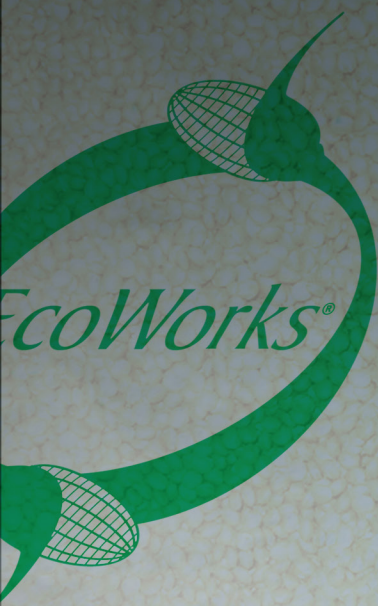


CORTEC CORPORATION (651) 429-1100 ST. PAUL, MN



GRADABLE

ST. PAUL, MN

# Cortec<sup>®</sup> Advanced Films





## Our Mission

*At Cortec® Advanced Films we are continually improving and expanding our facilities, equipment, processes, and ourselves to meet our customers' needs and expectations for consistent high quality film and bags delivered on time.*



Cortec® Advanced Films (CAF), in Cambridge, Minnesota, specializes in manufacturing Cortec's innovative Vapor phase Corrosion Inhibitor (VpCI®) films and offers customers complete converting, extruding, printing, and compounding capabilities.

CAF manufactures films and bags according to customer specification in terms of the product size and performance. CAF is very flexible when it comes to order size and meeting special customer requests for emergency delivery.

**At present, we have eleven extruders that make up:**

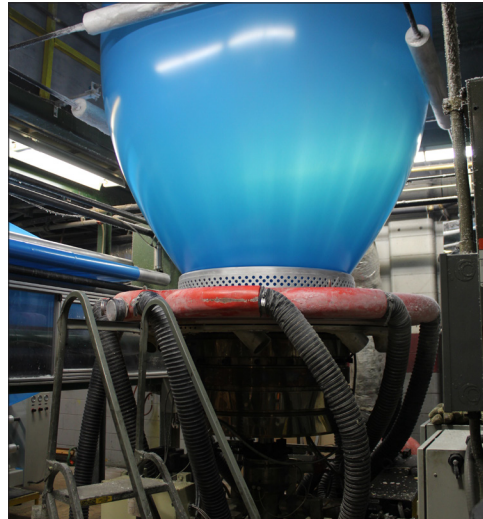
- Seven monolayer blown film lines from 3" to 360" (76 mm - 9144 mm)
- One co-extruded 3-layer blown film line
- Two compounding lines
- One pipestrip processing line

We also have seven bag machines, including one zip-lock bag machine. Additionally, we have a three color printing press.



## Extruding

The first step in manufacturing is the extrusion process, where raw resin is transformed into film. Our blown film extrusion lines can produce flat tubing, gusseted tubing, single-wound sheeting, J-sheeting, centerfold, and other configurations. We can add color concentrates, VpCI®, and other specialized additives such as static dissipatives, flame retardant, and ultraviolet inhibitors to exactly match your individual needs. We are capable of extruding linear low blends up to 100%. Sizes range from a 3" (76 mm) minimum layflat width up to a 30' (9 m) maximum width depending on film configuration and film thickness.



## Biodegradable/Compostable Packaging Films

Cortec® has pioneered two new technologies, Eco Film® and EcoWorks®. Eco Film® and EcoWorks® offer a certified biodegradable/compostable alternative to polyethylene films and bags while offering performance characteristics superior to LDPE and HDPE. Both product lines were designed with their entire life cycle in mind.

Eco Film® and EcoWorks® can also be combined with VpCI® technology (Eco-Corr®), ESD protection, even adhesives offering the most extensive biodegradable packaging lineup in the world.

EcoFilm® and EcoWorks® are available in all sizes and forms.

EcoOcean™ and Ecoworks® AD are Cortec's latest addition to this product line. Made from resin that is made with 77% renewable content and is biodegradable on land or marine environments, these products are designed for disposal in home or industrial compost facilities or by anaerobic digestion.





### Compounding Lines

To produce a high technology VpCI® film, Cortec® begins with a high quality concentrated Masterbatch. Our modern, high-tech compounding lines are on the cutting edge of the latest technology. From precise feeding systems to custom screw designs, Cortec® Compounding lines are second to none for ensuring the highest film product quality to our customers.

Cortec® Compounding lines will produce many different concentrated masterbatch products. We are also able to integrate our VpCI® technology into Biodegradable products. Cortec® has been a pioneer in the formulation and compounding of bio-based and/or biodegradable resins, with over fourteen years of experience in working with these materials. We offer a range of standard grades of our EcoWorks® compounded resins and will gladly make custom blends.

Compounding Capabilities: \*Contact Cortec® customer service for Compounding Capabilities



### Laboratory

Cortec® Advanced Films has a world-class laboratory that can perform testing compliant to Military Specifications (MIL-STD 3010) and ASTM standards (Section 8 Series D). The laboratory is located on-site at its blown film extrusion facility. All VpCI® film batches are tested for Vapor phase Corrosion Inhibitor (VpCI®). A Fourier Transform – Infrared (FT-IR) Spectrometer is used to examine VpCI® concentrations. Moisture levels are tested by Karl Fischer analysis for any VpCI® master batch production. Mechanical properties and coefficients of friction are measured with Instron precision instruments. Water vapor transmission rates and static decay rates for Electrostatic Discharge (ESD) films are determined using desiccant chambers designed for 0% RH.

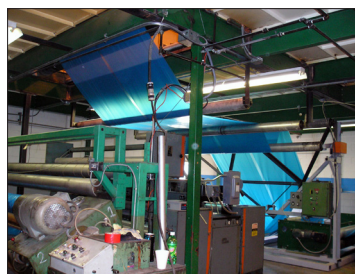
ESD films are manufactured in compliance with Military Specification MIL-PRF-81705D. Each ESD order is tested on-site for static decay and surface resistivity. Static decay testing complies with Federal Standard 101 Method 4046. Surface Resistivity exceeds ESD S 11.11 specifications.

Custom VpCI® films are developed and tested on site. Specific strengths, tear resistance, puncture resistance, tackiness, and slip qualities can be formulated according to the customer's needs.



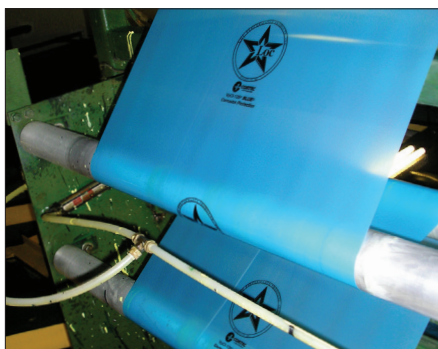
### Converting

In our converting department the film is made into bags in a wide variety of sizes and styles for packaging equipment, hardware, spare parts, or just about anything you require. Many different sizes of holes can be punched for venting, hanging, or carrying products. We are well equipped to manufacture the popular bag-on-roll and zip-lock bags. This department solves packaging requirements with creativity and experience.



### Printing

Our printing department can provide some of the most appealing packaging available. We can print materials from 4" (100 mm) up to 44" (1120 mm) wide, one to three colors.



## EXTRUSION CAPABILITIES

Film Products:		Available Additives:
Biobased Compostable films	Yes	VpCI® (Vapor phase Corrosion Inhibitors)
Certified Biodegradable/Compostable	Yes	
Coextruded blown stretch film	Yes	
EVA	Yes	Opaque Colors
Fractional Melt	Yes	Custom Colors
High Clarity	Yes	Tinted Colors
High Density Polyethylene	Yes	Anti-block
Industrial Clear	Yes	Flame Retardant
Liner	Yes	Static Dissipating
Linear Low Density	Blends up to 100%	Slip
Low Density Polyethylene	Yes	UVI
Random Reprocessed	Yes	
Shrink	Yes	
Skin Film	Yes	
Stretch Film	Yes	
Water Soluble Films (PVA)	Yes, limited sizes	

\* Complete compounding department for the production of masterbatches and concentrates.

## FILM CONFIGURATIONS

Film Products:	Size (Inches):	Size (Centimeters):
Flat Tubing	Width - 3" (76.2 mm) to 80" (2032 mm)	Width - 7.6 cm (76 mm) to 203.2 cm (2032 mm)
Gusseted Tubing	Layflat width - 9" (228.6 mm) to 180" (4572 mm)	Width - 22.8 cm (228 mm) to 457.2 cm (4572 mm)
Centerfold Sheeting	Width - 4.5" (114.3 mm) (opens to 9"/228.6 mm) to 80" (2032 mm) (opens to 160"/4064 mm)	Width - 11.4 cm (114 mm) (opens to 22.8 cm/228 mm) to 203.2 cm (2032 mm) (opens to 406.4 cm/4064 mm)
Single Wound Sheeting	Width - 4" (101.6 mm) to 80" (2032 mm)	Width - 10.1 cm (101 mm) to 203.2 cm (2032 mm)
Double Wound Sheeting	Width - 4" (101.6 mm) to 80" (2032 mm)	Width - 10.1 cm (101 mm) to 203.2 cm (2032 mm)
Slit-Gusseted Tubing (Sheeting)	Max width opens to 360" (9.1 m)	Width - 914.4 cm (9144 mm)
J-Sheeting		
M-Sheeting		
U-Sheeting		
Slit Seal	Width - 4.5" (114.3 mm) to 18" (457.2 mm)	Width - 11.4 cm (114 mm) to 45.7 cm (457 mm)

\* Contact Cortec® customer service for manufacturing capabilities of various film products.

## CONVERTING CAPABILITIES

BAGS		
Bottom Seal	Width - 4" (101.6 mm) to 48" (1219.2 mm) Length - 6" (152.4 mm) to 80" (2032 mm)	Width - 10.1 cm (101 mm) to 121.9 cm (1219 mm) Length - 15.2 cm (152 mm) to 203.2 cm (2032 mm)
Side Seal	Resealable Zipper Closure - 3.25" (82.55 mm) x 3" (76.2 mm) to 60" (1524 mm) x 42" (1066.8 mm) Heat Seal - 3.25" (82.55 mm) x 3" (76.2 mm) to 60" (1524 mm) x 54" (1371.6 mm)	Width - 8.25 cm (82.5 mm) x 7.62 cm (76.2 mm) to 152.4 cm (1524 mm) x 106.68 cm (1066.8 mm) Length - 8.25 cm (82.5 mm) 825 cm (8250 mm) x 7.62 cm (76.2 mm) to 152.4 cm (1524 mm) x 137.16 cm (1371.6 mm)

### OTHER BAG OPTIONS

Bottom Gusset	Venting (limited side seal capabilities)	Die Cut Handles
Resealable Zipper Closure		

### BAG ON A ROLL OR PERFERD SHEETS ON A ROLL

In-line	Width - 9" (228.6 mm) to 80" (2032 mm) Length - 6" (152.4 mm) to 9999" (253974.6 mm)	Width - 22.8 cm (228 mm) to 203.2 cm (2032 mm) Length - 15.2 cm (152 mm) - 25400 cm (254000 mm)
Off-line	Width - 9" (228.6 mm) to 80" (2032 mm) Length - 6" (152.4 mm) to 9999" (253974.6 mm)	Width - 22.8 cm (228 mm) to 203.2 cm (2032 mm) Length - 15.2 cm (152 mm) - 25400 cm (254000 mm)
* Minimum film thickness	0.75 mil	20 microns
* Maximum film thickness	10 mil Tubing and Sheeting	250 microns
* Maximum sealing thickness	24 mil (6 mil Gusseted Tubing)	600 microns (150 microns Gusseted Tubing)

### PRINTING IN-LINE

* One Color	* Three Color
Random	up to 44" / 1117.6 mm / 111 cm
* Web width - 9" to 30 ft (22.9 cm / 228.6 mm to 29.5276 ft / 9 m)	

### PRINTING OFF-LINE

* Three Color
up to 44" / 1117.6 mm / 111 cm



## LIMITED WARRANTY

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