

# NEWS ALERT



## New Eco-Friendly Films from Cortec® Corporation: Laboratory Compost Disintegration Studies

### Introduction

As a leading provider of environmentally responsible solutions in the fields of packaging and metals preservation, Cortec® practices “circular economy” chemistry wherever feasible. Cortec® R&D tries its best to select biobased and renewable materials in its product formulations and boasts over 30 USDA Certified Biobased Products that meet mandatory federal purchasing requirements under the USDA BioPreferred® Program.\* Cortec® also designs its products with an eye toward environmentally responsible disposal routes. Many Cortec® products have passed testing as biodegradable, recyclable, or compostable materials.

Packaging films contribute to many unfortunate pollution instances and are a burden to landfills. The responsibility falls upon everyone to reduce film pollution in the environment as the only habitat and sanctuary available to humankind! Responsible recycling is one route of environmental stewardship, and to this end, Cortec® has a popular recycling program that enables end users to send their eligible used VpCI®-126 Film and Bags back for recycling and reprocessing into fresh new VpCI®-126 Film. Composting is another route that can be convenient in some circumstances. Here again, Cortec® is a pioneer in designing compostable films, such as Eco Film®, Eco Works®, EcoOcean®, and Eco-Corr Film®,† for packaging customers at large, and for corrosion inhibitor customers in particular. With continued innovations at Cortec®, more compostable films with features appealing to a wide variety of applications have been introduced. This report surveys a few of the recent introductions and the laboratory composting studies conducted on them.

Eco Wrap® is a compostable general wrapping film applicable to all instances where a wrapping film is needed. This film does not contain corrosion inhibitors. The latest formula uses a certified compostable resin plus a tackifier additive to make an industrial strength compostable stretch wrap that can be used on most standard automated stretch wrap equipment.

Eco-Corr Film® 10 and Eco-Corr Film® 30 are compostable packaging films containing vapor-phase and contact corrosion inhibitors for multi-metals. These specialty anticorrosion films contain biopolymers (10% or 30%). They also pass the NACE Vapor-Inhibiting Ability Test (NACE TM0208-2008).

\* For more information about the BioPreferred® Program, go to <http://www.biopreferred.gov>.

† Most of these products are intended to be composted in a commercial composting facility operated in accordance with best management practices. Check locally to see if such a facility exists in your community and if they will accept your specific product.

Cortec® Corporation is the global leader in innovative, environmentally responsible VpCI® and MCI® corrosion control technologies for the Packaging, Metalworking, Construction, Electronics, Water Treatment, Oil & Gas, and other industries. Headquartered in St. Paul, Minnesota, Cortec® manufactures over 400 products distributed worldwide. ISO 9001, ISO 14001, and ISO 17025 Certified.



Eco-Corr Film® ESD is a commercially compostable packaging film that offers both corrosion inhibitors and a permanent anti-static agent. It is especially useful in applications where corrosion protection and ESD (Electrostatic Dissipating) protection are needed simultaneously, such as packaging of electronic components. It conforms to the NACE Vapor-Inhibiting Ability Test (NACE TM0208-2008). It does not have ill effects on the solderability of PCBs and meets the requirements of IPC-J-STD-003C, Am1 (Edge Dip Solderability Tests).

The common characteristics among these diverse packaging films are that they are all made with certified compostable resins with functional additives, and they all meet standard characteristics for composting in industrial composting facilities. During the R&D of these films, laboratory composting was conducted to ensure the disintegration of these films met the standard on the compostable definition of plastics, a regulated claim (much like the regulation of the “organic” claim for food items).

In the United States, the ASTM D6400 Standard Specification for Labeling of Plastics Designed to be Aerobically Composted in Municipal or Industrial Facilities specifies the tests a film must pass in order to be called compostable for processing at municipal or industrial composting sites. In Europe, the counterpart of ASTM D6400 is EN 13432, Requirements for Packaging Recoverable through Composting and Biodegradation – Test Scheme and Evaluation Criteria for the Final Acceptance of Packaging. The two are very similar. In order to meet the compost disintegration requirements aspect of ASTM D6400, a plastic product needs to demonstrate that after twelve weeks in a controlled composting test, no more than 10% of its original dry weight remains after filtering with a 2.0 mm (0.08 in) sieve.

## Experimental Procedure

Thermophilic aerobic composting was conducted as follows (according to ISO 20200).

Compost Medium: Purchased garden type of compost; mixed with yard and food waste.

Testing Conditions: Temperature was  $58 \pm 2$  °C ( $136 \pm 36$  °F) (in calibrated ovens #1 and #2); RH was 50-55% (in compost medium).

Twice a week, the composting container was examined. The container weight was monitored, and lost moisture was replenished by spraying DI water. Progress in the film disintegration was photographed weekly. The testing was terminated when no film fragments were observable.



## Results

### Composting Results Summary

Films	Weeks to meet the compostable disintegration criteria (residues <10% original film mass, ASTM D6400)	Weeks to total disintegration (no observable film fragments)
Eco-Corr Film® 10	7 weeks	8 weeks
Eco-Corr Film® 30	7 weeks	8 weeks
Eco Wrap®	10 weeks	11 weeks
Eco-Corr Film® ESD	10 weeks	11 weeks

### Progress in Film Disintegration

Eco-Corr Film® 10



Day 1



Week 3





Week 6



Week 7



Week 8



Eco-Corr Film® 30



Day 1



Week 3



Week 6



Week 7





Week 8

Eco Wrap®



Day 1



Week 3





Week 6



Week 8



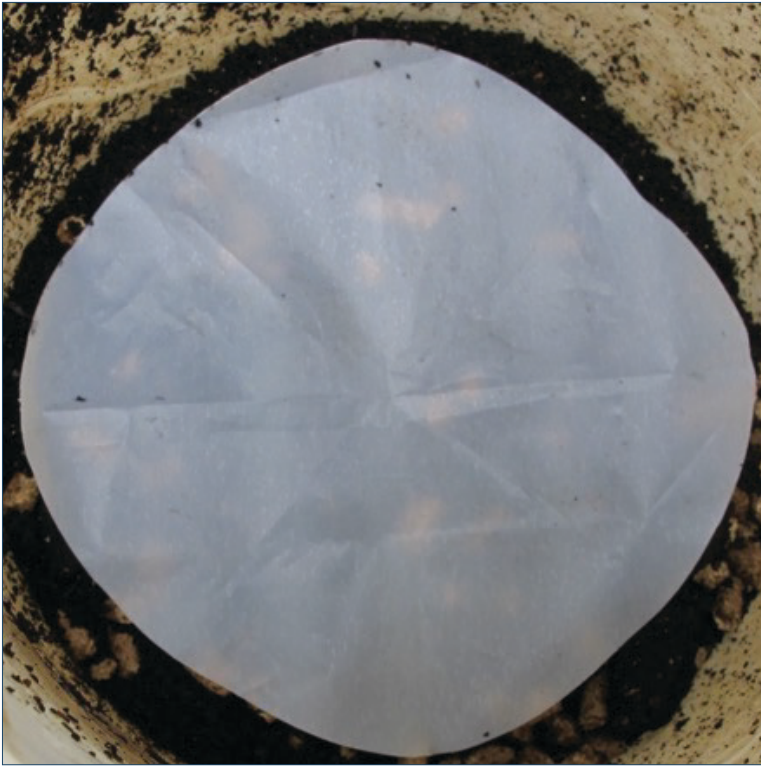
Week 10



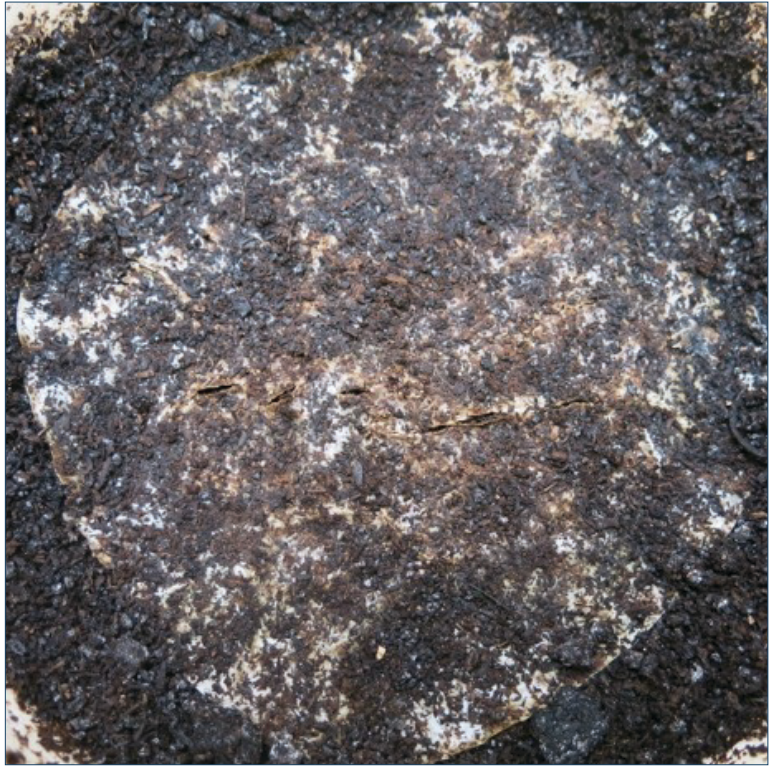
Week 11



# Eco-Corr Film® ESD



Day 1



Week 4



Week 6



Week 8





Week 9



Week 10



Week 11

## Conclusions

Eco Wrap®, Eco-Corr Film® 10, Eco-Corr Film® 30, and Eco-Corr Film® ESD meet the disintegration requirement specified by ASTM D6400. They all demonstrated complete disintegration within the time frame specified by ASTM D6400.

ASTM D6400 indicates that a film meets the compost disintegration criteria if it leaves less than 10% of the original film mass after 12 weeks of composting. All of the new Cortec® films listed above disintegrate faster than the requirement and leave no observable film fragments after less than 12 weeks of composting, some in as little as 8 weeks (two-thirds of the allowed time).



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*Environmentally Safe VpCI®/MCI® Technologies*