

VpCI[®] METALWORKING PRODUCTS



CORTEC
CORPORATION

Environmentally Safe VC/ICI[®] Technologies



Productivity, investment protection and cost reduction.

The total economic loss from corrosion in a metal producing plant can approach a staggering 5%. 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, leading to lost production capacity. The high cost of corrosion also includes rust claims and freight costs for returned goods.



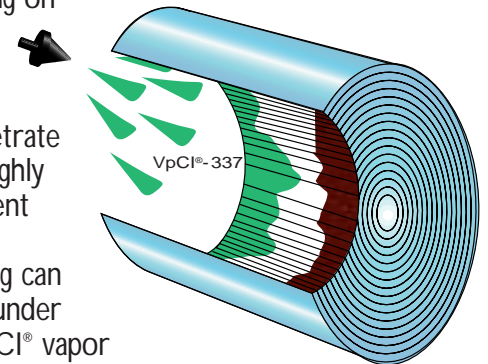
Cortec® VpCI® products solve a wide variety of corrosion problems.

VpCI® protects a multitude of metal products. Spraying or dipping pipe and other tubulars with VpCI® provides fast and economical protection for exterior and interior surfaces. In addition, water-based concentrates provide corrosion protection and lubricant action for hot rolled, cold rolled, galvanized and aluminized steels, copper, aluminum, brass and other products, eliminating the need for oil and oil-water emulsion rust preventives. Our technically trained staff can help you decide which product you need for long lasting and complete protection of your corrosion sensitive products.



How Cortec® VpCI® pre-vents corrosion and pro- tects your product.

For edge treatment VpCI® is applied in just seconds to the edges of coils or stacks with conventional manual or automated spray equipment. Traditional rust preventives do not stop speckling on the internal metal layers. Humidity and condensed moisture easily penetrate the coil forming a highly corrosive environment inside the coil. Rust, speckling and staining can develop in minutes under these conditions. VpCI® vapor phase action migrates wherever humidity and corrosive agents can penetrate to provide complete corrosion protection. It protects external surfaces as well as internal layers of coils or sheets.



How Cortec® VpCIs can cut costs.

- Water-based VpCIs are more economical than conventional oil-based rust preventives.
- Efficient application results in labor savings.
- Improved health, safety and pollution control.
- No need to remove VpCI® protection, eliminating extra processing steps.

VpCI® treatments virtually eliminate economic loss due to rust, speckling, staining and other forms of corrosion. You can eliminate claims and returns while improving the quality of your product. As a result, your processing will become more streamlined, allowing for more efficient operation.

	ANNUAL ECONOMIC LOSS DUE TO CORROSION	COST OF VpCI® TREATMENT TO PROTECT TOTAL PRODUCTION	TOTAL SAVINGS WITH CORTEC VpCI®
Per Shift	\$ 4,500	\$ 100	\$ 4,400
Per Day	13,500	300	13,200
Per Week	94,500	2,100	92,400
Per Month	410,625	9,125	401,500
Per Year	\$ 4,927,500	\$ 109,500	\$ 4,818,000

Figures are based on a steel mill producing and shipping 100 ten ton coils per shift, three shifts per day, seven days per week, a nominal material and manufacturing cost of \$300 per ton, with a 1.5% economic loss due to corrosive attack.

Water-Based Concentrates and Ready-to-Use Metalworking Liquids

VpCI®-316

Metalworking liquids for protection of copper, brass and aluminum alloys.

Characteristics:

- Protects copper, bronze and brass.
- Leaves a light semi-dry film for stamping or rolling (depends on concentration used).
- Biodegradable, zero VOC.

VpCI®-337

Temporary coating and fogging agent for indoor storage and packaging uses. Available in EcoAir™ brand sizes, 13 oz. (369 g) bottles.

Characteristics:

- Leaves a thin, non-tacky film.
- Ideal for edge protection of coils and stacks.
- Can be fogged or misted into containers, cavities, pipes, etc.
- Provides multimetal protection.
- Excellent vapor phase protection.

VpCI®-338 (Formerly VpCI®-337FW)

An emulsion made from FDA approved compounds to clean and protect tin plate, galvanized and cold rolled steel, aluminum and stainless steel. Primarily used for intermediate food processing operations. Performs well as a cleaner and gives protection to coiled stock as represented in a wet stack test.

Characteristics:

- Excellent vapor phase protection.
- Excellent wet stack protection.
- Mild cleaner.
- Can be disposed of easily.
- Easily removed.
- Multimetal protection.

VpCI®-344

Corrosion preventive liquid for wet tempering of galvanized and cold-rolled steel.

Characteristics:

- New generation wet tempering solution.
- Biodegradable.
- Free of phosphate, nitrate, nitrite, chlorine and sulfur.
- Ideal for ferrous metals and galvanized steel.
- Film persistency in turbulent, high temperature and high shear conditions.
- Easy disposal, handling and shipping.
- Excellent solubility in water.
- Passes cast iron chip test @ 2%.
- Excellent hard water stability.
- Provides extended protection against corrosion, white rust and staining.

VpCI®-345

A clear synthetic coolant for metalworking jobs.

Characteristics:

- Synthetic metalworking fluid.
- Suitable for CNC machines.
- Contains no burning vapors.
- Passes through a 1 micron filter.
- Excellent for grinding and tumblers.

VpCI®-347

Multifunctional emulsion used as a heavy-duty lubricant/coolant for metal stampings, tubular products and machined parts.

Characteristics:

- Low odor.
- Contains no burning vapors.
- Provides multimetal protection.
- EP Properties.
- Excellent protection in sheltered outdoor conditions.

VpCI®-377

Can be used in a multitude of operations from a temporary coating to use as a coolant in light to medium metalworking jobs for ferrous metals. Available in EcoAir™ brand sizes, 12 oz. (340 g) bottles.

Characteristics:

- Forms a clear, dry film which can be painted over.
- Biodegradable.
- Free of phosphate, nitrite, nitrate, chlorine, borates and sulfur.
- Excellent hard water stability.
- Passes cast iron chip test @ 2%.
- Effective at low concentrations.
- Multimetal protection.

VpCI®-378

An emulsion designed as a complete replacement for oil rust preventives.

Characteristics:

- Ideal for ferrous metals.
- Excellent salt and humidity results.
- Slightly tacky film.
- Easily removed with an alkaline cleaner.
- Readily soluble in water.
- Provides indoor and outdoor protection.
- Stable at higher temperatures for dipping baths.

VpCI®-379

Temporary film for storage and shipping protection of multimetal parts.

Characteristics:

- Forms a dry film.
- Excellent humidity results.
- Easily removed with an alkaline cleaner.
- Provides indoor and packaging protection.
- Hydrotesting.



Oil-Based Ready-to-Use Liquids and Concentrates

VpCI®-322

Provides superior protection in open atmosphere conditions.

Characteristics:

- Provides multimetal protection especially on zinc, aluminum, magnesium and the yellow metals.
- Excellent salt spray protection.
- Filters through a 5 micron filter.
- Forms a thin film.
- Dilutable.
- Low viscosity.
- High temperature resistance.
- Additive for hydraulic oil.

VpCI®-324

Light sanitary lubricant, penetrating oil or anti-corrosion film for equipment and machine parts where there is exposure of the lubricated parts to edible products. Penetrates quickly to free rusted or corroded fasteners. VpCI®-324 is authorized by the USDA for use in category H-1. Also contains a bacteriostatic preservative that retards the growth of bacteria which often breeds in conventional lubricants found in food and beverage processing plants. Available in EcoAir™ brand sizes, 10 oz. (284 g) bottles.

Characteristics:

- USDA H-1 rating for use in federal inspected meat and poultry plants, as well as beverage and other food processing facilities where incidental food contact may occur.
- Quickly frees corroded parts.
- Protects metal from corrosion.



VpCI®-325

A broad range corrosion inhibitor effective on ferrous metals, zinc, aluminum, galvanized steel, copper, cadmium, babbitt, brass, silver and many alloys.

Characteristics:

- Excellent salt spray results.
- Quick draining thin film.
- Low viscosity.
- Penetrates tight tolerances.
- Environmentally friendly.
- Vegetable oil carrier.

VpCI®-326

Corrosion inhibiting additive for machining lubricants and hydraulic fluids. Multimetal protection.

Characteristics:

- Low viscosity.
- Excellent indoor protection.
- Very good humidity results.
- Filters through a 1 micron filter.
- Forms a thin film.
- Excellent vapor phase protection.
- Additive for hydraulic oil.

VpCI®-327

Solvent-blended concentrate. Good for magnesium, aluminum and ferrous metals.

Characteristics:

- Quick penetration.
- Low viscosity.
- Forms a thin film.
- Excellent humidity and salt spray results.

VpCI®-329, VpCI®-329D and VpCI®-329F

Add VpCI®-329 concentrate to oils to enhance corrosion inhibiting characteristics. VpCI®-329D is the ready-to-use version, and requires no blending. VpCI®-329F is the version approved by the United States Department of Agriculture for use on packaging materials in direct contact with meat or poultry.

Characteristics:

- Excellent protection in outdoor sheltered conditions in coastal environments.
- Effective on multimetals.
- VpCI®-329 conforms to MIL-P-46002B.
- Forms a thin film.

VpCI®-369, VpCI®-369D and VpCI®-369M

VpCI®-369 is a self-healing barrier coating providing extended outdoor multimetal protection for up to 48 months. VpCI®-369D is a diluted version which provides months of outdoor protection. VpCI®-369M is a ready-to-use version which meets MIL-C-16173E Grade 2. This version also offers lower viscosity than VpCI®-369 and lower solids content. (QPL product.) Available in CorrShield™ brand sizes, 11 oz. (312 g) aerosol cans.

Characteristics:

- Medium viscosity.
- Excellent salt spray results.
- Excellent outdoor/salt spray protection.
- Effective on multimetals.
- Dilutable.
- Excellent lubricant.

Soy-Based Ready-to-Use Liquids and Concentrates

EcoLine™ All Purpose Lubricant
Soy-based lubricant that is designed for industrial applications. Contains a friction modifier and extreme pressure additive. Provides multimetal protection.

Characteristics:

- Provides multimetal corrosion protection.
- Leaves a thin film that remains oily.
- Environmentally friendly, and biodegradable.
- Performs well as a mold release.

EcoLine™ Bearing, Chain and Roller Lube
Soy-based, ready-to-use, high quality rust preventative lubricant.

Characteristics:

- Excellent for operating and mothballed equipment.
- Excellent for conveyor and lubricating drive chains.
- Tackifiers resist sling-off from high speed chains.
- Meets USDA's bio-based product definition for EO 13101.
- Provides multimetal protection.

EcoLine™ Cutting Fluid
Soy-based, multifunctional metalworking fluid for a variety of machining operations.

Characteristics:

- Effective at a wide range of dilutions.
- Provides corrosion protection after operation.
- Suberb lubricating properties for machining a wide range of metals.
- Excellent humidity resistance.
- Provides multimetal protection for indoor storage protection.

EcoLine™ Food Machinery Grease
Soy-based grease for food machinery applications. Formulated to meet USDA H-1 criteria for incidental food contact.

Characteristics:

- High viscosity index at a wide range of temperatures.
- High flash and fire points reduce fire hazard.
- Provides both contact and vapor phase corrosion protection.
- Environmentally safe, biodegradable formulation.

EcoLine™ Heavy Duty Grease
Soy-based grease for heavy industrial applications. Intended to replace non-degradable NLGI grade 2 greases.

Characteristics:

- Maintains viscosity over a wide temperature range.
- Excellent corrosion resistance in both industrial and marine environments.
- Performs well during operation and lay-up applications.
- Provides both contact and vapor phase corrosion protection.

EcoLine™ Long Term Rust Preventative
Soy-based rust preventative that provides temporary protection for up to 48 months.

Characteristics:

- Provides multimetal corrosion protection.
- Environmentally conscious replacement for petroleum based rust preventatives.
- Performs very well in both high humidity and marine environments.
- VOC free.



		Cortec Product	Coating Film Type	Film Thickness	Indoor Protection # of months	Sheltered Outdoor Protection # of months	Metals Protected	Removal Methods <i>Use Cortec 410 series cleaners</i>	Solution Color	
WATER-BASED METALWORKING LIQUIDS	Coolants & Lubricants	VpCI®-344	clear dry	0.25 mil/5 µm	6	3	Multimetal	Water or alkaline cleaners	Clear amber	
		VpCI®-345	clear dry	0.2 mil/0.5 µm	24	N.R.	Multimetal	Alkaline cleaners	Clear orange	
		VpCI®-347	waxy	0.5 mil/12.5 µm	24	12	Multimetal	Alkaline cleaners	Tan/brown	
	Edge Sprays	VpCI®-337	clear dry	0.5 mil/12.5 µm	12	1-2	Multimetal	Water or alkaline cleaners	Cloudy dark yellow	
		VpCI®-338	clear dry	0.5 mil/12.5 µm	12	1-2	Multimetal	Alkaline cleaners	Brownish off-white	
	General Purpose	VpCI®-316	clear dry	0.25 mil/5 µm	24	N.R.	Brass, copper, bronze	Water or alkaline cleaners	Clear yellow	
		VpCI®-377	clear dry	0.25 mil/5 µm	24	6	Multimetal	Water or alkaline cleaners	Dark brown	
		VpCI®-378	light, wax like	0.25 mil/5 µm	24	6-12	Multimetal	Water or alkaline cleaners	Cloudy brown	
		VpCI®-379	clear dry	0.5 mil/12.5 µm	24	6	Multimetal	Water or alkaline cleaners	Clear orange/yellow	
	OIL-BASED METALWORKING LIQUIDS/ADDITIVES	Penetrating Oils (contains solvents)	VpCI®-324	oily	0.5-1 mil/12.5-25 µm	12	N.R.	Ferrous & tinplate	Alkaline cleaners & mineral spirits	Clear, colorless liquid
			VpCI®-325	oily	0.5 mil/12.5 µm	24	12	Multimetal	Alkaline cleaners & mineral spirits	Opaque tan
			VpCI®-327	oily	0.5 mil/12.5 µm	24	12	Multimetal	Alkaline cleaners & mineral spirits	Clear yellow
Engine Oil		VpCI®-323	oily	1 mil/25 µm	24	12	Multimetal	Alkaline cleaners & mineral spirits	Dark orange	
Hydraulic Properties		VpCI®-322	oily	0.5 mil/12.5 µm	24	12	Multimetal	Alkaline cleaners & mineral spirits	Dark orange	
		VpCI®-326	oily	0.5 mil/12.5 µm	24	12	Multimetal	Alkaline cleaners & mineral spirits	Clear yellow	
General Purpose and Mothballing		VpCI®-329	oily	1 mil/25 µm	24	24	Multimetal	Alkaline cleaners & mineral spirits	Opaque tannish brown	
		VpCI®-329D 1:9	oily	1 mil/25 µm	24	18	Multimetal	Alkaline cleaners & mineral spirits	Opaque tannish brown	
		VpCI®-329F	oily	1 mil/25 µm	24	24	Multimetal	Alkaline cleaners & mineral spirits	Clear yellow	
		VpCI®-369	oily	0.5-5 mil/12.5-125 µm	60	48	Multimetal	Alkaline cleaners & mineral spirits	Tan/brown	
		VpCI®-369D	oily	1-3 mil/25-75 µm	48	18	Multimetal	Alkaline cleaners & mineral spirits	Tan/brown	
		VpCI®-369M	oily	0.5-5 mil/12.5-125 µm	60	24	Multimetal	Alkaline cleaners & mineral spirits	Tan/brown	
SOY-BASED		Coolants & Lubricants	EcoLine™ All Purpose Lube	oily	1 mil/25 µm	12	3	Multimetal	Alkaline cleaners	Amber
			EcoLine™ Bearing, Chain Roller Lube	oily	1 mil/25 µm	6	3	Multimetal	Alkaline cleaners	Amber
			EcoLine™ Cutting Fluid	clear dry	>0.25 mil/5 µm	9	3	Multimetal	Alkaline cleaners	Amber Milky white (when mixed)
	General Purpose	EcoLine™ Long Term Rust Preventative	oily	1 mil/25 µm	24	12	Multimetal	Alkaline cleaners	Amber	
		Grease	EcoLine™ Food Machinery Grease	grease	n/a	24	12	Multimetal	Alkaline cleaners & mineral spirits	Charcoal gray
	EcoLine™ Heavy Duty Grease		grease	n/a	24	12	Multimetal	Alkaline cleaners & mineral spirits	Tan	

Cortec Product	Application Methods All can be applied by spray or dip	Dilution Range	Description	Needs Removal Before:	
				Welding	Painting
VpCI®-344	Flood	2.5-20% in water	Contains water-based corrosion inhibitors to protect steel during wet tempering operations. Contains a blend of corrosion inhibitors and lubricants to provide a range of slip, control and corrosion protection. Hard water stable.	N	N
VpCI®-345	Flood	2.5-20% in water	Semi-synthetic. Use as a coolant in machining applications. Resistant to bacterial attack. Good for carbon steel and galvanized steel. Ideally suited for milling, turning, polishing, drilling, boring, deburring, broaching and other light-duty machining operations.	N	N
VpCI®-347	Flood	2.5-20% in water	Ideally suited for heavy-duty cutting, milling, turning, drilling, boring, broaching, gear cutting, drawing and other machining operations. A liquid concentrate which forms an emulsion with water. A heavy-duty lubricant for difficult-to-produce metal stampings and machined parts. Protects steel, galvanized 304, 316 stainless steel and copper. Does not promote, and is resistant to, bacterial attack.	N	Y
VpCI®-337	Fog	Ready to use	Good as an edge spray for coiled stock, parts finishing, and fogging. Apply before shipping or for medium-term storage. Spray on wood pallets and stacked sheet metal.	Y	Y
VpCI®-338	Fog	Ready to use	A water-based emulsion made from FDA certified compounds.	Y	Y
VpCI®-316	Tumble	2.5-20% in water	A sheltered exposure temporary coating designed for stamping, burnishing, grinding, rolling and tumblers.	N	Y
VpCI®-377	Brush, flood	2.5-50% in water	Use for castings, machined parts, polished metal, ground metal or hydrotesting as a temporary coating and/or coolant additive to parts washers. Excellent stability in hard water (passes ASTM D4637 iron chip test @ 2%). Excellent humidity. Designed for protecting ferrous metals in sheltered areas, indoors or in packaging.	N	N
VpCI®-378	Brush, flood	5-50% in water	Designed to protect ferrous and non-ferrous metals in sheltered areas, indoors or in packages. Not for direct exposure to rain and outdoor elements. Leaves a light tacky film. Provides good salt spray protection. Use as a quenching fluid or in dipping applications operating at elevated temperatures. Designed to protect castings, forgings, tubular parts, machined and honed metal components in difficult shipping scenarios, i.e., Pacific Rim.	N	Y
VpCI®-379	Brush, flood	10-50% in water	Use for castings, forgings, tubular parts, machined and honed metal components. Additive to parts washers and rinse water systems, as well as some types of tumblers. Does not need removal prior to painting. There is no cross-contamination in post water or oil operations. Mildly foaming.	N	N
VpCI®-324	Dip, brush	Ready to use	Light sanitary lubricant, penetrating oil or anti-corrosion film for equipment and machine parts where there is exposure of the lubricated parts to edible products. Penetrates quickly to free rusted or corroded fasteners. VpCI®-324 is authorized by the USDA for use in category H-1. Also contains a bacteriostatic preservative that retards the growth of bacteria which often breeds in conventional lubricants found in food and beverage processing plants.	Y	Y
VpCI®-325	Fog	Ready to use	Low viscosity containing oil for quick draining and excellent surface coverage. Provides excellent protection in humidity and salt fog. Safe to use with most gaskets and sealants. Good for long-term sheltered storage of parts (esp. cast iron), finishing, lay-up, and fog tanks. Apply by spraying or dipping. Also penetrates. Available in bulk and MRO forms.	Y	Y
VpCI®-327	Fog	Ready to use	Low viscosity oil with a solvent added for quick penetration and good coverage. Provides good humidity protection for ferrous metals. Good for parts, finishing and fogging of spaces.	Y	Y
VpCI®-323	Add	5-20% in oil	Oil additive for internal moving parts of a working engine. Contains no heavy metals. Passes through a 1µm filter.	Y	Y
VpCI®-322	Add	5-20% in oil	Light viscosity for protecting metals. Provides good protection in humid conditions. Designed for lubricating, hydraulic systems parts finishing, machining, fluid lay-up or as an oil additive.	Y	Y
VpCI®-326	Fog, add	5-20% in oil	For lubricating and hydraulic systems, parts finishing, machining, lay-up fluids, and mothballing. Passes through a 1 micron filter.	Y	Y
VpCI®-329	Fog, add	5-20% in oil	Light to medium viscosity oil for protecting ferrous metals against salt fog and humidity. Protects in a sheltered outdoor environment. Good for fogging, fluid lay-up, and dipping.	Y	Y
VpCI®-329D 1:9	Fog	Ready to use	Pre-diluted version of VpCI®-329.	Y	Y
VpCI®-329F	Fog, add	5-20% in oil	FDA approved version of VpCI®-329.	Y	Y
VpCI®-369	Brush	5-20% in oil	Multimetal protective coating for outdoor storage of metals in concentrated form.	N	Y
VpCI®-369D	Brush	Ready to use	Pre-diluted version of VpCI®-369.	N	Y
VpCI®-369M	Brush	Ready to use	Meets MIL-C-16173D	N	Y
EcoLine™ All Purpose Lube	Roll, brush, flood	Ready to use	For general purpose lubricating applications. Excellent for equipment or machinery requiring lubricity and corrosion protection.	Y	Y
EcoLine™ Bearing, Chain Roller Lube	Roll, brush, flood	Ready to use	For direct replacement of petroleum derived bearing, chain and roller lubes.	Y	Y
EcoLine™ Cutting Fluid	Roll, brush, flood	2.5-50% in water	Excellent for cutting, drilling, splitting and drawing applications. Direct replacement for soluble oil type fluids that provides superior lubricity and excellent corrosion protection.	Y	Y
EcoLine™ Long Term Rust Preventative	Roll, brush, flood	Ready to use	Low viscosity rust preventative that is safe for the environment. Provides excellent multimetal corrosion protection.	Y	Y
EcoLine™ Food Machinery Grease		Ready to use	Direct replacement for NLGI 2 grade petroleum derived grease. Provides excellent lubricity, even in extreme conditions.	Y	Y
EcoLine™ Heavy Duty Grease		Ready to use	USDA H-1 version of EcoLine Heavy Duty Grease.	Y	Y

Packaging

All Cortec metalworking fluids are available in 5 gal (19 liter) pails, 55 gal (208 liter) drums, totes and bulk. VpCI®-324, VpCI®-377 and VpCI®-337 are also available in EcoAir® compressed air bottles. EcoLine™ products also available in 16 fl. oz. bottles (cases of 12)

Total Corrosion Control™

Cortec Corporation® is dedicated to controlling corrosion at ALL STAGES of a product life cycle. Cortec has developed a diverse range of corrosion protection products including cleaners, metalworking fluids, water and oil-based coatings and corrosion inhibitors, rust removers, paint strippers, powders, packaging foams, paper, films, surface treatments and admixtures for concrete. Contact Cortec for additional brochures and information.

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.

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