

VpCI[®] Technology For Automotive Industry



CORTEC
CORPORATION

Environmentally Safe VpCI[®]/MCI[®] Technologies





Cortec® VpCI® Technology

PROTECT AUTOMOTIVE INDUSTRIES

The automotive industry has presented difficult challenges to researchers fighting the effects of corrosion — in terms of both economic loss and environmental safety. Cortec's capability offers highly efficient and economical corrosion protection for automotive applications. Cortec® products have been developed using proprietary VpCI® Technology, providing safer, cost-effective methods of preventing and diminishing the severe damage caused by corrosion.

PROTECT THE ENVIRONMENT

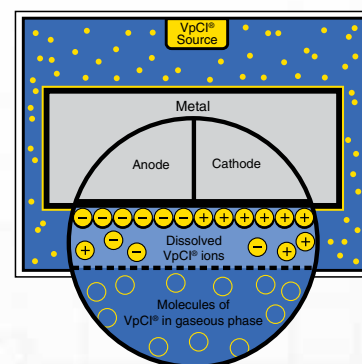
VpCI® Technology opens the door for environmentally responsible methods of treatment with low toxicity and low polluting effects. Unlike corrosion inhibiting systems of the past, many Cortec® VpCIs do not contain chromates or other heavy metals, nitrites, or chlorinated hydrocarbons. With Cortec® VpCIs you can turn the tables on corrosion. Supported by our corrosion scientists, engineers, and testing facility, Cortec® can provide simple, environmentally friendly, cost-effective solutions to corrosion problems.

PROTECT CONTINUOUSLY

Unlike conventional rust preventatives, which must be cleaned off and disposed as hazardous waste before parts can be used, Cortec® VpCI® Technology includes many dry protection options that offer continuous protection through the action of self-replenishing Vapor phase Corrosion Inhibitors. Packaged metal components can be used immediately without further cleaning or degreasing required, and many VpCI® materials are easy to dispose or recycle after use.

Vapor phase Corrosion Inhibitors (VpCI®)

VpCI® Technology is an innovative, environmentally responsible, cost-effective option for corrosion protection. Cortec® products protect with a thin, monomolecular protective barrier. The barrier re-heals and self-replenishes, and can be combined with other functional properties for added protective capabilities. Vapor phase Corrosion Inhibitors form a physical bond on the metal surface, creating a barrier layer against aggressive ions.



**Vertical Integration and ISO
Total Quality to Reduce Risk**



**Trusted Global Manufacturing
And Technical Service in 90+
Countries**



**ISO Accredited Laboratories
for Validation Testing**



Automotive Applications

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 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 does not undermine a successful new product launch.

RAW MATERIALS

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



VpCI®-126 - is a blue plastic film with VpCI® for multimetal corrosion protection. Heat sealable. Also available in top-seal bags and shrink film varieties. Commercial equivalent to MIL-PRF-22019 Recyclable. Patented.



VpCI®-146 - is a high-quality VpCI® coated paper for multimetal corrosion protection. Non-hazardous, nitrite free, 100% recyclable/repulpable. Excellent for single item packaging. Commercial equivalent to MIL-PRF-3420. Patented.



BioPad® - is a unique flexible corrosion inhibiting device constructed from biobased non-woven material. Bio-Pad® provides a more sustainable packaging option for corrosion inhibition.



VpCI®-377 - is a water-based concentrate designed as a complete replacement for oil-based rust preventatives for indoor protection of equipment and components. It leaves behind a clear dry protective film.



VpCI®-130 Series - has unique, flexible packaging materials that combine VpCI® protection, cushioning, and desiccant action, plus excellent antistatic capabilities, all in one step! Cortec® VpCI®-130 Series foams provide effective corrosion protection. Patented.



BioCorr® Rust Preventative - contains 64% USDA certified biobased content and is intended for preservation of metals in storage and during transportation. BioCorr® Rust Preventative provides multimetal protection and is an excellent environmentally sound alternative to petroleum derived products. Also available in ATF and FT versions.

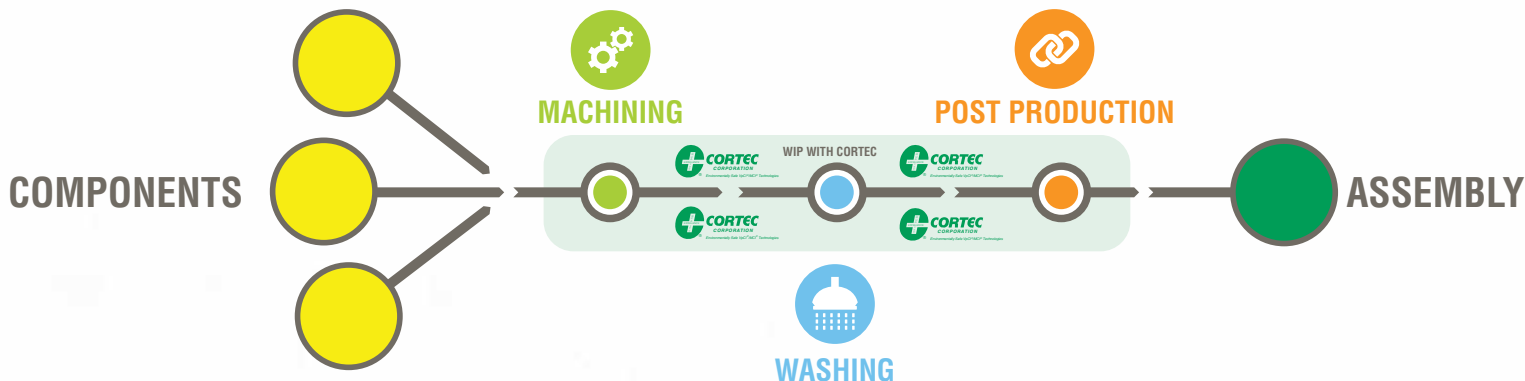


VpCI®-329 Oil-Based Concentrate - is a vapor corrosion inhibiting concentrate for use with lubricating, hydraulic, and preservation oils. It provides excellent protection in sheltered outdoor/indoor conditions. VpCI®-329 protects in two unique ways: by offering a tenacious film which clings to metal surfaces and by releasing Vapor phase Corrosion Inhibitors into the air-space above the oil.

Automotive Applications

WIP PROCESS

Cortec® will evaluate the total time required to produce a product from when the product enters the factory to when it leaves (the WIP cycle); including 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.

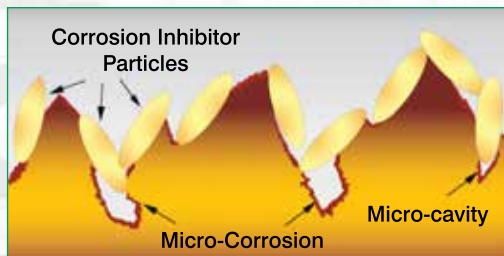


HIGH PERFORMANCE COATINGS

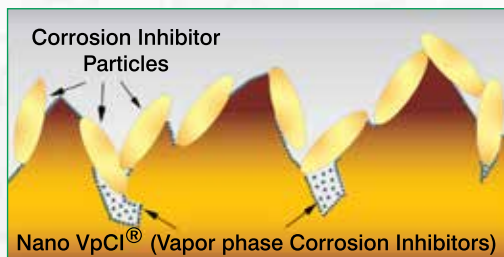
The total economic loss from corrosion can approach a staggering 5% of total profit. This huge loss comes from products that must be sold as a lower grade or must be repickled, reprocessed, or scrapped due to corrosive attack while in the plant. This leads to lost productivity. The high cost of corrosion also includes rust claims and freight costs for returned goods.

Cortec® can recreate your current colors with a customized formula or simply match it from our extensive list of standard colors. Most Cortec® coatings have outstanding UV resistance and gloss retention, which is important when aesthetics are a consideration.

With environmentally responsible VpCI® technology, your equipment and products will be effectively protected against humidity, saltwater, and oxidizing atmospheres as well as corrosive industrial, marine, and tropical environments.



Traditional coatings can not protect the micro-cavities due to the relative large size of corrosion inhibitor particles such as nitrate, aluminum, zinc, and so on. That's where micro-corrosion starts when using traditional coatings.



Cortec® Coatings are unique because the Nano VpCI® (Vapor phase Corrosion Inhibitors) penetrates and protects the micro-cavities against micro-corrosion.



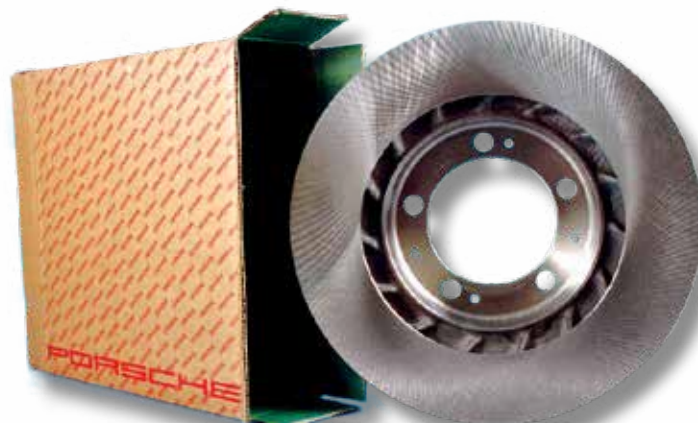
Automotive Applications

SHIPPING

Simply wrap, shroud, or pack your products or equipment; protection is continuous for transit. A self-replenishing vapor emits to protect all exposed metal surfaces regardless of temperature or humidity swings.

Cortec's VpCI® film and papers are QC inspected to ensure 100% quality of the physical, mechanical, and corrosion inhibiting properties of all products produced. We meet the most rigorous international quality standards for corrosion inhibiting films.

Using Cortec's VpCI® films will ensure that valued assets are clean, dry, corrosion free, and ready for shipping.



STORAGE

Banks/Build-Aheads – This is when a manufacturer makes more than standard production of parts in order to have extra on hand (a bank). It is often done while transitioning to a new supplier or during re-tooling of production lines so the stream of parts is still available to feed to other processes. It is also done for holiday shut-downs to make sure parts are available.

All-Time-Buys/End-of-Life – This is the service parts requirement the automaker must plan for up to 15 years. Once a vehicle/engine/part is no longer going to be needed, the manufacturer often prefers to make all the service parts and parts for future needs (including re-manufacturing) at one time. This allows them to avoid very costly, small volume parts runs in the future.



Automotive Applications

ELECTRIC VEHICLES

Cortec® Corporation is on the cutting edge of corrosion protection in the electric vehicle (EV) market. As EV production grows, so does the need for corrosion inhibiting packaging with ESD (electrostatic discharge) protection. Cortec® has satisfactorily met this need by supplying VpCI®-125 bags for overseas shipment of EV components from a leading automaker.

VpCI®-125 Film and Bags – combine contact and vapor-phase corrosion protection with electrostatic discharge (ESD) protection for packaging of sensitive electrical components. VpCI®-125 forms a molecular corrosion inhibiting layer on metal substrates but does not interfere with optical, physical, or chemical properties of the packaged parts. Items are immediately ready for use, with no cleaning or degreasing required.

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 before storage or shipment.



ECOAIR® MRO (MAINTENANCE, REPAIR, OPERATIONS)

One small rust spot on a high-cost auto component can be a big loss for manufacturers who do not have an easy way to clean, protect, and preserve metal goods. Cortec's line of EcoAir® corrosion solutions offers convenient cleaning, rust removal, and rust preventative options packaged in eco-friendly spray cans powered by compressed air instead of traditional chemical propellants.



EcoAir® 422/423 Rust Removers – are two rust removers with high biobased content. They provide fast, effective rust and stain removal on iron, steel, copper, and brass. Excellent for touch-up of auto parts that have minor corrosion spots.



EcoAir® 414 Cleaner/Degreaser – is a water-based cleaner and degreaser that effectively removes dirt, oils, and greases and protects against flash corrosion on iron, steel, galvanized steel, copper, and brass surfaces.



EcoAir® 325 Tool & Die Rust Preventative – is an excellent rust preventative for the automotive tool and die industry. EcoAir® 325 displaces water and is easy to apply over large surface areas such as plastic-injection molds. It does not require special cleanup before mold use.



Case History

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 inhibitor 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 rinse 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.



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

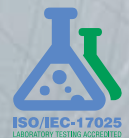
Environmental Management System (ISO 14001 Certified)

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.

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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