



# VpCI<sup>®</sup> Technology For Automotive Industry



**CORTEC**  
CORPORATION

*Environmentally Safe VpCI<sup>®</sup>/MCI<sup>®</sup> Technologies*







# Cortec® VpCI® Technology

## PROTECT AUTOMOTIVE INDUSTRIES

The Automotive Industry has presented difficult challenges to researchers in fighting the effects of corrosion — in 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. Cortec® VpCIs are a safe, cost-effective method for preventing and diminishing the severe damage caused by corrosive process streams.

## PROTECT THE ENVIRONMENT

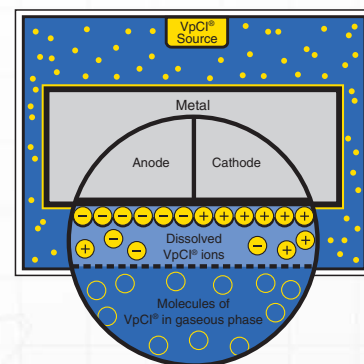
VpCIs offer an environmentally safe method of treatment with low toxicity and low polluting effects. Unlike corrosion inhibiting systems of the past, many of Cortec® VpCI's do not contain chromates or other heavy metals, nitrites, or chlorinated hydrocarbons. With Cortec® VpCIs you can turn the tables on corrosion. With the support of our corrosion scientists, engineers, and testing facility, Cortec® can provide simple, environmentally friendly, cost-effective solutions to corrosion problems.

## PROTECT CONTINUOUSLY

Unlike conventional methods, such as filming amine corrosion inhibitors, you can inject Cortec® VpCIs into any part of your system. Cortec® VpCIs go to work immediately and are self-replenishing. Continuous, uninterrupted protection in the liquid phase, inter-phase, and vapor phase can be added at multiple points. For example, the automatic injection of Cortec® VpCIs into a system — with no attendance operator — provides protection immediately, even on pre-rusted or scaled surfaces.

## Vapor phase Corrosion Inhibitors (VpCI®)

VpCI® technology is an innovative, environmentally safe, cost-effective option for corrosion protection. Cortec® products protect with a thin, mono-molecular protective barrier. The barrier re-heals and self-replenishes, and can be combined with other functional properties for added protective capabilities. VpCI® 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 ensure that safety risks are removed from the product before it reaches 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 the documenting and planning for success. Cortec® works with engineers to develop the most cost effective method to make sure corrosion doesn't undermine a successful new product launch.

## RAW MATERIALS

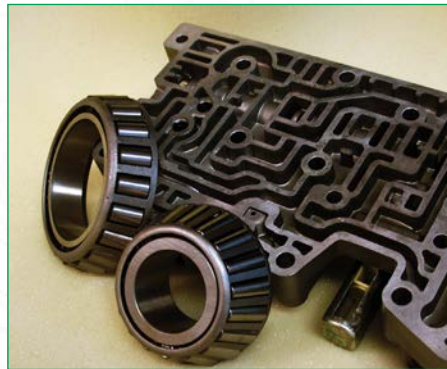
Cortec® will work with vendors of in-bound materials to make sure rust never enters your company's production process. Corrosion on raw materials often re-emerges in later processes. But with Cortec® solutions you can be assured that corrosion will not reappear.



**VpCI®-126** Blue- Transparent plastic film with VpCI® for multimetal protection. Heat sealable. Also available in Top-seal bags and Shrink film varieties. Conforms to MIL-PRF-22019D, according to the Naval Air Warfare Center Aircraft Division, QPL 13600 Ser 43500B120-3/531. Recyclable. Patented.



**VpCI®-146** - Multimetal VpCI® coated high quality natural base paper. Non-toxic, nitrite free, 100% recyclable/repulpable. Excellent for single item packaging. Conforms to MIL-P-3420. Patented.



**BioPad®** - is a unique flexible corrosion inhibiting device constructed from 100% biobased non-woven material, resulting in a finished good containing 66% biobased content. BioPad® provides an eco-friendly sustainable packaging option for corrosion inhibition and has been awarded USDA BioPreferred™ designation ([www.biopreferred.gov](http://www.biopreferred.gov)). Patent Pending.



**VpCI®-377** - is a water-based concentrate designed as a complete replacement for oil-based preventives for indoor protection of equipment and components. VpCI®-377 is a corrosion preventive liquid that meets tough antipollution requirements.



**VpCI®-130 Series** - 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** - is a water-based, biobased, and biodegradable rust preventative that is intended for preservation of metals in storage and during transportation. BioCorr® Rust Preventative provides multi-metal protection and is an excellent environmentally sound alternative to petroleum derived products. Also available in ATF and FT Versions. USDA BioPreferred™ designation.



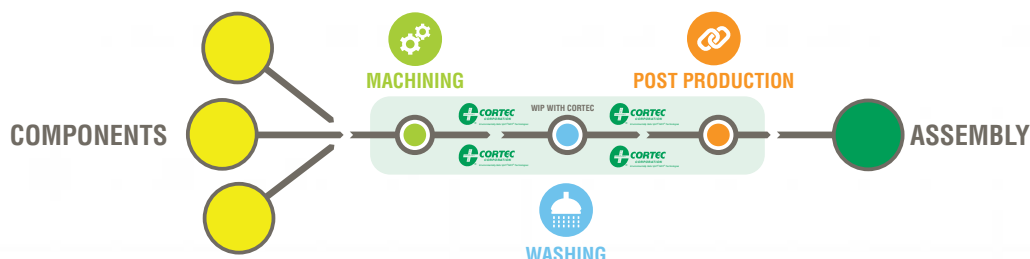
**VpCI®-329 Oil-Based Concentrates** - is a vapor corrosion inhibiting concentrate for use with lubricating, hydraulic, and preservation oils. It provides excellent protection in sheltered outdoor/indoor conditions. VpCI®-329 protects in two unique ways: by offering a tenacious film which clings to metal surfaces, as well as vapor phase inhibitors into the air 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 along with analyzing 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.

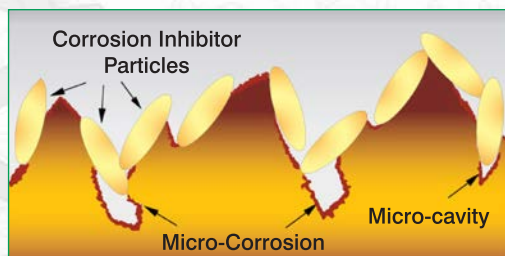
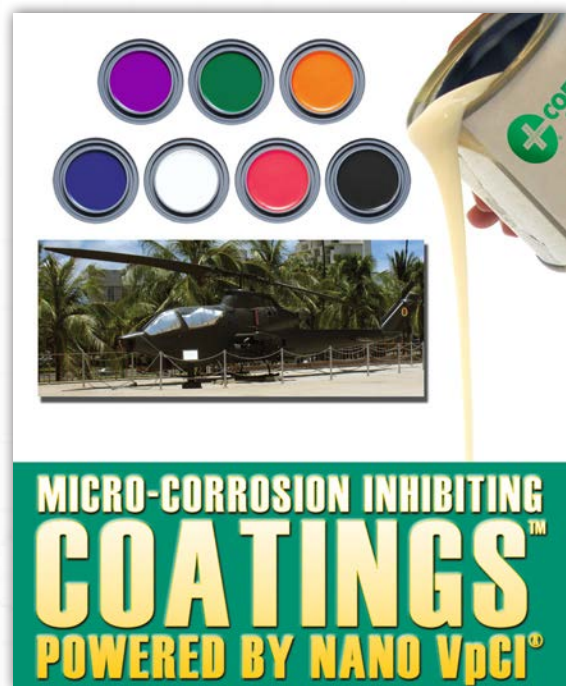


## HIGH PERFORMANCE COATINGS

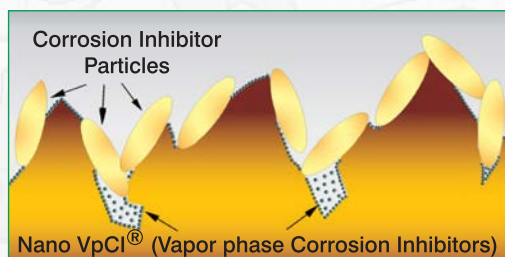
The total economic loss from corrosion can approach a staggering 5% of total profit. This huge loss comes from products that must be sold as a lower grade or must be repickled, reprocessed, or scrapped due to corrosive attack while in the plant. This leads to lost productivity. The high cost of corrosion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





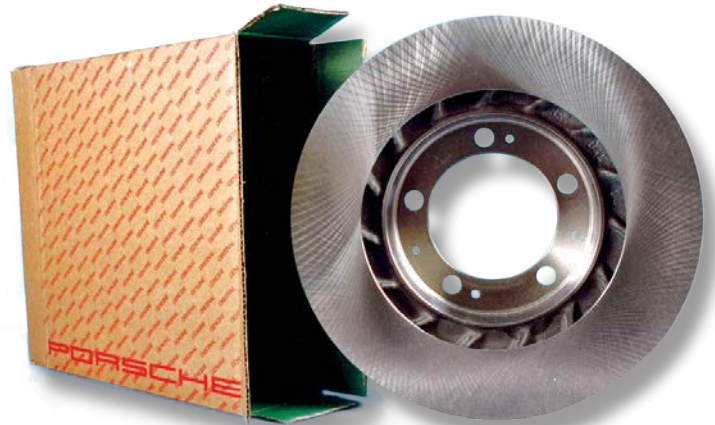
# Automotive Applications

## SHIPPING

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

Cortec's VpCI® films, papers, liners, corrugated, foams and devices are made exclusively from high technology resins using proprietary extrusion techniques to ensure 100% quality of the physical, mechanical, and corrosion inhibiting properties of all products produced. Our products 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** – When a manufacturer makes more than standard production of parts in order to have extra on hand (a bank). 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. Also done for holiday shut downs to make sure parts are available.

**All-Time-Buys/End-of-Life** – This is the service parts requirement for up to 15 years the automotive must plan for. 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.



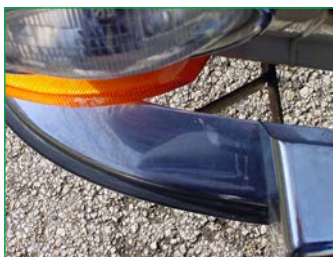


# Automotive Applications

## DE-RUSTING

Cortec's OEM approved de-rusting process has been utilized to de-rust millions of production parts including many different types of critical transmission components.

Cortec's rust removers easily and effectively remove rust and tarnish from steel, iron, copper, brass, chrome, and aluminum. They will not harm human skin or adversely affect most paints, plastics, wood, textiles, ceramics, or rubber. Long lasting, cost-saving solutions provide a time efficient, superior outcome that's gentle yet thorough on corroded tools, parts, and equipment.



**VpCI®-422** - Organic rust removers effectively remove rust and tarnish from steel, iron, copper, brass and chrome. Non-polluting. Will not harm human skin or adversely affect most paints, plastics, wood, textiles, ceramics or rubber. USDA BioPreferred<sup>SM</sup> designation.

**VpCI®-423** - is a rust remover that is harmless to people while effectively removing rust and tarnish from steel, iron, copper, brass, chrome, and aluminum. VpCI®-423 removes corrosion from metal without creating waste disposal difficulties. USDA BioPreferred<sup>SM</sup> designation.

**VpCI®-414** - is a cleaner and degreaser that also removes temporary coatings such as Cosmoline<sup>TM</sup>\*, Cortec® VpCI-368, VpCI®-388, VpCI®-389, and non-silicone-based waxes from metal and painted surfaces.

\*Cosmoline<sup>TM</sup> is a registered trademark of Houghton International, Inc.

**VpCI®-416** - While most cleaning compounds available on the market today are simple blends of surfactants and detergents which limit their cleaning effectiveness, VpCI®-416 offers improved cleaning plus multimetal corrosion protection action in one step, resulting in significant savings.

**VpCI®-418** - This heavy duty alkaline cleaner/degreaser contains inhibitors to protect metal parts from corrosion after cleaning. It has a unique ability to remove difficult deposits such as heavy hydrocarbons, greases, drawing and buffing compounds, and mill and machinery oils.

## UNTREATED



## TREATED





## 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 only lab in our industry that has received 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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