The Cortec Edge

CORTEC Laboratories

An Internal Newsletter of Cortec Corporation

Environmentally Safe VpCI™/MCI® Technology

May 2002

Welcome from the Laboratory

Cortec's laboratory staff has been working hard to prepare for our annual World Sales Meeting. We hope you will learn more about the technology and new products to help you grow your business. When developing new products, we are always thinking about environmentally friendly corrosion protection system, utilizing different renewable resources like soya-based oils, sugar beets and other bio-acceptable and biodegradable materials. That's why Cortec® Corporation is recognized as a "Green Company" and we are proud to be "Green".

A Green Cortec®

by Art Ahlbrecht, Vice President of R&D

An article in The April 2002 edition of Scientific America is titled “It’s not Easy Being Green”. The article goes on to say that developing 'green' products may be easier than marketing them and concludes that customers are in favor of environmentally safe products but are reluctant to pay for them. We know that at Cortec®, but time is on our side, as awareness slowly changes and new resin sources come on stream.

We are committed to be the first to offer corrosion inhibition with bio-based products to our customers and promote Cortec® as being “Green”. Cortec® is keeping at the forefront of Bio-based technology and using Bio components to develop corrosion inhibitors in products ranging from bio films to soy-based cutting fluids to gluconates for MCI® products.

For several years, we have been working on Bio-Films, as we

believed it is a technology, which will find a place in the packaging industry. In 1998 Cortec® worked with Showa Denko and their Bionolle resin, which was first in the marketplace and we worked out the technology and patented the VpCI™ products. In the last year, a German company and an American company have entered the market with resin costs less than half of Bionolle. We are working with both of these companies to develop films with and without the VpCI™ component and these new films are now available.

In the past year, we have added greases and oil bio-based soybean products for metal corrosion inhibition (EcoLine™ products) and the newly-developed bio-based product for our MCI®-line is introduced in this newsletter. Stay tuned.

Cortec® Corporation’s world headquarters in White Bear Lake Minnesota

New Products

by Margarita Kharshan, Laboratory Director

In this Newsletter we are introducing quite a few new products. They cover a wide range of applications and means of delivery. There is no doubt that we have great fun working on novel ideas and turning them into interesting applications.

Our "New Product" section starts with the introduction of the newly developed additions to the Packaging line.

Cortec's Biodegradable and Compostable Films Undergo Dramatic Face Lift

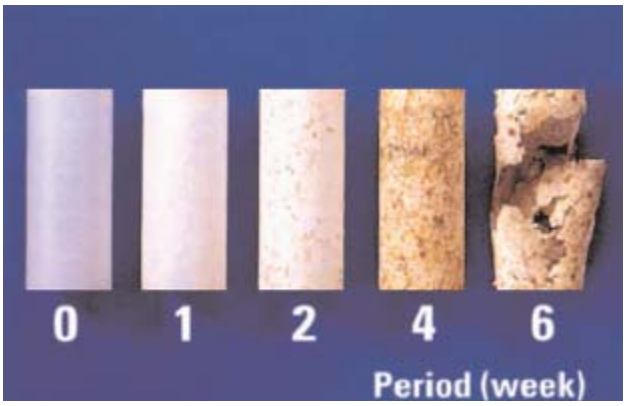
Eco Film™ and Eco-Corr

Eco Film™ and Eco-Corr have recently

undergone dramatic product development changes that not only improve their characteristics and therefore marketability, but also reduce the raw material and processing costs previously associated with biodegradable films. Cortec® biodegradable film sales for FY 2002 have already quintupled all previous years sales combined and the new version of Eco Film™ has only been available for two short months!

Eco Film™ and Eco-Corr are unique blends of co-polyesters that degrade 100% into carbon dioxide and water once they are composted or buried. Biodegradability and compostability are verified using the strict requirements of DIN V54900 and monitored by the Japanese Biodegradable Society (BPS). The benefits of our biodegradable film technology are far-reaching. Standard biodegradable films often lack sufficient strength and other physical characteristics (permeability) to be useful for their intended purpose. many of you may remember attempts by grocery stores to replace starch-blended films a few years ago. The bags would easily tear and did not stretch enough to be useful and were quickly replaced with standard polyethylene. With Cortec's latest technological breakthrough, the biodegradable films have superior physical properties without sacrificing their biodegradability.

The process of degrading a film involves two distinct steps. First, heat accelerates the degradation process. In the absence of heat, the film can still degrade, but it takes much longer. When heat is added to the environment, the film will look and perform exactly the same until the second condition is met. Enzymes found most frequently in soil and compost sites attack the film and break it into smaller bite-size pieces. Tiny organisms then begin eating the chain of polyesters and releasing carbon dioxide and water. Once subjected to both of these conditions, Eco Film™ and Eco-Corr will be completely degraded within weeks.



Film Degradation Process

Eco Film™ and Eco-Corr have significant strength and permeability advantages over PLA and starch-blended films. PLA film is derived from poly-lactic acid that is a derivative of corn. PLA is being pushed heavily by large companies with deep pockets, however costly processing is necessary to produce even common forms of film such as flat bags. Even when bags are produced, Eco Film™ and Eco-Corr are less susceptible to chemical leakage or water damage. Starch blended films are designed only to reduce the cost - starch is simply a low cost "filler" decreasing not only cost, but the films overall usability. In fact, users of PLA and starch-blended films were the first and largest customers of our Eco Film™ products.

Cortec® holds a patent for biodegradable films with corrosion inhibiting abilities. This puts Cortec® in the incredible position to be able to replace standard polyethylene films with Eco-Corr without any competition. We are simply the only company that can offer this solution to customers.

The markets for biodegradable plastics are endless and Cortec® Laboratories is continually pursuing additional applications and uses including various advanced blends, shrink, stretch, injection molding, woven and specialty products.
Bob Boyle, Technical Sales Representative
Bob Berg, Technical Service Engineer

New Packaging Systems

Incorporation of corrosion inhibitors in the different packaging materials is another approach for providing safe and harmless conditions for shipment and storage. Two unique products for packaging applications are Cor-Pak® VpCI™ Fabric and CorShrink Film.

Cor-Pak® VpCI™ Fabric

Cor-Pak® VpCI™ Fabric was developed out of the need for a product that could line the walls of a shipping container and provide corrosion protection as well as prevent surface abrasion of the protected item from occurring. Cor-Pak® VpCI™ Fabric fulfills these needs and more.

Cor-Pak® VpCI™ Fabric is a thin polyester nonwoven material impregnated with vapor corrosion inhibitors, and an adhesive tear off paper backing on one side. Simply remove the tear off paper and adhere to the inside surface of shipping container to receive up to two years of continuous corrosion protection. In addition to providing contact, barrier and vapor corrosion protection, Cor-Pak® VpCI™ Fabric will prevent electrostatic discharge (ESD) from occurring. This unique product will provide you and your customers with safe and dependable packaging.

CorShrink Film

CorShrink is a low density polyethylene shrink film laminated

to a soft polyester nonwoven material impregnated with Vapor phase Corrosion Inhibitors and a compound that will prevent electric static discharge (ESD) from occurring. Unlike its predecessor, EcoShield®, CorShrink is a shrink film that will form a custom fit around the object of interest, when heat is applied. Using CorShrink you will have a custom fit package for your item, along with mechanical protection offered by the soft polyester nonwoven material. CorShrink Film offers contact, barrier and vapor phase corrosion inhibitor protection.

CorShrink Film is ideal for an application in which the utmost care must be taken when contact is made with the surface and when a custom fit package is needed.

National News
President Bush signs Bio-Based Farm Bill

On May 13th, President George W. Bush signed a bill legally requiring all government agencies to purchase biobased products, whenever a biobased alternative exists.

What does this mean to Cortec's distribution? This new law will favor our EcoLine™ products based on our soya-based technology with corrosion protection. Cortec® offers what the government is now required to utilize, with a value added corrosion inhibitor. The possibilities are phenomenal and sales are going to show it!

The EcoLine™ includes products such as: all purpose lubricants, surface cleaner/degreasers, long term rust preventatives, cutting fluids, food machinery lubricating grease, bearing/chain/roller lube, and a heavy duty grease.

Recently a new product was added to Cortec's EcoLine™/MCI® Line.

MCI® EcoCure

MCI® EcoCure is a surface applied, soy-based, curing agent/sealer containing Migrating Corrosion Inhibitors (MCI®). This unique product has many benefits.

First of all, MCI® EcoCure is based on renewable resource - natural soy oil, meaning it is biodegradable and nontoxic. Additionally, it is water-based, nonflammable and environmentally safe.

At the same time, MCI® EcoCure is a high quality MCI® sealer and can carry out many valuable functions. It works as a curing agent on freshly worked concrete, retaining the hydration water necessary for developing the mechanical strength of the concrete. After the concrete has cured, MCI® EcoCure acts as a sealer, repelling water and helping to prevent scaling of the concrete surface, while stopping the ingress of deicing salt for up to two years.

But this is not all. Incorporating MCI® dramatically increases protection to embedded rebars. Utilization of Electrochemical Impedance Spectroscopy confirm that MCI® incorporated into the soy-based sealer lower the chloride induced corrosion rate of the rebars substantially.

Frequently Asked Questions about MCI® EcoCure are:

Is MCI® EcoCure environmentally save?
Yes, very much so.
Is it economical?
Yes, it is. It has a low cost and low application dosage.
Is it effective?
Yes. It aids in curing, increasing the mechanical strengths of concrete; it protects concrete from the elements; and it protects embedded metal reinforcement from corrosion.
Is it user friendly?
Yes. MCI® EcoCure is not hazardous, does not require special equipment or trained personnel for application—a child could clean up after its installation using only soap and water.
Is it unique?
Yes. This product is the wave of an environmentally friendly future and available exclusively through Cortec® Corporation.

We could list more questions and give to each a very complimentary answer.

Welcome new product MCI® EcoCure!!!

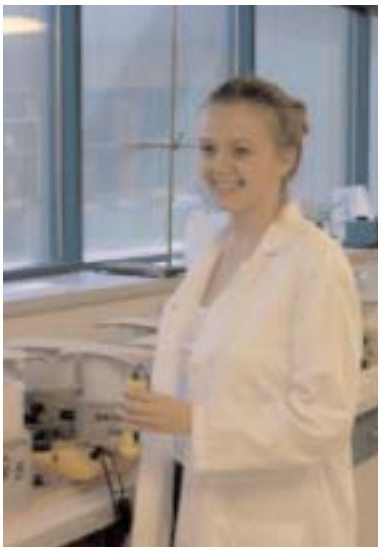
MCI® Corrosion Inhibitors in the News

As you know, Cortec's MCI® (Migrating Corrosion Inhibitors) are designed for use in the construction industry. We have admixtures, topical treatments, a complete repair system, and specialty products available. MCI®-2005 NS is Cortec's latest admixture technology in a liquid form. The most recent developments with this product include a new parking ramp case history, DOT approvals and new corrosion test projects.

MCI®-2005 NS beat out competitors with less shrinkage, less cracking due to shrinkage, and met required 24 hour strengths to be specified in the Wells Fargo Home Mortgage Parking Ramp in Minneapolis, MN. A case history and press release on this is available on Cortec's web site, as well as on the MCI® CD-ROM, and in the MCI® Manual.

MCI®-2005 and MCI®-2006 series products (which include MCI®-2005 NS) were recently approved by the Iowa and North Carolina Departments of Transportation as accepted corrosion inhibiting admixtures. These approvals are a huge step for the MCI® admixtures, and we are working towards approvals in other states at this time.

As a member of the CCIA (Concrete Corrosion Inhibitor Association), Cortec® participates in the development of standard testing procedures for evaluation of chloride threshold and corrosion rates in concrete treated with a corrosion inhibitor. Basically, this testing is a modified version of the well-known ASTM G-109, "Determining the Effect of Chemical Admixtures on the Corrosion of Embedded Reinforcement in Concrete Exposed to Chloride Environment". "Control" mortars as well as mortars containing MCI®-2005 NS were prepared (18 pieces) with the help of American Engineering Testing's laboratory. Measurements of electrochemical parameter and correspondent chloride concentration are carried out on a regular bases in the Cortec® laboratory, utilizing Cortec's electrochemical equipment. Preliminary results confirm that the MCI®-2005 NS effectively delays the onset of corrosion. The testing will be continued until measurements indicate that corrosion has developed in all samples. After that, all the analysis data, electrochemical and analytical, will be submitted to the CCIA Committee for statistic purposes. Of course, the testing will also be a valuable confirmation of MCI®-2005 NS performance.



Cortec's laboratory is also starting cracked beam testing of MCI®-2005 NS compared to controls and competitor products at American Engineering Testing. This test lasts for one year; final results will be available by July 2003.

The above information shows that MCI® technology proves time and again its effectiveness in the construction industry. This normally makes people start to promote MCI® products. But if you are not acting yet, but only thinking about it, welcome to Cortec's laboratory to learn more about MCI®.

Alla Furman, Sr. Corrosion Engineer &
Jessie Meyer, Technical Sales Manager

MCI®-2020 V/O Powder

Our most popular MCI® topical treatment, MCI®- 2020, is available in several different forms: liquid, gel, and powder.

MCI®-2020 V/O (gel form) is used widely for vertical and overhead applications. Some of our customers were asking for a powder form of this product to make overseas shipping more convenient and economical. Such a product was developed in our laboratory and is now available for sale.

To restore this powder to our standard MCI®-2020 V/O product, the MCI®-2020 V/O powder is simply blended with water in a 1:4 ratio by weight, or, one 100-pound (45.3 kg) drum of powder per 55 gallon (208 liter) drum. To establish the desired viscosity, the mixture should be blended for 30-40 minutes. Re-blended MCI®-2020 V/O Powder has all the same properties, including viscosity, as MCI®-2020 V/O liquid.

MCI®-2020 is now under evaluation by several of our customers.

QA Department Reminds...

Being ISO 9001 certified ensures consistent quality of Cortec's products and services. Our Quality Assurance Department makes sure all raw materials are tested according to specifications and meet all requirements before being released to production. A Certificate of Analysis is required for each material, and a sample from each lot is retained for testing. A Raw Material sheet is filled out and test results are recorded along with a signature of approval. This information is recorded in a log book, and the sheets are kept on file for reference.

All finished products are tested according to specifications and have to meet all requirements before being released. A sample from each batch is retained for testing. A Batch Sheet Cover Sheet is filled out and test results are recorded along with a signature of approval. The information is recorded in a log book, and these sheets are also kept on file for reference.

Upon request, Cortec® can provide Certificates of Analysis for all products using the above sheets containing specifications along with the actual test results for each individual batch produced.

Debbie Hannan, QA Coordinator

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