



— R E G R O U N D —

ecoen
by Huvis

Huvis brings sustainability to you with
biodegradable polyester.

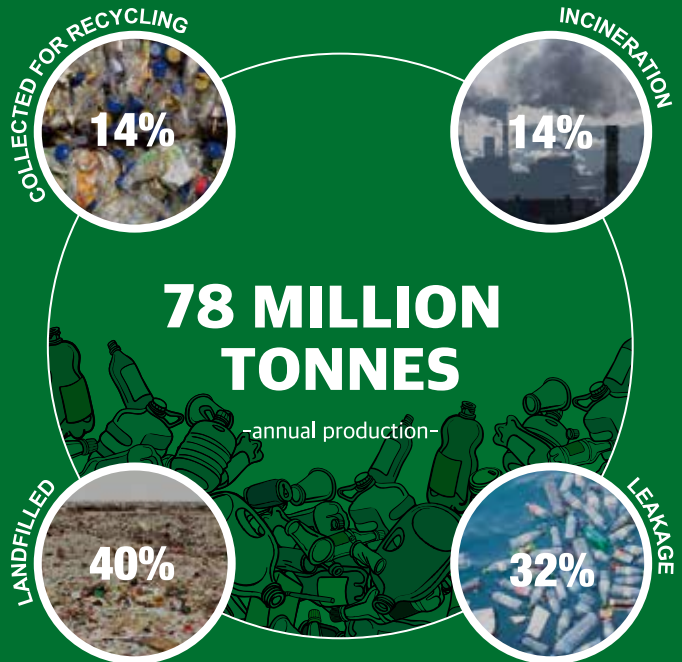
Respect for nature, that is why we developed ecoen.

Why Is Biodegradation Necessary?

Only 14% of the world's plastics are recycled, and 72% are either landfilled or never collected, causing environmental pollution.

In the United States, the country with the largest waste fiber, more than 60% is landfilled.

The amount of waste fiber generated in Korea has also increased more than 6 times in the past two years.



Source : The New Plastics Economy—Rethinking the future of plastics, Ellen MacArthur Foundation and McKinsey & company

What Is ecoen?

It is a biodegradable polyester fiber made by applying the biodegradable material independently developed by Huvis, and we are custom-producing filament yarns and staple fibers suitable for post-processing applications.



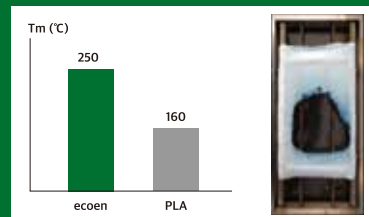
Biodegradable within 3 years when landfilled



The same physical properties as general polyester fibers



Excellent heat resistance compared to PLA



ecoen Life Cycle

REGROUND

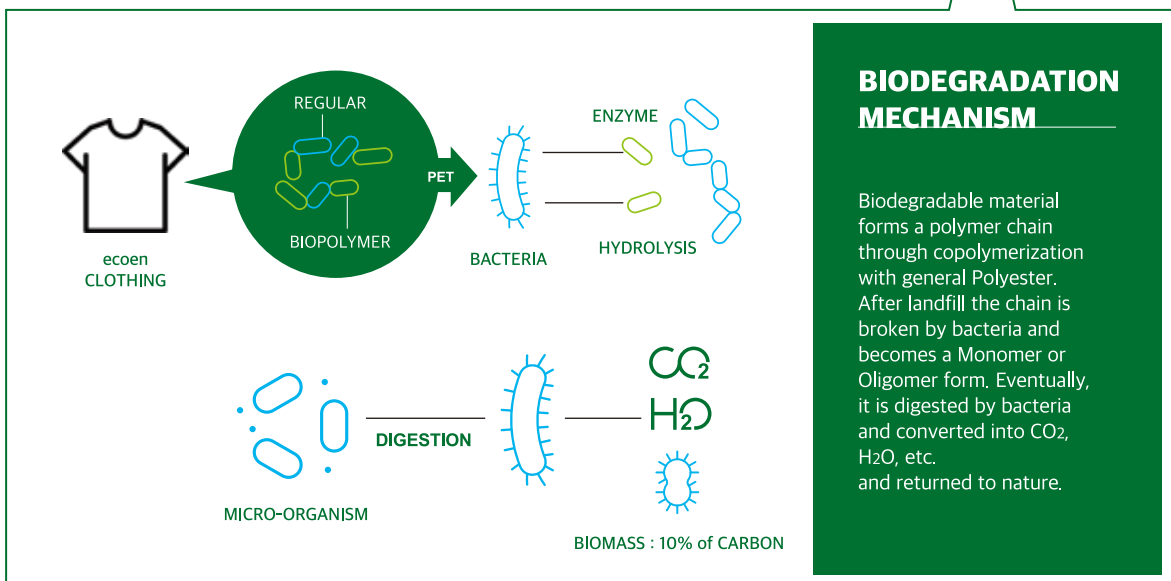
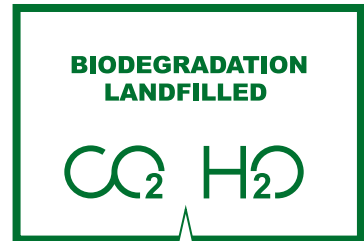
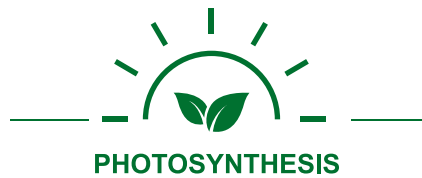
Huvis biodegradable fiber(ecoen) is heat-resisting, and bio-degradable by micro-organism.



POLYESTER
Reg / Recycle / co-Polyester



BIO-PLASTIC



BIODEGRADATION MECHANISM

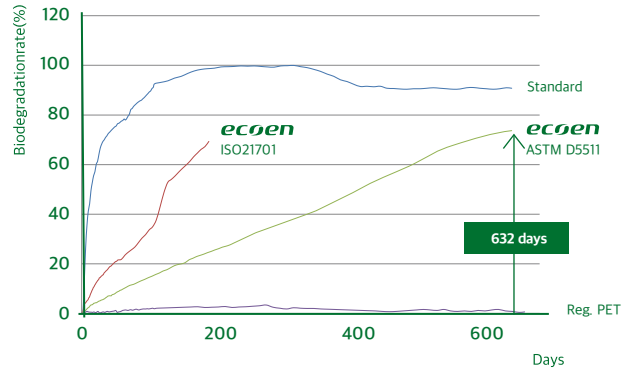
Biodegradable material forms a polymer chain through copolymerization with general Polyester. After landfill the chain is broken by bacteria and becomes a Monomer or Oligomer form. Eventually, it is digested by bacteria and converted into CO₂, H₂O, etc. and returned to nature.

Biodegradability

The biodegradability of ecoen was compared with that of cellulose as a reference sample and general polyester.

According to the ISO evaluation standard (ISO21701), it showed 61.7% biodegradability after 180 days.

According to ASTM evaluation standard (D5511), it showed 76.0% biodegradability after 632 days.



Test Method	Standard cellulose	ecoen
ISO 21701(180 Day)	92.3%	61.7 %
ASTM D5511(632 Day)	83.5%	76.0 %

Safety

ecoen do not contain harmful substances, and the safety of residues after biodegradation has been tested.

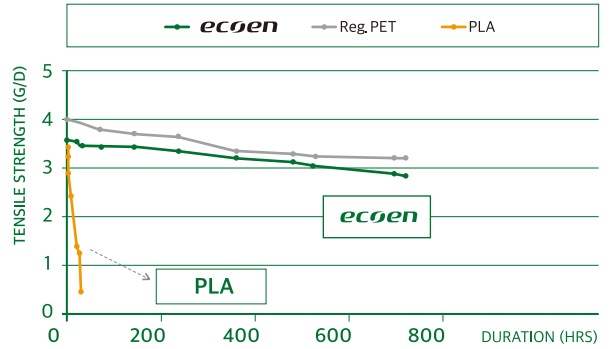
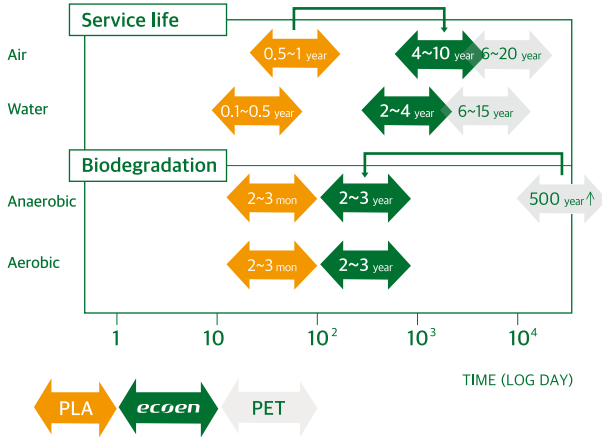
Harmful substances	N.D
Cadmium (Cd)	N.D
Chromium (Cr)	N.D
Lead (Pb)	N.D
Mercury (Hg)	N.D
Nickel (Ni)	N.D
Copper (Cu)	N.D
Zinc (Zn)	N.D
Arsenic (As)	N.D

OECD 208		Blank / Standard	Blank / ecoen	
White radish				
Barley				
		Blank	Standard	ecoen
Radish	Germination rate(%)	100	80	100
	Shoot weight(g)	0.228	0.243	0.250
Barley	Germination rate(%)	100	100	100
	Shoot weight(g)	0.122	0.136	0.129

Durability

REGROUND

Huvis ecoen has 3.8 times longer service life and excellent heat resistance than PLA fiber.



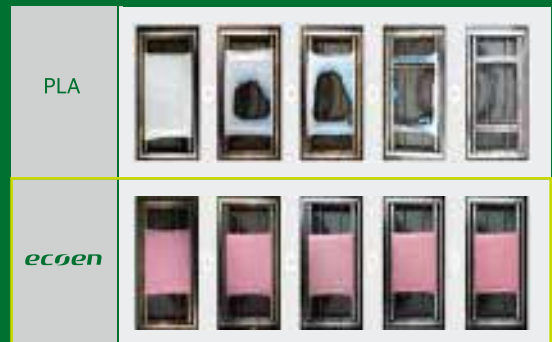
	Reg. PET	ecoen	PLA
Test condition	80, 90, 95°C x 95%RH		65, 70, 80°C
Service Life(yrs)	5.4	4.8	1.3
Comparison	4.2	3.8	1.0

Heat Resistance

It shows better performance than PLA in the heat resistance test, so it can be used for clothing.

PLA is deformed at 150°C or higher, whereas ecoen has excellent shape stability even at high temperatures of 190°C or higher.

It can be used as a textile for clothing that requires high heat processing such as dyeing and ironing.



Fiber	Tm	Heat Resistance
ecoen	230~250°C	190°C ↓
PLA	150~160°C	140°C ↓

APPLICATION

Biodegradable polyester ecoen can be used for a variety of application



Padding

Blanket
Pillow
Furniture
...



Apparel

Clothes
Backpack
Shoes
...



Agricultural

Mulching paper
...



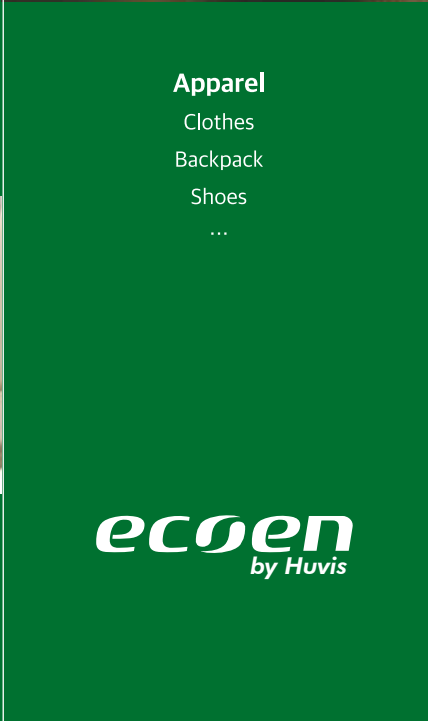
Industrial

Building interior
Wallpaper
Banner
...



Automotive

Seat cover
Filter
...



with Brand



HUVIS BRINGS
SUSTAINABILITY TO YOU WITH
BIODEGRADABLE POLYESTER



IS THERE POSSIBILITY TO BE DEGRADED DURING STORAGE PERIOD?
WHY ecoen HAVE LONGER DURATION OF BIODEGRADE COMPARED TO PLA?

1. Service life of ecoen is about 90% of ordinary Polyester.
There won't be issue during storage period related with biodegrade.
2. ecoen is designed to improve durability and thermostability than PLA.
Biodegradation become slow as PET and Bioplastic are copolymerized to have enough service life.



IS ecoen BIODEGRADED IN SEA-WATER CONDITION?

ecoen haven't officially been tested for marine biodegradability.
However, it could be biodegraded with longer duration than landfill based on our research.



IS ecoen BIODEGRADED IN NORMAL LANDFILL CONDITION?

ecoen could be degraded even In normal landfill condition.
However, biodegrade duration in normal landfill could be longer(10~20 times) than tested condition.



ANY IMPACT FROM ADDITIVE FOR BIODEGRADABILITY OF ecoen?

1. Biodegradability remained same after post-process(dyeing/alkali finish)
However, we recommend to use eco-friendly additive
2. In case of textile coating or lamination, fiber only is biodegraded.

ecoen by Huvis

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biodegradable polyester.

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Scan ecoen
on on your
phone

