The World's Best Selling Anti-Corrosion Film is now 100% Degradable

Introducing VpCI®-126 Blue BIO patented

VpCI®-126 Blue BIO Maintains the Superior Mechanical and Physical Properties of the Original

- Highest level of corrosion protection available
- ISO 9001 and 14001 certified
- Non-toxic
- FDA approved
- Not nitrite based

Plus it's 100% Degradable

- Once disposed, VpCI®-126 Blue Bio degrades to water and carbon dioxide within 9 to 60 months.
- Degrades completely once exposed to organic material common in most disposal environments
- VpCI®-126 Blue Bio is the only corrosion-inhibiting degradable film in the world

Proven VpCI® Anti-corrosion Technology

- Protects ferrous and non-ferrous metals
- Prevents rust, tarnish, staining, white rust, oxidation
- Protects against humidity, corrosive contaminants and vapors, salt, condensation, moisture
- No additional corrosion protection is necessary
- Safe to use even with sensitive electronic equipment
- 2-5 years of corrosion protection

Saves Time, Money

- Eliminates many costly shipping tariffs and disposal fees
- Metal products require no special preparation
- Does not require removal after shipping or storage
- Products are immediately available for use
- Greatly reduces labor costs

And, it's Fully Customizable

- Custom blended to meet specific customer needs
- Heat sealable and can be used with all types of manual and automated heat-seal equipment
- Variety of widths and gauges available
- Available as: sheeting reinforced film, Zip-Lock and Auto-Bags, gusseted liners, bags-on-a-roll, perforated sheeting, coil covers, shrink film, tubing
- Anti-static (ESD) and fire retardant (FR)

Learn More at **www.cortecvci.com**

CORTEC CORPORATION
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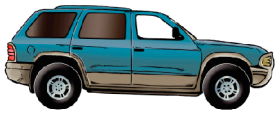
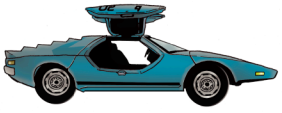
Are you STILL driving your corrosion prevention campaign with technology from the 1940s?





Cortec®

2004:
- VpCI®-126 BIO changes industrial corrosion inhibiting films forever.

1998:
- Cortec first VCI/VpCI® manufacturer to receive ISO 14001 certification.

1994:
- Cortec first VCI/VpCI® manufacturer to receive ISO 9001 certification.

1981:
- Cortec introduced non-nitrite based VpCI®-126 film.

1977:
- Cortec founded new VpCI Chemistry.
- Water-based liquids eliminate need for solvent rust preventatives.
- Emitters eliminate need for oils or direct-to-part rust preventatives.

Competition

2004:
- Nitrite-based technology *still* used by competitors

1980s:
- DICHAN used as coating for papers and films.

1940s:
- DICHAN introduced and used by the U.S. Navy.

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Attention: New Product Editor

January 22, 2004

NEW PRODUCT RELEASE

Advanced Anti-Corrosion Packaging Film Now 100% Degradable

Degradable 126 BIO

The world's most advanced and widely utilized packaging films (83 countries), Cortec® VpCI®-126 Blue is now available in a 100% Degradable version. Conventional Packaging PE film can take centuries to degrade if ever. In contrast, when 126 BIO film comes into contact with organic materials during disposal, its microbial activators start the process of degrading the film into basic organic elements such as water and carbon dioxide. VpCI® 126 BIO degrades in less than five (5) years, is recyclable, and meets MIL-B-22019-C and MIL-B-22020-C.

The new VpCI®-126 BIO version is very competitively priced to allow companies using older technology films to easily upgrade to safer and more effective packaging. Compared to conventional anti-corrosion packaging films, the new BIO version is 25% stronger in tear and puncture resistance, elongation, and tensile strength. Using high technology film blends, it provides more effective protection than vacuum pack with desiccant.

The Patented Cortec® VpCI®-126 BIO Film employs the most advanced technology available for anti-corrosion packaging. Unlike older films that use hazardous and toxic chemistry, 126 BIO is non-toxic, FDA approved, and does not contain nitrite-based inhibitors. With Cortec® Green Technology, metal products receive clean protection. 126 BIO eliminates the costs of rust-preventative fluids, coatings, grease and the labor used in traditional methods of rust protection. The film provides effective corrosion protection for both ferrous and nonferrous metals during interim processing, shipment, and long term storage.

Protection is easy. Simply package the part with 126 BIO and parts will remain corrosion-free for up to five (5) years. No special techniques or proprietary equipment are required. Normal manual and existing automated equipment can be used for packaging. The translucent BIO film allows visual inspection of parts without opening the package. Because parts receive clean protection, they are ready for immediate use. Simply open the package and install the part. No cleaning or degreasing is required, again saving chemical and labor costs.

Photo depicts part packaged in plain PE film (left) and part protected with Cortec® VpCI® 126 BIO (right).

Cortec® VpCI®-126 BIO Film provides multi-metal protection against humidity, corrosive gases and atmospheres that easily penetrate traditional packaging methods. It also protects against salt, condensation and moisture. It's advanced Cortec® VpCI® technology prevents all types of corrosion including rust, tarnish, staining, white rust and oxidation.

Photos: High-resolution photos of Cortec® VpCI 126 BIO film and bags available for download at: http://www.blueleopard.net/cortecdownload/126BIO

Company Description: Cortec® Corporation, a pioneer in environmentally friendly packaging, metalworking, cleaning, water treatment and metal protection technologies, is located in White Bear Lake, Minnesota. ISO 9001 and 14001 Certified, they manufacture over 300 products in five plants located in Minnesota and Wisconsin. Cortec is a global supplier of innovative and environmentally friendly specialty chemicals, plastics and coated papers.

Cortec Website: www.CortecVCI.com Phone: 1-800-426-7832 FAX: (651) 429-1122

- End -

HOUSEHOLD ORGANIC WASTE COLLECTION

Steven Cartlidge considers the pros and cons of degradable and biodegradable bags in waste collection.

The multiple varieties of degradable and biodegradable films and bags that are commercially available can cause private and public organisations significant problems when deciding on which best suits their cost requirements and performance expectations. In this article, we look at three areas that are increasing awareness of these products: chemical composition; degradability/ biodegradabilty/compostability; and product performance.

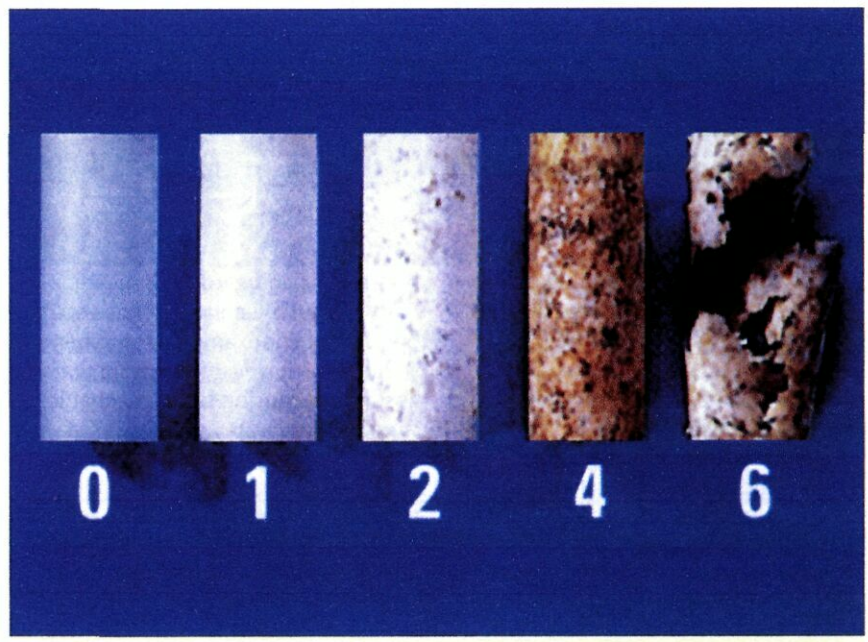
CHEMICAL COMPOSITION

There are three classes of product: 100 per cent chemical (derived from petroleum oil), 100 per cent biodegradable (derived from annually renewable cultivated resources) and a mixture of both.

The petroleum-based polyethylene (PE) plastic bags have been used for decades, and this class of product sets the performance standards by which we judge new technologies, i.e. tear resistance versus film thickness versus cost. By adding a chemical degradation catalyst derived from petroleum oil to a PE plastic, another type of petroleum oil-based plastic is created.

Technologies supported by cultivating plant life include starch, polyester, polyalcohol and paper. These bio-based products primarily use organic sustainable raw materials in their manufacture, meaning that the raw materials can be easily renewed, time after time. A mixed technology is, for example, a physical mixture of PE and starch.

Steven Cartlidge
Lake Chemicals and Minerals Ltd



Biodegradation of bio-polyester films over six weeks. From three to six months, depending on composting conditions, following contact with organic waste the bio-film completely disappears. The rate of biodegradation is the same as that of common garden compost

These three classes of product have an environmental impact from cradle to grave that is beyond the scope of this article. The reason for promoting 100 per cent biodegradable technology is simply the ability to process the used 100 per cent biodegradable films and bags in a natural composting process with no harm to the environment and in doing so remove the massive problem of 'white plastic waste'.

To take commercial advantage of the benefits of 100 per cent biodegradable technology, the work processes applied today for using, collecting and disposing of plastic must be changed. For example, costs of processes such as collecting waste plastic for disposal, landfill charges and cleaning waste plastic prior to recycling must be offset against the higher price of new 100 per cent biodegradable technology.

DEGRADABILITY, BIODEGRADABILITY AND COMPOSTABILITY

Plastic derived from petroleum oil will not degrade significantly, to the extent that after decades in landfill, the original article is still recognisable. Add a chemical degradation catalyst and the petroleum-derived plastic will degrade by chemical means, forming small bits of plastic that cannot be matched to the original article. When used in a composting process, this chemical catalyst plastic is ever present and is eventually deposited on open land as another form of landfill.

Plastic derived from 100 per cent biologicallysustainableresources has the benefit that it biodegrades in a composting process, making water and carbon dioxide with no

Filling a bio-polyester bag

Garden compost is often very dense

Kerbside collection point

residue. Although paper belongs in this category, the lifecycle for a cradle-to-grave process involving trees is a discussion point, not to mention the significant chemical processing necessary to manufacture the paper.

Plant-based polyester and starch technologies have been certified to European, American and Japanese standards for 100 per cent biodegradability, including ground water approval for the compost made with them. These technologies can be trusted as meeting the standard of 100 per cent biodegradability and customers should ask to see the relevant European test certificates (DIN 54 900 (composting process) and DIN 38412 Part 30 (ground water contamination)) from suppliers.

More importantly, the starch and polyester technologies perform closest to our expectations of a plastic film and bag product.

PRODUCT PERFORMANCE

In like-for-like comparisons, certain 100 per cent biodegradable plastic technologies have a higher performance than the petroleum oil-derived plastics and some do not. The clear message to users is not to pre-judge the technology before it is used in a practical application. Starch technology was first to market, and most commercial experience from the collection of organic waste from households and gardens indicates that the starch technology has yet to be proven. For example, a number of starch films have suffered from water absorption causing lower mechanical strength.

The physical performance of 100 per cent biodegradable polyester technology is closer to that of accepted PE products and many starch products currently sold are mixed with bio-polyester to improve mechanical integrity. The bags used to dispose of organic household and garden waste must be able to carry a minimum weight and avoid tearing when pierced with rose bush cuttings. The bio-polyester bags meet these performance criteria at a lower film thickness compared with starch bags.

A significant performance criterion is the ability to fill the bag and leave it for collection on the kerbside for up to two weeks in urban regions and up to four weeks in rural regions. This 'useful life' property is important since the ability to collect biodegradable material every two weeks is less costly than weekly collections.

In combination with the collection frequency and useful life, the size of the bag and its filled weight are extremely important. Experience tells that the standard black household waste collection bags are filled with so much bulky packaging materials that their weight-to-size ratio is a minor issue.

In comparison, much of the organic waste from gardens is very dense (wet leaves or grass cuttings) and the route that is finding most success is to supply householders with bio-bags that hold up to 15kg of denser garden or food waste. The householder can use as many of the bags as are needed for the job in hand. An appropriate bag capacity can also prevent householders inadvertently over-filling and having problems carrying it.

Once the bio-bags have been in contact with organic waste the biodegradation process starts, and 100 per cent biodegradation will be achieved in three to six months, depending on the composting process.

COMMERCIAL APPLICATION

Councils rely on the composting companies they work with to redefine the waste collection and disposal workflow when using bio-bags. An alliance of supplier (providing technical product information), the composting company (carrying out the work) and the council (responsible for waste collection and disposal) is essential to create a commercially viable solution to the collection of organic waste.

Successful councils have identified the collection and disposal of organic waste from households as a process that requires separate management. One solution is the use of bio-bags.

Writing a tender proposal for a mixture of standard PE bags that includes 100 per cent biodegradable bags as a side issue has proven to be unsuccessful.

Innovative local authorities have created manned temporary collection points for householders to deposit their organic waste, and this is one example of how the cost of collection can be reduced. However, this highlights the real need for educating the public. Successful local authorities begin organic waste collection campaigns by using all opportunities to highlight the benefits to householders, including leaflets, local newspaper interviews, surveys and relevant information printed on the bio-bag. Instructing the householder on what to send and not to send for composting is critical to the success of the entire process.

The ultimate product of the composting process is high quality

compost, free of petroleum-derived plastic waste that is an income stream for the local authority. No matter what the eventual outcome of cradle-to-grave analyses, the use of 100 per cent biodegradable plastic instantly removes society's current problems of plastic waste disposal and recycling.

The example of household organic waste collection is the first of many applications of 100 per cent biodegradable films and bags in waste management covering the public, agricultural and industrial sectors. A number of ongoing trials across sectors are demonstrating the true value of 100 per cent biodegradable polyester products.

We hope that the information contained in this article is helpful to gain a better understanding of biodegradable films, and that this will assist in finding the right partners and making informed and educated purchasing decisions. ■

Brian Coles, Karen Harvey, Charles McHugh, and Steven Cartlidge of technical distribution specialist Lake Chemicals and Minerals Ltd are promoting environmentally acceptable technologies. For more information on the issues developed in this article please contact:
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