

# BioCORTEC®

## NEWSLETTER

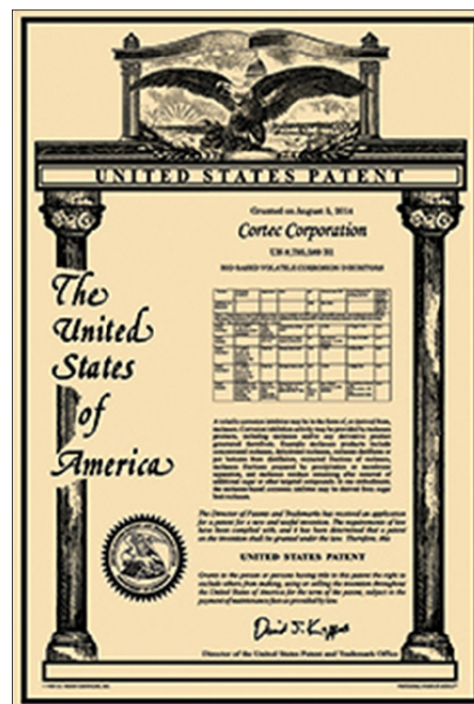
September 2014

### BioBased Corrosion Inhibitors

#### US Patent # 8,795,589

Back in 2010, Cortec® was the recipient of a Small Business Innovation Research (SBIR) Phase I Grant from the National Science Foundation (NSF) "Bio-Based corrosion Inhibitors" IIP-1013904. Under this project, Cortec® evaluated the feasibility of producing bio-based, environmentally benign products for the prevention and treatment of corrosion and scale from low-value agricultural by-product streams. Selected agricultural byproduct materials (feed stocks) were screened for corrosion prevention as well as removal of scale and existing surface corrosion on steel, galvanized steel, copper, and aluminum.

The Cortec® Research and Development department was successful in identifying several novel materials with commercial potential. This recently issued US patent covers perhaps the most unexpected and most interesting result from the research project. The Cortec® inventors discovered that a Bio-based volatile corrosion inhibitor could be manufactured from a very common product, molasses. Besides being bio-based and inexpensive, molasses and associated co-products are exceptionally safe for people and the environment.



### New Product

#### BioPouch™

One exciting product based on this technology is BioPouch™. A 28-month testing (shown below) shows that BioPouch™ provided excellent protection to carbon steel in an enclosure that was exposed to Minnesota outdoor through its historical cold winters, hot summers, and a wet-test spring. Currently BioPouch™ is available in marketing trial phase.

Cortec® has long been a leader in the application of volatile corrosion inhibitors (primarily under the VpCI® brand). This new technology has promise for strengthening our product portfolio while "Raising the bar" on our competitors. With this invention, Cortec® continues its track record of technical leadership and innovation in the field of environmentally friendly and cost effective corrosion prevention technologies.



## Featured Products

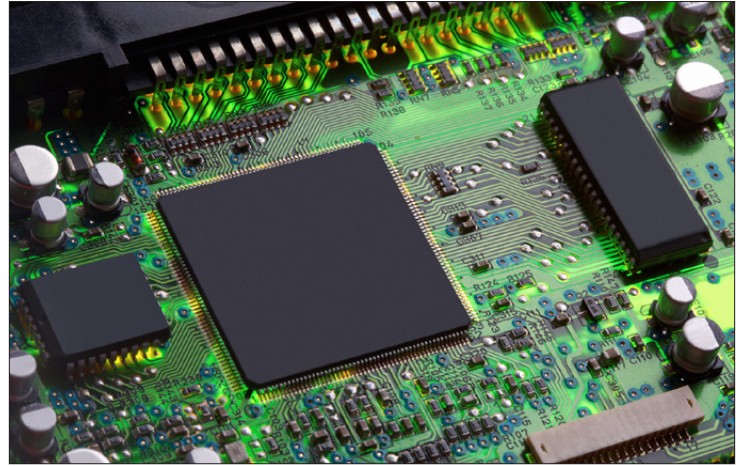
### Ecosonic® Conformal Coating powered by Nano-VpCI™

New Ecosonic® Conformal Coating powered by Nano-VpCI™ represents a technological breakthrough in a new generation of circuit board conformal coatings; combining outstanding moisture intrusion prevention as well as superior corrosion resistance with Cortec's patented Vapor phase Corrosion Inhibitor technology. It contains an optical identifier visible with UV light, assuring rapid and effective visual confirmation of proper coating on surfaces.

This high-tech nonconductive coating is designed to extend long-life performance of new and repaired electronic assemblies, especially those which are under adverse corrosion conditions such as high heat, chemicals, salt spray, moisture and atmospheric humidity. More importantly, it saves money by extending product life and reducing labor time.

The acrylic-based, VpCI® coating forms a strong protective barrier against microscopic dendrite growth, termination and surface corrosion, moisture, fungus, dust and other environmental contaminants. It also enhances circuit reliability by prohibiting dangerous conditions such as leakage from high impedance circuits with high component density topography. The coating is VOC free, fast drying and easily removed with solvents for repair.

Ecosonic® Conformal Coating powered by Nano-VpCI™ is a single component formulation that is much easier to use than two component coatings eliminating special metering and mixing equipment. It is available in aerosols and bulk liquid.



Ecosonic® Conformal Coating superiorly protects any environment that could damage the mechanics of a printed circuit board or substrate.

# ECosonic®

### EcoShield® Environmentally Friendly Moisture Barrier Paper

Cortec® presents patented EcoShield® Paper and Linerboard – a premium paper in the industry made from the highest quality recycled paper. This innovative, safe, and economical packaging product is coated with a water based barrier coating and is fully recyclable/repulpable while displaying barrier properties better than those of wax or polyethylene coated paper or linerboards.

Contrary to other barrier packaging products EcoShield® Paper can readily be recycled into other types of paper products such as boxes, cardboard, and other corrugated materials as well as “repulped”: made into or mixed with pulp to make new paper products. There is no need for costly processes to separate the paper base from the coating. This environmentally safe product also shows excellent oil and grease resistance perfectly combining moisture barrier properties and oil and grease resistivity into one step.

In addition to being safe to the environment, EcoShield® is in compliance with FDA regulations under 21 code of Federal Regulations for food contact. It can be used in applications where direct or indirect food contact may occur. In manufacturing process there is no chlorine or other bleaching chemicals which completely eliminates package contamination found with other papers on the market.



EcoShield® provides excellent protection to metal parts, food items, and moisture sensitive items.

**Continued on page 3....**



Developed in Cortec® laboratories utilizing high-tech, patented, recyclable, and repulpable technology, EcoShield® Paper also displays a greatly reduced Moisture Vapor Transmission Rate (MVTR). In other words, it has a MVTR value similar to poly-coated papers and superior to waxed papers while still being biobased, economical, and environmentally friendly.

EcoShield® effectively protects items that are sensitive to moisture. The items may be wrapped in EcoShield® Paper or packaged in boxes that have been made with EcoShield® Linerboard. It is non-toxic, non-irritating, nitrite and amine free, and does not contain any silicones, chromates, other heavy metals, or toxic products.

The product was tested according to the Fibre Box Assn. Voluntary Standard for repulpability and showed excellent performance. It was also tested according to ASTM E-96, 23°C, 50% RH, Example test ranges for: EcoShield Barrier Paper, a comparable polyethylene coated paper (40# 3msf paper, 6# PE coating) and commercial waxed paper.



EcoShield® is in compliance with FDA regulations for direct and indirect food contact and completely eliminates package contamination.

## Green Master's Program Welcomes Cortec® Coated Products

Cortec® Coated Products (CCP) has been welcomed into the Wisconsin (WI) Green Master's Program in the Paper/Packaging/Forestry sector with an initial total score of 468. The Green Masters Program is an objective, points-based recognition program that enables Wisconsin institutions of all sizes and from any sector to join a group of like-minded companies that are "on the road to sustainability." Developed by the WI Sustainable Business Council, in conjunction with the University of Wisconsin, the Green Masters Program helps to recognize Wisconsin's sustainability leaders and encourage continuous improvement. This program will help to give a more accurate perspective of how CCP compares to others in the Paper/Packaging/Forestry sector.

The Green Masters Program can be shared with CCP's supply chain and partners, which will help to strengthen and improve the program. As potential areas for improvement are identified, or as additional sustainability actions are taken CCP will increase their score. The scores were tabulated from a comprehensive survey that was completed from CCP on their energy and waste management metrics, Climate Change Actions, Emissions, and Water Usage, and many other sustainability criteria. The Green Masters Program will give CCP a pragmatic view of the clarity and maturity of sustainability at their location. To find out more about the program visit the WI Green Masters Program website at:

<http://www.wisconsinsustainability.com/green-masters>

The Green Masters Program is a sustainability recognition program developed by the Wisconsin Sustainable Business Council for businesses interested in sustainability credentials. The objective of the Green Masters Program is to get businesses in Wisconsin started on the journey toward sustainability, and to encourage, recognize, and reward sustainability progress. The Green Masters Program consists of three tiers, Green Apprentice, Green Professional and Green Master.



Category	Your Score	Program Average	Program Minimum and Maximum
<b>Total Score:</b>	<b>468</b>	311	84 ___ 592
Energy:	60	42	7 ___ 84
Climate Change:	34	24	1 ___ 78
Water:	43	34	1 ___ 71
Waste Management:	72	49	7 ___ 85
Transportation:	24	19	1 ___ 54
Supply Chain:	51	24	1 ___ 61
Education and Outreach:	36	31	4 ___ 62
Workforce:	62	41	5 ___ 80
Governance:	86	46	1 ___ 88

## **Flashback:** **Cortec's Early Years by Boris Miksic**

When I first got involved in the field of vapor phase inhibitors I quickly recognized that his research was among the best in the world next to Wachter's in Houston and Vernon's in UK. As I was getting more involved with NACE the unit committee T-3A on Corrosion Inhibitors asked me to be a symposium chairman on first ever symposium on vapor phase corrosion inhibitors to be held in Houston in March of 1976. I lucked out as all the big names in those years confirmed their participation Professor TrabANELLI of University of Ferrara, Dr. Legault of Inland Steel, Dr. Phelps of US Steel and among them Professor Rosenfeld of USSR Academy of Sciences whom I appointed as a keynote speaker for my Symposium.

This was during cold war era and to travel from USSR to US was almost impossible due to restrictions by both US and USSR. As the date for my Symposium was approaching, I got increasingly nervous as I haven't heard from Prof. Rosenfeld for a long time. Just a year before in 1975, all invited speakers from USSR haven't showed up at the world's most prestigious Symposium in Ferrara, Italy organized by the European Federation of Corrosion. That made me think that Rosenfeld's trip to Houston was nixed by some communist autocrat.

This was before emails, although I made many attempts to contact Prof. Rosenfeld by phone or mail with no success. Couple of weeks before the Symposium I contacted my neighbor from North Oaks who in the meantime became a Vice President of the United States under Jimmy Carter, Walter Mondale. Although he wasn't immediately available, his office sent my request for help to bring Ilya Rosenfeld to Houston to the US ambassador in Moscow.

And guess what, a day before my Symposium Rosenfeld shows up at the Conference hotel Hyatt Regency of Houston. With him arrived two secret agents who introduced themselves as chemists. The only problem was that all three of them slept in the same room and I couldn't have a private meeting with him to ask some questions about certain VCI compounds that he tested and looked quite promising to me.

At the end of our Symposium, which by the way was quite a success, I made a bald move in order to have eye to eye meeting with him. I invited all three of them for a dinner at the old Don the Beachcomber restaurant at our hotel. This restaurant was one of the oldest "Hawaiian" drinking holes in the old days anywhere in the world. The KGB boys were so impressed with the Hawaiian decor and music so they finally relaxed before departing back to the grayness of Soviet Union.

In the meantime I asked our waiter to double up on the rum in their mai-tais while serving only mai-tai juice for Rosenfeld and myself. Immediately after we finished with our dinners the two secret agents slid under the table after five or six mai-tais so Professor Rosenfeld and I finally had a chance to talk eye to eye.

And guess what, some of his recommendations about chemistry of VCI compounds are still in use by Cortec for some of our longstanding and most successful products worldwide...



Boris Miksic (Middle) with Professor Rosenfeld (Left) and friend Dick Singer (Right) attending Corrosion Conference 1979 in Atlanta. This was the first year Cortec exhibited at NACE Expo.



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