



The **LEADING** Edge

R&D Achievements Featured in European Sales Meeting Presentation



The European Sales Meeting, held October 11th-12th in Croatia, was a time to look back on Cortec's R&D achievements of the last two years. During the gathering of regional distributors, Cortec® Technical Service Engineer John Wulterkens gave an informative overview of approximately 22 new or re-engineered products released by Cortec® since the previous European Sales Meeting in 2016. These included five packaging products, six coatings and rust preventatives, two surface prep materials, and seven new EcoLine® products.

Wulterkens also took some time to explain the product development process—how Cortec® gets new product ideas from a variety of sources (e.g., customers, sales, and internal employees) and then looks at sales, market potential, product requirements, and product impact before starting in on the actual product development. Cortec® is also working hard to ensure new products have a specific targeted application and that relevant testing is performed to provide the best product support after release. Keep an eye out as Cortec® R&D continues to develop and release new products in the future.

For recent releases in the past sixth months, including a significant output of "green" chemistry products, please see the "Product Releases" section.

EU Compliance Goals Within REACH

Cortec® Laboratories is happy to announce its recent progress on REACH registration, which allows Cortec® to import a large variety of key products into the EU. Registration is complete for most of the raw materials Cortec® has strategically decided to register. A few more are pending but expected to be complete within 2018. Stay tuned.

Cortec® Laboratories has been working closely with Ivana Borsic (VP of Sales, Europe) to complete the REACH registrations and has implemented new processes to complete REACH registration.

This exercise has included the following processes:

1. Data analysis of past product sales in the EU to select the most strategic raw materials for REACH registration. The REACH team has built and launched a sophisticated internal database system to enable and expedite such analysis. More importantly, it allows an efficient and accurate means for product and raw material tracking for REACH purposes.
2. Optimization of logistics and work flow for raw material sourcing, product management, data tracking, SDS updates to reflect regulation changes, and R&D efforts for REACH compliance.
3. Registration of strategic raw materials, including internal and external lab testing, collection of manufacturing information, and vigorous communication with Cortec's OR ("Only Representative" in the EU) to prepare and submit the registration dossier to the European Chemicals Agency (ECHA).
4. Utilizing the database system to track export amounts to the EU and provide product availability info to the EU sales taskforce and distributors for current year and forecast.
5. Collaboration with multiple departments and facilities within Cortec® (customer service, sales, production, purchasing, accounting, EcoCortec®, and CorteCros®) to analyze product availability options and provide optimal solutions for EU downstream users.
6. Defining a process to expand the list of REACH compliant raw materials and products to ensure continued supply of Cortec® products based on future sales forecast and projected company growth.

As a result of this tremendous amount of effort put forth by Cortec® Laboratories, European distributors are and will be enabled to continue providing strategic Cortec® corrosion protection products to their customers in the EU.



Concrete Durability Research Using MCI® at Historic Chinese Bridge

Cortec® Laboratories has been working in conjunction with a Chinese civil engineering research institute to study concrete durability enhancement using MCI® at the historic Nanjing Yangtze River Bridge in the past two years. Three flagship MCI® products—MCI®-2005, MCI®-2020, and MCI®-2018—were selected to participate in the durability research in the recent full-scale restoration of this first Chinese-designed and constructed bridge over the mighty Yangtze River. After 50 years in service, the bridge is showing signs of deterioration, such as cracks in supporting beams, corrosion of rebar, and spalling of concrete cover. Extensive evaluation concluded that carbonation was the main cause for the concrete deterioration.

Cortec® Laboratories worked closely together with the Chinese researcher counterparts to design the best durability study strategy on the bridge. In 2016, Ming Shen (current Director of Innovations and New Technologies) and Jessi Meyer (VP MCI® Sales) traveled to the bridge to survey the site selection, and shared MCI® Technology with the research institute involved. In 2017 Cortec® Laboratories returned to the bridge again to gather baseline corrosion data at the selected study sites with the Chinese researchers. Just recently this year, all three chosen MCI® products were applied to the bridge.



Following this first phase of baseline testing and MCI® application, researchers and engineers will periodically measure the corrosion rates at the structures with MCI® products applied and those without MCI® treatment (the controls). In due time in the coming years, corrosion characteristics in these testing areas will be monitored and evaluated. Stay tuned!

To learn more about the project, please visit:

<https://www.cortecmci.com/wp-content/uploads/2018/11/Chinese-Bridge-NA.pdf>

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Cortec® Laboratories Reorganizes for Greater Efficiency and Effectiveness

Cortec® Laboratories is made up of a group of scientists with different areas of special expertise. The entity recently reorganized to ensure greater effectiveness by reflecting the following specialties and streamlining operations.

- Ming Shen, Ph.D., formerly New Product Development Manager, has been promoted to the role of Director of Innovations and New Technologies. Her primary focus will be on new product development and technical leadership of the lab.
- With his skills as a patent agent, Lab Manager Robert Kean, Ph.D., will now be focusing more on legal and organizational leadership aspects in his specialty areas of patent management, ISO standards, and compliance. He will also continue to support Cortec's film and paper R&D efforts.

By capitalizing on individual strengths of lab leadership, Cortec® Laboratories looks forward to enhanced effectiveness in the coming years.

Enhanced Capabilities with New Equipment

Cortec® Laboratories has added several new pieces of equipment for better testing capabilities. One of these is a temperature cycling chamber with an exciting range of temperature capabilities. The temperature of the chamber can cool down to -65 °C (-85° F) and heat up to 175 °C (347 °F). That's almost as cold as the freezing point of carbon dioxide and almost twice the temperature required to boil water! This equipment will allow Cortec® Laboratories to test the performance and characteristics of Cortec® products as it cycles through extreme temperatures. One example of how this could be used would be to test the compatibility of a corrosion inhibiting oil additive in the end-user's oil. Cycling the materials through extreme temperature variations "stress-tests" the chemistries of the oil additives and reveals any chemical incompatibilities in a shorter period of time. This equipment will be an excellent expansion of the testing capabilities of Cortec® Laboratories.

The lab also has added a new LPR meter that can be used for analyzing corrosion rates of rebar in MCI® applications. This new equipment is easier to use and is industry reputed for its reliability. With this new LPR meter, Cortec® will be even better equipped than before to help its customers address corrosion issues in reinforced concrete.



On-Line and In-Print Resources

The Cortec® Laboratories website and brochure provide insight into the credentials, services, accreditations, and testing capabilities available at Cortec's on-site laboratory facilities. The redesigned website highlights Cortec® Laboratories' unique position as the only ISO/IEC-17025 Laboratory Testing Accredited facility in the industry and provides a direct link to requesting laboratory testing. The latest brochure includes updated images of laboratory equipment used to gather important data for testing and research and highlights Cortec's updated count of 63 patents awarded over four decades.

To view the laboratory website, please visit: <https://www.corteclaboratories.com/>

To view the latest brochure, please visit: https://www.corteclaboratories.com/wp-content/uploads/2018/06/Lab-Brochure_06-08-18.pdf



PRODUCT ANNOUNCEMENTS

A Growing “Green” Chemistry Portfolio of USDA Certified Biobased Products

EcoLine® Wire Rope Grease

Target Application: Cables and Wire Rope
NLGI Grade: 0 and 1



EcoLine® Wire Rope Grease is formulated from vegetable oils, aluminum-based thickener, and anti-corrosion additives for maximum wire rope protection. It is available in NLGI grades 0 or 1. EcoLine® Wire Rope Grease is an excellent choice for environmentally sensitive areas (e.g., near waterways).* More info: https://www.cortecvci.com/whats_new/announcements/EcoLine_Wire_Rope_Grease.pdf



EcoLine® Drilling Rod Grease

Target Application: Drilling/High Vibration Applications
NLGI Grade: 1, 2, and 3



EcoLine® Drilling Rod Grease is formulated from vegetable oils and aluminum complex based thickener. It offers superior lubricity and water repellency with a better lubricity than most petroleum-based grease. EcoLine® Drilling Rod Grease contains extreme pressure additives for excellent protection where constant drilling vibration creates a high load on drilling rod joints. It is formulated to be applied to wet surfaces and is available in NLGI grades 1, 2, and 3. More info: https://www.cortecvci.com/whats_new/announcements/EcoLine-Drilling-Rod-Grease-PR.pdf



EcoLine® ELP

Target Application: General-Purpose Lubrication



EcoLine® ELP (Extreme Lubricant Penetrant) is a high-performance biodegradable soy-based lubricant and penetrant. It is formulated from natural seed oils and select additives that offer lubricity and performance superior to conventional lubricants. Its excellent performance, biobased nature, and low environmental impact make EcoLine® ELP a highly desirable option for industrial and household applications. EcoLine® ELP can be used on all types of metal for multiple purposes around the shop, plant, or home. Whether lubricating moving parts, loosening rusty bolts, or cooling/lubricating basic metal cutting operations, EcoLine® ELP serves as an excellent all-purpose lubricant for general maintenance needs.

More info: https://www.cortecvci.com/whats_new/announcements/Eco-Line-ELP-PR.pdf



EcoLine® Fifth Wheel Grease (USDA Biobased Certification Pending)

Target Application: Extreme Pressure Areas (e.g., semi-truck fifth wheels)

EcoLine® Fifth Wheel Grease is premium quality biodegradable NLGI grade 2 grease that meets NLGI LB grease requirements and is formulated from vegetable oils and a lithium-based thickener. Its superior lubricity and advanced extreme pressure additives promote longer equipment life by reducing friction and wear in sliding and rolling applications. The grease shows good adhesion to resist water washout and has a wide range of operating temperatures. Instead of risking potential pollution with a fossil-fuel based grease that could spill on the ground, using EcoLine® Fifth Wheel Grease on semi-trucks provides needed lubricity but is non-harmful to the environment if it happens to leak on the road.* More info: https://www.cortecvci.com/whats_new/announcements/EcoLine-Fifth-Wheel-Grease.pdf

EcoLine® 4320/4330

Target Application: Paint Removal



EcoLine® 4320 and 4330 are heavy-duty, green chemistry paint strippers designed to remove coatings, inks, and resins from metals, concrete, and wood surfaces. They do not contain any EPA-listed cancer-causing compounds or any California Prop 65 components that cause cancer, birth defects, or other reproductive harm. The products are formulated with renewable materials and recycled solvent.

EcoLine® 4320 and 4330 have a mild odor, are made with biodegradable

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materials, and are VOC compliant to the California Regulation for Reducing Emission from Consumer Products.** They are nonflammable and do not contain methylene chloride, NMP (n-methylpyrrolidone), chlorinated solvents, toluene, or acetone.

EcoLine® 4320 can be applied via dipping, brushing, or rolling. EcoLine® 4330 is a gelled version that improves surface cling and dwell time for application on large or complicated objects or vertical and overhead surfaces. More info: https://www.cortecvci.com/whats_new/announcements/EcoLine-4320-4330-PR.pdf



EcoLine® Bio-Based Rubber Revitalizer

Target Application: Rubber Protection/Revitalization



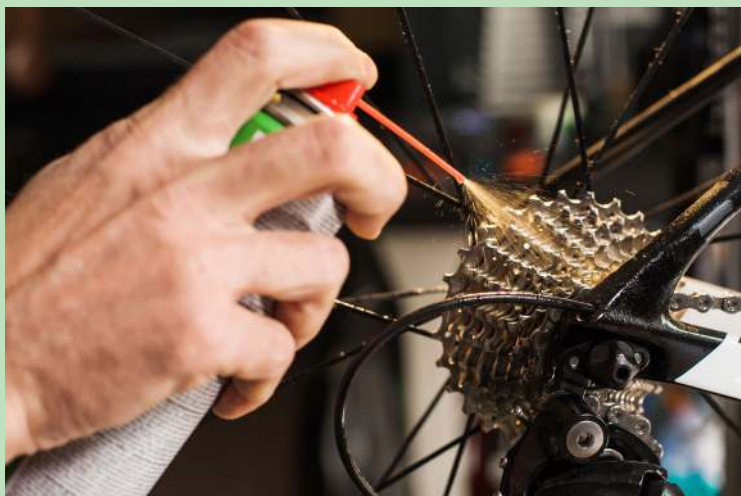
EcoLine® Biobased Rubber Revitalizer is a soy-based product designed for cleaning and protecting genuine and synthetic rubber against the damaging effects of drying and sun damage. More info: https://www.cortecvci.com/whats_new/announcements/EcoLine-Rubber-Revitalizer-PR.pdf

EcoAir® Biobased CLP

Target Application: Clean, Lubricate, Protect



EcoAir® Biobased CLP is a canola oil based multifunctional cleaner/lubricant/protectant packaged in an environmentally friendly air-powered spray can (no CFCs, etc.). It can be sprayed on metal components to loosen and remove dirt and grime, loosen frozen and rusted bolts and other components, and provide multi-metal corrosion protection. More info: https://www.cortecvci.com/whats_new/announcements/EcoAir-Biobased-CLP-PR.pdf



Specialty Product Innovations

M-540

Target Application: Biobased/Ester-Based Grease Additive

M-540 is formulated with proprietary technology to provide superior corrosion protection in biobased and ester-based greases. It provides excellent long-term protection, even in humid and salt-containing environments, such as coastal and offshore conditions, where the chance for condensation and corrosion increases. When tested according to ASTM D5969 for rust prevention, grease that failed to prevent rust in a 5% seawater solution was able to pass the same test after M-540 was added. M-540 contains Vapor phase Corrosion Inhibitors that form a protective layer on metals above the surface of the grease as well as those in direct contact with it. More info: https://www.cortecvci.com/whats_new/announcements/M540-PR.pdf



M-531 T

Target Application: Ashless Turbine Systems

Cortec's M-531 T is an oil-based package of ashless corrosion inhibitors that can be added to petroleum and synthetic lubricants in turbine systems during layup. Using M-531 T in turbine oil and a wide variety of industrial lubricant applications protects systems (e.g., gear boxes and generators) from the rust that could otherwise lead to equipment failure. M-531 T corrosion inhibitors protect metal surfaces with which they are in direct contact while also releasing molecules in the vapor phase. These Vapor phase Corrosion Inhibitors form a protective molecular layer on metal surfaces above the fluid level, allowing economical and efficient rust protection at a low dose. More info: https://www.cortecvci.com/whats_new/announcements/M-531-T-PR.pdf

VpCI®-648

Target Application: Low Conductivity/Low Sodium Cooling Systems

VpCI®-648 is a simple water treatment for use in cooling systems where low conductivity or low sodium products are required. Based solely on organic components, VpCI®-648 does not contain nitrites or any halogen counter ions. At recommended dosages, VpCI®-648 does not significantly contribute to the conductivity of water systems. VpCI®-648 protects both ferrous metals and copper. It contributes less than two parts of sodium per billion at a typical dose, making it an excellent choice for use in the nuclear industry. VpCI®-648 is also applicable to low conductivity cutting operations such as EDM machining, plasma arc machining, and laser cutting operations. More info: https://www.cortecvci.com/whats_new/announcements/VpCI-648-PR.pdf

*It is always important to ensure that use and disposal of all materials is in accordance with local guidelines.

**California Code of Regulations, Title 17, Division 3, Chapter 1, Subchapter 8.5, Article 2, Sections 94507-94517

TESTING

Failed Competitor Test Supports Changeover to VpCI®-126 Film

Two competitor films recently failed razor blade and VIA testing after being received in good condition at Cortec® Laboratories. The corrosion protection capabilities of the blue Armor film and yellow Zerust film samples were being evaluated on behalf of a manufacturer who used these brands and was contemplating a switch to Cortec® VpCI® film.

The Armor and Zerust films underwent razor blade testing on carbon steel and copper panels to test their protective ability when in direct contact with metal. Both competitor films failed these tests in contrast to VpCI®-126 film, which passed all razor blade tests for carbon steel and copper in a previous test used for reference (Cortec® Laboratories Project #16-083-1125).*

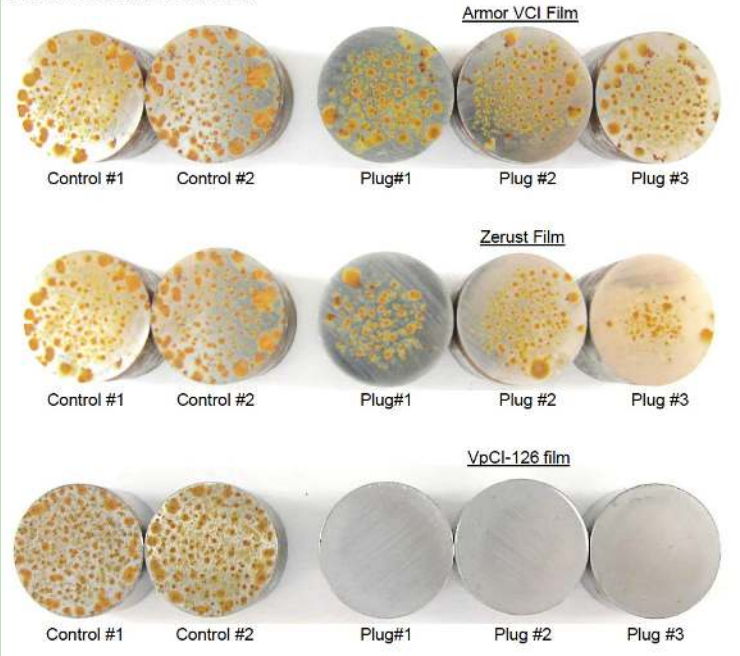
The two competitor films also failed NACE VIA testing, which uses steel plugs to evaluate whether the film has vapor corrosion inhibiting ability. The plug is placed in the same enclosed space as the film—but not in direct contact with it—and subjected to a high humidity environment. In order to pass this test, all three metal plugs tested must meet or exceed Grade 2 requirements (defined as a “medium corrosion inhibiting effect”).

However, the two competitor films left plugs that were speckled with many corrosion spots that placed them at Grade 1 (defined as a “minute corrosion inhibiting effect”) or lower. In contrast, the reference set of plugs from NACE VIA testing of VpCI®-126 (Project #16-083-1125) successfully passed with two out of three at Grade 3 (“good corrosion inhibiting effect”) and one out of three at Grade 2 (“medium corrosion inhibiting effect”). The plugs appeared effectively clean and in good condition to the eye.

Cortec® holds all VpCI® film to a high standard by requiring it to pass VIA and razor blade testing before it can be shipped to customers. Compared with the unsatisfactory performance of the competitor film samples, the customer now has good evidence to support a change to Cortec® VpCI® films for improved reliability

* Cortec® requires all VpCI® film pass razor blade and VIA testing before release.

Photo from the NACE VIA test:



UPCOMING EVENTS

NACE Corrosion Conference & Expo 2019

March 24th-28th, 2019

Music City Center

Nashville, TN

USA

Booth # 1500

<http://nacecorrosion.org/>



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