CORTEC CORPORATION

Environmentally Safe VpCI®/MCI® Technologies

VpCI® Technology For Transportation and Municipalities

ISO 14001 CERTIFIED ENVIRONMENTAL SYSTEM REGISTERED

ISO 9001 CERTIFIED QUALITY SYSTEM REGISTERED

ISO/IEC-17025

Cortec® VpCI® Technology

PROTECT TRANSPORTATION AND MUNICIPALITIES

Corrosion costs the transportation industry billions of dollars. It is an especially significant problem for airports, highways, ports, railways, or municipalities located in harsh coastal conditions or severe winter climates. Deteriorated infrastructure and equipment are expensive to replace and pose safety hazards—as in the case of rusting tankers or structurally deficient bridges. These costs and hazards can be significantly decreased or eliminated through effective corrosion prevention and treatment. Cortec's capability offers environmentally friendly, highly efficient, cost effective, and easy-to-use Vapor phase Corrosion protection for municipalities and transportation applications.

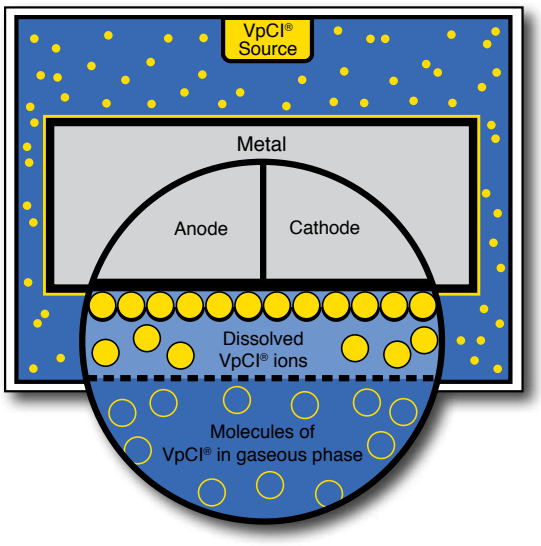
PROTECT THE ENVIRONMENT

Vapor phase Corrosion Inhibitors (VpCIs) and Migrating Corrosion Inhibitors (MCIs) offer environmentally safe methods of treatment with low toxicity and low polluting effects. Unlike corrosion inhibiting systems of the past, many Cortec® products do not contain chromates or other heavy metals, nitrites, or chlorinated hydrocarbons; Cortec® VpCI® and MCI® help turn the tables on corrosion. With the support of our corrosion scientists, engineers, and testing facility, Cortec® can provide simple, environmentally friendly solutions to corrosion problems.

PROTECT CONTINUOUSLY

VpCI® and MCI® can be applied at multiple points forming continuous chemical bonds over metal surfaces. If the protective layer is scratched away, new VpCI® molecules will rush in to replenish the VpCI® shield. The ability of Cortec VpCI® Technology to protect in the liquid phase, vapor phase, and interface allows VpCI® molecules to travel through different media for more effective and uninterrupted protection. For example, VpCIs injected into a water system immediately go to work on pre-rusted or scaled surfaces and also protect metal above the water level. MCIs can be added directly into new concrete mixtures or applied to hardened concrete surfaces, migrating in to protect embedded rebar at both the anode and cathode.

Vapor phase Corrosion Inhibitors (VpCI®)



Vapor phase Corrosion Inhibitors (VpCI®)

Cortec's 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.

Cortec's VpCI® additives offer excellent corrosion protection for process industries. While conventional corrosion inhibiting treatments for the internal surfaces of fluid systems protect only in the liquid phase, Cortec® VpCI® Technology can provide corrosion protection in the liquid phase, vapor phase, and at the liquid-vapor interface. Partial pressure capabilities allow Cortec® VpCIs to continually replenish in the void space above the liquid.

Cortec® VpCIs can be added into your system at single or multiple points. For example, inject VpCIs automatically into a system – without any operator attendance – and immediately start protecting hundreds of feet of piping. As the pro-environmental corrosion treatment of the century, our organic formulations give an environmentally acceptable way to protect and extend the life of equipment.

Cortec® Products Summary and Benefits

Cortec® provides unique patented
Vapor phase Corrosion Inhibition that:

- Saves costly time and labor
- Protects the environment
- Offers complete package solutions
- Disperses in water, oils, solvents
- Formulates easily
- Protects multi-metals
- Remains compatible with biocides
- Can be used in all process industries
- Comes in multifunctional products
- Does not alter emulsion properties
- Protects against SCC (Stress Corrosion Cracking) and HE (Hydrogen Embrittlement)
- Requires little or no surface preparation
- Prevents further corrosion of ferrous surfaces
- Often does not require removal prior to processing or use
- Does not interfere with operation of mechanical components

Unprotected Steel Wool in Water

VpCI® Protected Steel Wool in Water

Cortec® Products Safely Replace

- Nitrites
- Molybdates
- Phosphonates
- Morpholine
- Hydrazine

Transportation Solutions

A bustling transportation system is the heartbeat of an active economic society. To keep that transportation pulse healthy, vehicles, ports, roads, and bridges must be kept in good condition. This is difficult when unrelenting corrosion threatens to wear away the concrete and metal structures that keep us moving. Cortec® offers innovative solutions that inhibit corrosion, increase service life, and minimize costly replacements for a broad range of these transportation concerns.

AIRPORTS, HIGHWAYS, PORTS, AND RAILWAYS

Airplanes and buses, cars and ships, trains and trucks need airports, highways, ports, and railways to function. All risk corrosion from extreme conditions such as sea salt spray, winter deicing salts, or even corrosive materials under transport making them more vulnerable. Corrosion not only devalues vehicles and transportation infrastructure but increases safety risks, repair expenses, and replacement costs.

Cortec® has VpCI® solutions for transportation corrosion on land, sea, and in air. From protecting rail crossings and train sole bars, to airplanes and floating dock gates, Cortec's rust removers, coatings, vehicle washes, emitters, and powders safeguard your valuable transportation assets from multiple angles.

ROADS AND BRIDGES

The roads and bridges that tie society together are constantly deteriorating through heavy daily use exacerbated by harsh coastal or winter environments. Many concrete and metal bridge structures are aging and nearing the end of their service life. Some are structurally deficient or functionally obsolete. Maintenance, repair, and replacement are expensive and time consuming.

Cortec® stands ready to help with economical treatments that prevent rust, stop existing rust, and extend the service life of roads and bridges. Cortec's MCI® products are especially effective at protecting reinforced concrete from rebar corrosion.

SHIPMENTS

Transportation conditions are often extreme. Transporting metal goods is a major aspect of global commerce with high risk for rust. Unprotected bare metal can experience corrosion within hours of manufacturing. Rust claims create added costs that can damage customer relationships.

VpCI® packaging solutions not only eliminate high costs associated with rust claims—they lower labor costs because of easier application and removal. Parts wrapped in VpCI® packaging can arrive at their destination rust-free and ready-to-use with no degreasing required.

Municipal Solutions

Cities large and small must actively maintain basic transportation and utility infrastructures. Corrosion in these areas mean higher costs and shortened service life. These are especially unwelcome where budget constraints are concerned.

Cortec® offers innovative, environmentally friendly, and cost-effective solutions to address the repair, protection, and maintenance challenges of municipalities. Cortec's products provide simple, reliable ways to enhance the efficiency, safety, and durability of your equipment and infrastructure.

PUBLIC TRANSPORTATION AND MUNICIPAL EQUIPMENT

City buses, subways, trains, trucks, snow plow, and emergency vehicles keep thoroughfares open and citizens moving. Maintaining this equipment in good condition is important not only to avoid costly replacements and stay on budget, but to maintain safety and good service. Cortec's range of VpCI® coatings, emitters, sprays, and vehicle washes will help your city ward off the rust that threatens equipment during normal use or seasonal layup.

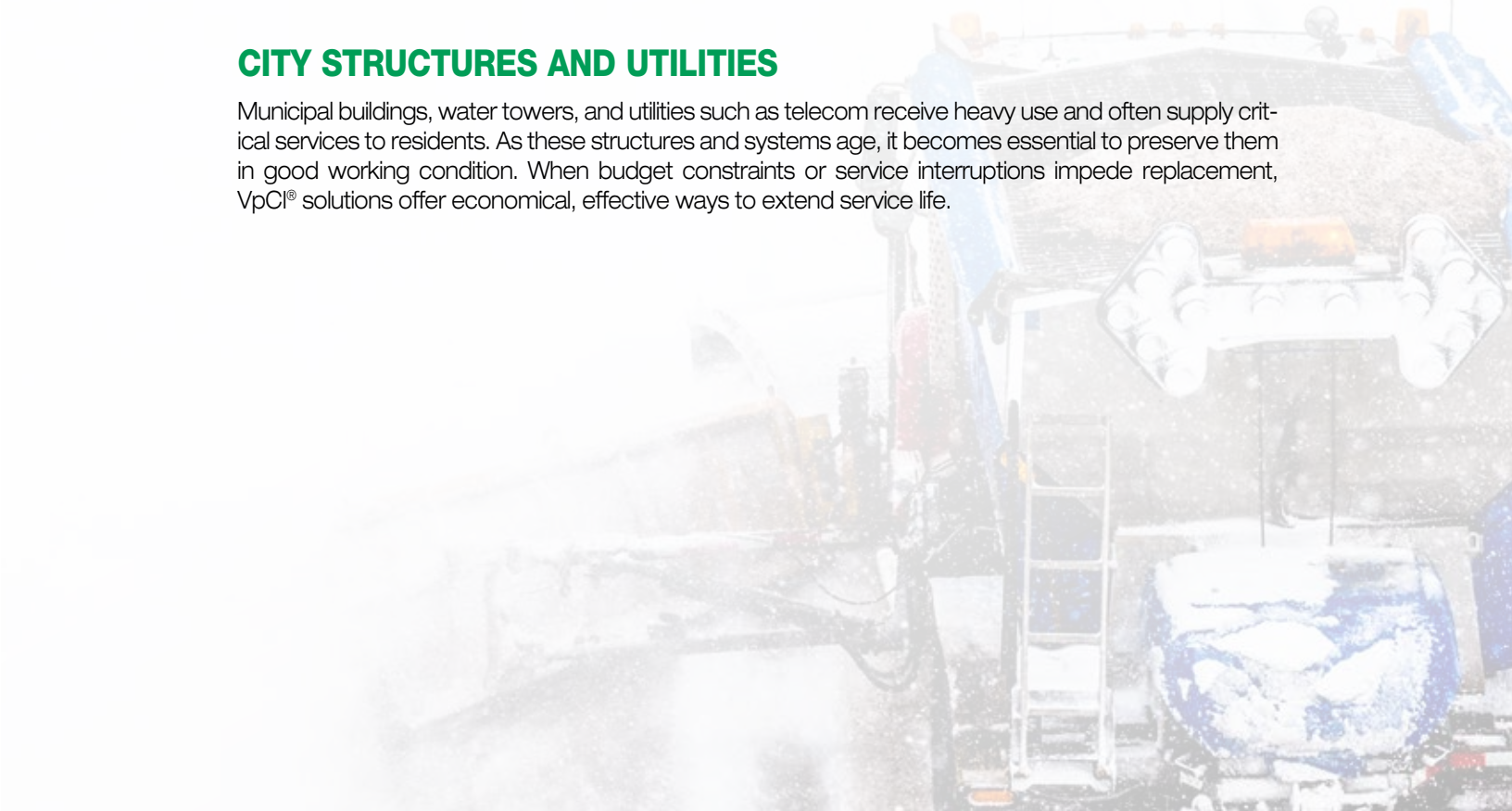
WATER AND SEWER

Municipalities are often responsible for an extensive system of pipes and pumps that supply water and handle sewage. At best, critical storage tanks and pressure vessels that service these systems need periodic repainting and annual corrosion touch up. At worst, water and sewer corrosion could result in leakage, contamination, failures, and potential health risks to those relying on the systems.

Cortec's VpCI® coatings and surface prep products help extend the service life of water and sewer infrastructure and prevent steel loss in tanks. Specific water treatment products are ideal for use in water systems because of VpCIs' ability to protect in the water phase, vapor phase, and at the air-water interface. Cortec's subsidiary Bionetix® also offers a variety of waste water-treatment products that are biologically based and replace dangerous chemicals. These products can reduce odor and accelerate the breakdown of waste. Visit ***www.bionetix-international.com*** for more information.

CITY STRUCTURES AND UTILITIES

Municipal buildings, water towers, and utilities such as telecom receive heavy use and often supply critical services to residents. As these structures and systems age, it becomes essential to preserve them in good working condition. When budget constraints or service interruptions impede replacement, VpCI® solutions offer economical, effective ways to extend service life.



Case Histories

CORROSION PROTECTION OF COMMERCIAL VEHICLE

A township experiencing corrosion of a year old plow/salt truck wanted to stop the corrosion and preserve the truck as long as possible. VpCI®-415 was used first to pressure wash the truck. VpCI®-105 Emitters were placed under the dashboard near electrical components and Electricorr® sprayed on all external electrical contacts. All visible rusty surfaces were hand painted with Corrverter®. VpCI®-368 D was applied to all metal undercarriage surfaces. VpCI®-369 wet film lubricant was sprayed on door hinges and moving parts. VpCI®-396 aggregate resistant coating was applied to the box of the salt truck. The application was considerably less expensive than other solutions and required minimal labor. The vehicle had a longer, more dependable service life as well as a preserved visual appearance.

TOWNSHIP LIFT STATION

Community townships are responsible for maintaining over 100 water supply systems with vast underground piping and pump networks. A township may have 100 plus lift stations averaging 50 years old with a service life of 100 years. Moist and humid conditions in these underground environments deteriorate painted surfaces and leave steel and electronic components susceptible to corrosion. Replacement is expensive, so one township asked Cortec® for advice on protecting four lift stations from corrosion. After cleaning and drying the stations, surfaces were painted with VpCI®-387, VpCI®-396, and VpCI®-386 in various colors. VpCI® Emitters were used to protect electrical panels. The corrosion inhibiting nature of these products was ideal for this application.

Case Histories

PARKING FACILITIES PRESERVATION

A parking garage in Indianapolis was doing a second-phase repair consisting of 380,500 square feet (35,300 square meters). Following repairs, the concrete deck surfaces were blast racked and MCI®-2019 W FD was applied. This treatment was chosen due to the success of the first phase and durability thus far. The installation was successful and the garage was opened on schedule.

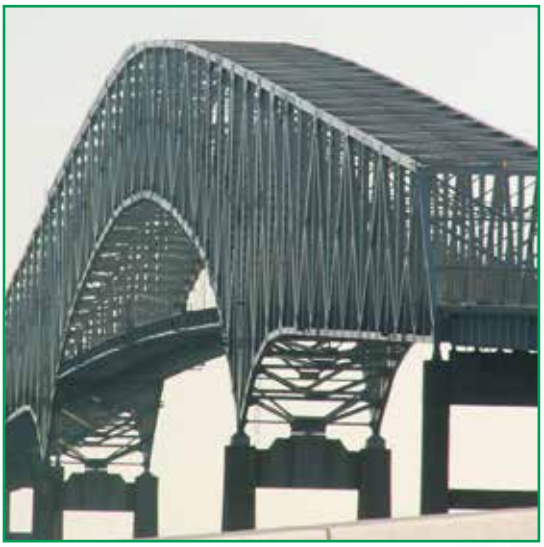
SOLE BAR PROTECTION

Due to salt water ingress, the sole bars of passenger trains in the United Kingdom became rusty after more than seven years of service. The original coating was no longer effective, so VpCI®-368 D was pumped into the sole bars through five or more drilled holes and left to penetrate for one hour. The sole bars were drained and plugged, leaving a VpCI® coating inside to protect the sole bars for five years until re-treatment. VpCI®-368 was found to be the only treatment that worked when independently tested against several other products.

Case Histories

FRANCIS SCOTT KEY BRIDGE REPAIR

The bridge was scheduled for maintenance repairs and re-application of a water repellant to ensure continued protection from the environment. Patching and repair work was completed and the deck cleaned. MCI®-2018 was sprayed on the surfaces, achieving a wet-wet application that saturated the concrete a few minutes before drying. This gave the silane time to sink in and react. The Maryland DOT had chosen Cortec's MCI®-2018 over competitor material. It went down easily and is expected to protect the bridge from corrosion for 10 years from application.



PROTECTION OF FLOATING DOCK GATE

Harland & Wolff in Belfast have one of the largest dry docks in Europe. Internal voids, cavities, and recesses of their floating dock gate were corroded due to extreme weather and sea immersion. VpCI®-309 Powder was sprinkled throughout the accessible areas of the dock gate. The gate was opened and inspected several years later after being used and anchored out at sea. Harland & Wolff chose to reapply VpCI®-309 Powder because it proved to be the best corrosion protection for this application.

CORTEC® GLOBAL SERVICES

Cortec® offers innovative turn-key solutions to mitigate corrosion on plant equipment and infrastructure. Available services include evaluation and treatment of trouble spots to keep plant operations at highest possible performance. When asset preservation is required, VpCI® cleaning and packaging products provide low-cost, easy-to-apply solutions for long term results, whether maintaining ready-to-use spares or mothballing. From our experience providing zero-defect, low-cost preservation across various industries, Cortec® is able to transfer knowledge of best-in-class solutions to the sector at hand.

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 to serve 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 Specification
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

Certified Applicator Training

Applicator Training - Crew	Cortec® supplied training to provide short-duration training on key asset/task
Applicator Training Individual Certification	Cortec® supplies training services and individually certifies attendees on demonstrated competencies
Applicator Training – OJT Modular	Cortec® provides supervisory training services onsite using OJT modules pertinent to job scope

Advisory Services

Specification Review	Cortec® supplies SME (subject-matter-expert) remotely or onsite to review and assist in writing or reviewing preservation specifications
Onsite Liaison	Cortec® supplies SME onsite or in back-to-back rotator format or similar in office setting to advise and consult on preservation issues and plan preservation resources
Project Manager	Cortec® supplies PMs for duration of project to plan and execute preservation resources
Scoping Visit	Cortec® supplies Preservation Advisor for initial scoping visits

Engineering, Design and Monitoring Services

Corrosion Monitoring	Cortec® supplies SME onsite for comprehensive monitoring of all critical components of industrial objects, assets, facilities and plants for signs of corrosion based on project specifications
Corrosion Inspection	Cortec® supplies SME to onsite for inspection of asset integrity and suitability of service. Can also evaluate, design, and implement robust corrosion inspection program
Engineering Design Services	Cortec® supplies a corrosion engineer to build a product and/or process with a specified performance goal
Maintenance Services	Cortec® supplies SME for maintenance of preservation application and projects

Full Service Preservation Services

Supervisory	Cortec® supplies a Preservation Supervisor to oversee preservation application and/or training of Company crews
Full Crew	Cortec® supplies trained crews to complete preservation projects
Skilled Labor	Cortec® supplies labor to preservation projects to work with Company team

Laboratory and Corrosion Testing Services

Technical Liaison	Cortec® supplies primary technical expert in the use and application of Cortec® products and preservation methods
Technical Service	Cortec® supplies technical service contact to assist with product and application clarification

Buyer's Guide

Product	Description	Application	Dosage
BioCorr® Rust Preventative	Ready-to-use water based, biodegradable, VOC-free, and 64% biobased rust preventative. An excellent environmentally sound alternative to petroleum products. USDA BioPreferred®* designation for Metalworking Fluids for Federal preferred purchasing.	Preservation of multi-metals in storage and during transportation. Good indoor protection. Leaves a very thin film easily removed with water.	Product comes ready-to-use. Also comes in a super-concentrate form, BioCorr® SC. A 5% dilution of BioCorr® SC in 95% water attains the same concentration as ready-to-use BioCorr®.
Bio-Pad®	Flexible corrosion inhibiting device constructed from biobased non-woven material. Up to two times as much corrosion inhibiting action as related foam products. No isocyanates, nitrites, or chromates. 66% biobased content.	Corrosion inhibitor for packaged metal parts. No degreasing or coating removal required after use.	Bio-Pad® 2"x 6" for up to 1.5 ft^3 (0.042 m^3). Bio-Pad® 8"x 8" for up to 8 ft^3 (0.23 m^3). Bio-Pad® Roll for up to 15 ft3 per material ft^2 (4.5 m^3/m^2).
Cor-Pak® EX VpCI® Film	High-density polyethylene film with VpCIs to protect ferrous and most non--ferrous metals from corrosion.	Interleave, wrap, or shroud parts made of ferrous and most non-ferrous metals and alloys.	When using Cor-Pak® EX VpCI® film, metal items should be completely wrapped or shrouded to prevent the entry of moisture or air.
Corrosorber®	Absorbs hydrogen sulfide and other gases that cause corrosion. Non-toxic and has no effect on the environment. Will not interfere with VpCI® protection.	Useful in telecommunications equipment, water treatment plants, aerospace electrical controls, marine navigation and communication equipment, power boxes, and more.	Simply select a space within any enclosed device where corrosion protection would be useful, and attach with adhesive backing. Replace cup as soon as the container appears gray.
Corrverter® Rust Primer	A water-based primer with a novel chemical chelating agent that modifies surface rust into a hydrophobic passive layer. Environmentally friendly, non-toxic, and non-flammable.	Recommended for application to rusty or poorly prepared steel surfaces where further corrosion protection is required and good preparation is difficult to achieve.	Coverage: 3-5 mils (75-125 um) WFT leaves a 1-2 mil (25-50 um) DFT.
EcoAir® 422 Non-Toxic Rust Remover	USDA 92% Certified Biobased Product. Water-based, non-toxic rust remover for multimetal protection. Removes rust and stains without polluting and is packaged in an air-powered spray can.	Multi-metal protection and rust removal from steel, iron, copper, brass, and chrome.	Apply to the metal surface as needed to remove rust.

*BioPreferred® is a registered trademark of the USDA

Product	Description	Application	Dosage
EcoLine® 3220	Environmentally safe 99% biobased ready-to-use temporary coating with canola oil carrier. Tenaciously clings to metal surfaces for excellent contact corrosion protection and vapor corrosion inhibition in storage and shipment.	Multi-metal protection and lubricity on machines and equipment, wire, sheet metals, pipes, flanges, gears, fabricated or machined parts, and ballast tanks.	When used as an oil additive, dilute as much as 1:20 with base oil for corrosion protection. Can be fogged for void space protection at 1L/m^3 (1 qt/35 ft^3).
EcoLine® 3680	Temporary wax-like film coating formulated with renewable and biodegradable materials. 72% biobased.	Corrosion protection of equipment where incidental contact with food is possible.	Brush or spray to film thickness of 5-6 mils (125-150 microns) for outdoor use, 2-3 mils (50-70 microns) for indoor use. Remove with alkaline cleaner like VpCI®-414.
EcoLine® 3690	Biodegradable, 76% biobased, ready-to-use temporary coating leaves oily film for excellent outdoor protection on metal surfaces in severe marine and high humidity conditions. Self-healing and canola-oil based. Commercial equivalent to MIL-PRF-16173E Grade 2.	Long-term (5+ years) equipment layup; pipes, couplings, pumps, cylinders, and cables; sheltered outdoor coating; gear protectant/lubricant; working/moving parts.	Normal DFT is 2 mils (50 microns). Used in brush/spray applications.
EcoLine® All-Purpose Lubricant	Environmentally friendly lubricant with friction modifier, extreme pressure additive, and VpCI® corrosion protection. Based on soybean derivitaves and methyl esters. Biodegradable and 93% biobased.	In-plant machining, bar and chain oil, flange lubricant, locks and hinges, nuts and bolts, office machinery, penetrating oil/lubricant. Excellent mold release.	Use as other lubricating oils.
EcoLine® Food Machinery Lubricating Grease	High-quality 92% biobased corrosion inhibiting lubricant formulated with American-grown natural seed oil. Conforms to USDA H-2 criteria and FDA regulation 21 CFR, Section 178.3570. USDA BioPreferred® designated Food Grade Grease for Federal preferred purchasing. Meets EPA EPP criteria.	Excellent corrosion protection and superior lubricity for ferrous and colored metals in operating and mothballed equipment.	Use as other lubricating greases.
Electricorr® VpCI®-238	Electronic cleaner specificially formulated for electrical/electronic equipment, and components. Thin film of Vapor phase Corrosion Inhibitors (VpCIs) does not alter electrical resistance or magnetic properties of metal substrates.	Corrosion protection and cleaning agent for electrical contacts and components, printed circuit boards, generators, junction boxes, and electric motors.	Dip part to be cleaned in VpCI®-238 or spray with Electricorr® VpCI®-238. Remove excess and dry (approximately 1-2 hours at 70°F and 50% relative humidity). Amount needed will depend on enclosure characteristics.
FlashCorr® VpCI®	A highly effective, non-toxic, environmentally safe cleaner that removes and neutralizes even the harshest of salt build-up from any metal surface.	Can be effectively used on salt spreaders, snow plows, blowers, boats, commercial vehicles, machinery and engine blocks, and marine equipment.	Use 0.05-0.2% (by weight) FlashCorr® VpCI® in water. Equivalent to 4.2-17 lb/ 1,000 gal (0.5-2 kg/1,000 L) tank.
MCI® Coating for Rebar	Water based, environmentally friendly coating provides excellent outside storage protection and superior corrosion resistance for embedded rebars.	Protection of rebar partially embedded in concrete, jobsite storage, overseas shipping, maintenance repairs.	Mix well. Use as is or dilute with water up to 50% to achieve at least 1.0-2.0 mils (25-50 microns) DFT. Undiluted WFT of 3-6 mils will achieve this DFT.
MCI® CorteCure®	Water based, membrane-forming, curing compound containing Migrating Corrosion Inhibitors (MCI®). Made of 62% biobased content. VOC compliant per European and California regulations. ASTM C-309 compliant.	Recommended as a convenient, excellent initial cure for all reinforced, precast, prestressed, post-tensioned, or marine concrete structures exposed to corrosive environments.	Apply at rate of 200-250 ft^2 /gal (4.9-6.1 m^2 /l) by roller, squeegee, or paint brush.

Product	Description	Application	Dosage
MCI®-2005*/ MCI®-2005NS *Biobased certification only refers to MCI®-2005	Water based, organic corrosion inhibiting admixture for the protection of metallic reinforcement in concrete structures. NSF Standard 61 approved for use in potable water tanks (UL certified). Earns LEED credits to user. Safe, environmentally friendly, and 67% biobased content. Meets ASTM C1582 requirements. MCI®-2005 NS approved by North Carolina, South Carolina, Kentucky, Ohio, Nebraska, Iowa, and Colorado DOTs.	Admixture recommended for all reinforced concrete including precast, prestressed, and post-tensioned structures in corrosive environments exposed to saline groundwater, airborne chlorides, and carbonation.	Add MCI®-2005 to concrete mix or repair mortars at 1 pt/yd^3 (0.6 l/m^3). Add MCI®-2005 NS to concrete mix or repair mortars at 1.5 pt/yd^3 (1.0 l/m3). Dosage is fixed and independent of chloride levels.
MCI®-2006	A powder concrete admixture with Migrating Corrosion Inhibitor (MCI®) and contact inhibitor. NSF Standard 61 approved for potable water applications (UL certified).	Recommended for steel-reinforced concrete bridges, highways, and streets exposed to corrosive environments; parking decks, ramps, garages, and all reinforced marine concrete structures.	Add to concrete mix at 1 lb/yd^3 (0.6 kg/m^3).
MCI®-2018	A 100% silane concrete sealer containing MCIs. Complies with Alberta DOT Standards for Type 1b and 1c sealers.	Protects reinforcing steel in parking garages, bridges, tunnels, marine structures, and any other reinforced concrete structure.	Approximate coverage rate: 125-175 ft^2/gal (3-4.3 m^2/L).
MCI®-2019/ MCI®-2019 FD	A 40% silane, solvent-based concrete sealer containing MCIs.	Recommended for use on exterior, above grade concrete, brick masonry, concrete masonry units, and some natural stones.	Approximate coverage rate: 125-175 ft^2/gal (3-4.3 m^2/L).
MCI®-2020	Clear MCI® surface treatment for existing concrete. Designed to penetrate and migrate throughout the concrete structure. Patented. ANSI/NSF Standard 61 Approval for structures containing potable water.	Provides MCI® corrosion protection for rebar in existing structures such as bridges, buildings, garages, decks, and lanais.	Coverage: One coat at 150 ft2 / gal, or two coats at 15 ft2 /half gal.
MCI®-2020 V/O Powder	A water-soluble migratory corrosion inhibitor for the treatment of existing concrete structures. Proven effective in the Strategic Highway Research Program (SHRP) funded by the federal government and state DOTs. Confirmed effective in international documented field evaluation (ASTM G-109, Industrial Standards (IS) Japan and Korea, etc.).	Recommended for reinforced, precast, prestressed, post-tensioned, or marine concrete structures; steel-reinforced concrete bridges, highways, viaducts; parking decks, ramps, and garages, reinforced commercial and civil engineered concrete structures; concrete piers, dams, piles, pillars, pipes, and utility poles; cooling towers and potable water tanks.	Mixing: Use 20 wt% of MCI®-2020 V/O Powder in water. Coverage: One coat at 150 ft^2/gal, or two coats at 150 ft^2 /half gal.
MCI®-2021	A concrete sealer that combines a blend of reactive silicates, surface-active agents, and MCIs. A UV tracer may be added upon request.	Recommended for repair and maintenance of all reinforced, precast, prestressed, post-tensioned concrete structures; including bridges, piers, highways, parking decks, ramps, garages, buildings, and streets.	The total overall dosage rate, (i.e. all coats combined), should be within 150-250 ft^2/gal (3.7-6.1 m^2/L). Do not overdose.
MCI®-2022 Sealer	A ready-to-use, water-based silane/siloxane sealer containing MCIs.	Recommended for all reinforced, precast, prestressed, post-tensioned, or marine concrete structures, including reinforced concrete bridges, highways, streets, parking decks, ramps, garages, piers, piles, pillars, pipes, and utility poles.	Approximate coverage rate is 125-175 ft^2/gal (3-4 m^2/L).
MCI®-2023 Passivating Grout	Two component system forms a cement slurry with good adhesion and high durability. Uses MCIs to stop corrosion and form an effective barrier against water penetration and dissoved salts.	Recommended to protect steel reinforcing prior to restoration with MCI® or other repair mortars.	Approximate coverage per 2.5 gal (9.4 L) kit is 60 ft^2 (5.6 m^2) at 1/16 inch (1.6mm) thickness or 120 ft^2 (11.1 m^2) at 1/32 inch (0.8 mm) thickness.
MCI®-2026 Floor Coating	A 100% solids, two-component, novolac epoxy coating designed for environments that require a high degree of chemical or temperature resistance. Meets all USDA guidelines for use in federally inspected poultry and meat plants.	Recommended as a high performance coating in areas subjected to heavy traffic, chemical spillage, and/or elevated temperatures.	Primer Spread Rate: 250-300 ft^2/gal. 225-250 ft^2/gal on rougher floors. Coating Spread Rate: 125-150 ft^2/gal.

Product	Description	Application	Dosage
Mini MCI® Grenades	Migrating Corrosion Inhibitors packaged in water-soluble PVA bags. Ideal for repair mortars.	Recommended for all reinforced, precast, prestressed, post-tensioned, or marine concrete structures, including reinforced concrete bridges, highways, streets, parking decks, ramps, garages, piers, piles, pillars, pipes, and utility poles.	Each Mini MCI® Grenade treats 0.4-0.6 ft^3 (0.015 m^3).
S-14 Bio	Unique "green" water treatment building block for scale inhibition and corrosion protection. Non-toxic, non-hazardous, readily biodegradable, and 84% biobased. Contains natural polymer, GRAS (Generally Recognized As Safe by CFR) substances, and food approved preservatives.	Powerful scale inhibitor with multi-metal corrosion protection for cooling towers and open-loop, recirculating cooling systems.	Add to make-up water at rate of 100-200 ppm (20-50 ppm of active ingredients). Effective at 6.0-9.0 pH.
S-69	Additive package for water treatment formulations. Protects ferrous and non-ferrous metals from corrosive contaminants.	Replaces nitrites, molybdates, phosphonates, amines, and other types of restricted corrosion inhibitors in water treatment formulations.	Closed Loop Dosage: 2500 to 3000 ppm. Open Loop Dosage: 200-400 ppm for first 1-2 weeks. Dosage can be lowered later.
VpCI®-101 Device	Provides corrosion protect for metal components and parts enclosed in non-ventilated control boxes, cabinets, or tool boxes. Commercial equivalent to MIL-PRF-81705D. Meets Southern California Clean Air Act, and other national and local regulations.	Protects telecom, electrical, scientific, and medical equipment; electric wireways and motors, hand-held battery-operated devices, and other containers holding metals.	Stick one emitter in enclosed space of up to 1 ft^3. Use additional devices for larger spaces.
VpCI®-105 Emitter	Unique devices designed to provide corrosion protection for metal components in enclosed spaces. Accepted by FDA for corrosion protection of electrical and electronic equipment within food processing plants. Commercial equivalent to MIL 1-22110C. RoHS compliant.	Long-term protection of electrical, marine, communication, medical, and switching equipment in any enclosure.	Stick one emitter in enclosed space of up to 5 ft^3. Add additional emitters for larger spaces.
VpCI®-111 Emitter	A small patented plastic emitter with a breathable Tyvek® membrane through which corrosion inhibitors are slowly released. Commercial equivalent to MIL 1-22110C. IBM approval # 44V5421.	Install in enclosed space for corrosion protection of electrical, telecom, navigation, communication, and switching equipment; aerospace electrical controls, electric motors, electrical wireways and terminal boxes, and scientific and measuring instruments.	Stick one emitter in enclosed space of up to 11 ft^3. Add additional emitters for larger spaces.
VpCI®-130 Series Foam	Unique flexible packaging materials that combine VpCI® protection, desiccant action, and excellent antistatic capabilities. Commercial equivalent to MIL-PRF-81705D (static dissipative materials) and MIL-B-22110 B (VpCI®).	Affords long-term multi-metal protection in large export packages, crates, and seagoing containers.	Foam is cut to predosed sizes capable of protecting 0.25, 1.5, and 8.0 ft^3. Large, uncut rolls also availiable. See PDS for more information.
VpCI®-143 Paper Emitters	Fully recyclable/repulpable emitters provide superior corrosion protection for ferrous and non-ferrous metals without affecting physical properties of most sensitive electrical components.	Use to protect industrial metal products, electrical components, engines, motors, machinery, equipment, tools, etc.	Use approximately 1 in^2 (6.5 cm^2) of emitter paper per 25 in^3 of void space.
VpCI®-2026 Top Coat	A 100% solids, two-component, novolac epoxy coating with excellent chemical resistance and good abrasion resistance.	Designed for environments that require a high degree of chemical or temperature resistance.	Apply a 4-8 mil coating over a primed surface.
VpCI®-368	Time-proven coating provides excellent protection to metal substrates in harsh outdoor conditions. Leaves a firm, wax-like film on metal substrates removable by alkaline cleaners. Commercial equivalent to MIL-C-16173E (Grades 1 and 2). NATO 6850-66-132-5848 and 6850-55-132-6099.	Use as a vehicle underbody coating or apply to pipe coating, steel plate, machined parts, and wire rope. Protects carbon steel, stainless steel, copper, aluminum, and cast iron.	At least 2-3 mils (50-70 microns) film thickness recommended for uncovered outdoor storage.

Product	Description	Application	Dosage
VpCI®-369	Our best inhibitor for use as an oil additive and/or temporary coating. Protective film is self-healing and moisture-displacing for superior protection against aggressive environments. Commercial equivalent to MIL-PRF-16173E (Grade 2)	Use as a protective lubricant on moving parts. Can also be used for electrical connections/wiring, cylinders, gear protection/lubrication, and long-term (5+ years) equipment lay-up.	Mix thoroughly and apply by spray, brush, roll, or dip. Normal DFT is 1-3 mils (25-75 microns).
VpCI®-372	A water-based corrosion inhibiting peelable coating that protects against atmospheric corrosion and physical nicks, abrasion, scratches, etc.	Used as a dry film temporary coating for parts and equipment. Coating can be easily peeled off prior to equipment use, leaving no residue.	DFT (indoor): 2-6 mils (50-150 microns). DFT (outdoor): 8-10 mils (200-250 microns). WFT (indoor): 5-14 mils (125-350 microns). WFT (outdoor): 20-25 mils (500-625 microns
VpCI®-380 Railcar Coating	A unique direct to metal fluoropolymer modified water-based acrylic coating designed specifically for the railcar industry. Has excellent adhesion to ferrous and non-ferrous metals and certain engineered plastics. Competes with most primer/topcoat systems.	Can be used as topcoat and primer on railcars.	Spray, flow coat, brush, or dip to 3-5 mil DFT when used as topcoat and primer.
VpCI®-384	Two-part urethane top coat to be used over a moisture cure urethane primer such as VpCI®-396. Offers excellent adhesion to a moisture cure urethane even after it is fully cured.	Protects steel, aluminum, cast iron, and galvanized steel on bridges, structures, tanks, and OEM applications.	Normal WFT of 3-5 mils (75-125 microns) yields 1-2 mils (25-50 microns) DFT.
VpCI®-386	A unique water-based acrylic primer/topcoat with a complex mixture of non-toxic organic inhibitors for high performance corrosion protection that can compete with most paints.	Use as a topcoat/primer to protect carbon steel, cast iron, aluminum, stainless steel, galvanized steel (coated with VpCI®-373 green), and copper against corrosive electrolytes and aggressive environments.	Normal WFT of 3-5 mils (75-125 microns) yields 1-2 mils (25-50 microns) DFT.
VpCI®-387 Water-Based Outdoor Coating	A high-build topcoat that provides long-term corrosion inhibition for metal substrates in tough atmospheric conditions. Excellent for applications that require a thicker coating. Available in custom colors.	Long-term direct to metal coating for corrosion protection and excellent UV light resistance. Can be used in conjunction with a compatible primer.	Mix thoroughly and apply by brush, spray, or roller. Normal WFT of 13-15 mils (325-375 microns) yields 6-8 mils (150-200 microns) DFT.
VpCI®-391	A waterborne, temporary coating intended for medium to long-term indoor and outdoor protection. Builds a non-tacky transparent film for excellent salt, humidity, and UV resistance.	Excellent corrosion protection of metal surfaces. Recommended when a non-tacky coating is required and optimal removability is beneficial.	Normal WFT of 2.5-7.5 mils (62.5-187.5 microns) yields 1-3 mils (25-75 microns) DFT.
VpCI®-395	A waterborne epoxy primer. UL Classified in accordance with ANSI/NSF Standard 61 for potable water (applies only to RAL 7046).	Provides excellent adhesion, salt spray, immersion, and long term corrosion protection to steel.	Normal WFT of 3-6 mils (75-150 microns) yields 1.5-3 mils (25-50 microns) DFT.
VpCI®-396	A high solids aromatic moisture cure urethane. Direct to metal primer for multi-metal protection. Forms a very hard but flexible coating that cures in the presence of moisture in the air.	Outstanding barrier protection for bridges, OEM, structural steel, storage tanks, ballast tanks, or ships.	Normal wet film thickness of 3-5 mils (75-125 microns) yields 2-3 mils (50-75 microns) DFT. Cover with aliphatic urethane top coat for best results.
VpCI®-398 Vehicle Undercoat	A soft, tack free, pliable, self-healing, durable undercoat that protects against abrasion, salt, and other corrosive elements. Excellent UV resistance.	Protective undercoat for automobiles, trucks, trailers, etc. Protects carbon steel, stainless steel, copper, aluminum, and cast iron.	Apply by brush, spray, or dip to a film of at least 4-5 dry mils (100-125 microns) for uncovered outdoor storage.

Product	Description	Application	Dosage
VpCI®-406 Bus Wash/Exterior Vehicle Wash	A phosphate-free cleaner designed to remove salt, grime, oils, greases, and carbon deposts. Protects against flash corrosion on ferrous and non-ferrous metals. Improved cleaning and corrosion protection action in one process.	Can be metered into automatic bus and car washes, steam cleaners, dip tanks, or power wash equipment.	Hand applications: dilute with water up to 1:40 and apply to surface with cloth or brush and rinse with water. Automatic washers, pressure washers, and steam cleaners: dilute with water up to 1:50
VpCI®-414	A cleaner and degreaser that also removes temporary coatings and non-silicone-based waxes from metal and painted surfaces.	Can be used to clean carbon steel, stainless steel, cast iron, galvanized steel, brass (<30%Zn), and copper. Provides some corrosion protection of parts after cleaning.	Dilute to 5-20% in water depending on the level of cleaning
VpCI®-609 Powder	A water-soluble VpCI® powder for wet or dry corrosion protection of ferrous metals and aluminum. Commercial equivalent to MIL-I-22110C.	Protects voids, cavities, and tanks; tubular structures, pipes, and vessels; internal surfaces of compressors, turbines, engines, tanks, boilers, and heat exchangers. Can be used as an additive to standing water.	For powder application with average environmental conditions, use 0.3-0.5 ounce (8.5-14 grams) of VpCI®-609 per 1 ft^3 (28 liters) of enclosed space (300-500 g/m^3). Liquid application dosage ranges from 0.5-10% (depending on application).
VpCI®-641	A water-based rust preventive additive. Non-toxic, environmentally safe, and does not contain nitrite or phosphate inhibitors. Based on all organic components.	Protection of ferrous and non-ferrous metals in industrial waters. Most typically used in hydrotesting water. Can be used in fresh water cooling systems in some cases.	Dilute to 500-1000 ppm. Solution may become cloudy if calcium is present.
VpCI®-705	Multifunctional fuel additive serves as a corrosion inhibitor, fuel stabilizer, and water emulsifier for gasoline, diesel, and gasohol mixtures. Provides corrosion protection, lubricity, and elastomer protection.	Provides excellent corrosion protection for all common engineering metals used in automotive fuel systems, including aluminum, aluminum die cast and zinc die cast alloys, tinplate, copper, ferrous alloys, cast iron, and solder.	Add VpCI®-705 to gasoline or diesel fuel, fuel blending and storage facilities, or directly to fuel tanks. Dosage: 0.1 - 0.15% per volume of tank to be protected.

QUALITY EXCELLENCE ®

CORTEC CORPORATION

Environmentally Safe VpCI®/MCI® Technologies

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 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.

CORTEC CORPORATION
Environmentally Safe VpCI®/MCI® Technologies

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

printed on recycled paper 100% post consumer

Revised: 03/2016

Distributed by: