VpCl[®] Technology For Automotive Industry











Cortec® VpCI® & ESD Technology for the Auto Industry

Cortec[®] VpCI[®] Technology has become a standard for rust prevention in the automotive industry. Of special note, Cortec's Vapor phase Corrosion Inhibitors (which diffuse throughout enclosed spaces and adsorb on metal surfaces) offer many forms of dry protection that do not require the removal of oils or greases before the parts can be used. Cortec[®] also manufactures a variety of robust wetand dry-film corrosion inhibitors with biobased options for greater sustainability. Last, but not least, Cortec[®] is on the cutting edge of electronics protection with packaging that combines corrosion inhibitors and permanent ESD protection for today's rapidly growing electronic and electric vehicle (EV) market. Start your auto industry protection journey here and let Cortec[®] guide you through the process!



PPAP

The Pre-Production Approval Process (PPAP) is a set of steps originally developed by the Automotive Industry Action Group. PPAP is followed by Cortec[®] Corporation to minimize safety risks and economic loss when recommending products to the distributor and customer. This is accomplished by anticipating possible sites of failure, eliminating them in the design, assessing accuracy of measuring systems, assuring consistency, and documenting and planning for success. Cortec[®] works with engineers to develop the most cost-effective method to make sure corrosion or static charge does not undermine a successful new product launch.

GLOBALLY SOURCED COMPONENTS

Cortec[®] will work with vendors of inbound materials to make sure rust never enters your company's production process. Corrosion on raw materials often reemerges in later processes. But with Cortec[®] solutions, you can be assured that corrosion will not reappear.

WIP CYCLE

Cortec[®] will evaluate the total time required to produce a product from when the product enters the factory to when it leaves. This includes processing, transport, and time spent waiting in queue. Cortec[®] will use this information and analyze the work-in-progress (WIP) to implement corrosion inhibitors at the best point in manufacturing. Rust preventatives can be introduced in machining, washing, and post-production applications.



GLOBAL SUPPLY CHAIN

Electronic, electrical, and mechanical components from around the world undergo unpredictable shipping conditions on their way to assembly. Cortec[®] packaging materials and rust preventatives provide continuous protection to ensure corrosion-free arrival regardless of temperature or humidity swings. Self-replenishing Vapor phase Corrosion Inhibitors and translucent packaging also promote ease of inspection at customs.

STORAGE

Banks/Build-Aheads – Manufacturers often make a larger quantity of parts than standard production requires in order to have extra on hand (a bank). This is often done while transitioning to a new supplier or during retooling of production lines so the stream of parts is still available to feed other processes. It is also done to make sure parts are available during holidays or unexpected shutdowns.

All-Time-Buys/End-of-Life – The automaker must plan to meet 15 years or more of service parts requirements. Once a vehicle/engine/part is ready to be phased out, the manufacturer often prefers to make all the service parts for future needs (including re-manufacturing) at one time. This allows them to avoid very costly small volume parts runs in the future.

TRADITIONAL AUTO COMPONENTS

Protect engines, transmissions, stampings, wheels, bearings, and other metal auto components.



CorShield® VpCI®-146 – is premium VpCI® coated paper for multi-metal contact/vapor-phase corrosion protection. *USDA Certified Biobased Product.* Single item packaging and interleaving. Recyclable.



BioPad® – is a unique flexible corrosion inhibiting device constructed from biobased non-woven material. High VpCl® concentration for multi-metal vapor-phase protection. *USDA Certified Biobased Product*.



BioCorr® HP – is a water-based, biobased rust preventative that leaves behind a dry, virtually undetectable film on the metal surface. Multi-metal protection. USDA Certified Biobased Product.



CorrLam® LD VpCI® Barrier Laminate – is a multilayered laminate structure of clear polyester extrusion coating, aluminum foil, and VpCI®-126 Film. Great for long-term build-ahead programs.



Cor-Pak® 1-MUL/8-MUL Pouches – are breathable pouches that contain Vapor phase Corrosion Inhibitors for multi-metal protection within a pack-age. Protects 1 ft³ (28 L) or 8 ft³ (0.23 m³) of space, respectively.



CorShield® VpCI®-220E Films and Bags – are Vapor phase Corrosion Inhibitor packaging materials made with 30% recycled content and improved corrosion protection. Recyclable.



Eco-Corr Film[®] – is Vapor phase Corrosion Inhibitor packaging film that is certified as industrially compostable by TÜV Austria.[†] A great alternative to conventional polyethylene films for shipping and storage.



EcoLine® 3690 – is a biobased readyto-use removable coating designed for high humidity conditions. Leaves behind oily protective film that does not dry. USDA Certified Biobased Product.



VpCI®-126 Films and Bags – are high technology Vapor phase Corrosion Inhibitor films and bags for multi-metal corrosion protection. Eligible for Cortec®/EcoCortec® VpCI® plastic recycling program.*

† This product is intended to be composted in a commercial composting facility operated in accordance with best management practices. Check locally to see if such a facility exists in your community and if they will accept this product. Not suitable for backyard composting.



VpCI®-130 Series – is a collection of flexible foam packaging material infused with Vapor phase Corrosion Inhibitors for multi-metal protection in a variety of sizes.

VpCI®-377 – is a water-based rust preventative concentrate designed for surface applied applications including transmission components.

EV & ELECTRONIC COMPONENTS

Protect EV batteries and the thousands of sensors and electronic components that control today's vehicles.



EcoSonic[®] **ESD Paper** – combines corrosion inhibiting and static-dissipative properties in a recyclable paper for wrapping individual parts, interleaving, or inserting into a package.



EcoSonic[®] VpCI[®]-125 HP Permanent ESD Films & Bags – are high-performance contact/vapor-phase corrosion inhibiting films and bags with permanent anti-static properties for long-term use.



ElectriCorr™ VpCI®-238/239 – are electronic cleaners/protectors containing VpCI®. They can be sprayed on EV electrical contacts, PCBs, and other electrical components to add a layer of corrosion protection.



EcoSonic® ESD Glassine Paper – is a recyclable translucent glassine paper with contact/vapor-phase corrosion inhibiting and static dissipative properties. Can be made into envelopes and bags.

CASE HISTORIES

TWO-IN-ONE ESD/CORROSION PROTECTION FOR ELECTRONICS

A major North American distributor of electronic components was intrigued with Cortec's idea of combining corrosion protection with ESD bags and started using Cortec's EcoSonic[®] VpCI[®]-125 HP Permanent ESD Film & Bags after the bags passed the client's necessary electronics and quality testing. The distributor has been very happy with the bags and uses a variety of styles and sizes including long narrow bags with zippers for hand packing and bags-on-a-roll for automated packaging.



LONG-TERM STORAGE OF AUTO SERVICE PARTS

In early 2020, a Big Three automaker needed to preserve thousands of rear differential units for up to 15 years. They decided to use CorrLam[®] LD VpCI[®] Barrier Laminate and Cor-Pak[®] 1-MUL Pouches, which had been on their specification for over 20 years. The differentials were placed inside CorrLam[®] LD VpCI[®] Barrier Laminate bags along with a Cor-Pak[®] 1-MUL or 8-MUL Pouch for added corrosion protection depending on the size of the bag. The bags were either heat-sealed or sealed with long-term preservation tape. This preservation system has been used with repeated success by multiple automakers globally over the last two decades. Its excellent track record together with its long-time presence in company specifications made it the default choice for this automaker.



ADOPTING ECOLINE® 3690 FOR ALL-TIME-BUYS

A third-party packager of parts for a Big Three automaker wanted to replace a solvent-based rust preventative that had been used for decades but was difficult to remove and raised concerns for worker safety and the environment. They sent auto parts to Cortec® Laboratories for testing according to automaker specifications. Two camshafts and one cylinder head were coated with EcoLine® 3690 and subjected to relevant accelerated corrosion tests (e.g., salt spray, humidity). Results were considered successful, and the biobased rust preventative was written into the automaker's specifications for aftermarket engineering processes. The third-party packager began using EcoLine® 3690 in early 2019 when packing the automaker's crankshafts, camshafts, or cylinder heads for long-term indoor storage (up to 10 years) of alltime-buys. The packaging company was very happy with the results, environmental aspect, and worker benefits.



TRANSMISSION BUILDOUT PROGRAM

A major auto manufacturer was phasing out a transmission model and needed a buildout program to meet lifetime requirements of up to 15 years for almost 1.5 million transmission components (mostly all-time-buys). The manufacturer opted to preserve the components in CorrLam[®] LD VpCI[®] Barrier Laminate, with a Cor-Pak[®] 1-MUL Pouch inserted in the packaging before sealing the CorrLam[®]. This method offered long-term corrosion protection at low cost per package compared to the high expected costs that would otherwise be incurred from setup and new production of the service parts at inflated prices five to 15 years later.

PROTECTING TRANSMISSIONS WITH BIOCORR® ATF and VpCI®-126

A large manufacturer of OEM transmissions was having costly corrosion problems in the interim period between manufacturing and export shipping. Like many other facilities, they had been relying on a standard flash corrosion inhibitor wash additive to provide all the necessary protection for several months until the transmissions were shipped to another site to be wrapped in VpCI[®]-126 for international export. A standard wash additive with flash rust inhibitors typically does not provide protection for more than 30 days, especially during summer months ("corrosion season"). Because of this, the OEM faced problems when storing the transmissions for one to nine months inside a warehouse with no temperature or humidity control.

Cortec[®] worked closely with engineers at the transmission manufacturer to provide a rust preventative that would be compatible with transmission fluid, would not leave much residue, and could be easily washed off in future processes. After a lengthy approval period, the OEM adopted BioCorr® ATF to provide an added layer of protection during storage and shipment. Cortec[®] developed this product specifically for the transmission industry in order to provide an effective rust preventative that would be compatible with the needs of transmission manufacturing. The OEM now sprays BioCorr® ATF on the transmissions after the washing process, leaving behind a dry film that is virtually undetectable. Following a period of storage in the warehouse, the transmissions are shipped to another site, where they are wrapped in VpCI®-126 Film and bulk-packed in boxes as usual before being shipped overseas.

BioCorr® ATF provides the extra protection needed during



storage before export shipment. If desired, it can be easily removed by rinsing with water at the receiving facility before final assembly. As a USDA Certified Biobased Product that is easy to use, BioCorr[®] ATF provides an excellent alternative to traditional petroleum-based rust preventatives that are more difficult to remove.

Cortec[®] Corporation



Quality Management System (ISO 9001 Certified)

World Class Product Offerings An innovative producer of leading edge products.

World Class Customer Service

A positive, long-lasting impression through every link of our company.

World Class Environmental Commitment

Cortec[®] commits to continued development of processes and products that are useful, non-hazardous to the environment, and recyclable whenever possible.

An Ethical and Respectful Company Culture

Respect and treat our colleagues, customers, and vendors as we would our own family members.

Environmental Management System (ISO 14001 Certified)

Cortec's strong environmental concern is demonstrated in the design and manufacturing of products that protect materials of all kinds from environmental degradation. A strong commitment to produce recyclable products made from sustainable resources has been and will be our future policy. This brochure can be recycled.



Laboratory Accreditation (ISO/IEC 17025)

Cortec[®] Laboratories, Inc. is the first lab in our industry to receive ISO/IEC 17025 Certification, which ensures quality in recording and reporting data, as well as calibrating equipment within the laboratory.



LIMITED WARRANTY

All statements, technical information and recommendations contained herein are based on tests Cortec* Corporation believes to be reliable, but the accuracy or completeness thereof is not guaranteed. Cortec* Corporation warrants Cortec* products will be free from defects when shipped to customer. Cortec* Corporation's obligation under this warranty shall be limited to replacement of product that proves to be defective. To obtain replacement product under this warranty, the customer must notify Cortec* Corporation of the claimed defect within six months after shipment of product to customer. All freight charges for replacement product shall be paid by customer.

shipment of product to customer. All freight charges for replacement product shall be paid by customer. Cortec* Corporation shall have no liability for any injury, loss or damage arising out of the use of or the inability to use the products. BEFORE USING, USER SHALL DETERMINE THE SUITABILITY OF THE PRODUCT FOR ITS INTENDED USE, AND USER ASSUMES ALL RISK AND LIABILITY WHATSOEVER IN CONNECTION THERE WITH. No representation or recommendation not contained herein shall have any force or effect unless in a written document signed by an officer of Cortec[®] Corporation.

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and antique cars.

Distributed by:

4119 White Bear Parkway, St. Paul, MN 55110 USA Phone (651) 429-1100, Fax (651) 429-1122 Toll Free (800) 4-CORTEC, E-mail productinfo@cortecvci.com www.CortecVCI.com

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Cortec's CEO Boris Miksic is a car enthusiast having his own collection of rare