



**COMPOSTABLE**  
**SAFE for ENVIRONMENT**  
**SAFE for PEOPLE**  
**BIODEGRADABLE**

We are often asked whether our X-pendable Filter cartridges may be safely put into landfills

This bit of information should address that concern



4790 NW 157th Street  
Miami Gardens FL 33014, USA  
305-430-0550  
[infor@Lawrence-Factor.com](mailto:infor@Lawrence-Factor.com)



**Biodegradable**



**Compostable**



“X-PENDABLE  
CARTRIDGES  
ARE BASED  
ON THESE  
CELLULOSIC  
PLASTICS”

Thermoplastic biodegradable fibers include those fibers which are both thermoplastic and biodegradable, that is that can be broken down in the presence of microbial enzymes by biologic processes.

Non-limiting examples of suitable thermoplastic biodegradable fibers include lower alkyl cellulose esters, like cellulose acetate, and triacetate cellulose, polylactic acid, starch, polyvinyl alcohol (PVA), chitosan, and PHBV (copolymer of polybetahydroxy butyrate and betahydroxyvalerate).

The proprietary formula used in our X-pendable Cartridge shell is based on these cellulosic plastics.

Compostable and biodegradable compositions of a blend of natural cellulosic and thermoplastic biodegradable fibers.

Kermit E. Duckett (et al). The University of Tennessee Research Corporation. Priority 1996-01-04 • Filed 1996-01-04 • Granted 1998-07-21 • Published 1998-07-21

## TESTED PLASTICS

The prepared plastic materials were tested for biodegradability/ compostability of the textile fibers. The two standard test methods used for this were AATCC (American Association of Textile Chemists and Colorists) 30-1988 ("Anti-fungal Activity, Assessment on Textile Materials: Mildew and Rot Resistance of Textile Materials") and ASTM D5209-91 ("Standard Test Method for Determining the Aerobic Biodegradation of Plastic Materials in the Presence of Municipal Sewage Sludge").

## RESEARCH



**“...IS COMPLETELY DESTROYED  
IN SOIL IN LESS THAN 1 YEAR”**

Since its initial commercial development from cellulose and acetic anhydride/acetic acid in the beginning of the 20th century, this cellulosic base material has been successfully and safely used in many important applications, such as photography film, in textiles, and cigarette filter. If it was harmful to human health, it would not have been used in cigarette filters, diapers, and in surgical products.

Our proprietary blend is a biodegradable thermoplastic, its degradation by biological agents highly depends on the degree of esterification of hydroxyl groups of cellulose (i.e.,  $-OH$ ) with acetic acid/anhydride. Generally, it is a compostable polymer that is completely destroyed in soil in less than one year.

## FURTHER READING

### Articles

#### [Biodegradable Plastics Based on Cellulose Acetate](#)

Alexander Ach  
Journal of Macromolecular Science, Part A  
Volume 30, 1993 - Issue 9-10  
**Published online:** 22 Sep 2006

#### Article

#### [Biodegradability of Cellulose Acetate Plasticized with Citrate Esters](#)

Vatsal P. Ghiya et al.  
Journal of Macromolecular Science, Part A  
Volume 33, 1996 - Issue 5  
**Published online:** 22 Sep 2006

#### Article

#### [Biodegradation of Cellulose Acetate by \*Neisseria sicca\*](#)

Kiyofumi Sakai et al.  
Bioscience, Biotechnology, and Biochemistry  
Volume 60, 1996 - Issue 10  
**Published online:** 12 Jun 2014