LIDAR
-  Short-range LIDAR

RELIABILITY AND RESPONSIBILITY GO HAND-IN-HAND

The main control board is considered the brain of an EV, and its reliable performance is critical. In addition, if any of the complex electronic components of the battery, power distribution/conversion and critical charging components are compromised, an EV won't run. As these systems generate significant heat, which needs to be well managed, the coordinating coolant loop components are critical in their own right and crucial to keeping power systems running safely and optimally. Failure of any of these processes may not only result in performance and safety issues for the vehicle but may also pose serious safety consequences for the passengers.

SCS Parylene conformal coatings provide superior barrier and dielectric protection at smaller thicknesses compared to other coatings on the market. Parylene HT®, for example, has the lowest dielectric constant (2.17) of the Parylene series; it has also been proven to remain stable in high temperature applications (450°C short-term) and possesses long-term UV stability (2,000 hours). In addition, Parylene HT has the highest penetrating ability of the Parylenes, ensuring complete component protection.



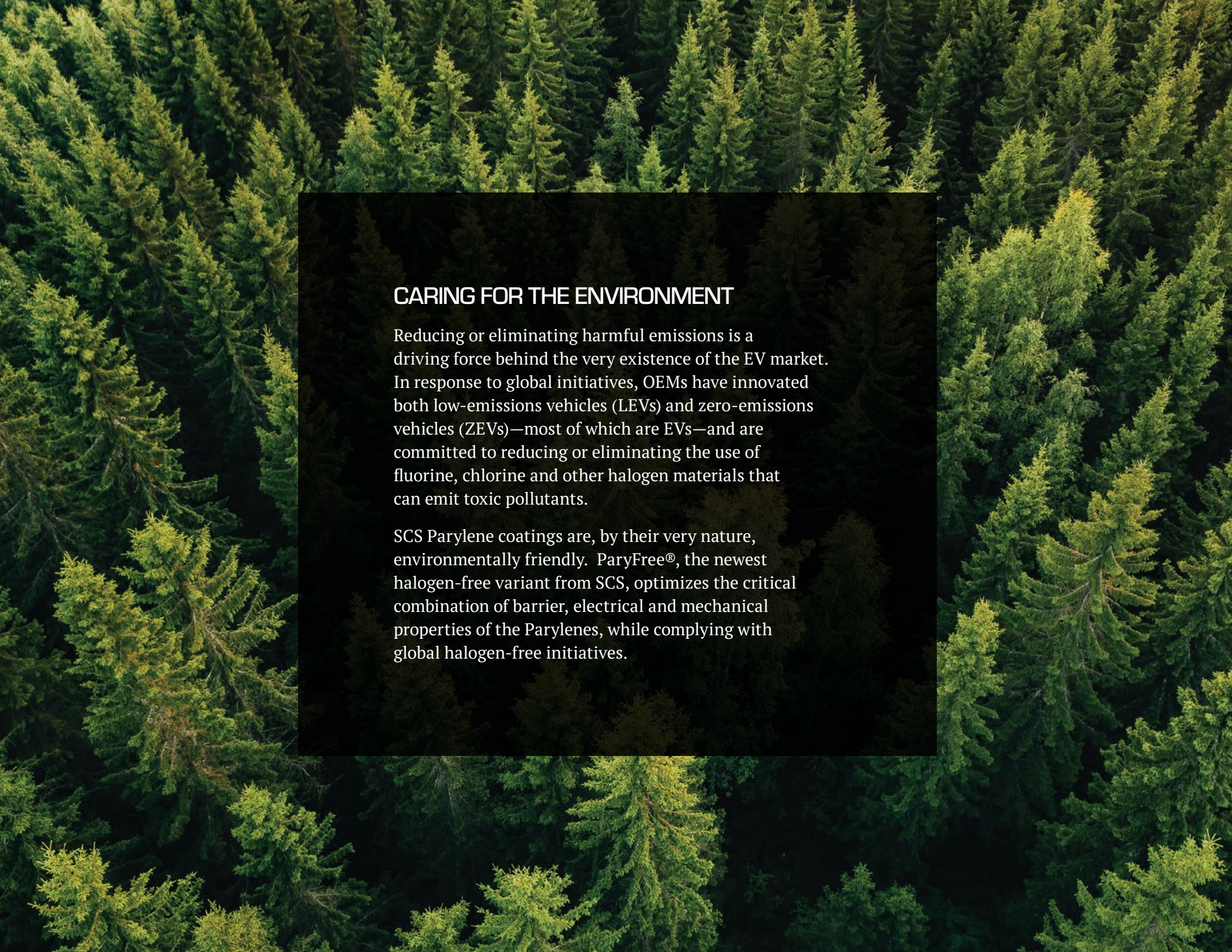


ENHANCING YOUR BRAND THROUGH COMFORT CONTROLS

As technologies advance in the automotive market, consumer comfort is also top of mind. In fact, consumers are expecting an increasing number of comfort and convenience features in their vehicle – even in mid-market models. If any of these components malfunction, the consumer's driving experience may be negatively impacted, which may, in turn, impact their brand loyalty. Building and growing brand loyalty will be critical as consumers find their way through new models and emerging brands in the EV market.

Operationally, the challenge for these components is that they are often located on the exterior of the vehicle or under its hood, which means they require significant and complete protection from harsh environmental conditions such as heat, freezing temperatures and moisture as well as from the extreme heat and chemical contaminants that may be found in the engine environment. Another challenge is the amount of available space. Even as the volume of components in EVs increases exponentially, the overall vehicle size remains relatively the same.

SCS Parylenes provide best-in-class moisture and chemical barrier properties for both multi-climate driving experiences and spilled drinks. The dielectric barrier properties of ultra-thin Parylene coatings also provide for high performance electrical isolation in ever-tightening spaces, while adding no significant mass to the components.



CARING FOR THE ENVIRONMENT

Reducing or eliminating harmful emissions is a driving force behind the very existence of the EV market. In response to global initiatives, OEMs have innovated both low-emissions vehicles (LEVs) and zero-emissions vehicles (ZEVs)—most of which are EVs—and are committed to reducing or eliminating the use of fluorine, chlorine and other halogen materials that can emit toxic pollutants.

SCS Parylene coatings are, by their very nature, environmentally friendly. ParyFree®, the newest halogen-free variant from SCS, optimizes the critical combination of barrier, electrical and mechanical properties of the Parylenes, while complying with global halogen-free initiatives.

CARING FOR PEOPLE

Because passenger safety is paramount, OEMs work hard to reduce the six most common auto accidents, which are often caused by drivers – rear, head-on, side, single, low-speed and pedestrian collisions. Most new vehicles already operate with some level of Advanced Driver-Assisted Systems (ADAS) controls: LiDAR, MEMs monitors, 360° camera views and a host of other safety sensors. But government regulations mandate that these safety measures increase steadily until full autonomous driving is reached. It is critical, then, that these safety systems and sensors work as designed – 100% of the time – even under the harshest of conditions.

Well-known in the aerospace industry for their optical clarity, which allows for protection without distortion of light or signals, Parylenes are ideal for protecting and optimizing the function of EV safety sensors and indicators.

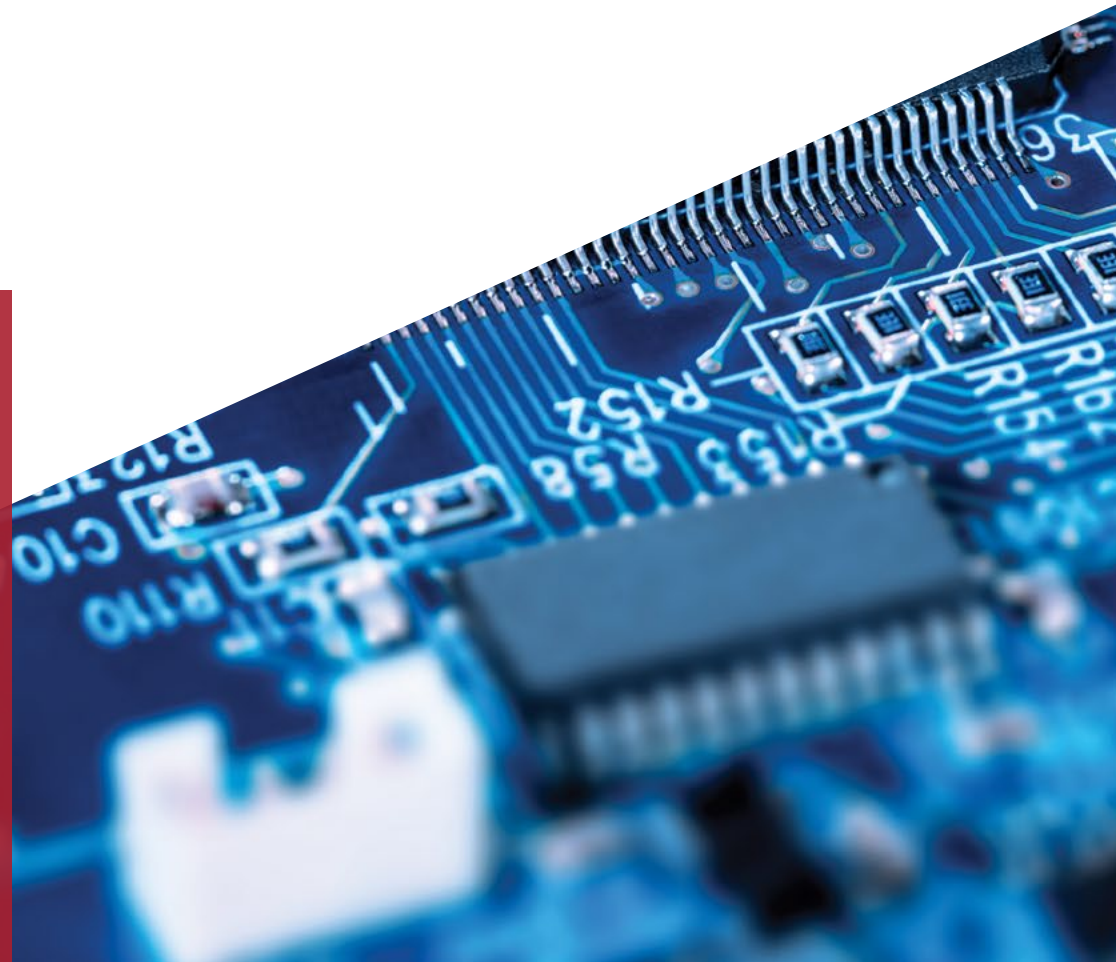


PARYLENES: THE PROTECTION, PERFORMANCE AND GLOBAL PRODUCTION YOU NEED

Consumers need their vehicles to go – at any time and to any location. The challenge for OEMs is to make sure they do just that; EVs are no exception. Yet, due to the volume of electronic content onboard, EVs are more vulnerable to system failures. As electronics become more prevalent and complex, OEMs are looking to more sophisticated coatings to protect the greater investment in designs and builds.

Parylene conformal coatings often outperform alternative coatings due to their superior dielectric properties, moisture and chemical barrier properties, and their UV and temperature stability. Considering the number of critical electronic components designed into EVs, OEMs can't afford not to use the most effective protection available.

To match this growing demand, SCS offers its customers global production support for high-volume applications through 20 AS9100 and ISO9001-certified coating locations around the world. Our tenured engineering and production teams are experienced in meeting the needs of the automotive industry and stand ready to support customers' regulatory and quality requirements.





PARTNERING WITH CUSTOMERS

To maintain the highest quality and performance, SCS employs some of the world's foremost Parylene specialists who perform their work at state-of-the-art coating facilities in 11 countries worldwide. The company has 50 years of experience developing customized solutions for clients who have a variety of requirements, including cost control and high-volume production schedules. SCS is trusted by many of the biggest names in the consumer electronics, aerospace, defense, transportation and medical device industries to provide critical protection of their advanced technologies.

To learn more about Parylene conformal coatings and how SCS can help provide solutions to your EV protection challenges, contact us today.

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