

VpCI® Technology For Off-Road Equipment and Mining Industries





Cortec® VpCI® Technology

PROTECT THE OFF-ROAD EQUIPMENT AND MINING INDUSTRIES

The Off-Road and Mining Industries have presented difficult challenges to researchers in fighting the effects of corrosion—in economic loss and environmental safety. The Cortec® corrosion engineers understand that each facility has a different atmosphere thus exposed to very different corrosive environments.

Selecting the right products to protect structures against corrosion is key in order to ensure longevity of the equipment, as well as good performance regardless of what metal or minerals are being extracted.

Cortec® is prepared to create a unique plan to fight and prevent corrosion-related problems in the Off-Road and Mining Industries, using industry leading products. Cortec® products have been developed using proprietary VpCI® Technology.

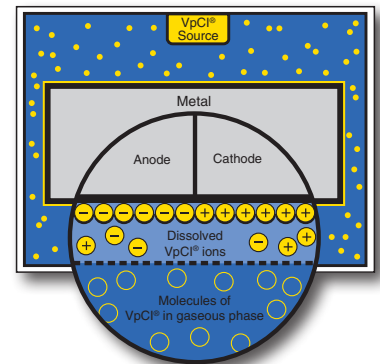
Cortec® VpCIs are a safe, cost-effective method for preventing and diminishing the severe damage caused by corrosive process streams. Whether a company is concerned with maintenance painting to prevent corrosion, or more serious corrosion problems affecting personal safety and continuation of production; Cortec® provides highly efficient and economical corrosion protection for the Off-Road and Mining Industries.

PROTECT THE ENVIRONMENT

Vapor phase Corrosion Inhibitors (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® VpCIs 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 for any corrosion problems.

PROTECT CONTINUOUSLY

Unlike conventional methods, such as filming amine corrosion inhibitors, you can inject the self-replenishing Cortec® VpCIs into any part of your system making them go to work immediately. Continuous, uninterrupted protection in the liquid phase, interphase, 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® forms a physical bond on the metal surface creating a barrier layer against aggressive ions.

Vertical Integration and ISO Total Quality to Reduce Risk

ISO Accredited Laboratories for Validation Testing

Trusted Global Manufacturing And Technical Service in 90+ Countries



CLEAN, PROTECT, PRESERVE CYCLE



Cortec's Clean, Protect, Preserve Cycle for the Off-Road and Mining industries begins with the quality and safety check of parts. To achieve the very highest standards in corrosion protection, these parts and its performance are analyzed, and the question of quality is addressed by Cortec® at every stage. Repeated checks are made and tests are applied to ensure that every product meets the strictest standards on quality.

Parts are evaluated for corrosion based on the length of its storage, damage caused, the cost, sensitivity of the part, and the packaging path is determined. The parts are then cleaned; if necessary, existing corrosion is removed. The product is dipped, sprayed, or brushed if required (without being given time to dry), and then neutralized with Cortec's environmentally friendly products.

Once primary protection is reached through cleaning the parts; packaging, coating, or both can be utilized to further the corrosion protection process. This can be done through Cortec's packaging, coatings, bags, emitters, MRO sprays, or Milcorr for crate replacement. The length of storage and speed should be assessed to determine the best path to provide 1 to 5+ year solutions.

Finally the product is preserved, thus reducing labor costs and increasing efficiency. The Clean, Protect, Preserve Cycle helps to keep quality, safe parts in great working condition.





MACHINERY MAINTENANCE

The different types of Off-Road Equipment and Mining Machinery experience different challenges - everything from impact and abrasion to immersion and exposure to chemicals and weather. Cortec's full line of degreasers, depainters, and rust/oxide removers can eliminate more costly and dimension changing processes like sand blasting, bead blasting, and acid dipping. By incorporating VpCI® products you can integrate this cleaning directly into your existing manufacturing processes.

DERUSTING PRODUCTS

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 is an organic rust remover that effectively removes 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™ designation.



VpCI®-423 Gel 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™ designation.



VpCI®-426 Gel removes corrosion, scale, and naturally occurring oxides from iron, carbon and stainless steel, and their alloys. It stays in place on vertical and difficult to treat surfaces where corrosion is heavy, allowing extra time for VpCI®-426 Gel to remove corrosion from the metal surface.

VpCI®-427 is a heavy-duty concentrate designed to remove oxide scale from parts and equipment fabricated from aluminum alloys, and as a preparation of aluminum surfaces for further processing such as anodizing, electroplating, or coating.

CLEANING PRODUCTS

While most cleaning compounds available on the market today are simple blends of surfactants and detergents which limit their cleaning effectiveness, VpCI® Cleaners offers improved cleaning plus multi-metal corrosion protection action in one step, resulting in significant savings. VpCI® Cleaners have the unique ability to remove such deposits as heavy hydrocarbons, grease, drawing and buffing compounds, and machinery compounds.

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

*Cosmoline™ is a registered trademark of Houghton International, Inc

VpCI®-416 is a heavy duty water-based alkaline cleaner and degreaser offering unique flash corrosion protection. VpCI®-416 can provide corrosion protection for up to 6 months during indoor storage.

VpCI®-418 LM is a heavy duty alkaline cleaner/degreaser for cleaning industrial, oil field, commercial, and marine equipment. VpCI®-418 is designed for use in power washing machinery, high agitation parts washers, and high-pressure spray washers.

VpCI®-432/433 are Paint Strippers and Cleaners that are environmentally safe for removing paint from metal, wood, and concrete, as well as providing protection against corrosion, flash rusting, and discoloring of stainless steel, iron, copper, aluminum, and brass.



Applications

PROTECTING/PRESERVING PRODUCTS

Cortec® offers a cost effective way of protecting and preserving the good metal of Off-Road Equipment and Mining Industries to the highest degree possible and prevents corrosion from reoccurring while still adhering to the customer's required parameters for immediate use, easy cleaning, or lubrication.

ElectriCorr® 238/239 is an electronic cleaner containing Vapor phase Corrosion Inhibitor (VpCI®). This cleaner is specifically formulated for electrical/electronic equipment, and components. ElectriCorr® VpCI®-238 forms a thin film of VpCI® effective against aggressive environments including industrial, marine, and tropical climates.

VpCI®-329 is a vapor corrosion inhibiting concentrate for use with lubricating, hydraulic, and preservation oils. Provides excellent protection in sheltered outdoor/indoor conditions. It 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.

VpCI®-705 Fuel Additive is specially formulated to use as a multifunctional fuel additive. It serves as a corrosion inhibitor, fuel stabilizer, and water emulsifier for gasoline, diesel, and gasohol mixtures. VpCI®-705 provides corrosion protection, lubricity, and elastomer protection.

VpCI®-105/111 Emitters, Patented are unique devices designed to provide corrosion protection for metal components and parts enclosed in non-ventilated control boxes, cabinets, or tool boxes. The VpCI® emit vapors, which form a molecular layer on internal metal surfaces.

MilCorr® VpCI® Shrink Film is a heavy duty film featuring Cortec® multi-metal Vapor phase Corrosion Inhibitors. MilCorr® VpCI® Shrink Film provides a top-notch universal protection system with high ultraviolet (UV) light protection to maintain the integrity of the film itself as well as the parts packaged within.

VpCI®-126 Series films combine the latest film technology with the most effective corrosion protection for all of your metal products. Sealing your product in Cortec® VpCI® films protects metal parts from all types of corrosion including rust, tarnish, stains, white rust, and oxidation for up to 5 years.

VpCI®-368 is a time-proven coating that provides excellent protection to metal substrates exposed to harsh outdoor conditions. VpCI®-368 leaves a firm, wax-like film that can be removed by mineral spirits or alkaline cleaners such as Cortec® VpCI-414.

VpCI®-369 is our best inhibitor for use as an oil additive and/or temporary coating. The protective film is self-healing and moisture-displacing, providing superior protection against aggressive environments. VpCI®-369 is also excellent when used as an oil additive for mothballing, shipping, or storage of parts and equipment.

VpCI®-322 provides corrosion protection to lubricating or hydraulic oils in indoor or open air conditions. It forms a tenacious film that clings to metal surfaces, giving excellent contact corrosion protection.

M-529, Patented is an oil-based package of corrosion inhibitors for lubricating oils. It provides excellent corrosion protection during operating conditions and intermittent operation. M-529/M-529L are very effective for mineral and synthetic based oils: naphthenic, iso-paraffinic, PAOs, etc.

M-531 is an oil-based package of corrosion inhibitors for petroleum and synthetic lubricants. M-531 provides outstanding non-staining properties with excellent demulsibility and filterability. M-531 is very effective for naphthenic, iso-paraffinic, PAO, etc. based lubricants.

VpCI®-379® is a water-based corrosion preventive liquid concentrate designed to meet tough anti-pollution requirements. It is designed to protect ferrous and nonferrous metals in sheltered areas, indoor or in packages not in direct exposure to rain and outdoor elements.



STRUCTURAL STEEL

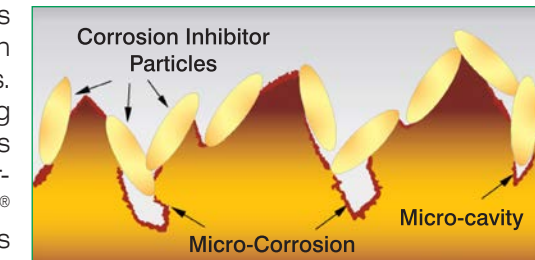
Steel structure exposed to an aggressive Off-Road and Mining environment needs to be protected with a sophisticated treatment and may need to be designed with maintenance in mind if extended life is required. The optimum protection treatment offered by Cortec®, which combines appropriate surface preparation, suitable coating materials, required durability and minimum cost, is available with modern surface treatment technology.

HIGH PERFORMANCE COATINGS FOR OFF-ROAD AND MINING INDUSTRIES

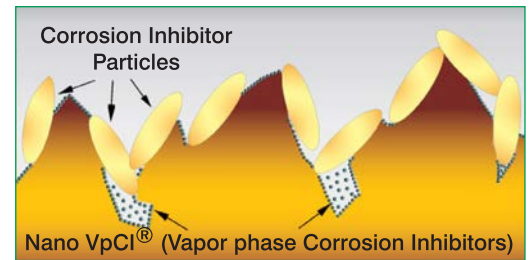
Cortec® can recreate your current colors with a customized formula or simply match it from our extensive list of standard colors. Most Cortec® coatings have outstanding UV resistance and gloss retention, which is important when aesthetics are a consideration. With the environmentally safe VpCl® technology, your equipment and products will be effectively protected against humidity, saltwater, and oxidizing atmospheres as well as corrosive industrial, marine, and tropical environments.

- *Both temporary and permanent coatings programs can be provided.*
- *Coatings systems that do not require sandblasting or other rust removal provide interesting options.*
- *Custom colors are available.*

CorrVerter® is a water-based primer recommended for application to rusty or poorly prepared steel surfaces where further corrosion protection is required and good surface preparation is difficult to achieve. CorrVerter® is formulated to penetrate and eliminate rust; piercing down to the bare metal, and stop further rusting.



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 VpCl® (Vapor phase Corrosion Inhibitors) penetrates and protects the micro-cavities against micro-corrosion.

CorrBarrier™ is a waterbased coating which exhibits excellent properties over various substrates. Primarily designed for the automotive underbody/under-hood market, it also has application in industrial maintenance, railcar, truck/trailer, and heavy machinery.





Applications

PROCESSING/ STORAGE

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.



MOTHBALLING PROCESSES

When asset preservation is required for periodic, seasonal lay-up, or longer term mothballing for asset; VpCI® packaging solutions provides a low-cost, easy-to-apply solution that will preserve assets for periods of several months to over 15 years.

In cases where equipment or systems require layup, temporary shutdown, or longterm mothballing; Cortec® products can be applied quickly with little or no surface preparation (depending on the product). Cortec's VpCI®/MCI® technology provides corrosion protection to external and internal metal surfaces and parts. The degree of protection needed is based on the severity of the environment and the length of exposure to corrosive elements. The protected system will be ready for immediate use when needed.



FACILITY AND ASSET PROTECTION WITH GLOBAL SERVICES

Preservation. Simplified.

Cortec® Global Services provides customers and clients with best-in-class technology, project management, engineering, design, application, and training services to ensure zero defect, low-cost preservation. For over 35 years, Cortec® has delivered high performance turn-key solutions for manufacturers, engineering firms, and project owners from industries ranging from automotive, telecommunications, construction, aerospace, military, power generation, oil and gas, and mining. By transferring knowledge of best practices between industries, Cortec® can ensure your preservation goals are attained at the lowest possible environmental impact and cost.

TOTAL SOLUTION PROVIDER

Global Services is focused on providing our customers with optimum corrosion control solutions to meet their everyday needs. The scope for Cortec® Global Services includes a variety of corrosion control design, engineering, and field applications serving Cortec® customers worldwide. Our group is committed to providing a cost effective service designed to ensure our customers receive the correct products, technologies, and applications the first time, every time.

Training and Supervision	Advisory and Consultancy	Engineering and Design (CEFS)	Turnkey Application Services	Laboratory Testing and Product Design
Cortec® Certified Applicator Training	Subject Matter Expert Liaison with Client Engineering	Full Service System Design	Single Purchase Order Full Service Preservation Execution	ISO/IEC 17025 Certified Independent Laboratory
On-the-job-training (OJT) Modular Programs	Application Method and Specification	Corrosion Monitoring and Inspection	Value-Added, Turn-Key Solutions	Technical
Supervision of Client Crews Including Short and Prolonged Deployment	Onsite Liaison: Including Short and Prolonged Deployment	Onsite or Offsite	Assistance Through Entire Project Life-Cycle	Product Design



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 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.

THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, EXPRESS, IMPLIED OR STATUTORY, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE. IN NO CASE SHALL CORTEC® CORPORATION BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.



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

Revised: 09/15

Cortec®, BioCorr®, BioCortec®, BioCushion™, Boiler Lizard®, Closed Loop Toad®, Cooling Tower Frog®, VpCI®, VpCI® Film Color of Blue®, VpCI-126®, VpCI-609®, VpCI-137®, VmCI-307®, EcoWorks®, EcoAir®, Eco-Corr®, EcoLine®, EcoClean®, EcoShield®, EcoWeaver®, EcoSpray®, EcoCoat®, Eco Emitter®, EcoSol®, Eco-Tie®, Eco-Card®, Eco-Shrink™, EcoWrap®, Eco Film®, Cor-Mitt®, Cor-Pak®, CorShield®, CorSol®, Corrosorbors®, CorWipe®, CorVerte®, Cor Seal®, CorLam®, Cor-Fill™, Corrlube™, CRI®, Desicorr®, Electricorr®, GalvaCorr®, Super Corr®, HPRS®, CRI®, MCI®, MCI Grenade®, Milcorr®, Nano VpCI®, and Rust Hunter® are trademarks of Cortec® Corporation.
 ©Cortec Corporation 2010. All rights reserved