Innovative Technology of Biodegradable Packaging in Croatia – Why Not?

Spring 2008. Plitvice Lake, Croatia
EcoCortec’s Mission

• Develop and bring to market, value-added biodegradable flexible films that outperform non-degradable and other biodegradable materials currently on the market.

• Customers buy first on PERFORMANCE, then on environmental attributes.

• Therefore our mission is to develop eco-efficient production of biodegradable films that combines new technology and high productivity with positive effect on the environment.
Biobased Vs. Biodegradable

• Biobased: A renewable product engineered or composed in whole or in significant part from plant or animal material (other than food or feed).

• Biodegradable: Material that left to itself will be decomposed by natural processes (microorganisms)
Compostable

- According to ASTM D6400/ D6868 (for compostable plastics) a product or material must meet three key criteria to be certified as Compostable
  - Product or Material must disintegrate/fragment small enough to NOT have to be screened out.
  - Product or material must convert into carbon dioxide, water and organic matter at an acceptable rate. (such as yard trimmings)
  - Finished product must support plant growth – must not leave behind toxic residue.
  - Eco Film® and Eco Works® Meet those standards and can carry Din Certco (German Institute for standardization) (IBAW Mark) and BPI/USCC approval logos.
Eco Film®

- Certified compostable per ASTM D 6400
- 300% stronger than LDPE
- High and Low temperature stable
- Heat-Sealable, Convertible, Laminations
- Biodegrades rapidly in soil (varies on region), as little as 45 days
- Elastic and visually attractive material
- Stock products available in 3 common sizes
- Accepts Printing – for marketing and identification
Eco Film® bags for organics collection are the most common product form at this time.
Eco Film® Cryogenic Film

- Certified by BPI, Din Certco per ASTM D 6400
- Specific Eco Film formula for frozen goods
- Patented in 2003
- Does not become brittle at extremely low temperatures
- All the benefits of Eco Film® (strength, etc)
- Ideal for frozen packaging
  - Food, Medical
Eco Film™ Cryogenic film and bags are ideal for frozen food packaging.
Eco Works® Premium Films & Bags

- Certified compostable per ASTM 6400 and DIN CERTCO
- Meet proposed USDA definition of Biobased
  - A minimum of 25% of the formulation must contain material that is derived from an annually – renewable source
  - New formula Eco Works® 70 has been tested for biobased content at Iowa State University and has a completed BEES environmental profile for “Durable Films”
- Certified and approved for Food Contact (Faculty of Food Technology and Biotechnology Zagreb, Croatia)
- 300% Stronger than LDPE
- More rigid than Eco Film® (allows handle bags)
- Longer curb life in some areas (UK)
- More marketable to some customers
- Formulation derived, in part from corn
Eco Wrap® Compostable Stretch Film

- **Up to 60% better yield per roll**
  - Wraps 60% more pallets than standard stretch film
- **Perfect for items that are flash frozen**
  - Frozen food, medical
  - Does not become brittle
- **Applied with the same stretch equipment**
  - Hand or machine, can withstand 400% prestretch
- **Agricultural markets initially**
  - Typically do not use pallets, so twine (also biodegradable) and stretch film are only packaging materials
- **Accepts printing**
  - For marketing and identification
Eco Wrap™ is perfect for agricultural import/export customers.
Eco-Corr® VpCI
Biodegradable/Compostable bags and film

- 100% Biodegradable per Din V 54900, BPS Certified
- Offers superior strength compared to LDPE
- Heat and Water stable
- Once exposed to a compost environment Eco-Corr® will biodegrade rapidly with no harmful effects to the environment
Eco-Corr® ESD compostable Films & Bags

- Meets requirements for compostability

- Combines
  - All the benefits of Eco-Corr, Eco Film®, Eco Works
  - Multi-metal corrosion protection (VpCl)
  - Electro-static Discharge (like VpCl 125)

- Designed specifically for electronics
  - Protects electronics from corrosion, static damage
  - Leaves no residue after unwrapping
  - Does not affect solderability

- Custom Sizes and Formulations
Eco-Corr® ESD was designed specifically to protect high-value electronic components for customers concerned with the environmental impact of their packaging materials.
CorrTainer™ brand of corrugated boxes

- Fully recyclable, repulpable
- Moisture resistant
- Eliminates the need for secondary packaging in some applications
- Cost effective, environmentally friendly, corrosion protection
- Easy to use, with no need for desiccants or poly-coated wraps
CorrTainer™ ideally suited for automotive components
EcoShield®
Paper and Linerboard

- Environmentally Friendly barrier coating
  - Offers the same if not better barrier protection than wax or poly-coated paper
- Fully recyclable - repulpable
- Complies with FDA and USDA regulations for direct and indirect food contact
- Also available with Cortec’s patented Vapor phase corrosion inhibitor (VpCl)
  - Offering protection to both ferrous and non-ferrous metals
EcoShield® can be used to protect items sensitive to moisture.
Conclusions

- EcoCortec’s line of biodegradable/compostable films bridge the gap between performance and environmental impact for flexible films.
- Our products are the strongest, most resilient on the market while retaining strict adherence to the international environmental standards.
- EcoCortec's vision is to combined early development into new cost effective eco friendly products.
- NOT JUST MAKING DIFFERENT PRODUCTS MAKING PRODUCT DIFFERENTLY
Our mission

At EcoCortec, we are continually improving and expanding our facilities, equipment, processes, and ourselves to meet our customer’s needs and expectations for consistent high quality films and bags delivered on time.

EcoCortec, in Bell Manastici, Croatia, specializes in manufacturing Cortec’s innovative Vapor phase Corrosion Inhibitor (VpCl™) films and offers customers complete converting, extruding, and printing capabilities.

Located on 10,000 square meters site it places this facility in an excellent geo-strategic location. Situated in Central Eastern Europe, our plant can be reached by truck, railway, river, Danube, and by air.

EcoCortec is positioned on a crossroad of state highways and is only 3 km away from trans-European corridor C5.

EcoCortec manufactures films and bags according to customer specifications in terms of the product size and performance. We are very flexible when it comes to the order size and meeting special customer requests for just-in-time deliveries.

At present, we have 1 extruder which consists of:
- one 3-layer (co-extruded) blown film line
- two color inline printing capabilities
- inline bag on the roll (BOR)

EcoCortec has sideward and bottomward converting machines with zip-lock attachment.

EXTRUISING

The first step in manufacturing is the extrusion process, where raw resin is manufactured into film. Our blown film extrusion line can produce flat tubing, gusseted tubing, single wound sheeting, centerfold sheeting, and other custom configurations. Color concentrates, VpCl™, and other specialized additives such as static dissipative, flame retardant, and ultraviolet inhibitors can all be added to the formulations to precisely attain our customer’s individual needs. EcoCortec is capable of extruding linear low blends of up to 100%. The size ranges from 1050 mm minimum by flat width up to 2000 mm maximum width depending on the film configuration and the film thickness.

Biodegradable & Compostable Packaging Films

EcoCortec has pioneered two new technologies of biodegradable and compostable films, Eco Film™ and Eco Works®. Both Eco Film™ and Eco Works® offer a certified biodegradable alternative to polyethylene films and bags while still offering performance characteristics superior to both low and high density poly films. Both product lines were designed with their entire lifecycle in mind.

Eco Film™ and Eco Works® can also be combined with VpCl™ technology (Eco Corr®) and ESD protection (Eco Corr® ESD). We are also able to coat adhesives on Eco products (Eco Wrap®). All of these innovative and patented products offer the most extensive biodegradable packaging lineup in the world.

Eco Film™ and Eco Works® are available in a range of sizes and forms, as well as in retail packs and boxes.
Laboratory

EcoCortec has world-class laboratory that can perform testing compliant to Military Specifications (MIL-STD 3016) and ASTM standards (Section B series D). ABVCI™ film batches are tested for Vapor phase Corrosion Inhibitor (VCI™) ability. A Fourier Transform – Infrared (FTIR) Spectrometer is used to examine VCI™ and other additive concentrations. Mechanical properties and coefficient of friction are measured with Instron precision instrument. Water vapor transmission and Electrostatic Discharge (ESD) rates are determined using desiccant chamber designed for 0% RH.

ESD films are manufactured in compliance with Military Specification MIL-PRF-81765D. Each ESD production order is tested on-site for static decay and surface resistivity. Static decay testing complies with Federal standard 101 Method 404A. Surface Resistivity exceeds ESD S 11.11 specifications.

Custom VCI™ films are developed and tested on site. Specific strengths, tear resistance, tackiness, and slip qualities can all be formulated according to the customer’s needs.

Converting

In our converting department the film is fabricated into bags in a wide variety of sizes, shapes, and styles for packaging foods, equipment, hardware, spare parts, or just about anything you require. Specialized tooling enables us to manufacture unique bags such as V-sealed contoured or other custom designs. Many different shapes and sizes of holes can be punched for venting, hanging, or carrying products. We are well equipped to manufacture the hem reinforced handle, draw tape handle, and the popular bag-on-roll and zip lock bags. This department solves packaging requirements with creativity and experience.

Printing

Our printing department produces some of the most appealing packaging films available. We can print films from 1000 mm to 1830 mm wide in two colors. By using varying halftones we can obtain numerous shading effects as well.
OBAVIJEST ZA MEDIJE

Dodjela World Star nagrada
15. svibnja, 2007 - Chicago, SAD

Impresivna je činjenica da je na dodjeli World Star nagrada Hrvatska dobila više Oskara od Italije i Austrije, dok su Slovenija i Srbija išle doma praznih ruku.

Dobitnici Cropak-a 2006, Ecocortec d.o.o, Beli Manastir i agencija Tri dva jedan, Zagreb, pobjednici su ovogodišnjeg World Star natjecanja, koje je sponzorirala World Packaging Organization za najbolje ambalažne proizvode u konkurenciji 35 zemalja svijeta.

Isto tako obavještavamo vas da je EcoCortec počeo s proizvodnjom EcoCor® biorazgradive plastike u Hrvatskoj. Pogon EcoCortec-a u Belom Manastiru najmodernija je tvornica ambalaže u Europi, a upravo naš proizvod EcoCor® dobivnik je svjetske nagrade za trenutno najbolju biorazgradivu plastiku u svijetu. Predviđena godišnja proizvodnja višeslojnih biorazgradivih plastičnih folija te PE folija, koje bi se (preko 85%) izvozile u europske i azijske zemlje, iznosi cca 5 milijuna kg finalnih proizvoda. Proizvodna hala veličine 1700 m2 u potpunosti je opremljena novom automatiziranim opremom s visokim stupnjem ekološke zaštite te energetskim iskorištenjem i visokim stupnjem ekonomsko učinkovitosti.

Tvornica biorazgradivih folija u Belom Manastiru predstavlja konkretnu izgradnju i ulaganje u Hrvatsku kao zemlju izvoznica gotovih proizvoda, koja uz primjenu novih tehnologija ostaje i postaje ekološka oaza Europe.
Cortec® Corporation Receives Two CROPAK 2006 Awards.

June 06, 2006

Cortec® Corporation wins two awards in the ECOCROPAK category at CROPAK2006, held in “Plitvice Lakes” National Park, Croatia, May 18 & 19. The ECOCROPAK category focuses on ecological packaging, machine or equipment for waste packaging management, and a project for packaging and waste packaging management. Cortec® was one of 37 nominated in five different categories. Cortec® was awarded the CROPAK 2006 “Eco Packaging” Award for its innovative biodegradable EcoWork® bags & films and the CROPAK 2006 “A Project for Packaging & Waste Packaging Management” Award for its EcoCortec® plant in Belli Manastir, Croatia.

The EcoCortec® plant is one of the first in Europe to incorporate an advanced green technology in the production of multilayered biodegradable films and corrosion protection films. The EcoWorks® packaging is biodegradable 100% compostable packaging that does not pollute the environment. EcoWorks® incorporates Cortec’s Advanced Green Technology and uses natural renewable resources from corn instead of petrochemical raw materials.

The awards were given during the International Conference “Polymeric Materials In Packaging” at CROPAK 2006 (Plitvice, Croatia). The conference explores the development and applications of new polymeric materials in the packaging industry, emphasizing on food and beverage packaging. Lectures were given by industry experts and leaders. Among them, Cortec® Corporation President, Boris Miksic, presented “Packaging and Environmental Protection, EcoCortec® - Biodegradable Packaging Technology.”

CROPAK is organized by the Institute for “Packaging and Graphic Arts Industry”, the “Packaging” Trade Journal, and TECTUS d.o.o. in Croatia. The goal is to promote innovative products & packaging, product designs & labels, environmentally responsible packaging & waste packaging management systems.