SOLUTIONS TO CORROSION

For Industrial Water Applications

EXCELLENCE QUALITY ®

CORTEC CORPORATION

Environmentally Safe VpCI®/MCI® Technologies

Asset Preservation

Corrosion is a threat to the integrity, value, and efficient operation of common industrial assets such as boilers, closed loops, and evaporative cooling water systems. Proper preservation of these assets during layup is critical to ensuring long service life and smooth operations when bringing the equipment back online. Cortec's highly effective corrosion solutions help keep your assets in good condition while minimizing downtime and labor costs.

Short-Term/Long-Term Layup

Whether your equipment will be offline for two weeks or two years, Cortec® offers outstanding layup strategies for keeping your equipment corrosion-free and making it easy to bring back into operation. Many of Cortec's products contain Vapor phase Corrosion Inhibitors that offer multi-phase protection—forming a self-replenishing molecular barrier below the surface of the water, in void spaces above water, and at the air-water interface. This allows the flexibility of corrosion protection in either dry or wet layup—for the long-term, on standby, and sometimes even during operation.

Safer, Simpler Alternatives

Cortec® offers a wide range of corrosion solutions that are much safer and/or simpler to use compared to standard protection methods. With Cortec® strategies, you can replace the cumbersome use of desiccants and avoid the hazards associated with nitrogen blanketing and hydrazine. Cortec's broad range of organic corrosion inhibitors are also generally easier to discharge into municipal wastewater systems than traditional inorganic inhibitors that do not biodegrade. Cortec® water chemistry allows you to replace nitrites, molybdates, phosphonates, morpholine, and phosphates.

Boilers

Cortec's Boiler Lizard® is a prime example of how Cortec has revolutionized the protection of boilers using Vapor phase Corrosion Inhibitor technology. Boiler Lizard® is extremely easy to use. There is no special need to dry the boiler and apply silica gel or quicklime before layup or ensure constant pressure is maintained as for nitrogen blanketing. Simply place the Boiler Lizard® into position, slit the water-soluble bag, and shut the boiler openings. In many cases, the boiler can be recommissioned simply by filling with water and allowing the Boiler Lizard® to dissolve. In addition to several boiler treatment options, Cortec® also offers corrosion protection for steam condensate lines.

Closed Loops

Cortec® offers excellent options for protecting closed loop systems with a range of high and low temperature heat exchange fluids. Special inhibitors are available for brine systems, low sodium nuclear applications, and hydrostatic testing.

Cooling Water

Open evaporative cooling water systems also require protection during extended outages or layups. Cooling Loop Gator™ or the Cooling Loop Croc™ are easy to add to a system, dissolve, and mix throughout, leaving behind a protective barrier against corrosion. Already drained? Similar to the Boiler Lizard®, the Cooling Tower Frog™ can be added to a chiller or heat exchanger while it is opened. Slit open the Frog; then close the unit to provide protection for the remaining layup period.

Additives

In addition to many highly effective, practical ready-to-use products, Cortec® also supplies additives for water treatment formulators to use as building blocks in their own formulations. Formulators can choose from corrosion inhibitor, defoamer, or anti-scalant agents to add the desired characteristics to their own ready-to-use products.

Specialty/Multi-Use Applications

Cortec® carries a variety of water treatment corrosion inhibitors for specialty or multi-use applications. These include a flash corrosion inhibitor for food can processing, a biobased scale remover for system maintenance, and versatile products that can be used for wet or dry layup across multiple assets (boilers, closed loops, and cooling systems).

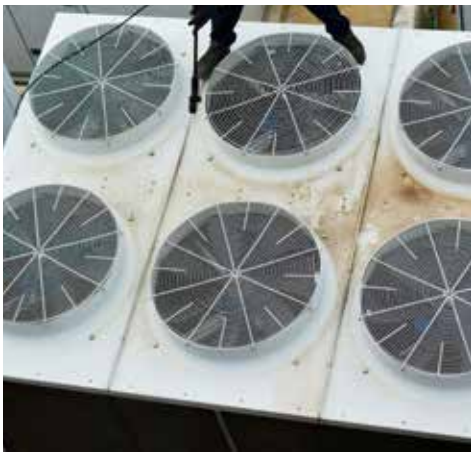
Product Selection Guide

BOILERS		
Product	**Description**	**Application**
VpCI® Dragon™	A ready-to-use, waterborne VpCI® fogging fluid for dry layup of boilers and steam systems. Provides vapor-phase corrosion protection without full coverage and allows quick return to service—no removal or flushing needed.	Should be applied by spraying or fogging into the equipment interior. Recommended dosage rate is 0.7-1.0 fluid ounce per cubic foot (0.7-1.0 L/m^3). One gallon of VpCI® Dragon™ liquid will treat approximately 1,000 gallons (1 L/1 m^3) of boiler volume.
Boiler Egg™	Designed to scavenge oxygen and passivate metal during boiler startup after seasonal or long-term dry layup. It dissolves upon contact with water, releasing active ingredients that protect against oxygen pitting when makeup water isn't pre-heated and treatment programs aren't yet active. It can be used alone or with the Boiler Lizard® for complete boiler preservation. NSF G7 Certified.	Apply during dry layup preparation or at the start of boiler startup. Remove the outer protective bag, but leave the inner PVA bag intact, and place inside the boiler (lowest point for firetube, below feedwater line for watertube). Seal all openings. At startup, fill the boiler normally—the PVA dissolves in the water side, releasing the contents to treat up to 1,000 gallons (3,800 L) of makeup water. When used with Boiler Lizard® in the Boiler Lizard® Plus kit, it provides complete layup and startup protection.
VpCI® Gecko™	A ready-to-use VpCI® non-aerosol spray for dry layup of small boilers and steam components. Ideal for seasonal or long-term preservation, it protects water side and fire side surfaces without direct application. No removal or flushing is needed before returning the boiler to service.	Completely drain and cool boiler. Shake can well before use. Spray evenly and consistently throughout the internal void space to ensure proper distribution of the product. No product removal is required prior to boiler startup. When the boiler is put back in service, fill with water and employ normal startup procedure. The remaining product will dissolve. One VpCI® Gecko™ can will treat approximately 100 gallons (380 L) of boiler volume (12 cans to a carton).
VpCI® Iguana™	A ready-to-use corrosion inhibitor that protects multi-metal boilers above and below the water. Low-maintenance and easy to apply, it eliminates frequent testing and allows quick startup without draining the system.	For hot closed loops or non-steaming boilers, maintain 2,000 ppm of VpCI® Iguana™ in circulating water. For wet layup of hot closed loops or non-steaming boilers as well as steaming boilers. Contact Cortec® Technical Services for application guidelines and additional details. For standby boilers, monitor concentration periodically.

Boiler Lizard®	A water-soluble PVA bag of Vapor phase Corrosion Inhibitors for dry layup of boilers. An excellent alternative to nitrogen blankets, silica gel, and hydrazine. NSF G7 Certified.	Protects ferrous metals and aluminum. One Boiler Lizard® protects up to a 1,000 gallon (3,785 L) capacity system (5 yd^3 or 3.8 m^3).
Boiler Lizard® Plus	An easy-to-use, two-part preservation kit for dry boiler layup. It combines Boiler Lizard® for continuous layup protection with Boiler Egg™, which activates at startup to scavenge oxygen and protect metal during initial filling until normal operation.	Layup and startup: Drain and cool the boiler. Place Boiler Lizard® and Boiler Egg™ inside as directed and seal openings. At startup, fill normally—PVA bags dissolve, releasing corrosion protection automatically. One kit treats 1,000 gal (3,785 L).
VpCI®-648	A ready-to-use waterborne corrosion inhibitor for wet layup of high-purity steam boilers. It provides contact and vapor-phase protection at a low dosage and can be added directly to feedwater or condensate without draining the boiler.	Add VpCI®-648 to feedwater and/or condensate system and pump to the boiler. Shut the system down and maintain it at high water level for up to 12 months of layup. Recommended dosage is 600-800 ppm.
VpCI®-649 Series	A range of ready-to-use waterborne corrosion inhibitors for wet or dry layup of boilers. Its contact and vapor-phase inhibitors protect multi-metal surfaces above and below water. The VpCI®-649 Series can be applied without draining or opening the boiler—an easy alternative for long-term layup.	Shut down the boiler per normal procedures. Once below 180 °F (82 °C), add product to feedwater or condensate and circulate. For dry layup, maintain high-water level 24 hours before draining; for wet layup, keep at high-water level. Dosage: 3,000–10,000 ppm for 3–12 months.
VpCI® Chameleon™	An innovative corrosion inhibitor for wet layup of boilers in food processing areas. Contact and vapor-phase protection covers all surfaces, including those at the air/water interface, without frequent monitoring or reapplication—saving time and labor compared to traditional methods. NSF G6 Certified.	For wet layup, use 0.5% by volume. Add to the total boiler volume with thorough mixing; then seal the boiler for the layup period. Contact Cortec® Technical Service for guidance on monitoring concentration.
VpCI®-615	A complete corrosion and scale inhibitor liquid concentrate for use in low- to medium-pressure boilers.	Protects ferrous metals, aluminum alloys, and galvanized steel in low- to medium-pressure boilers.
VpCI®-617	Water-based corrosion inhibitor to protect low- to medium-pressure boilers during operation. Contains an antiscalant for high mineral waters. Neutralizes acids in condensate systems and depletes oxygen to prevent boiler damage.	Protects steel and copper. Low- to medium-pressure boilers.
CLOSED LOOPS		
Product	**Description**	**Application**
Closed Loop Toad™	A water-soluble PVA bag of Vapor phase Corrosion Inhibitors for corrosion protection in closed loop cooling systems during operation or layup. Also contains organic-based scale inhibitors.	Protects iron, aluminum, copper (contact only), and galvanized steel. Four bags treat up to 1,000 gallons (3.8 m^3) of water.
M-605 Series	M-605 is a series of corrosion inhibitor additives to prevent corrosion due to chlorides. M-605 PS contains 96% USDA certified biobased content.	Protects carbon steel. Additive to deicing salts or closed loop cooling systems containing brine solutions.
VpCI® Coolant Antifreeze	Thermally stable corrosion inhibitor for a wide range of temperatures. Nitrite-, chromate-, and heavy-metal-silicate-free. Contains contact and Vapor phase Corrosion Inhibitors.	Protects copper, brass, solder, carbon steel, cast iron, and aluminum. Applications include engine coolants and low temperature closed loop systems. Effective with systems operating from -60 °F to 280 °F (-50 °C to 140 °C).
VpCI®-641 Series	A liquid water-based rust preventive based on all organic components that can protect at extremely low concentration levels. Contains no nitrates or phosphates. Fluorescent tracer available.	Protects carbon steel, stainless steel, aluminum, copper, and brass. Hydrostatic testing and some fresh-water closed loop cooling systems. Not for long-term post-application protection.
VpCI®-645	Proprietary blend of water-soluble contact corrosion inhibitors for protection in corrosive solutions containing chlorides.	Protects ferrous and non-ferrous metals. Low dosage effectiveness for a wide variety of marine and process applications requiring economical corrosion inhibition for fresh and salt water (e.g., layup, hydrotesting). Offers best protection in alkaline system.
VpCI®-648	Organic water treatment for corrosion protection in deionized or reverse osmosis water. Does not contain nitrites or halogen counter ions.	Protects ferrous metals and copper. Specifically intended for water-cooled generator stators in the power industry. Also applicable to other low conductivity/low sodium cooling systems or cutting operations.
VpCI®-649 Series	Combines contact and Vapor phase Corrosion Inhibitors along with anti-scalants. Does not contain nitrites, phosphates, chromates, or heavy metals. Minimizes disposal problems. Available in several versions for different application needs.	Protects ferrous and non-ferrous metals. Hydrotesting, layup, closed loop systems, fire extinguishing systems.

COOLING WATER		
Product	**Description**	**Application**
BioClean™ 612	A powerful aliphatic amide based organic penetrating agent and organic deposit dispersant for use in industrial applications. Not a biocide, but works synergistically with many biocides to improve system cleanliness.	Water treatment applications susceptible to microbiological contamination.
Cooling Loop Croc™	A water-soluble, PVA-packaged powder combining contact and Vapor phase Corrosion Inhibitors. Designed for cooling towers restarting after extended shutdowns, it provides temporary corrosion protection. Can be used alone or following Cooling Loop Gator® layup.	One Cooling Loop Croc™ bag treats 250 gallons (0.95 m^3) of water. At startup, fill water to normal operating level and turn on circulating pumps. Remove and discard outer Cooling Loop Croc™ barrier bag and add one water-soluble inner bag at a time directly into a turbulent area of the cooling tower basin to allow adequate mixing. Each carton contains four bags.
Cooling Loop Gator®	A water-soluble PVA bag of Vapor phase Corrosion Inhibitors for corrosion protection during cooling tower wet or dry layup.	Protects multi-metals, including galvanized steel and yellow metals (copper, brass). One Gator treats up to 88 gallons (0.33 m^3) water. Add bag to water and circulate 10-12 hours before shutdown. Shut off all valves.
Cooling Tower Frog®	A water-soluble PVA bag of Vapor phase Corrosion Inhibitors for protection during cooling tower dry layup.	Protects steel, copper, aluminum, and galvanized steel. Two bags treat up to 1,000 gallons or 3,800 L (133.7 ft^3 or 3.8 m^3) of enclosed space.
VpCI®-646	Highly water-soluble proprietary blend of contact and Vapor phase Corrosion Inhibitors. Protects against corrosion, sludge, and scale deposits.	Ferrous metals, yellow metals, aluminum, and stainless steel. Open-evaporative cooling water systems where corrosion, scale, or sludge may be a problem. Also, use in standby systems needing protection in head space.
VpCI®-647	A complete corrosion and scale inhibitor liquid concentrate for use in open recirculating cooling water systems. Contains organic phosphorous compounds, polymers, aromatic azoles, and proprietary components. Vapor-phase and contact protection.	Protects ferrous and non-ferrous metals. Open loop cooling water systems up to 167 °F (75°C).
ADDITIVES		
Product	**Description**	**Application**
M-615	M-615 is a corrosion-inhibiting, anti-scalant additive for low- and medium-pressure boilers that improves heat transfer efficiency, extends equipment life, and can be used with other boiler additives.	This economical liquid treatment protects boiler systems from pitting and corrosion, extending system life and reducing maintenance costs. It's easy to use, low-dosage, and safeguards multiple metals without premixing.
M-640 Series	High-temperature corrosion inhibitor building block for water and glycol-based closed loop products. An excellent replacement for silicates and phosphate/nitrite-based/amine compounds. Contains contact and Vapor phase Corrosion Inhibitors. Available in liquid or powder.	Protects copper, brass, solder, carbon steel, cast iron, and aluminum. Designed for heat exchange fluids, antifreeze, and coolants. Effective with systems operating up to 302 °F (150 °C).
M-95	A basic biodegradable corrosion inhibitor additive that protects in both the contact and vapor phases. Nitrite and phosphate-free. Soluble in water, glycol, alcohol; insoluble in hydrocarbon-based solvents; dispersible in oils.	Protects steel, copper, brass, magnesium, aluminum, bronze, galvanized steel, and other ferrous/non-ferrous metals. Can be added to almost any water-based product requiring contact and Vapor phase Corrosion Inhibitors. Use in operating systems up to 180 °F (82 °C) with intermittent peaks up to 200 °F (93 °C).
S-10 Series	Proprietary blends of corrosion inhibitors for steam condensate lines. S-10 and S-10 F contain FDA compliant ingredients (see PDS for details). Filming and neutralizing versions available. S-10 F also contains 82% USDA certified biobased content.	Protection of steam condensate lines.
S-15	Total replacement for hydrazine programs in medium- to high-pressure boilers.	Add separately to deaerator storage section or feedwater line, or directly inject into steam drum of medium- to high-pressure boilers.
S-69 Series	A series of liquid and powder corrosion inhibitor building blocks for use in products designed for operation and layup applications.	Protects ferrous and non-ferrous metals. Typical treatment rates: 0.3-1.0%. Effective in chill and hot water systems up to 176 °F (80 °C) degrees. Compatible with glycol and other high-polarity solvent systems.

SPECIALTY/MULTI-USE APPLICATIONS		
Product	**Description**	**Application**
EcoClean® Scale and Rust Remover	A heavy duty, fast-acting biodegradable scale and rust remover. Contains 100% USDA certified biobased content. Protects against flash rust.	Effective and safe to use on iron, carbon steel, stainless steel, copper, aluminum, magnesium, and their alloys. Offline cleaning of heat exchange equipment or pipes affected with rust or scale.
S-8	Corrosion inhibitor for washing or sterilization of packed food cans. Forms a thin protective layer that will not cause sticky deposits. Contains FDA compliant ingredients (see PDS for details).	Corrosion protection of food cans during washing and sterilization.
S-11	Corrosion inhibitors for organic or inorganic acids. Suitable replacements for propargyl alcohol.	Aqueous systems with low pH levels, such as acid pickling and chemical cleaning.
VpCI®-308 Series	Water-soluble corrosion inhibitor powder for yellow metals. Also available in pouch form for dry layup. Vapor phase and contact protection.	Protects ferrous metals, aluminum, copper, and bronze. Dry layup of boilers, heat exchangers, and closed- and open-loop cooling systems. Protects equipment after hydrostatic testing.
VpCI®-609 Series	Biodegradable, water-soluble Vapor phase Corrosion Inhibitor powder for wet or dry corrosion protection of ferrous metals and aluminum. Provides liquid-phase, vapor-phase, and interface protection. Also available in breathable EcoPouch® form for dry application.	Protects ferrous metals and aluminum (do not use with yellow metals). Steam condensate lines, closed circuit heating, and cooling systems. Hydrostatic testing. Additive to standing water.
VpCI®-611	Water-based rust preventive concentrate. Contains contact and Vapor phase Corrosion Inhibitors. Does not contain nitrite or phosphate.	Protects aluminum, carbon steel, stainless steel, mild steel, and other ferrous metals. Water blasting, hydrotesting, and ballast tank preservation.



Cortec® Corporation is a global leader in innovative, environmentally responsible corrosion control technologies, specializing in VpCI® (Vapor phase Corrosion Inhibitors) and MCI® (Migrating Corrosion Inhibitors) systems. Since our founding in 1977, Cortec® has demonstrated a commitment to innovation, developing over 500 products and securing more than 60 patents in corrosion prevention.

With over 45 years of experience, we have helped industries worldwide implement effective, economical asset preservation strategies, protecting equipment, structures, and materials from corrosion throughout their life cycle. Our VpCI® and MCI® preservation systems have been successfully applied across a diverse range of industries—from automotive manufacturing and aerospace to oil and gas, military, construction, and beyond—demonstrating the versatility and reliability of our technologies.

Cortec's expertise spans every stage of manufacturing, construction, and storage. By implementing a proactive, strategic preservation process, owners and operators can ensure that all equipment, machinery, and components remain ready-to-use whenever needed, reducing downtime, extending asset life, and lowering maintenance costs. Our integrated preservation approach not only protects assets in challenging environments but also contributes to operational efficiency and sustainability, making Cortec® a trusted partner for businesses committed to long-term performance.

See Corrosion Protection in Action – Subscribe to Cortec® on YouTube!

QUALITY EXCELLENCE®

CORTEC CORPORATION

Environmentally Safe VpCI®/MCI® Technologies

Distributed by:

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.

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4119 White Bear Parkway, St. Paul, MN 55110 USA
1 (651) 429-1100 • 1 (800) 4-CORTEC
productinfo@cortecvci.com
www.CortecVCI.com • www.cortecadditives.com

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